

Appendix M – Preliminary Stormwater Control Plan and Peer Review

PRELIMINARY STORMWATER CONTROL PLAN
for
Spieker Senior Continuing Care Community

850 Seven Hills Ranch Rd, Walnut Creek 94598

Permit Number: DP20-3018 & MS20-007

10/31/2020

Revised 10/04/2021

Spieker Development Partners
2 Las Estrellas Loop
Rancho Mission Viejo, CA 92694

Prepared by:

BKF Engineers
1646 N. California Blvd., Suite 400
Walnut Creek, CA 94596
925-940-2200

TABLE OF CONTENTS

I. PROJECT DATA	1
II. SETTING	2
II.A. Project Location and Description	2
II.B. Existing Site Features and Conditions	2
II.C. Opportunities and Constraints for Stormwater Control	2
III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES	3
III.A. Optimization of Site Layout	3
III.A.1. Limitation of development envelope	3
III.A.2. Preservation of natural drainage features	3
III.A.3. Setbacks from creeks, wetlands, and riparian habitats	3
III.A.4. Minimization of imperviousness	3
III.A.5. Use of drainage as a design element	3
III.B. Use of Permeable Pavements	3
III.C. Dispersal of Runoff to Pervious Areas	3
III.D. Integrated Management Practices	3
IV. DOCUMENTATION OF DRAINAGE DESIGN	4
IV.A. Descriptions of each Drainage Management Area	4
IV.A.1. Drainage Management Area Descriptions	4
IV.B. Integrated Management Practice Descriptions	12
IV.C. Tabulation and Sizing Calculations	12
IV.C.1. Self-Treating Areas	12
IV.C.2. Self-Retaining Areas	12
IV.C.3. Areas Draining to Self-Retaining Areas	12
IV.C.4. Areas Draining to IMPs	13
V. SOURCE CONTROL MEASURES	13
V.A. Site activities and potential sources of pollutants	13
V.B. Source Control Table	13
V.C. Features, Materials, and Methods of Construction of Source Control BMPs	13
VI. STORMWATER FACILITY MAINTENANCE	14
VI.A. Ownership and Responsibility for Maintenance in Perpetuity	14
VI.B. Summary of Maintenance Requirements for Each Stormwater Facility	14
VII. CONSTRUCTION PLAN C.3 CHECKLIST	14
VIII. CERTIFICATIONS	15

Tables

Table 1. Project Data	1
Table 2. Drainage Management Area	4
Table 3. Information Summary for IMP Design	12
Table 4. Sources and Source Control Measures	13

Attachments

Vicinity Map	Attachment A
Stormwater Control Plan Exhibit	Attachment B
IMP Sizing Tool Summary Report	Attachment C
DMA Sizing Calculations	Attachment D
Treatment Facility Typical Sections	Attachment E

I. PROJECT DATA

Table 1. Project Data

Project Name/Permit Number	Seven Hills Ranch Road / DP20-3018 & MS20-000##
Application Submittal Date	July 2020
Project Location	850 Seven Hills Ranch Rd, Walnut Creek 94598 APN #: 172-150-012-0 & 172-080-007-5
Name of Developer	Spieker Development Partners
Project Phase No.	N/A
Project Type and Description	The proposed project is self-contained continuing care retirement community that provides housing, resident services, and long-term care. The project will include up to 360 Independent Living Units and a Health Care Center for residents.
Project Watershed	Walnut Creek
Total Project Site Area (acres)	30.6+/- Ac
Total Area of Land Disturbed (acres)	26.1 +/- Ac
Total New Impervious Surface Area (sq. ft.)	725,542 SF (16.7 +/- Ac)
Total Replaced Impervious Surface Area	13,891 SF (0.3 +/- Ac)
Total Pre-Project Impervious Surface Area	13,891 SF (0.3 +/- Ac)
Total Post-Project Impervious Surface Area	739,433 SF (17.0 +/- Ac)
50% Rule	Applies
Project Density	NA: 360 CCRC units on 11.4 acres
Percent LID and non LID treatment	100% LID
HM Compliance	Applies

[*50% rule applies if:

Total Replaced Impervious Surface Area > 0.5 x Pre-Project Impervious Surface Area]

[†HM required (unless project meets one of the exemptions on *Guidebook* p. 9) if:

(Total New Impervious Surface Area + Total Replaced Impervious Surface Area) ≥ 1 acre]

II. SETTING

II.A. Project Location and Description

The Project Site is approximately 30.6 total acres, situated in unincorporated Walnut Creek at the easterly end of Seven Hills Ranch Road. This infill Project Site extends nearly 2,000 feet from the extension of Seven Hills Ranch Road on the south to the Heather Farms Park and Seven Hills School boundaries on the north, and approximately 800 feet from the Walnut Creek City boundary on the east to Walnut Creek Channel on the west.

The project includes development of a self-contained continuing care retirement community, or CCRC, offering continuing care contracts that provide housing, resident services, and long-term care. The CCRC will include two main components: (1) Up to 360 Independent Living Units and amenities for residents capable of residing in the community without daily assistance; and (2) a Health Care Center for residents requiring daily assistance or daily medical attention, including up to 100 total skilled nursing, memory care, and assisted living units.

II.B. Existing Site Features and Conditions

The existing site is characterized by rolling topography, rising from a low point (approximately 100-foot elevation) adjoining the central drainage swale's discharge to Walnut Creek, to a high point (approximately 190-foot elevation) at the top of the small hill in the northcentral portion of the site. The location of the project site is a part of the Pine Creek Watershed area and thus contributes to the Walnut Creek. Per the USDA's Web Soil Survey, the onsite soil description is Lodo clay loam (hydraulic soil group D).

The project site is adjacent to, and partially covered on the northeast and southwest ends, by the Ygnacio Valley Groundwater Basin which underlies much of northern Contra Costa County, and is managed by the San Francisco Bay RWQCB. As documented in the Geotechnical Investigation conducted by Baez in 2020, the USDA Natural Resources Conservation Services Web Soil Survey shows that the majority of site to be mantled by the Lodo soil series, characterized by low expansive clays with bedrock near the ground surface. Groundwater has been shown to occur on site at a depth of 17 feet, and no natural springs or seeps have been found to exist within the property. The project site is served by the Contra Costa Water District (CCWD) which receives water sourced primarily from the Sacramento-San Joaquin Delta and Los Vaqueros Reservoir. The project would not involve any form of ground water extraction. The project design calls for improvements over portions of the 30.4-acre site that would utilize a low impact development (LID) design, incorporate landscaping and biofiltration facilities throughout to accommodate groundwater recharge and manage drainage, and preserve a large central open space corridor along the existing engineered drainage course which discharges to Ygnacio Channel. These improvements would nevertheless result in a net increase of total impervious surface compared to predevelopment conditions, and will therefore be engineered for compliance with Contra Costa County C.3 Stormwater Guidelines. As designed and based on existing soil conditions, groundwater depth, and avoidance of extraction, the project would therefore not substantially interfere with the groundwater recharge rate.

The existing drainage condition has nine watersheds that ultimately drain to two different points of discharge: Walnut Creek and the Contra Costa Canal.

II.C. Opportunities and Constraints for Stormwater Control

The site consists of rolling topography that provide constraints to grading and layout. Due to the nature of the project being a senior continuing care facility, site grading has been designed to accommodate reduced walk and driveway slopes to be more user-friendly to the project's constituency.

The main independent living building (on south side of project site) will have interior courtyards that present opportunity for raised planters to treat building runoff. Paved parking areas provide opportunities for permeable pavements as they will be subject to light vehicular loading. Retaining walls will be terraced, providing opportunity to place bioretention facilities. Landscaping areas in Independent Living Villas and the Health Care Building provide space for bioretention facilities. Existing landscape areas near the limits of grading (and near the points of hydraulic discharge) provide opportunity for bioretention facilities as well.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The primary site constraints are the rolling terrain and the central drainage channel and wetlands.

III.A.2. Preservation of natural drainage features

Existing wetlands along the center of the site will be preserved.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

Setbacks from the central wetland area have been provided to protect the wetland.

III.A.4. Minimization of imperviousness

The project proposes to incorporate permeable pavers as well as planting vegetation in all available locations.

III.A.5. Use of drainage as a design element

Raised flow-through planters and bioretention facilities are used as both treatment areas and landscaping areas.

III.B. Use of Permeable Pavements

Permeable pavers are provided within parking areas to reduce required bioretention facility footprints and increase the stormwater infiltration throughout the site. Out of the total proposed parking area provided on site, 66% (minimum of 10%) is permeable pavers.

III.C. Dispersal of Runoff to Pervious Areas

Runoff from the podium level and portions of the rooftops is collected via roof drains and routed to flow-through planters located on the podium. Runoff from the remaining rooftops is collected via roof drains and is routed to bioretention facilities around the site. The runoff associated with other pervious areas across the site generally sheet flows until it is intercepted by curb and gutter, where it flows as shallow concentrated flow and ultimately drains via curb cuts into bioretention facilities.

III.D. Integrated Management Practices

The project will have proposed locations where raised flow-through planters and bioretention facilities will be designated for treatment.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of each Drainage Management Area

See Attachment B for DMA locations.

IV.A.1.

Table 2. Drainage Management Areas

See Attachment D.

Drainage Management Area Descriptions

DMA T1, totaling 14,309 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-1. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T2, totaling 17,036 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-2. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T3, totaling 12,097 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-3. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T4, totaling 15,063 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-4. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T5, totaling 14,411 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-5. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T6, totaling 12,166 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-6. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T7, totaling 10,176 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-7. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T8, totaling 17,068 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious.

Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-8. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T9, totaling 7,783 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-9. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T10, totaling 13,236 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-10. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T11, totaling 6,021 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-11. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T12, totaling 8,007 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-12. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T13, totaling 10,410 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-13. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T14, totaling 7,527 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-14. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T15, totaling 3,784 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-15. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T16, totaling 26,961 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-16. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T17, totaling 11,123 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-17. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T18, totaling 67,881 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-18. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T19, totaling 12,833 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-19. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T20, totaling 4,435 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-20. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T21, totaling 4,767 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-21. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T22, totaling 6,875 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-22. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T23, totaling 10,495 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-23. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T24, totaling 10,494 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-24. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T25, totaling 10,161 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-25. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T26, totaling 2,416 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-26. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T27, totaling 9,252 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention

facility, A-27. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T28, totaling 16,290 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-28. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T29, totaling 17,503 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-29. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T30, totaling 5,125 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-30. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T31, totaling 11,601 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-31. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T32, totaling 6,726 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-32. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T33, totaling 7,291 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-33. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T34, totaling 14,018 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-34. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T35, totaling 4,302 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-35. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T36, totaling 24,976 square feet, treats the majority of runoff from Road B. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-36. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T37, totaling 20,228 square feet, treats portions of the anticipated roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious.

Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-37. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T38, totaling 3,111 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-38. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T39, totaling 6,693 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-39. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T40, totaling 4,459 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-40. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T41, totaling 6,666 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-41. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T42, totaling 9,847 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-42. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T43, totaling 6,945 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-43. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T44, totaling 6,986 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-44. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T45, totaling 7,895 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-45. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T46, totaling 20,950 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Runoff from impervious areas is collected from anticipated inlets and trench drains along the paved areas into underground pipes and outfalls into the associated bioretention facility, A-46, which is

located southeast of the DMA boundary. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T47, totaling 14,436 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-47. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T48, totaling 17,110 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-48. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T49, totaling 24,813 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-49. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T50, totaling 26,106 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-50. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T51, totaling 40,434 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-51. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T52, totaling 7,275 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-52. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T53, totaling 27,480 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-53. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T54, totaling 6,986 square feet, treats portions of the anticipated roof, roadway, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated bioretention facility, A-54. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T55, totaling 49,071 square feet, treats portions of the anticipated roof, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated flow-through planter, A-55. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T56, totaling 59,999 square feet, treats portions of the anticipated roof, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated flow-through planter, A-56. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA T57, totaling 51,860 square feet, treats portions of the anticipated roof, sidewalk and pervious areas on site. As a preliminary assumption, the DMA is assumed to be entirely impervious. Storm water from the drainage area is directed via surface runoff to the associated flow-through planter, A-57. After treatment, the storm water is discharged into the storm drain within the roadway. See plans for ultimate discharge location.

DMA ST1, totaling 29,600 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1" of rainfall and provide a minimum of 3" of ponding to promote infiltration into the soil. Any stormwater in excess of the 3" will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST2, totaling 31,671 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1" of rainfall and provide a minimum of 3" of ponding to promote infiltration into the soil. Any stormwater in excess of the 3" will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST3, totaling 4,424 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1" of rainfall and provide a minimum of 3" of ponding to promote infiltration into the soil. Any stormwater in excess of the 3" will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST4, totaling 3,992 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1" of rainfall and provide a minimum of 3" of ponding to promote infiltration into the soil. Any stormwater in excess of the 3" will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST5, totaling 1,530 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1" of rainfall and provide a minimum of 3" of ponding to promote infiltration into the soil. Any stormwater in excess of the 3" will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST6, totaling 17,220 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely

pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST7, totaling 20,280 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST8, totaling 7,953 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST9, totaling 14,269 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST10, totaling 7,008 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST11, totaling 7,437 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST12, totaling 19,762 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be

captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA ST13, totaling 11,452 square feet, treats a mainly landscape area as well as a small amount of impervious area on site. As a preliminary assumption, the self-treating area is assumed to be entirely pervious. Stormwater water from the drainage area is directed via surface runoff to the associated area drain. The area drain will be designed to treat the first 1” of rainfall and provide a minimum of 3” of ponding to promote infiltration into the soil. Any stormwater in excess of the 3” will be captured by the area drain and discharged into the storm drain system. See the plans for the ultimate discharge location.

DMA SR1, totaling 17,143 square feet, is an entirely landscaped area on the perimeter of the site. Stormwater from the drainage area is not affected by any impervious area and does not require treatment. Any runoff produced in these areas will flow directly offsite and mirror the existing drainage patterns. See the plans for the ultimate discharge location.

DMA SR2, totaling 27,341 square feet, is an entirely landscaped area on the perimeter of the site. Stormwater from the drainage area is not affected by any impervious area and does not require treatment. Any runoff produced in these areas will flow directly offsite and mirror the existing drainage patterns. See the plans for the ultimate discharge location.

DMA SR3, totaling 17,216 square feet, is an entirely landscaped area on the perimeter of the site. Stormwater from the drainage area is not affected by any impervious area and does not require treatment. Any runoff produced in these areas will flow directly offsite and mirror the existing drainage patterns. See the plans for the ultimate discharge location.

IV.B. Integrated Management Practice Descriptions

The project has multiple raised flow-through planters on building podium levels for roof treatment of specific buildings and bioretention facilities for the remaining site treatment.

IV.C. Tabulation and Sizing Calculations

Table 3. Information Summary for IMP Design

Total Project Area (Square Feet)	1,325,885 sf (30.6 Ac)
Mean Annual Precipitation	18.5 in
IMPs Designed For:	Hydromodification

Please see Attachment C for the IMP summary report. Please see Attachment D for the DMA surface area and storage required and the surface area and storage provided.

IV.C.1. Self-Treating Areas

ST 1, ST 2, ST 3, ST 4, ST 5, ST 6, ST 7, ST 8, ST 9, ST 10, ST 11, ST 12, ST 13

IV.C.2. Self-Retaining Areas

SR 1, SR 2, SR 3

IV.C.3. Areas Draining to Self-Retaining Areas

There are no areas draining to Self-Retaining areas.

V. SOURCE CONTROL MEASURES

V.A. Site activities and potential sources of pollutants

Table 5 lists site activities and potential sources of pollutants.

V.B. Source Control Table

Table 4. Sources and Source Control Measures

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
Landscape/outdoor pesticide use	Although Landscaping in this project is minimal, Landscape plans will be designed to minimize irrigation and runoff and to minimize use of fertilizers and pesticides, include pest resistant plants, planting appropriate site soils, slopes, climate, sun, wind, rain, and land use.	Landscape will be maintained using minimum or no pesticides. IPM information will be provided to new residents.
Interior floor/parking garage drains	Interior floor drains garage structure will drain to a sand oil separator discharge into the sanitary sewer.	Inspect and maintain drains to prevent blockages and overflows.
Roofing, gutters, and trim	Roofing, gutters, and trim will avoid materials with copper or other unprotected metals that may leach into runoff.	
Plazas, sidewalks, and parking lots.		Plazas, sidewalks, and parking lots will be swept regularly to prevent accumulation of litter and debris. Any debris from pressure washing will be collected to prevent entry into the storm drain system. Any wash water containing any cleaning agent or degreaser and will be collected and discharged to the sanitary sewer not to a storm drain.

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

Sources of runoff pollution will drain to flow-through planters and bioretention facilities. Proposed flow-through planters and bioretention facilities are designed with a variable layer of Class II permeable rock per Caltrans Specifications, an 18-inch deep Bio-treatment soil mix, a variable ponding depths for treatment as well as an additional depth of ponding for storage of larger rainfall

events. A typical section of the flow-through planter and bioretention areas can be found in Attachment E.

VI. STORMWATER FACILITY MAINTENANCE

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The owner agrees to maintain and operate the stormwater treatment measures (flow-through planters and bioretention facilities) as described in this report.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

Flow-through planter and bioretention facilities:

Detains runoff in a surface reservoir, filters it through plant roots and a biologically active soil mix, and then flows out to the public storm drain system. Typical maintenance consists of the following:

- Inspect **inlets** for channels, exposure of soils, or other evidence of erosion. Clear any obstructions and remove any accumulation of sediment. Examine rock or other material used as a splash pad and replenish if necessary.
- Inspect **outlets** for erosion or plugging.
- Observe soil at the bottom of the swale or filter for uniform **percolation** throughout. If portions of the swale or filter do not drain within 48 hours after the end of a storm, the soil should be tilled and replanted. Remove any debris or accumulations of sediment.
- Examine the **vegetation** to ensure that it is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary, remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas. When mowing, remove no more than $\frac{1}{3}$ height of grasses. Confirm that irrigation is adequate and not excessive. Replace dead plants and remove noxious and invasive vegetation.
- Abate any potential **vectors** by filling holes in the ground in and around the swale and by insuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent, contact the Contra Costa Mosquito and Vector Control District for information and advice. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.

VII. CONSTRUCTION PLAN C.3 CHECKLIST

Table 5. Construction Plan C.3 Checklist

N/A

VIII. CERTIFICATIONS

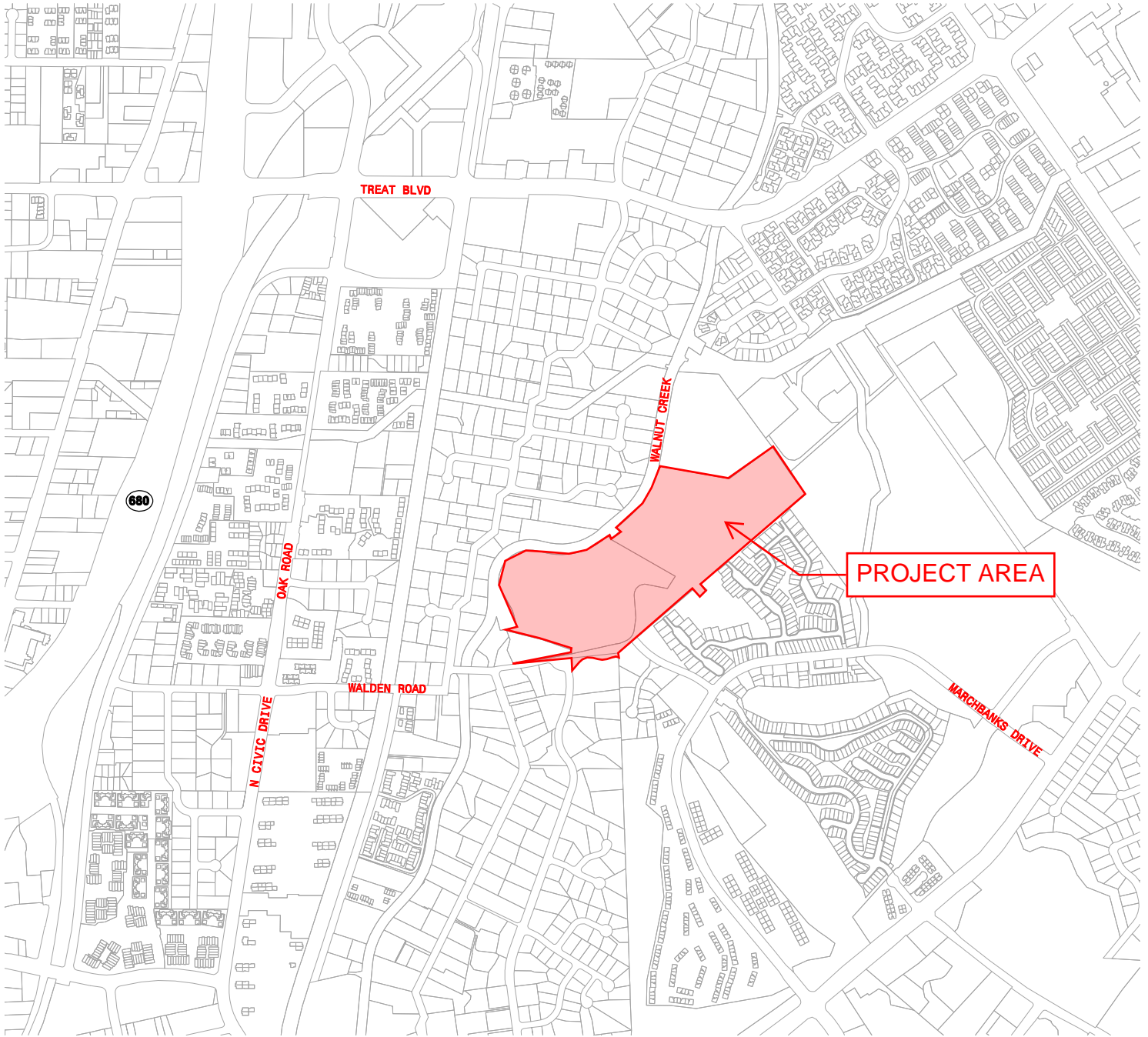
The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2015-0049.

By

Print Name

ATTACHMENT A

Vicinity Map



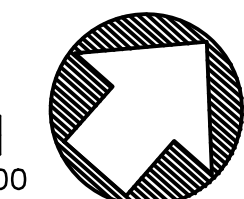
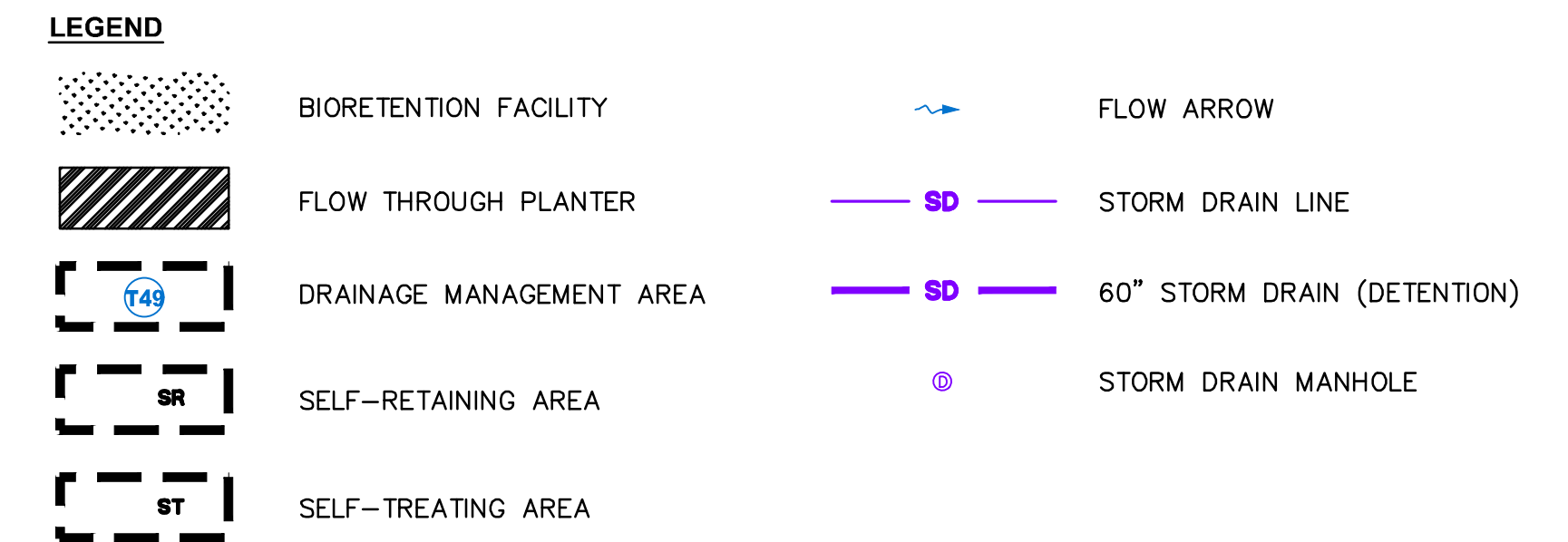
VICINITY MAP
SEVEN HILLS PROJECT

ATTACHMENT B

Stormwater Control Plan Exhibit



STORMWATER TREATMENT SUMMARY					
TREATMENT AREA	DRAINAGE MANAGEMENT AREA (SF)	TREATMENT AREA REQUIRED (SF)	TREATMENT AREA PROVIDED (SF)	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)
T1	14,309	769	992	1,492	1,587
T2	17,036	916	936	1,776	1,498
T3	12,097	650	665	1,261	1,064
T4	15,063	809	1,224	1,570	1,958
T5	14,411	774	911	1,503	1,458
T6	12,166	654	654	1,268	1,046
T7	10,176	547	841	1,061	1,346
T8	17,068	917	995	1,779	1,592
T9	7,783	418	1,043	811	1,669
T10	13,236	711	1,002	1,379	1,603
T11	6,021	324	356	628	570
T12	8,007	430	750	834	1,200
T13	10,410	559	697	1,085	1,115
T14	7,527	405	913	785	1,461
T15	3,784	203	390	395	624
T16	26,961	1,449	1520	2,811	2,432
T17	11,123	598	842	1,160	1,347
T18	67,881	3,648	3,765	7,077	6,024
T19	12,833	690	774	1,338	1,238
T20	4,435	238	740	462	1,184
T21	4,767	256	611	497	978
T22	6,785	365	850	708	1,360
T23	10,495	564	1,904	1,094	3,046
T24	10,494	564	1,064	1,094	1,702
T25	10,161	546	1,534	1,060	2,454
T26	2,416	130	169	252	270
T27	9,252	497	1,233	965	1,973
T28	16,290	875	947	1,698	1,515
T29	17,503	941	1,191	1,825	1,906
T30	5,125	275	360	534	576
T31	11,601	623	768	1,210	1,229
T32	6,726	361	422	702	675
T33	7,291	392	820	760	1,312
T34	14,018	753	1,217	1,462	1,947
T35	4,302	231	871	448	1,394
T36	24,976	1,342	1,377	2,603	2,203
T37	20,228	1,087	1,168	2,109	1,869
T38	3,111	167	181	324	290
T39	6,693	360	766	698	1,226
T40	4,459	240	240	465	384
T41	6,666	358	1,284	695	2,054
T42	9,847	529	583	1,027	933
T43	6,945	373	473	725	757
T44	6,986	375	869	728	1,390
T45	7,895	424	1,587	823	2,539
T46	20,950	1,126	1,204	2,184	1,926
T47	14,436	776	815	1,505	1,304
T48	17,110	919	1,120	1,783	1,792
T49	24,813	1,333	1,424	2,587	2,278
T50	26,106	1,403	1,407	2,721	2,251
T51	40,434	2,173	3,401	4,215	5,442
T52	7,275	391	395	758	632
T53	27,480	1,477	1,845	2,864	2,952
T54	6,986	375	403	728	645
T55	49,071	2,637	2,783	5,116	4,453
T56	59,999	3,224	3,677	6,255	5,883
T57	51,860	2,787	3,948	5,407	6,317



ATTACHMENT C

IMP Sizing Tool Summary Report

Project Name: Spieker Senior Continuing Care Community
Project Type: Treatment and Flow Control
Location: Walnut Creek
APN: 172-150-012, 172-080-007
Drainage Area: 1080912 sf
Mean Annual Precipitation: 18.5 in

I. Self-Treating Areas

DMA Name	Area (sq ft)
ST1	29600
ST2	31671
ST3	4424
ST4	3992
ST5	1530
ST6	17220
ST7	20280
ST8	7953
ST9	14269
ST10	7008
ST11	7437
ST12	19762
ST13	11452

II. Self-Retaining Areas

DMA Name	Area (sq ft)
SR1	17143
SR2	27341
SR3	17216

IV. Areas Draining to IMPs

IMP Name: IMP1 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T1	14,309	Concrete or Asphalt	1.00	14,309	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				14,309				
				Area	0.050	1.075	769	992
				Surface Volume	0.042	1.075	646	496
				Subsurface Volume	0.055	1.075	846	1,091
				Maximum Underdrain Flow (cfs)				0.02
				Orifice Diameter (in)				0.99

IMP Name: IMP2 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T2	17,036	Concrete or Asphalt	1.00	17,036	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				17,036				
				Area	0.050	1.075	916	936
				Surface Volume	0.042	1.075	769	468
				Subsurface Volume	0.055	1.075	1,007	1,030
				Maximum Underdrain Flow (cfs)				0.03
				Orifice Diameter (in)				1.08

IMP Name: IMP3 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T3	12,097	Concrete or Asphalt	1.00	12,097		Rain		

Total	12,097	IMP Sizing Factor	Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
	Area	0.050	1.075	650	665
Surface Volume		0.042	1.075	546	332
Subsurface Volume		0.055	1.075	715	732
Maximum Underdrain Flow (cfs)					0.02
Orifice Diameter (in)					0.91

IMP Name: IMP4 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T4	15,063	Concrete or Asphalt	1.00	15,063	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume	
Total					15,063	0.050	1.075	809	1,224
Area						0.042	1.075	680	612
Surface Volume						0.055	1.075	890	13,468
Subsurface Volume						Maximum Underdrain Flow (cfs)			0.02
						Orifice Diameter (in)			1.01

IMP Name: IMP5 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T5	14,411	Concrete or Asphalt	1.00	14,411	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume	
Total					14,411	0.050	1.075	774	911
Area						0.042	1.075	651	455
Surface Volume						0.055	1.075	852	1,002
Subsurface Volume						Maximum Underdrain Flow (cfs)			0.02
						Orifice Diameter (in)			0.99

IMP Name: IMP6 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T6	12,166	Concrete or Asphalt	1.00	12,166	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume	
Total					12,166	0.050	1.075	654	654
Area						0.042	1.075	549	327
Surface Volume						0.055	1.075	719	719
Subsurface Volume						Maximum Underdrain Flow (cfs)			0.02
						Orifice Diameter (in)			0.91

IMP Name: IMP7 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T7	10,176	Concrete or Asphalt	1.00	10,176	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume	
Total					10,176	0.050	1.075	547	841
Area						0.042	1.075	459	420
Surface Volume						0.055	1.075	602	925
Subsurface Volume						Maximum Underdrain Flow (cfs)			0.02
						Orifice Diameter (in)			0.83

IMP Name: IMP8 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T8	17,068	Concrete or Asphalt	1.00	17,068	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				17,068	0.050	1.075	917	995
				Area	0.042	1.075	770	497
				Surface Volume	0.055	1.075	1,009	1,095
				Subsurface Volume	Maximum Underdrain Flow (cfs)			0.03
					Orifice Diameter (in)			1.08

IMP Name: IMP9 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T9	7,783	Concrete or Asphalt	1.00	7,783	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				7,783	0.050	1.075	418	1,043
				Area	0.042	1.075	351	522
				Surface Volume	0.055	1.075	460	1,147
				Subsurface Volume	Maximum Underdrain Flow (cfs)			0.01
					Orifice Diameter (in)			0.73

IMP Name: IMP10 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T10	13,236	Concrete or Asphalt	1.00	13,236	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				13,236	0.050	1.075	711	1,002
				Area	0.042	1.075	597	501
				Surface Volume	0.055	1.075	782	1,102
				Subsurface Volume	Maximum Underdrain Flow (cfs)			0.02
					Orifice Diameter (in)			0.95

IMP Name: IMP11 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T11	6,021	Concrete or Asphalt	1.00	6,021	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,021	0.050	1.075	324	356
				Area	0.042	1.075	272	178
				Surface Volume	0.055	1.075	356	392
				Subsurface Volume	Maximum Underdrain Flow (cfs)			0.01
					Orifice Diameter (in)			0.64

IMP Name: IMP12 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T12	8,007	Concrete or Asphalt	1.00	8,007	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				8,007	0.050	1.075	430	750
				Area	0.042	1.075	361	375
				Surface Volume				
				Subsurface Volume				

Subsurface Volume	0.055	1.075	473	825
Maximum Underdrain Flow (cfs)				0.01
Orifice Diameter (in)				0.74

IMP Name: IMP13 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T13	10,410	Concrete or Asphalt	1.00	10,410	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				10,410				
				Area	0.050	1.075	559	697
				Surface Volume	0.042	1.075	470	349
				Subsurface Volume	0.055	1.075	615	767
				Maximum Underdrain Flow (cfs)			0.02	
				Orifice Diameter (in)			0.84	

IMP Name: IMP14 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T14	7,527	Concrete or Asphalt	1.00	7,527	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				7,527				
				Area	0.050	1.075	405	913
				Surface Volume	0.042	1.075	340	457
				Subsurface Volume	0.055	1.075	445	1,004
				Maximum Underdrain Flow (cfs)			0.01	
				Orifice Diameter (in)			0.72	

IMP Name: IMP15 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T15	3,784	Concrete or Asphalt	1.00	3,784	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				3,784				
				Area	0.050	1.075	203	390
				Surface Volume	0.042	1.075	171	195
				Subsurface Volume	0.055	1.075	224	429
				Maximum Underdrain Flow (cfs)			0.01	
				Orifice Diameter (in)			0.51	

IMP Name: IMP16 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T16	26,961	Concrete or Asphalt	1.00	26,961	IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				26,961				
				Area	0.050	1.075	1,449	1,520
				Surface Volume	0.042	1.075	1,217	760
				Subsurface Volume	0.055	1.075	1,594	1,672
				Maximum Underdrain Flow (cfs)			0.04	
				Orifice Diameter (in)			1.36	

IMP Name: IMP17 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T17	11,123	Concrete or Asphalt	1.00	11,123				
Total				11,123				
				Area	0.050	1.075	598	842
				Surface Volume	0.042	1.075	502	421
				Subsurface Volume	0.055	1.075	658	926
Maximum Underdrain Flow (cfs)								0.02
Orifice Diameter (in)								0.87

IMP Name: IMP18 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T18	67,881	Concrete or Asphalt	1.00	67,881				
Total				67,881				
				Area	0.050	1.075	3,648	3,765
				Surface Volume	0.042	1.075	3,064	1,883
				Subsurface Volume	0.055	1.075	4,013	4,142
Maximum Underdrain Flow (cfs)								0.11
Orifice Diameter (in)								2.15

IMP Name: IMP19 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T19	12,833	Concrete or Asphalt	1.00	12,833				
Total				12,833				
				Area	0.050	1.075	690	774
				Surface Volume	0.042	1.075	579	387
				Subsurface Volume	0.055	1.075	759	851
Maximum Underdrain Flow (cfs)								0.02
Orifice Diameter (in)								0.94

IMP Name: IMP20 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T20	4,435	Concrete or Asphalt	1.00	4,435				
Total				4,435				
				Area	0.050	1.075	238	740
				Surface Volume	0.042	1.075	200	370
				Subsurface Volume	0.055	1.075	262	814
Maximum Underdrain Flow (cfs)								0.01
Orifice Diameter (in)								0.55

IMP Name: IMP21 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T21	4,767	Concrete or Asphalt	1.00	4,767				
Total				4,767				
				Area	0.050	1.075	256	611
				Surface Volume	0.042	1.075	215	306
				Subsurface Volume	0.055	1.075	282	672
Maximum Underdrain Flow (cfs)								0.01
Orifice Diameter (in)								0.57

IMP Name: IMP22 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T22	6,785	Concrete or Asphalt	1.00	6,785	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed	
Total				6,785				Area	365
							Surface Volume	425	
							Subsurface Volume	935	
								Maximum Underdrain Flow (cfs)	0.01
								Orifice Diameter (in)	0.68

IMP Name: IMP23 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T23	10,495	Concrete or Asphalt	1.00	10,495	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed	
Total				10,495				Area	564
							Surface Volume	952	
							Subsurface Volume	2,094	
								Maximum Underdrain Flow (cfs)	0.02
								Orifice Diameter (in)	0.85

IMP Name: IMP24 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T24	10,494	Concrete or Asphalt	1.00	10,494	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed	
Total				10,494				Area	564
							Surface Volume	532	
							Subsurface Volume	1,170	
								Maximum Underdrain Flow (cfs)	0.02
								Orifice Diameter (in)	0.85

IMP Name: IMP25 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing				
T25	10,161	Concrete or Asphalt	1.00	10,161	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed	
Total				10,161				Area	546
							Surface Volume	767	
							Subsurface Volume	1,687	
								Maximum Underdrain Flow (cfs)	0.02
								Orifice Diameter (in)	0.83

IMP Name: IMP26 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T26	2,416	Concrete or Asphalt	1.00	2,416	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed
Total				2,416				Area

Surface Volume	0.042	1.075	109	85
Subsurface Volume	0.055	1.075	143	186
Maximum Underdrain Flow (cfs)			0.00	
Orifice Diameter (in)			0.41	

IMP Name: IMP27 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T27	9,252	Concrete or Asphalt	1.00	9,252	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				9,252	0.050	1.075	497	1,233
				Area	0.042	1.075	418	617
				Surface Volume	0.055	1.075	547	1,356
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.02	
				Orifice Diameter (in)		0.79		

IMP Name: IMP28 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T28	16,290	Concrete or Asphalt	1.00	16,290	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				16,290	0.050	1.075	875	947
				Area	0.042	1.075	735	474
				Surface Volume	0.055	1.075	963	1,042
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.03	
				Orifice Diameter (in)		1.05		

IMP Name: IMP29 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T29	17,503	Concrete or Asphalt	1.00	17,503	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				17,503	0.050	1.075	941	1,191
				Area	0.042	1.075	790	596
				Surface Volume	0.055	1.075	1,035	1,310
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.03	
				Orifice Diameter (in)		1.09		

IMP Name: IMP30 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T30	5,125	Concrete or Asphalt	1.00	5,125	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				5,125	0.050	1.075	275	360
				Area	0.042	1.075	231	180
				Surface Volume	0.055	1.075	303	396
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.01	
				Orifice Diameter (in)		0.59		

IMP Name: IMP31 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T31	11,601	Concrete or Asphalt	1.00	11,601				
Total				11,601				
				Area	0.050	1.075	623	768
				Surface Volume	0.042	1.075	524	384
				Subsurface Volume	0.055	1.075	686	845
Maximum Underdrain Flow (cfs)								0.02
Orifice Diameter (in)								0.89

IMP Name: IMP32 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T32	6,726	Concrete or Asphalt	1.00	6,726				
Total				6,726				
				Area	0.050	1.075	361	422
				Surface Volume	0.042	1.075	304	211
				Subsurface Volume	0.055	1.075	398	464
Maximum Underdrain Flow (cfs)								0.01
Orifice Diameter (in)								0.68

IMP Name: IMP33 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T33	7,291	Concrete or Asphalt	1.00	7,291				
Total				7,291				
				Area	0.050	1.075	392	820
				Surface Volume	0.042	1.075	329	410
				Subsurface Volume	0.055	1.075	431	902
Maximum Underdrain Flow (cfs)								0.01
Orifice Diameter (in)								0.71

IMP Name: IMP34 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T34	14,018	Concrete or Asphalt	1.00	14,018				
Total				14,018				
				Area	0.050	1.075	753	1,217
				Surface Volume	0.042	1.075	633	609
				Subsurface Volume	0.055	1.075	829	1,339
Maximum Underdrain Flow (cfs)								0.02
Orifice Diameter (in)								0.98

IMP Name: IMP35 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
T35	4,302	Concrete or Asphalt	1.00	4,302				
Total				4,302				
				Area	0.050	1.075	231	871
				Surface Volume	0.042	1.075	194	436
				Subsurface Volume	0.055	1.075	254	958
Maximum Underdrain Flow (cfs)								0.01
Orifice Diameter (in)								0.54

IMP Name: IMP36 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T36	24,976	Concrete or Asphalt	1.00	24,976	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				24,976	0.050	1.075	1,342	1,377
				Area	0.042	1.075	1,127	689
				Surface Volume	0.055	1.075	1,476	1,515
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.04	
						Orifice Diameter (in)		1.31

IMP Name: IMP37 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T37	20,228	Concrete or Asphalt	1.00	20,228	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				20,228	0.050	1.075	1,087	1,168
				Area	0.042	1.075	913	584
				Surface Volume	0.055	1.075	1,196	1,285
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.03	
						Orifice Diameter (in)		1.17

IMP Name: IMP38 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T38	3,111	Concrete or Asphalt	1.00	3,111	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				3,111	0.050	1.075	167	181
				Area	0.042	1.075	140	91
				Surface Volume	0.055	1.075	184	199
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.01	
						Orifice Diameter (in)		0.46

IMP Name: IMP39 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T39	6,693	Concrete or Asphalt	1.00	6,693	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,693	0.050	1.075	360	766
				Area	0.042	1.075	302	383
				Surface Volume	0.055	1.075	396	843
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.01	
						Orifice Diameter (in)		0.68

IMP Name: IMP40 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T40	4,459	Concrete or Asphalt	1.00	4,459	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				4,459				

Area	0.050	1.075	240	240
Surface Volume	0.042	1.075	201	120
Subsurface Volume	0.055	1.075	264	264
			Maximum Underdrain Flow (cfs)	0.01
			Orifice Diameter (in)	0.55

IMP Name: IMP41 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T41	6,666	Concrete or Asphalt	1.00	6,666	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,666				
				Area	0.050	1.075	358	1,284
				Surface Volume	0.042	1.075	301	642
				Subsurface Volume	0.055	1.075	394	1,412
					Maximum Underdrain Flow (cfs)		0.01	
					Orifice Diameter (in)		0.67	

IMP Name: IMP42 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T42	9,847	Concrete or Asphalt	1.00	9,847	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				9,847				
				Area	0.050	1.075	529	583
				Surface Volume	0.042	1.075	445	292
				Subsurface Volume	0.055	1.075	582	641
					Maximum Underdrain Flow (cfs)		0.02	
					Orifice Diameter (in)		0.82	

IMP Name: IMP43 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T43	6,945	Concrete or Asphalt	1.00	6,945	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,945				
				Area	0.050	1.075	373	473
				Surface Volume	0.042	1.075	314	237
				Subsurface Volume	0.055	1.075	411	520
					Maximum Underdrain Flow (cfs)		0.01	
					Orifice Diameter (in)		0.69	

IMP Name: IMP44 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T44	6,986	Concrete or Asphalt	1.00	6,986	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,986				
				Area	0.050	1.075	375	869
				Surface Volume	0.042	1.075	315	435
				Subsurface Volume	0.055	1.075	413	956
					Maximum Underdrain Flow (cfs)		0.01	
					Orifice Diameter (in)		0.69	

IMP Name: IMP45 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area	Post-Project Surface	DMA Runoff	DMA Area x

	(sq ft)	Type	Factor	Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
T45	7,895	Concrete or Asphalt	1.00	7,895				
Total				7,895				
Area				0.050	1.075	424	1,587	
Surface Volume				0.042	1.075	356	794	
Subsurface Volume				0.055	1.075	467	1,746	
Maximum Underdrain Flow (cfs)							0.01	
Orifice Diameter (in)							0.73	

IMP Name: IMP46 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
T46	20,950	Concrete or Asphalt	1.00	20,950				
Total				20,950				
Area				0.050	1.075	1,126	1,204	
Surface Volume				0.042	1.075	946	602	
Subsurface Volume				0.055	1.075	1,238	1,324	
Maximum Underdrain Flow (cfs)							0.03	
Orifice Diameter (in)							1.20	

IMP Name: IMP47 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
T47	14,436	Concrete or Asphalt	1.00	14,436				
Total				14,436				
Area				0.050	1.075	776	815	
Surface Volume				0.042	1.075	652	408	
Subsurface Volume				0.055	1.075	853	897	
Maximum Underdrain Flow (cfs)							0.02	
Orifice Diameter (in)							0.99	

IMP Name: IMP48 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
T48	17,110	Concrete or Asphalt	1.00	17,110				
Total				17,110				
Area				0.050	1.075	919	1,120	
Surface Volume				0.042	1.075	772	560	
Subsurface Volume				0.055	1.075	1,011	1,232	
Maximum Underdrain Flow (cfs)							0.03	
Orifice Diameter (in)							1.08	

IMP Name: IMP49 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjust-ment Factor	Minimum Area or Volume	Proposed Area or Volume
T49	24,813	Concrete or Asphalt	1.00	24,813				
Total				24,813				
Area				0.050	1.075	1,333	1,424	
Surface Volume				0.042	1.075	1,120	712	
Subsurface Volume				0.055	1.075	1,467	1,566	
Maximum Underdrain Flow (cfs)							0.04	
Orifice Diameter (in)							1.30	

IMP Name: IMP50 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T50	26,106	Concrete or Asphalt	1.00	26,106	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				26,106	0.050	1.075	1,403	1,407
				Area	0.042	1.075	1,178	704
				Surface Volume	0.055	1.075	1,543	1,548
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.04	
						Orifice Diameter (in)		1.33

IMP Name: IMP51 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T51	40,434	Concrete or Asphalt	1.00	40,434	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				40,434	0.050	1.075	2,173	3,401
				Area	0.042	1.075	1,825	1,701
				Surface Volume	0.055	1.075	2,390	3,741
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.07	
						Orifice Diameter (in)		1.66

IMP Name: IMP52 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T52	7,275	Concrete or Asphalt	1.00	7,275	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				7,275	0.050	1.075	391	395
				Area	0.042	1.075	328	198
				Surface Volume	0.055	1.075	430	435
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.01	
						Orifice Diameter (in)		0.70

IMP Name: IMP53 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T53	27,480	Concrete or Asphalt	1.00	27,480	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				27,480	0.050	1.075	1,477	1,845
				Area	0.042	1.075	1,240	923
				Surface Volume	0.055	1.075	1,624	2,030
				Subsurface Volume	Maximum Underdrain Flow (cfs)		0.05	
						Orifice Diameter (in)		1.37

IMP Name: IMP54 (Soil Type: D)

IMP Type: Bioretention Facility

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T54	6,986	Concrete or Asphalt	1.00	6,986	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				6,986				

Area	0.050	1.075	375	403
Surface Volume	0.042	1.075	315	202
Subsurface Volume	0.055	1.075	413	443
Maximum Underdrain Flow (cfs)				0.01
Orifice Diameter (in)				0.69

IMP Name: IMP55 (Soil Type: D)

IMP Type: Flow-Through Planter

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T55	49,071	Concrete or Asphalt	1.00	49,071	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				49,071				
Area				0.050	1.075	2,637	2,783	
Surface Volume				0.042	1.075	2,215	1,392	
Subsurface Volume				0.055	1.075	2,901	3,062	
Maximum Underdrain Flow (cfs)				0.08				
Orifice Diameter (in)				1.71				

IMP Name: IMP56 (Soil Type: D)

IMP Type: Flow-Through Planter

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T56	59,999	Concrete or Asphalt	1.00	59,999	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				59,999				
Area				0.050	1.075	3,224	3,677	
Surface Volume				0.042	1.075	2,708	1,839	
Subsurface Volume				0.055	1.075	3,547	4,045	
Maximum Underdrain Flow (cfs)				0.10				
Orifice Diameter (in)				1.89				

IMP Name: IMP57 (Soil Type: D)

IMP Type: Flow-Through Planter

Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
T57	51,860	Concrete or Asphalt	1.00	51,860	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Total				51,860				
Area				0.050	1.075	2,787	3,948	
Surface Volume				0.042	1.075	2,341	1,974	
Subsurface Volume				0.055	1.075	3,066	4,343	
Maximum Underdrain Flow (cfs)				0.09				
Orifice Diameter (in)				1.76				

ATTACHMENT D

DMA Sizing Calculations

LEGEND:

POST DMA AREA 1	POST DMA AREA 4	POST DMA AREA 7
-----------------	-----------------	-----------------

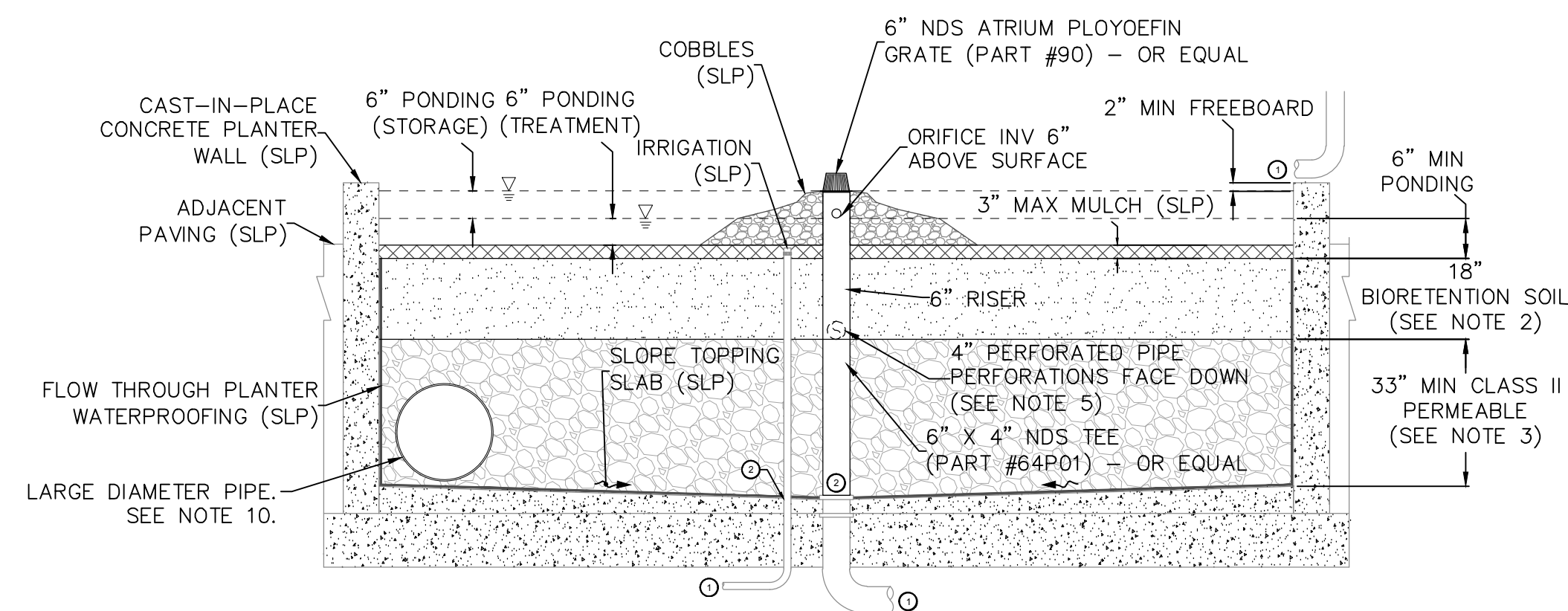
STORMWATER TREATMENT SUMMARY								
TREATMENT AREA	HYDRO-MODIFICATION	DRAINAGE MANAGEMENT AREA (SF)	TREATMENT AREA REQUIRED (SF)	TREATMENT AREA PROVIDED (SF)	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)	SURFACE TYPE	DRAINS TO
T1	YES	14,309	769	992	1,492	1,587	Impervious (Concrete or Asphalt)	A-1
T2	YES	17,036	916	936	1,776	1,498	Impervious (Concrete or Asphalt)	A-2
T3	YES	12,097	650	665	1,261	1,064	Impervious (Concrete or Asphalt)	A-3
T4	YES	15,063	809	1,224	1,570	1,958	Impervious (Concrete or Asphalt)	A-4
T5	YES	14,411	774	911	1,503	1,458	Impervious (Concrete or Asphalt)	A-5
T6	YES	12,166	654	654	1,268	1,046	Impervious (Concrete or Asphalt)	A-6
T7	YES	10,176	547	841	1,061	1,346	Impervious (Concrete or Asphalt)	A-7
T8	YES	17,068	917	995	1,779	1,592	Impervious (Concrete or Asphalt)	A-8
T9	YES	7,783	418	1,043	811	1,669	Impervious (Concrete or Asphalt)	A-9
T10	YES	13,236	711	1,002	1,379	1,603	Impervious (Concrete or Asphalt)	A-10
T11	YES	6,021	324	356	628	570	Impervious (Concrete or Asphalt)	A-11
T12	YES	8,007	430	750	834	1,200	Impervious (Concrete or Asphalt)	A-12
T13	YES	10,410	559	697	1,085	1,115	Impervious (Concrete or Asphalt)	A-13
T14	YES	7,527	405	913	785	1,461	Impervious (Concrete or Asphalt)	A-14
T15	YES	3,784	203	390	395	624	Impervious (Concrete or Asphalt)	A-15
T16	YES	26,961	1,449	1,520	2,811	2,432	Impervious (Concrete or Asphalt)	A-16
T17	YES	11,123	598	842	1,160	1,347	Impervious (Concrete or Asphalt)	A-17
T18	YES	67,881	3,648	3,765	7,077	6,024	Impervious (Concrete or Asphalt)	A-18
T19	YES	12,833	690	774	1,338	1,238	Impervious (Concrete or Asphalt)	A-19
T20	YES	4,435	238	740	462	1,184	Impervious (Concrete or Asphalt)	A-20
T21	YES	4,767	256	611	497	978	Impervious (Concrete or Asphalt)	A-21
T22	YES	6,785	365	850	708	1,360	Impervious (Concrete or Asphalt)	A-22
T23	YES	10,495	564	1,904	1,094	3,046	Impervious (Concrete or Asphalt)	A-23
T24	YES	10,494	564	1,064	1,094	1,702	Impervious (Concrete or Asphalt)	A-24
T25	YES	10,161	546	1,534	1,060	2,454	Impervious (Concrete or Asphalt)	A-25
T26	YES	2,416	130	169	252	270	Impervious (Concrete or Asphalt)	A-26
T27	YES	9,252	497	1,233	965	1,973	Impervious (Concrete or Asphalt)	A-27
T28	YES	16,290	875	947	1,698	1,515	Impervious (Concrete or Asphalt)	A-28
T29	YES	17,503	941	1,191	1,825	1,906	Impervious (Concrete or Asphalt)	A-29
T30	YES	5,125	275	360	534	576	Impervious (Concrete or Asphalt)	A-30
T31	YES	11,601	623	768	1,210	1,229	Impervious (Concrete or Asphalt)	A-31
T32	YES	6,726	361	422	702	675	Impervious (Concrete or Asphalt)	A-32
T33	YES	7,291	392	820	760	1,312	Impervious (Concrete or Asphalt)	A-33
T34	YES	14,018	753	1,217	1,462	1,947	Impervious (Concrete or Asphalt)	A-34
T35	YES	4,302	231	871	448	1,394	Impervious (Concrete or Asphalt)	A-35
T36	YES	24,976	1,342	1,377	2,603	2,203	Impervious (Concrete or Asphalt)	A-36
T37	YES	20,228	1,087	1,168	2,109	1,869	Impervious (Concrete or Asphalt)	A-37
T38	YES	3,111	167	181	324	290	Impervious (Concrete or Asphalt)	A-38
T39	YES	6,693	360	766	698	1,226	Impervious (Concrete or Asphalt)	A-39
T40	YES	4,459	240	240	465	384	Impervious (Concrete or Asphalt)	A-40
T41	YES	6,666	358	1,284	695	2,054	Impervious (Concrete or Asphalt)	A-41
T42	YES	9,847	529	583	1,027	933	Impervious (Concrete or Asphalt)	A-42
T43	YES	6,945	373	473	725	757	Impervious (Concrete or Asphalt)	A-43
T44	YES	6,986	375	869	728	1,390	Impervious (Concrete or Asphalt)	A-44
T45	YES	7,895	424	1,587	823	2,539	Impervious (Concrete or Asphalt)	A-45
T46	YES	20,950	1,126	1,204	2,184	1,926	Impervious (Concrete or Asphalt)	A-46
T47	YES	14,436	776	815	1,505	1,304	Impervious (Concrete or Asphalt)	A-47
T48	YES	17,110	919	1,120	1,783	1,792	Impervious (Concrete or Asphalt)	A-48
T49	YES	24,813	1,333	1,424	2,587	2,278	Impervious (Concrete or Asphalt)	A-49
T50	YES	26,106	1,403	1,407	2,721	2,251	Impervious (Concrete or Asphalt)	A-50
T51	YES	40,434	2,173	3,401	4,215	5,442	Impervious (Concrete or Asphalt)	A-51
T52	YES	7,275	391	395	758	632	Impervious (Concrete or Asphalt)	A-52
T53	YES	27,480	1,477	1,845	2,864	2,952	Impervious (Concrete or Asphalt)	A-53
T54	YES	6,986	375	403	728	645	Impervious (Concrete or Asphalt)	A-54
T55	YES	49,071	2,637	2,783	5,116	4,453	Impervious (Concrete or Asphalt)	A-55
T56	YES	59,999	3,224	3,677	6,255	5,883	Impervious (Concrete or Asphalt)	A-56
T57	YES	51,860	2,787	3,948	5,407	6,317	Impervious (Concrete or Asphalt)	A-57

POST DMA AREA VOLUME TOTALS				
AREA	REQUIRED (CF)	PROVIDED (CF)	DIFFERENCE (CF)	60" PIPE REQ. (LF)
1	28172	31795	-3623	0
4	43587	57856	-14269	0
7	19345	19222	123	6.24
TOTAL:				6.24

- NOTES:**
- The treatment area and volume required are based on the IMP sizing tool.
 - The volume provided is based on the typical bioretention and flow-through planter section for hydromodification, which assumes a 33" gravel layer with 40% porosity, and 6" ponding depth.
 - Where additional detention is required, a 60" RCP pipe is proposed to provide necessary storage. See sheet C5.0 for location

ATTACHMENT E

Treatment Facility Typical Sections



FLOW THROUGH PLANTER KEY

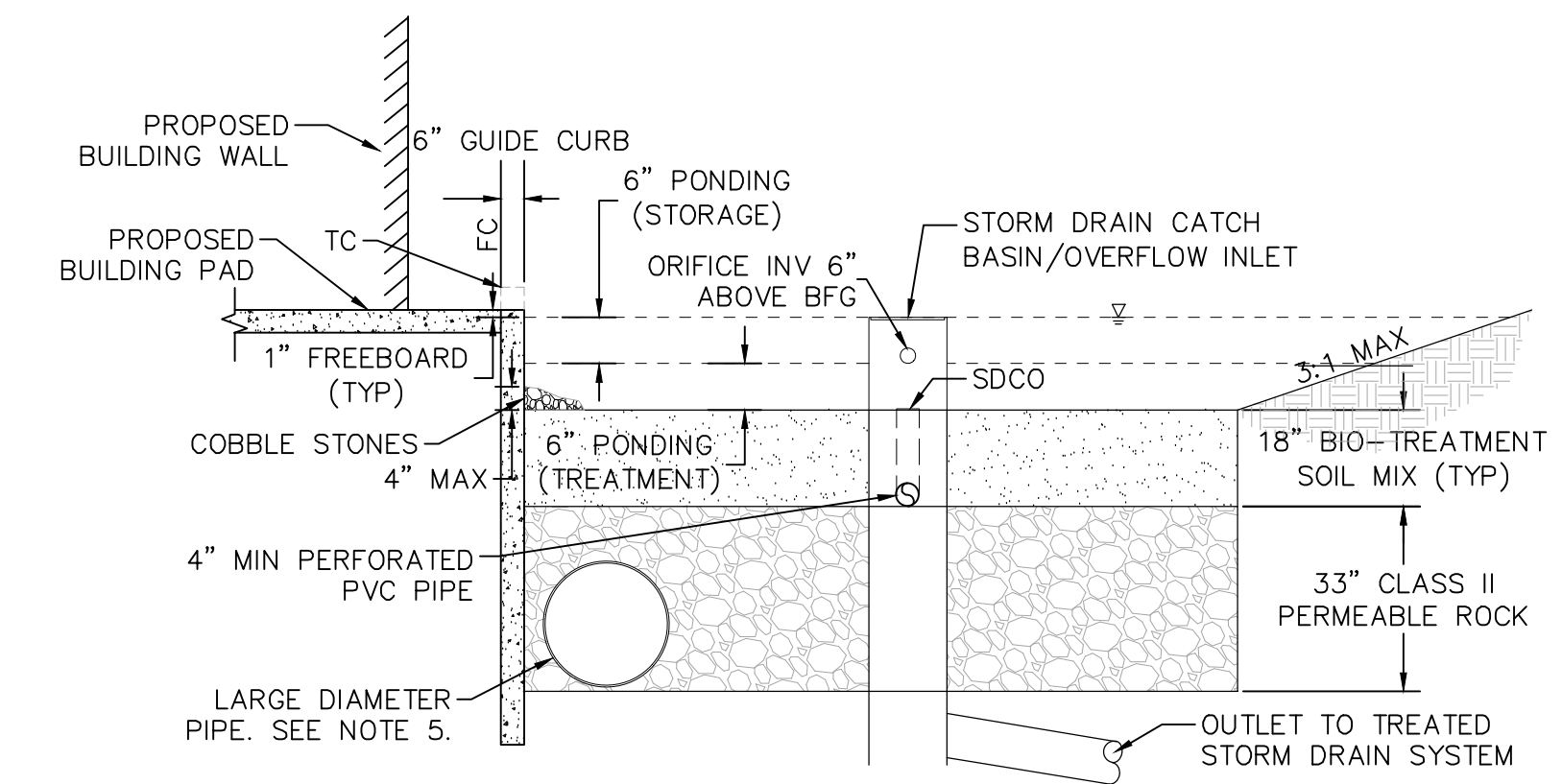
- 1 REFER TO PLUMBING PLANS FOR CONTINUATION OF UTILITY LINES THROUGH BUILDING
- 2 PLANTER WALL PENETRATION = SSP & SAP WATERPROOFING = SAP
- SAP SEE ARCHITECTURAL PLANS
- SLP SEE LANDSCAPE PLANS
- SPP SEE PLUMBING PLANS
- SSP SEE STRUCTURAL PLANS

GENERAL NOTES

1. INSTALL BUBBLER FROM BUILDING ROOF TO DRAIN ABOVE DESIGN PONDING ELEVATION.
2. BIORETENTION SOIL SHALL BE PER CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION), APPENDIX B.
3. CLASS 2 PERMEABLE SHALL COMPLY WITH CALTRANS SPECIFICATION SECTION 68-2.02(F)(3). DO NOT USE FILTER FABRIC TO SEPARATE THE SOIL MIX FROM THE GRAVEL DRAINAGE LAYER.
4. ALL WATERPROOFING SHALL BE BY THE OTHERS; COORDINATE PLANTER CONSTRUCTION WITH BUILDING FACADE AND WATERPROOFING.
5. SUBDRAIN TO BE PERFORATED PVC WITH THE HOLES FACING DOWN AND TO BE LOCATED AT THE TOP OF THE ROCK SECTION. 4" MINIMUM PIPE DIAMETER AND SLOPE OF SUBDRAIN IS FLAT TO MATCH THE TOP OF THE TOP OF THE ROCK SECTION (S=0.00).
6. UNLESS OTHERWISE STATED ALL STORM DRAIN PIPE (SOLID AND PERFORATED) WITHIN PLANTER SHALL BE PVC SDR 35 OR APPROVED EQUAL.
7. MINIMUM ROCK MULCH COBBLE DIAMETER SHALL BE LARGER THAN MAXIMUM GRATE OPENING.
8. FOR ADDITIONAL PLANTER CONSTRUCTION INFORMATION NOT SHOWN REFER TO LANDSCAPE, ARCHITECTURAL AND PLUMBING PLANS FOR DETAILS.
9. DESIGN BASED ON CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION).
10. LARGE DIAMETER CLOSED PIPES OR ARCHES MAY BE INCORPORATED ON A LATER SUBMITTAL TO AUGMENT STORAGE VOLUME. SHOWN HERE FOR REFERENCE ONLY.

TYPICAL FLOW-THROUGH PLANTER CROSS SECTION

NTS

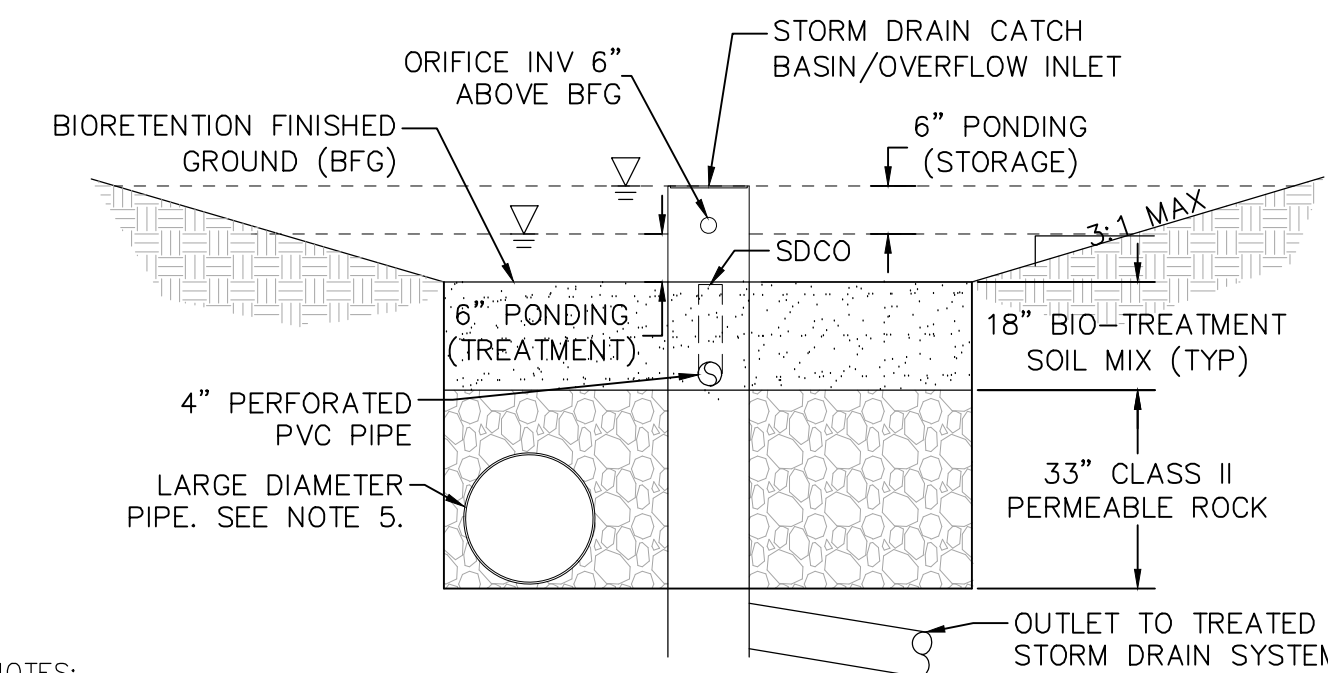


NOTES:

1. BIORETENTION SOIL SHALL BE PER CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION), APPENDIX B
2. CLASS 2 PERMEABLE SHALL COMPLY WITH CALTRANS SPECIFICATION SECTION 68-2.02(F)(3). DO NOT USE FILTER FABRIC TO SEPARATE THE SOIL MIX FROM THE GRAVEL DRAINAGE LAYER.
3. SUBDRAIN TO BE 4" MINIMUM SDR 35. PERFORATE PVC WITH HOLES FACING DOWN AND TO BE LOCATED FLAT ON TOP OF GRAVEL LAYER.
4. DESIGN BASED ON CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION).
5. LARGE DIAMETER CLOSED PIPES OR ARCHES MAY BE INCORPORATED ON A LATER SUBMITTAL TO AUGMENT STORAGE VOLUME. SHOWN HERE FOR REFERENCE ONLY.

TYPICAL PARTIALLY RETAINED BIORETENTION FACILITY CROSS SECTION

NTS

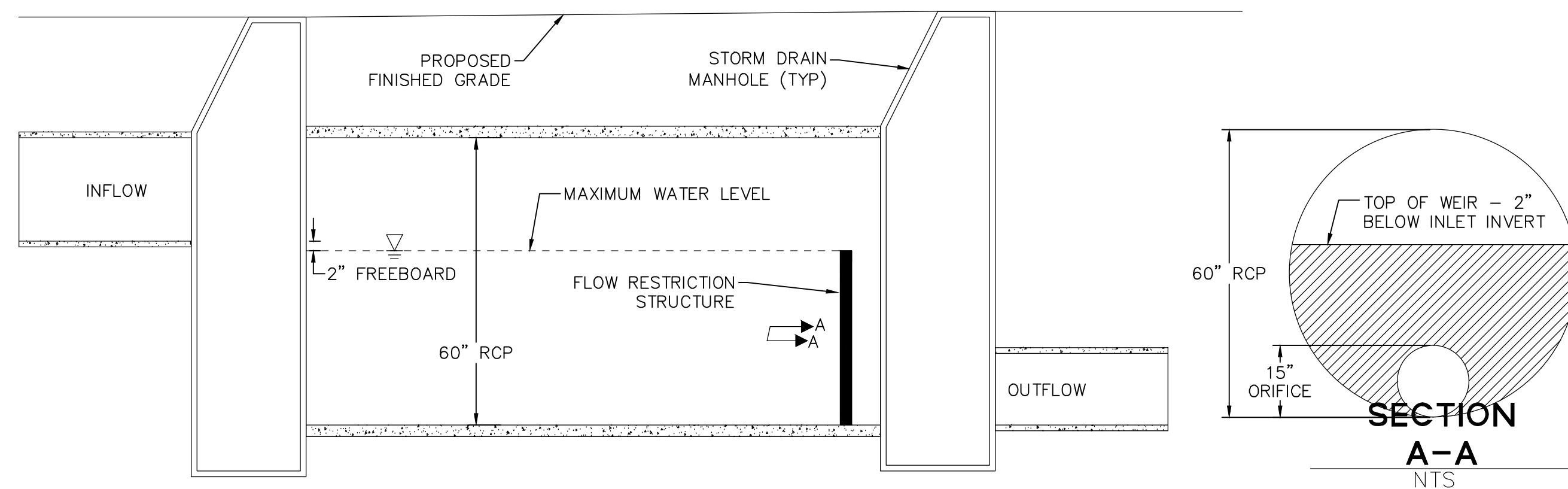


NOTES:

1. BIORETENTION SOIL SHALL BE PER CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION), APPENDIX B
2. CLASS 2 PERMEABLE SHALL COMPLY WITH CALTRANS SPECIFICATION SECTION 68-2.02(F)(3). DO NOT USE FILTER FABRIC TO SEPARATE THE SOIL MIX FROM THE GRAVEL DRAINAGE LAYER.
3. SUBDRAIN TO BE 4" MINIMUM SDR 35. PERFORATE PVC WITH HOLES FACING DOWN AND TO BE LOCATED FLAT ON TOP OF GRAVEL LAYER.
4. DESIGN BASED ON CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION).
5. LARGE DIAMETER CLOSED PIPES OR ARCHES MAY BE INCORPORATED ON A LATER SUBMITTAL TO AUGMENT STORAGE VOLUME. SHOWN HERE FOR REFERENCE ONLY.

TYPICAL UNSTRUCTURED BIORETENTION FACILITY CROSS SECTION

NTS

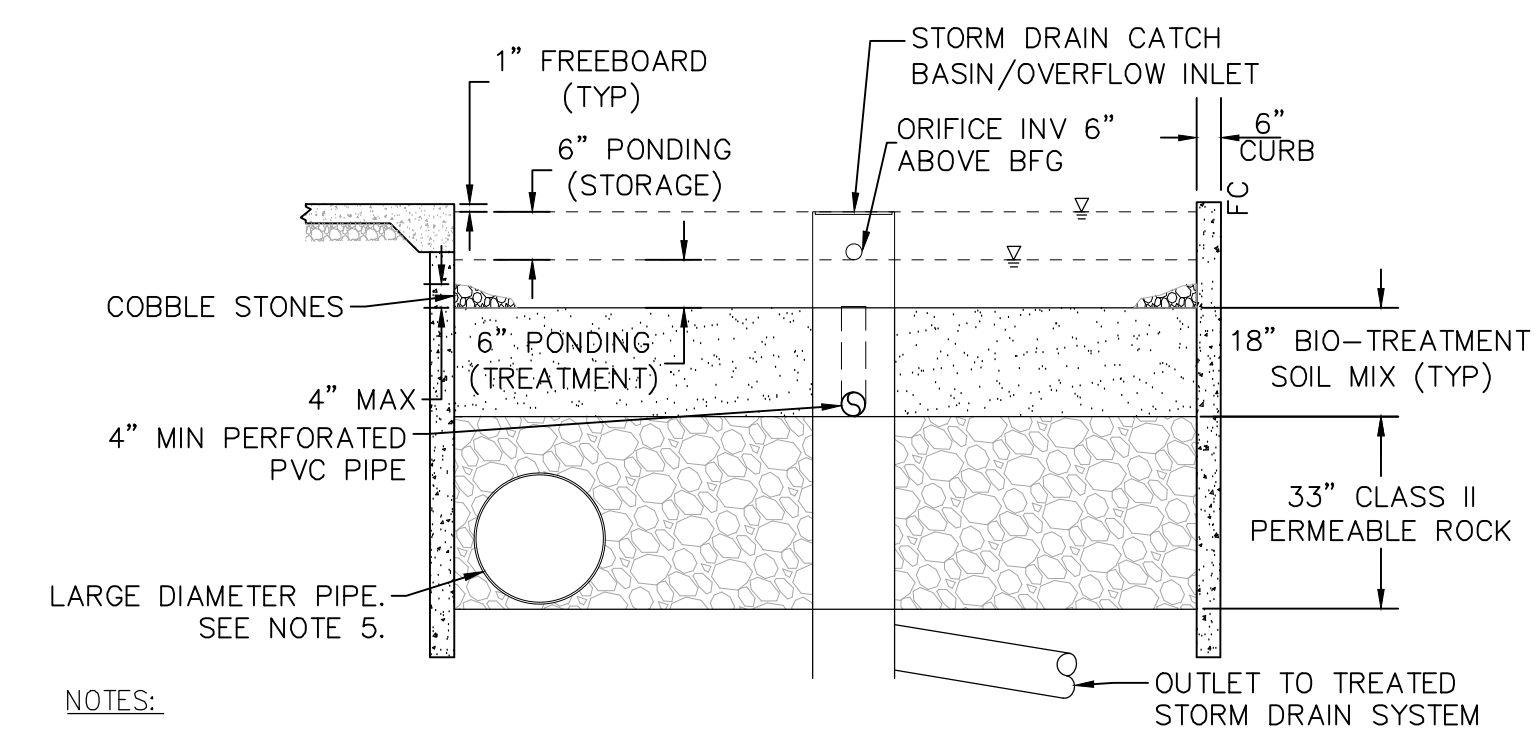


NOTES:

1. THIS DETAIL IS FOR REFERENCE ONLY, TO DEMONSTRATE THE FEASIBILITY OF USING A LARGE DIAMETER PIPE FOR STORAGE. ALL DIMENSIONS SHOWN ARE SUBJECT TO CHANGE.

TYPICAL 60" RCP DETENTION

NTS



NOTES:

1. BIORETENTION SOIL SHALL BE PER CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION), APPENDIX B
2. CLASS 2 PERMEABLE SHALL COMPLY WITH CALTRANS SPECIFICATION SECTION 68-2.02(F)(3). DO NOT USE FILTER FABRIC TO SEPARATE THE SOIL MIX FROM THE GRAVEL DRAINAGE LAYER.
3. SUBDRAIN TO BE 4" MINIMUM SDR 35. PERFORATE PVC WITH HOLES FACING DOWN AND TO BE LOCATED FLAT ON TOP OF GRAVEL LAYER.
4. DESIGN BASED ON CONTRA COSTA COUNTY STORMWATER GUIDEBOOK (7TH EDITION).
5. LARGE DIAMETER CLOSED PIPES OR ARCHES MAY BE INCORPORATED ON A LATER SUBMITTAL TO AUGMENT STORAGE VOLUME. SHOWN HERE FOR REFERENCE ONLY.

TYPICAL RETAINED BIORETENTION AREA CROSS SECTION

NTS

Preliminary Stormwater Control Plan Peer Review

MEMORANDUM

TO: Connor Tutino
David J, Powers & Associates

DATE: September 27, 2021

FROM: Caitlin Gilmore, PE
Victoria Belli, PE

JOB#: DPOW.119.21:001

SUBJECT: 850 Seven Hills Ranch Road EIR Review

We have reviewed the Stormwater Control Plan (SWCP) dated February 2021 for the Spieker Senior Continuing Care Community project in Walnut Creek for agreement with the California Environmental Quality Act (CEQA). Please review the following comments.

Compliance with CEQA thresholds of significance - X. Hydrology and Water Quality

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Add the explanation of groundwater impact to the SWCP Report, or provide memo or report where this information is contained.

Water Quality Comments

- For note only: The following items must be completed during the final permitting phase to comply:
 - SWPPP
 - Narrative of infeasible treatment
 - O&M Plan for each treatment and flow-control facility.
 - Revised bioretention area details
 - Updated source control table for Appendix D