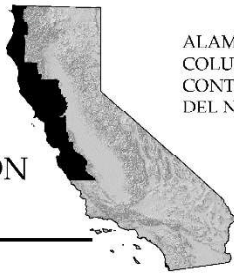


CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM



ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE

HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO

SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1400 Valley House Drive, Suite 210
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
<https://nwic.sonoma.edu>

February 9, 2022

File No.: 21-1230

Adam Sharron, Project Planner
County of Sonoma
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

re: PLP22-0001 / APN 058-071-015 at 4614 Old Redwood Hwy., Santa Rosa / Ugenti

Dear Adam Sharron,

Records at this office were reviewed to determine if this project could adversely affect cultural resources. **Please note that use of the term cultural resources includes both archaeological sites and historical buildings and/or structures. The review for possible historic-era building/structures, however, was limited to references currently in our office and should not be considered comprehensive.**

Project Description:

Design Review of a 45-unit multifamily housing development (8 studios, 21 one bedroom units, and 16 two-bedroom units) on a one acre parcel to be served by public sewer and water; and a Zone Change to add the WH (Workforce Housing) Combining District to the parcel's zoning. Development will consist of a 40-foot tall building with parking on the first floor and residential above, a community room and outdoor courtyard, 51 parking spaces, 32 bicycle parking spaces, and new landscaping and hardscaping. The applicant requests a 100% density bonus under the County's Housing Opportunity Program in exchange for providing 40 percent of the total project units (18 units) as affordable.

Previous Studies:

XX Study # 1249 (Werner 1978), covering approximately 100% of the proposed project area, identified no cultural resources. (see recommendation below).

Archaeological and Native American Resources Recommendations:

XX The proposed project area has the possibility of containing unrecorded archaeological sites. Due to the passage of time since the previous survey, Study # 1249 (Werner 1978), and the changes in archaeological theory and method since that time, we recommend a qualified archaeologist conduct further archival and field study for the entire project area to identify any unrecorded archaeological resources.

XX We recommend the lead agency contact the local Native American tribe(s) regarding traditional, cultural, and religious heritage values. For a complete listing of tribes in the vicinity of the project, please contact the Native American Heritage Commission at (916)373-3710.

Built Environment Recommendations:

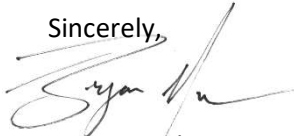
XX Since the Office of Historic Preservation has determined that any building or structure 45 years or older may be of historical value, if the project area contains such properties, it is recommended that prior to commencement of project activities, a qualified professional familiar with the architecture and history of Sonoma County conduct a formal CEQA evaluation.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

For your reference, a list of qualified professionals in California that meet the Secretary of the Interior's Standards can be found at <http://www.chrisinfo.org>. If archaeological resources are encountered during the project, work in the immediate vicinity of the finds should be halted until a qualified archaeologist has evaluated the situation. If you have any questions please give us a call (707) 588-8455.

Sincerely,

A handwritten signature in black ink, appearing to read "Bryan Much", with a stylized flourish extending to the right.

Bryan Much
Coordinator

Adam Sharron

From: Ben Macias <BMacias@cloverdalerancheria.com>
Sent: Monday, February 14, 2022 10:45 AM
To: Adam Sharron
Cc: Patrick Dirden
Subject: RE: PLP22-0001 (4614 Old Redwood Hwy., Santa Rosa) Completeness Referral (Respond by February 28, 2022)

EXTERNAL

The Cloverdale Rancheria will go on record:

If the Applicant discovers archaeological remains or resources during construction or any movement of dirt, the Applicant should immediately stop construction and notify the appropriate Federal Agency and the Tribe.

Benjamin Macias
Cloverdale Rancheria

From: Patrick Dirden <Patrick.Dirden@sonoma-county.org>
Sent: Thursday, January 27, 2022 4:07 PM
Cc: Adam Sharron <Adam.Sharron@sonoma-county.org>
Subject: PLP22-0001 (4614 Old Redwood Hwy., Santa Rosa) Completeness Referral (Respond by February 28, 2022)

Greetings,

Please see the following link to the Completeness Referral regarding the project in the subject line.

<https://share.sonoma-county.org/link/5UI8HIPBNcg/>

If you have any questions please feel free to reach out to the planner at Adam.Sharron@sonoma-county.org or (707) 565-7389. Please respond by February 28, 2022.

Kind Regards,
--Patrick

Patrick Dirden
Planning Secretary
County of Sonoma
2550 Ventura Avenue, Santa Rosa, CA 95403
Lunch from 12 to 1
Office: 707-565-2164 | Fax: 707-565-1103
www.PermitSonoma.org



Due to the Public Health Orders, online tools remain the best way to access Permit Sonoma's services like permitting, records, scheduling inspections, and general questions. You can find out more about our extensive online services at PermitSonoma.org.

The Permit Center has reopened with limited capacity Monday, Tuesday, Thursday, Friday from 8:00 AM – 4:00 PM; Wednesday, 10:30 AM – 4:00 PM.

Thank you for your patience as we work to keep staff and the community safe.

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Adam Sharron

From: Brenda L. Tomaras <btomaras@mtowlaw.com>
Sent: Monday, February 7, 2022 11:33 AM
To: Adam Sharron
Subject: Lytton Rancheria Response for PLP22-0001

EXTERNAL

Mr. Sharron:

This shall serve as the Lytton Rancheria's acknowledgment of receipt of the above-referenced referral for AB52 purposes. Based on the information provided, the Tribe is requesting a Phase 1 archaeological survey.

Thank you.

Brenda L. Tomaras
Tomaras & Ogas, LLP
10755-F Scripps Poway Parkway #281
San Diego, CA 92131
(858) 554-0550
(858) 583-3482 Mobile
(858) 777-5765 Facsimile

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Adam Sharron

From: Maria Arce <Maria.Arce@sctransit.com>
Sent: Tuesday, February 8, 2022 4:31 PM
To: Adam Sharron
Cc: Steven Schmitz
Subject: RE: PLP22-0001 (4614 Old Redwood Hwy., Santa Rosa) Completeness Referral (Respond by February 10, 2022)
Attachments: PLP22-0001 Completeness Referral Letter.pdf; 20305-00.pdf

EXTERNAL

RE: PLP22-0001

Thank you for the opportunity to review project PLP22-0001 for a proposed 45-unit multifamily housing development to be located at 4614 Old Redwood Highway in Santa Rosa. Sonoma County Transit provides public transit to the project site. As a condition of project approval, please request that a passenger waiting shelter, with access to electrical for shelter lighting, be provided as part of the frontage improvements along Old Redwood Hwy. We request that the bus stop and shelter be located on the sidewalk along Old Redwood Highway adjacent to the transformer between the two driveways. Attached are Sonoma County Transit's shelter specifications.

Should you have any questions regarding these comments, please contact me at (707) 585-7516.

Maria Arce
Transit Specialist

SonomaCountyTransit

355 W. Robles Ave
Santa Rosa, CA
707.585-7516
sctransit.com

From: Patrick Dirden [<mailto:Patrick.Dirden@sonoma-county.org>]
Sent: Thursday, January 27, 2022 3:37 PM
Cc: Adam Sharron <Adam.Sharron@sonoma-county.org>
Subject: PLP22-0001 (4614 Old Redwood Hwy., Santa Rosa) Completeness Referral (Respond by February 10, 2022)

Greetings,

Please see the following link to the Completeness Referral regarding the project in the subject line.
<https://share.sonoma-county.org/link/Fp3eubiXoPg/>

If you have any questions please feel free to reach out to the planner at Adam.Shareon@sonoma-county.org or (707) 565-7389. Please respond by February 10, 2022.

Kind Regards,
--Patrick

Patrick Dirden

Planning Secretary

County of Sonoma

2550 Ventura Avenue, Santa Rosa, CA 95403

Lunch from 12 to 1

Office: 707-565-2164 | Fax: 707-565-1103

www.PermitSonoma.org



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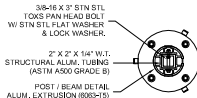
Thank you for your patience as we work to keep staff and the community safe.

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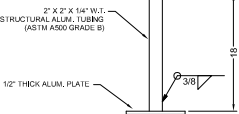
Warning: If you don't know this email sender or the email is unexpected, **do not** click any web links, attachments, and **never** give out your user ID or password.

THIS DRAWING HAS BEEN GENERATED AND IT IS THE PROPERTY OF TOLAR MANUFACTURING COMPANY. THIS DRAWING SHALL ONLY BE REPRODUCED AS SHOWN BY TOLAR MANUFACTURING COMPANY'S ENGINEERING DEPT.

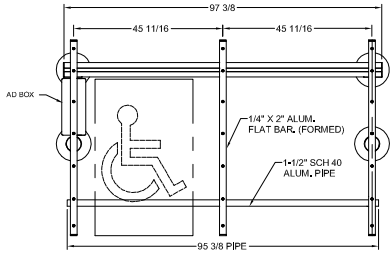
- GENERAL NOTES:**
1. ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL BE ASTM A-36, MINIMUM YIELD STRENGTH 36,000 PSI.
 2. ALL ALUMINUM MEMBERS, UNLESS OTHERWISE NOTED, SHALL BE OF ALLOY 6063-T5.
 3. ALL HOLES SHALL BE DRILLED OR PUNCHED.
 4. STEEL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STANDARD D1.1-98. ELECTRODES SHALL CONFORM TO AWS A5.1, CLASS E70XX.
 5. ALUMINUM WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STANDARD D1.2-99. ELECTRODES SHALL CONFORM TO AWS/SFA 5.10 CLASS ER40.
 6. ALL WELDING TO BE DONE AT TOLAR MANUFACTURING CO., INC. FACILITY.



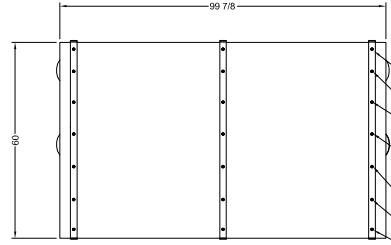
POST TO SHOE CONNECTION DETAIL (4 PLCS)



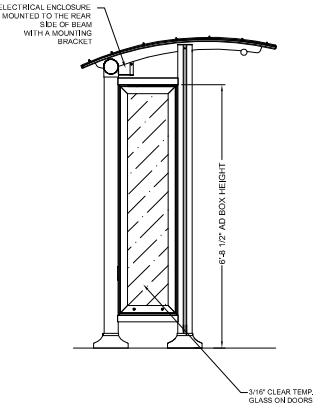
POST SHOE WELDMENT DETAIL (3 PLCS)



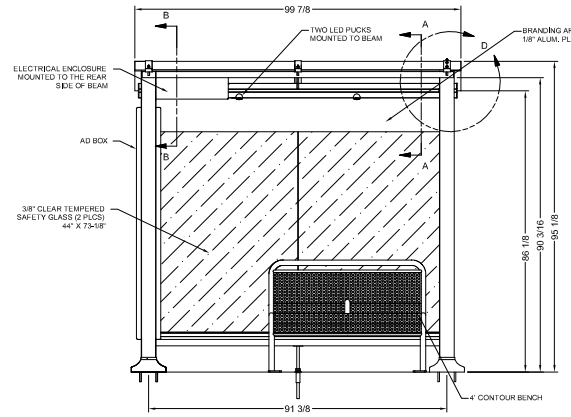
TOP VIEW (SHOWN WITHOUT ROOF PANELS)



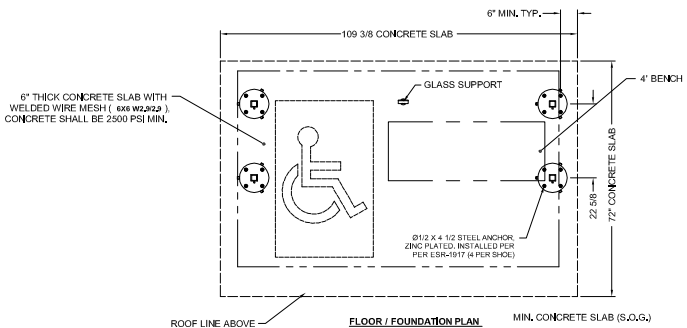
TOP ELEVATION



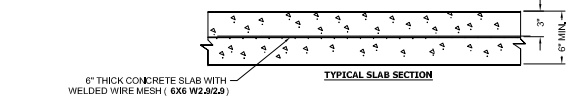
FRONT ELEVATION



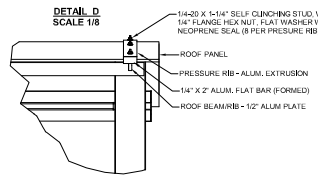
SIDE ELEVATION



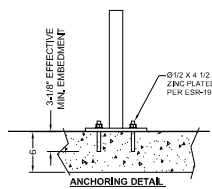
FLOOR / FOUNDATION PLAN



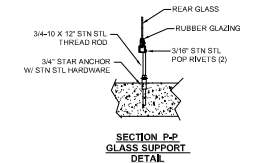
TYPICAL SLAB SECTION



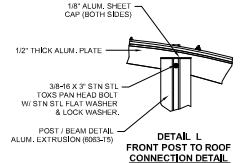
DETAIL D SCALE 1/8"



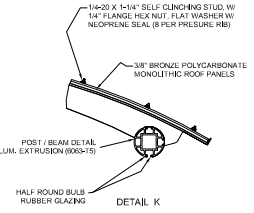
ANCHORING DETAIL



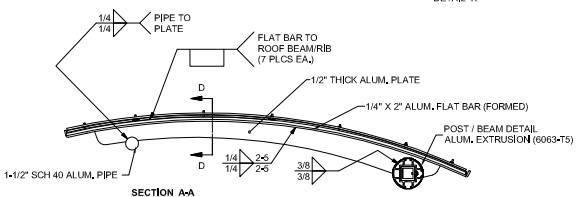
SECTION P-P GLASS SUPPORT DETAIL



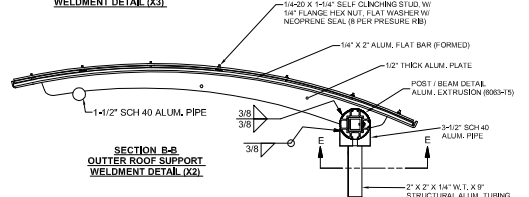
DETAIL L FRONT POST TO ROOF CONNECTION DETAIL



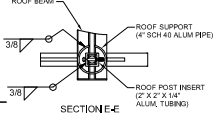
DETAIL K



SECTION A-A MID ROOF SUPPORT WELDMENT DETAIL (X3)



SECTION B-B OUTER ROOF SUPPORT WELDMENT DETAIL (X2)



SECTION E-E

TOLAR MANUFACTURING COMPANY		Tolar Manufacturing Company, Inc	
153 AR		258 Marlon Circle, Corona, CA 92679	
DATE: 11/07/13	SCALE: 1/8" = 1'-0"	PROJECT: 8' AD SUNSET WITH GLASS WALLS	REV: 00
DESIGNER: [Signature]	CHECKED: [Signature]	DATE: 11/06/2013	BY: ER



February 10, 2022

Electronically Mailed

Adam Sharron
County of Sonoma
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

RE: PLP22-0001 - A request for Design Review of a 45-unit multifamily housing development (8 studios, 21 one-bedroom units, and 16 two-bedroom units) on a one acre parcel to be served by public sewer and water; and a Zone Change to add the WH (Workforce Housing) Combining District to the parcel's zoning. Development will consist of a 40-foot tall building with parking on the first floor and residential above, a community room and outdoor courtyard, 51 parking spaces, 32 bicycle parking spaces, and new landscaping and hardscaping. The applicant requests a 100% density bonus under the County's Housing Opportunity Program in exchange for providing 40 percent of the total project units (18 units) as affordable. This property is located at 4614 Old Redwood Hwy., Santa Rosa.

Dear Mr. Sharron,

Thank you for the opportunity to comment on this project. This request is for Design Review for the project as described above.

If a public pool/spa/therapy pool or public interactive water feature is proposed, a review and approval of the building plans is required prior to issuance of a public pool permit.

If you have any questions, please call me at (707) 565-6562 or email at Lisa.Steinman@sonoma-county.org.

Sincerely,

Lisa Steinman

Lisa Steinman
Program Planning and Evaluation Analyst
Sonoma County Environmental Health

C: Sundari Mase, MD, MPH, Health Officer
Christine Sosko, Director of Environmental Health
Leslye Choate, Environmental Health Program Manager

PERMIT AND RESOURCE MANAGEMENT DEPARTMENT
RECOMMENDED SANITATION SECTIONS
MEMORANDUM

TO: Adam Sharron, Project Planner
FROM: Keith Hanna
LOCATION: 4614 Old Redwood Hwy., Santa Rosa
APPLICANT: Paul Ugenti

DATE: 2022 February 9
PROJECT RECORD: PLP22-0001
APN: 058-071-015

Project description:

Design Review of a 45-unit multifamily housing development (8 studios, 21 one-bedroom units, and 16 two-bedroom units) on a one acre parcel to be served by public sewer and water; and a Zone Change to add the WH (Workforce Housing) Combining District to the parcel's zoning. Development will consist of a 40-foot tall building with parking on the first floor and residential above, a community room and outdoor courtyard, 51 parking spaces, 32 bicycle parking spaces, and new landscaping and hardscaping. The applicant requests a 100% density bonus under the County's Housing Opportunity Program in exchange for providing 40 percent of the total project units (18 units) as affordable.

Sanitation Conditions

1. Sonoma County Water Agency (Sonoma Water) operates and owns Airport/Larkfield/Wikiup Sanitation Zone (Zone). References to District employees are understood to be Sonoma Water employees.
2. Prior to the start of construction within the County Right-of-Way of Old Redwood Hwy., the Applicant shall have a licensed general contractor in possession of a valid Public Road bond obtain an Encroachment Permit from the Permit and Resource Management Department (Permit Sonoma).
3. The Applicant shall obtain a permit to construct sanitary sewer facilities. The sewer design, and construction, shall comply with the Sonoma County Water Agency, Design and Construction Standards for Sanitation Facilities and Sonoma County Water Agency Sanitation Code Ordinance. All sewer work shall be inspected and accepted by the County Inspector, and the sewer permit finalized, prior to temporary occupancy and building permit final.

Under the sewer permit, the existing sewer lower lateral shall be video inspected and the lateral repaired or replaced to comply with Sonoma County Water Agency, Design and Construction Standards for Sanitation Facilities and Sonoma County Water Agency Sanitation Code Ordinance, including that the existing lateral is appropriately sized.

4. Sewer Use Fees for sewer service shall be calculated at the prevailing Sewer Connection and Annual Sewer Service Charge rates in effect at the time of sewer permit issuance.
5. All Sewer Fees per Airport/Larkfield/Wikiup Sanitation Zone Ordinances (latest revision) shall be paid to the Sanitation Section of Permit Sonoma prior to temporary occupancy and building permit final for the proposed 45-unit multifamily housing development.
6. The Applicant shall be responsible for the restoration of existing conditions including, but not limited to surfacing, landscaping, utilities and other public improvements that have been disturbed due to the construction of sanitary sewer facilities. Restoration shall be completed prior to the final of the sewer construction permit, unless otherwise specifically approved in advance by Permit Sonoma.

MARK WEST CITIZENS ADVISORY COUNCIL
RECOMMENDATION OF APPROVAL OF APPLICATION

At the meeting of The Mark West Citizens Advisory Council, February 9, 2022, Council members voted (5-0) to recommend approval of the following application.

File Number: PLP22-0001, 4614 Old Redwood Hwy. Santa Rosa

Applicant/Owner Name: Paul Ugenti, Director of Development, Tandem Real Estate and Jenny Kenyon, Property Owner

Site Address: 4614 Old Redwood Hwy. Santa Rosa, CA

APN: 058-071-015

The Mark West Citizens Advisory Council approves the concept of a work-force housing project, with the following concerns, suggestions and conditions:

The design of the building is beautiful and the Council sees the value and need for workforce housing.

The concerns are:

Number of Units

- 45 units are too many for a one-acre site. We recommend reducing the overall number.

Height of the building

- It is way too tall and dominating for the Larkfield area. Not only for the visual aspect, also for the single-family homes, right next door. Does not reflect the look of the area.

Parking

- There is not enough. There is only one parking place for each unit. Many families will have more than one car. There is absolutely no street parking on Mark West Springs Road. The overflow parking will be in the Mark West Estates neighborhood in front of homes.

Traffic

- The volume increase, without dealing with the existing traffic issues on Old Redwood Hwy. would create safety issues.
- The ingress and egress at the property entrance would be unsafe, being so close to the corner of Old Redwood Hwy. and Mark West Springs Rd. unless there is some way to mitigate that.

The suggestions are:

- Dedicated public transportation stop at the property
- Shuttle to businesses, work places, airport and SMART
- Roundabout intersection(s)
- Transportation and Public Works be involved and communicate with the Council

The conditions are:

- The owners agree to keep it at 40% affordable.
- Some traffic calming measures on Old Redwood, in the Larkfield area are put in place.

The Council looks forward to future presentations as this project walks through the process.

Karen Fies, Chairperson

Karen Fies, Chairperson
Dated: February 10, 2022



February 16, 2022

Adam Shaeon
County of Sonoma
2550 Ventura Ave
Santa Rosa, CA 95403

Re: PLP22-0001
4614 Old Redwood Highway, Santa Rosa, CA 95403

Dear Adam:

Thank you for giving us the opportunity to review the subject plans. The proposed PLP22-0001 is within the same vicinity of PG&E's existing facilities that impact this property.

PG&E holds an easement for an existing line of towers across APN 058-071-015-000 in Sonoma county. Said easement does not allow for the construction of any building or other structure within the easement area. The plans must be revised to remove the proposed carports (Item 37) out of the PG&E easement. Said carports are considered encroachments. Additionally, PG&E's easement provides PG&E the right to trim, cut down and clear away any and all trees and brush within the easement area. Trees and vegetation are an interference with PG&E's tower lines and pose a safety hazard. The project plans will need to be revised to limit landscaping to low growing shrubs and grasses. The applicant plans must also show the proposed vertical and horizontal clearances between PG&E's existing tower line and the proposed garages.

Please contact the Building and Renovation Center (BRSC) for facility map requests by calling 1-877-743-7782 and PG&E's Service Planning department at www.pge.com/cco for any modification or relocation requests, or for any additional services you may require.

As a reminder, before any digging or excavation occurs, please contact Underground Service Alert (USA) by dialing 811 a minimum of 2 working days prior to commencing any work. This free and independent service will ensure that all existing underground utilities are identified and marked on-site.

If you have any questions regarding our response, please contact me at Justin.Newell@pge.com.

Sincerely,

Justin Newell
Land Management
916-594-4068

Trees and shrubs for power line-friendly landscaping



Bay Area and Inland

At Pacific Gas and Electric Company (PG&E), our most important responsibility is the safety of our customers and the communities we serve.

As part of that responsibility, we created this guide to help you select the right trees and shrubs when planting near power lines. Planting the right tree in the right place will help promote fire safety, reduce power outages and ensure beauty and pleasure for years to come.

Plan before you plant

1

How to plant and care for your tree

1

Key characteristics of recommended small trees

6

Keeping the lights on and your community safe

1

Plan before you plant

Consider these questions for successful planting:

1. What types of utility lines are near you?

Planting restrictions for trees and other vegetation vary widely for different types of utility lines—electric transmission lines, electric distribution lines and gas pipelines.

2. Are you planting in a high fire-threat area?

If you live in an area designated as high fire threat by the California Public Utilities Commission (CPUC), you can take steps to help reduce wildfire risks.

3. Are there any underground utility lines?

To avoid contact with underground utilities, **call 811** at least two working days before digging. Workers will visit your property free of charge to mark the location of gas lines or other underground utilities so you can avoid them.

Learn which plants will thrive in your region. Refer to the *Sunset Western Garden Book* map below to find your planting zone.



Planting with fire safety in mind

You can help reduce wildfire risks by choosing the right plants, trees and shrubs and by following new vegetation and fire safety standards that require greater clearances between trees, limbs and power lines.

Create defensible space

In addition to maintaining a safe distance between trees and power lines, we recommend fire-resistant plants in high fire-threat areas. Their purpose is to replace important plants for wildlife in areas where brush and tree removal can leave an area bare.

Fire-resistant plant features include:

- High moisture content
- Minimal buildup of dry vegetation
- Fewer branches and leaves
- Slow growing
- Stems, leaves or needles that are not oily or waxy

To learn more about high fire-threat areas visit cpuc.ca.gov/FireThreatMaps

A Planting outside of high fire-threat areas

Planting restrictions for trees and other vegetation vary widely for different types of utility power lines—electric transmission, electric distribution and gas pipelines. Please consider the following when planting near:



Distribution power lines: Select only small trees that will grow no taller than 25 feet at maturity.



Transmission power lines: Plant only low-growing shrubs under the wire zone and only grasses within the area directly below the tower. Along the border of the transmission line right-of-way, plant only small trees no taller than 10 feet.

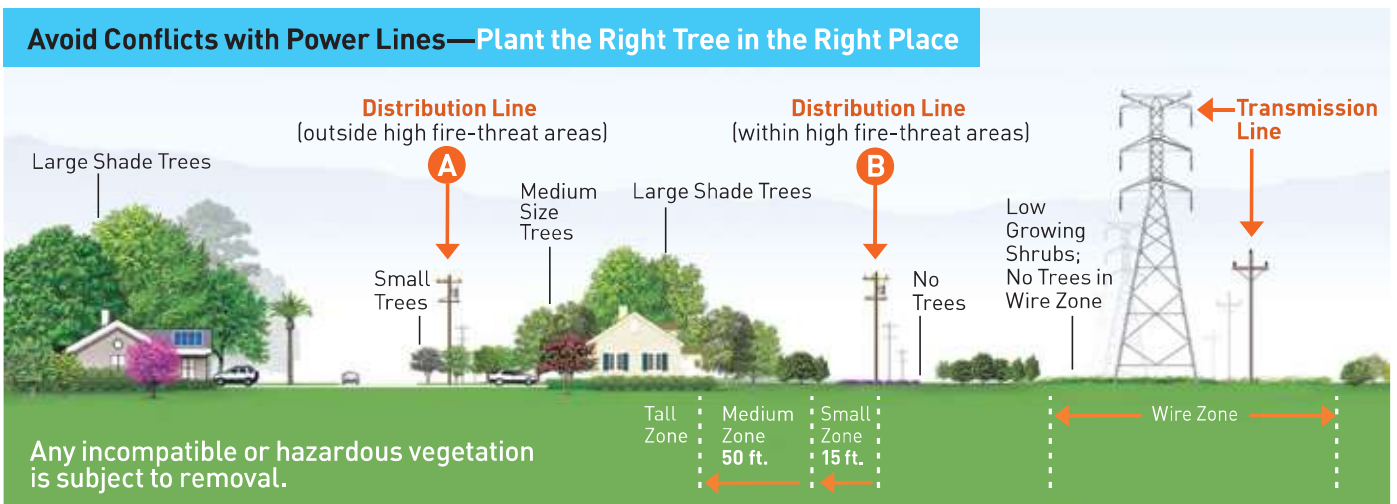
B Planting within high fire-threat areas

You play a vital role to ensure that the right tree is safely planted in the right place. This planting guide will help you select a species of tree and appropriate planting location that is compatible with our safety clearances.

Small zone: Within 15 feet of the pole, plant only low-growing plants less than 12 inches at maturity that have high moisture and low sap content.

Medium zone: From 15 to 50 feet of the pole, plant trees no taller than 40 feet at maturity.

Tall zone: At least 50 feet away from the pole, plant trees taller than 40 feet at maturity.



Proper tree and site selection

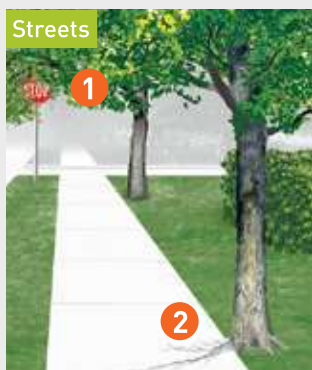
Always consider tree size when planting where space is limited—near power lines, in narrow side yards or close to buildings.

Small trees that grow no taller than 20 feet are the right choice.

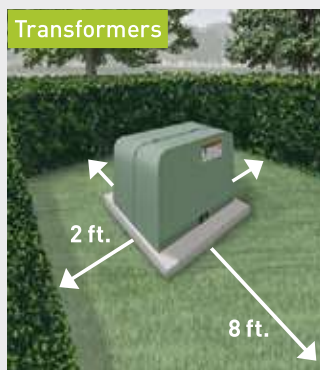
1. When planting near distribution lines in high fire-threat areas, plant only low-growing, fire resistant shrubs.
2. Small flowering trees or shrubs add interest and beauty to the landscape and may attract butterflies and hummingbirds.
3. Many small tree species add curb appeal and help improve your neighborhood.
4. Small trees produce fruit or nuts that attract birds and other wildlife.
5. Small trees create hedges for privacy or screening.
6. Small trees add interest and beauty to small spaces.



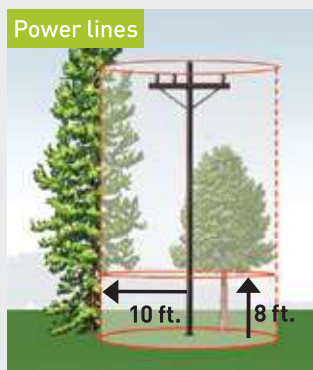
When planting, you should AVOID:



- 1 Blocking vision at street corners. Plant at least 10 feet from the curb at corners.
- 2 Planting too close to sidewalks, streets or driveways.



Planting closer than 8 feet from the front and 2 feet from the back and sides of pad-mounted transformers.



Planting within 10 feet of the base of utility poles and allowing vegetation that can grow more than 8 feet above the ground.

Safety tip for planting

Know what's below

To remain safe while planting trees, shrubs or flowers, **call 811 at least two days before digging.** Workers will visit your property free of charge to mark the location of gas lines or other underground utilities so you can avoid them.



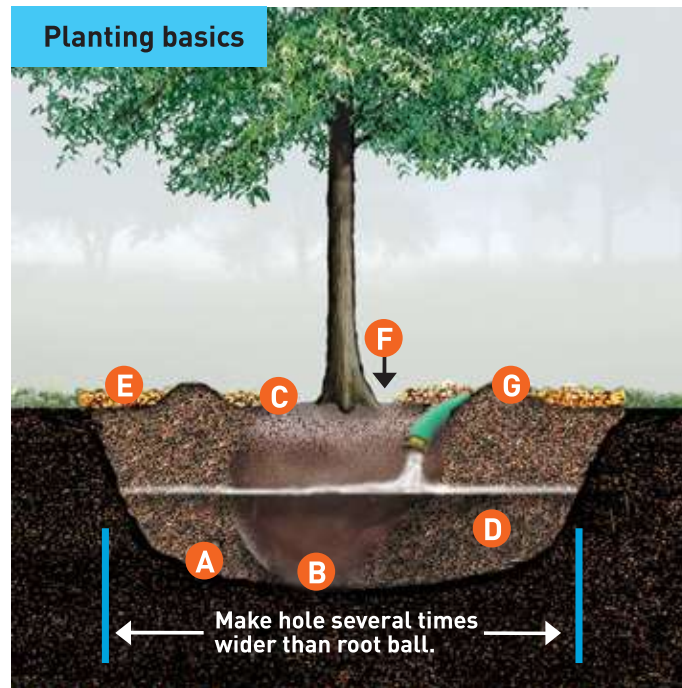
How to plant and care for your tree

- 1. Prepare the planting area.** Mark an area several times wider than the root ball diameter. Loosen this area to about the depth of the root ball.
- 2. Dig the hole.** Shallow is better than deep. Ensure the sides of the hole are rough and uneven. In hard soils, a rough edge to the hole helps new roots grow out into the surrounding soil.
- 3. Place the tree in the hole.** The trunk flare should be at or just above the soil surface. Planting too deep is the most common mistake since soil above the trunk flare causes the bark to rot.
 - **For containerized trees,** gently remove the container from root ball. Don't pull by the trunk. Loosen roots with finger tips and prune away damaged or circling roots.
 - **For balled and burlapped trees,** rest the root ball in the center of the hole. Reshape the hole if necessary so the tree will be straight and at the proper level. Carefully, remove the burlap and any other material away from the sides and top of the root ball.
- 4. Loosen the soil near the trunk.** Find the trunk flare, which should be visible at the top of the root ball. If the trunk flare is not visible, remove soil from the top of the root ball until it is visible.
- 5. Tree adjustments.** Stand back and look at the tree before putting soil back into the hole. Careful adjustments can be made at this time to the planting height and the direction the branches face without seriously harming the roots.
- 6. Do not add fertilizer at time of planting.** Do not add compost or other material to the hole. Fertilizer may be added at the drip line of the tree after the first year if poor growth is experienced. Follow fertilizer manufacturer's instructions; too much will injure or kill the tree.
- 7. Fill the hole with original soil around the tree.** Gently backfill the hole using one-third of the soil at a time. Break up dirt clods and remove any grass, weeds or rocks. Lightly pack the soil with the shovel handle to remove air pockets. Do not stamp on or compress soil heavily. The best soil for root growth has spaces for both air and water, but not large air pockets. Refill and pack again until soil is even with top of root ball. The trunk flare should be slightly above the soil. Water thoroughly.
 - **For trees not planted in a lawn,** construct a small earthen dam or berm, less than four inches tall, with excess soil just outside of the root ball zone. This will help hold water until it soaks into the soil, rather than letting it run off. The berm is temporary while your tree becomes established and, in most cases, should be removed two years after planting.
- 8. Cover the entire loosened area of soil.** Use three to four inches of mulch. Keep mulch away from the trunk of the tree to prevent disease.
- 9. Stake only if tree stability is a problem.** Staking is a temporary measure to allow the trunk to develop strength. The sooner the stakes and ties are removed the stronger your tree will be. If staked, typically this should be one to two years and no longer than three. Reddy Stakes are the easiest to use and are available from your local nursery.
- 10. Water:** New trees need about 1 inch of water per week for about two years. This is true for all trees including native and drought tolerant. Be careful not to drown the roots; they need air to grow as well. Water slowly by hand.

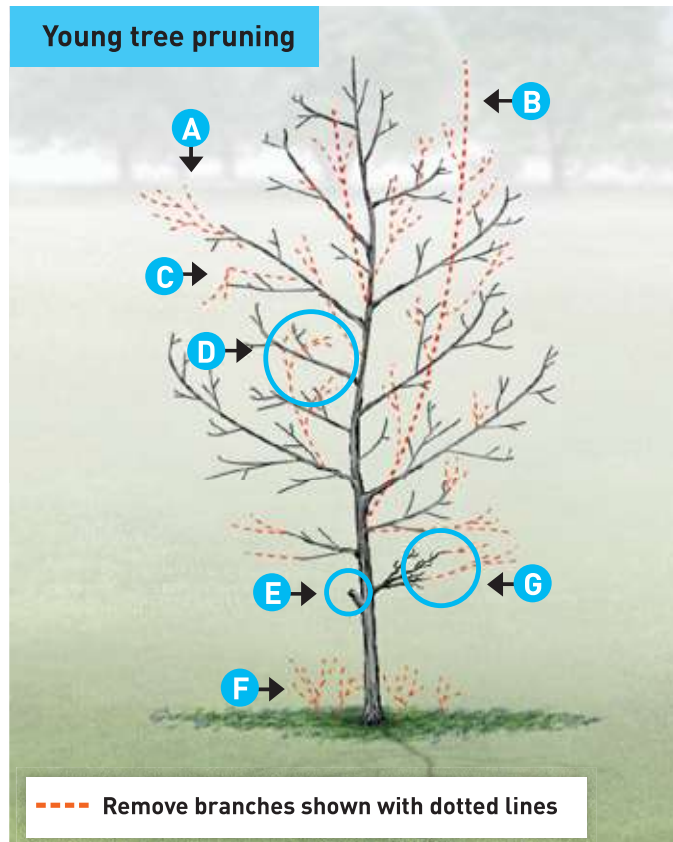
How to plant and care for your tree

Planting basics

- A.** Dig hole no deeper than root ball.
- B.** Bottom of root ball on firm soil.
- C.** Top of root ball level with or slightly above ground.
- D.** Backfill with original soil, tamping gently and watering briefly when filling hole.
- E.** Mulch 3–4 inches deep in circle around tree.
- F.** Keep mulch away from trunk.
- G.** If not planting in a lawn, build a soil dam 3–4 feet from trunk.



Young tree pruning



- A.** Remove limbs that extend beyond the natural crown of the tree.
- B.** Remove competing stems to develop a single trunk.
- C.** Remove dead, broken or crossing limbs.
- D.** Remove limbs that turn inward towards the trunk.
- E.** Do not leave branch stubs.
- F.** Remove root suckers and sprouts.
- G.** Shorten low branches to develop trunk thickness.

Key characteristics of recommended small trees

(Reference zone map on page 1)



Weeping Bottlebrush

Callistemon viminalis

A beautiful tropical tree that produces scarlet blossoms March through July, this tree attracts hummingbirds and is drought tolerant. It is ideal for creating high hedges that screen views. Not suitable for windy areas or near the street. Grows well in restricted soil space.

Mature height: 25 feet. Zones 8–9, 14–17.

EVERGREEN

Fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Buttonbush

Cephalanthus occidentalis

Produces unusual flowers that smell like honey and attract butterflies and hummingbirds. Its seeds provide wildlife food, especially for ducks, and its thick foliage provides habitat for many wetland birds. Useful for naturalizing wet areas.

Mature height: 20 feet. Zones 7–9, 14.

DECIDUOUS, CALIFORNIA NATIVE

NOT fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



California Buckeye

Aesculus californica

This tree, native to the dry slopes of the Coast Ranges and Sierra Nevada foothills, makes an excellent choice for low water use areas. In spring, fragrant, cream-colored flower plumes transform it into a giant candelabra. Following winter leaf drop, its silvery bark creates an interesting silhouette.

Mature height: 25 feet. Zones 7–9, 14–17.

DECIDUOUS, CALIFORNIA NATIVE

Fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Camellia Reticulata

Camellia reticulata

The main decorative feature is its spectacular flowers, which bloom January through May. This tree is very susceptible to cold. It develops better form and heavier foliage in open ground. Good for shrub borders and screens.

Mature height: 20 feet. Zones 7–9, 14–17.

EVERGREEN

Fire-resistant ☀️🌑 PARTIAL-FULL SHADE



A beautiful decorative flowering tree with yellow fall color, this cherry does not bear fruit. Often used near a patio or as a specimen away from lawn grass competition, this tree is not suitable for planting near the street.

Mature height: 25 feet. Zones 7, 14–17.

DECIDUOUS

Fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



tree reportedly close to extinction. White flowers appear year-round and olive-like fruit attracts birds and other wildlife. Good near a deck or patio, in sidewalk cutouts and as a street tree.

Mature height: 20 feet. Zones 8–9, 14–17.

EVERGREEN, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



Erythrina crista-galli

This beautiful, showy tree, which boasts brilliant red and fragrant flowers in spring, attracts hummingbirds. It is widely planted as a street or garden tree.

Mature height: 20 feet. Zones 7–9, 14–17.

DECIDUOUS

NOT fire-resistant ☀️ FULL SUN



Hopa Crabapple

Malus hopa

Grown for its adaptability, fragrant flowers and attractive, brightly colored fruit, this tree creates a warm glow of color each spring. It bears edible fruit and attracts wildlife. Good for sidewalk cutouts and as a street tree.

Mature height: 25 feet. Zones 7–9, 14–17.

DECIDUOUS

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



Crape Myrtle

Lagerstroemia indica

This is among the longest blooming trees in existence, with striking summer color and attractive fall foliage. It is a favorite small tree for landscaping. It is drought tolerant and well suited as a buffer near a street, deck or patio.

Mature height: 25 feet. Zones 7–9, 12–14.

DECIDUOUS

NOT fire-resistant



FULL SUN



Dragon Tree

Dracaena draco

Native to the Canary Islands, this palm-like, tropical tree grows slowly and can live for hundreds of years. It is drought tolerant and makes a dramatic statement in landscaping. It is a good choice for coastal areas since it tolerates salty spray and soils.

Mature height: 25 feet. Zones 16–17.

EVERGREEN

NOT fire-resistant



PARTIAL SHADE



Weeping Dogwood

Cornus florida

This is one of the most popular decorative trees and earliest springtime bloomers. It produces a non-edible fruit that attracts butterflies, birds and other wildlife. Use dogwood as a framing or background tree.

Mature height: 25 feet. Zones 7–9, 14–16.

DECIDUOUS

NOT fire-resistant



PARTIAL-FULL SHADE



Fringe Tree

Chionanthus virginicus

One of the most beautiful small trees when in full bloom, its purple-blue fruits attract many birds and other wildlife. Famous for its sweet but not overpowering fragrance, it is most commonly used as a free standing decorative tree.

Mature height: 25 feet. Zones 15–17.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant



FULL SUN-PARTIAL SHADE



Golden Ball Lead Tree

Leucaena retusa

Bright yellow powder-puff blossoms appear April through October. They are prominent after heavy rain and attract butterflies and wildlife. It seeds itself, spreads rapidly and is drought tolerant. Good as an accent tree in a shrub border or backyard garden.

Mature height: 25 feet. Zones 7-9, 14-17.

EVERGREEN, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️ FULL SUN



Washington Hawthorn

Crataegus phaenopyrum

The small white, abundant flowers in spring are followed by orange to red fruit that lasts until winter and attracts birds. The fall leaf color is striking orange and red. Well suited for creating a barrier or as a street tree.

Mature height: 25 feet. Zones 7-9, 14-17.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️ FULL SUN



Pineapple Guava

Feijoa sellowiana

Hardest of the subtropic trees, it blossoms in spring and produces fruit in late summer and early fall. Both flowers and fruit are edible and attract birds and bees. The plants can be pruned into a small tree or a hedge.

Mature height: 20 feet. Zones 7-9, 14-17.

EVERGREEN

NOT fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Yaupon Holly

Ilex vomitoria

Tiny white flowers, which appear in spring, attract bees for several weeks. Bright red berries appear fall through winter and attract wildlife. Commonly used as a trimmed hedge, screen or windbreak. Well suited as a topiary.

Mature height: 20 feet. Zones 7-9, 14-17.

EVERGREEN, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Kumquat

Fortunella margarita

Fragrant flowers, which blossom in late spring, attract butterflies and become fruit that look like tiny oranges in the fall. Great ornamental element in a landscape.

Mature height: 25 feet. Zones 8–9, 14–17.

EVERGREEN

NOT fire-resistant



FULL SUN



Bronze Loquat

Eriobotrya deflexa

Small white, fragrant flowers appear in spring followed by small, inedible fruits. Leaves are a bright red-bronze or coppery color. Well suited as a decorative tree near the street or a shade tree for a patio or deck.

Mature height: 25 feet. Zones 7–9, 14–17.

EVERGREEN

NOT fire-resistant



FULL SUN–PARTIAL SHADE



Lemon Tree

Citrus limon

Dark green foliage and pure white, extremely fragrant blossoms make citrus a popular garden choice for frost-free locations. Juicy, fragrant edible fruit ripens in fall and winter. Well suited for shade or as a screen.

Mature height: 25 feet. Zones 8–9, 14–17.

EVERGREEN

Fire-resistant



FULL SUN



Little Gem Magnolia

Magnolia grandiflora x 'little gem'

Fragrant white blossoms open to perfume the entire garden in late spring and turn into fuzzy brown cones with bright red seeds, which are used by a variety of wildlife. Well suited for a screen or hedge.

Mature height: 20 feet. Zones 7–9, 14–17.

EVERGREEN

NOT fire-resistant



FULL SUN



Saucer Magnolia
Magnolia x soulangeana

Blooms open late winter to early spring producing a display of large white flowers shaded in pink. Can be used near a patio or deck. Best used as a stand-alone specimen in a sunny spot.

Mature height: 25 feet. Zones 7-9, 14-17.
DECIDUOUS

NOT fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Amur Maple
Acer ginnala

Its main decorative value is in its brilliant red fall foliage and pink/red-winged fruit. It is well suited as a patio tree, hedge or screen.

Mature height: 25 feet. Zones 7-9, 14-16.
DECIDUOUS

NOT fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Manzanita
Arctostaphylos manzanita

Popular for shiny red or mahogany colored bark, its pink to white flowers attract wildlife and provide nectar to butterflies and hummingbirds. It is very drought tolerant and looks green even in the hottest, driest part of the summer. Good for hillside covers, background plantings and screens.

Mature height: 20 feet. Zones 7-9, 14-17.
EVERGREEN, CALIFORNIA NATIVE

Fire-resistant ☀️🌑 FULL SUN-PARTIAL SHADE



Japanese Maple
Acer palmatum

Famous for its striking display of fall color when leaves turn brilliant shades of scarlet, yellow or orange, it is one of the most beautiful small trees for the landscape. Well suited as an accent tree.

Mature height: 25 feet. Zones 7-9, 14-17.
DECIDUOUS

NOT fire-resistant 🌑🌑 PARTIAL-FULL SHADE



Rattan Palm

Rhapis humilis

A hardy, slow growing and graceful-looking palm variety, it is especially well suited as a dense screen or hedge or accent tree.

Mature height: 20 feet. Zones 16–17.

EVERGREEN

NOT fire-resistant

PARTIAL-FULL SHADE



Sonoran Palo Verde

Cercidium praecox

Valued for its yellow floral display in spring, this plant is attractive to bees, butterflies and birds. It does well in arid climates and is tough and trouble-free. Well suited for streetscape plantings or as an accent tree.

Mature height: 20 feet. Zones 14–17.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant

FULL SUN



Pinyon Pine

Pinus edulis

This rugged conifer is best known for its edible pine nuts. This pine grows slowly and does not overwhelm the surrounding area. It is more drought and wind tolerant than other pines. It provides good cover for wildlife. The tree works well in small, dry gardens and can be used to screen unwanted views, as a windbreak or an accent tree.

Mature height: 25 feet. Zones 7–9, 14–17.

EVERGREEN, CALIFORNIA NATIVE

NOT fire-resistant

FULL SUN-PARTIAL SHADE



Purple-Leaf Plum

Prunus cerasifera 'Newport'

Very popular for its unusual changing leaf color, which starts out ruby red, then turns reddish-purple, and finally greenish-bronze. The small white to light pink blossoms are followed by a crop of small, edible purple fruit. Often used as a decorative landscape element, it is good near patios and decks. Only plant the smaller 'Newport' or 'Thundercloud' varieties near power lines.

Mature height: 25 feet. Zones 7–9, 14–17.

DECIDUOUS

Fire-resistant

FULL SUN-PARTIAL SHADE



Eastern Redbud

Cercis canadensis

Blossoms appear all over the tree in spring followed by beans, which provide food for hummingbirds and other wildlife. Not suitable as a street tree but well suited as an accent plant.

Mature height: 25 feet. Zones 7–9, 14–17.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



American Smoke Tree

Cotinus obovatus

Long flowers have a fluffy, grayish-buff appearance resembling a cloud. One of the best plants for fall color with orange, purple, red and yellow leaves. Best used in a shrub border or as a patio or accent tree.

Mature height: 25 feet. Zones 7–9, 14–17.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



Tangelo

Citrus reticulata x citrus maxima

Fragrant white flowers appear March through April and attract honeybees and butterflies. Edible, orange-colored fruit matures September through December. The best fruit is produced in warm summer areas. Well suited as an ornamental accent tree.

Mature height: 25 feet. Zones 8–9, 14–15.

EVERGREEN

Fire-resistant ☀️ FULL SUN



Tasmanian Tree Fern

Dicksonia antarctica

Best known and hardiest of tree ferns, it has a dark brown trunk and dark green, lacy fronds that arch five to seven feet. Easy to transplant and establish, it makes a beautiful accent tree for a tropical effect or can be a backdrop to other plants.

Mature height: 20 feet. Zones 8–9, 14–17.

EVERGREEN

NOT fire-resistant 🌑🌑 PARTIAL–FULL SHADE



Tea Tree

Leptospermum petersonii

Leaves have a strong lemon scent and when dried are used to make tea. Small white flowers bloom in spring to early summer. This is a fast-growing plant well suited for hedges, screening unwanted views or as a windbreak.

Mature height: 20 feet. Zones 14–17.

EVERGREEN

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



Toyon

Heteromeles arbutifolia

Also known as “Christmas Berry” or “California Holly,” this evergreen is native to California Coast Ranges and is great in butterfly and bird gardens. Drought resistant and low maintenance, it blooms in summer and bears beautiful red berries in winter. It is well suited for hedges, screens for unwanted views or as an accent tree.

Mature height: 25 feet. Zones 7–9, 14–17.

EVERGREEN, CALIFORNIA NATIVE

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE



Common Witch Hazel

Hamamelis virginiana

The bark of this slow growing, drought tolerant plant is the source of the liniment witch hazel. It has bright foliage and yellow and red bloom clusters in the fall. It is well suited for borders and naturalistic, shady areas.

Mature height: 25 feet. Zones 7–9, 14–16.

DECIDUOUS, NORTH AMERICAN NATIVE

NOT fire-resistant ☀️🌑 FULL SUN–PARTIAL SHADE

IMPORTANT NOTE: This guide makes recommendations for planting small trees near distribution lines only.

Near or under transmission lines, plant only low-growing shrubs. Any incompatible vegetation is subject to removal.

If you are not sure if a power line is distribution or transmission, please call us at **1-800-743-5000**.

Key characteristics of recommended small trees

The following is a guide to small trees suitable near distribution power lines in areas that are not at high risk for wildfire. Work with your local nursery to identify other suitable plants for your specific planting zone.

Common/Scientific name	Mature ht.	Growth/yr.	Soil	Wildlife attraction and flower facts
Bottlebrush, Weeping <i>Callistemon viminalis</i>	25 feet	36 inches	Wet– Dry	Hummingbirds, screening, drought tolerant. RED FLOWERS
Buckeye, California** <i>Aesculus californica</i>	25 feet	24 inches	Moist– Dry	Hummingbirds, provides screening, blooms in spring. WHITE, FRAGRANT FLOWERS
Buttonbush** <i>Cephalanthus occidentalis</i>	20 feet	24–36 inches	Wet– Moist	Hummingbirds, butterflies, wildlife habitat. CREAM OR WHITE, FRAGRANT FLOWERS
Camellia Reticulata <i>Camellia reticulata</i>	20 feet	12–24 inches	Moist	Decorative, provides screening, not suitable for cold environment. PINK, RED FLOWERS
Cherry, Kwanzan <i>Prunus serrulata</i> ‘Kwanzan’	25 feet	24 inches	Moist	Fall color, no fruit, not suitable for street planting. PINK OR ROSE, FRAGRANT FLOWERS
Cockspur Coral Tree <i>Erythrina crista-galli</i>	20 feet	24 inches	Moist– Dry	Hummingbirds, good for streets and gardens. PINK OR RED, FRAGRANT FLOWERS
Cordia* <i>Cordia boissieri</i>	20 feet	24 inches	Moist– Dry	Birds and wildlife, good for streets and patios. YELLOW OR WHITE, FRAGRANT, YEAR-ROUND FLOWERS
Crabapple, ‘Hopa’ <i>Malus</i> ‘hopa’	25 feet	36 inches	Moist	Wildlife, edible fruit, good for streets and sidewalk cutouts. RED OR ROSE, FRAGRANT FLOWERS
Crape Myrtle <i>Lagerstroemia indica</i>	25 feet	24 inches	Moist– Dry	Long blooming period, fall color, good for narrow lawns, drought tolerant. RED, PINK, PURPLE OR WHITE FLOWERS
Dogwood, Weeping <i>Cornus florida</i>	25 feet	24 inches	Moist	Butterflies and wildlife, blooms in early spring. WHITE, FRAGRANT FLOWERS
Dragon Tree <i>Dracaena draco</i>	25 feet	12 inches	Moist	Slow growing, long lasting, drought tolerant. CHARTREUSE OR WHITE FLOWERS
Fringe Tree* <i>Chionanthus virginicus</i>	25 feet	12 inches	Moist	Birds and wildlife, decorative free-standing tree. GREEN OR WHITE, FRAGRANT FLOWERS
Golden Ball Lead Tree* <i>Leucaena retusa</i>	25 feet	12–36 inches	Well Drained	Butterflies and wildlife, accent tree, drought tolerant. YELLOW FLOWERS
Guava, Pineapple <i>Feijoa sellowiana</i>	20 feet	24 inches	Moist– Dry	Birds and bees, blooms in spring, edible flower and fruit. PURPLE, RED OR WHITE FLOWERS
Hawthorn, Washington* <i>Crataegus</i>	25 feet	24 inches	Moist– Dry	Wildlife, good screen or street tree. WHITE FLOWERS
Holly, Yaupon* <i>Ilex vomitoria</i>	20 feet	24 inches	Moist	Bees and wildlife, good hedge or screen. TINY, WHITE FLOWERS
Kumquat <i>Fortunella margarita</i>	25 feet	24 inches	Moist	Butterflies, edible fruit, decorative. WHITE, FRAGRANT FLOWERS

Chart continued on next page

Key characteristics of recommended small trees

Common/Scientific name	Mature ht.	Growth/yr.	Soil	Wildlife attraction and flower facts
Lemon Tree Citrus limon	25 feet	24 inches	Moist	Edible fruit, good for shade or screening. WHITE, FRAGRANT FLOWERS
Loquat, Bronze Eriobotrya deflexa	25 feet	36 inches	Moist	Birds and wildlife, good for patios and decks. WHITE, FRAGRANT FLOWERS
Magnolia, Little Gem Magnolia grandiflora x 'little gem'	20 feet	12 inches	Moist	Wildlife, provides a dense screen. WHITE, FRAGRANT FLOWERS
Magnolia, Saucer Magnolia x soulangeana	25 feet	24 inches	Moist	Birds. PINK, PURPLE OR WHITE, FRAGRANT FLOWERS
Manzanita** Arctostaphylos manzanita	20 feet	12–24 inches	Moist–Dry	Butterflies, hummingbirds and wildlife, colorful bark. PINK OR WHITE FLOWERS
Maple, Amur Acer ginnala	25 feet	12–24 inches	Moist–Dry	Fall color, good for patios and decks, hedge or screen. YELLOW, FRAGRANT FLOWERS
Maple, Japanese Acer palmatum	25 feet	12–24 inches	Moist–Well Drained	Fall color, good as accent tree. PURPLE FLOWERS
Palm, Rattan Rhapsis humilis	20 feet	12 inches	Moist	Good screen or hedge, decorative, drought tolerant. INCONSPICUOUS FLOWERS
Palo Verde, Sonoran* Cercidium praecox	20 feet	36 inches	Moist–Dry	Bees, butterflies and birds, smooth green bark, blooms in spring, drought tolerant. YELLOW FLOWERS
Pine, Pinyon** Pinus edulis	25 feet	12 inches	Moist–Dry	Wildlife habitat, edible seeds, drought and wind tolerant. INCONSPICUOUS FLOWERS
Plum, Purple-Leaf Prunus cerasifera 'Newport'	25 feet	24 inches	Moist	Winter and spring floral display, edible fruit, self-sowing. PINK OR WHITE, FRAGRANT FLOWERS
Redbud, Eastern* Cercis canadensis	25 feet	36 inches	Moist	Hummingbirds and wildlife. PINK OR ROSE FLOWERS
Smoke Tree, American* Cotinus obovatus	25 feet	12–24 inches	Well Drained	Fall color. PINK OR WHITE, SMOKE-LIKE EFFECT FLOWERS
Tangelo Citrus reticulata x citrus maxima	25 feet	24 inches	Moist	Bees and butterflies, blooms in spring, edible fruit. WHITE, FRAGRANT FLOWERS
Tasmanian Tree Fern Dicksonia antarctica	20 feet	12 inches	Moist	Cold tolerant, easy to transplant and establish, good as an accent. NO FLOWERS
Tea Tree Leptospermum petersonii	20 feet	24 inches	Moist–Dry	Fragrant leaves, good for hedges, screening and as a windbreak. WHITE FLOWERS
Toyon** Heteromeles arbutifolia	25 feet	12–24 inches	Moist–Dry	Butterflies, hummingbirds and wildlife, drought tolerant. WHITE FLOWERS
Witch Hazel, Common* Hamamelis virginiana	25 feet	12–24 inches	Moist	Fall foliage and flowers, drought tolerant. YELLOW, FRAGRANT FLOWERS

*North American Native

**California Native

Keeping the lights on and your community safe

At PG&E our most important responsibility is the safety of our customers and the communities we serve. We know how much trees mean to our communities, and we are committed to helping you ensure the right trees are located in the right places to help reduce wildfire risks and improve public safety.

Every year, we inspect each segment of **approximately 100,000 miles** of overhead power lines, with some locations patrolled multiple times a year. We prune or remove **1.4 million trees annually** and work to address dead and dying trees in areas affected by drought.

By planting the right tree in the right place, you can help reduce fire hazards, promote safety and reduce the risk of damage to properties and power lines.

For more information regarding tree planting near power lines or gas pipelines and to download a copy of this booklet, please visit: pge.com/righttreerightplace.

To verify the type of utility line near you, schedule an appointment with our tree care professionals or request gas pipeline planting information, please call **1-800-743-5000**.

Additional references and resources:

PG&E Vegetation Management Program:
pge.com/trees

Planting the right tree in the right place:
arborday.org/trees/righttreeandplace

High Fire-Threat District Map:
cpuc.ca.gov/FireThreatMaps

California Tree Selections:
selectree.calpoly.edu

Climate Zone maps and information are courtesy of *Sunset Western Garden Book*, 2008.

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Adam Sharron

From: Steve Snow
Sent: Tuesday, February 22, 2022 4:21 PM
To: 'rkarn@rakengineers.com'
Cc: 'p_ugenti@yahoo.com'; Adam Sharron
Subject: ISWLIDS Storm Water Review complete notification for PKLP22-0001 @ 4614 Old Redwood Hwy, Santa Rosa
Attachments: Redlined PLP22-0001 PC1 ISWLIDS_2-22-22_SS.pdf; SWLID-Submittal-Guide-PDF.pdf; PLP22-0001 ISWLIDS submittal guide checklist.pdf

Hi Robert,

I have completed my review of the Initial Storm Water LID Submittal (ISWLIDS) for the subject project & posted the redlined report to the documents/attachments tab in Accela Citizens Access/Permits Online & attached it to this email for your convenience.

Please review the redlined report, address the comments & contact me if you have any questions. Once the revised report has been uploaded/resubmitted, please notify both myself & project planner, Adam Sharron.

Regards,

Steve Snow, P.E.

Engineer/Flood Plain Manager

www.PermitsSonoma.org

County of Sonoma

Engineering Division | Grading, Drainage, Sanitation & Encroachment

2550 Ventura Avenue, Santa Rosa, CA 95403

Direct: 707-565-4443 | Office: 707-565-1900



OFFICE HOURS: Permit Sonoma's public lobby is open Monday through Friday from 8:00 AM to 4:00 PM, except Wednesdays, open from 10:30 AM to 4:00 PM.

Due to the Public Health Orders, online tools remain the best and fastest way to access Permit Sonoma's services like permitting, records, scheduling inspections, and general questions. You can find out more about our extensive online services at PermitsSonoma.org.

The Permit Center has reopened full time with limited capacity.

Thank you for your patience as we work to keep staff and the community safe.



To: Interested Agencies

January 27, 2022

The following application has been filed with the Sonoma County Permit and Resource Management Department.

File Number: PLP22-0001
Applicant Name: Paul Ugenti
Owner Name: JJP Redwood LLC
Site Address: 4614 Old Redwood Hwy., Santa Rosa
APN: 058-071-015
Zoning: PF, VOH

Project Description: Design Review of a 45-unit multifamily housing development (8 studios, 21 one-bedroom units, and 16 two-bedroom units) on a one acre parcel to be served by public sewer and water; and a Zone Change to add the WH (Workforce Housing) Combining District to the parcel's zoning. Development will consist of a 40-foot tall building with parking on the first floor and residential above, a community room and outdoor courtyard, 51 parking spaces, 32 bicycle parking spaces, and new landscaping and hardscaping. The applicant requests a 100% density bonus under the County's Housing Opportunity Program in exchange for providing 40 percent of the total project units (18 units) as affordable.

We are submitting the above application for your review and recommendation. Additional information is on file in this office.

Responses to referrals should include a combination of any or all of the following details:

- (1) Statement of any environmental concerns or uncertainties your agency may have with the project.
- (2) Comments you wish to make regarding the merits of the project.
- (3) Identification of any missing information or application submittals that will preclude you from providing conditions and mitigations for this project in the future.
- (4) Your proposed conditions of approval and/or mitigations for this project.

After reviewing this application, please respond to the planner with your *marked* response below:

- Conditions will be provided and no further information is necessary.
- Conditions will be provided and additional information is necessary.
- Comments and/or concerns. (Grading & Storm Water)
- No comments or conditions.

Responsible agencies under CEQA are requested to indicate whether permits will be required for this project.

Your comments will be appreciated by February 10, 2022, and should be sent to the attention of:





PLP22-0001, Adam Sharron (Adam.Sharron@sonoma-county.org). The Project Planner can also be reached at 707-565-7389. **If no response is received by February 10, 2022, it will be assumed that no comments or conditions will be provided.**

Please send a copy of your comments to the applicant(s) or their representatives as indicated on the attached Planning Application.

- | | |
|---|---|
| <input checked="" type="checkbox"/> PRMD Management Group | <input checked="" type="checkbox"/> Windsor Chamber of Commerce |
| <input checked="" type="checkbox"/> PRMD Natural Resources | <input checked="" type="checkbox"/> NW Information Center, S.S.U. |
| <input checked="" type="checkbox"/> Sanitation | <input checked="" type="checkbox"/> PG&E |
| <input checked="" type="checkbox"/> Grading and Storm Water | <input checked="" type="checkbox"/> School District – Mark West USD |
| <input checked="" type="checkbox"/> SUSMP | <input checked="" type="checkbox"/> Santa Rosa CSD |
| <input checked="" type="checkbox"/> Building Inspection | <input checked="" type="checkbox"/> Water District – Cal-American |
| <input checked="" type="checkbox"/> So. Co. Environmental Health | <input checked="" type="checkbox"/> Recology Sonoma Marin (Disposal) |
| <input checked="" type="checkbox"/> DTPW, Land Development | <input checked="" type="checkbox"/> State Dept of Transportation (Caltrans) |
| <input checked="" type="checkbox"/> DTPW, Drainage | <input checked="" type="checkbox"/> State Dept of Fish and Wildlife |
| <input checked="" type="checkbox"/> Regional Parks Dept. | <input checked="" type="checkbox"/> State Water Resources Control Board |
| <input checked="" type="checkbox"/> Fire Prevention | <input checked="" type="checkbox"/> State Parks and Recreation-Duncans Mills Office |
| <input checked="" type="checkbox"/> Local Fire District – Sonoma County FPD | <input checked="" type="checkbox"/> Regional Water QCB: North Coast |
| <input checked="" type="checkbox"/> Economic Development Board | <input checked="" type="checkbox"/> Mark West CAC |
| <input checked="" type="checkbox"/> Transit/BPAC | <input checked="" type="checkbox"/> Sonoma MOAG |
| <input checked="" type="checkbox"/> SCTA/RCPA | <input checked="" type="checkbox"/> Tribal Notification |
| <input checked="" type="checkbox"/> BOS Dist. 4 Director and Commissioners | |



Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

4. Design Information:

Narrative:

Project Description

- Description of proposed project type, size, location, and any specific uses or features.
- Description of any sensitive features (creeks, wetlands, trees, etc.) and whether they are going to be preserved, removed or altered.
- Description of the existing site.
- Description of how this project triggers these requirements (impervious area, CALGreen, 401 Permit, etc.).
- Describe any "on-site offset" used.

Pollution Prevention and Runoff Reduction Measures

- Description of all proposed pollution prevention measures (street sweeping, covered trash enclosures, indoor uses, etc).
- Description of all Runoff Reduction Measures (Interceptor Trees, Impervious Area Disconnection, and/or Alternative Driveway Design).

Type of BMPs Proposed

- Description of the types of BMPs selected including priority group that each is in.
- Description of level of treatment and volume capture achieved for each BMP.

Maintenance

- Description of maintenance for each type of BMP.
- Description of funding mechanism.
- Designation of Responsible Party.

Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

Exhibits:

Proposed SW LID Exhibit:

- Exhibit should include: street names, property lines, storm drainage system, waterways, title block, scale and north arrow.
- Tributary areas shown for all inlets (including off-site drainage areas).
- C value for each tributary area.
- Soil Type of existing site.
- New or replaced impervious area shown.
- All inlets and BMP, shown (including unique identifier).
- All interceptor trees shown.
- All proposed BMPs shown including dimensions.

Existing Condition Exhibit

- Exhibit should include: street names, property lines, proposed storm drainage system, waterways, title block, scale, and north arrow.
- Soil Type of existing site.
- Proposed tributary areas shown for all proposed inlets (including offsite drainage areas). Existing impervious areas.
- Existing impervious area.

BMP Details:

- Detail for each type of BMP selected- provide a preliminary 8.5"x11" detail for each BMP type or include on submitted drawings. These can be taken straight from the Fact Sheets if no significant changes are proposed.

On Plans:

- Show all applicable elements of the selected BMPs on the appropriate plan sheets.

Calculations:

- Calculations, for each inlet, and summary sheet using the Storm Water Calculator found at www.srcity.org/stormwaterLID
- Supplemental or supporting calculation if applicable.

Initial Storm Water LID
Submittal (ISWLIDS).

~~**PRELIMINARY SUSMP**~~

For

4614 OLD REDWOOD HIGHWAY

Santa Rosa, CA

APN: 058-071-015

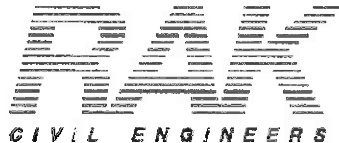
PLP22-0001

December 8, 2021

Prepared For:

Paul F. Ugenti
Tandem Real Estate Co.
P.O. Box 20581
San Jose, CA 95160
(510) 910-5839

Prepared By:



Robert A. Karn & Associates, Inc.
707 Beck Avenue
Fairfield, CA 94533
(707) 435-9999

Project #A20059

Provide engineer's
seal & signature on
cover sheet.

ATTACHMENTS

1. Determination Worksheet
2. Preliminary SUSMP Exhibit
3. Existing Condition Exhibit
4. Impervious Area Exhibit
5. BMP Selection Tables
6. Preliminary Calculations
7. Preliminary Details
8. Maintenance Checklists

Include a completed
LID submittal guide.
See email attachments.

Applicant Name	Tandem Real Estate Co., c/o Paul F. Ugenti
Mailing Address	P.O. Box 20581
City/State/Zip	San Jose, CA 95160
Phone/Email/Fax	(510) 910-5839 / p_ugenti@yahoo.com
Project Name	4614 Old Redwood Highway
Site Address	4614 Old Redwood Highway
City/State/Zip	Santa Rosa, CA 95403
Permit #(s)	
Engineer Name	Robert A. Karn & Associates, Inc.
Mailing Address	707 Beck Avenue
City/State/Zip	Fairfield, CA 94533
Phone/Email/Fax	(707) 435-9999 / RKarn@RAKEngineers.com / (707) 435-9988
Type of Project	Building Permit / Design Review / Use Permit

and treatment

Project Location and Description:

The project is a proposed multi-family development located at 4614 Old Redwood Highway in Santa Rosa, California. The 1.0-acre project site is situated on the east side of Old Redwood Highway north of Mark West Springs Road and south of Ramsgate Court. The site is mainly undeveloped however the front portion along Old Redwood Highway has some existing pavement in poor condition. There is existing curb, gutter, sidewalk and two driveways along the project frontage, along with an overhead utility pole. The project will include the construction of a multi-family development building, along with parking lot and drive aisles. The project will also include associated concrete curbs, walks, sanitary sewer, water services, site lighting, storm drainage and other underground utilities, and landscaping. Refer to the vicinity map in Figure 1.

The site consists of Type D soils, as identified in the geotechnical report. The project triggers stormwater quality treatment and trash capture by creating or replacing 10,000 SF or more of impervious surface. The project does not require Hydromodification Control Requirements since it is not creating or replacing 1 acre or more of impervious surface, however since the project is increasing the amount of impervious surface, Delta Volume Capture Requirement is required.

There are no existing sensitive features associated with this project site, such as creeks, wetlands, or endangered species, therefore no regulatory permits will be required.



Figure 1: Vicinity Map

Discuss whether any offsets are proposed. On-site offsets are typical to account for any off-site improvements or DMA's with site constraints where a BMP can't be located to treat runoff from a particular DMA & another BMP is then oversized to account for/offset runoff from the subject DMA.

Pollution Prevention and Credits:

Downspouts from roof gutters will be disconnected from the storm drain system. Interceptor Trees will be planted along the bio-retention swales and within 25 feet of impervious areas. This will reduce the total tributary area required for treatment by taking credit for these treatment reduction measures.

Discuss any proposed pollution prevention measures (e.g. source controls - covered trash enclosure, street cleaning/sweeping, pollutants stored/used indoors, etc.)

Type of BMPs Proposed:

Stormwater from the proposed building, parking lot and drive aisles will be directed through curb cuts to the three (3) bio-retention areas proposed within the project site. The bioretention will be installed per Detail P2-04, "Priority 2 Roadside Bioretention – Curb Opening", as detailed in the Storm Water Low Impact Development Technical Design Manual (Revised 01-06-21), and Appendices (Updated 07-15-21).

Note how. Will runoff flow over landscape prior to entering BMPs to claim runoff reduction credit?

Level of Treatment and Volume Capture:

The requirement of 100% Stormwater Treatment is being achieved through the construction of the onsite bio-retention facilities, which drain the to the existing storm drain inlet within Old Redwood Highway. ~~Since there is no increase in impervious surface with the proposed development, Delta Volume Capture is not required for this project.~~

Discuss how much volume capture will be achieved in each BMP & how treatment will be achieved.

Maintenance and Funding:

BMPs shall be inspected and maintained as described in the 4-page "Planter Strip Bioretention-Checklist", which is found within the Appendix E of the Storm Water Low Impact Development Technical Design Manual. All costs associated with inspections and maintenance of these privately owned improvements shall be the sole responsibility of the property owner on which they reside. All legal paperwork and agreements will be provided with the Final SUSMP report.

SWLIDS

Discuss the funding mechanism for maintenance in perpetuity.

Certifications:

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of North Coast Regional Water Quality Control Board NPDES MS4 Permit, Order No. R1-2015-0030.

Signature

ROBERT A. KARN

ATTACHMENT 1

Determination Worksheet





2017 Storm Water LID Determination Worksheet



PURPOSE AND APPLICABILITY: This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Part 1: Project Information

4614 Old Redwood Highway

Project Name

4614 Old Redwood Highway

Project Site Address

Santa Rosa, CA 95403

Project City/State/Zip

Permit Number(s) - (if applicable)

Robert A. Karn & Associates, Inc.

Designer Name

Fairfield, CA 94533

Designer City/State/Zip

Tandem Real Estate Co.

Applicant (owner or developer) Name

P.O. Box 20581

Applicant Mailing Address

San Jose, CA 95160

Applicant City/State/Zip

(510) 910-5839

Applicant Phone/Email/Fax

707 Beck Avenue

Designer Mailing Address

(707) 435-9999

Designer Phone/Email

Type of Application/Project:

- Subdivision
 Grading Permit
 Building Permit
 Hillside Development
 Design Review
 Use Permit
 Encroachment
 Time Extensions
 Other : _____

PART 2: Project Exemptions

1. Is this a project that creates or replaces *less than 10,000 square feet of impervious surface¹*, including all project phases and off-site improvements?

- Yes
 No

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2. Is this project a routine maintenance activity² that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots?

Yes No

3. Is this project a stand alone pedestrian pathway, trail or off-street bike lane?

Yes No

4. Did you answer "YES" to any of the questions in Part 2?

YES: This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. Please complete the "Exemption Signature Section" on Page 4.

NO: Please complete the remainder of this worksheet.

Part 3: Project Triggers

Projects that Trigger Requirements:

Please answer the following questions to determine whether this project requires permanent Storm Water BMP's and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.

1. Does this project create or replace a combined total of 10,000 square feet or more of impervious surface¹ including all project phases and off-site improvements?

Yes No

2. Does this project create or replace a combined total or 10,000 square feet or more of impervious streets, roads, highways, or freeway construction or reconstruction³? Yes No

3. Does this project create or replace a combined total of 1.0 acre or more of impervious surface¹ including all project phases and off-site improvements? Yes No

4. Did you answer "YES" to any of the above questions in Part 3?

YES: This project will need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. Please complete remainder of worksheet and sign the "Acknowledgement Signature Section" on Page 4.

NO: This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 permit. Please complete the "Exemption Signature Section" on Page 4.

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

² "Routine Maintenance Activity" includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities per section VI.D.2.b.

³ "Reconstruction" is defined as work that extends into the subgrade of a pavement per section VI.D.2.b.

Part 4: Project Description

1. Total Project area: square feet
 acres

2. Existing land use(s): (check all that apply)

Commercial Industrial Residential Public Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

Vacant, unimproved land with approximately 4,500 SF of existing impervious surface used for parking.

3. Existing impervious surface area: square feet
 acres

4. Proposed Land Use(s): (check all that apply)

Commercial Industrial Residential Public Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

Proposed multi-family development.

5. Existing impervious surface area: square feet
 acres

Proposed

2017 Storm Water LID Determination Worksheet

4614 Old Redwood Highway

Acknowledgment Signature Section:

As the property owner or developer, I understand that this project is required to implement permanent Storm Water Best Management Practices and provide a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit Order No. R1-2015-0030. *Any unknown responses must be resolved to determine if the project is subject to these requirements.

DocuSigned by:
Paul F. Ugenti
EB3E878FE9574C0...

12/9/2021

Applicant Signature

Date

Exemption Signature Section:

As the property owner or developer, I understand that this project as currently designed does not require permanent Storm Water BMP's nor the submittal of a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit*. I understand that redesign may require submittal of a new Determination Worksheet and may require permanent Storm Water BMP's.

Applicant Signature

Date

- * This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Implementation Requirements: All calculations shall be completed using the "Storm Water Calculator" available at: www.srcity.org/stormwaterLID

Hydromodification Control/100% Volume Capture: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

Treatment Requirement: Treatment of 100% of the flow calculated using the modified Rational Method and a known intensity of 0.20 inches per hour.

Delta Volume Capture Requirement: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

ATTACHMENT 2

Preliminary SUSMP Exhibit



FACILITY APPLIED WATER ALLOWANCE					
FAMA = (PIV) (PIV) (PIV) (PIV) (PIV)					
ADJUST	SAVINGS	PIV	CIAT	LA	CIAT

ESTIMATED TOTAL WATER USE						
FAMA = (PIV) (PIV) (PIV) (PIV) (PIV)						
DESCRIPTION	ED	EC	EA	CE	II	ESU (IN GALLONS PER YEAR)
1. SOUTH PERIMETER	35.0	0.4	3,180	0.81	0.9	23,870
2. EAST PERIMETER	35.0	0.4	3,180	0.81	0.9	23,870
3. NORTH CONCRETE PLANTER	35.0	0.3	1,800	0.81	0.9	13,600
4. WEST PLANTERS	35.0	0.4	450	0.81	0.9	4,800
5. WEST PERIMETER	35.0	0.4	1,800	0.81	0.9	23,870
6. STREETSIDE PLANTERS	35.0	0.3	1,800	0.81	0.9	13,600
TOTAL GALLONS PER YEAR						107,610

NOTE THAT ALL PLANTERS ARE TO BE IRRIGATED BY AN AUTOMATIC LOW VOLUME IRRIGATION SYSTEM BELOW GRADE.
ALL PLANTERS WILL BE MULCHED TO A DEPTH OF 2" WITH AN APPROVED ORGANIC MULCH PRODUCT.
THE LANDSCAPE AND IRRIGATION PLANS WILL COMPLY WITH THE 2015 MODEL WATER EFFICIENT LANDSCAPE ORDINANCE.

SUGGESTED PLANT MATERIALS

TREE LEGEND

DESCRIPTION	AVERAGE MATURE HEIGHT	USE	QUANTITY
LAURUS SARGENTII CHINESE SHARBON BURN	40 FT.	1 GAL.	7
LAURUS SARGENTII HYBRID LAUREL	35 FT.	1 GAL.	23
FRAXINUS GRANDIFLORA AMERICAN BEECH	15 FT.	1 GAL.	4
QUERCUS OCCIDENTALIS WESTERN REDBELL	15 FT.	1 GAL.	11
ACEQUILARIA EMERALD GREEN GUM	8 FT.	1 GAL.	

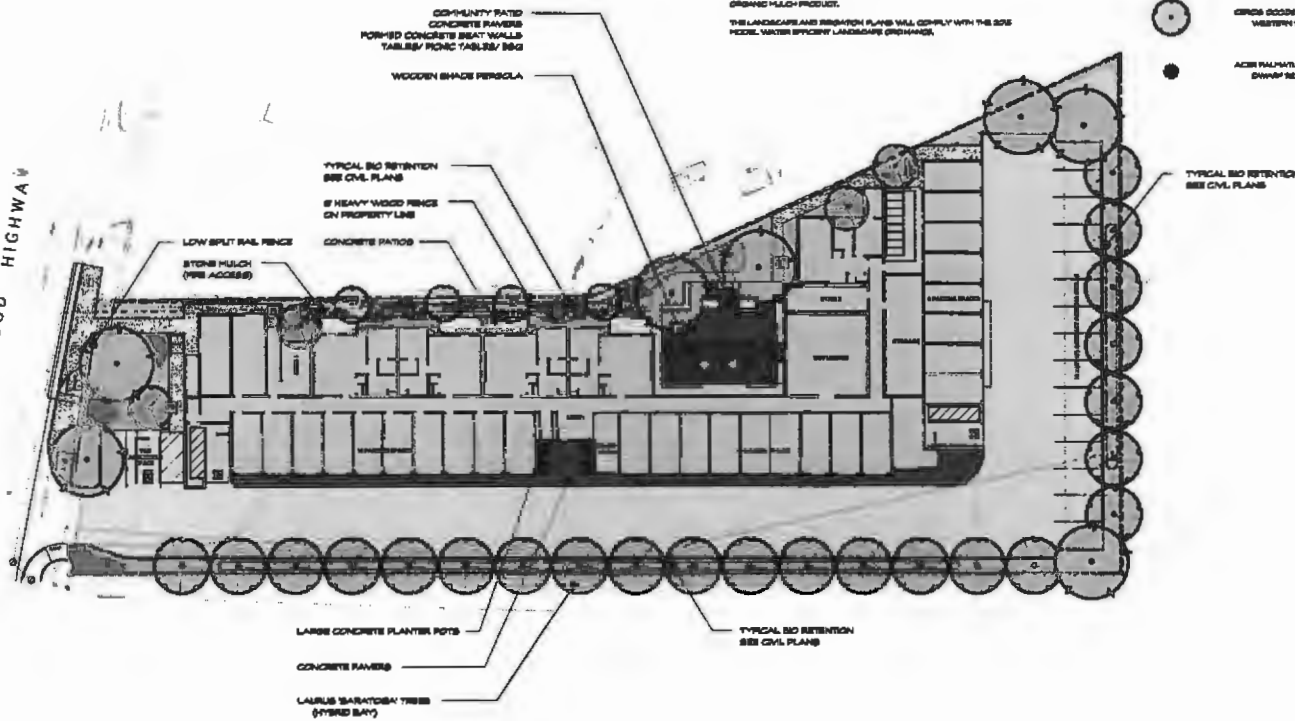
SHRUB, ACCENTS AND GROUND COVERS:

USE	DESCRIPTION
2 GAL.	ARTEMISIA CANADENSIS COMMON STRAWBERRY BUSH
2 GAL.	SPRENGERIA WHITE DWARF SPYRASA
2 GAL.	MANISIA SCHREIBERII HEAVENLY SAMPSON
2 GAL.	CORREA YACONI AUSTRALIAN HEDERA
1 GAL.	CRATAEGUS DWARF FLOR-SAGO
1 GAL.	ARCTOSTAPHYLOS SANDWICH
2 GAL.	PRODRIN RED PLUM
1 GAL.	FRAXINUS RED BELL
1 GAL.	TULASTIA SOCIETY BARK

BIOSWALE PLANTINGS

1 GAL.	FRAXINUS RED BELL
1 GAL.	FRAXINUS RED BELL
1 GAL.	FRAXINUS RED BELL
1 GAL.	FRAXINUS RED BELL
1 GAL.	FRAXINUS RED BELL

OLD REDWOOD HIGHWAY



SITE PLAN
SCALE: 1" = 20' - 0"

0 10' 20' 30'

JAMES FERGUSON CLABAUGH
LANDSCAPE ARCHITECT
655 SHAW LANE
VICENTE, CA 95088
PHONE: 707-644-8888
info@jamesclabaugh.com



4614
OLD
REDWOOD
HIGHWAY

SANTA ROSA, CA				
DATE	1" = 20'	REVISION	DATE	BY

**PRELIMINARY
LANDSCAPE
PLAN**

L1
of 1

ATTACHMENT 3

Existing Condition Exhibit





PROVIDE THE PRE-DEVELOPMENT CURVE NUMBER FOR EACH DMA.

CALL OUT EACH SOIL TYPE PRESENT ON SITE & SHOW LOCATIONS FOR EACH.

IDENTIFY THE EXISTING IMPERVIOUS SURFACE AREA.

PRE DEVELOPMENT EXHIBIT MUST BE A PLAN SHEET THAT SHOWS CURRENT (EXISTING) IMPROVEMENTS, PROPERTY LINES, EXISTING DRAIN LINES, PROPOSED DMA BOUNDARIES, TITLE BLOCK, SCALE, NORTH ARROW, ETC.

ATTACHMENT 4

Impervious Area Exhibit



ATTACHMENT 5

BMP Selection Tables



Project Name: _____

Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with High Ground Water Contamination			Slope Constraints Achieved		Treatment Volume Capture		Runoff Reduction Measure		BMP in priority selected?		Unique Identifier of BMP per planes	Explanation of selection	Other notes:	
			Yes	No	Yes	No	Yes	No	Yes	No							
Universal BMP- to be considered on all projects.	Living Roof	N/A	N/A	X	X	X		X	X								
	Rainwater Harvesting	N/A	N/A	X	X	X		X									
Runoff Reduction Measures	Interceptor Trees	N/A	N/A	X	X	X				X							
	Bovine Terrace	RRM-01	Bovine Terrace	X						X							
	Vegetated Buffer Strip	RRM-02	Vegetated Buffer Strip							X							
	Impervious Area Disconnection	N/A	N/A	X	X	X				X							
Priority 1- to be installed with no underdrains or liners. Must drain all staging water within 72 hours.	Bioretention	P1-02	Roadside Bioretention - no C & G					X	X								
	Vegetated Swale with Bioretention	P1-06	Swale with Bioretention					X	X								
	Constructed Wetlands	N/A	N/A					X	X								
Priority 2 BMPs- with subsurface drains installed above the capture volume.	Bioretention	P2-02	Roadside Bioretention - Flush Design Roadside					X	X								
		P2-03	Roadside Bioretention- Contiguous SW					X	X								
		P2-04	Roadside Bioretention- Curb Opening					X	X								
		P2-05	Roadside Bioretention- No C & G					X	X								
	Constructed Wetlands	N/A	N/A					X	X								

Date: _____

Page ____ of ____

Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...			Slope Constraints Achieved	Treatment	Volume Capture	Runoff Reduction Measure	BMP in priority selected?		Unique Identifier of BMP per plan	Explanation of selection	Other notes:	
			High Ground Water	Contamination	Shore					Yes	No				
Priority 3 BMPs- installed with subdrains and/or impermeable liner. Does not achieve volume capture and must be used as part of a treatment train.	Bioretention	P3-02	Roadside Bioretention - Flush Design Roadside	X	X	X	X								
		P3-03	Roadside Bioretention- Contiguous SW	X	X	X	X								
		P3-04	Roadside Bioretention- Curb Opening	X	X	X	X								
	Flow Through Planters	P3-05	Flow Through Planters	X	X	X	X								
	Vegetated Swale	P3-06	With Bioretention	X	X	X	X	X							
		P3-07	Vegetated Swale	X	X	X	X								
	Priority 4 BMPs- does not achieve volume capture and must be used as part of a	Tree Filter Unit			X	X	X	X							
Modular Bioretention				X	X	X	X								
Priority 5 BMPs- does not achieve volume capture and must be used as part of a treatment train.	Chambered Separator Units			X	X	X	X								
	Centrifugal Separator Units			X	X	X	X								
	Trash Excluders			X	X	X	X								
	Filter Inserts			X	X	X	X								
Priority 6 BMPs- see the "Offset Program" chapter for details.	Offset Program						N/A	N/A	N/A						
Other	Detention			X											

ATTACHMENT 6

Preliminary Calculations



STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

Hydromodification Control Requirement: 100% Volume Capture; V_{hydromod} *If User Composite CN is used, Supporting calculations are required to be submitted.*

Post development hydrologic soil type within tributary area:

Post development ground cover description:

CN_{POST} =

User Composite post development CN:

Entering a calculated composite CN will override selections made from the pull down menus above.

V_{Hydromod} : ft³

BMP Sizing Tool: Hydromodification Control Requirement

BMP Depth:

- Measured from ground surface WITHOUT perforated pipe
- Measured from bottom of perforated pipe if installed.

	BMP Volume Below Ground	Ponded Water Above Ground
Imported BMP Soil Porosity:	0.10	
Depth:	0.00 ft	0.00 ft
Width:	0.00 ft	0.00 ft
Length:	0.00 ft	0.00 ft

The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.

-- OR -- Entering an Area information will override Volume and Length information!

Area BMP: ft² Ponded Area: ft²

Total Volume achieved in BMP: ft³

Select Hydromodification BMP Design when Saving? Yes

Percent of Requirement Achieved:
 %
Results must be at least 100%

100% Treatment *If User Composite C_{POST} and or I_{historical} are used, supporting calculations are required to be submitted.*

A_{Reduced}: ft²

Post development surface:

C_{POST}:

User Composite post development C_{POST}:

-- OR -- Entering a calculated C_{POST} will override selection made from the pull down menu.

Treatment Factor (Tf): Calculated

I_{Design Storm}: In./hr. Default Value

-- OR -- Entering I_{Historical} will override I_{Design Storm} and set Tf to 2x

I_{Historical}: In./hr.

$Q_{\text{TREATMENT}}$ = cfs

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: 100% Treatment Horizontal Flows - Swales

Swale Side Slope (H / V):	<input type="text" value="2.00"/>	ft./ft. (2:1 Max Slope)
Swale Bed Width:	<input type="text" value="2.00"/>	ft. (2-7 foot width)
Longitudinal Swale Slope, %:	<input type="text" value="1.0%"/>	(8% Maximum Slope)
Manning Roughness Coefficient for Sheet Flow:	<input type="text" value="Smooth surfaces; Concrete, Asphalt, Gravel, or Bare Soil"/>	
Manning's n:	<input type="text" value="0.011"/>	
Grass Height:	<input type="text" value="3.0"/>	Inches
Swale Input Flow Characteristics:	<input type="text" value="90% or more of flow enters upstream end"/>	
Minimum required contact time:	<input type="text" value="5"/>	Minutes
Design Swale Length:	<input type="text" value="0.0"/>	ft

Calculated Swale Flow Depth = ft
 Vsw = ft/s
 Q Calculated Design Flow = cfs

Percent of Treatment Requirement Achieved: %
Results must be at least 100%

Reset Treatment Sizing Inputs

Display "Horizontal Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Horizontal BMP Design Requirements when Saving? Yes

BMP Sizing Tool: 100% Treatment Vertical Flow - Planter Boxes

Infiltration rate of the specified BMP soil, k:	<input type="text" value="0.00"/>	in./hr.
Depth of drainage pipe:	<input type="text" value="1.50"/>	ft (1.5 ft. minimum)
BMP Length:	<input type="text" value="0.0"/>	ft
BMP Width:	<input type="text" value="0.0"/>	ft

Q Calculated Design Flow = cfs

Percent of Requirement Achieved: %
Results must be at least 100%

Reset Vertical Sizing Inputs

Display "Vertical Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Vertical BMP Design Requirements when Saving? Yes

Delta Volume Capture; V_{delta}

If User Composite CN is used, Supporting calculations are required to be submitted.

Hydrologic soil type within tributary area:	<input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>
Predevelopment ground cover description:	<input type="text" value="Brush: weed-grass mixture with brush major element - Good (>75% ground cover)"/>
Post development ground cover description:	<input type="text" value="Residential - 1/8 acre or less (town houses)"/>
CN _{PRE} =	<input type="text" value="73"/>
CN _{POST} =	<input type="text" value="92"/>
User Composite Predevelopment CN:	<input type="text"/>
User Composite Post development CN:	<input type="text"/>

User Cells must be blank to use CN_{PRE} OR CN_{POST} from drop down lists.

V_{DELTA} = ft³

- OR - Entering a calculated composite CN_{PRE} Or CN_{POST} will override selections made from the pull down menus above.

Reset VDelta Input

Display "Delta Volume Capture" calculation

Calculate Results

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: Delta Volume Capture Requirement

BMP Depth:
- Measured from ground surface WITHOUT perforated pipe.
- Measured from bottom of perforated pipe if installed

BMP Volume Below Ground
Imported BMP Soil Porosity:
Depth: ft
Width: ft
Length: ft

Ponded Water Area Above Ground
Depth: ft
Width: ft
Length: ft

Area BMP: ft² **Area:** ft²

Total Volume for calculation: ft³

Percent of Requirement Achieved: %
Results must be at least 100%

Design Check: Perforated Pipe is NOT allowed with Ponded Water values!

Buttons: Reset V/Delta BMP Sizing Inputs, Display "V/Delta BMP Sizing" calculation worksheet, Calculate Results, Select Delta Volume Capture BMP Design Requirements when Saving? Yes, Clear/Reset All Inputs, Calculate All, Save BMP Data and Results

The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.

Provide a source for the porosity in this report.

Depth is that below the perforated pipe, which is only 6" per detail on exhibit. Revise these calculations &/or the exhibit for consistency.

Reflect these dimensions on the plans & exhibits.

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): DMA-2 BMP's Physical Tributary Area: 8,200 ft ² 0.188 Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!								
BMP Design Criteria: Type of BMP Design (select from pull down): Priority 1: P1-06 Swale with Bioretention		Delta Volume & Treatment	Action Buttons:								
BMP Notes:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Clear/Reset All Inputs</td> <td style="padding: 2px;">Clear or load default values into cells of individual section or entire page.</td> </tr> <tr> <td style="padding: 2px;">Calculate</td> <td style="padding: 2px;">Will load values into worksheet, calculate and displays results.</td> </tr> <tr> <td style="padding: 2px;">Display Calculation Worksheet</td> <td style="padding: 2px;">Will load the values, calculate and display the corresponding worksheet with results.</td> </tr> <tr> <td style="padding: 2px;">Save BMP Data and Results</td> <td style="padding: 2px;">Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.</td> </tr> </table>		Clear/Reset All Inputs	Clear or load default values into cells of individual section or entire page.	Calculate	Will load values into worksheet, calculate and displays results.	Display Calculation Worksheet	Will load the values, calculate and display the corresponding worksheet with results.	Save BMP Data and Results	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
Clear/Reset All Inputs	Clear or load default values into cells of individual section or entire page.										
Calculate	Will load values into worksheet, calculate and displays results.										
Display Calculation Worksheet	Will load the values, calculate and display the corresponding worksheet with results.										
Save BMP Data and Results	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.										
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>									

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees		
Number of new <i>Evergreen Trees</i> that qualify as interceptor trees:	<input style="width: 50px;" type="text" value="0"/>	Interceptor Tree trunk must be no greater than 25 feet from impervious surface.
Number of new <i>Deciduous Trees</i> that qualify as interceptor trees:	<input style="width: 50px;" type="text" value="7"/>	
Enter square footage of qualifying existing tree canopy:	<input style="width: 50px;" type="text" value="0"/> ft ²	
Disconnected Roof Drains		
Select disconnection condition <input style="width: 100%;" type="text" value="Select disconnection condition"/>		
Method 1		
Amount of rooftop area that drain to disconnected downspouts:	<input style="width: 50px;" type="text" value="0"/> ft ²	
OR Method 2		
Percent of rooftop area to be disconnected from downspouts:	<input style="width: 50px;" type="text" value="0"/> %	
Select Density:	<input style="width: 50px;" type="text" value="1"/> Units per Acre	
Paved Area Disconnection		
Paved Area Type (select from drop down list): <input style="width: 100%;" type="text" value="Select paved area type"/>		
Enter area of alternatively designed paved area: <input style="width: 50px;" type="text" value="0.0"/> ft ²		
Buffer Strips & Bovine Terraces		
Area draining to a Buffer Strip or Bovine Terrace: <input style="width: 50px;" type="text" value="0.0"/> ft ²		Total Runoff Reduction Measures <input style="width: 50px;" type="text" value="700"/> ft ²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>
<input type="button" value="Calculate Results"/>		Resulting reduced Tributary Area used for BMP sizing: <input style="width: 50px;" type="text" value="7,500"/> ft ²

STORM WATER CALCULATOR

4814 Old Redwood Highway
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Robert A. Kam Associates
12/8/2021

Hydromodification Control Requirement: 100% Volume Capture; V_{hydromod}		<i>If User Composite CN is used, Supporting calculations are required to be submitted.</i>
Post development hydrologic soil type within tributary area:	A: <input type="text" value="greater than 0.30 in/hr infiltration (transmission) rate"/>	
Post development ground cover description:	Brush: weed-grass mixture with brush major element - Poor (<50% ground cover)	
CN _{POST} =	<input type="text" value="48"/>	
User Composite post development CN:	<input type="text"/>	
<i>Entering a calculated composite CN will override selections made from the pull down menus above.</i>		
		$V_{\text{Hydromod}} = $ <input type="text" value="0.00"/> ft^3
Reset Hydromod Inputs	Display "Hydromod" calculation worksheet	Calculate Results

BMP Sizing Tool: Hydromodification Control Requirement			<i>The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.</i>
BMP Depth: - Measured from ground surface WITHOUT perforated pipe - Measured from bottom of perforated pipe if installed.	Imported BMP Soil Porosity: <input type="text" value="0.10"/> Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft	BMP Volume Below Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft	Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
<i>- OR - Entering an Area Information will override Width & Length Information!</i>			Percent of Requirement Achieved:
Area BMP: <input type="text" value="0.00"/> ft^2		Ponded Area: <input type="text" value="0.00"/> ft^2	<input type="text" value="0.00"/> % <i>Results must be at least 100%</i>
Total Volume achieved in BMP: <input type="text" value="0.00"/> ft^3			
Reset Hydromod Sizing Inputs	Display "Hydromod Sizing" calculation worksheet	Calculate Results	Select Hydromodification BMP Design when Saving? <input checked="" type="radio"/> Yes

100% Treatment		<i>If User Composite C_{POST} and/or $I_{\text{historical}}$ are used, supporting calculations are required to be submitted.</i>
Post development surface:	<input type="text" value="Concrete"/>	
User Composite post development C_{POST} :	<input type="text" value="0.80"/>	
<i>- OR - Entering a calculated C_{POST} will override selection made from the pull down menu.</i>		
Treatment Factor (Tf):	<input type="text" value="1.0"/> Calculated	
$I_{\text{Design Storm}}$:	<input type="text" value="0.20"/> In./hr. Default Value	
<i>- OR - Entering $I_{\text{Historical}}$ will override $I_{\text{Design Storm}}$ and set Tf to 2x</i>		
$I_{\text{Historical}}$:	<input type="text"/> In./hr.	
		$Q_{\text{TREATMENT}} = $ <input type="text" value="0.0000"/> cfs
Reset Treatment Inputs	Display "100% Treatment" calculation worksheet	Calculate Results

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: 100% Treatment Horizontal Flows - Swales

<table border="0"> <tr> <td>Swale Side Slope (H / V):</td> <td><input type="text" value="2.00"/></td> <td>ft./ft. (2:1 Max Slope)</td> </tr> <tr> <td>Swale Bed Width:</td> <td><input type="text" value="2.00"/></td> <td>ft. (2-7 foot width)</td> </tr> <tr> <td>Longitudinal Swale Slope, %</td> <td><input type="text" value="1.0%"/></td> <td>(8% Maximum Slope)</td> </tr> <tr> <td>Manning Roughness Coefficient for Sheet Flow:</td> <td colspan="2"><input type="text" value="Smooth surfaces; Concrete, Asphalt, Gravel, or Bare Soil"/></td> </tr> <tr> <td>Manning's n:</td> <td><input type="text" value="0.011"/></td> <td></td> </tr> <tr> <td>Grass Height:</td> <td><input type="text" value="3.0"/></td> <td>Inches</td> </tr> <tr> <td>Swale Input Flow Characteristics:</td> <td colspan="2"><input type="text" value="90% or more of flow enters upstream end"/></td> </tr> <tr> <td>Minimum required contact time:</td> <td><input type="text" value="5"/></td> <td>Minutes</td> </tr> <tr> <td>Design Swale Length:</td> <td><input type="text" value="0.0"/></td> <td>ft</td> </tr> </table>	Swale Side Slope (H / V):	<input type="text" value="2.00"/>	ft./ft. (2:1 Max Slope)	Swale Bed Width:	<input type="text" value="2.00"/>	ft. (2-7 foot width)	Longitudinal Swale Slope, %	<input type="text" value="1.0%"/>	(8% Maximum Slope)	Manning Roughness Coefficient for Sheet Flow:	<input type="text" value="Smooth surfaces; Concrete, Asphalt, Gravel, or Bare Soil"/>		Manning's n:	<input type="text" value="0.011"/>		Grass Height:	<input type="text" value="3.0"/>	Inches	Swale Input Flow Characteristics:	<input type="text" value="90% or more of flow enters upstream end"/>		Minimum required contact time:	<input type="text" value="5"/>	Minutes	Design Swale Length:	<input type="text" value="0.0"/>	ft	<table border="0"> <tr> <td>Calculated Swale Flow Depth =</td> <td><input type="text" value="0.0000"/></td> <td>ft</td> </tr> <tr> <td>V_{sw} =</td> <td><input type="text" value="0.0000"/></td> <td>ft/s</td> </tr> <tr> <td>Q Calculated Design Flow =</td> <td><input type="text" value="0.0000"/></td> <td>cfs</td> </tr> </table> <table border="0"> <tr> <td>Percent of Treatment Requirement Achieved:</td> <td><input type="text" value="0.0"/></td> <td>%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Results must be at least 100%</i></td> </tr> </table>	Calculated Swale Flow Depth =	<input type="text" value="0.0000"/>	ft	V _{sw} =	<input type="text" value="0.0000"/>	ft/s	Q Calculated Design Flow =	<input type="text" value="0.0000"/>	cfs	Percent of Treatment Requirement Achieved:	<input type="text" value="0.0"/>	%	<i>Results must be at least 100%</i>		
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Reset Treatment Sizing Inputs

Display "Horizontal Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Horizontal BMP Design Requirements when Saving? Yes

BMP Sizing Tool: 100% Treatment Vertical Flow - Planter Boxes

<table border="0"> <tr> <td>Infiltration rate of the specified BMP soil, k:</td> <td><input type="text" value="0.00"/></td> <td>In./hr.</td> </tr> <tr> <td>Depth of drainage pipe:</td> <td><input type="text" value="1.50"/></td> <td>ft (1.5 ft. minimum)</td> </tr> <tr> <td>BMP Length:</td> <td><input type="text" value="0.0"/></td> <td>ft</td> </tr> <tr> <td>BMP Width:</td> <td><input type="text" value="0.0"/></td> <td>ft</td> </tr> </table>	Infiltration rate of the specified BMP soil, k:	<input type="text" value="0.00"/>	In./hr.	Depth of drainage pipe:	<input type="text" value="1.50"/>	ft (1.5 ft. minimum)	BMP Length:	<input type="text" value="0.0"/>	ft	BMP Width:	<input type="text" value="0.0"/>	ft	<table border="0"> <tr> <td>Q Calculated Design Flow =</td> <td><input type="text" value="0.0000"/></td> <td>cfs</td> </tr> </table> <table border="0"> <tr> <td>Percent of Requirement Achieved:</td> <td><input type="text" value="0.0"/></td> <td>%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Results must be at least 100%</i></td> </tr> </table>	Q Calculated Design Flow =	<input type="text" value="0.0000"/>	cfs	Percent of Requirement Achieved:	<input type="text" value="0.0"/>	%	<i>Results must be at least 100%</i>		
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Percent of Requirement Achieved:	<input type="text" value="0.0"/>	%																				
<i>Results must be at least 100%</i>																						

Reset Vertical Sizing Inputs

Display "Vertical Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Vertical BMP Design Requirements when Saving? Yes

Delta Volume Capture; V_{delta}

If User Composite CN is used, Supporting calculations are required to be submitted.

<table border="0"> <tr> <td>Hydrologic soil type within tributary area:</td> <td><input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/></td> </tr> <tr> <td>Predevelopment ground cover description:</td> <td><input type="text" value="Brush: weed-grass mixture with brush major element - Good (>75% ground cover)"/></td> </tr> <tr> <td>Post development ground cover description:</td> <td><input type="text" value="Residential - 1/8 acre or less (town houses)"/></td> </tr> <tr> <td>CN_{PRE} =</td> <td><input type="text" value="73"/></td> </tr> <tr> <td>CN_{POST} =</td> <td><input type="text" value="92"/></td> </tr> <tr> <td>User Composite Predevelopment CN:</td> <td><input type="text"/></td> </tr> <tr> <td>User Composite Post development CN:</td> <td><input type="text"/></td> </tr> </table>	Hydrologic soil type within tributary area:	<input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>	Predevelopment ground cover description:	<input type="text" value="Brush: weed-grass mixture with brush major element - Good (>75% ground cover)"/>	Post development ground cover description:	<input type="text" value="Residential - 1/8 acre or less (town houses)"/>	CN _{PRE} =	<input type="text" value="73"/>	CN _{POST} =	<input type="text" value="92"/>	User Composite Predevelopment CN:	<input type="text"/>	User Composite Post development CN:	<input type="text"/>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="font-size: small;">User Cells must be blank to use CN_{PRE} OR CN_{POST} from drop down lists.</p> </div> <table border="0"> <tr> <td>V_{DELTA} =</td> <td><input type="text" value="240.750"/></td> <td>ft³</td> </tr> </table>	V _{DELTA} =	<input type="text" value="240.750"/>	ft ³
Hydrologic soil type within tributary area:	<input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>																	
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- OR - Entering a calculated composite CN_{PRE} or CN_{POST} will override selections made from the pull down menus above.

Reset VDelta Input

Display "Delta Volume Capture" calculation

Calculate Results

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: Delta Volume Capture Requirement		BMP Volume Below Ground	Ponded Water Area Above Ground
BMP Depth: - Measured from ground surface WITHOUT perforated pipe - Measured from bottom of perforated pipe if installed.	Imported BMP Soil Porosity:	0.36	
	Depth:	1.0 ft	Depth: 0.50 ft
	Width:	3.0 ft	Width: 3.0 ft
	Length:	100.0 ft	Length: 100.0 ft
-- OR -- Entering Area number will override Width & Length information!			
	Area BMP:	ft ²	Area: ft ²
Check: Perforated Pipe is NOT allowed with Ponded Water values!		Total Volume for calculation: 450.00 ft ³	
<input type="button" value="Reset VDelta BMP Sizing Inputs"/>	<input type="button" value="Display 'VDelta BMP Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	<input type="button" value="Select Delta Volume Capture BMP Design Requirements when Saving? Yes"/>
<input type="button" value="Clear/Reset All Inputs"/>		<input type="button" value="Calculate All"/>	<input type="button" value="Save BMP Data and Results"/>

The above and below ground Depth, Width, and Length or Area will be summed together for the Percent of Requirement Achieved calculation.

Percent of Requirement Achieved:
107.17 %
Results must be at least 100%

Depth is that below the perforated pipe, which is only 6" per detail on exhibit. Revise these calculations &/or the exhibit for consistency.

Reflect these dimensions on the plans & exhibits.

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): DMA-3	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP's Physical Tributary Area: 13,000 ft ² 0.298 Acres		BMP Design Criteria: Delta Volume & Treatment	
Type of BMP Design (select from pull down): Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter		Action Buttons:	
BMP Notes:		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
(Empty field for notes)		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
(Empty field for notes)		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
(Empty field for notes)		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	
Runoff Reduction Measures			Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees			Interceptor Tree trunk must be no greater than 25 feet from impervious surface.
Number of new <i>Evergreen Trees</i> that qualify as interceptor trees:		<input type="text" value="2"/>	
Number of new <i>Deciduous Trees</i> that qualify as interceptor trees:		<input type="text" value="4"/>	
Enter square footage of qualifying existing tree canopy:		<input type="text" value="0"/> ft ²	
Disconnected Roof Drains			
Select disconnection condition:		<input type="text" value="Select disconnection condition"/>	
Method 1			
Amount of rooftop area that drain to disconnected downspouts:		<input type="text" value="0"/> ft ²	
OR Method 2			
Percent of rooftop area to be disconnected from downspouts:		<input type="text" value="0"/> %	
Select Density:		<input type="text" value="1"/> Units per Acre	
Paved Area Disconnection			
Paved Area Type (select from drop down list)		<input type="text" value="Select paved area type"/>	
Enter area of alternatively designed paved area		<input type="text" value="0.0"/> ft ²	
Buffer Strips & Bovine Terraces			
Area draining to a Buffer Strip or Bovine Terrace		<input type="text" value="0.0"/> ft ²	
		Total Runoff Reduction Measures : <input type="text" value="800"/> ft ²	
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="12,200"/> ft ²	
<input type="button" value="Reset Reduction Measures Inputs"/>	<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

Hydromodification Control Requirement: 100% Volume Capture; V_{hydromod}		<i>If User Composite CN is used, Supporting calculations are required to be submitted.</i>
Post development hydrologic soil type within tributary area:	A: greater than 0.30 In/hr infiltration (transmission) rate	
Post development ground cover description:	Brush: weed-grass mixture with brush major element - Poor (<50% ground cover)	
CN _{POST} =	48	
User Composite post development CN.		
<i>Entering a calculated composite CN will override selections made from the pull down menus above.</i>		Error! CN too low to generate runoff!
		V_{Hydromod} : 0.00 ft ³
Reset Hydromod Inputs	Display "Hydromod" calculation worksheet	Calculate Results

BMP Sizing Tool: Hydromodification Control Requirement		<i>The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.</i>	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground	Ponded Water Above Ground	
Imported BMP Soil Porosity:	0.10	Depth:	0.00 ft
Depth:	0.00 ft	Width:	0.00 ft
Width:	0.00 ft	Length:	0.00 ft
Length:	0.00 ft		
<i>-- OR -- Entering an Area information will override Width & Length information!</i>			
Area BMP:	0.00 ft ²	Ponded Area:	0.00 ft ²
Total Volume achieved in BMP:		0.00 ft ³	
Percent of Requirement Achieved:		0.00 %	
		<i>Results must be at least 100%</i>	
Reset Hydromod Sizing Inputs	Display "Hydromod Sizing" calculation worksheet	Calculate Results	Select Hydromodification BMP Design when Saving? <input type="checkbox"/> Yes

100% Treatment		<i>If User Composite C_{POST} and or I_{historical} are used, supporting calculations are required to be submitted.</i>
A _{Reduced} :	12,200.0 ft ²	
Post development surface:	Concrete	
C _{POST} :	0.80	
User Composite post development C _{POST} :		
<i>-- OR -- Entering a calculated CPOST will override selection made from the pull down menu.</i>		
Treatment Factor (Tf):	1.0 Calculated	
I _{Design Storm} :	0.20 In./hr. Default Value	
<i>-- OR -- Entering I_{historical} will override I_{Design Storm} and set Tf to 2x</i>		
I _{Historical} :		
		$Q_{\text{TREATMENT}}$ = 0.0478 cfs
Reset Treatment Inputs	Display "100% Treatment" calculation worksheet	Calculate Results

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: 100% Treatment Horizontal Flows - Swales

Swale Side Slope (H / V):	2.00	ft./ft. (2:1 Max Slope)	
Swale Bed Width:	2.00	ft. (2-7 foot width)	
Longitudinal Swale Slope, %	1.0%	(8% Maximum Slope)	
Manning Roughness Coefficient for Sheet Flow:	Smooth surfaces; Concrete, Asphalt, Gravel, or Bare Soil		
Manning's n:	0.011		
Grass Height:	3.0	Inches	
Swale Input Flow Characteristics:	90% or more of flow enters upstream end		
Minimum required contact time:	5	Minutes	
Design Swale Length:	0.0	ft	

Calculated Swale Flow Depth = ft

V_{sw} = ft/s

Q Calculated Design Flow = cfs

Percent of Treatment Requirement Achieved:

%

Results must be at least 100%

Reset Treatment Sizing Inputs

Display "Horizontal Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Horizontal BMP Design Requirements when Saving? Yes

BMP Sizing Tool: 100% Treatment Vertical Flow - Planter Boxes

Infiltration rate of the specified BMP soil, k:	0.00	in./hr.	
Depth of drainage pipe:	1.50	ft (1.5 ft. minimum)	
BMP Length:	0.0	ft	
BMP Width:	0.0	ft	

Q Calculated Design Flow = cfs

Percent of Requirement Achieved:

%

Results must be at least 100%

Reset Vertical Sizing Inputs

Display "Vertical Flow Sizing" calculation worksheet

Calculate Results

Select 100% Flow Base Treatment Vertical BMP Design Requirements when Saving? Yes

Delta Volume Capture; V_{delta}

If User Composite CN is used, Supporting calculations are required to be submitted.

Hydrologic soil type within tributary area:	D: 0 - 0.05 in/hr Infiltration (transmission) rate
Predevelopment ground cover description:	Brush: weed-grass mixture with brush major element - Good (>75% ground cover)
Post development ground cover description:	Residential - 1/8 acre or less (town houses)
CN _{PRE} =	73
CN _{POST} =	92
User Composite Predevelopment CN:	
User Composite Post development CN:	

User Cells must be blank to use CN_{PRE} OR CN_{POST} from drop down lists.

V_{DELTA} = ft³

-- OR -- Entering a calculated composite CN_{PRE} or CN_{POST} will override selections made from the pull down menus above.

Reset VDelta Input

Display "Delta Volume Capture" calculation

Calculate Results

STORM WATER CALCULATOR

4614 Old Redwood Highway
4614 Old Redwood Highway
Robert A. Karn Associates
12/8/2021

BMP Sizing Tool: Delta Volume Capture Requirement		BMP Volume Below Ground	Ponded Water Area Above Ground	The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.
BMP Depth: - Measured from ground surface WITHOUT perforated pipe - Measured from bottom of perforated pipe if installed	Imported BMP Soil Porosity: <input type="text" value="0.36"/>	Depth: <input type="text" value="1.0"/> ft Width: <input type="text"/> ft Length: <input type="text"/> ft	Depth: <input type="text" value="0.50"/> ft Width: <input type="text"/> ft Length: <input type="text"/> ft	Percent of Requirement Achieved: <input type="text" value="101.02"/> % <i>Results must be at least 100%</i>
-- OR -- Entering Area number will override Width & Length Information!		Area BMP: <input type="text" value="460"/> ft ²	Area: <input type="text" value="460"/> ft ²	
Check: Perforated Pipe is NOT allowed with Ponded Water values!		Total Volume for calculation: <input type="text" value="690.00"/> ft ³		
<input type="button" value="Reset VDelta BMP Sizing Inputs"/>	<input type="button" value="Display 'VDelta BMP Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	<input type="button" value="Select Delta Volume Capture BMP Design Requirements when Saving?"/>	<input checked="" type="radio"/> Yes
<input type="button" value="Clear/Reset All Inputs"/>		<input type="button" value="Calculate All"/>	<input type="button" value="Save BMP Data and Results"/>	

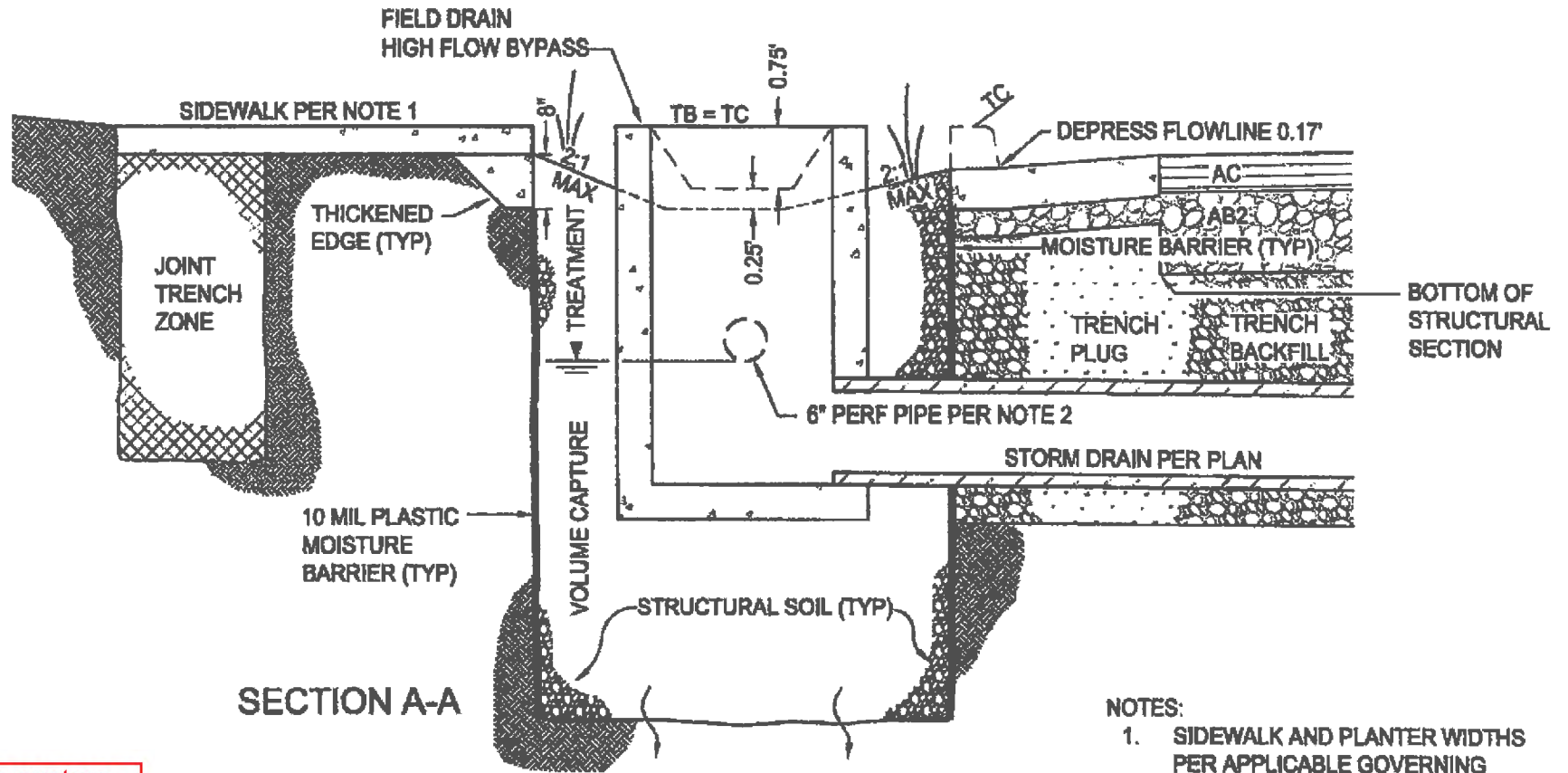
Depth is that below the perforated pipe, which is only 6" per detail on exhibit. Revise these calculations &/or the exhibit for consistency.

Reflect these dimensions on the plans & exhibits.

ATTACHMENT 7

Preliminary Details



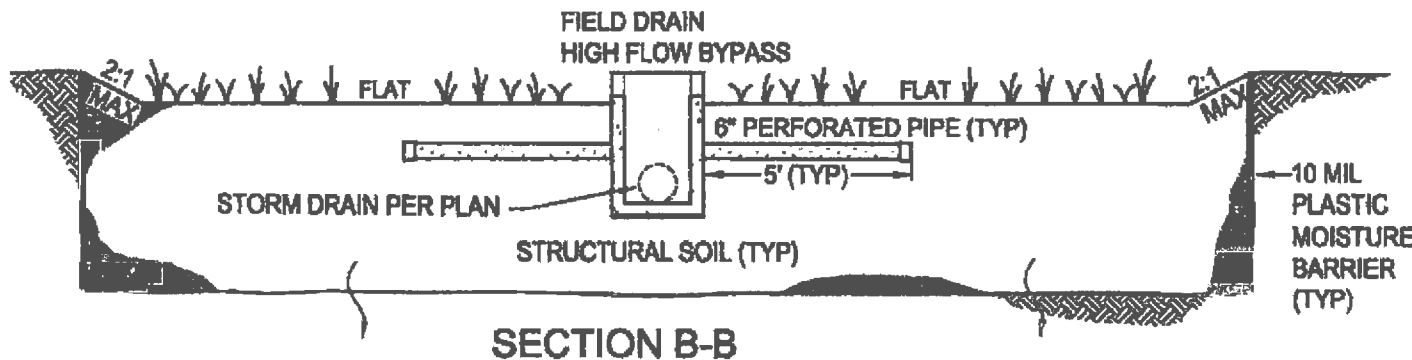


SECTION A-A

NOTES:

1. SIDEWALK AND PLANTER WIDTHS PER APPLICABLE GOVERNING AGENCY STANDARDS (TYP).
2. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW BOTTOM OF ROAD STRUCTURAL SECTION.

Provide a custom detail, consistent with the plans.



SECTION B-B

Not to Scale

PRIORITY 2 ROADSIDE BIORETENTION - CURB OPENING SECTION A-A & B-B		
SCALE: NONE	DATE: 04/06/17	
DWN. DIT CHK. HM	SHEET 2 of 2	P2-04

FACT SHEET- BIORETENTION

BIORETENTION

Also know as: Street rain garden, roadside bioretention, and bioretention cell



DESCRIPTION

The bioretention area best management practice (BMP) functions as a soil and plant-based filtration and infiltration feature that removes pollutants through a variety of natural physical, biological, and chemical treatment processes.

ADVANTAGES

- Achieves both water quality and volume capture objectives.
- Bioretention areas provide storm water treatment that enhances the quality of downstream water bodies by using natural processes.
- The vegetation provides shade and wind breaks, absorbs noise, reduces heat island effects and improves an area's landscape.
- Bioretention provides habitat for birds and attracts other pollinators like butterflies and bees.
- Does not interrupt utility installation.
- Does not interfere with tree planting.

FACT SHEET- BIORETENTION

LIMITATIONS

- Bioretention is not recommended for areas where street slopes exceed 10%.
- Should not be used in areas of known contamination. If soil and/or groundwater contamination is present on the site or within a 100' radius of the proposed BMP location, the North Coast Regional Water Quality Control Board will need to be contacted and the site reviewed.
- Should not be used in areas of high groundwater. In general a minimum of 2' of clearance should be provided between the bottom of the bioretention cell and seasonal high groundwater.
- Should not be used in areas of slope instability where infiltrated storm water may cause failure. Slope stability should be determined by a licensed geotechnical engineer.
- Do not use in locations that can negatively impact building foundation or footings. Location shall be approved by a licensed Geotechnical Engineer.

KEY DESIGN FEATURES

ALL BIORETENTION

- Structural soil should be used within the bioretention area requiring load bearing capacity (adjacent to roadways and/or buildings.)
- Structural soil shall be installed as described in Reference Document E.
- * ◦ Some BMPs may not require the use of structural soil and a more organic type planting soil and/or treatment media may be used in its place. It may be possible in some cases to use native soil or to amend the native soil so that it is suitable. Use of non-structural soil will depend on evaluation of the criteria in "Chapter 4-Site Assessment" as well as consideration of structural needs and may require evaluation by a licensed Geotechnical Engineer.
- Native soil should remain uncompacted to preserve infiltration capacity. Fence off the area during construction to protect it from compaction.
- Bottom of bioretention should be unlined to allow infiltration into native soil.
- Moisture barrier must be installed to protect road sub-base and any trenches adjacent to the bioretention area.
- If used, pervious concrete shall be designed and installed as described in Appendix G.
- If used, porous gutter must be protected during construction to prevent sediment loading.
- If the porous gutter design option is used additional trash and sediment capture BMPs may be required
- A curb opening type design may be used in place of a porous gutter if appropriate for the project.
- Bioretention areas shall be planted with plants from the approved plant and tree list included in Appendix F and shall be planted to achieve 51% cover.

FACT SHEET- BIORETENTION

- All bioretention areas shall be designed with a designated high flow bypass inlet for storms larger than the design storm.
- 6" perforated pipe to be installed at a depth of 6" below road structural section.
- Perforated pipe shall be installed in straight runs.
- The volume below the perforated pipe must be sufficient to hold and infiltrate the design volume.

SIZING DESIGN- GOAL AND REQUIREMENTS

- The design goal for all bioretention areas is to capture (infiltration and/or reuse) 100% of the volume of runoff generated by the 85th percentile 24 hour storm event. This is a retention requirement. If 100% volume capture is achieved than no additional treatment is required.
- If the design goal is not achievable, then the bioretention area *sizing requirement* is:
 - Water Quality Treatment of 100% of the flow generated by the 85th percentile 24 hour storm event, as calculated using the Rational Method and a known intensity of 0.20 inches per hour, and
 - Volume Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by the 85th percentile 24 hour storm event. This is a retention requirement.
- All calculations shall be completed using the "Storm Water Calculator" available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SUSMP. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist.

At a minimum maintenance shall include the following:

- Dry street sweeping upon completion of construction
- Dry street sweeping annually, and
 - When water is observed flowing in the gutter during a low intensity storm.
 - Algae is observed in the gutter.
 - Sediment/debris covers 1/3 of the gutter width or more.
- Inspect twice annually for sedimentation and trash accumulation in the gutter. Obstructions and trash shall be removed and properly disposed of.
- Inspect twice during the rainy season for ponded water.
- Pesticides and fertilizers shall not be used in the bioretention area.
- Plants should be pruned, weeds pulled and dead plants replaced as needed.

ATTACHMENT 8

Maintenance Checklists



PLANTER STRIP BIORETENTION- CHECKLIST

Planter Strip Bioretention

Inspection and Maintenance Checklist

(aka: Street Rain Garden, Roadside Bioretention, Bioretention Cell)

Date of Inspection: _____

Inspector(s): _____

BMP ID #: _____

Property Owner: _____

Location Description: _____

Type of Inspection: Pre-rainy Season (PRS) Rainy Season (RS) After-rainy Season (ARS)

This inspection and Maintenance Checklist is to be used in conjunction with its corresponding LID Factsheet and Maintenance Plan. Please review these documents before performing the field inspection.

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Drainage	RS	Is there standing or pooling of water in the Bioretention area after 3 days of dry weather?		<ul style="list-style-type: none"> • Check perforated pipe outlet for obstruction or damage. * • Flush perforated pipe to remove obstructions/sediment. * • Remove and replace the first few inches of topsoil. • Remove soil and inspect perforated pipe. Repair or replace perforated pipe, replace with new soil and regrade. 	
		Is water not draining into catch basin from the overflow pipe during a high intensity storm? *			
	PRS RS ARS	Is there sediment visible in the gutter?		<ul style="list-style-type: none"> • In dry weather, use a mechanical sweeper or a Vactor truck to clean gutter pan. 	
	RS	Is there water flowing in the pervious concrete gutter section during a low intensity storm? *		<ul style="list-style-type: none"> • In wet weather, use a Vactor truck to clean gutter pan. 	

* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Erosion	RS ARS	Is there under cutting or washouts along the sidewalks and/or curbs abutting the planter strip?		<ul style="list-style-type: none"> • Fill in eroded areas and regrade. 	
	RS ARS	Is there channelization (gully) forming along the length of the planter area?		<ul style="list-style-type: none"> • Fill in eroded areas and regrade. 	
	RS ARS	Is there accumulation of sediment (sand, dirt, mud) in the planter?		<ul style="list-style-type: none"> • Remove sediment and check the grading. Add replacement soil and/or mulch. 	
	PRS RS ARS	Is the mulch unevenly distributed in the planter area?		<ul style="list-style-type: none"> • Redistribute and add additional mulch if needed. • Regrade planter area. 	
	PRS RS ARS	Are there voids or deep holes present? Is there sediment present in the catch basin and in the overflow pipe?		<ul style="list-style-type: none"> • Check the perforated pipe for damage.* 	
	PRS RS ARS	Is there evidence of animal activity such as holes or dirt mounds from digging or borrowing?		<ul style="list-style-type: none"> • Repair and fill in damage areas. • Rodent control activities must be in accordance with applicable laws and do not affect any protected species. 	

* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Vegetation	PRS RS ARS	Is the vegetation clogging the inlet flow areas?		<ul style="list-style-type: none"> • Trim and/or remove the excess vegetation. 	
	PRS RS ARS	Is the mulch distributed evenly throughout the planter area?		<ul style="list-style-type: none"> • Redistribute and add additional mulch if needed. • Regrade planter area. 	
	PRS RS ARS	Are there dead or dry plants/weeds? Is the vegetation over grown?		<ul style="list-style-type: none"> • Remove dead and/or dry vegetation. Replace as needed. • Remove or trim any vegetation that is causing a visual barrier, trip, and or obstruction hazard. 	

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
BMP General	PRS RS ARS	Is there debris/trash in the planter area?		<ul style="list-style-type: none"> Remove all trash and debris. 	
	PRS RS ARS	Is graffiti present?		<ul style="list-style-type: none"> Remove all graffiti from the area. 	
	PRS RS ARS	Are there missing or disturbed aesthetics features?		<ul style="list-style-type: none"> Replace and/or reposition aesthetics features to original placement. Placement should not disrupt flow characteristics/design. 	
	PRS RS ARS	Is the vegetation irrigation functional?		<ul style="list-style-type: none"> Repaired broken missing spray/drip emitters. Reposition and/or adjust to eliminate over spray and/or over watering. 	
	PRS RS ARS	Are the aesthetic features firmly secured in placed?		<ul style="list-style-type: none"> Repair and/or replace loose or damage features. 	
	PRS RS ARS	Check for damage sidewalk, curb, gutter, and catch basin including uplift and setting.		<ul style="list-style-type: none"> Remove and replace damaged areas. 	

Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

1. **Submittal Information:**

Submittal Date: _____

Initial SW LIDS

Final SW LIDS

Design Manual Used for design:

2005 Standard Urban Storm Water Mitigation Plan

2011 Storm Water Low Impact Development Technical Design Manual

2017 Storm Water Low Impact Development Technical Design Manual

2. **Applicant Information:**

Applicant Name (Owner or Developer): _____

Mailing Address: _____

City/State/Zip: _____

Phone/Email/Fax: _____

Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

3. Project Information:

Project Name:

Site Address:

City/State/Zip:

APN (s):

Permit # (s):

Subdivision Grading Permit Building Permit Design Review

Use Permit Hillside Development Encroachment Time Extension

Other:

Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

4. Design Information:

Narrative:

Project Description

- Description of proposed project type, size, location, and any specific uses or features.
- Description of any sensitive features (creeks, wetlands, trees, etc.) and whether they are going to be preserved, removed or altered.
- Description of the existing site.
- Description of how this project triggers these requirements (impervious area, CALGreen, 401 Permit, etc.).
- Describe any "on-site offset" used.

Pollution Prevention and Runoff Reduction Measures

- Description of all proposed pollution prevention measures (street sweeping, covered trash enclosures, indoor uses, etc).
- Description of all Runoff Reduction Measures (Interceptor Trees, Impervious Area Disconnection, and/or Alternative Driveway Design).

Type of BMPs Proposed

- Description of the types of BMPs selected including priority group that each is in.
- Description of level of treatment and volume capture achieved for each BMP.

Maintenance

- Description of maintenance for each type of BMP.
- Description of funding mechanism.
- Designation of Responsible Party.

Project Name: _____

Date: _____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

Exhibits:

Proposed SW LID Exhibit:

- Exhibit should include: street names, property lines, storm drainage system, waterways, title block, scale and north arrow.
- Tributary areas shown for all inlets (including off-site drainage areas).
- C value for each tributary area.
- Soil Type of existing site.
- New or replaced impervious area shown.
- All inlets and BMP, shown (including unique identifier).
- All interceptor trees shown.
- All proposed BMPs shown including dimensions.

Existing Condition Exhibit

- Exhibit should include: street names, property lines, proposed storm drainage system, waterways, title block, scale, and north arrow.
- Soil Type of existing site.
- Proposed tributary areas shown for all proposed inlets (including offsite drainage areas). Existing impervious areas.
- Existing impervious area.

BMP Details:

- Detail for each type of BMP selected- provide a preliminary 8.5"x11" detail for each BMP type or include on submitted drawings. These can be taken straight from the Fact Sheets if no significant changes are proposed.

On Plans:

- Show all applicable elements of the selected BMPs on the appropriate plan sheets.

Calculations:

- Calculations, for each inlet, and summary sheet using the Storm Water Calculator found at www.srcity.org/stormwaterLID
- Supplemental or supporting calculation if applicable.