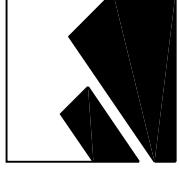


PRELIMINARY STORM WATER MITIGATION PLAN
NORTH RIVER APARTMENTS

SEPTEMBER 2016

CIVIL DESIGN CONSULTANTS, INC.
2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820



**STORM WATER CONTROL PLAN
FOR A REGULATED PROJECT**

NORTH RIVER APARTMENTS

*Located at
368 & 402 Petaluma Boulevard North
Petaluma, CA*

APN 006-163-040 & 041

Prepared for

A.G. SPANOS COMPANIES
10100 Trinity Parkway, 5th Floor
Stockton, CA 95219

SEPTEMBER 2016

Prepared by

*CIVIL DESIGN CONSULTANTS, INC.
2200 RANGE AVENUE, SUITE 204
SANTA ROSA, CA 95403*

CONTENTS

- 1 INTRODUCTION AND PROJECT DATA**
- 2 PROJECT DESCRIPTION AND SETTING**
- 3 LOW IMPACT DEVELOPMENT DESIGN MEASURES**
- 4 DRAINAGE DESIGN DOCUMENTATION**
- 5 SOURCE CONTROL MEASURES**
- 6 STORMWATER FACILITY MAINTENANCE**
- 7 CONSTRUCTION CHECKLIST**
- 8 CERTIFICATION**

ATTACHMENTS

- Existing Site Conditions**
- Proposed Site Conditions**
- Proposed Bio-retention Areas and DMAs**
- Proposed Bio-retention Details**
- Schematic Rainwater Storage Plan**
- Preliminary Courtyard Landscape Plans**
- E.12 Review Form**
- Post-construction Water Balance Calculator**

1 INTRODUCTION AND PROJECT DATA

The North River Apartments project site is within the permit boundary of the adopted NPDES MS4 Storm Water Permit which regulates discharges into the watershed with the intent to reduce storm water pollution and protect the water quality of our local creeks and waterways and continue to promote groundwater recharge. The City of Petaluma has been designated to comply with the Phase II rule because its population is between 10,000 and 100,000. This Stormwater Control Plan was developed to show compliance with its requirements.

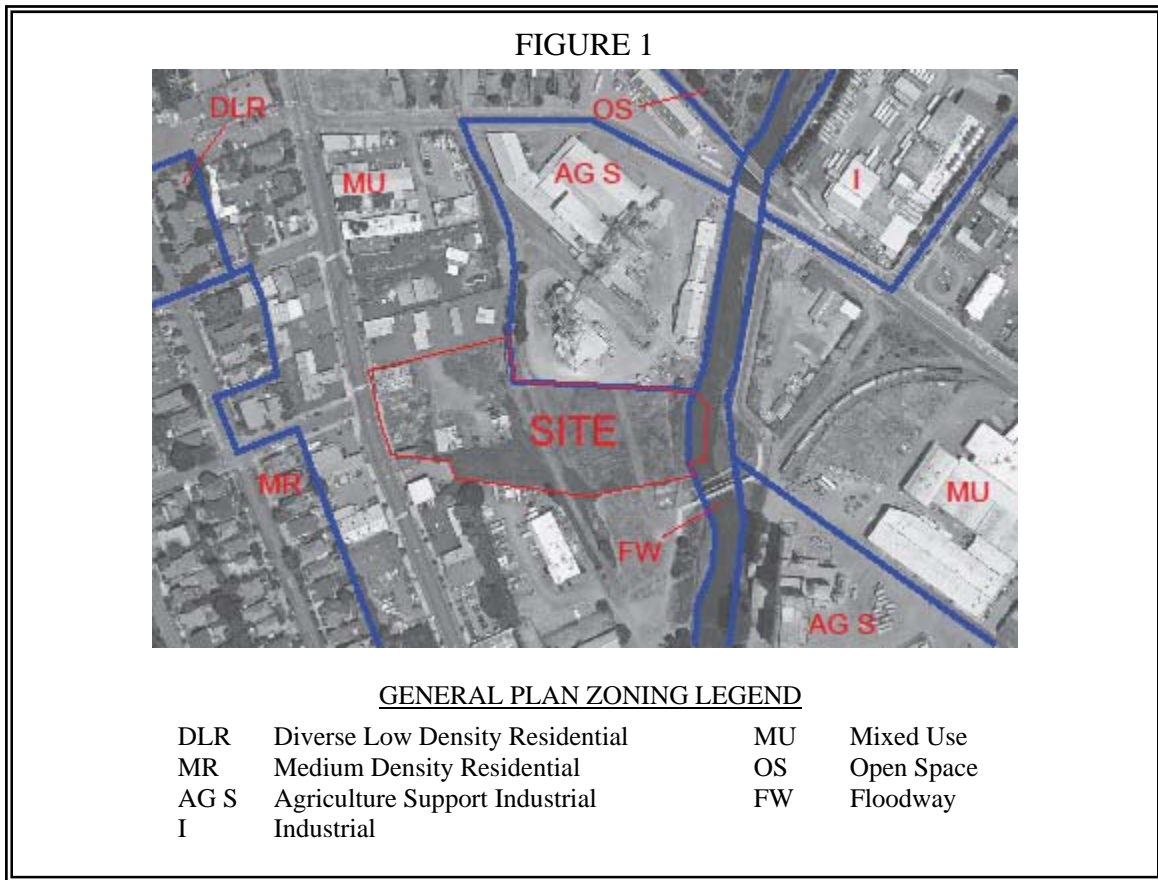
Table 1. Project Data Form

Project Name/Number	North River Apartments/PLSR-15-0015
Application Submittal Date	March 10,2016
Project Location	368 & 402 Petaluma Boulevard North Petaluma CA (APN 006-163-040 & 041)
Project Phase No.	N/A
Project Type and Description	Two 5-story buildings to contain 196 apartments and 7500 SF of commercial space.
Total Property Area	170,616 SF (3.92 AC)
Total Project Area	162,650 SF (3.73 AC)
Total New and Replaced Impervious Surface Area	146,680 SF (3.37 AC)
Total Pre-Project Impervious Surface Area	26,354 SF (0.60 AC)
Total Post-Project Impervious Surface Area	146,680 SF (3.37 AC)

2 PROJECT SITE AND DESCRIPTION

The proposed project site is located on the easterly side of Petaluma Boulevard North between East Washington Street and Lakeville Street in Petaluma, California and is adjacent to the Petaluma River. The property is comprised of 3.92 acres and is contained within two Sonoma County Assessor's Parcels (APN 006-163-040 and 041). The project area, which includes off-site improvements at the intersection of Oak Street and Petaluma Boulevard North and improvements to the Petaluma River pedestrian path, has a total area of 3.73 acres. This area does not include the 0.22 acres of on-site area located below the top of river bank, which shall not be disturbed during construction activities. The physical address of the project is 368 & 402 Petaluma Boulevard North, Petaluma California.

The adjacent land north of the property contains a car wash development. The industrial complex Hunt & Behrens Inc. lies northeast of the site. More industrial and commercial areas are located to the east, across the Petaluma River. Retail centers lie to the south and to the west, across Petaluma Boulevard North. Figure 1 provides an aerial view of the adjacent land uses and also contains an overlay of the General Plan Zoning designations of these areas.



The proposed North River Apartments project will be consistent with the current Mixed Use General Plan Designation. AG Spanos proposes to develop the 3.92 acres as an apartment complex with some retail spaces fronting Petaluma Boulevard North as a single, non-phased project. The proposed North River Apartments project will be constructing Water Street through the project and will extend Oak Street to the new portion of Water Street. The 196-unit development will have ground and podium level parking spaces within the buildings for residents and guests. Street parking will also be available. The proposed density is $45 \pm$ dwelling units per acre.

The project site currently contains an unoccupied building and an old sandwich shop, but is otherwise vacant. Another large building formerly sat between the two previously mentioned structures, but was recently torn down. The foundation of yet another structure remains today, behind the sandwich shop, and provides evidence of where this structure once stood. Some existing rail road tracks run through the property, as does a gravel road. The historical use of the land is unclear, but appears to not have been used for agricultural practices.

The terrain is relatively flat, with the exception of a steep drop off from Petaluma Boulevard North. The rest of the terrain gently slopes toward the existing rail road tracks or to the Petaluma River. The project site is tributary to the Petaluma River. Currently, there is no storm drain system located within the project site, which allows the stormwater runoff to ultimately sheet flow into the Petaluma River. The slope of the existing surface is approximately 1.5% and consists of primarily undeveloped land covered by native vegetation. Wetlands do not appear to be present on the site and there is no evidence that any runoff becomes concentrated within the project site except at the aforementioned railroad tracks. See the Existing Site Conditions attachment for topography of the existing site.

The North River Apartments project proposes to increase the impervious surface area of the 3.92 acre project site from 0.60 acres to 3.37 acres. The large increase in impervious area proposed with this urban project limits the possible locations for bio-retention facility construction, and is the project's primary constraint. There is a limited amount of proposed pervious project areas being considered and analyzed to determine if bio-retention facility construction is feasible.

Bio-retention will be constructed in the proposed tree wells along Oak Street and Water Street for to treat stormwater from the newly constructed public roads. Runoff from the proposed streets and sidewalk areas will sheet flow to the gutter pan where drainage will be transported to one of many proposed tree wells via curb openings. Drainage will then be treated by infiltrating through a mixture of planting soil mix and structural soil. An area below the perforated pipe will provide stormwater volume capture before entering the underground storm drain system. The location and details of the bio-retention facilities proposed with the North River Apartments project are located on sheets 3 and 4 of the attachments.

There is an area located at the northwest portion of the project within the landscaped area adjacent to Oak Street that could be utilized as bio-retention for treating runoff from Building B. Unfortunately, consuming a large area for bio-retention along the frontage of Petaluma Blvd. North is not an ideal design feature, as building facade is the preferred

streetscape view for pedestrians and automobiles. This area will be better utilized as a future building site with the ultimate buildout of the Petaluma Blvd. North street frontage.

The landscaped areas located north and east of Building A, adjacent to the EVA and pedestrian path could be utilized as bio-retention to treat runoff from Building A. Construction will be limited in this area due to the required 25' setback of the Petaluma River. The area below the top of river bank shall not be disturbed with the project improvements. Ultimately, the areas available here would be adjacent to the building, potentially compromising the foundation if used to treat and store stormwater, and thus making these areas unsuitable for bio-retention beds.

Due to the aforementioned site constraints, impervious areas proposed with Buildings A and B will be unable to utilize a landscape based treatment system, as preferred by the BASMAA Post-Construction Manual. Instead, the project will utilize a rainwater harvesting program as outlined in the San Francisco Stormwater Guidelines for Phase II Communities. Rainwater harvesting programs are considered acceptable storm water BMPs in various communities within the San Francisco Bay Area in consideration of the challenges faced by high density urban developments, which are less common here in the North Bay, but clearly need to be considered with this project.

All runoff from the roof and podium areas produced from the 2-year-24 hour storm event will be stored onsite. Minimum storage requirements shall be satisfied, and the stored water will be reused for irrigation purposes during the "dry" season (April through September). Storage tanks shall be located at or below grade to allow both the upper story roofs and the podium level to gravity drain to the tanks. Once the tanks are full, any additional runoff will exit the tanks from a high level outflow pipe and discharge to the storm drain. If storage is depleted during the dry months, irrigation will be provided from potable water through a typical irrigation meter with backflow device.

Storage for each building should be considered independent. Building A will require a minimum of 21,475 gallons of storage. Building B will require a minimum of 25,080 gallons of storage. Storage tanks shall be located at grade within the garage. Refer to Sheet 5 of the attachments for a schematic rainwater storage plan.

Additionally, a robust landscaping plan has been incorporated into the podium level courtyards of both buildings. Approximately 555 ft² of raised planter beds will be provided on the courtyard of Building A (labeled River Building on Landscape Plans) and 2929 ft² of raised planter beds will be provided on the courtyard of Building B (labeled Blvd. Building on Landscape Plans). Stormwater falling onto these planter beds will infiltrate through the soil before entering the building drainage system, providing pre-treatment before entering the rainwater storage tanks. See the Preliminary Courtyard Landscape Plans attached to the end of this report.

3 LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

As mentioned above, the site is currently partially developed. The project site is tributary to the Petaluma River and the proposed North River Apartments project will not alter the existing drainage patterns. The attached plan titled "Proposed Bio-retention Areas and DMAs" shows the overall drainage pattern along with bio-retention facility locations and Drainage Management Areas (DMAs).

In order to ensure that the design of the North River Apartments meets the requirements set forth by Provision E.12 of the Phase II Small MS4 General permit, the project site was graded into several DMAs. Pervious areas are broken up into self-treating areas or self-retaining areas that drain directly to the storm drain system where possible. Impervious areas drain either to self-retaining areas or bio-retention facilities, with the exception of the building areas. Drainage from both buildings produced by the 2-year-24 hour storm will be routed to on-site storage tanks to be reused for irrigation during the dry season.

The project will collect overland flow from public streets and sidewalks and route it to a series of proposed bio-retention facilities before entering the underground drainage system. This pre-treatment design feature shall not only remove pollutants, but also limit channel-forming discharge by capturing and slowly releasing storm drainage from the project site. The bio-retention facilities are proposed within the tree wells along Oak and Water Streets throughout the project site, providing treatment for the newly constructed roads.

Best Management Practices (BMP's) are design features that address the quality and quantity of the storm waters that flow from a development. In most cases, these BMP's are used to mitigate a development's impact on the quality of storm water by treating or cleaning the storm water. Some controls have dual treatment control measure capabilities, not only treating, but also providing retention of storm water runoff. The North River Apartments project will implement bio-retention and storage facilities to mitigate pollutants and provide retention for the 85th percentile 24-hour storm. Retention is accomplished by two methods, robust tree planting plan and disconnecting roof downspouts will allow storm water to be retained onsite.

Bio-retention facilities have been selected for this project because of their ability to remove pollutants through a variety of natural physical, biological and chemical treatment processes. These BMP's are considered a Low Impact Development (LID) device for treatment control. They have also been selected because they provide an excellent opportunity for the runoff to settle any suspended solids and remove hydrocarbons, both of which have been identified as pollutants that can degrade the downstream receiving waters of the project.

4 DRAINAGE DESIGN DOCUMENTATION

The North River Apartment project site is broken up into nine Drainage Management Areas, including four self-treating areas, one self-retaining area, one area draining to a self-retaining area, one area draining to bio-retention facilities, and two areas draining to storage facilities. Impervious areas drain directly to, or are piped into various bio-retention / storage facilities laid out throughout the project.

Table 2. Drainage Management Areas

DMA Name	Surface Type	Area (SF)
Landscape 1	Landscaping	2,660
Landscape 2	Landscaping	694
Landscape 3	Landscaping	726
Landscape 4	Landscaping	217
Landscape 5	Landscaping / Turfblock	4,982
EVA / River Walk	Concrete / Turfblock / Landscape	11,442
Streets	Asphalt / Concrete	42,494
Building A	Roof / Podium	45,112
Building B	Roof / Podium	52,688

DMA Landscape 1, totaling 2,660 square feet, drains a concrete buss pad and landscaped area north of Oak Street. DMA Landscape 1 is a self-treating area that overland flows across landscape before entering the underground storm drain system.

DMA Landscape 2, totaling 694 square feet, drains a landscaped portion of land directly adjacent to Building B. DMA Landscape 2 is a self-treating area that overland flows across landscape before entering the underground storm drain system.

DMA Landscape 3, totaling 726 square feet, drains a landscaped portion of land directly adjacent to Building B. DMA Landscape 3 is a self-treating area that overland flows across landscape before entering the underground storm drain system.

DMA Landscape 4, totaling 216 square feet, drains a landscaped portion of land directly adjacent to Building A. DMA Landscape 4 is a self-treating area that overland flows across landscape before entering the underground storm drain system.

DMA Landscape 5, totaling 4,448 square feet, drains a turfblock EVA and landscape area north and east of Building A. DMA Landscape 5 is a self-retaining DMA that sheet flows across landscape before entering the underground storm drain system, and accepts drainage from DMA EVA / River Walk.

DMA EVA / River Walk, totaling 11,687 square feet, drains the river path and EVA to Landscape 5 and does so by sheet flowing directly into Landscape 5.

DMA Streets, totaling 42,494 square feet, drains both the street and sidewalks of the new portions of Oak Street and Water Street being constructed. DMA Streets drains to bio-retention beds under the planters, tree wells, and sidewalks along Oak Street and Water Street. Runoff infiltrates the bio-retention beds by entering individual planters

through curb openings along the streets. While the planter areas themselves only amount to 880 square feet, or about half of the required area for bio-retention, the structural soil under the planter will be extended along the roads under the sidewalks to a total area of 3,273 square feet, or about twice the required area for bio-retention.

DMA Building A, totaling 44,360 square feet, drains the entire roof area and podium level of Building A. DMA Building A drains to stormwater storage tanks located at garage level within Building A. Once the tanks are full, any additional runoff will exit the tanks from a high level outflow pipe and discharge to the storm drain.

DMA Building B, totaling 52,529 square feet, drains the entire roof area and podium level of Building B. DMA Building B drains to stormwater storage tanks located at garage level within Building B. Once the tanks are full, any additional runoff will exit the tanks from a high level outflow pipe and discharge to the storm drain.

Table 3. Information Summary for Bio-retention Facility Design

DMA Name	Area (SF)
Total Project Area	162,650
Landscape 1	2,660
Landscape 2	694
Landscape 3	726
Landscape 4	216
Landscape 5	4,448
EVA / River Walk	11,687
Streets	42,683
Building A	44,360
Building B	52,529

Table 4. Self-Treating Areas

DMA Name	Area (SF)
Landscape 1	2,660
Landscape 2	694
Landscape 3	726
Landscape 4	216

Table 5. Self-Retaining Areas

DMA Name	Area (SF)
Landscape 5	4,448

Table 6. Areas Draining to Self-Retaining Areas

DMA Name	Area (SF)	Post-Project Surface Type	Runoff Factor	Area x Runoff Factor [A]	Receiving Self-Retaining DMA	Receiving Self-Retaining DMA Area [B]	Ratio [A]/[B]
EVA / River Walk	4,596	Concrete	1.0	4,596	Landscape 5	4,448 SF	1.03

Stormwater Control Plan For A Regulated Project

Table 7. Areas Draining to Bio-retention Facilities

DMA Name	DMA Area (SF)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					Bio-retention		
Street	42,161	Concrete	1.0	42,161	Sizing Factor	Minimum Facility Size	Proposed Facility Size
Street	522	Landscape	0.1	52			
Total				42,213	0.04	1,689	3,273

Building A Minimum Rainwater Storage

$$V = CPAK$$

$$V = (1) \times \left[(0.92 \text{ in}) \times \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \right] \times (44,360 \text{ ft}^2) \times (0.83)$$

$$V = 2,823 \text{ ft}^3 = 21,114 \text{ gal}$$

Building B Minimum Rainwater Storage

$$V = CPAK$$

$$V = (1) \times \left[(0.92 \text{ in}) \times \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \right] \times (52,529 \text{ ft}^2) \times (0.83)$$

$$V = 3,353 \text{ ft}^3 = 25,003 \text{ gal}$$

5 SOURCE CONTROL MEASURES

The North River Apartments project has been designed to optimize onsite volume capture and treatment of all stormwater generated onsite before it is released into the underground storm drain system. In order to minimize the potential source of pollutants discharged into the Petaluma River, all stormwater runoff created onsite that is required to be treated, has been routed to a bio-retention facility for treatment. Other than the pollutants being transported to bio-retention facilities, another source of pollution could be the unauthorized non-stormwater discharges and accidental spills or leaks that directly drain to on-site storm drain inlets. In order to mitigate the possibility of these pollutants entering the storm drain system, all storm drain inlets and catch basins will be stenciled with prohibitive language (such as: “NO DUMPING-DRAINS TO OCEAN”) and/or graphical icons to discourage illegal dumping. Operational Source Control BMPs will be implemented to ensure that pollutants do not enter the storm drain inlets throughout the life of the project. In order to accomplish this, storm drain inlet markings will be maintained and periodically replaced and the language “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit material so as to create a potential discharge to storm drains” will be included in lease agreements.

Table 10. Source Control Table

Potential Source of Runoff Pollutants	Structural Source Control BMPs	Operational Source Control BMPs
On-site Storm Dain Inlets (Unauthorized discharge and accidental spills)	Mark all inlets with the words “NO DUMPING-DRAINS TO OCEAN”	Inlet markings will be maintained and periodically replaced Lease agreement will include: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit material so as to create a potential discharge to storm drains.”

6 STORMWATER FACILITY MAINTENANCE

Treatment control devices for the apartment buildings and adjacent areas are located on the private portion of the project, outside of the City of Petaluma right-of-way. The project owner will be responsible for the surface and sub-surface oversight and maintenance of the private BMP's. Treatment control devices for the new streets being constructed are located within the City of Petaluma right-of-way. The City of Petaluma will be responsible for the surface and sub-surface oversight and maintenance of the BMP's within their right-of-way.

"The applicant accepts responsibility for interim operation and maintenance of stormwater treatment and flow-control facilities until such time as this responsibility is formally transferred to a subsequent owner."

In order to insure adequate treatment of stormwater in the proposed bio-retention facilities, yearly maintenance is required and should be increased as needed for each bio-retention facility.

The maintenance required for all bio-retention facilities will be identical and shall include:

1. The removal of any soil or debris blocking planter inlets or overflow devices.
2. Pruning or replacement of bio-retention plants to ensure flow into the inlets and across the surface of the facility. When replanting, maintain the design surface elevation and minimize the introduction of soil.
3. Weeds shall be removed manually or by the use of soil amendments. In response to problem weed areas, non-selective natural herbicides can be used.
4. Remove graffiti if present on bio-retention facilities.
5. Do not add fertilizer to bio-retention facilities. Apply Compost tea at a rate of 5 gallons mixed with 15 gallons of water per acre, up to two weeks prior to planting and once per year between March and June if needed. Do not apply when temperatures are below 50°F or above 90°F or when rain is forecast in the next 48 hours.
6. Do not use synthetic pesticides on bio-retention facilities. Beneficial nematodes and non-toxic controls may be used. Acceptable natural pesticides include Safer® products and Neem oil

Stormwater Control Plan For A Regulated Project

In order to insure adequate performance of the rainwater harvesting systems, yearly maintenance is required and should be increased as needed for each system.

The maintenance required for all rainwater harvesting systems will be identical and shall include:

1. Screening of gutters tributary to the rainwater storage tanks with a leaf guard or maximum ½-inch to ¼-inch minimum corrosion-resistant metallic hardware fabric.
2. Screening any openings in the tanks with a corrosion-resistant metallic fine mesh (1/16-inch or smaller) to prevent mosquito harborage.
3. Annual cleaning of gutters and rainwater storage tanks.

7 CONSTRUCTION CHECKLIST

Table 11. Construction Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #'s
6 & 8	Bio-retention in Tree Wells	C3 – C5
9	Mark all inlets with the words "NO DUMPING-DRAINS TO OCEAN"	C4 & C5

8 CERTIFICATIONS

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the BASMAA Post-Construction Manual.

S:\SDSK\PROJ\15-104\DWG\PSWMP\PRE-PROJECT.dwg - 6/1/2016 3:12:51 PM

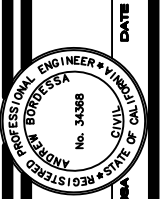


PRE-PROJECT IMPERVIOUS AREA 

BUILDINGS	23,161 SF	(0.53 AC)
PAVEMENT	3,193 SF	(0.07 AC)
TOTAL	26,354 SF	(0.61 AC)

LANDSCAPE AREA 144,262 SF (3.31 AC)

PROJECT AREA 170,616 SF (3.92 AC)



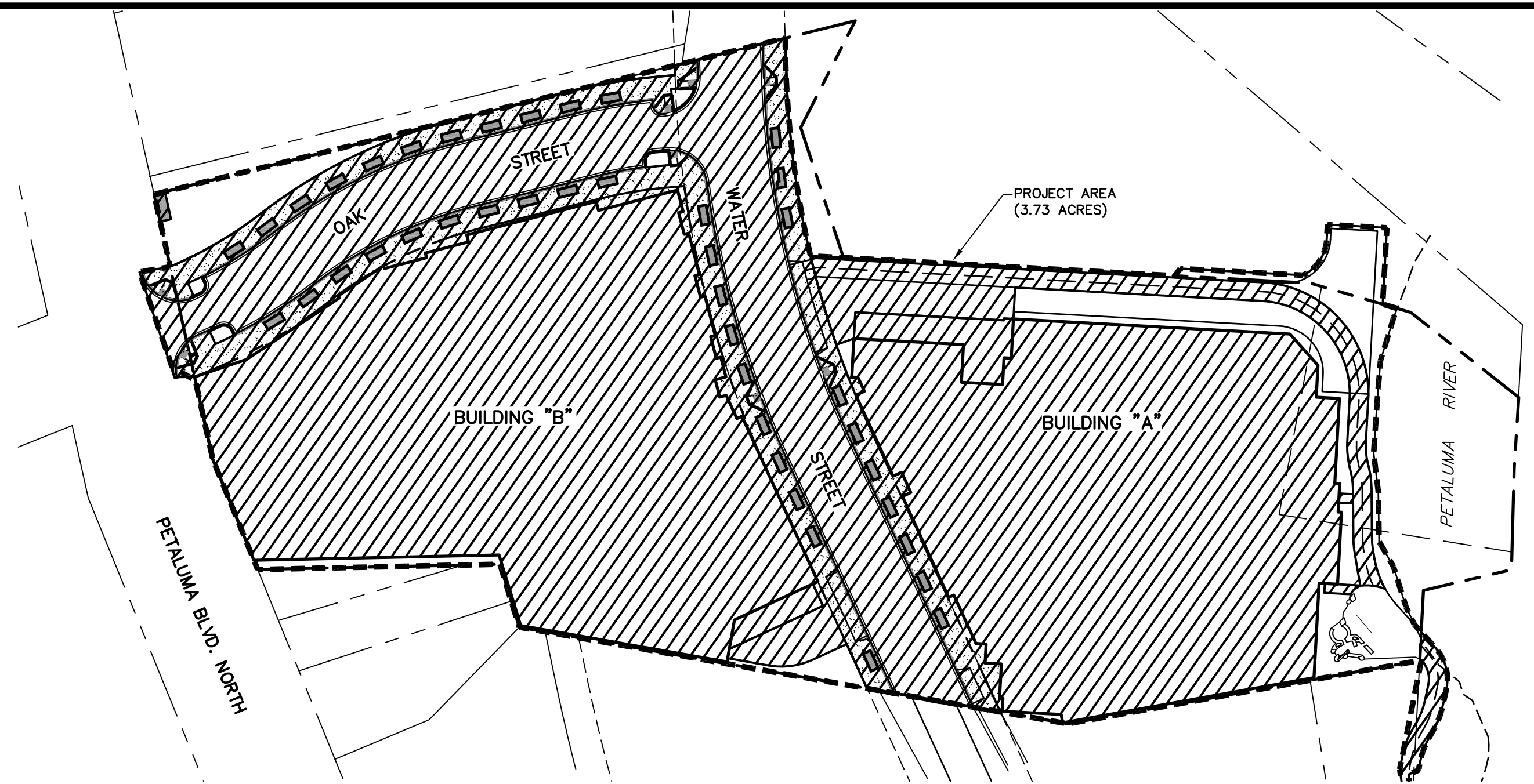
CIVIL DESIGN CONSULTANTS, INC.
 2200 Range Avenue, Suite 204
 Santa Rosa, CA 95403
 (707) 542-4820

EXISTING SITE CONDITIONS
 NORTH RIVER APARTMENTS
 PETALUMA, CALIFORNIA

JUNE 2016
 JOB NO. 15-104

SHEET NO. 1
 OF 5 SHEET

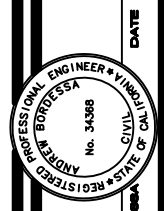
S:\SDSK\PROJ\15-104\DWG\PSWMP\POST-PROJECT.dwg, 6/2/2016, 4:13:19 PM



POST-PROJECT IMPERVIOUS AREA 

BUILDINGS	97,800 SF	(2.25 AC)
STREETS/HARDSCAPE	48,880 SF	(1.12 AC)
TOTAL	146,680 SF	(3.37 AC)
BIO-RETENTION AREA	1,680 SF	(0.04 AC)
LANDSCAPE	14,290 SF	(0.33 AC)
PROJECT AREA*	162,650 SF	(3.73 AC)

*INCLUDES IMPROVEMENTS TO OAK STREET AND RIVER WALKWAY OUTSIDE OF PROPERTY BOUNDARY. DOES NOT INCLUDE AREA BELOW TOP OF RIVER BANK.



CIVIL DESIGN CONSULTANTS, INC.
 2200 Range Avenue, Suite 204
 Santa Rosa, CA 95403
 (707) 542-4820

PROPOSED SITE CONDITIONS
 NORTH RIVER APARTMENTS
 PETALUMA, CALIFORNIA

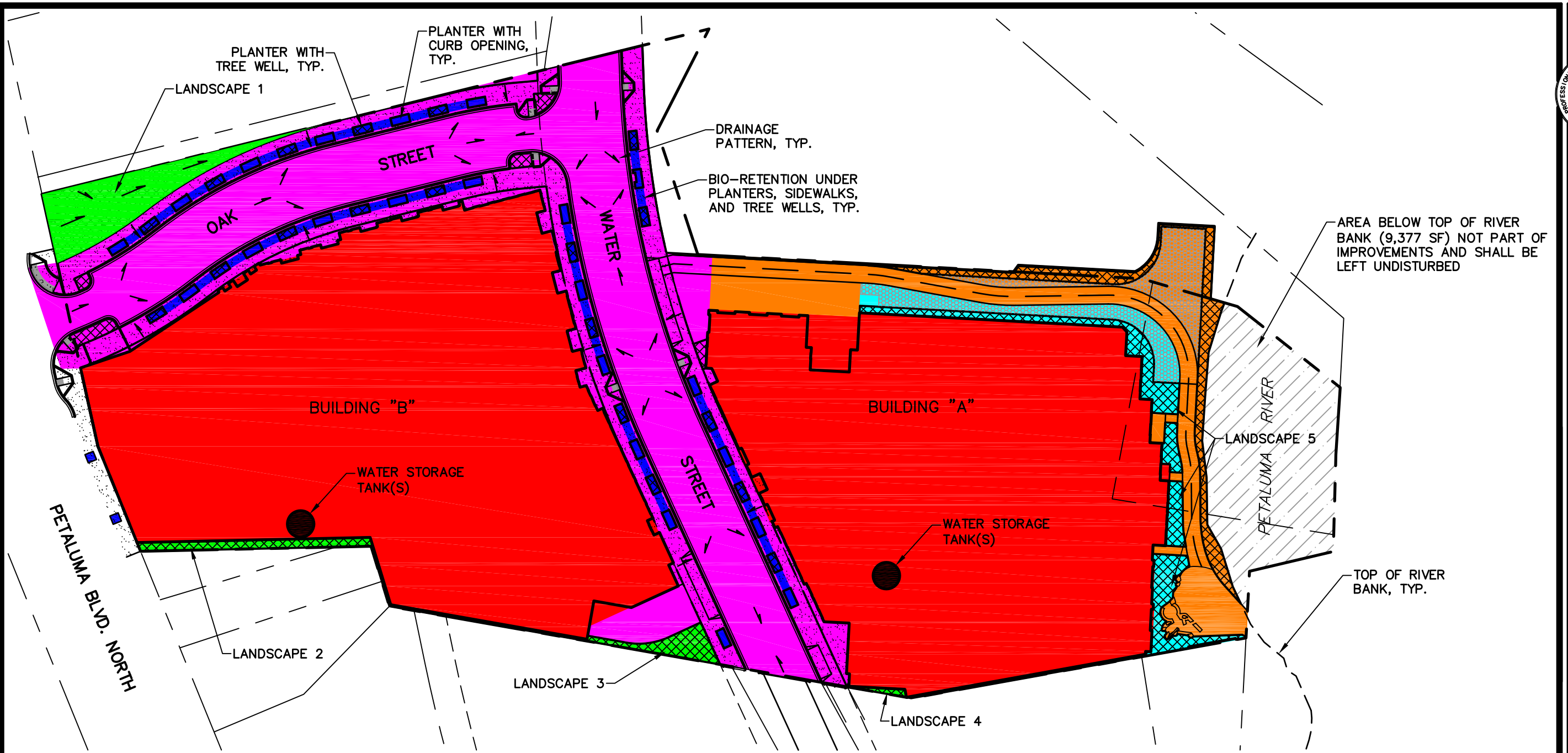
JUNE 2016

JOB NO.
15-104

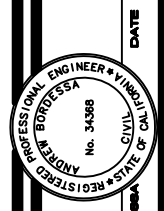
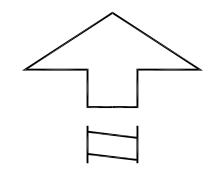
SHEET NO.

2

OF 5 SHEET



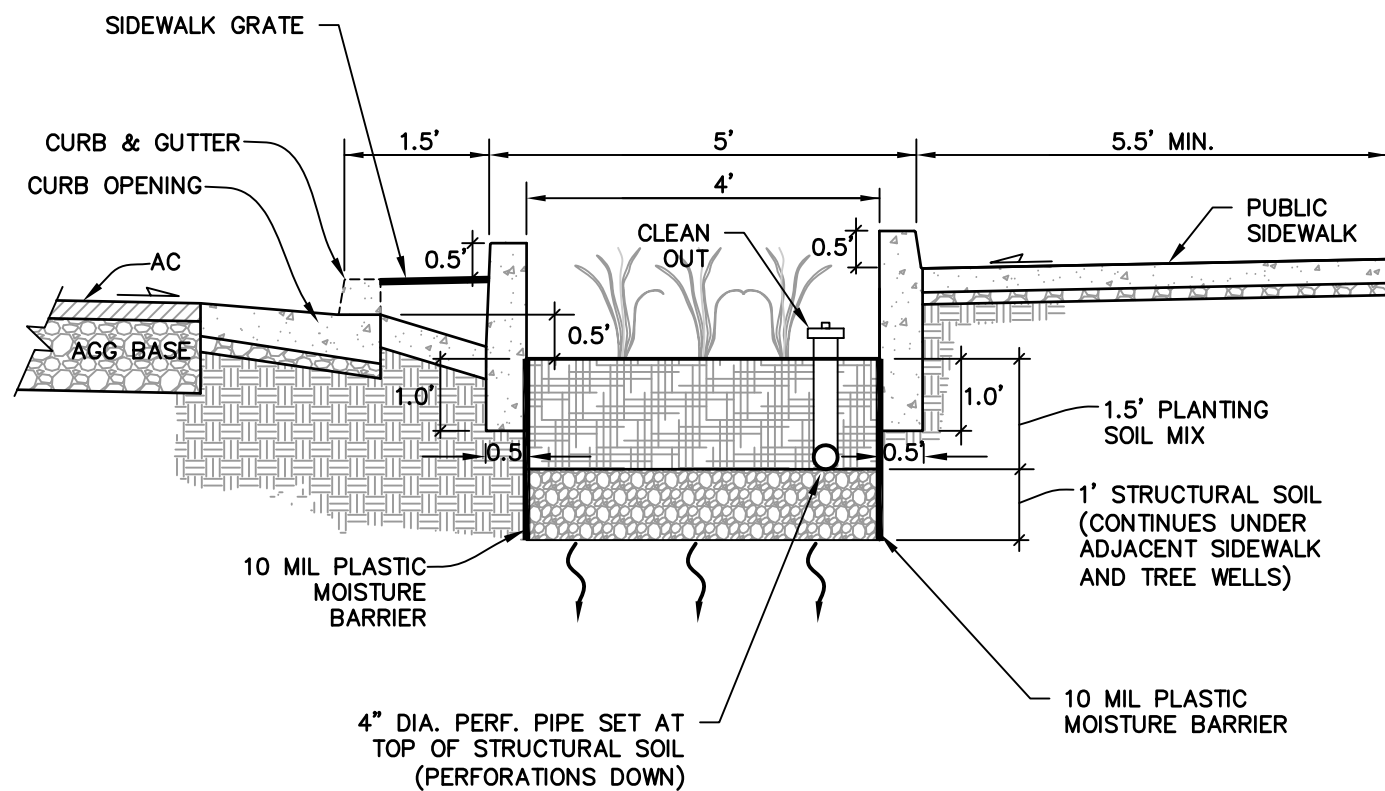
DRAINAGE MANAGEMENT AREAS (DMA)	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)
■ SELF TREATING AREAS		
LANDSCAPE 1	113	2,547
LANDSCAPE 2	0	694
LANDSCAPE 3	0	726
LANDSCAPE 4	0	216
■ SELF RETAINING AREAS		
LANDSCAPE 5	0	4,448
■ TO SELF RETAINING AREAS EVA & RIVER WALK	4,596	7,091
■ TO BIORETENTION STREETS	41,972	522
■ TO RAINWATER STORAGE TANKS		
BUILDING A	44,360	0
BUILDING B	52,529	0
■ BIO-RETENTION	0	3,273



CIVIL DESIGN CONSULTANTS, INC.
 2200 Range Avenue, Suite 204
 Santa Rosa, CA 95403
 (707) 542-4820

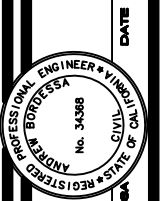
PROPOSED BIO-RETENTION AREAS AND DMAs
 NORTH RIVER APARTMENTS
 PETALUMA, CALIFORNIA
 JULY 2016

JOB NO.
15-104
 SHEET NO.
3
 OF 5 SHEET



BIORETENTION PLANTER DETAIL

NO SCALE



CIVIL DESIGN CONSULTANTS, INC.

2200 Range Avenue, Suite 204
 Santa Rosa, CA 95403
 (707) 542-4820

BIO-RETENTION DETAILS
 NORTH RIVER APARTMENTS
 PETALUMA, CALIFORNIA

JULY 2016

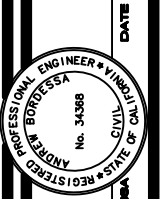
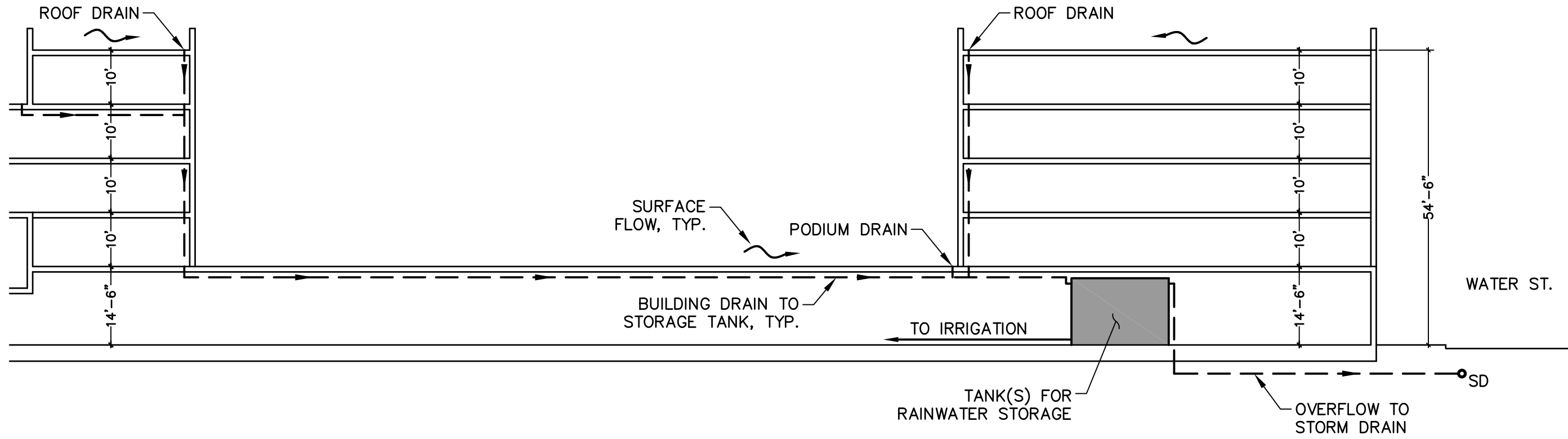
JOB NO.
15-104

SHEET NO.

4

OF 5 SHEET

S:\SDSK\PROJ\15-104\DWG\PSWMP\PA-PSWMP-HYDRO.dwg, 6/2/2016, 5:05:00 PM



ANDREW BORDEGNONI
 No. 34388
 REGISTERED PROFESSIONAL ENGINEER - CIVIL
 STATE OF CALIFORNIA
 DATE



CIVIL DESIGN CONSULTANTS, INC.
 2200 Range Avenue, Suite 204
 Santa Rosa, CA 95403
 (707) 542-4820

SCHEMATIC RAINWATER STORAGE PLAN
 NORTH RIVER APARTMENTS
 PETALUMA, CALIFORNIA

JUNE 2016

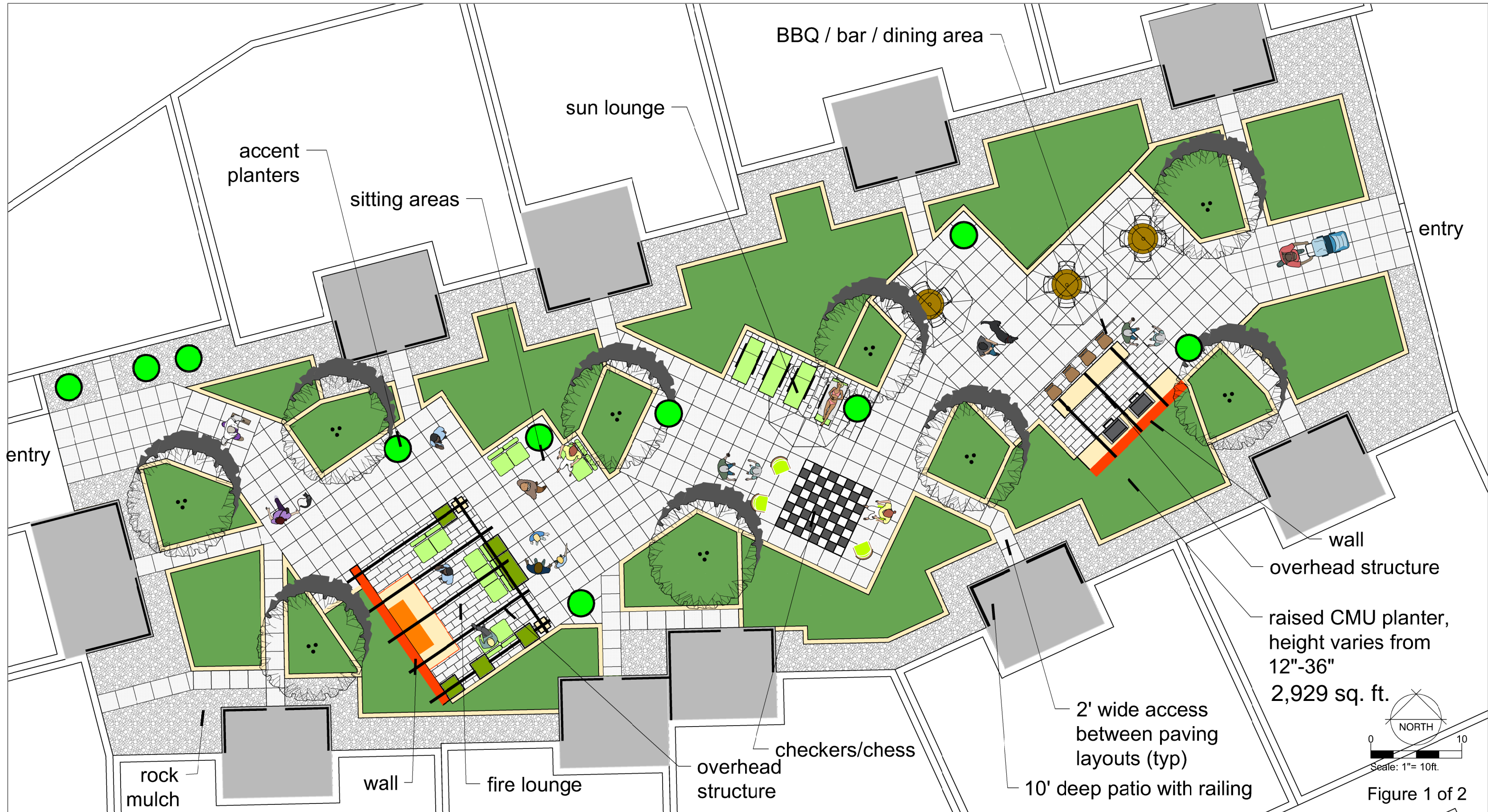
JOB NO.
 15-104

SHEET NO.

5

OF 5 SHEET

Blvd. Bldg. Courtyard #1 Study



NORTH RIVER APARTMENTS

Petaluma, California



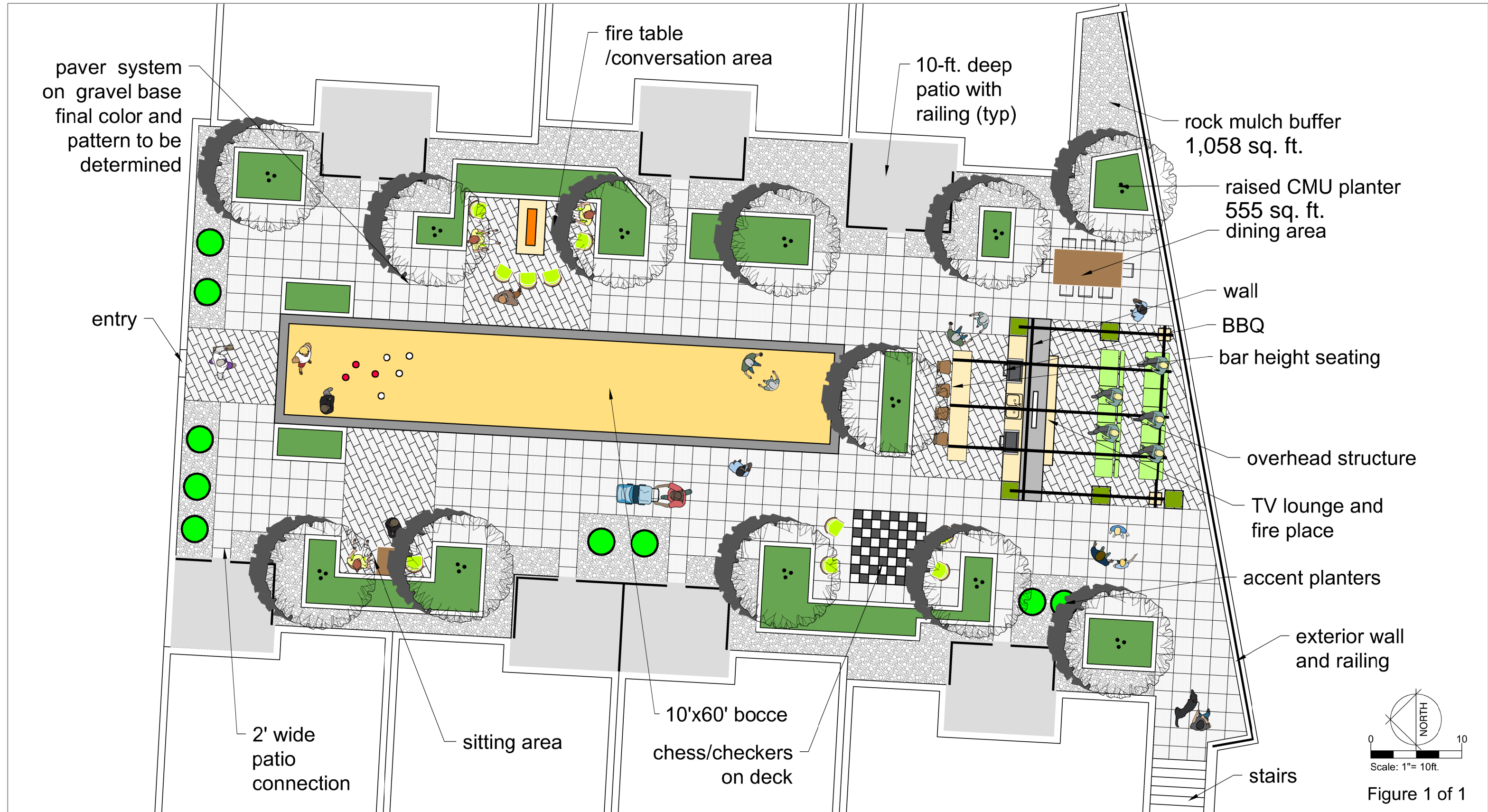
June 13, 2016
2000ex005.dwg

Blvd. Building Courtyard #2 Study



Figure 1 of 1

River Building Courtyard #1 Study



MODEL SIGN-OFF FORM FOR E.12 REVIEW OF AGENCY PROJECTS

Name of Project: North River Apartments

Location: 368 & 402 Petaluma Blvd. North, Petaluma, CA

Exempt

- Governing body or designee approved initiation of the project design prior to July 1, 2015
- Less than 2,500 square feet impervious area are to be constructed or replaced.
- Project consists of interior remodel or routine maintenance or repair such as roof or exterior surface replacement, pavement resurfacing, and repaving within the existing footprint.
- Project is a Roads or Linear Underground and Overhead Project (LUP) and less than 5,000 square feet of contiguous impervious area are to be constructed or replaced, once the following are excluded from the tally of impervious area:
 - o Sidewalks and bicycle lanes built as part of new streets or roads and built to direct stormwater runoff to adjacent vegetated areas.
 - o Impervious trails built to direct stormwater runoff to adjacent vegetated areas or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees.
 - o Sidewalks, bicycle lanes, or trails constructed with permeable surfaces (pervious concrete, porous asphalt, unit pavers, or granular materials).
 - o Trenching, excavation, and resurfacing associated with LUPs; pavement grinding and resurfacing of existing roadways and parking lots; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; and routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway.

When calculating the E.12-applicable impervious area of a road project, include all roadway surfaces related to creation of additional traffic lanes (including, for example, passing lanes and turning pockets). Shoulders and widened portion of existing lanes may be excluded from the calculation.

Not Exempt—Compliance documented.

The following documents show that the project meets all E.12 requirements.

- Stormwater Control Plan for Small Projects (project is not a roads or LUP project and 2,500 square feet or more of impervious area, and less than 5,000 square feet, is to be constructed or replaced).

Date: September 2016

Stormwater Control Plan for Regulated Projects dated: _____

Construction Documents dated: _____

Other documentation (describe): Post Construction Water Balance Calculator

9/6/2016

Signature

Date

Andrew Bordessa

P.E. RCE 34368

Name

Title

Post-Construction Water Balance Calculator

1	Post-Construction Water Balance Calculator									
2										
3	User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.		(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below		(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.		SONOMA			
4					(Step 1c) If you would like a more precise value select the location closest to your site. If you do not recognize any of these locations, leave this drop-down menu at location. The average value for the County will be used.		PETALUMA FIRE STA 2			
5	Project Information			Runoff Calculations						
6	Project Name:		North River Apartments		(Step 2) Indicate the Soil Type (dropdown menu to right):		Group D Soils		Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.	
7	Waste Discharge Identification (WDID):		Optional		(Step 3) Indicate the existing dominant non-built land Use Type (dropdown menu to right):		Open Space: grass cover 50% to 75%			
8	Date:		Optional		(Step 4) Indicate the proposed dominant non-built land Use Type (dropdown menu to right):		Solid lawn, grass, pasture or meadow covering the open space			
9	Sub Drainage Area Name (from map):		Optional				Complete Either			
10	Runoff Curve Numbers						Sq Ft		Acres	
11	Existing Runoff Curve Number		86		(Step 5) Total Project Site Area:		3.73		3.73	
12	Proposed Development Runoff Curve Number		96		(Step 6) Sub-watershed Area:		3.73		3.73	
13	Design Storm				Percent of total project:		100%			
14	Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area.		0.89		in					
15	The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^)		0.33		in		(Step 7) Sub-watershed Conditions		Complete Either	
16	P used for calculations (in) (the greater of the above two criteria)		0.89		in		Sub-watershed Area (acres)		Calculated Acres	
17	Available at www.cabmphandbooks.com				Existing Rooftop Impervious Coverage		0.53		0.53	
18					Existing Non-Rooftop Impervious Coverage		0.07		0.07	
19					Proposed Rooftop Impervious Coverage		2.25		2.25	
20					Proposed Non-Rooftop Impervious Coverage		1.12		1.12	
21										
22					Credits		Acres		Square Feet	
23					Porous Pavement		0.09		3,920	
24					Tree Planting		0.11		4,792	
25	Pre-Project Runoff Volume (cu ft)		1,963		Cu.Ft.		Downspout Disconnection		0.00	
26	Project-Related Runoff Volume Increase w/o credits (cu ft)		5,212		Cu.Ft.		Impervious Area Disconnection		1.12	
27							Green Roof		0.00	
28							Stream Buffer		0.00	
29							Vegetated Swales		0.00	
30	Project-Related Volume Increase with Credits (cu ft)		0		Cu.Ft.		Subtotal		1.32	
31							Subtotal Runoff Volume Reduction Credit		2539 Cu. Ft.	
32										
33	You have achieved your minimum requirements				(Step 9) Impervious Volume Reduction Credits		Volume (cubic feet)			
34							Rain Barrels/Cisterns		5,549 Cu. Ft.	
35							Soil Quality		4,426 Cu. Ft.	
36							Subtotal Runoff Volume Reduction		9,975 Cu. Ft.	
37							Total Runoff Volume Reduction Credit		12,514 Cu. Ft.	
38										
39										