

March 6, 2024

March 28, 2024

Kathy Austin 7621 Healdsburg Ave kaaustin@pacbell.net

Re: Tentative Map, Conditional Use Permit, Tree Removal, Design Review

File: 2023-078

Dear Kathy Austin:

The City of Sebastopol has received your applications referenced above. Staff has completed its review of the plans and application materials you have submitted, which has included a referral to other City Departments and any pertinent outside agencies. Based on this review, staff has found that the following information is needed in order to complete the application submittal process:

Please see items in Red in response to your letter of March 6, 2024, Kathy Austin

Planning Department:

- 1. Project plan set is missing Tentative Subdivision map sheets.# A vesting tentative map has been submitted along with the previous set of plans that contained the Location Map, Architectural Site Plan, Grading and Drainage Plan, Utilities Plan and Tree Preservation Plan. They have been updated to show the new bus stop location.
- 2. The title report is dated September 15, 2020. This report shall be no older than 6 months# from the current date of application submission. A new Title Report dated Feb. 22, 2024 has been submitted.
- 3. Small lot subdivision standards should be noted on the plan set. If not, then setbacks# provided for building orientations would be out of compliance. A note referencing the Small Lot Standards has been added to the Vesting Tentative Map and the cover sheet for the other engineering plans.
- 4. The rear corner of Building 4 is located within the rear setback. As discussed, this is part of the storage shed at the back of the home. It is approximately 8' high and not part of the conditioned space. We can cut it back but would prefer to ask the PC to allow it as we are planning on getting an easement in that area to keep the fence where it is and use that area as yard.
- 5. Elevation pages do not show scaled building height dimensions. Heights have been added to the elevation sheets along with verbiage describing the heights and floor to floor heights. The drawings are not to scale as they are based on a 3D model.
- 6. Building setbacks for lots 9-12 appear to have the wrong setbacks shown. These are correct. The orientation of the lot is per individual lot not existing single lot. The rear setback is 10'

- 7. Lot 12 appears to show insufficient turn radius to back out of driveway. As well as# parking spaces 9 and 18 along the Healdsburg Ave building. The dimensions are based on the parking lot requirements in the Sebastopol Zoning Code. They are sufficient without the need for a turn out. They should comply.
- 8. Survey is missing information on Calder Creek (location, top of bank, etc.), which runs# along the southern portion of the property. Please provide this as part of the survey to# ensure that the buildings are not located within any creek setbacks. Neither Calder nor Zimpher Creeks are near the site. This direction is incorrect.

Public Works Department: We agree and these will be a condition of approval.

No incompleteness items

- 1. Water connection to City main shall be a 3-valve tree.
- 2. All onsite utilities shall be labeled private.

Engineering Department:

- 1. Contact and coordinate with Sonoma County Transit for relocating existing bus stop and comply with any requirements and/or conditions, which may include but not be limited to irrevocable offer of dedication of easement for potential bus shelter, providing for ADA access, etc. Provide this information as part of the Tentative Map proposal when resubmitted. We have been in contact with Steven Schmitz of SoCoTransit and agree on the new location per our plans. SoCoTransit has requested a paved area behind the sidewalk to relocate the bench and will provide a new pole mounted trash receptacle. We show this paved area in front of 7631 Healdsburg Ave under the oak tree. Steven Schmitz verified that the red curbed area is sufficient to serve their needs. This is property is owned by our client.
- 2. Both apartments lot and townhomes lot driveways shall be designated as fire lanes and signed accordingly and curbs shall be red in order to maintain clear access at all times for emergency services. Agree and assume this as a Condition of Approval.
- 3. If the proposed project intends to reuse existing water and sewer services verify and provide proof thereof to the city engineer that existing water and sewer services are sufficiently adequate for reuse for proposed project. Otherwise existing water and sewer services connected into the property shall be removed to the point of connection at the city water and sewer mains, respectively, in accordance with City of Sebastopol Standard specifications and Details. All existing services are intended to be abandoned and removed. Assume this as a condition of approval.
- 4. Existing sanitary sewer lateral(s) shall be video inspected by a qualified contractor, from the existing building to the main to verify the integrity of the existing pipe is adequate for proposed reuse for the replacement house. Any repairs or replacement thereof shall be completed at the developer's sole expense. Existing sanitary sewer lateral will be abandoned and removed.
- 5. Prepare and submit the Tentative Map for review and approval. Content and form shall conform to City of Sebastopol standards and shall show and label proposed lots and common areas, required and proposed private and public easements, including water supply, sanitary sewer, storm drain, etc. A vesting tentative map has been submitted with this re-submittal containing all the required information.
- 6. Prepare and submit for review and approval joint maintenance agreement (JMA) for the maintenance, repair, replacement, etc. of the private common use facilities, including, but not limited to, pedestrian access, water and sewer utilities, storm drain, LID measures, etc. The approved JMA shall be recorded with the Sonoma County Recorder's Office concurrent with an approved Final Map. We agree and assume this as a condition of approval. It will be developed with the Final Map.

- The Project is subject to the City of Sebastopol storm water low impact development requirements. Prepare and submit Storm Water Low Impact Development Submittal (SWLIDS) package for review and approval. A LID report is included with this resubmittal.
- 8. The Project shall install Murphy Avenue frontage improvements along the property, including curb, gutter, driveway approach, etc. in accordance with improvement plans prepared by a registered civil engineer in conformance with City Street Standard Details and Specifications, and submitted for city engineer review and approval. Improvement plans shall include all proposed grading, paving, utilities and drainage improvements. Improvements plans shall include but not be limited to street and utility information, all concrete curbs, gutters, sidewalk, walkways, storm drain system, striping and signing, paving, water lines and sewer lines, tree preservation plan, erosion and sediment control, Storm Water Pollution Prevention Plan, and any necessary transitions for the portion of the public street fronting the project, if applicable. All improvements shall be designed in accordance with the City of Sebastopol Standard Details and Specifications. We agree and assume that this will be a condition of approval. A preliminary grading and paving plan and a utility plan has been provided with this and the original submittal. A tree protection plan has been submitted with this and the original submittal.
- Prepare and submit storm drainage design calculations supporting the proposed storm drain design. A Hydrology & Hydraulics Report and a LID Report have been provided with this re-submittal.

Anyone dissatisfied with this decision of the Planning Director has the right to file an appeal to the Planning Commission within seven calendar days of the decision. This requires the submittal of a completed City Appeal Form, written statement, and payment of the applicable fee delivered to the Planning Department at 7120 Bodega Avenue, Sebastopol, California no later than 5:00 P.M. on March 14th, 2024.

Please feel free to contact me if you have any questions at 707-823-6167, or via email at jiay@cityofsebastopol.gov.

This concludes our response. K. Austin

Sincerely,

John Jay, Associate Planner

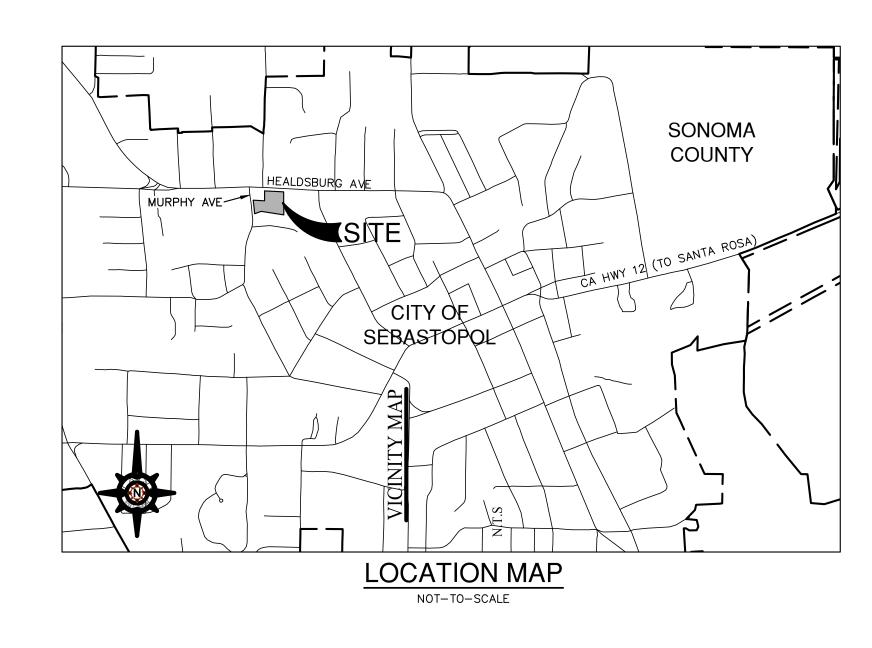
CC:

Mark Hanf, via email Planning Department Fire Department Public Works Department Building Department Engineering Department

PACIFIC KNOLLS

PACIFIC KNOLLS SEBASTOPOL, CALIFORNIA

SITE PLAN



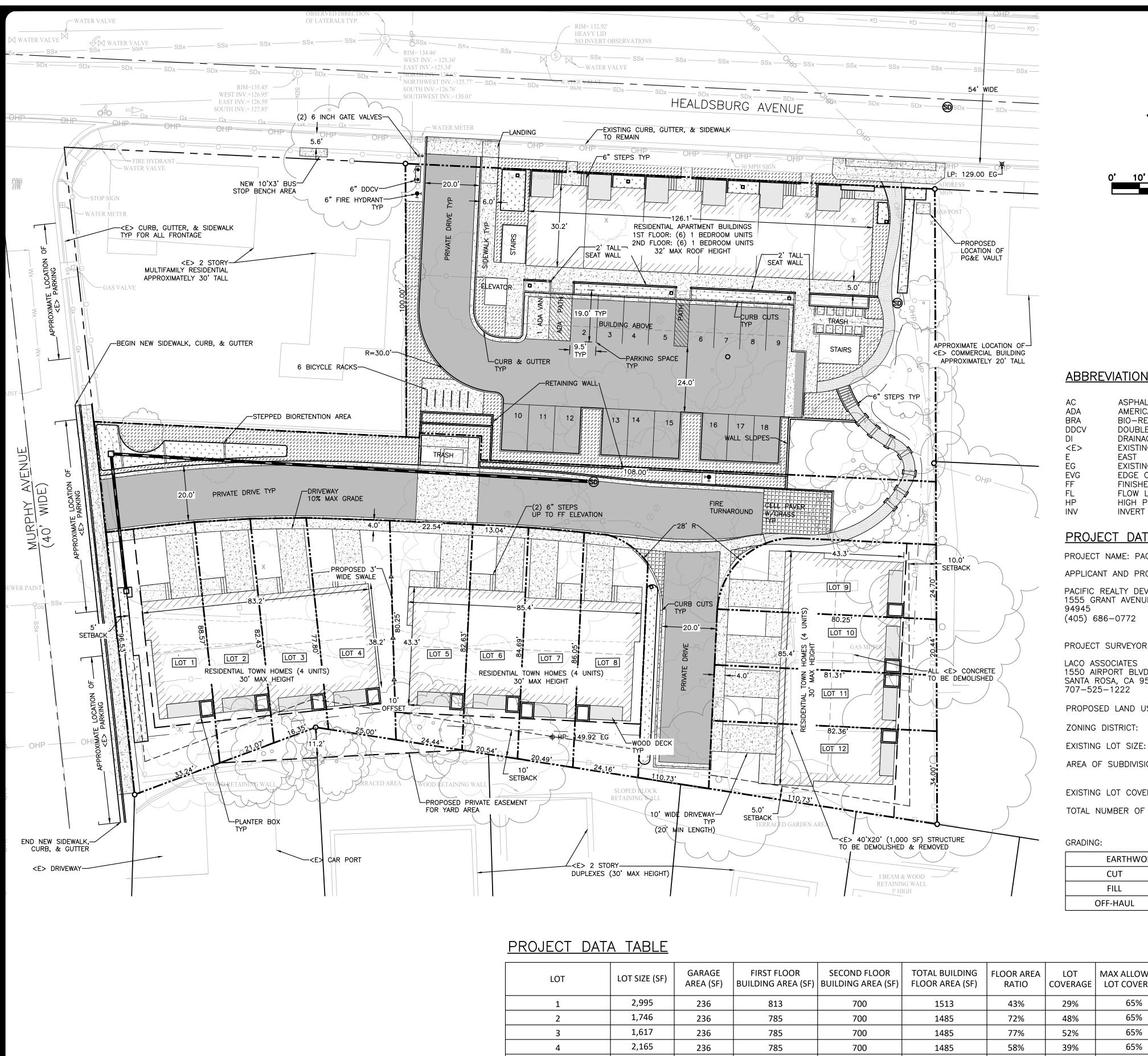
Sheet Description	Sheet No.
COVER SHEET	C0.00
ARCHITECTURAL SITE PLAN	C1.00
GRADING AND DRAINAGE PLAN	C2.00
UTILITIES PLAN	C3.00
TREE PRESERVATION PLAN	C4.00

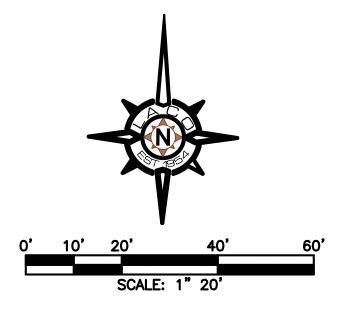
PREPARED FOR:

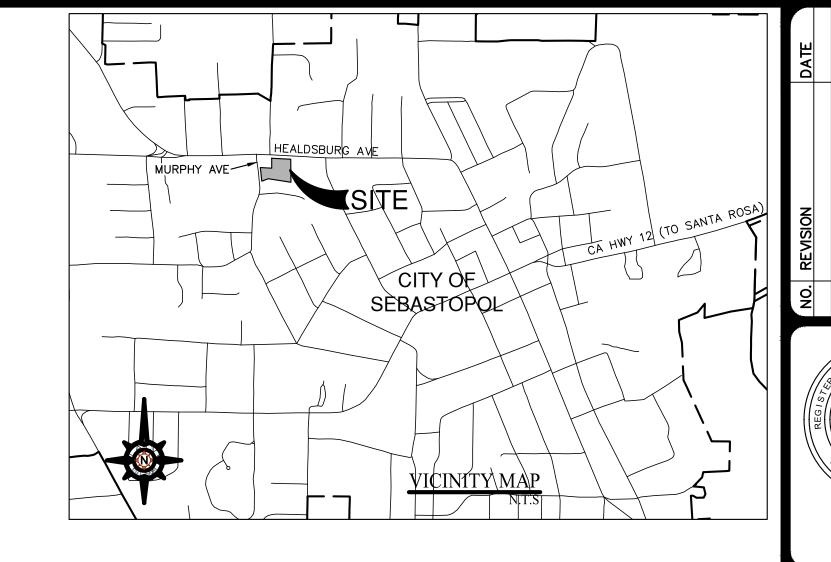
PACIFIC REALTY DEVELOPMENT LLC 1555 GRANT AVENUE, NOVATO CALIFORNIA 94945

JUNE 2023









<u>ABBRE</u>	EVIATIONS:	
AC ADA BRA DDCV DI <e> E EG EVG FF FL HP INV</e>	ASPHALT CONCRETE AMERICANS WITH DISABILITIES ACT BIO—RETENTION AREA DOUBLE DETECTOR CHECK VALVE DRAINAGE INLET EXISTING EAST EXISTING GRADE EDGE OF VALLEY GUTTER FINISHED FLOOR FLOW LINE HIGH POINT INVERT	LF LP N NA R S SCH SVC SW TC TG TYP W
DRO IE	CT DATA.	

PROJECT DATA:

PROJECT NAME: PACIFIC KNOLLS

APPLICANT AND PROPERTY OWNER: PACIFIC REALTY DEVELOPMENT LLC 1555 GRANT AVENUE, NOVATO, CA

PROJECT SURVEYOR / ENGINEER:

LACO ASSOCIATES 1550 AIRPORT BLVD., SUITE 120 SANTA ROSA, CA 95403 707-525-1222

PROPOSED LAND USE: RESIDENTIAL MULTIFAMILY

ZONING DISTRICT: OFFICE COMMERCIAL (CO) & MULTIFAMILY RESIDENTIAL (R7)

SITE ADDRESS:

7621 HEALDSBURG AVENUE

ASSESSOR PARCEL NUMBER: 004-291-019

THE BASIS OF ELEVATION FOR THIS SURVEY

WAS ESTABLISHED FROM STATIC GPS

ELEVATION = 140.79 FEET (NAVD88).

OBSERVATIONS AT PROJECT POINT #1,

SEBASTOPOL, CA 95472

BASIS OF ELEVATIONS:

1.28 ACRES AREA OF SUBDIVISION: 1.28 ACRES

EXISTING LOT COVERAGE: 2% (1,000 SF) TOTAL NUMBER OF RESIDENTIAL UNITS: 24

EARTHWORK DATA			
CUT	2530 CY		
FILL	1515 CY		
OFF-HAUL	1015 CY		

LEGEND/ABBREVIATIONS:

LINEAL FEET LOW POINT

NOT APPLICABLE

STORM DRAIN SERVICE

TOP OF CURB

TOP OF GRATE

SIDEWALK

TYPICAL

NORTH

RADIUS SOUTH SCHEDULE

> PROPOSED PROPERTY LINE EXISTING WOOD FENCE EXISTING WIRE FENCE

ROOF RIDGE LINE

PROPOSED EASEMENT

SETBACK LINE

EXISTING OVERHEAD POWER EXISTING STORM DRAIN

EXISTING SEWER PIPE BRA AREA

LANDSCAPING CONCRETE

PATIO TURF CELL PAVER

STORM DRAIN CLEANOUT

12"X12" CATCH BASIN W/ GRATE FLOW DIRECTION ARROW

PATHWAY

STORM DRAIN MANHOLE FIRE HYDRANT

→ DOUBLE DETECTOR CHECK VALVE

GATE VALVE

PRESERVED TREE (26 TREES)

DEMOLISHED TREE (42 TREES)

9272.02	
3/26/2024	
DCT	
PAP DRAWN DCT	

PACIFIC SEBASTOPOL

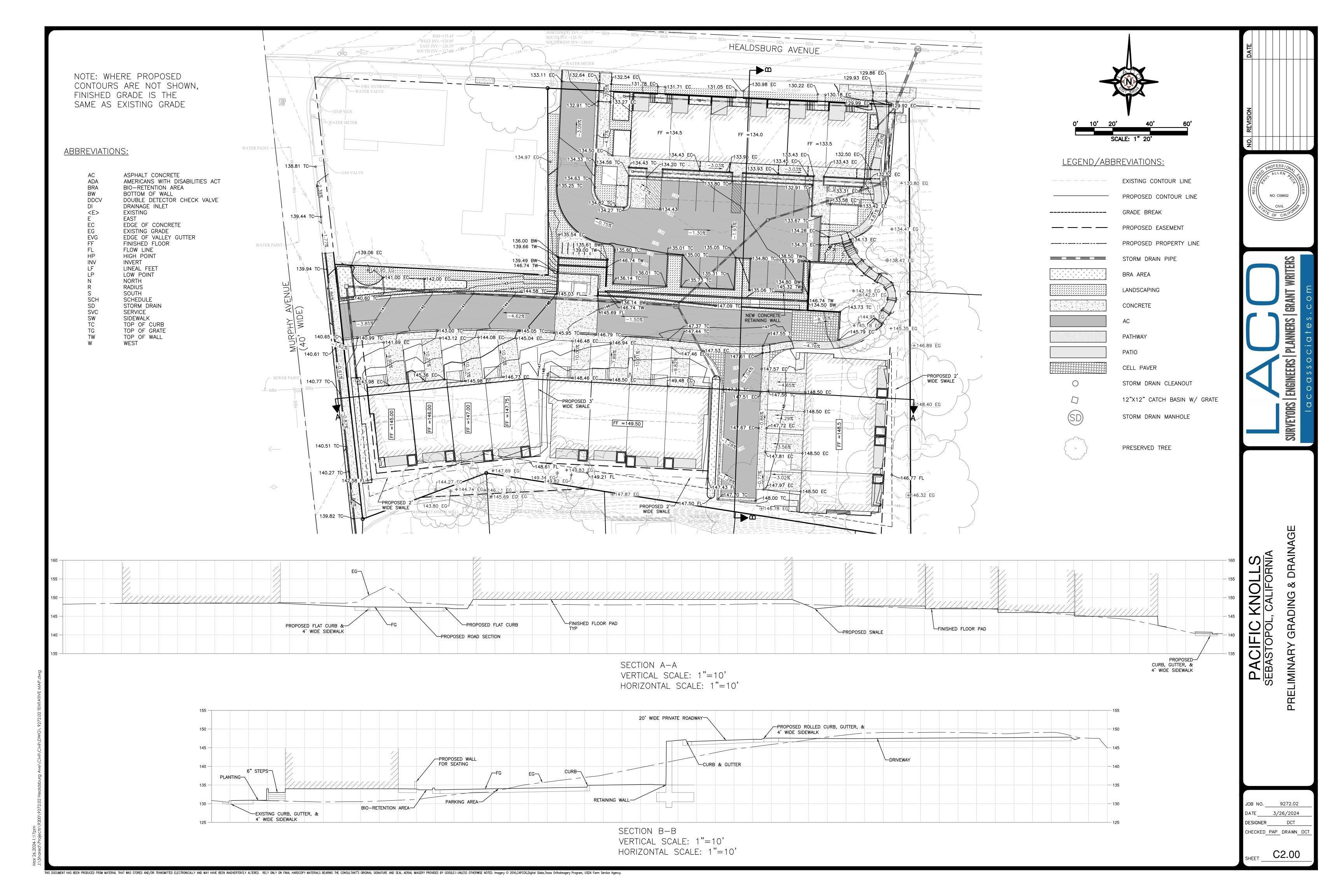
WRITERS

SURVEYORS

SHEET C1.00

LOT	LOT SIZE (SF)	GARAGE AREA (SF)	FIRST FLOOR BUILDING AREA (SF)	SECOND FLOOR BUILDING AREA (SF)	TOTAL BUILDING FLOOR AREA (SF)	FLOOR AREA RATIO	LOT COVERAGE	MAX ALLOWABLE LOT COVERAGE	PROPOSED PARKING SPACES	REQUIRED PARKING SPACES
1	2,995	236	813	700	1513	43%	29%	65%	2	2
2	1,746	236	785	700	1485	72%	48%	65%	2	2
3	1,617	236	785	700	1485	77%	52%	65%	2	2
4	2,165	236	785	700	1485	58%	39%	65%	2	2
5	2,222	236	813	700	1513	57%	40%	65%	2	2
6	1,708	236	785	700	1485	73%	49%	65%	2	2
7	1,742	236	785	700	1485	72%	48%	65%	2	2
8	2,024	236	785	700	1485	62%	42%	65%	2	2
9	1,872	236	813	700	1513	68%	43%	65%	2	2
10	1,649	236	785	700	1485	76%	48%	65%	2	2
11	1,671	236	785	700	1485	75%	47%	65%	2	2
12	2,445	236	785	700	1485	51%	32%	65%	2	2
HEALDSBURG AVE APTS.	20,505	0	3,559	5,077	8636	42%	20%	NA	18	18
COMMON PARCEL	11,336	NA	NA	NA	NA	NA	NA	NA	NA	NA

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LEGEND/ABBREVIATIONS:

---- EXISTING CONTOUR LINE PROPOSED EASEMENT EXISTING OVERHEAD POWER EXISTING GAS LINE EXISTING WATER PIPE EXISTING STORM DRAIN

DOMESTIC WATER PIPE (2", SCH80 PVC) & FIRE WATER PIPE (6" SCH80 PVC)

LANDSCAPING CONCRETE

PATIO

TURF CELL PAVER FLOW DIRECTION ARROW

12"X12" CATCH BASIN W/ GRATE

STORM DRAIN CLEANOUT

SEWER CLEAN OUT

WATER METER

EXISTING WATER VALVE

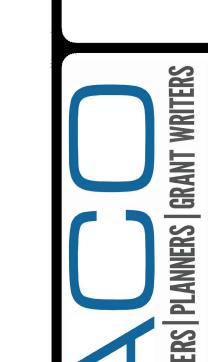
PRESERVED TREE (28 TREES)

ASPHALT CONCRETE AMERICANS WITH DISABILITIES ACT BRA BIO-RETENTION AREA DOUBLE DETECTOR CHECK VALVE DRAINAGE INLET

EXISTING EDGE OF CONCRETE EXISTING GRADE EDGE OF VALLEY GUTTER FINISHED FLOOR FLOW LINE

HIGH POINT INVERT LINEAL FEET LOW POINT NORTH RADIUS SOUTH SCHEDULE STORM DRAIN

SEWER SERVICE SERVICE SIDEWALK TOP OF CURB TOP OF GRATE WEST





PACIFIC KNOLLS
SEBASTOPOL, CALIFORNIA

DESIGNER DCT CHECKED PAP DRAWN DCT

JOB NO. 9272.02 DATE_____3/26/2024

SHEET _ C3.00

STORM DRAIN PIPE (CORRUGATED HDPE)

EXISTING SEWER PIPE

SEWER PIPE (8" SDR26 PVC)

BRA AREA

PATHWAY

EXISTING STORM DRAIN MANHOLE

STORM DRAIN MANHOLE EXISTING SEWER MANHOLE

SEWER MANHOLE

EXISTING WATER METER

GATE VALVE

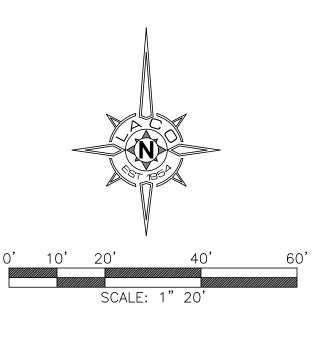
FIRE HYDRANT

DOUBLE DETECTOR CHECK VALVE

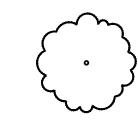
DEMOLISHED TREE (40 TREES)

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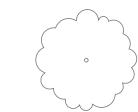
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LEGEND



TREE TO BE PRESERVED

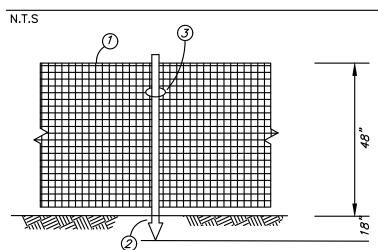


TREE TO BE REMOVED

TREE PROTECTION NOTES

- ALL TREE PROTECTION MEASURES SHALL BE CONSTRUCTED PER THE SPECS OUTLINED IN THE ARBORIST REPORT BY HORTICULTURAL ASSOCIATES'.
- 2. FENCING SHALL BE INSTALLED 2' OUTSIDE THE DRIPLINES OF PROTECTED TREES WHERE POSSIBLE (AS SHOWN HEREON) PRIOR TO THE ISSUANCE OF A PERMIT THAT WOULD INITIATE ANY ON-SITE WORK. PROOF OF INSTALLATION OF FENCING IS REQUIRED, PRIOR TO ANY PERMIT ISSUANCE AND/OR ANY SITE WORK.
- 3. FOUR FOOT HIGH TREE PROTECTIVE FENCING SHALL BE USED. HEAVY FENCING MATERIAL SUCH AS CHAIN LINK OR AN EQUIVALENT SHALL BE INSTALLED.
- 4. NO ACTIVITY SHALL OCCUR WITHIN DRIPLINES OF PROTECTED TREES, EXCEPT AS SUPERVISED AND DIRECTED ON SITE BY THE PROJECT ARBORIST. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY BE CAUSE FOR ISSUANCE OF AN ORDER TO STOP WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING AVAILABILITY OF ARBORIST FOR ON—SITE INSPECTIONS.
- 5. THE PROJECT ARBORIST SHALL KEEP WRITTEN RECORDS OF ON SITE INSPECTIONS AND SHALL FORWARD A SUMMARY REPORT TO THE PLANNING DEPARTMENT OF ALL WORK AUTHORIZED WITHIN THE DRIPLINES. GENERAL COMPLIANCE TO TREE PRESERVATION RECOMMENDATIONS AND ANY DAMAGE AFFECTING TREE SURVIVABILITY IN ACCORDANCE WITH CONDITIONS OF PROJECT APPROVAL. REPORT SHALL INCLUDE FINAL RECOMMENDATIONS FOR RETENTION/REMOVAL AND SHALL BE RECEIVED PRIOR TO FINAL CLEARANCE OF IMPROVEMENTS AUTHORIZED BY THESE PLANS.
- DEVIATION FROM THESE REQUIREMENTS IS SUBJECT TO THE APPROVAL OF THE COUNTY INSPECTOR.

TREE PROTECTION FENCE



1. STEEL FIELD FENCE

2. LIGHTWEIGHT 5-1/2" HEIGHT STANDARD STEEL "T-POST" PLACED AS NEEDED TO FORM DRIPLINE RADIUS. (POST SPACING 6' MAXIMUM)

3. SLIDE FENCE OVER "T-POST" AND INSTALL METAL TIE WIRE AT TOP OF POST

NOTES:
INSTALL TEMPORARY TREE PROTECTION FENCING
AROUND TREES TO BE SAVED. FENCING TO BE
LOCATED NO CLOSER TO THE TREE THAN THE
DRIPLINE WHERE POSSIBLE, OR NEAREST ADJACENT
PAVED SURFACE.

REGISTAN ON STATE OF STATE OF





SURVEYORS | ENGINEERS | PLANNERS | GRAN

PACIFIC KNOLLS SEBASTOPOL, CA

JOB NO. 9272.02

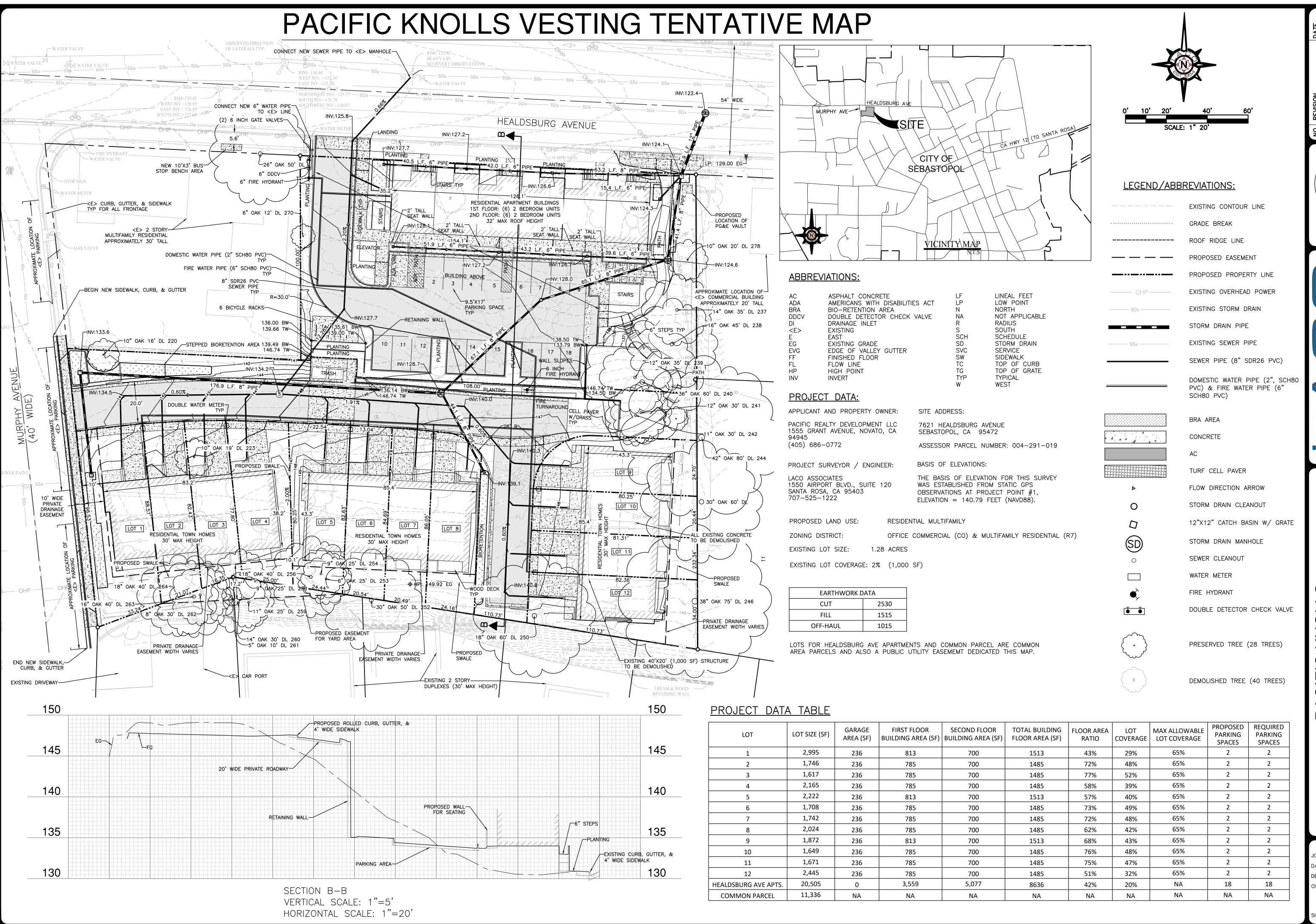
DATE 6/9/2023

DESIGNER DCT

CHECKED PAP DRAWN DCT

C4.00

HEET ____



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AC SE

JOB NO. <u>9272.02</u> ATE MARCH 2024 DESIGNER PAP CHECKED PAP DRAWN DCT

Street View of Healdsburg Avenue



Street View of Murphy Avenue with proposed new private street entrance to Town Homes

Healdsburg Ave. Sebastopol CA
Pacific Realty Development LLC
555 Grant Ave., Novato, CA, 415-850-5555

Street Views of Both Healdsburg & Murphy Aves.

> outh Main Street, Sebastopol, CA E Rice Way, Bend, OR 29-5565 kaaustin@pacbell.net

Date 3-27-2024

Scale As Noted

Drawn K. Austin

Job

or 10 sheet

Date 3-27-2024 Scale As Noted



Perspective of Apartments looking from North East Corner along Healdsburg Avenue



Perspective of the Apartments from the rear Parking Lot

/621 Healdsburg Ave. Sebastopol CA

Pacific Knolls Apartment Building Floor Plans

nerine Austin, AIA, Archite South Main Street, Sebastopol, CA SE Rice Way, Bend, OR

Date: 3-27-2024 Scale: As noted Drawn: KA&MG Sheet:

3

Date 3-27-2024

Scale As Noted

Drawn K. Austin

Job

4 or 10 sheets



East Elevation



North Elevation along Healdsburg Avenue

Note: Drawings are not to scale. Maximum Height at middle parapet is 29' +/- Building steps 6" at each color change to work with slope to minimize height. At no point will the building exceed 30' in height. Floor to floor height is 10' at west end and 11' at east end. Parapet is 3' on east and west, 4' at center. Site slopes in both east and west and north and south direction. Maximum foundation height is 4' on north east and 3' on north west to provide ADA access on the south side.



West Elevation with elevator tower



South Elevation facing parking lot

Apartment Building Elevations NTS

Sheet 5

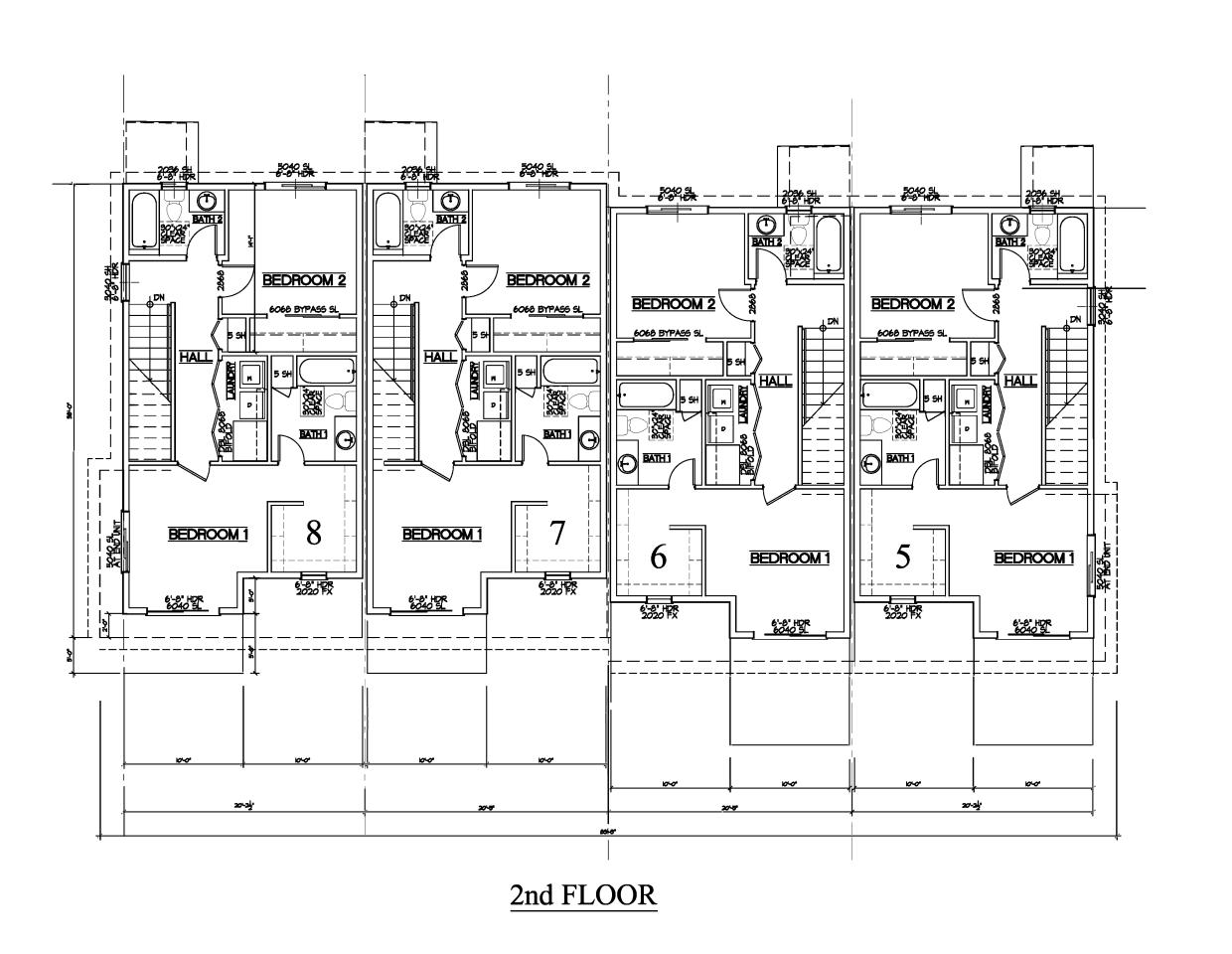


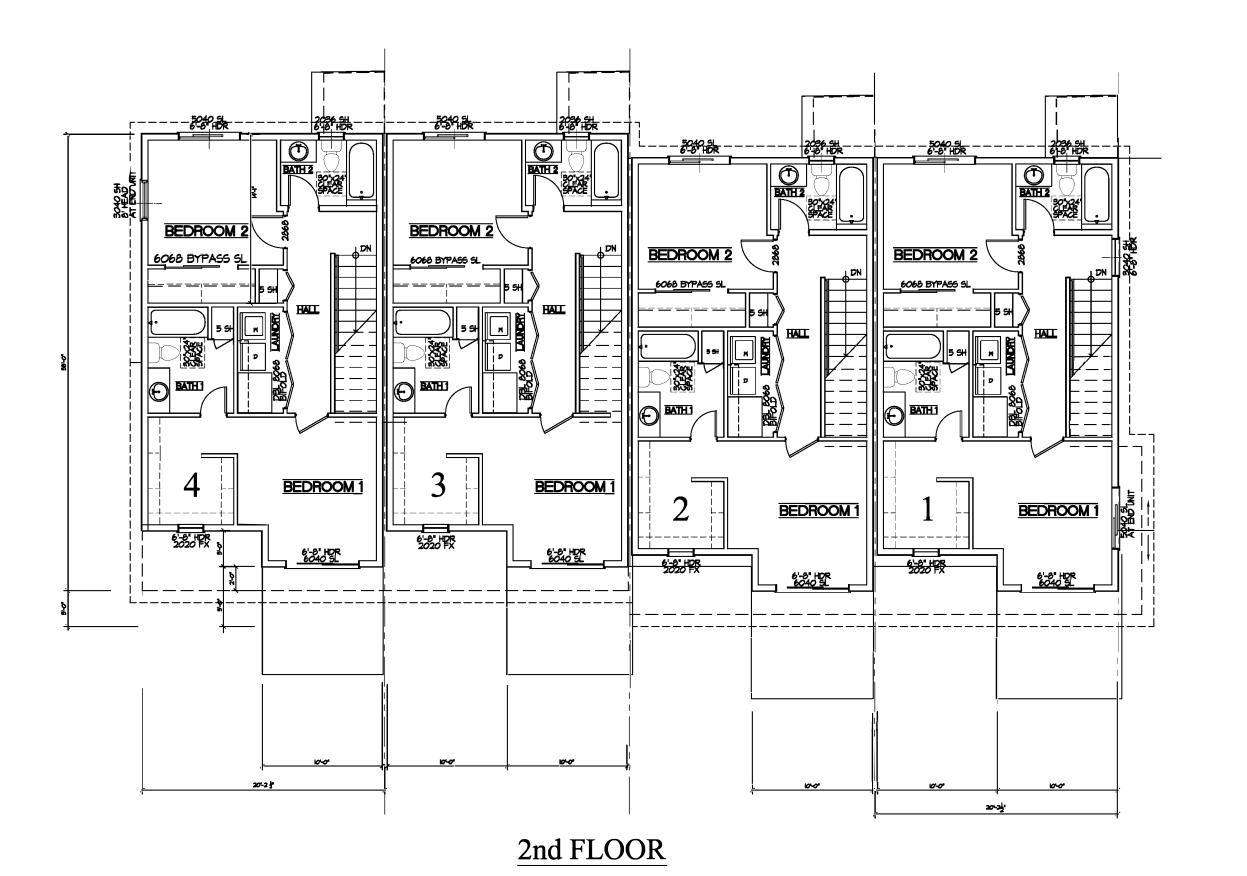
Perspective of Town Homes lots 8 through 5 left to right



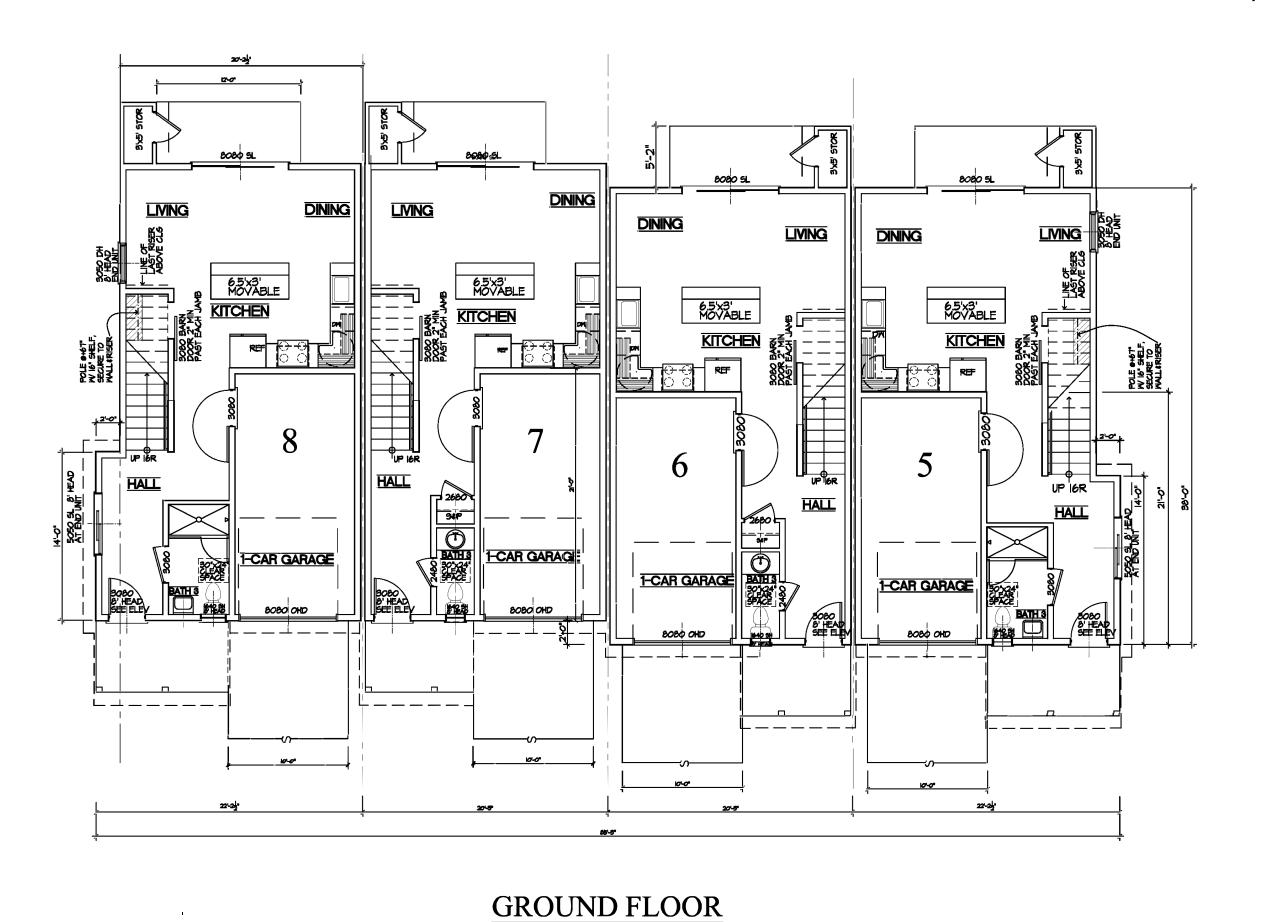
Perspective of Town Homes 4 through 1 left to right

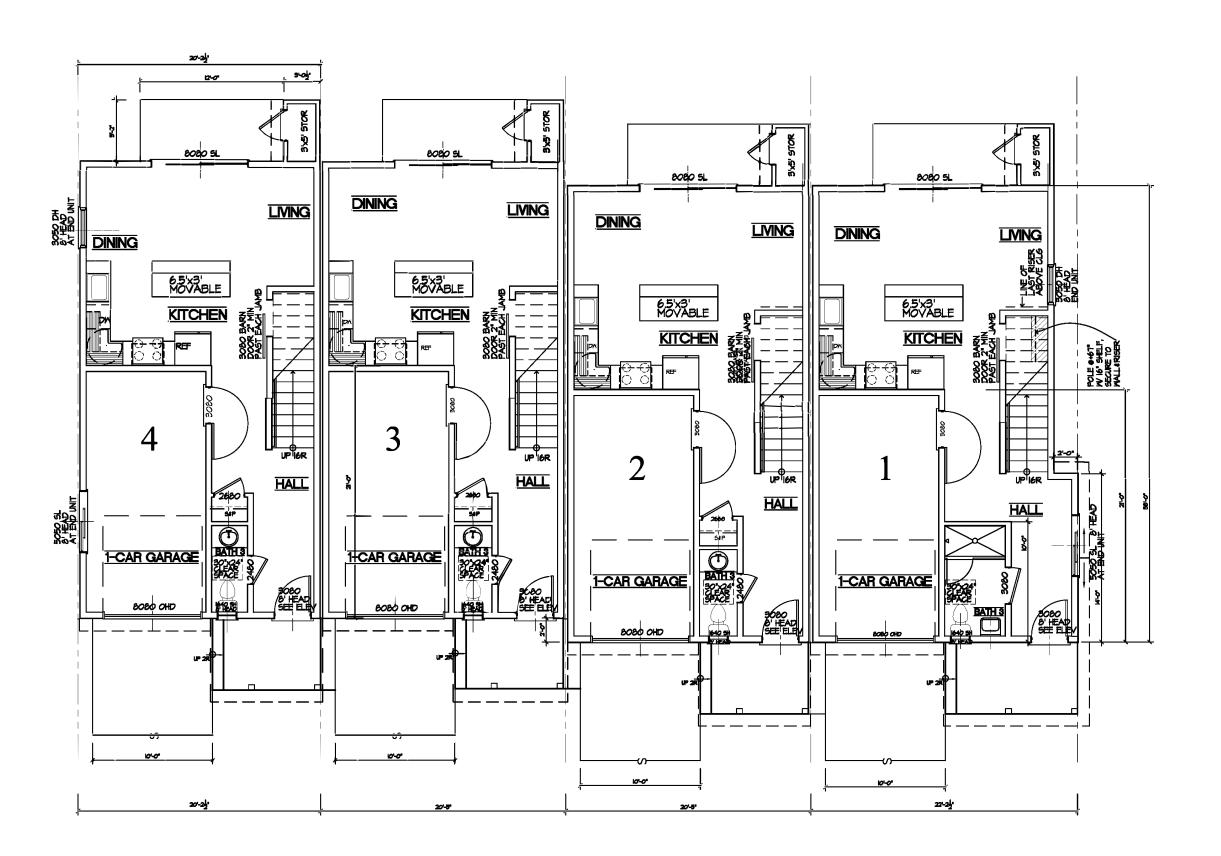
of 10 Sheets





Town Homes 1,5,8 = 1148 +/- SFTown Homes 2,3,4,6&7 = 1120 +/- SF





GROUND FLOOR

Town Homes lots 1 - 8

Floor Plans 1/8"=1'-0"

Scale As Noted



East Elevation Lot 4



North Elevations lots 4 through 1 left to right

Note: Drawings are not to scale. Maximum height at peak of ridge is 30', each unit steps with the grade. First floor 9' plate, 12"+/- ceiling joists, second floor 8' plate with scissor trusses for vaulted ceilings. Foundations to be pier and grade beam around root zones and remain as low as possible to grade.



West Elevation lot 1 on Murphy Avenue



South Elevations lots 1 through 4 left to right

Town Home Elevations lots 1 through 4 NTS

Date 3-27-2024
Scale As Noted

Drawn K. Austin

heet 8

or 10 sheets



East Elevation lot 8

Note: Drawings are not to scale. Maximum height at peak of ridge is 30'. each unit steps with the grade. First floor 9' plate, 12"+/- ceiling joists, second floor 8' plate with scissor trusses for vaulted ceilings. Foundations to be pier and grade beam around root zones and remain as low as possible to grade.



West Elevation lot 5

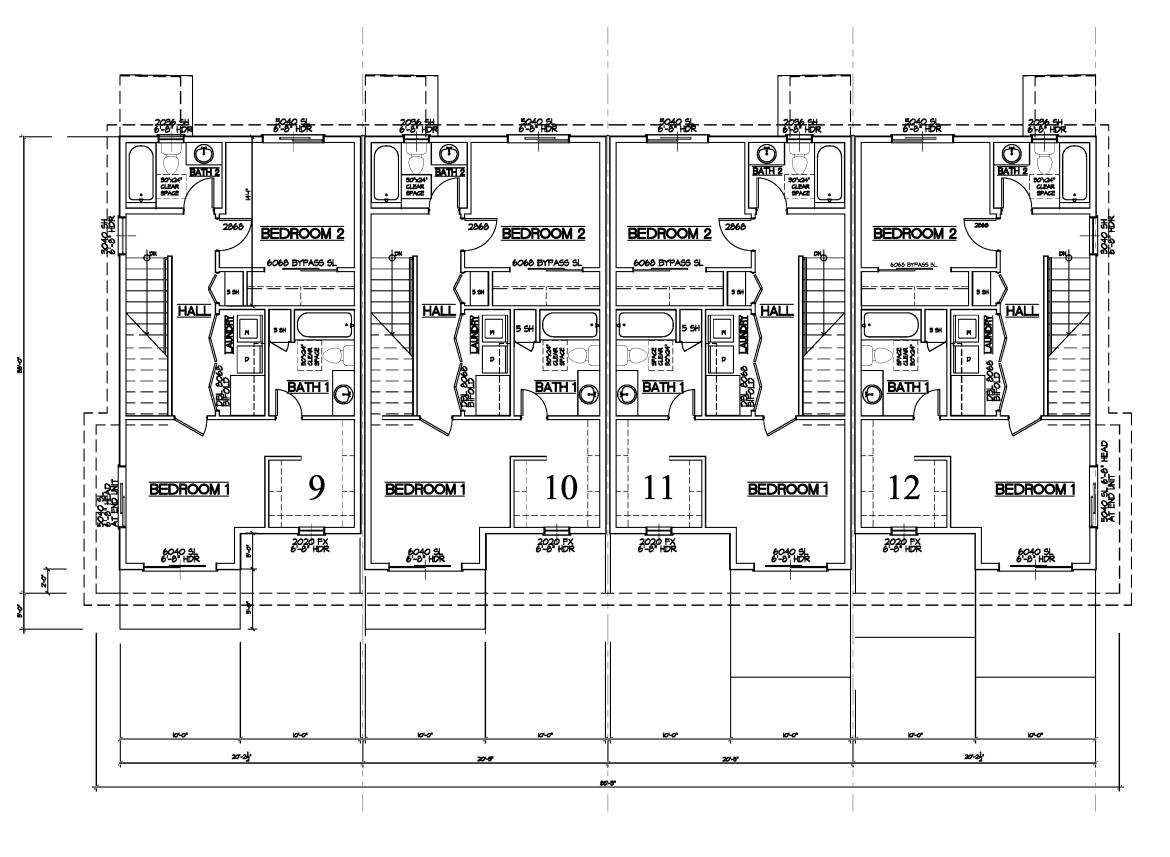


North Elevation lots 8 through 5 left to right



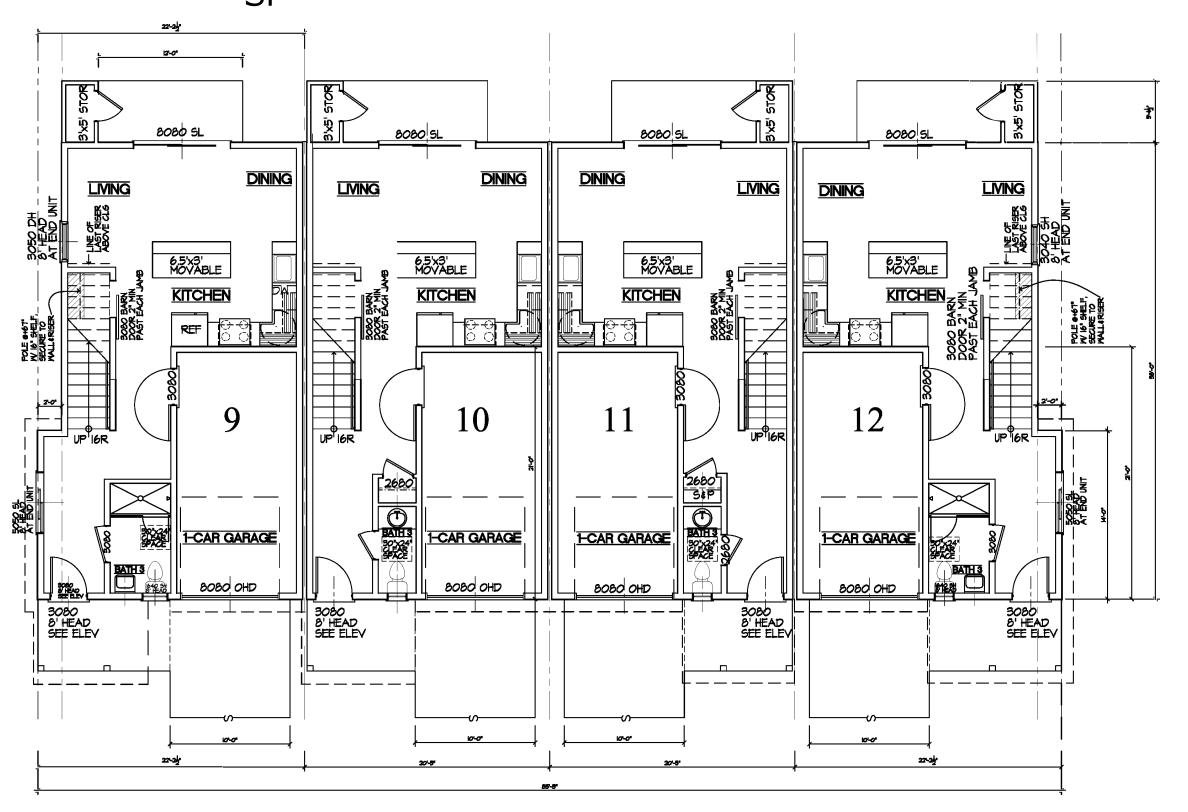
South Elevation lots 5 through

Town Home Elevations lots 5 through 8 NTS



2nd FLOOR

Town Homes 9 & 12 = 1148 +/- SF Town Homes 10 & 11 = 1120 +/-



GROUND FLOOR

Town Homes 9 - 12 Floor Plans

1/8"=1'0"

Scale As Noted



North Elevation lot 9

Note: Drawings are not to scale. Maximum height at peak of ridge is 30', each unit steps with grade. First floor 9' plate, 12"+/- ceiling joists, second floor 8' plate with scissor trusses for vaulted ceilings. Foundations to be pier and grade beam around root zones and remain as low as possible to grade.



South Elevation lot 12

West Elevation lots 9 through 12 left to right



East Elevation lots 12 through 9 left to right

Town Home Elevations lots 9 through 12 NTS

Street View of Healdsburg Avenue Revised to show access drive on east

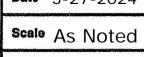


Street View of Murphy Avenue with proposed new private street entrance to Town Homes

1 Healdsburg Ave. Sebastopol CA
Pacific Realty Development LLC
1555 Grant Ave., Novato, CA, 415-850-5555

Date 3-27-2024 Scale As Noted

8-13-2024 KA

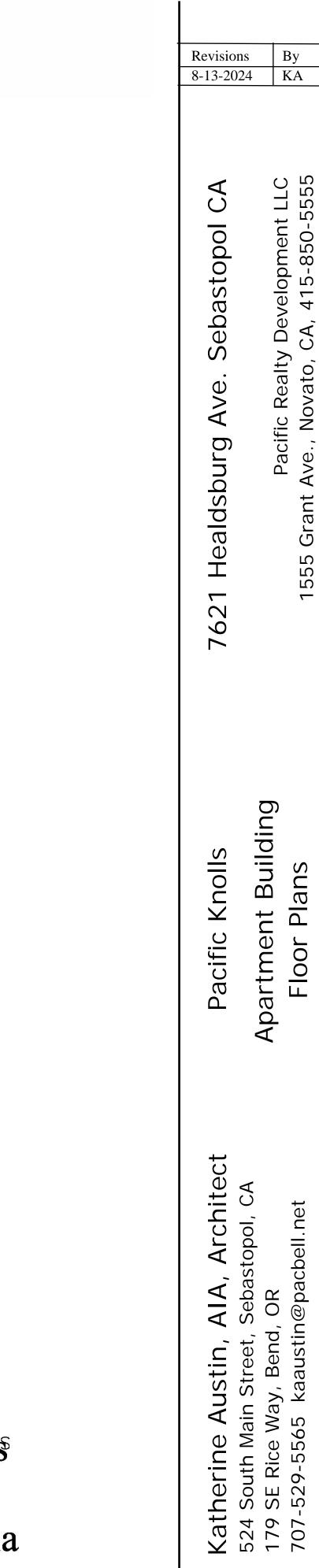


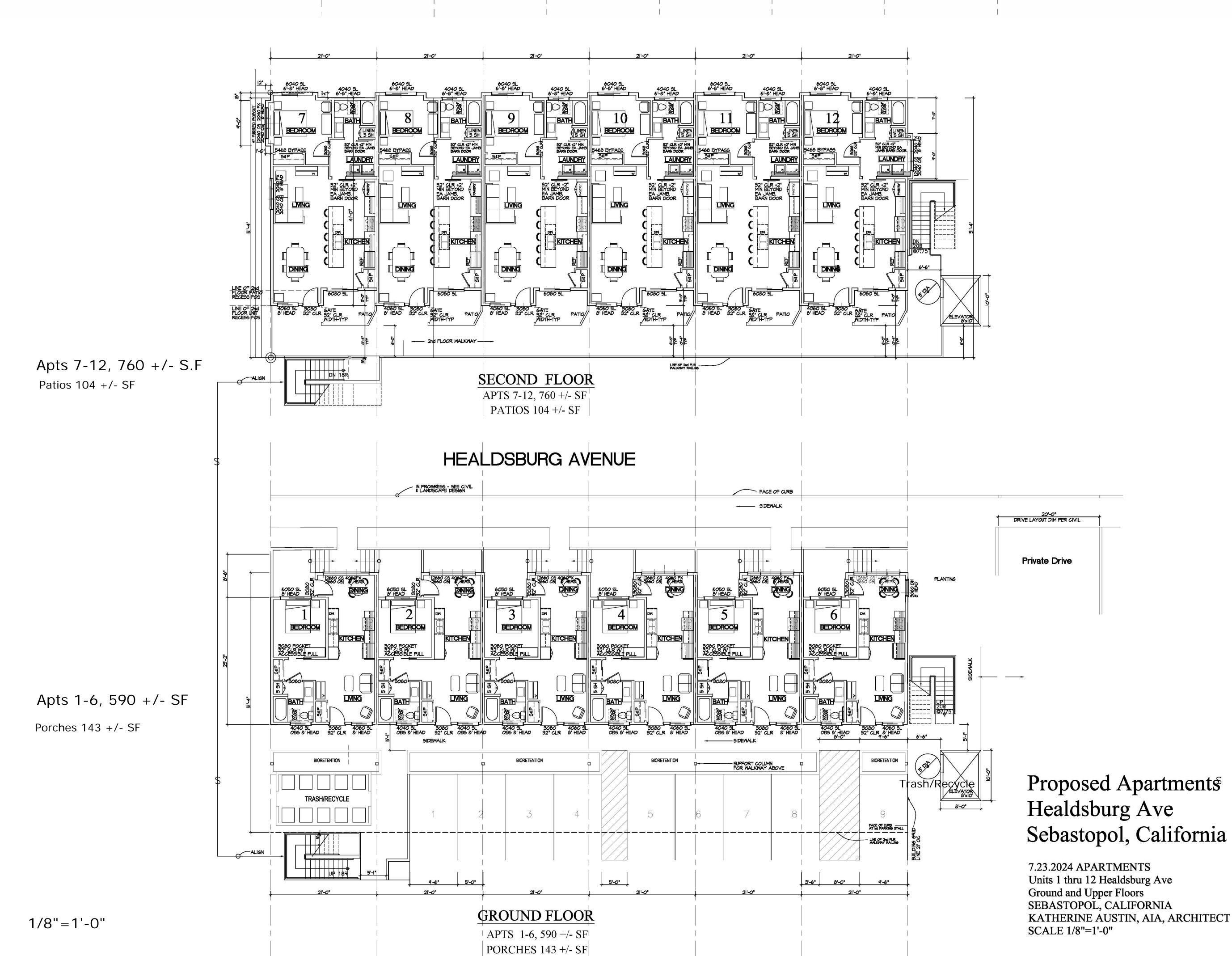


Perspective of Apartments looking from North East Corner along Healdsburg Avenue, Revised to show access on East



Perspective of the Apartments from the rear Parking Lot, Revised to show access on East





Date: 3-27-2024 Scale: As noted Drawn: KA&MG Sheet:

3

Date 3-27-2024 Scale As Noted





East Elevation'k]h\ 'Y`Yj Uhcf'hck Yf

North Elevation along Healdsburg Avenue

Note: Drawings are not to scale. Maximum Height at middle parapet is 29' +/- Building steps 6" at each color change to work with slope to minimize height. At no point will the building exceed 30' in height. Floor to floor height is 10' at west end and 11' at east end. Parapet is 3' on east and west, 4' at center. Site slopes in both east and west and north and south direction. Maximum foundation height is 4' on north east and 3' on north west to provide ADA access on the south side.





West Elevation

South Elevation facing parking lot

Apartment Building Elevations NTS

8-13-2024 Revised to show access drive on east

Pacific Knolls Storm Water Low Impact Development Report

Prepared For

Pacific Realty Development LLC

7261 Healdsburg Ave Sebastopol, CA 95472 405-686-0772 LACO Job No. 9272.02 APN: 164-150-054

PREPARED BY



LACO ASSOCIATES 1550 Airport Blvd, Suite 120 Santa Rosa, Ca 95403 (707) 525-1222

March, 2024

Prepared under the supervision of Paul Peck, PE



Project Description:

The project involves the construction of six new townhomes, twelve new single-family duplexes, construction of two residential driveways including grading and drainage, and associated site improvements.

Existing Site Description:

The site is located at 4245 Hargrave Ave. Sebastopol, CA. The total project area contained within parcel 164-150-054 encompasses 1.28 acres and consists primarily of oak woodland, tall grass, and scattered shrubs. The site includes a one-story dilapidated house with minimal concrete walkways around it. All existing structures and concrete will be demolished and removed. Pre-development on-site runoff consists of sheet flow from the southeast corner of the site flowing both north and west toward Healdsburg Ave and Murphy Ave, where it then collects into the city storm drain system. Once in the storm drain system, runoff eventually exits at the Morris St outfall into the Laguna de Santa Rosa. Of the 68 existing trees on the site, 27 will be preserved and remain and there are no other sensitive features. See Tree Preservation Plan.

Project Triggers:

The project will involve the construction of 37,192 SF (0.85 acres) of new or replaced impervious areas. According to Chapter 2, of the 2020 Storm Water LID Technical Design Manual (LIDTDM), project sites that create or replace more than 10,000 SF and less than 1.0 acres of impervious surface are required to incorporate permanent Storm Water BMPs to achieve 100% delta volume Capture as required by the NPDES MS4 Permit. There are no creek outfalls and therefore the size of the impervious area is the only project trigger.

Runoff Reduction Measures:

Downspouts from roof gutters will be disconnected from the storm drain system and discharge into landscape areas and swales. Drainage Management Area (DMA) 7 is the only DMA that takes credit for impervious area disconnection and trees. The total tributary area used for BMP sizing calculations has been reduced by 2,210 SF in the by taking credit for these measures.

Because it is a residential project, the only pollution prevention measures that will be required is that trash be kept inside a covered trash enclosure. There are no other pollution prevention requirements.

Types of BMPs

The selected BMPs for the developed site will include the following:

Universal LID Features

<u>Impervious area disconnection:</u> Allows stormwater coming from impervious areas to pervious areas that more effectively treat storm water and allow for infiltration. Paved area disconnection is used on the site to disconnect direct discharge.

<u>Interceptor Trees:</u> Existing trees that intercept rain water on their leaves and branches, allowing rain water to evaporate or run down the branches and trunk of the tree where it readily infiltrates into the soil. Tree roots also increase infiltration. Trees also provide shade over impervious surfaces which reduce peak flow in streams and provide shade which reduces the heat island effects of urban areas.

Priority 2 BMPs

<u>Roadside Bio-retention – No Curb and Gutter (P2-05):</u> Priority two bioretention facilities are designed with perforated pipe beneath the engineered treatment material that allows gradual drainage after the runoff is treated. (See attached detail)

Pre & Post Development Runoff Conditions:

We have analyzed the pre and post development condition by using the Santa Rosa LID runoff curve number worksheet. We compared the pre and post development worksheets and determined the following composite curve numbers (CN) and runoff coefficients (C).

DMA #	Curve Number (CN)	Runoff Coefficient (C)
1	90.0	0.80
2	89.6	0.80
3	90.0	0.80
4	89.3	0.80
5	89.5	0.80
6	89.4	0.80
7	83.1	0.36
8	87.4	0.46
9	85.1	0.49
10	87.3	0.63

For the CN calculations, it was assumed that the native soil type had an infiltration rate of 0.05 in/hr and a cover description of 50% woods, 50% grass and curve number of 76. See attached for the composite curve numbers (CN) and runoff coefficients (C) calculations.

By utilizing the City of Santa Rosa Storm Water Calculator we modeled the pre vs. post condition. The imported BMP fill material (Soiland BASMAA Bioswale Mix) for the priority one bioretention facility will have an infiltration rate of 5 in/hr. Additionally, porosity of the imported BMP soil was assumed to be 0.30 or better.

The results show that, with the designed bioretention areas, the 100% volume capture requirement is achieved. Furthermore, the bioretention facilities effectively meet the 100% treatment requirement. The bioretention facilities are designed and will be constructed to effectively treat trash debris. The mechanism for this is the flora and engineered soil that filters and intercept particles down to 100 microns in size, before entering the downstream waterways. Trash capture will not be an issue on this site given the nature of the project such as site use and location.

See all calculations in attached documents. As a result, this project conforms to County standards and post construction water quality impacts are not anticipated.

Maintenance and Funding

BMPs shall be inspected and maintained as described in the Storm Water Low Impact Development Technical Design Manual. All BMPs are located on private land throughout the entire property. Furthermore, BMPs will be the sole responsibility of and funded by the owner. All legal documents and agreements have been provided within this Report.

Maintenance of BMPs

The maintenance of selected BMPs is recommended as follows:

Impervious Area Disconnection

At a minimum inspection and maintenance shall include the following:

- Routinely inspect for ponding water near building foundation
- Annually inspect for undercutting/washouts at the outlet of pipe
- Annually inspect for splash blocks or rain chain damage
- Annually inspect for vegetation or debris blocking outlet of pipe

Roadside Bio-retention – No Curb and Gutter (P2-05)

At a minimum maintenance shall include the following:

- Dry street sweeping upon completion of construction
- Dry street sweeping annually, and
 - o When water is observed flowing in the gutter during a low intensity storm.
 - o Algae is observed in the gutter.
 - o Sediment/debris covers 1/3 of the gutter width or more.
- Inspect twice during the rainy season for ponded water.
- Obstructions and trash shall be removed and properly disposed of.
- Pesticides and fertilizers shall not be used in the bioretention area.
- Plants should be pruned, weeds pulled, and dead plants replaced as needed.
- Inspection \$100
- Annual Maintenance \$300
- Replacement (30 years) \$5000

Inspections of all BMPs will be recorded using the checklists attached at the end of this document. The property owner is responsible for following all county inspection and maintenance requirements. BMP inspection record keeping requirements, provisions for unscheduled maintenance, estimated costs associated with inspection & maintenance, design life and estimated replacement costs can be found in the operations and maintenance agreement.

Attachments:

- 1. Preliminary SUSMP Submittal Guide
- 2. Determination Worksheet
- 3. BMP Selection Tables
- 4. Calculations (CN Composite Worksheet, Storm Water Calculator, and BMP Sizing Calculations)
- 4. BMP Details
- 5. Fact Sheets
- 6. Inspection & Maintenance Checklists
- 7. Soils Data
- 8. Pre and Post development Conditions & BMP Location Exhibits

Project Name: Pacific Knolls

Date: _3/22/2024_____



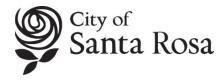
Storm Water Low Impact Development Submittal Coversheet

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): Pacific Realty Development LLC
Applicant Name (Owner or Developer): Pacific Realty Development LLC 1555 Grant Ave
Mailing Address:
City/State/Zip: Novato, CA 94945
Phone/Email/Fax: 405-686-0772

Project Name:

Date: 3/22/2024_____



Storm Water Low Impact Development Submittal Coversheet <u>To be submitted with all SW LID submittals</u>

3. Project Info	ormation:			
Project Name:	Pacific Knolls			
Site Address:	7261 Healsburg Ave.			
City/State/Zip:	Sebastopol, CA			
APN (s): 164-7	150-054			
Permit # (s):				
Subdivision	Grading Permit	Building Permit	Design Review	\checkmark
Use Permit	Hillside Development	Encroachment	Time Extension	
Other:				

Project Name: Pacific Knolls

Date: 3/22/2024_____



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

4. Design Information:

<u></u>
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 use etc).
Description of all Runoff Reduction Measures (Interceptor Trees, Impervious Area Disconnection, and/or Alternat 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.
Maintence
✓ Description of maintenance for each type of BMP.
✓ Description of funding mechanism.
✓ Designation of Responsible Party.

Project Name: Pacific Knolls

Date: 3/22/2024_____



Storm Water Low Impact Development Submittal Coversheet <u>To be submitted with all SW LID submittals</u>

Exhibits:
Proposed SW LID Exhibit:
Exhibit should include: street names, property lines, strom 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.
<u>Calculations:</u>
Calculations, for each inlet, and summary sheet using the Storm Water Calculator found at www.srcity.org/stormwaterLID
Supplemental or supporting calculation if applicable.



Part 1: Project Information

Santa Rosa 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.

Pacific Knolls	Pacific Realty Development LLC
Project Name	Applicant (owner or developer) Name
7261 Healsburg Ave	1555 Grant Ave
Project Site Address	Applicant Mailing Address
Sebastopol, California, 95472	Novato, California
Project City/State/Zip	Applicant City/State/Zip
	707-236-7624
Permit Number(s) - (if applicable)	1550 Airport Blvd., Ste 120 Santa Rosa, CA 9
David Thiessen	Designer Mailing Address
Designer Name	707-525-1222 thiessend@lacoassociates.con
Santa Rosa, CA 95403	Designer Phone/Email
Designer City/State/Zip	
Type of Application/Project:	
Subdivison Grading Permit	Building Permit Hillside Development
DesignReview Use Permit	Encroachment Time Extensions Other :
PART 2: Project Exemptions	
1. Is this a project that creates or repla	ices less than 10,000 square feet of impervious surface ¹ , including all project
phases and off-site improvements?	
Yes Vo	
	

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.

Project Name

2017 Storm Water LID Determination Worksheet

7261 Healdsburg Ave.

Is this project a routine maintenance activity ² 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 <i>not</i> 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' and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.
 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
 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 surface ¹ including all project phases and off-site improvements? Yes Vo
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 <i>not</i> 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 Imprevious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintence activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacint, trenching and patching are defined as maintenance activities per section VI.D.2.b.

^{2 &}quot;Rountine 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.

7261 Healdsburg Ave.

Part 4: Project Description

1. Total Project area: 1.28 square feet acres				
2. Existing land use(s): (check all that apply)				
Commercial Industrial Residential Public Other				
Description of buildings, creeks, wetlands, heritage trees, etc on the site.				
There are is one existing building that will be demolished, but there are no creeks, wetlands, heritage trees, etc on the site.				
3. Existing impervious surface area: 0.03 square feet acres 4. Proposed Land Use(s): (check all that apply)				
Commercial Industrial Residential Public Other				
Description of buildings, creeks, wetlands, heritage trees, etc on the site.				
The project involves the construction of six new townhomes, twelve new single-family duplexes, construction of two residential driveways including grading and drainage, and associated site improvements.				
Proposed 5. Existing impervious surface area: 0.85 square feet				

2017	Storm	Water	IID	Determination	Work	sheet
	2621111	88666	-1 -		AA OIL	1011000

Pacific Knolls

Management Practices and provide a Storm Water Low Impa National Pollutant Discharge Elimination System (NPDES) M	project is required to implement permanent Storm Water Best act Development Submittal (SW LIDS) as required by the City's Iunicipal Separate Storm Sewer Systems (MS4) Permit Order resolved to determine if the project is subject to these
Applicant Signature	Date '
Exemption Signature Section: As the property owner or developer, I understand that this posterm Water BMP's nor the submittal of a Storm Water Low City's National Pollutant Discharge Elimination System (NPDE) I understand that redesign may require submittal of a new Discharge BMP's.	Impact Development Submittal (SW LIDS) as required by the ES) Municipal Separate Storm Sewer Systems (MS4) Permit*.

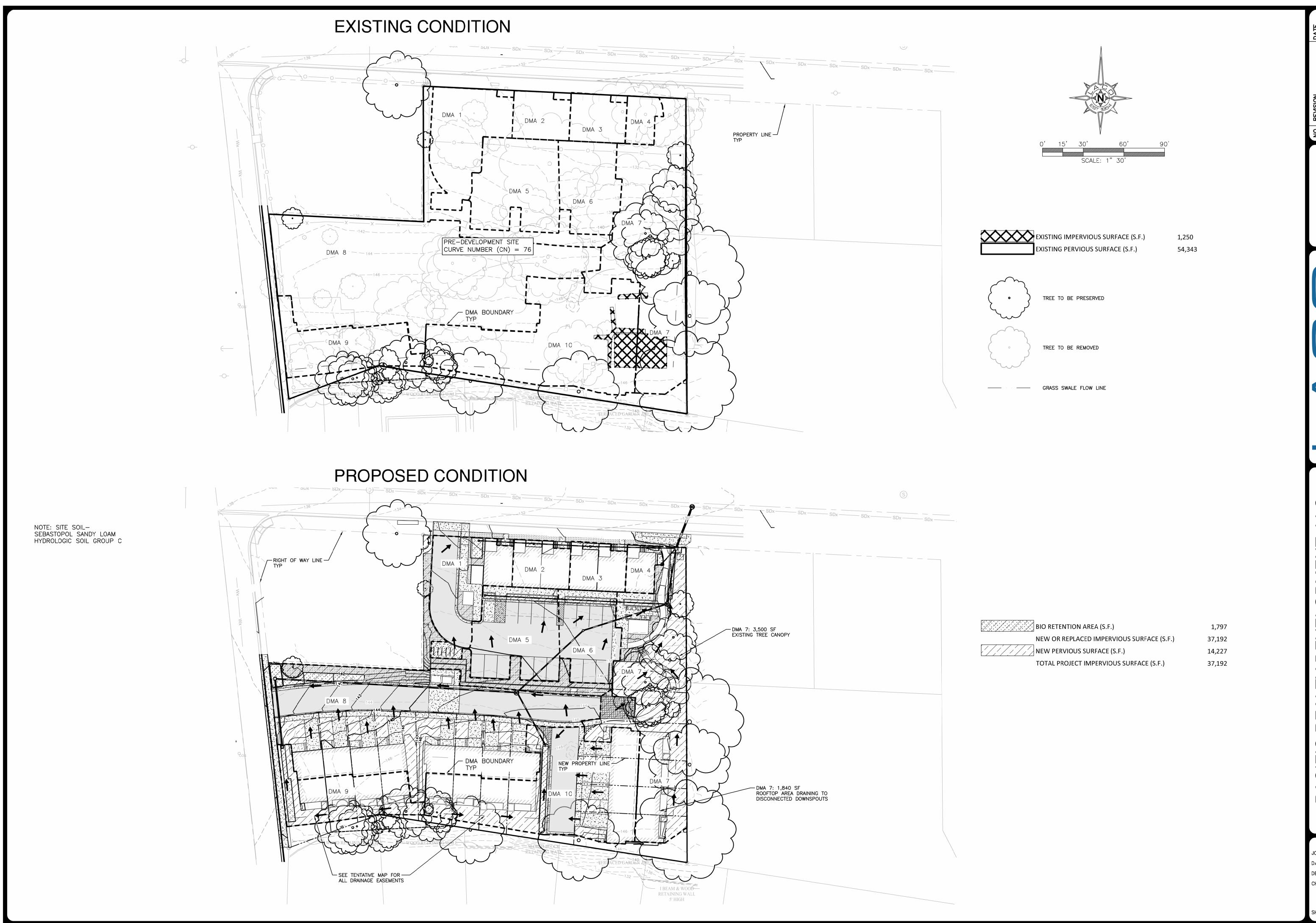
* This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design 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.



NO. REVISION DATE

SURVEYORS | ENGINEERS | PLANNERS | GEOLOGISTS

SIFIC REALTY DEVELOPMENT SEBASTOPOL, CA

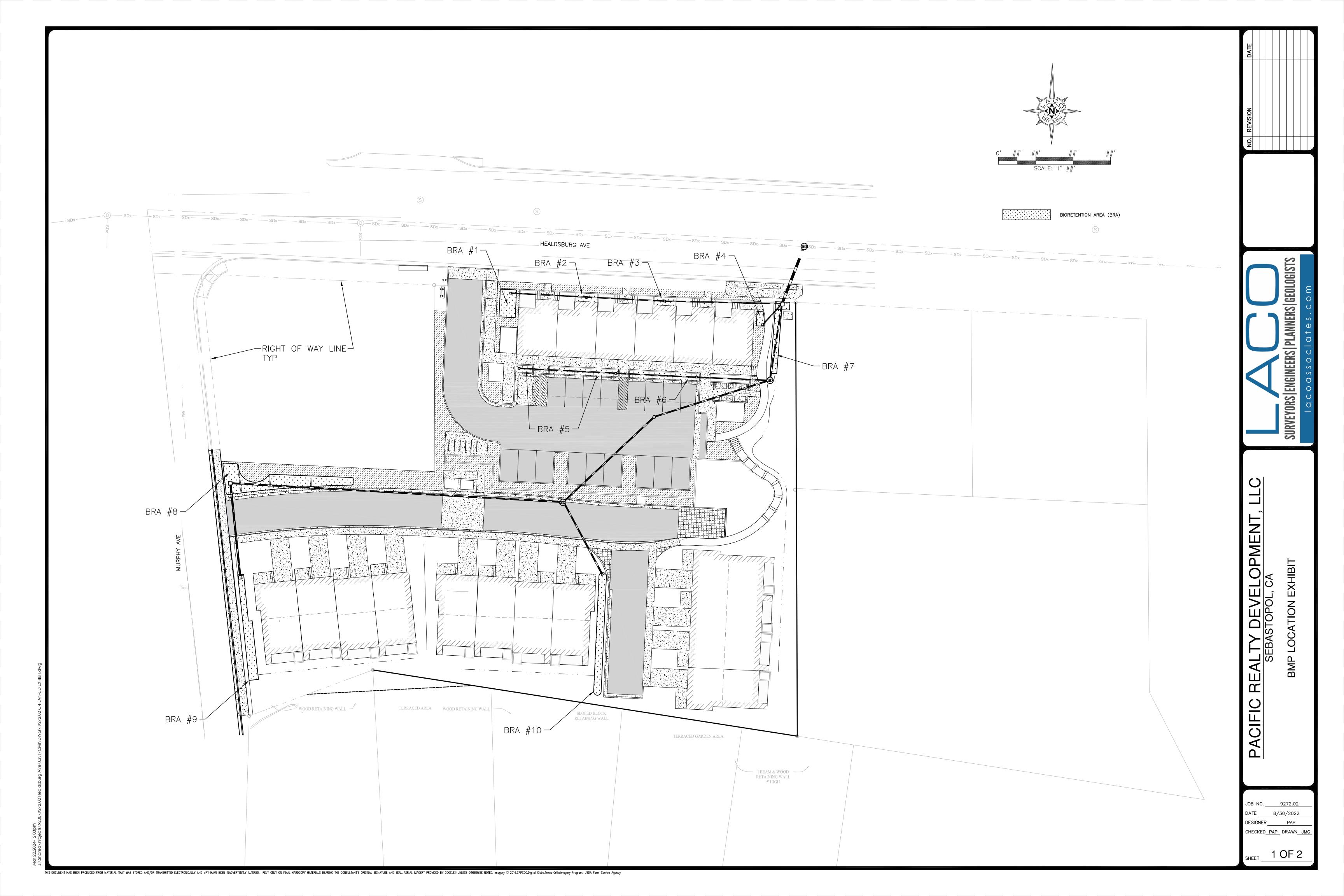
JOB NO. 9272.02

DATE 8/30/2022

DESIGNER PAP

CHECKED PAP DRAWN JMG

1 OF 2





o & Sito Global Vali

	LID BMI	P Summar	y Page &	Site Global Values									
	Project Information:					Site Information: Based upon the pre and post de							
	P	Project Name: 9272.02 Pacific Realty Address/Location: 7261 Healdsburg Ave			Mean Seasonal Precipitation (MSP) of Project Site: 35.00 (inches) K=MSP/3(K= 1.17			(inches)	impervious area, the post construction BMP				
	Addr								requiremen	ıt is:			
	Designer		David Thies	sen			·		•				
		Date:	3/1/2024			Impervious area - pre development:		1,250.3	ft ²	Delta	Volume	& Treat	tment
						Impervious area - post development:		36,805.0	ft ²				
					Sui	mmary of Saved BMP Results:							
							ВМР	P Design Results					
		Tributa	ry Area		Requireme	ents		Hydromo	dification				
L								Coi	ntrol	Flow Base Treatment Delta		Delta Volun	ne Capture
			Runoff							Required			
	BMP ID:	Tributary	Reduction					Required V _{Hydromod}	Achieved	_ Q	Achieved	Required	Achieved
		Area (ft ² .)	Measures (Y/N)	Type of Requirement Met		Type of BMP Design	Percent Achieved	(ft ³)	(ft ³)	Treatment (cfs)	(ft ³)	Vdelta (ft ³)	(ft ³)
1	DMA 1	3,588	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	101.3					106.7071	360.4500
2	DMA 2	1,411	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	112.7					39.9454	150.0000
3	DMA 3	1,405	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	113.1					39.7756	150.0000
4	DMA 4	807	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	109.3					21.9504	80.0000
5	DMA 5	4,081	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	104.4					114.3496	397.9000
6	DMA 6	2,776	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	110.9					76.2567	282.0000
7	DMA 8	15,465	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	111.8					329.4045	1227.5000
8	DMA 9	3,339	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	141.9					50.7528	240.0000
9	DMA 10	8,873	No	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	104.3					187.0428	650.0000
10	DMA 7	9,405	Yes	Delta Volume Capture	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	105.3					77.9219	273.6000
11													
12													
13													
14													
15													
16													
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Release 8 Draft Rev. 5 3/22/2024

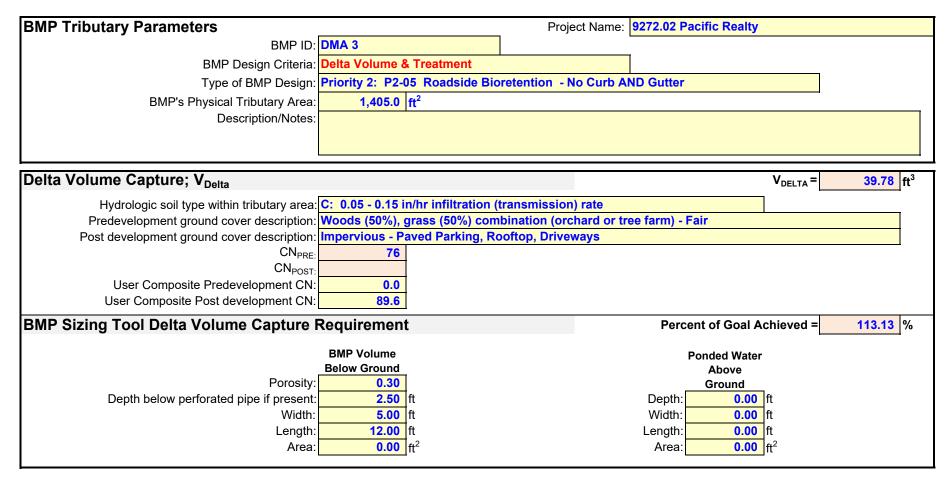


BMP Tributary Parameters		Project Name	9272.02 Pacific Realty	
BMP ID:	DMA 1	-		
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside Bio	retention - No Curb A	AND Gutter	
BMP's Physical Tributary Area:	3,588.0 ft ²			
Description/Notes:				
Delta Volume Capture; V _{Delta}				V _{DELTA} = 106.71 ft ³
Hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate		
Predevelopment ground cover description:	Woods (50%), grass (50%) com	bination (orchard or t	ree farm) - Fair	
Post development ground cover description:	Residential - 1/8 acre or less (to	own houses)		
CN _{PRE:}	76			
CN _{POST:}	90			
User Composite Predevelopment CN:	0.0			
User Composite Post development CN:	0.0			
BMP Sizing Tool Delta Volume Capture I	Requirement		Percent of Goal A	Achieved = 101.34 %
	BMP Volume		Ponded Water	•
	Below Ground		Above	
Porosity:	0.30		Ground	_
Depth below perforated pipe if present:			Depth: 0.00	
Width:	9.00 ft		Width: 0.00	
Length:	15.00 ft		Length: 0.00	_
Area:	0.00 ft ²		Area: 0.00	_ft²



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 2			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside Bio	retention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	1,411.0 ft ²			
Description/Notes:				
Delta Volume Capture; V _{Delta}				V _{DELTA} = 39.95 ft ³
Hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (1	transmission) rate		
Predevelopment ground cover description:			ree farm) - Fair	
Post development ground cover description:	Impervious - Paved Parking, Ro	ooftop, Driveways		
CN _{PRE:}	76			
CN _{POST:}				
User Composite Predevelopment CN:	0.0			
User Composite Post development CN:	89.6			
BMP Sizing Tool Delta Volume Capture I	Requirement		Percent of Goal Ac	chieved = 112.65 %
	BMP Volume		Ponded Water	
	Below Ground		Above	
Porosity:			Ground	
Depth below perforated pipe if present:			Depth: 0.00	
Width:	5.00 ft		Width: 0.00	ft
Length:	12.00 ft		Length: 0.00	ft
Area:	0.00 ft ²		Area: 0.00	ft ²







	9272.02 Pacific Realty	Project Name:			BMP Tributary Parameters
				DMA 4	BMP ID:
			& Treatment	Delta Volume 8	BMP Design Criteria:
	ND Gutter	oretention - No Curb Al	05 Roadside Bi	Priority 2: P2-	Type of BMP Design:
			ft ²	807.0	BMP's Physical Tributary Area:
			1		Description/Notes:
21.95 ft ³	V _{DELTA} =				Delta Volume Capture; V _{Delta}
		(transmission) rate	n/hr infiltration	C: 0.05 - 0.15 i	Hydrologic soil type within tributary area
	ee farm) - Fair				Predevelopment ground cover description:
		ooftop, Driveways	aved Parking, R		Post development ground cover description:
					CN _{PRE}
					User Composite Predevelopment CN:
				89.3	User Composite Post development CN:
109.34 %	Percent of Goal Achieved =		t	Requiremen	BMP Sizing Tool Delta Volume Capture
	Ponded Water			BMP Volume	
	Above		_	Below Ground	
	Ground			0.30	Porosity:
	Depth: 0.00 ft		ft	2.50	Depth below perforated pipe if present:
	Width: 0.00 ft		ft	4.00	Width:
	Length: 0.00 ft		4 _		Length:
	Area: 0.00 ft ²		∫ft²	0.00	Area:
109	Ponded Water Above Ground Depth: 0.00 ft Width: 0.00 ft Length: 0.00 ft		ft ft	0.0 89.3 Requiremen BMP Volume Below Ground 0.30 2.50 4.00 8.00	User Composite Post development CN: BMP Sizing Tool Delta Volume Capture Porosity: Depth below perforated pipe if present: Width: Length:



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 5			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside Bio	retention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	4,081.0 ft ²			
Description/Notes:				
Delta Volume Capture; V _{Delta}				V _{DELTA} = 114.35 ft ³
Hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate		
Predevelopment ground cover description:			ree farm) - Fair	
Post development ground cover description:	Impervious - Paved Parking, Ro	ooftop, Driveways		
CN _{PRE:}	76			
CN _{POST:}				
User Composite Predevelopment CN:	0.0			
User Composite Post development CN:	89.5			
BMP Sizing Tool Delta Volume Capture I	Requirement		Percent of Goal A	chieved = 104.39 %
	BMP Volume		Ponded Water	
	Below Ground		Above	
Porosity:			Ground	
Depth below perforated pipe if present:			Depth: 0.00	
Width:	0.00 ft			ft
Length:	0.00 ft		Length: 0.00	ft
Area:	173.00 ft ²		Area: 0.00	ft²



BMP Tributary Parameters		Project Name: 9272.02 Pacific Realty	
BMP ID:	DMA 6		
BMP Design Criteria:	Delta Volume & Treatment		
Type of BMP Design:	Priority 2: P2-05 Roadside Biorete	ention - No Curb AND Gutter	
BMP's Physical Tributary Area:	2,776.0 ft ²		
Description/Notes:			
Delta Volume Capture; V _{Delta}		V _{DELTA} = 76	6.26 ft ³
Hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (trans	smission) rate	
Predevelopment ground cover description:			
Post development ground cover description:		op, Driveways	
CN _{PRE:}			
CN _{POST:}			
User Composite Predevelopment CN:			
User Composite Post development CN:	89.4		
BMP Sizing Tool Delta Volume Capture I	Requirement	Percent of Goal Achieved = 110	. <mark>94</mark> %
	BMP Volume	Ponded Water	
	Below Ground	Above	
Porosity:	0.30	Ground	
Depth below perforated pipe if present:		Depth: 0.00 ft	
Width:	0.00 ft	Width: 0.00 ft	
Length:	0.00 ft	Length: 0.00 ft	
Area:	141.00 ft ²	Area: 0.00 ft ²	
	<u> </u>		

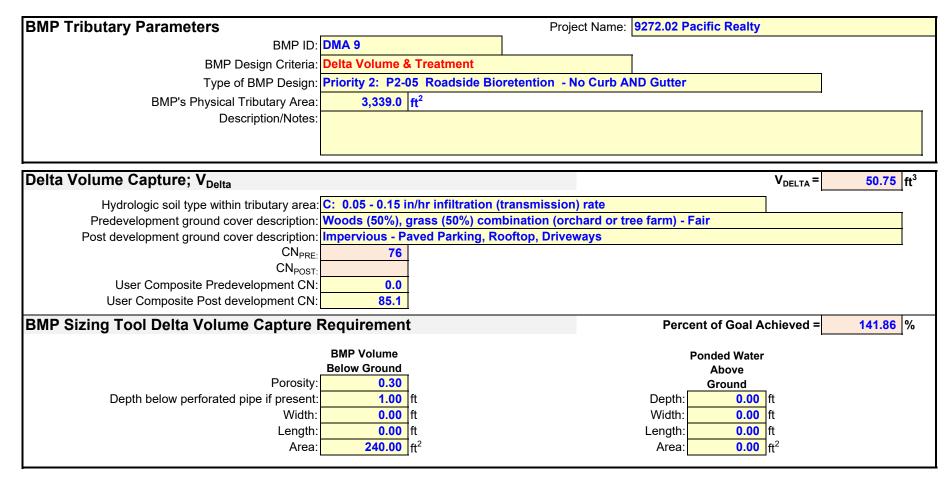
Santa Rosa WATER

BMP Tributary Parameters	Project Name: 9272.02 Pacific Realty	
BMP ID:	DMA 7	
BMP Design Criteria:	Delta Volume & Treatment	
Type of BMP Design:	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	
BMP's Physical Tributary Area:	9,405.0 ft ²	
Description/Notes:		
Runoff Reduction Measures	Resulting reduced Tributary Area used for BMP sizing = 7,195.0 Total Runoff Reduction Measures = 2,210.0	
Interceptor Trees		
Number of new interceptor Evergreen Trees :	Total Number of New trees in BMP Tributary Area:	
Number of new interceptor Deciduous Trees:	0	
Square footage of qualifying existing tree canopy:	3,500.0 ft ²	
Disconnected Roof Drains		
Select disconnection condition:	Runoff is directed across landscape; Width of area: 5' to 9'	
Disconnected Roof Drains Method 1	Disconnected Roof Drains Method 2	
Roof area of disconnected downspouts:	· · · · · · · · · · · · · · · · · · ·	
	Select Density: 1 Units per Acre	
Paved Area Disconnection		
Paved Area Type:	Select paved area type	
Alternatively designed paved area:	: 0.0 ft ²	
Buffer Strips & Bovine Terraces		
Area draining to a Buffer Strip or Bovine Terrace:		
Delta Volume Capture; V _{Delta}	V _{DELTA} = 77.92	ft ³
Hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate	·
	Woods (50%), grass (50%) combination (orchard or tree farm) - Fair	
	Impervious - Paved Parking, Rooftop, Driveways	
CN _{PRE:} CN _{POST:}	. 76	
User Composite Predevelopment CN:	0.0	
User Composite Post development CN:		
BMP Sizing Tool Delta Volume Capture R	Requirement Percent of Goal Achieved = 105.34	%
	BMP Volume Ponded Water	
	Below Ground Above	
Porosity: Depth below perforated pipe if present:		
Width:		
Length:	. 0.00 ft Length: 0.00 ft	
Area:	152.00 ft ² Area: 0.00 ft ²	

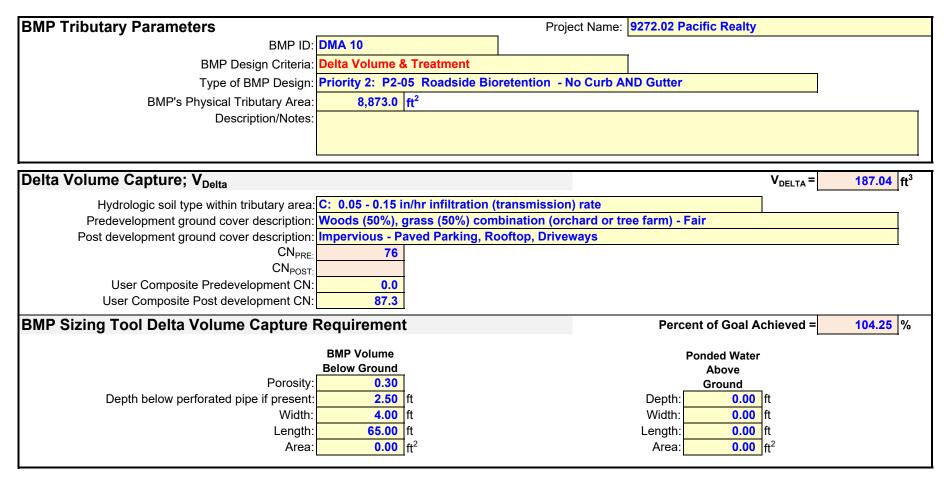


	Project Name: 9272.02 Pacific R	Realty
DMA 8		
Delta Volume & Treatment		
Priority 2: P2-05 Roadside Bior	etention - No Curb AND Gutter	
15,465.0 ft ²		
,		
		V _{DELTA} = 329.40 ft ³
C: 0.05 - 0.15 in/hr infiltration (ti	ransmission) rate	
Open Space (lawns, parks, golf	courses, cemeteries, etc.) - Fair (50% to	75% grass cover)
76		
87.4		
Requirement	Percent of C	Goal Achieved = 111.79 %
BMP Volume	Ponded	Water
Below Ground	Abo	
0.30	Grou	
	Depth:	0.00 ft
0.00 ft	Width:	0.00 ft
	Length:	0.00 ft
491.00 ft ²	Area:	0.00 ft ²
	15,465.0 ft ² C: 0.05 - 0.15 in/hr infiltration (to Woods (50%), grass (50%) combod (50%), grass (50%), grass (50%) combod (50%), grass (50%), gra	DMA 8 Delta Volume & Treatment Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter 15,465.0 ft² C: 0.05 - 0.15 in/hr infiltration (transmission) rate Woods (50%), grass (50%) combination (orchard or tree farm) - Fair Open Space (lawns, parks, golf courses, cemeteries, etc.) - Fair (50% to 76 0.0 87.4 Requirement Percent of C BMP Volume Below Ground Abord O.30 Ground C.50 ft Depth: C











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P	•	ormation:				Otto Information							
		Project Information:				Site Information:						d post deve	
	Project Name		Project Name: 9272.02 Pacific Realty			Mean Seasonal Precipitation (MSP) of Project Site: 35.00 (inches) K=MSP/3(K= 1.17			(inches)	impervious area, the post construction BMP			
	Addre	Address/Location: 7261 Healdsburg Ave							requiremen	t is:			
	Designer:		David Thies	sen			•		•				
		Date:	3/1/2024			Impervious area - pre development:		1,250.3	ft ²	Delta '	Volume	& Treat	tment
					<u>.</u>	Impervious area - post development:		36,805.0	ft ²				
					Sui	mmary of Saved BMP Results:							
									ВМР	/IP Design Results			
		Tributa	ry Area		Requireme	ents		Hydromo	dification				
			1					Cor	ntrol	Flow Base	Treatment	Delta Volun	ne Capture
			Runoff							Required			
ı	BMP ID:	Tributary	Reduction				D4	Required V _{Hydromod}	Achieved	Q	Achieved	Required	Achieved
		Area (ft ² .)	Measures (Y/N)	Type of Requirement Met		Type of BMP Design	Percent Achieved	(ft ³)	(ft ³)	Treatment (cfs)	(ft ³)	Vdelta (ft ³)	(ft ³)
1	DMA 1	3,588	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	dside Bioretention - No Curb AND Gutter	101.6			0.0154	0.0156		
2	DMA 2	1,411	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	114.9			0.0060	0.0069		
3	DMA 3	1,405	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	dside Bioretention - No Curb AND Gutter	115.3			0.0060	0.0069		
4	DMA 4	807	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	107.1			0.0035	0.0037		
5	DMA 5	4,081	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	dside Bioretention - No Curb AND Gutter	143.1			0.0175	0.0250		
6	DMA 6	2,776	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	136.8			0.0119	0.0163		
7	DMA 8	15,465	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	161.6			0.0381	0.0616		
8	DMA 9	3,339	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	330.2			0.0088	0.0289		
9	DMA 10	8,873	No	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	dside Bioretention - No Curb AND Gutter	100.5			0.0299	0.0301		
10	DMA 7	9,405	Yes	100% Vertical Flow Treatment	Priority 2: P2-05 Roa	adside Bioretention - No Curb AND Gutter	100.7			0.0139	0.0140		
11													
12													
13													
14													
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Release 8 Draft Rev. 5 3/22/2024



BMP Tributary Parameters		Project Name	9272.02 Pacific Realty	
BMP ID:	DMA 1			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside	e Bioretention - No Curb A	AND Gutter	
BMP's Physical Tributary Area:	3,588.0 ft ²			
Description/Notes:				
100% Treatment			Q _{TREATMENT}	= 0.0154 cfs
Post surface type:	Concrete			
C _{POST} :	0.80			
User Composite post development C _{POST} :	0.00	Treatment	Factor (Tf): 1 Calculat	ted
User Input I _{Historical} :	0.00 in./hr.		I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical			Percent of Goal Achieved	= 101.62 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	1.50 ft			
BMP Length:	15.00 ft			
BMP Width:	9.00 ft			



BMP Tributary Parameters	Project Name:	9272.02 Pacific Realty		
BMP ID:	DMA 2			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside B	ioretention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	1,411.0 ft ²			
Description/Notes:				
100% Treatment			Q _{TREATMENT} =	0.0060 cfs
Post surface type:	Concrete			
C _{POST} :	0.80			
User Composite post development C _{POST} :	0.00	Treatment F	` '	t
User Input I _{Historical} :	0.00 in./hr.		I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical			Percent of Goal Achieved =	114.85 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	1.50 ft			
BMP Length:	12.00 ft			
BMP Width:	5.00 ft			



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 3			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside B	ioretention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	1,405.0 ft ²			-
Description/Notes:	•			
100% Treatment			Q _{TREATMENT} =	0.0060 cfs
Post surface type:	Concrete			
C _{POST} :	0.80			
User Composite post development C _{POST} :	0.00	Treatment F	` '	ed
User Input I _{Historical} :	0.00 in./hr.		I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical			Percent of Goal Achieved =	115.34 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	2.50 ft			
BMP Length:	12.00 ft			
BMP Width:	5.00 ft			



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 4			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside	Bioretention - No Curb A	AND Gutter	
BMP's Physical Tributary Area:	807.0 ft ²			
Description/Notes:				
100% Treatment			Q _{TRE}	eatment = 0.0035 cfs
Post surface type:	Concrete			
C _{POST} :	0.80			
User Composite post development C _{POST} :	0.00	Treatment I	. '	Calculated
User Input I _{Historical} :	0.00 in./hr.		Design Storm: 0.20 in	n./hr.
BMP Sizing 100% Treatment Vertical			Percent of Goal Ac	hieved = 107.10 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	2.50 ft			
BMP Length:	8.00 ft			
BMP Width:	4.00 ft			



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 5			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside Bio	retention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	4,081.0 ft ²			-
Description/Notes:				
100% Treatment			Q _{TREATMENT} =	0.0175 cfs
Post surface type:	Concrete			
C _{POST} :	0.80	<u> </u>		
User Composite post development C _{POST} :	0.00	Treatment F	1	d
User Input I _{Historical} :	0.00 in./hr.		I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical			Percent of Goal Achieved =	143.09 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	2.30 ft			
BMP Length:	46.00 ft			
BMP Width:	4.70 ft			



BMP Tributary Parameters		Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 6			
BMP Design Criteria:	Delta Volume & Treatment			
Type of BMP Design:	Priority 2: P2-05 Roadside E	Bioretention - No Curb A	ND Gutter	
BMP's Physical Tributary Area:	2,776.0 ft ²			-
Description/Notes:	•			
100% Treatment			Q _{TREATMENT} =	0.0119 cfs
Post surface type:	Concrete			
C _{POST} :	0.80			
User Composite post development C _{POST} :	0.00	Treatment F		d
User Input I _{Historical} :	0.00 in./hr.		I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical			Percent of Goal Achieved =	136.80 %
Infiltration rate of the specified BMP soil:	5.00 in./hr.			
Depth of drainage pipe:	1.50 ft			
BMP Length:	38.00 ft			
BMP Width:	3.70 ft			



BMP Tributary Parameters	Project Name	9272.02 Pacific Realty
BMP ID:	DMA 7	
BMP Design Criteria:	Delta Volume & Treatment	
Type of BMP Design:	Priority 2: P2-05 Roadside Bioretention - No Curb /	AND Gutter
BMP's Physical Tributary Area:	9,405.0 ft ²	
Description/Notes:		
Runoff Reduction Measures	_	ary Area used for BMP sizing = 7,195.0 ft²
	То	tal Runoff Reduction Measures = 2,210.0 ft ²
Interceptor Trees		
Number of new interceptor Evergreen Trees : Number of new interceptor Deciduous Trees : Square footage of qualifying existing tree canopy :	0 Total Number of New tre 0 3,500.0 ft ²	es in BMP Tributary Area: 0
Disconnected Roof Drains		
	Runoff is directed across landscape; Width of area:	5' to 9'
Disconnected Roof Drains Method 1 Roof area of disconnected downspouts:	Disconnected Roof Disconnected	
Paved Area Disconnection		
Paved Area Type:	Select paved area type	
Alternatively designed paved area:	0.0 ft ²	_
Buffer Strips & Bovine Terraces		
Area draining to a Buffer Strip or Bovine Terrace:	0.0 ft ²	
100% Treatment		Q _{TREATMENT} = 0.0139 cfs
Post surface type:	Concrete	
C_{POST} : User Composite post development C_{POST} :	0.36 Treatment	Factor (Tf): 1 Calculated
User Input I _{Historical} :	0.00 in./hr.	I _{Desian Storm} : 0.20 in./hr.
BMP Sizing 100% Treatment Vertical		Percent of Goal Achieved = 100.73 %
_		referred of Goal Achieved - 100.73 //
Infiltration rate of the specified BMP soil:	5.00 in./hr.	
Depth of drainage pipe: BMP Length: BMP Width:	1.50 ft 34.50 ft 3.50 ft	



BMP Tributary Parameters			Project Name:	9272.02 Pacific	Realty	
BMP ID:	DMA 8					
BMP Design Criteria:	Delta Volume &	Treatment				
Type of BMP Design:	Priority 2: P2-0	5 Roadside Bio	retention - No Curb A	ND Gutter		
BMP's Physical Tributary Area:	15,465.0 f	ft ²				
Description/Notes:						
100% Treatment					Q _{TREATMENT} =	0.0381 cfs
Post surface type:	Concrete					
C_{POST} : User Composite post development C_{POST} :	0.46		Treatment F	actor (Tf):	1 Calculated	
User Input I _{Historical} :		in./hr.		Design Storm:	0.20 in./hr.	
BMP Sizing 100% Treatment Vertical				Percent of	Goal Achieved =	161.59 %
Infiltration rate of the specified BMP soil:	5.00 ji	in./hr.				
Depth of drainage pipe:						
BMP Length: BMP Width:	66.50 f 8.00 f					
2						



BMP Tributary Parameters			Project Name:	9272.02 Pacific Realty	
BMP ID:	DMA 9				
BMP Design Criteria:	Delta Volume 8	& Treatment			
Type of BMP Design:	Priority 2: P2-	05 Roadside Bio	retention - No Curb Al	ND Gutter	
BMP's Physical Tributary Area:	3,339.0	ft ²			_
Description/Notes:		•			
100% Treatment				Q _{TREATMENT} =	0.0088 cfs
Post surface type:	Asphalt				
C _{POST} :					
User Composite post development C _{POST} :	0.49		Treatment F		ed
User Input I _{Historical} :	0.00	in./hr.	!	I _{Design Storm} : 0.20 in./hr.	
BMP Sizing 100% Treatment Vertical				Percent of Goal Achieved :	330.16 %
Infiltration rate of the specified BMP soil:	5.00	in./hr.			
Depth of drainage pipe:	1.50]ft			
BMP Length:	50.00				
BMP Width:	5.00]ft			



BMP Tributary Parameters			Project Name:	9272.02 Pacific Realty		
BMP ID:	DMA 10					
BMP Design Criteria:	Delta Volume 8	& Treatment				
Type of BMP Design:	Priority 2: P2-0	05 Roadside Bio	retention - No Curb Al	ND Gutter		
BMP's Physical Tributary Area:	8,873.0	ft ²			-	
Description/Notes:		•				
100% Treatment				Q _{TREATMENT} =	0.0299	cfs
Post surface type:	Concrete					
C _{POST} :						
User Composite post development C _{POST} :	0.63		Treatment F		ed	
User Input I _{Historical} :	0.00	in./hr.	!	I _{Design Storm} : 0.20 in./hr.		
BMP Sizing 100% Treatment Vertical				Percent of Goal Achieved =	100.50	%
Infiltration rate of the specified BMP soil:	5.00	in./hr.				
Depth of drainage pipe:	1.50	[ft				
BMP Length:	65.00	ft				
BMP Width:	4.00	[ft				

Page _____ of ____



Project Name:	4245 Hargra	ve Ave.																			
	Best Management Practice (BMP)	Detail Sheet	Detail Title	/	Carrie	iself (stiff.	site ve	311		ST S	Marin Con Control	Meas nitrition	se little	sertified at the service of the serv	of deepling	Other notes.				
Universal BMP- to be	Living Roof	N/A	N/A		х	Х	Х	х	Х				X								
considered on all projects.	Rainwater Harvesting	N/A	N/A		х	х	х		Х				Х								
	Interceptor Trees	N/A	N/A		х	Х	Х			Х		Х									
Runoff Reduction	Bovine Terrace	RRM-01	Bovine Terrace		х					Х			Х								
Measures	Vegetated Buffer Strip	RRM-02	Vegetated Buffer Strip							Х			Х								
	Impervious Area Disconnection	N/A	N/A		х	х	х			Х		Х									
	-																				
Priority 1- to be installed with no	Bioretention	P1-02	Roadside Bioretention - no C & G					х	х				Х								
underdrains or liners. Must drain all stading	Vegetated Swale- with Bioretention	P1-06	Swale with Bioretention					х	Х				Х								
water within 72 hours.	Constructed Wetlands	N/A	N/A					Х	х				Х								
		P2-02	Roadside Bioretinton - Flush Design Roadside					х	х				Х								
Priority 2 BMPs- with subsurface drains	Bioretention	P2-03	Roadside Bioretenion- Contiguous SW					х	Х				X								
installed above the capture volume.		P2-04	Roadside Bioretenion- Curb Opening					х	Х				Х								
		P2-05	Roadside Bioretenion- No C & G					х	Х			X									
	Constructed Wetlands	N/A	N/A					Х	Χ				X								

Date: _____



	Best Management Practice (BMP)	Detail Sheet	Detail Title	n de vi	g dig of		Actie Actie			Cold of the Cold o	& July Land	orients	July July July July July July July July	the depth of selection of selections	etion	Other notes:
	rractice (DMI)	P3-02	Roadside Bioretinton - Flush Design Roadside			x	X		Y Q		87	X		,		7 0
Priority 3 BMPs- installed with subdrains and/or impermeable liner.	Bioretention	P3-03	Roadside Bioretenion- Contiguous SW	х	x	x	х					X				
Does not achieve volume capture and		P3-04	Roadside Bioretenion- Curb Opening	х	Х	x	х					Х				
must be used as part of a treatment train.	Flow Through Planters	P3-05	Flow Through Planters	Х	х	х	х					Χ				
	Warneton d Country	P3-06	With Bioretention	х	Х	x	х	х				Х				
	Vegetated Swale	P3-07	Vegetated Swale	Х	х	х	х					Х				
Priority 4 BMPs- does not achieve volume	Tree Filter Unit			Х	Х	x	х					Χ				
capture and must be used as part of a	Modular Bioretention			Х	х	х	х					Х				
	Chambered							1					· · ·			
Priority 5 BMPs- does	Separator Units			Х	Х	X	Х					Х				
not achieve volume capture and must be	Centrifugal Separator Units			х	X	x	х					Х				
used as part of a	Trash Excluders			х	X	x	х					Х				
treatment train.	Filter Inserts			х	Х	х	Х					Х				
Driovity & PMDs and																
Priority 6 BMPs - see the "Offset Program" chapter for details.	Offset Program						N/A	N/A	N/A			X				
Other	Detention			х								Х				

FACT SHEET- IMPERVIOUS AREA DISCONNECTION

IMPERVIOUS AREA DISCONNECTION

Including: splash blocks, rain chains, bubble up emitters, and pavement disconnection.









OVERVIEW

Impervious area disconnection allows storm water from impervious areas, such as rooftops and pavement, to be directed to pervious natural or landscaped areas and infiltrate into the soil. Impervious surfaces that drain directly to catch basins or storm drains are a directly connected impervious area. These areas prevent storm water infiltration into the soil or filtering through vegetation and soil. Impervious areas also increase the speed and amount of runoff from a site, which may contribute to peak flows and scour in downstream creeks and waterways. This BMP addresses these issues by disconnecting direct discharges by using: splash blocks, bubble-up emitter, and paved area disconnection.



SPLASH BLOCK DESCRIPTION

Splash blocks are a low tech option to hard piped downspout systems. Existing downspouts can be retrofitted using splash blocks.

ADVANTAGES

- Can be used as part of a treatment train with volume capture BMPs.
- Can reduce the size of downstream water quality treatment and volume capture BMPs by increasing the potential for infiltration.



FACT SHEET- IMPERVIOUS AREA DISCONNECTION

- Can be used as a retrofit BMP.
- Can be used to direct storm water to other BMPs

LIMITATIONS

- Adjacent buildings and overflow requirements need to be considered in design.
- May not be appropriate on all sites due to space constraints.

KEY DESIGN FEATURES

- Sites should be evaluated to ensure that splash blocks won't have negative impacts.
- Rain water must be directed away from foundations and footings.
- Downspouts should not be directed to paved areas or across sidewalks.
- Landscaped areas receiving roof water should be adequately sized to prevent runoff or erosion.

BUBBLE-UP EMITTER DESCRIPTION

Bubble-up emitters work very much like splash blocks, but allow for storm water to be released further from the building and even in landscape areas that are not directly adjacent to the building.

ADVANTAGES

- Can be used as part of a treatment train with volume capture BMPs.
- Can reduce the size of downstream water quality treatment and volume capture BMPs by increasing the potential for infiltration.
- Can be used as a retrofit BMP.
- Can be used to direct storm water to other BMPs

LIMITATIONS

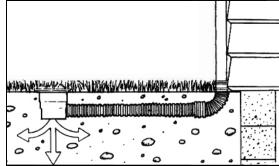
- Adjacent buildings and overflow requirements need to be considered in design.
- May not be appropriate on all sites due to space constraints.

KEY DESIGN FEATURES

- Rain water must be directed away from foundations and footings.
- Downspouts should not be directed to paved areas or across sidewalks.
- 4" diameter SDR-35 pipe required as a minimum.

FACT SHEET- IMPERVIOUS AREA DISCONNECTION

- Distance and location of emitter relative to the building must be approved by a Licensed Geotechnical Engineer.
- Landscaped areas receiving roof water should be adequately sized to prevent runoff or erosion.
- Landscaped areas receiving roof water need to be designed to ensure proper drainage and to prevent ponding water.
- May be installed with a bottomless emitter to allow for infiltration. Bottom of emitter should be placed over drain rock to prevent sedimentation of pipe.
- Emitter should be equipped with "pop up" cover to prevent mosquito breeding.



PAVED AREA DISCONNECTION DESCRIPTION

Paved areas that can be graded so that they drain onto pervious area, such as landscape or natural area can increase the opportunity for infiltration and minimize the size of downstream treatment.

ADVANTAGES

- Can be used as part of a treatment train with other BMPs.
- Can reduce the size of downstream treatment and volume capture BMPs by increasing the potential for infiltration.

LIMITATIONS

- Areas receiving flow need to be adequately sized and stabilized.
- May be limited by site slopes.
- Overflow drainage must be provided.
- May not be appropriate on all sites.



KEY DESIGN FEATURES

- Rain water must be directed away from foundations and footings.
- Landscaped areas receiving storm water should be adequately sized to prevent runoff or erosion.
- Landscaped areas receiving roof water need to be designed to ensure proper drainage and to prevent ponding water.

Impervious Area Disconnection Date of Inspection: Inspection and Maintenance Checklist Inspector(s): (aka: splash blocks, rain chains, bubble up emitters and pavement disconnection) BMP ID #:_____ Property Owner: _____

Type of Inspection: 2 Pre-rainy Season (PRS) 2 Rainy Season (RS) 2 After-rainy Season (ARS)

Location Description:

This Inspection and Maintenance Checklist is to be usde 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)
	RS	Is there standing or pooling of water after 3 days of dry weather?		Regrade drainage area.Reposition splash block.Clean inlets/outlets of obstructions.	
age	RS	Is there excessive splashing/spray?		Reposition splash block or dissipater to reduce or eliminate splash/spray.	
Drainage	RS	Are the house/building gutters overflowing during a rain event?		 Flush bubble up pipe to remove any obstructions. Check gutter down spout and gutter for obstructions. Clean if necessary. 	

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)
	RS ARS	Is there evidence of under cutting or washouts around splash block/dissipater?		Reposition the inlet splash block or dissipater.Fill in eroded areas and regrade.	
uo	RS ARS	Is there channelization (gully) forming around the bubble ups?		Fill in eroded areas and regrade.	
Erosion	RS ARS	Is there accumulation of sediment (sand, dirt, mud) in the inlets/outlets areas?		Remove sediment and check the grading.	
	RS ARS	Are there voids or holes along the path of the bubble up pipe or excess sediment in and around the bubble up outlet?		 Flush and inspect pipe for damage. Replace damage pipe, fill in voids, and regrade. 	

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/outlet areas?		 Trim and/or remove the excess vegetation around the inlet/outlet areas. 	
	PRS RS ARS	Is the mulch spread evenly throughout the vegetation area?		 Redistribute and add additional mulch if needed. Regrade vegetation area. 	
	PRS RS ARS	Are there dead or dry plants/weeds?		 Remove dead and/or dry vegetation. Replace as needed. Remove or trim any vegetation that is causing a visual barrier hazard. 	

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 area?		Remove all trash and debris.	
	PRS RS ARS	Is the surrounding area marked with graffiti?		Remove all graffiti from the area.	
	PRS RS ARS	Are there missing or disturbed aesthetics features?		 Replace and/or reposition aesthetic features to original placement. Placement should not disrupt flow characteristics/design. 	
	PRS RS ARS	Check for broken or damage drain inlets/outlets, splash blocks, bubble ups, and grates.		Replace or repair all damaged features.	
	PRS RS ARS	Is the vegetation irrigation functional?		 Repaired broken missing spray/drip emitters. Reposition to eliminate over spray and/or over watering. 	
	PRS RS ARS	Are the aesthetic features firmly secured in placed?		 Repair and/or replace loose or damaged features. 	

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

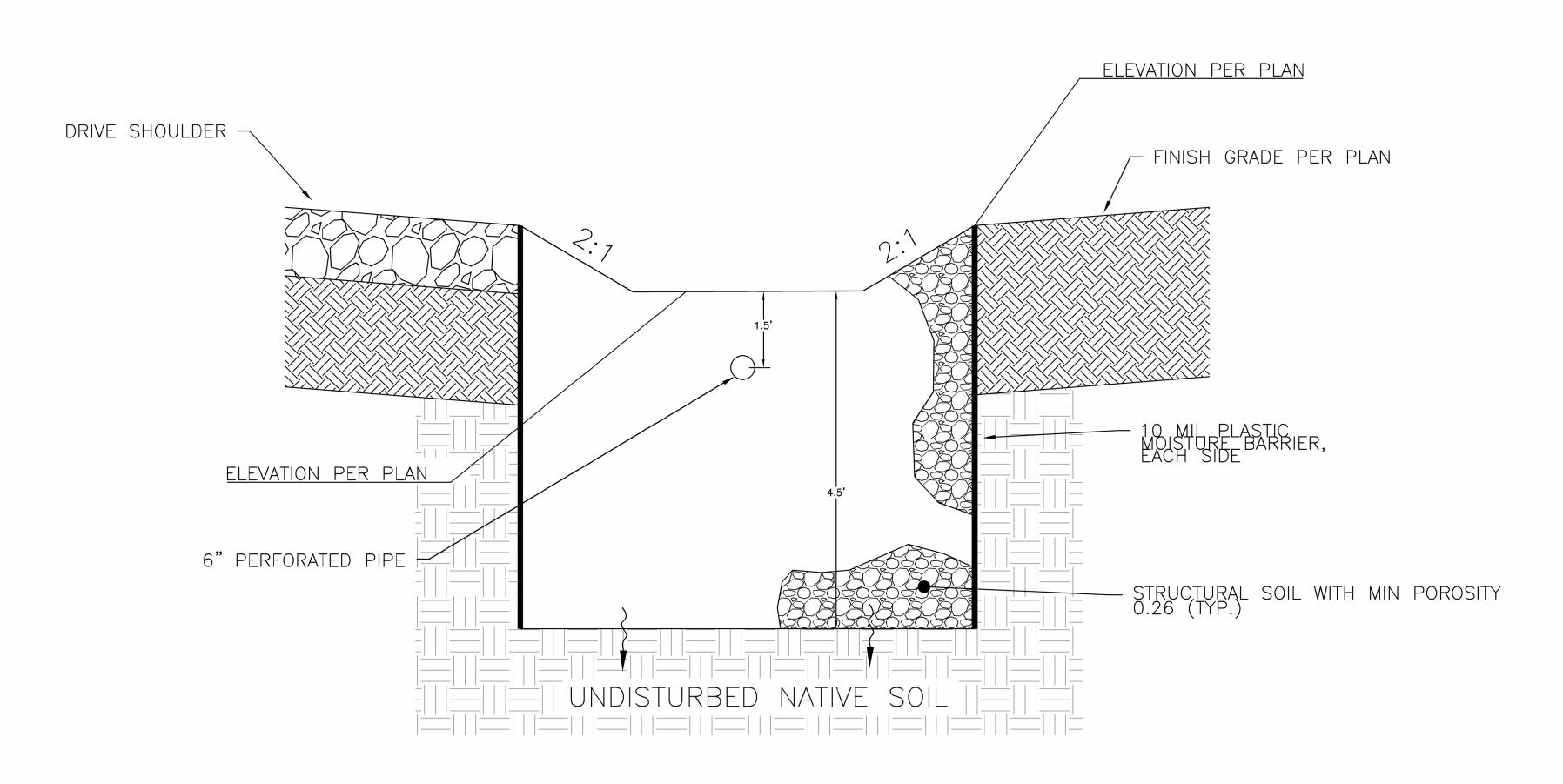
- The design goal for all bioretention areas is to capture (infiltration and/or reuse) 100% of the volume of runoff generated by the 85th percentile 24 hour storm event. This is a retention requirement. If 100% volume capture is achieved than no additional treatment is required.
- If the design goal is not achievable, then the bioretention area sizing requirement is:
 - o 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.
 - o 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.



SURVEYORS ENGINEERS | PLANNERS | GEOLOGISTS

JOB NO. 9272.02

DATE 3/14/2024

DESIGNER

1 OF 1

CHECKED____ DRAWN___

ROADSIDE BIORETENTION

24-12:35pm N Projects, 9200/9272.02 Healdsburg Ave \ Civil\ Civil\ DWG\ 9272.02 Details, dwa

Planter Strip Bioretention Date of Inspection: Inspection and Maintenance Checklist Inspector(s): (aka: Street Rain Garden, Roadside Bioretention, Bioretention Cell) 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?		 Check perforated pipe outlet for obstruction or damage. * Flush perforated pipe to remove obstructions/sediment. * 	
		Is water not draining into catch basin from the overflow pipe during a high intensity storm? *		 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. 	
Drai	PRS RS ARS	Is there sediment visible in the gutter?		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? *		In wet weather, use a Vactor truck to clean gutter pan.	

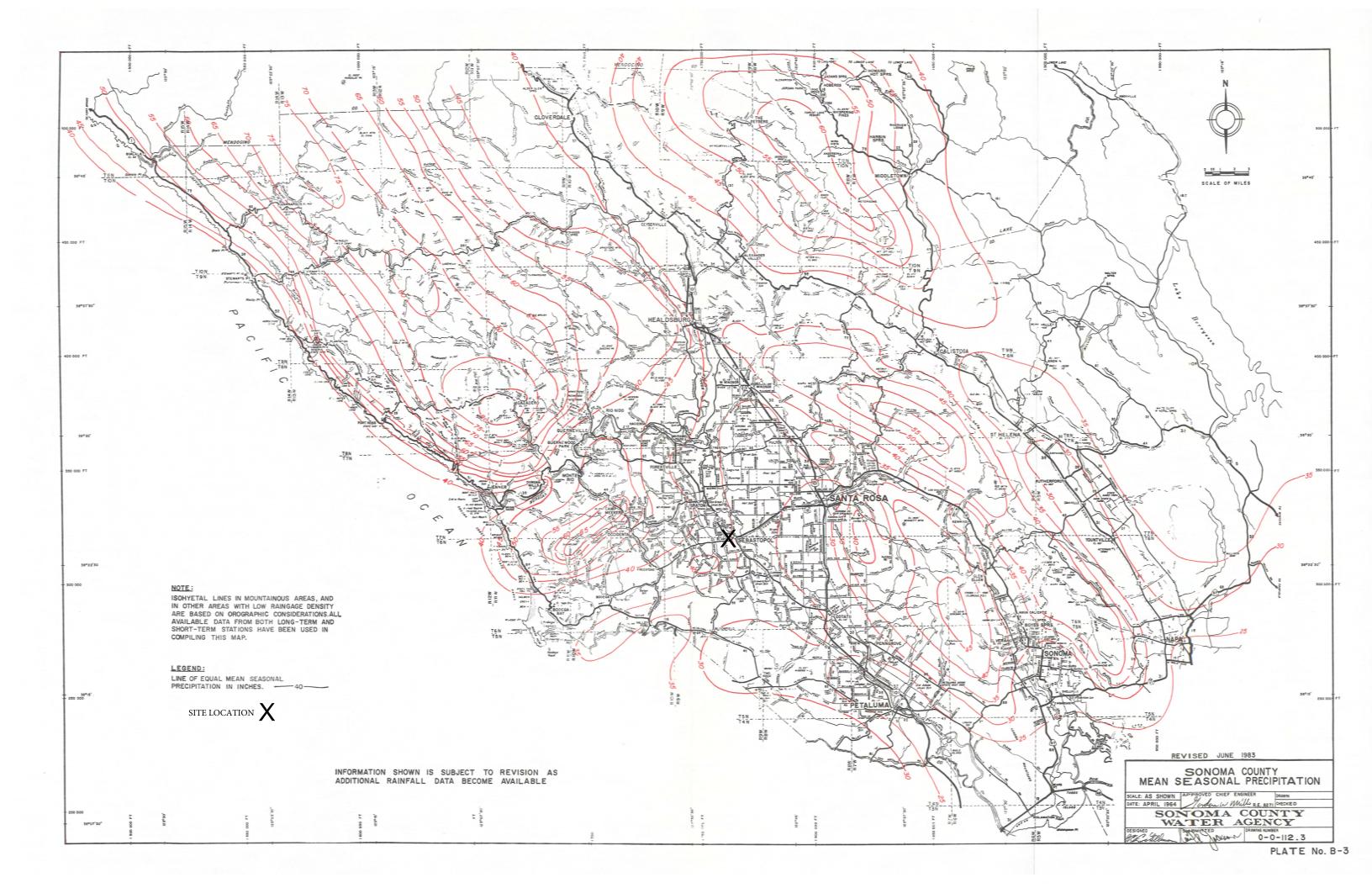
^{*} If perforated pipe is present.

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)
	RS ARS	Is there under cutting or washouts along the sidewalks and/or curbs abutting the planter strip?		• Fill in eroded areas and regrade.	
	RS ARS	Is there channelization (gully) forming along the length of the planter area?		• Fill in eroded areas and regrade.	
	RS ARS	Is there accumulation of sediment (sand, dirt, mud) in the planter?		 Remove sediment and check the grading. Add replacement soil and/or mulch. 	
Erosion	PRS RS ARS	Is the mulch unevenly distributed in the planter area?		 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?		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?		 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.

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)
	PRS RS ARS	Is the vegetation clogging the inlet flow areas?		• Trim and/or remove the excess vegetation.	
Vegetation	PRS RS ARS	Is the mulch distributed evenly throughout the planter area?		 Redistribute and add additional mulch if needed. Regrade planter area. 	
Vege	PRS RS ARS	Are there dead or dry plants/weeds? Is the vegetation over grown?		 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. 	

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)
	PRS RS ARS	Is there debris/trash in the planter area?		Remove all trash and debris.	
	PRS RS ARS	Is graffiti present?		Remove all graffiti from the area.	
General	PRS RS ARS	Are there missing or disturbed aesthetics features?		 Replace and/or reposition aesthetics features to original placement. Placement should not disrupt flow characteristics/design. 	
BMP G	PRS RS ARS	Is the vegetation irrigation functional?		 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?		 Repair and/or replace loose or damage features. 	
	PRS RS ARS	Check for damage sidewalk, curb, gutter, and catch basin including uplift and settling.		Remove and replace damaged areas.	





MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

contrasting soils that could have been shown at a more detailed misunderstanding of the detail of mapping and accuracy of soil Enlargement of maps beyond the scale of mapping can cause line placement. The maps do not show the small areas of Warning: Soil Map may not be valid at this scale.

Please rely on the bar scale on each map sheet for map measurements.

scale

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

distance and area. A projection that preserves area, such as the Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required. This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California Survey Area Data: Version 17, Sep 11, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger. Date(s) aerial images were photographed: Mar 26, 2022—Apr

Not rated or not available

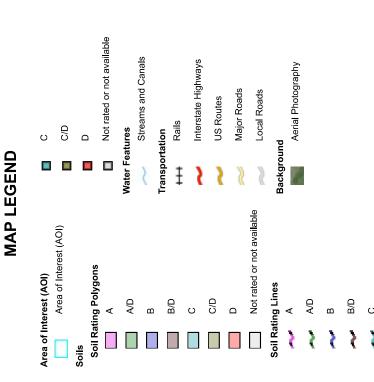
Soil Rating Points

⋖

ΑD

B/D

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GdC	Goldridge fine sandy loam, 2 to 9 percent slopes	С	0.0	1.2%
SbD2	Sebastopol sandy loam, 9 to 15 percent slopes, eroded	С	1.7	98.8%
Totals for Area of Intere	est		1.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrology & Hydraulics Report Prepared For Pacific Realty Development LLC

7261 Healdsburg Ave Sebastopol, CA 95472 405-686-0772 LACO Job No. 9272.02 APN: 164-150-054

PREPARED BY



LACO ASSOCIATES 2561 California Park Dr #200 Chico, Ca 95928 (530) 801-6170

March, 2024

Prepared under the supervision of Paul Peck, PE



Project Description:

The project involves the development of a mixed-use subdivision, which will include the construction of townhomes, apartment and commercial buildings, a drive aisle, and a parking structure. The project will include grading & earthwork fill, storm drainage, and associated site improvements.

Pre & Post Development Runoff Conditions:

The total project area contained within parcel 004-291-019 encompasses 1.28 acres.

Pre-development on-site runoff primarily consists of sheet flow that begins at the southeast corner of the site and flows both north and west toward Healdsburg Ave and Murphy Ave, where it then collects into the city storm drain system. Once in the storm drain system, runoff eventually exits at the Morris St outfall into the Laguna de Santa Rosa. Refer to the attached Existing Conditions Exhibit for Pre-Development conditions which also shows an outline of impervious areas.

Post-development on-site runoff will generally flow through proposed gutters and collect into the various proposed bioretention areas. Tributary Areas 7, 9, 10, and 12 will drain through grass swales behind the townhomes before entering bioretention areas. When bioretention areas are at capacity, overflow will enter the proposed storm drain system and be conveyed to the city storm drain system at Healdsburg Ave, or overland flow to Healdsburg and Murphy Ave where it will collect into the city storm drain system.

Potential Impacts

Industrial operations occur on highly impervious surfaces such as gravel equipment parking areas, concrete, and asphalt paving. In addition to the high rate of runoff from these types of surfaces, non-visible pollutants such as sediment and sand, hydrocarbon emissions from vehicles and equipment, oils and greases, and particulate matter all pose potential environmental impacts. In accordance with CASQA and the USEPA, the project is being designed with Low Impact Development (LID) features to capture and treat stormwater runoff which may contain sediment and pollutants. Please see the document entitled "Pacific Knolls Storm Water Low Impact Development Report."

Concentrating and channelizing stormwater runoff increases the chance of erosion and sedimentary deposit, and increasing the impervious area will increase the flow rate of runoff. Design elements included in this project include bioretention areas and drop inlets set above grade to allow for settling and infiltration as a primary means of stormwater flood control.

Flood Control Hydrology

The project existing site consists of an old building, a concrete walkway, a gravel driveway, dirt, grass, and trees. The existing site drainage consists generally of sheet flow from south to north and east to west over grass, dirt, and gravel.

The proposed drainage will route runoff to landscaped areas and then to bioretention areas that will eventually overflow into storm drain inlets. Overflow inlets are set 6" over grade.

Websoil survey has identified one soil type for this site: Sebastopol sandy loam, which belongs to hydrologic soil group C.

For the purposes of the flood control portion of this drainage report we used the Flood Management Design Manual (FMDM) as a guideline for estimating runoff.

In accordance with the FMDM, the rational method was used to estimate flow rates. The FMDM also provides the following mathematical models and constant values used in the hydraulic analysis:

Design Storm Event 10 Year Runoff Coefficient: C = 0.85

(FMDM, Table C-1)

Time of Concentration 7 min

Rainfall Intensity (NOAA Atlas 14)

Table C-1 of the FMDM was used to calculate the composite runoff coefficient. Per the FMDM, a runoff coefficient value of 0.47 was used for the pervious area and 0.90 for impervious area. A slope greater than twelve percent was assumed for the future landscaped area to make the design conservative. See attached spreadsheet calculation and tabulation called "Pre and Post Development Flow Calculations" for each tributary area (includes 10 and 100 year flows). Attached Hydrology exhibit shows the tributary areas. Predevelopment and Post-development overall flows were calculated. The project design includes closed pipe systems which were designed to convey the 10 year storm; see attached Channel report.

Associated design elements from Storm Water Low Impact Development have been sized to capture and treat the increase in runoff from the predevelopment to post-development. More detailed information can be found in the document titled "Pacific Knolls Storm Water Low Impact Development Report."

100 year storm overland release route is shown on the 100 Year Overland Flow Exhibit. Note that site design features and slopes mimic existing patterns, especially in terms of outfall locations from the project, and proposed grading maintains a general south to north and east to west drainage pattern. Should the proposed on-site storm drain system become inundated, overland flow release

from the project site will remain at the existing north and west locations for the vast majority of the project area. Grades at the northern overland release locations are 132.29 and 129.59, and grades at the western overland release locations are 140.25 and 139.95.

Table 1: C-Values

Soil Type C						
Residential ¹						
Rural		0.03	0.33	0.38	0.43	0.47
Very low density	2	0.11	0.38	0.42	0.47	0.51
	1	0.24	0.45	0.49	0.53	0.57
Low density	1/2	0.32	0.50	0.53	0.57	0.60

Land Use	Lot Size	Impervious		Average Slope (%)				
	(acres)	Fraction	0-2	>2-6	>6-12	>12		
	1/3	0.41	0.56	0.59	0.62	0.64		
Medium-low density	1/4	0.49	0.60	0.63	0.65	0.68		
Medium density	1/8	0.70	0.73	0.74	0.76	0.77		
Medium-high density	1/18	1	0.90	0.90	0.90	0.90		
Business, commercial, etc.		1	0.90	0.90	0.90	0.90		
General industrial		1	0.90	0.90	0.90	0.90		
Parks and recreation		0.05	0.34	0.39	0.44	0.48		
Ag and open space		0.02	0.33	0.38	0.43	0.47		

C value taken as 0.9 for post-development impervious areas. C value taken as 0.47 for pervious areas given the soil Hydrologic group C and Ag and open space land use with average slopes of >12% coupled with Table 1 above, per FMDM.

Table 2: Manning's n

Table D.2-1. Manning's Roughness Coefficients for Channels

Channel Material	Manning's Roughness (n)
Concrete, steel troweled, or smooth-form finish	0.014
Concrete, wood float or broomed finish, including pneumatically applied mortar	0.015
Asphaltic concrete	0.017
Sack concrete riprap	0.030
Grouted rock riprap	0.030
Loose rock riprap	0.035
Grass channels	0.035
Constructed natural waterways	0.050 minimum, under typical conditions*
Other natural channels	See references: Arcement, G. J., and V. R. Schneider. 1989. Guide for selecting Manning's roughness coefficients for natural channels and flood plains. U.S. Department of the Interior, US Geological Survey, 67 pp. Available at: pubs.er.usgs.gov/publication/wsp2339. Barnes, H. H. 1967. Roughness characteristics of natural channels. U.S. Government Printing Office, 213 pp. Available at: pubs.usgs.gov/wsp/wsp_1849/pdf/wsp_1849_h.pdf.

^{*} Sonoma Water may be willing to allow values as low as 0.035 for channels that are well maintained and hydraulically smooth.

Manning's roughness coefficient is selected as 0.012 for storm drain HDPE pipe. A value of 0.035 was used for grass swales and channels.

Hydraulics

Hydraflow Express Civil 3D extension was used to model proposed storm drain pipes and swales using the calculated flow for a 10 year storm. The proposed storm drain system outfalls into the city storm drain system at the northeast corner of the site through a 12" HDPE pipe. A 12" HDPE pipe was modeled with the flow from the entire site to ensure it had the capacity for a 10 year storm. The three proposed swales that will transport the water from Tributary Areas 7, 9,10, and 12 will be 6" deep with 2:1 side slopes and have the capacity to carry the flows from each of the respective areas. See attached for full calculations and channel models.

<u>Conclusio</u>n

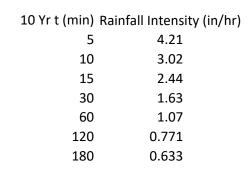
In accordance with Sonoma County Code sections 11.14.040, this project's drainage system has been designed for the 10 year design discharge. The project has been analyzed in accordance with FMDM section 3.3.1 in utilizing the rational method for hydrology to calculate peak flow rates.

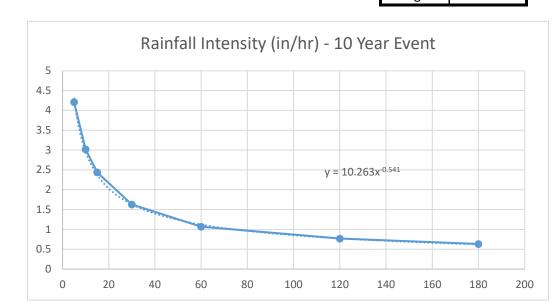
Attachments:

- 1. Pre and Post Development Flow Calculations
- 2. Existing Conditions Exhibit
- 3. Hydrology Exhibit
- 4. 100 Year Overland Flow Exhibit
- 5. Hydraflow Express Storm Drain Pipe Model
- 6. Hydraflow Express Swale Model Tributary Area 9
- 7. Hydraflow Express Swale Model Tributary Area 10
- 8. Hydraflow Express Swale Model Tributary Area 12
- 9. Hydraflow Express Swale Model Tributary Area 7 & 12
- 10. NOAA Point Precipitation Frequency Estimates
- 11. NOAA PDS-Based Intensity-Duration-Frequency (IDF) Curves
- 12. NOAA Maps and Aerials
- 13. Websoilsurvey Soil Map and Map Unit Descriptions

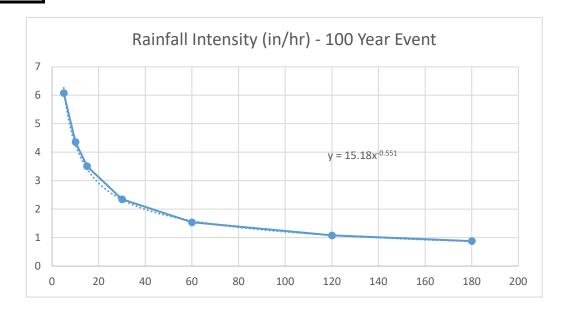
				Pre-Dev	elopment							
Tributary Area	Area (SF)	Pervious Area (SF)	Impervious Area (SF)	Trib Area (ac.)	$C_{pervious}$	C _{impervious}	$C_{weighted}$	t _c (min)	i ₁₀ (in/hr)	i ₁₀₀ (in/hr)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
1	55593	54343	1250	1.28	0.47	0.9	0.48	7	3.58	5.20	2.19	3.18

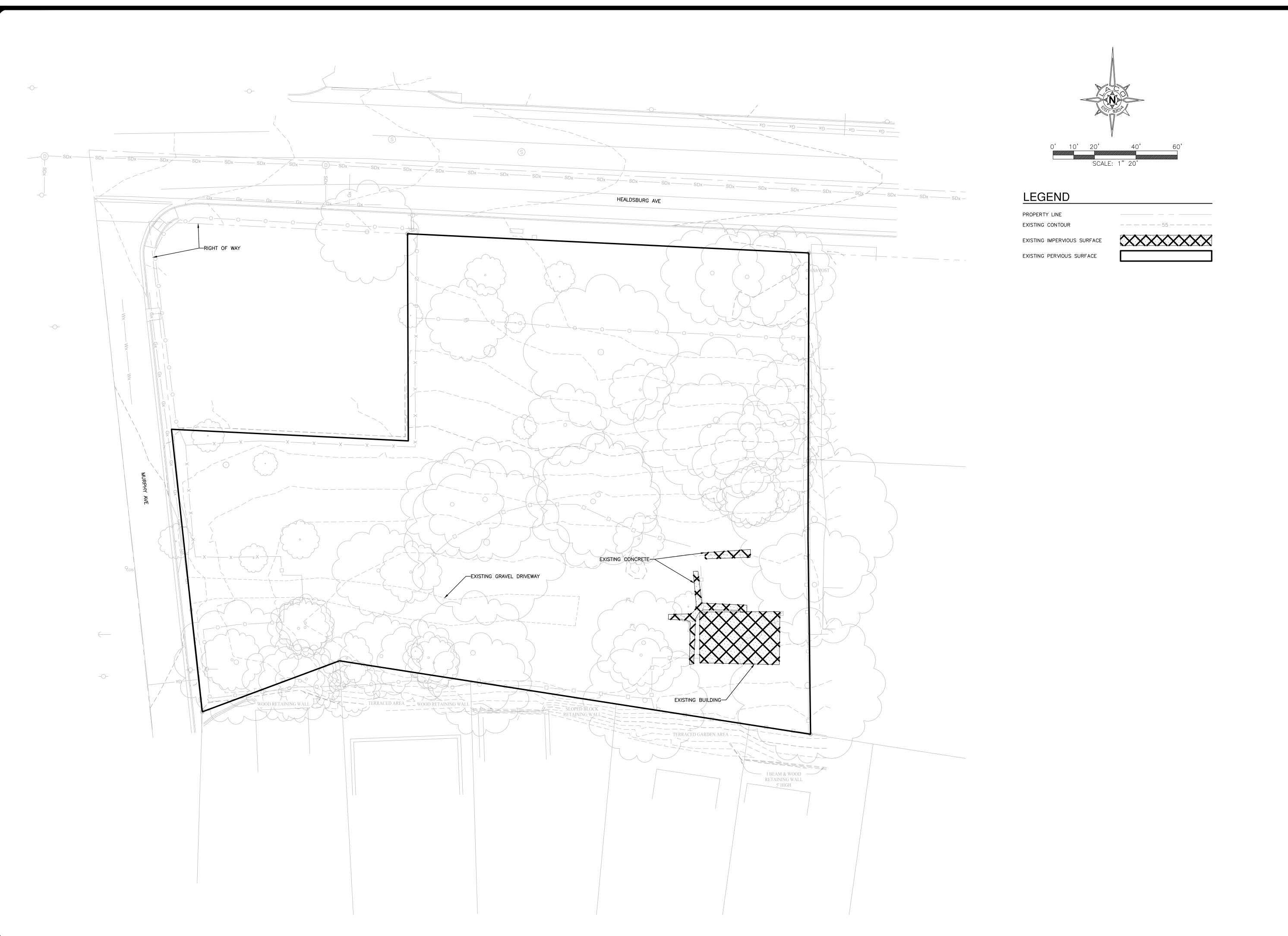
				Post-Dev	elopment							
Tributary Area	Area (SF)	Pervious Area (SF)	Impervious Area (SF)	Trib Area (ac.)	$C_{pervious}$	$C_{impervious}$	$C_{weighted}$	t _c (min)	i ₁₀ (in/hr)	i ₁₀₀ (in/hr)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
1	4697	1452	3245	0.11	0.47	0.9	0.77	7	3.58	5.20	0.30	0.43
2	1411	58	1353	0.03	0.47	0.9	0.88	7	3.58	5.20	0.10	0.15
3	1405	52	1353	0.03	0.47	0.9	0.88	7	3.58	5.20	0.10	0.15
4	807	48	759	0.02	0.47	0.9	0.87	7	3.58	5.20	0.06	0.08
5	4467	604	3863	0.10	0.47	0.9	0.84	7	3.58	5.20	0.31	0.45
6	3054	461	2593	0.07	0.47	0.9	0.84	7	3.58	5.20	0.21	0.30
7	6533	4792	1741	0.15	0.47	0.9	0.58	7	3.58	5.20	0.31	0.46
8	16009	4012	11997	0.37	0.47	0.9	0.79	7	3.58	5.20	1.04	1.51
9	4397	2624	1773	0.10	0.47	0.9	0.64	7	3.58	5.20	0.23	0.34
10	3358	1584	1774	0.08	0.47	0.9	0.70	7	3.58	5.20	0.19	0.28
11	6456	1717	4739	0.15	0.47	0.9	0.79	7	3.58	5.20	0.42	0.60
12	3413	1662	1751	0.08	0.47	0.9	0.69	7	3.58	5.20	0.19	0.28
						Avg C	0.77			Total Post	3.47	5.03

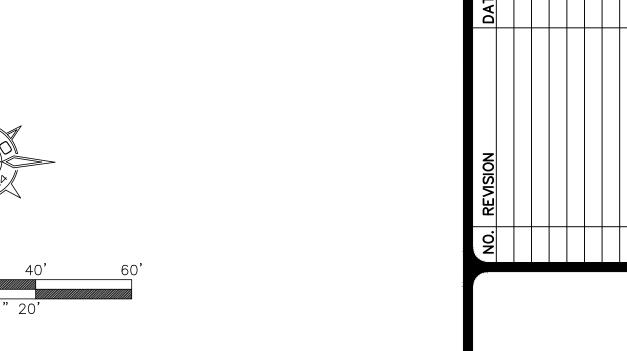




100 Vr +	Dainfall Intensity (in /br)
100 Yr t	Rainfall Intensity (in/hr)
5	6.08
10	4.36
15	3.51
30	2.35
60	1.54
120	1.08
180	0.88

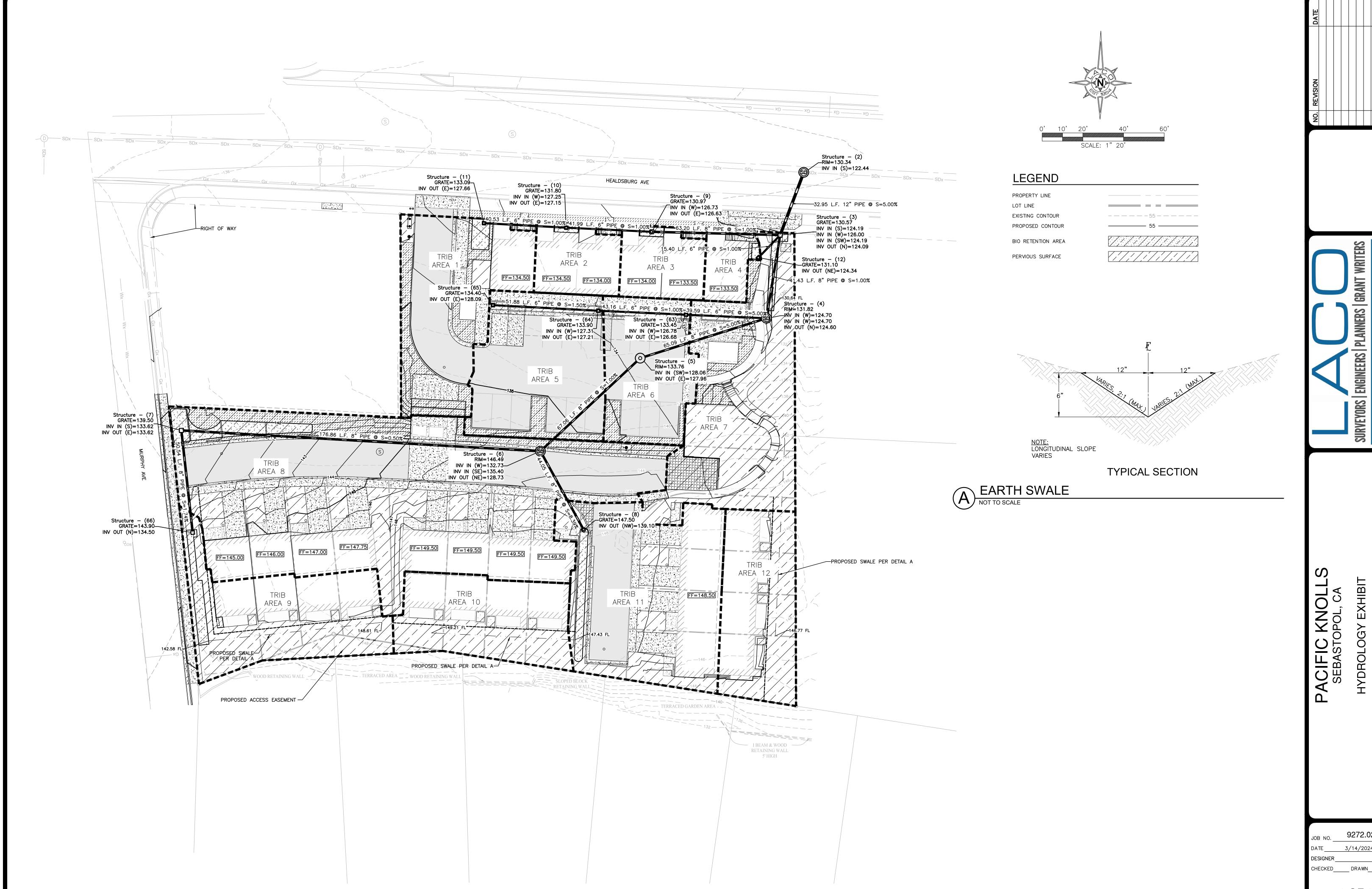




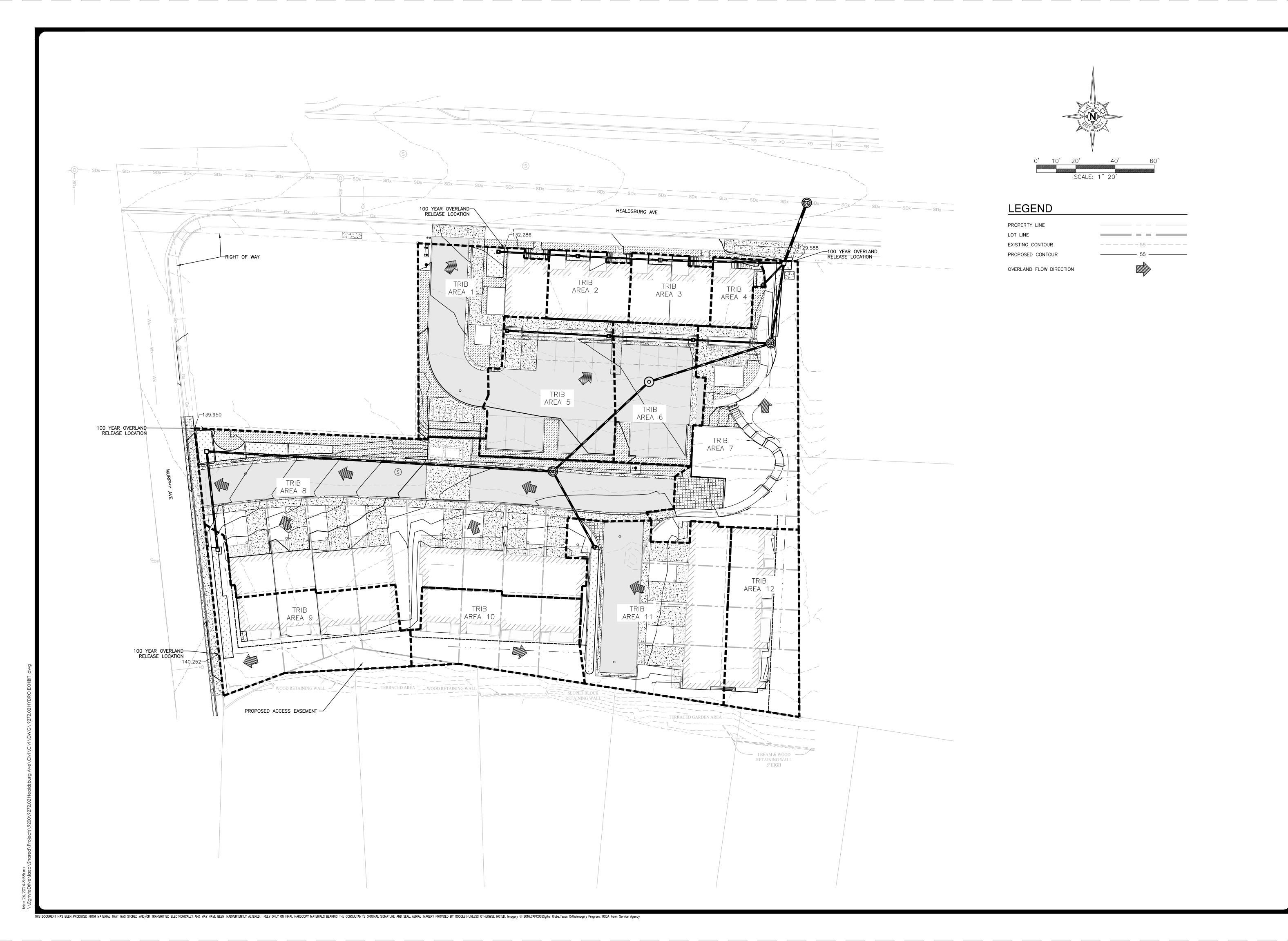


3/14/2024

CHECKED____ DRAWN___



JOB NO. _ 9272.02 3/14/2024 DESIGNER



_{JOB NO.} 9272.02 3/14/2024 DESIGNER___

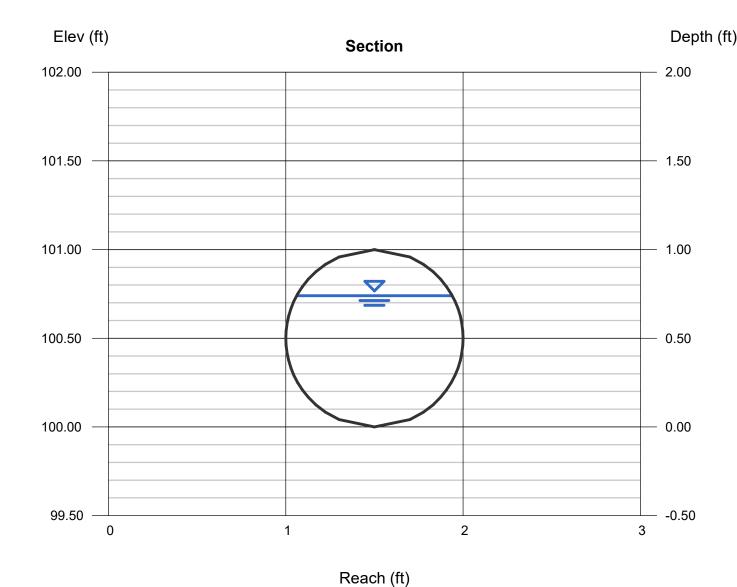
CHECKED____ DRAWN___

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Mar 14 2024

Storm Drain Pipe

Circular		Highlighted	
Diameter (ft)	= 1.00	Depth (ft)	= 0.74
		Q (cfs)	= 3.470
		Area (sqft)	= 0.62
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 5.56
Slope (%)	= 1.00	Wetted Perim (ft)	= 2.08
N-Value	= 0.012	Crit Depth, Yc (ft)	= 0.80
		Top Width (ft)	= 0.88
Calculations		EGL (ft)	= 1.22
Compute by:	Known Q		
Known Q (cfs)	= 3.47		



Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Mar 14 2024

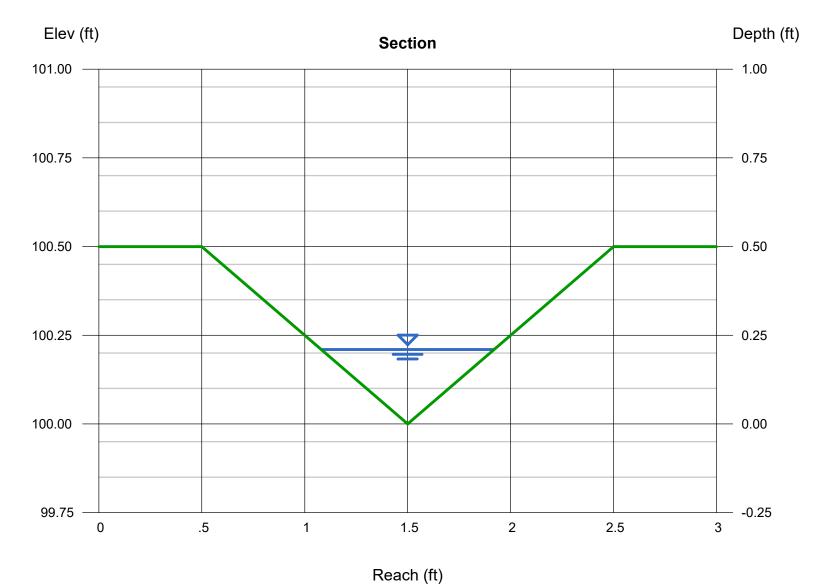
Typical Swale - Trib Area 9

Side Slopes (z:1) Total Depth (ft)	= 2.00, 2.00 = 0.50
Invert Elev (ft) Slope (%) N-Value	= 100.00 = 9.50 = 0.035
N-Value	= 0.035

Calculations

Compute by: Known Q Known Q (cfs) = 0.23

Highlighted	
Depth (ft)	= 0.21
Q (cfs)	= 0.230
Area (sqft)	= 0.09
Velocity (ft/s)	= 2.61
Wetted Perim (ft)	= 0.94
Crit Depth, Yc (ft)	= 0.25
Top Width (ft)	= 0.84
EGL (ft)	= 0.32



Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Mar 14 2024

= 0.29

Typical Swale - Trib Area 10

Triangular
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 0.50

Invert Elev (ft) = 100.00 Slope (%) = 2.70 N-Value = 0.035

Calculations

Compute by: Known Q Known Q (cfs) = 0.19

 Highlighted

 Depth (ft)
 = 0.25

 Q (cfs)
 = 0.190

 Area (sqft)
 = 0.13

Area (sqft) = 0.13

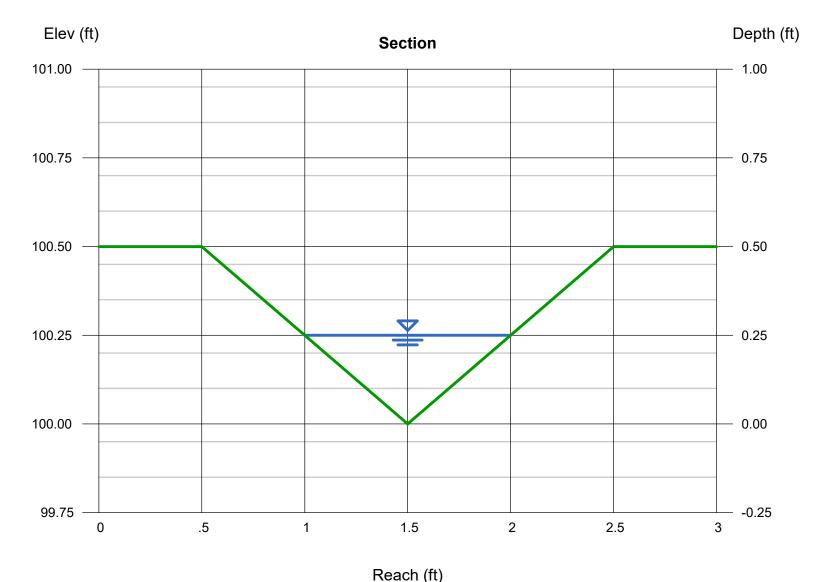
Velocity (ft/s) = 1.52

Wetted Perim (ft) = 1.12

Crit Depth, Yc (ft) = 0.23

Top Width (ft) = 1.00

EGL (ft)



Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

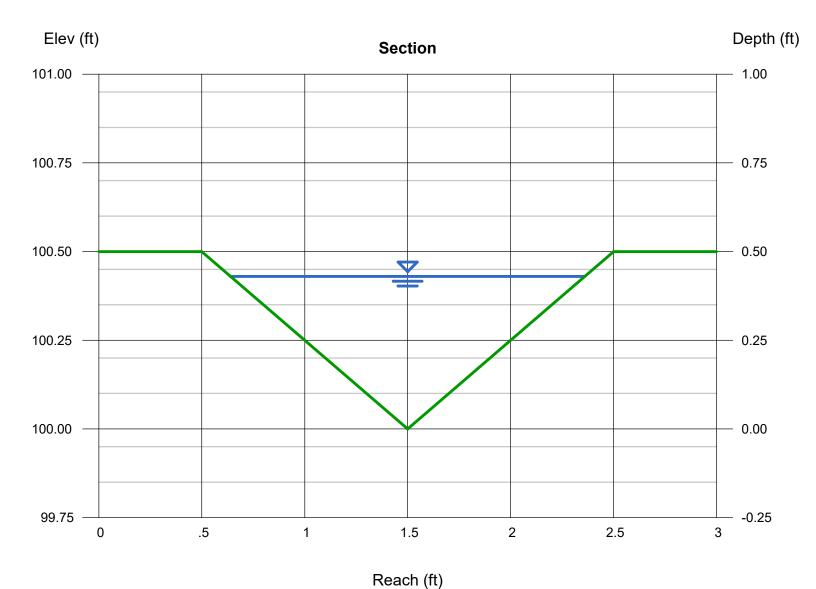
= 0.50

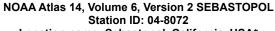
Friday, Mar 22 2024

DMA 7 & 12 Swale

Known Q (cfs)

Triangular		Highlighted	
Side Slopes (z:1)	= 2.00, 2.00	Depth (ft)	= 0.43
Total Depth (ft)	= 0.50	Q (cfs)	= 0.500
		Area (sqft)	= 0.37
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 1.35
Slope (%)	= 1.00	Wetted Perim (ft)	= 1.92
N-Value	= 0.035	Crit Depth, Yc (ft)	= 0.33
		Top Width (ft)	= 1.72
Calculations		EGL (ft)	= 0.46
Compute by:	Known Q		







Location name: Sebastopol, California, USA* Latitude: 38.4086°, Longitude: -122.8211° Elevation:

Elevation (station metadata): 68 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

Duration	Average recurrence interval (years)									
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	2.42 (2.16-2.76)	2.96 (2.64-3.37)	3.66 (3.24-4.18)	4.21 (3.70-4.86)	4.96 (4.18-5.94)	5.52 (4.54-6.78)	6.08 (4.85-7.69)	6.65 (5.14-8.70)	7.40 (5.45-10.2)	7.98 (5.64-11.4)
10-min	1.74 (1.55-1.97)	2.13 (1.89-2.42)	2.62 (2.32-2.99)	3.02 (2.65-3.48)	3.55 (2.99-4.26)	3.95 (3.25-4.86)	4.36 (3.48-5.51)	4.76 (3.68-6.23)	5.30 (3.90-7.29)	5.72 (4.04-8.18)
15-min	1.40 (1.25-1.59)	1.72 (1.52-1.95)	2.12 (1.87-2.41)	2.44 (2.14-2.81)	2.86 (2.41-3.44)	3.19 (2.62-3.92)	3.51 (2.80-4.44)	3.84 (2.96-5.02)	4.28 (3.15-5.88)	4.61 (3.26-6.59)
30-min	0.938 (0.834-1.07)	1.15 (1.02-1.30)	1.41 (1.25-1.61)	1.63 (1.43-1.88)	1.92 (1.61-2.30)	2.13 (1.75-2.62)	2.35 (1.87-2.97)	2.57 (1.98-3.36)	2.86 (2.10-3.93)	3.08 (2.18-4.41)
60-min	0.616 (0.548-0.699)	0.752 (0.668-0.855)	0.928 (0.822-1.06)	1.07 (0.937-1.23)	1.26 (1.06-1.51)	1.40 (1.15-1.72)	1.54 (1.23-1.95)	1.68 (1.30-2.20)	1.88 (1.38-2.58)	2.02 (1.43-2.89)
2-hr	0.452 (0.402-0.513)	0.550 (0.489-0.625)	0.674 (0.597-0.768)	0.771 (0.676-0.888)	0.897 (0.756-1.08)	0.991 (0.814-1.22)	1.08 (0.864-1.37)	1.17 (0.907-1.54)	1.29 (0.950-1.78)	1.38 (0.975-1.97)
3-hr	0.373 (0.332-0.424)	0.454 (0.403-0.516)	0.554 (0.491-0.633)	0.633 (0.555-0.729)	0.734 (0.618-0.880)	0.808 (0.664-0.994)	0.880 (0.702-1.11)	0.951 (0.734-1.24)	1.04 (0.766-1.43)	1.11 (0.782-1.58)
6-hr	0.276 (0.245-0.313)	0.337 (0.300-0.384)	0.412 (0.365-0.471)	0.470 (0.412-0.542)	0.544 (0.458-0.652)	0.596 (0.490-0.733)	0.647 (0.516-0.819)	0.696 (0.538-0.911)	0.759 (0.558-1.04)	0.803 (0.567-1.15)
12-hr	0.189 (0.168-0.215)	0.237 (0.211-0.270)	0.295 (0.261-0.336)	0.338 (0.297-0.390)	0.393 (0.331-0.471)	0.432 (0.355-0.531)	0.468 (0.374-0.593)	0.504 (0.389-0.659)	0.548 (0.403-0.752)	0.579 (0.409-0.828
24-hr	0.123 (0.111-0.140)	0.158 (0.142-0.180)	0.200 (0.179-0.228)	0.232 (0.206-0.266)	0.270 (0.233-0.320)	0.298 (0.252-0.359)	0.323 (0.268-0.398)	0.348 (0.281-0.439)	0.378 (0.294-0.496)	0.399 (0.301-0.540
2-day	0.088 (0.079-0.099)	0.113 (0.101-0.128)	0.142 (0.127-0.162)	0.164 (0.146-0.188)	0.191 (0.165-0.226)	0.210 (0.178-0.253)	0.228 (0.189-0.281)	0.245 (0.198-0.310)	0.266 (0.207-0.349)	0.281 (0.211-0.380
3-day	0.067 (0.061-0.077)	0.086 (0.078-0.098)	0.109 (0.098-0.124)	0.126 (0.112-0.144)	0.146 (0.126-0.173)	0.161 (0.136-0.194)	0.174 (0.144-0.215)	0.187 (0.151-0.236)	0.202 (0.157-0.266)	0.214 (0.161-0.289
4-day	0.056 (0.051-0.064)	0.072 (0.065-0.082)	0.091 (0.081-0.104)	0.105 (0.093-0.120)	0.122 (0.105-0.144)	0.134 (0.113-0.161)	0.145 (0.120-0.179)	0.156 (0.126-0.197)	0.169 (0.131-0.221)	0.178 (0.134-0.241
7-day	0.040 (0.036-0.046)	0.051 (0.046-0.058)	0.065 (0.058-0.074)	0.074 (0.066-0.085)	0.086 (0.075-0.102)	0.095 (0.080-0.114)	0.103 (0.085-0.127)	0.110 (0.089-0.139)	0.119 (0.093-0.157)	0.126 (0.095-0.170
10-day	0.032 (0.029-0.036)	0.041 (0.037-0.046)	0.051 (0.046-0.058)	0.059 (0.052-0.068)	0.069 (0.059-0.081)	0.075 (0.064-0.091)	0.081 (0.067-0.100)	0.087 (0.070-0.110)	0.094 (0.073-0.124)	0.099 (0.075-0.135
20-day	0.021 (0.019-0.024)	0.027 (0.024-0.031)	0.034 (0.030-0.039)	0.039 (0.035-0.045)	0.045 (0.039-0.054)	0.050 (0.042-0.060)	0.054 (0.044-0.066)	0.057 (0.046-0.073)	0.062 (0.048-0.081)	0.065 (0.049-0.088
30-day	0.017 (0.015-0.019)	0.022 (0.019-0.025)	0.027 (0.024-0.031)	0.031 (0.028-0.036)	0.036 (0.031-0.043)	0.039 (0.033-0.047)	0.042 (0.035-0.052)	0.045 (0.037-0.057)	0.049 (0.038-0.064)	0.051 (0.039-0.070
45-day	0.014 (0.012-0.016)	0.018 (0.016-0.020)	0.022 (0.020-0.025)	0.025 (0.022-0.029)	0.029 (0.025-0.034)	0.032 (0.027-0.038)	0.034 (0.028-0.042)	0.036 (0.029-0.046)	0.039 (0.030-0.052)	0.041 (0.031-0.056
60-day	0.012	0.015	0.019	0.022	0.025	0.028	0.030	0.032	0.034	0.036

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

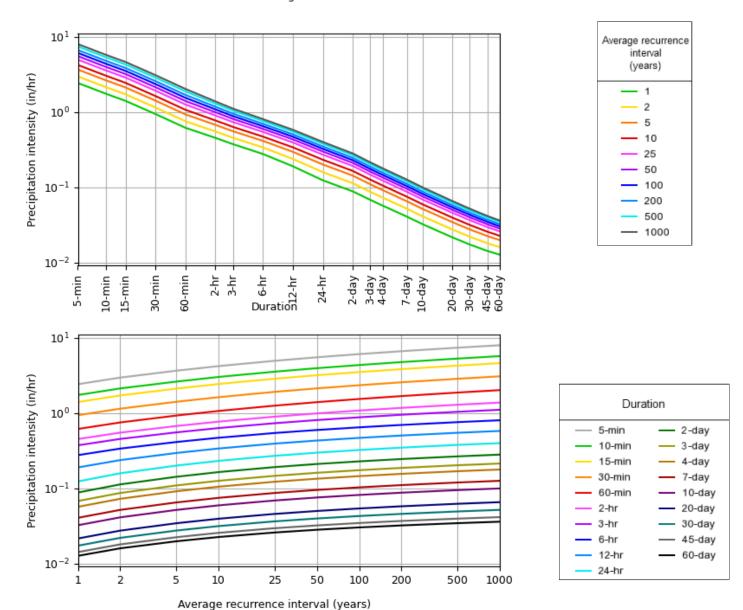
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based intensity-duration-frequency (IDF) curves Latitude: 38.4086°, Longitude: -122.8211°



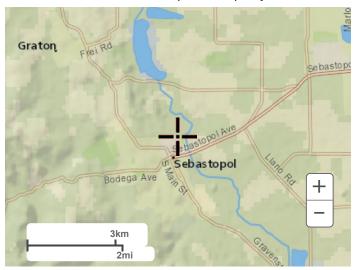
NOAA Atlas 14, Volume 6, Version 2

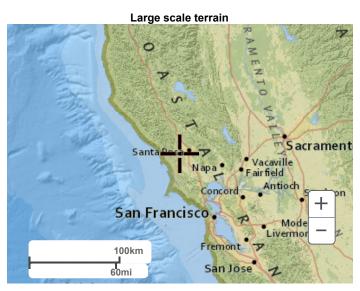
Created (GMT): Wed Mar 13 21:17:08 2024

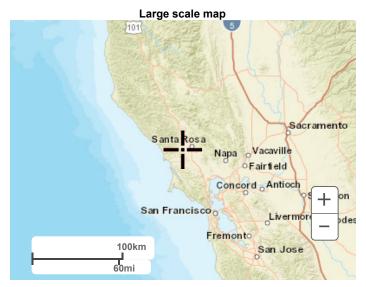
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Maps & aerials

Small scale terrain







Large scale aerial



Back to Top

US Department of Commerce

National Oceanic and Atmospheric Administration

National Weather Service

National Water Center

1325 East West Highway

Silver Spring, MD 20910

Questions?: HDSC.Questions@noaa.gov

Disclaimer



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

(o)

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

å

Spoil Area Stony Spot

Very Stony Spot

Ŷ

Wet Spot Other

Δ

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

00

Major Roads Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20.000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California Survey Area Data: Version 17, Sep 11, 2023

Soil map units are labeled (as space allows) for map scales 1:50.000 or larger.

Date(s) aerial images were photographed: Mar 26, 2022—Apr 25. 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI			
GdC	Goldridge fine sandy loam, 2 to 9 percent slopes	0.0	0.1%			
SbD2	Sebastopol sandy loam, 9 to 15 percent slopes, eroded	1.5	99.9%			
Totals for Area of Interest		1.5	100.0%			

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

Custom Soil Resource Report

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sonoma County, California

GdC—Goldridge fine sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hfcy Elevation: 200 to 2,000 feet

Mean annual precipitation: 40 inches Mean annual air temperature: 57 degrees F

Frost-free period: 225 to 240 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Goldridge and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldridge

Setting

Landform: Hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Concave Across-slope shape: Convex

Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 24 inches: fine sandy loam H2 - 24 to 28 inches: sandy clay loam H3 - 28 to 72 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20

to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: F004BK103CA - Upper slopes and higher elevation mountains

Hydric soil rating: No

Minor Components

Cotati

Percent of map unit: 4 percent

Hydric soil rating: No

Custom Soil Resource Report

Blucher

Percent of map unit: 4 percent

Hydric soil rating: No

Sebastopol

Percent of map unit: 3 percent

Hydric soil rating: No

Steinbeck

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Swales Hydric soil rating: Yes

SbD2—Sebastopol sandy loam, 9 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hfjf Elevation: 100 to 1,000 feet

Mean annual precipitation: 40 inches Mean annual air temperature: 55 degrees F

Frost-free period: 200 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Sebastopol and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebastopol

Setting

Landform: Terraces

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Concave Across-slope shape: Convex

Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 8 inches: sandy loam H2 - 8 to 12 inches: sandy clay loam

H3 - 12 to 43 inches: clay
H4 - 43 to 62 inches: clay loam
H5 - 62 to 72 inches: sandy clay loam

Properties and qualities

Slope: 9 to 15 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R004BY066CA - CLAYPAN

Hydric soil rating: No

Minor Components

Cotati

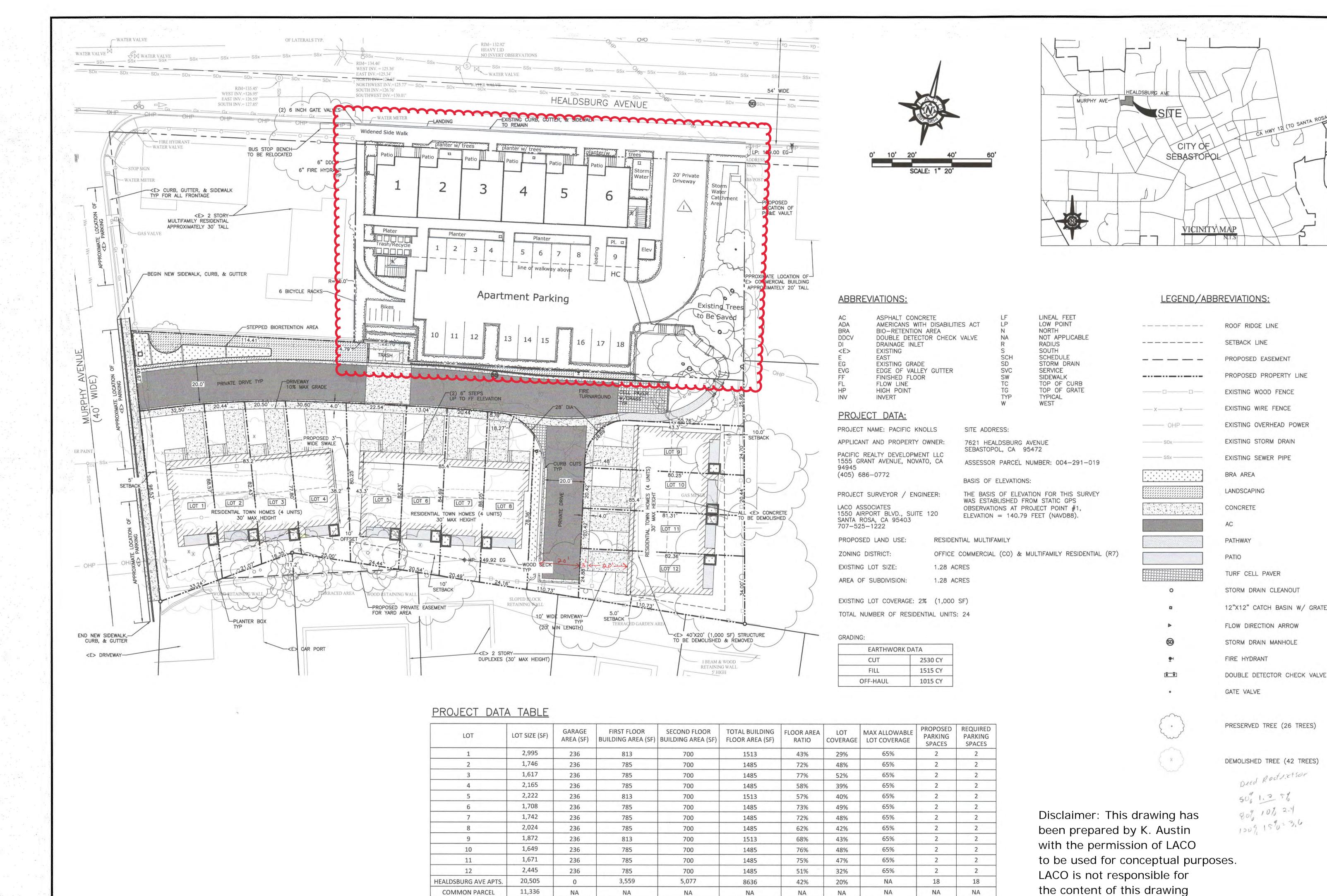
Percent of map unit: 8 percent

Hydric soil rating: No

Goldridge

Percent of map unit: 7 percent

Hydric soil rating: No



NA

NA

NA

NA

11,336

NA

COMMON PARCEL

24 X 38 PRINTED ON NO. 1000H CLEARPRINTO

AIA topol,

REVISIONS

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aldsbur

Pacific

Revised

Date 8-14-2024

Scale 1"=10'

Drawn K Austin

Rev. SP