Stormwater Control Plan

For

831 Water Street Affordable Housing

831 Water Street
Santa Cruz, California

By: Matthew Regan
Reviewed By: Richard Tso, RCE #60628

September, 2021

Job # 20035

IFLAND ENGINEERS
Civil Engineering ■ Structural Design ■ Land Development

5300 Soquel Avenue Suite 101
Santa Cruz, CA 95062
(831) 426-5313 FAX (831) 426-1763
www.iflandengineers.com

Contents

I. Introduction

The purpose of this report is to outline the design methodology used in sizing the stormwater mitigation facilities for the subject project that are consistent with Chapter 6B of the Best Management Practices Manual for the City's Stormwater Management Program. The City requirements are based on the minimum design standards from Chapter E.12.d "Source Control Measures" of the State of California General Permit for Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (Water Quality Order No. 2013-0001-DWQ) and the Central Coast Post-Construction Storm Water Management Requirements for Development Projects adopted by the Central Coast Regional Water Quality Control Board (Resolution No. R3-2013-0032).

II. Project Site Assessment Summary

A. Site Topography

Existing elevations onsite vary from approximately 82' at the northeast corner, to 75' near the southwest corner, with slopes generally less than 2%. The site is currently developed with a car wash and single level strip center along the northerly property line, with associated parking and vehicular access along the southerly boundary parallel with Water Street, which descends past the site from east to west. A retaining wall along the back of sidewalk supports the project site above.

Figure 1 – Site Location Map
Not to scale – Source: City of Santa Cruz GIS, 2020

B. Geology and soil types

The NRCS classifies soil in the site area as the following map unit symbols:

- 129 – Elder sandy loam, 0 to 2 percent slopes (18% of site)
- 161 – Pinto loam, 0 to 2 percent slopes (47% of site)
- 170 – Soquel loam, 0 to 2 percent slopes (26% of site)
- 178 – Watsonville loam, 0 to 2 percent slopes (9% of site)

The NRCS estimates saturated conductivity (Ksat) of the limiting layer of soil at varying levels ranging from approximately 8 inches/hour in the area of Elder sandy loam (southeast corner), to approximately 0.1 inches/hour in the area of Watsonville loam (south-center and southwest corner). The limiting layer of soil is taken to be at a depth of 4 feet below grade. See Appendix B for NRCS Web Soil Survey Data.

As of the date of this report, a Geotechnical Investigation has not yet been performed.

C. Hydrologic Considerations

The site is located in a fully developed area consisting of single-family residences and the project site as described above. There are no natural features such as wetlands or springs and no drinking water wells are located in the vicinity of the project site.

D. Natural Areas

As the site has been previously developed as a retail center, there are no naturally undisturbed areas on the site, which is covered by buildings and paved parking/access areas.

E. Other Site Features and Constraints

There are no known sources of off-site run-on to the property. The site has a paved drainage swale along the southerly boundary behind the retaining wall that supports the site above Water Street below. A catch basin in the southwest corner of the site has a vertical pipe extending downward to a point of undetermined connection/release. No evidence was found of a through-curb drain and a nearby catch basin behind the sidewalk only has an incoming pipe from a direction that implies it does not emanate from the parking lot. However, given the proposed redevelopment of the site, this catch basin and down-drain would be removed so its functionality will be replaced and/or moved elsewhere on the site. A public storm drain system exists in Water Street that could provide a connection point for discharge stemming from the project site.

As the site is located within an Urban Sustainability Area (USA), it qualifies for certain reductions and/or exemptions for stormwater retention and detention. Retention is required only to match the retention rate of the existing site, which is none as the site is nearly 100% impervious and all runoff is collected and conveyed off-site without any retention.

As runoff from the site will be discharged directly to the concrete lined Branciforte Creek via closed pipe systems, the project also qualifies for an exemption from peak flow management requirements (detention).

III. Project Storm Water Performance Criteria and Drainage Management

A. Development Area and BMP Requirement Tier

Based on the area breakdown provided in Appendix A of this report, the project is considered a Tier 4 category project.

B. Drainage Management Areas (DMA's)

Based upon site improvements and drainage requirements, the site is in two DMAs (see Appendix C).

IV. Site Design and SCM's

A. Summary of Site Design and Runoff Reduction Measures included in the Project (Tier 1)

To minimize runoff and pollution from the development, a number of design considerations and Low Impact Development (LID) methods have been implemented including:

1. Parking has been limited to only the required number of spaces and is provided in an underground garage. Vehicle stackers are proposed to further reduce the footprint needed for required parking.
2. Patios and walkways will drain into landscaped areas for treatment to the extent feasible.
3. Site runoff will be directed into a biotreatment facilities located on grade alone the northern side of the site, as well as a mechanical filtration system located in the underground parking garage, prior to discharge from the site.
4. Minimize storm water runoff by implementing:
    a. Direct runoff from walkways and/or patios onto vegetated areas safely away from building foundations and footings, consistent with the CBC.
    b. Limit new impervious surfaces to those areas within the footprint of existing impervious coverage.
    c. Provide landscaping in areas that are currently impervious.

The project will also implement a number of source control measures to address & reduce potential pollution sources created as a part of this project. The source control measures used are found in the following table.

Pollution Source	Y/N ?	Source Control Measures
Accidental Spills or Leaks	Y	- Owner/operator shall prepare a spill prevention plan to be located onsite - Employees shall be trained on spill prevention and cleanup - Spill cleanup materials shall be located onsite
Interior Floor Drains	Y	- All interior floor drains will be connected to sanitary sewer system
Parking/Storage Area Maintenance	Y	- Underground parking and storage areas shall direct wash down runoff to the sanitary sewer system

Indoor and Structural Pest Control	Y	- Owner/operator shall incorporate integrated pest management practices into maintenance plan
Landscape/Outdoor Pesticide Use	Y	- Owner/operator shall incorporate integrated pest management practices into maintenance plan - Owner/operator shall minimize pesticide use onsite - Pesticides shall be applied with a handheld sprayer to minimize quantity used and spray drift - Pesticides shall not be applied prior to rain - Landscape areas shall be maintained per project O&M Manual and CASQA BMP Fact Sheets SC-41 Building Grounds & Maintenance & SC-73 Landscape Maintenance
Pools, Spas, Ponds, Fountains - Water Features	N	- No water features onsite
Restaurants, Grocery Stores, Food Service Operations	Y/N	- Use of Retail space unknown at this time - Waste from on-site food service facilities shall be directed to grease traps and the sanitary sewer system
Refuse Areas	Y	- The refuse area will be covered and drained to sanitary sewer
Industrial Processes	N	- No industrial processes will occur onsite
Outdoor Storage of Equipment or Materials	N	- No outdoor storage of equipment or materials will occur onsite
Vehicle and Equipment Cleaning	N	- No vehicle or equipment cleaning will occur onsite
Vehicle and Equipment Repair and Maintenance	N	- No vehicle or equipment maintenance will occur onsite
Fuel Dispensing Areas	N	- No vehicle or equipment fueling will occur onsite
Service Docks	N	- No service docks are proposed
Fire Sprinkler Test Water	Y	- Fire sprinkler test water shall not be released to the storm drain system - A fire sprinkler test drain will be installed and connected to the sanitary sewer system
Drain or Wash Water from Boiler Drain Lines, Condensate Drain Lines, Rooftop Equipment, Drainage Sumps and Other Sources	Y	- Condensate lines will discharge to the sanitary sewer or landscape areas
Unauthorized Non-stormwater Discharges	Y	- Storm drains will be painted "NO DUMPING - DRAINS TO BAY. NO TIRE - DESECHO CORRE AL MAR"
Building and Ground Maintenance	Y	- Building and landscape shall be maintained per project O&M Manual and CASQA BMP Fact Sheets SD-20 - Pervious Pavement, SC-41 - Building Grounds & Maintenance, SC-43 - Parking Area Maintenance, SC-73 - Landscape Maintenance & SC-74

Table 2 – Source Control Measure

B. Description of each SCM

- As the site is in two DMAs, surfaces will drain to four SCMs. SCM-A is an in-ground biotreatment pond that treats runoff from hardscape on the northern side of the site and the roofs. The second SCM, SCM-B, is a mechanical filtration system located in the parking garage that treats the hardscape on the southern side of the site. See Appendix C: DMA & SCM Map for a visual breakdown of the DMAs and SCMs.

- Tier 2: Water Quality Treatment – given that on-site retention is not required, nor is it feasible given the extent of the underground parking garage, filtration of runoff will be provided via non-retention based systems (biotreatment facilities and a mechanical filtration system).

- Tier 3: Runoff Retention – the site is located within a USA and the existing site does not provide any on-site retention. Therefore, no on-site retention is required.

- Tier 4: Peak Flow Management – with site runoff being conveyed in a continuous pipe system to the concrete-lined Branciforte Creek, the project qualifies for an exemption from peak flow management. As the project proposes no increase in impervious area coverage from existing conditions, no downstream modifications to existing public drainage infrastructure are warranted and no downstream assessment has been performed.

V. BMP Operations and Maintenance Plan

An Operations and Maintenance Plan and Maintenance Agreement will be created during future phases of the project. The maintenance agreement will set forth a schedule of maintenance tasks to be performed by the building maintenance staff, which is required for maintaining the functionality of the onsite stormwater facilities. It will also specify procedures for yearly inspections and record keeping of inspections, maintenance and repairs performed.

APPENDIX A
STORM WATER AND LOW-IMPACT DEVELOPMENT BMP REQUIREMENT WORKSHEET

APPENDIX A
STORM WATER AND LOW-IMPACT DEVELOPMENT BMP REQUIREMENT WORKSHEET

How to Use This Worksheet

The City's Storm Water BMP requirements are based on project type, proposed impervious area, and location within the watershed. This worksheet was developed to help permit applicants determine and meet storm water BMP requirements applicable to a proposed development or redevelopment

1 - Download this fillable form online at **www.cityofsantacruz.com/LID**
2 - Fill out the Worksheet to determine what stormwater BMP requirements apply to a proposed project.
3 - Attach Worksheet and additional documentation required as listed in the City Storm Water Best Management Practices for Private and Public Development Projects to plans for review by the Department of Public Works
4 - Please contact the Public Works Environmental Project Analyst at 420-5160 if you have any questions on completing the worksheet.

Project Address: 831 Water Street, Santa Cruz **Bldg Permit #:** TBD

A - Project Type

Check project type that applies:

☐ Single Family Home ☑ Multi-family, Commercial, Industrial, Public facilities

Check development type that applies:

☐ New Development ☑ Redevelopment / Remodel

B - Proposed Development Area and Impervious Area:

Pre-project impervious surface area:	39,659	sq ft
Post-project impervious surface area:	37,258	sq ft
Amount of impervious surface area that will be **replaced**:	37,258	sq ft
Amount of new impervious surface area that will be **created**:	0	sq ft
Reduced Impervious Area Credit:	2401	sq ft
New and Replaced Impervious Area =	**37258**	**sq ft**
Net Impervious Area =	**34857**	**sq ft**

(Net Impervious Area = Impervious Area created + Impervious Area replaced - Reduced Impervious Area Credit)

C - Post-Construction BMP Tier requirement:

Check Project Type and Impervious Area (from calculations above) that applies.
BMP requirements are cumulative (e.g. a project subject to BMP Tier 3 is also subject to Tiers 1 and 2), permit review fees are not cumulative.
Projects requiring a Stormwater Control Plan will need to involve a civil engineer.

SINGLE-FAMILY HOMES	BMP TIER	Permit Review Fee	Stormwater Control Plan required?
☐ Single-family Home with Net Impervious Area **< 15,000 sf**, **please consult Chapter 6A, BMPs for Single-Family Homes on Small Lots**	**N/A**	$0	No
☐ Net Impervious Area **≥ 15,000 sf**; New and replaced impervious area **< 22,500 sf**	**3**	$330	Yes
☐ New and replaced impervious area **≥ 22,500 sf**	**4**	$550	Yes

MULTI-FAMILY, COMMERCIAL, INDUSTRIAL, PUBLIC FACILITIES	BMP TIER	Permit Review Fee	Stormwater Control Plan Required?
☐ New and Replaced Impervious Area **≥ 2,500 sf**; Net Impervious Area **< 5,000 sf**	**1**	$0	No
☐ Net Impervious Area **≥ 5,000 sf**; New and Replaced Impervious Area **< 15,000 sf**	**2**	$330	Yes
☐ New and Replaced Impervious Area **≥ 15,000 sf** but **< 22,500 sf**	**3**	$550	Yes
☑ New and replaced impervious area **≥ 22,500 sf**	**4**	$550	Yes

If the proposed project is only subject to BMP Tiers 1 or 2, skip to Step F.

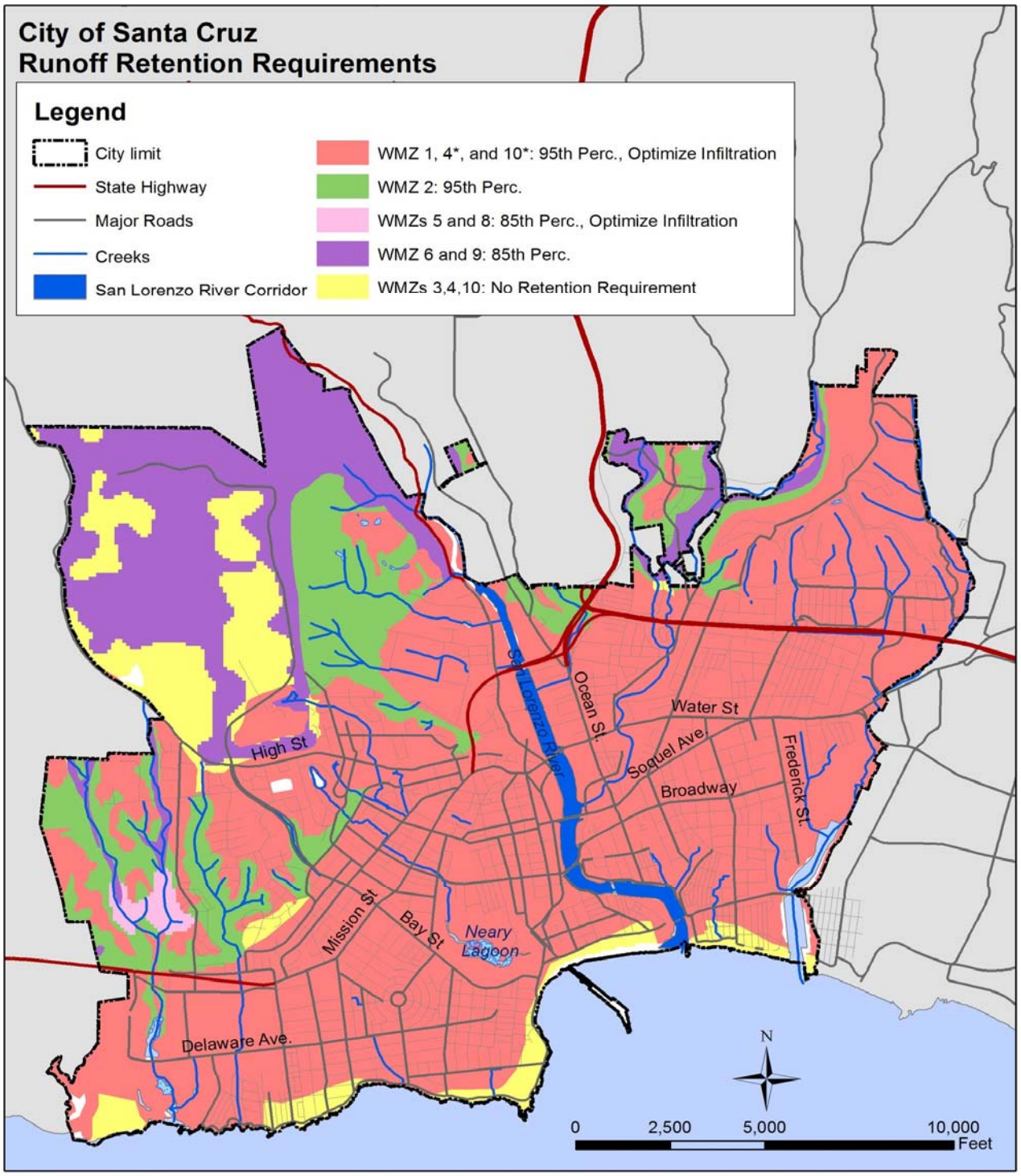
D - Watershed Management Zones - For projects subject to Tiers 3 Post-Construction BMP requirements only.

Watershed Management Zones are viewable online on the City of Santa Cruz GIS website at: http://gis.cityofsantacruz.com/gis/index.html

Watershed Management Zones and associated Tier 3 (Runoff Retention) Post-Construction BMP requirements

If Tier 3 BMP requirements are applicable to the project, check the watershed management zone area where the project is located.

- ☑ WMZ 1, and portions of 4, and 10 overlying groundwater basin
- ☐ WMZ 2
- ☐ WMZ 5 and 8
- ☐ WMZ 6 and 9
- ☐ WMZ 3, 4 and 10



E - Special Circumstances - For projects subject to Tiers 3 and 4 Post-Construction BMP requirements only.
Check if special circumstance applies to the project

- ☑ Highly Altered Channel and Intermediate Flow Control Facility
- ☑ Urban Sustainability Area

F - Additional Stormwater BMP Requirements for Multi-family, Commercial and Industrial projects
Check if additional BMP requirements apply to the project

a) State Construction Activities Storm Water General Permit

- ☐ Construction activity resulting in land disturbance of one acre or more, or part of a larger common plan of development

b) Additional Source Control BMP requirements for specific facilities

- ☐ Commercial or industrial facility
- ☐ Material Storage Areas
- ☐ Vehicle fueling, maintenance and wash areas
- ☐ Equipment and accessory wash areas
- ☑ Interior and parking garage floor drains
- ☑ Parking areas
- ☐ Pools, spas and other water features
- ☑ Trash Storage Areas
- ☐ Restaurants and food processing or manufacturing facilities
- ☐ Miscellaneous drain or wash water

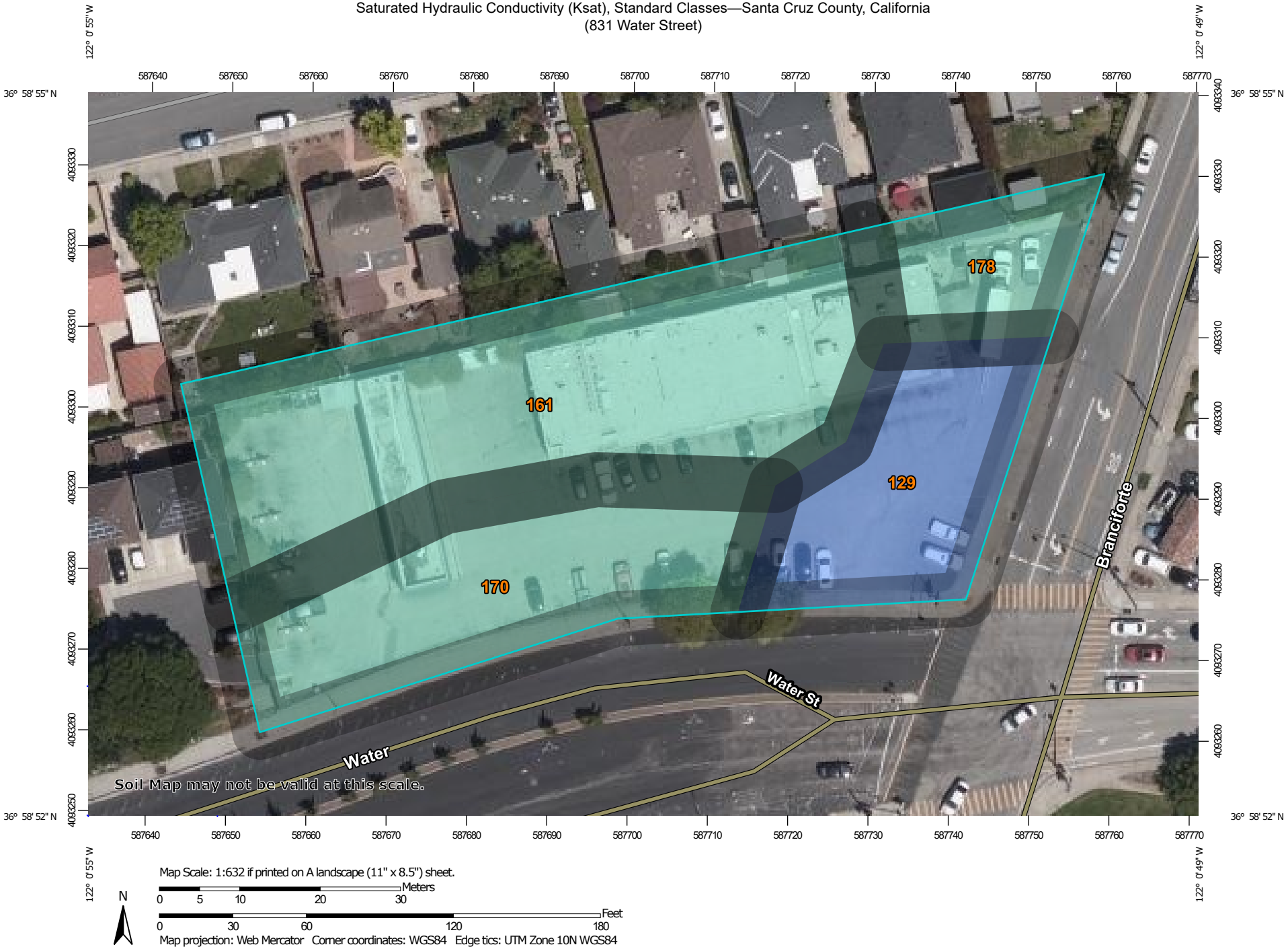
G - Complete if your project is <u>only</u> subject to Tier 1 Requirements - Site planning and LID design measures.
LID design measures shall be clearly marked on site plans

Check applicable boxes and provide short description of measure and location

- ☐ Conserve natural areas, riparian areas and wetlands
  Description: N/A, no natural areas exist on site.
- ☑ Concentrate improvements on the least-sensitive portions of the site and minimize grading
  Description: Improvements are contentrated to the extent feasible, new landscaped areas are being created by this project.
- ☐ Direct roof runoff into cisterns or rain barrels
  Description: N/A
- ☑ Direct roof downspouts to landscaped areas or rain gardens
  Description: Roof downspouts area directed to a biotreatment pond and flow-through planters.
- ☐ Use pervious pavement (pervious concrete or asphalt, turf block, crushed aggregate, etc.)
  Description: N/A, not feasible due to low infiltration and underground parking garage.
- ☑ Disperse runoff from paved areas to adjacent pervious areas
  Description: Runoff from paved areas is directed to a biotreatment pond were feasible.

APPENDIX B
NRCS WEB SOIL SURVEY DATA

Saturated Hydraulic Conductivity (Ksat), Standard Classes—Santa Cruz County, California
(831 Water Street)



Map Scale: 1:632 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available

Soil Rating Lines
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available

Soil Rating Points
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Santa Cruz County, California
Survey Area Data: Version 14, May 29, 2020

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

Date(s) aerial images were photographed: Apr 13, 2020—Apr 24, 2020

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.

Saturated Hydraulic Conductivity (Ksat), Standard Classes

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
129	Elder sandy loam, 0 to 2 percent slopes, MLRA 14	55.0000	0.2	18.0%
161	Pinto loam, 0 to 2 percent slopes	3.9603	0.5	46.9%
170	Soquel loam, 0 to 2 percent slopes	5.0754	0.3	25.6%
178	Watsonville loam, thick surface, 0 to 2 percent slopes	2.5193	0.1	9.4%
Totals for Area of Interest			**1.1**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits. The classes are:

Very low: 0.00 to 0.01

Low: 0.01 to 0.1

Moderately low: 0.1 to 1.0

Moderately high: 1 to 10

High: 10 to 100

Very high: 100 to 705

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 12

Bottom Depth: 36

Units of Measure: Inches

APPENDIX C
DMA & SCM MAP

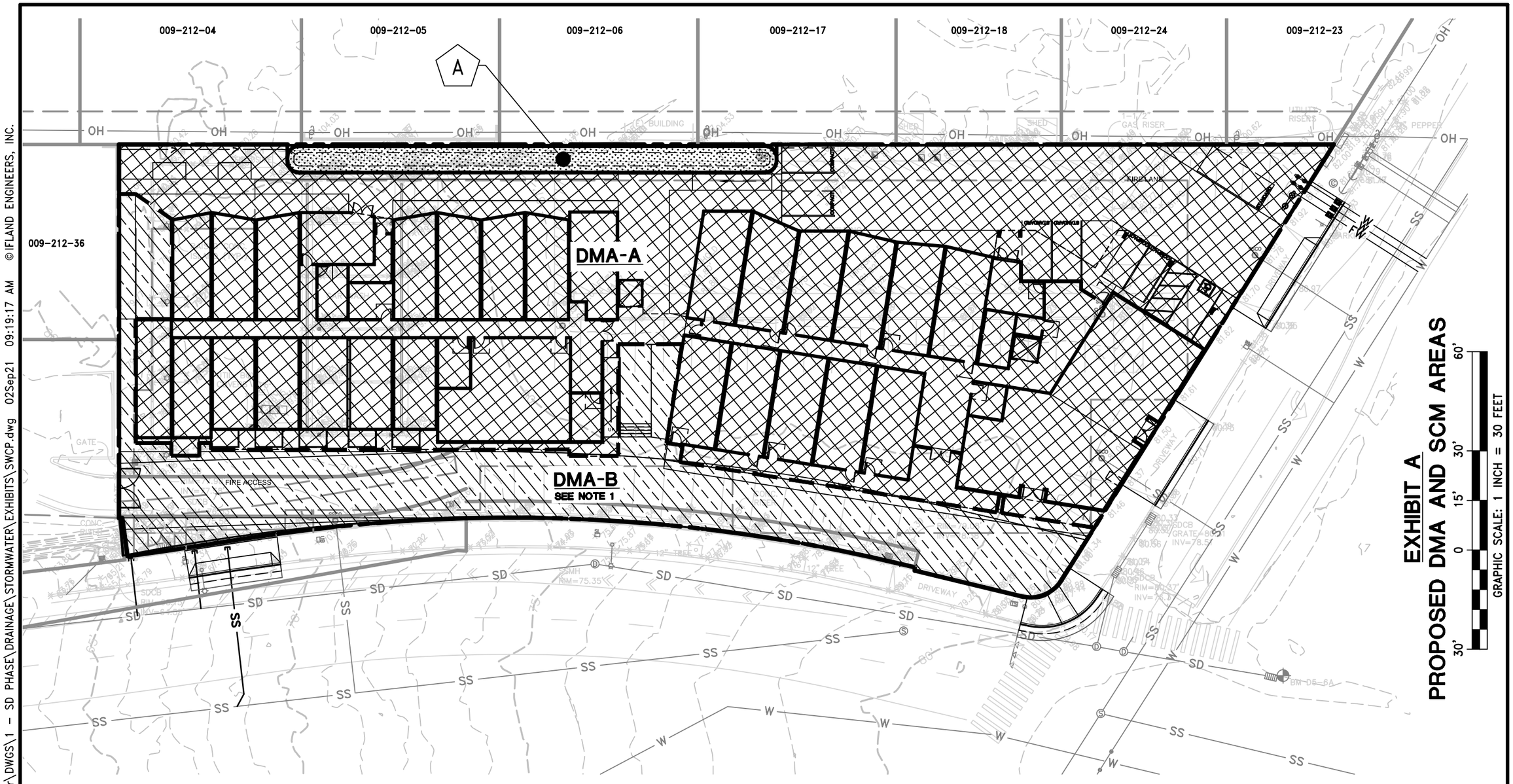


EXHIBIT A
PROPOSED DMA AND SCM AREAS

GRAPHIC SCALE: 1 INCH = 30 FEET

0 15' 30' 60'

0 30'

JOB NO.	20035	APN	009-212-30, 31, & 38
ADDRESS	831 WATER STREET, SANTA CRUZ, CA		
DRAWN	MR	DATE	9/2/21
SCALE	AS SHOWN	SHEET	1 OF 1

TREATMENT CONTROL MEASURE SUMMARY TABLE

DMA	DRAINAGE AREA (SF)	IMPERVOUS SURFACE (SF)	TYPE OF IMPERVIOUS SURFACE	REQUIRED TREATMENT AREA (SF)	PROVIDED TREATMENT AREA (SF)	REQUIRED FLOW CAPACITY (CFS)	PROVIDED FLOW CAPACITY (CFS)	PROPOSED TREATMENT CONTROL
DMA-A	30,613	29,205	ROOF/CONC/ AC PVMT	1,169	1,171	–	–	SCM-A BIOTREATMENT POND
DMA-B	7,630	7,420	CONC	–	–	0.03	0.042	SCM-B MECH. FILTRATION UNIT

NOTES:

1. TREATMENT FOR ALL IMPERVIOUS SURFACES IN DMA-B WILL BE PROVIDED VIA A MECHANICAL FILTRATION UNIT LOCATED IN THE PARKING GARAGE PRIOR TO DISCHARGE TO THE PUBLIC STORM DRAIN IN WATER STREET.

IFLAND ENGINEERS
CIVIL ENGINEERING ▪ LAND PLANNING ▪ STRUCTURAL DESIGN
6300 SOQUEL AVE, SUITE 101
SANTA CRUZ, CA 95062
TEL (831) 426-5313
FAX (831) 426-7763
www.iflandengineers.com