Buck Gulch Falls

Accessible Trail Feasibility Study

Ignacio Valley Preserve
Marin County, CA
December 2024

Prepared for:

Marin County Open Space District
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Appendix

1 Executive Summary & Introduction

Marin County Parks (MCP), which includes the Marin County Open Space District (District), manages and maintains the Ignacio Valley Preserve (Preserve), one of its 34 open space preserves in Marin County. The Preserve supports a small network of trails and limited fire roads for hikers, bikers, dog walkers, and equestrians situated on the outskirts of Novato (See Figure 1). The Buck Gulch Falls Trail study area is located in the northwest corner of the Preserve along Arroyo de San Jose Creek, and can be accessed at the end of Fairway Drive, off Ignacio Boulevard. The existing Buck Gulch Falls Trail extends approximately 0.7 miles alongside Arroyo de San Jose Creek, leading visitors to the falls (See Figure 2).

The Ignacio Valley Preserve is located within Region 3 of the District. A portion of the Buck Gulch Falls Trail lies within a public use easement on private property. The easement is with Marin Country Club Estates, LLC. The public easement is a 20-foot wide corridor for pedestrian, equestrian, and bicycle use, District maintenance vehicle use, and emergency vehicles. In 2016, the Buck Gulch Falls Trail was approved for formal adoption subject to improvements as part of the Region 3 Road and Trail Designation process. The identified trail upgrades include two bridge crossings on Arroyo de San Jose Creek and at least two drainage crossings on ephemeral tributaries.

The objective of this study is to evaluate the feasibility of converting a portion of the existing trail, located a quarter-mile from the trailhead and leading to Buck Gulch Falls (approximately 2,000 linear feet), into a fully accessible route in accordance with the District's Inclusive Access Plan. The District analyzed the first quarter mile and identified as the existing trail as having the potential to achieve full accessibility. To support this assessment, the District has partnered with PCI Ecological (PCI) to gather valuable insights to guide future initiatives aimed at improving trail accessibility. This evaluation determines the feasibility of achieving full accessibility along the entire trail length, as well as identification of appropriate accessibility standards for sections where complete compliance may not be feasible. The feasibility study is grounded in an analysis of environmental constraints, as well as a review of technical challenges, constructability, and estimated construction costs.

The study found that full accessibility can be achieved along the entire trail; although, potential accessibility varies in terms of standards, costs, constructability, and future maintenance requirements. The current conditions reveal that certain segments of the trail are more amenable to the necessary improvements, while others present greater challenges, which impact the level of achievable accessibility as well as associated costs.

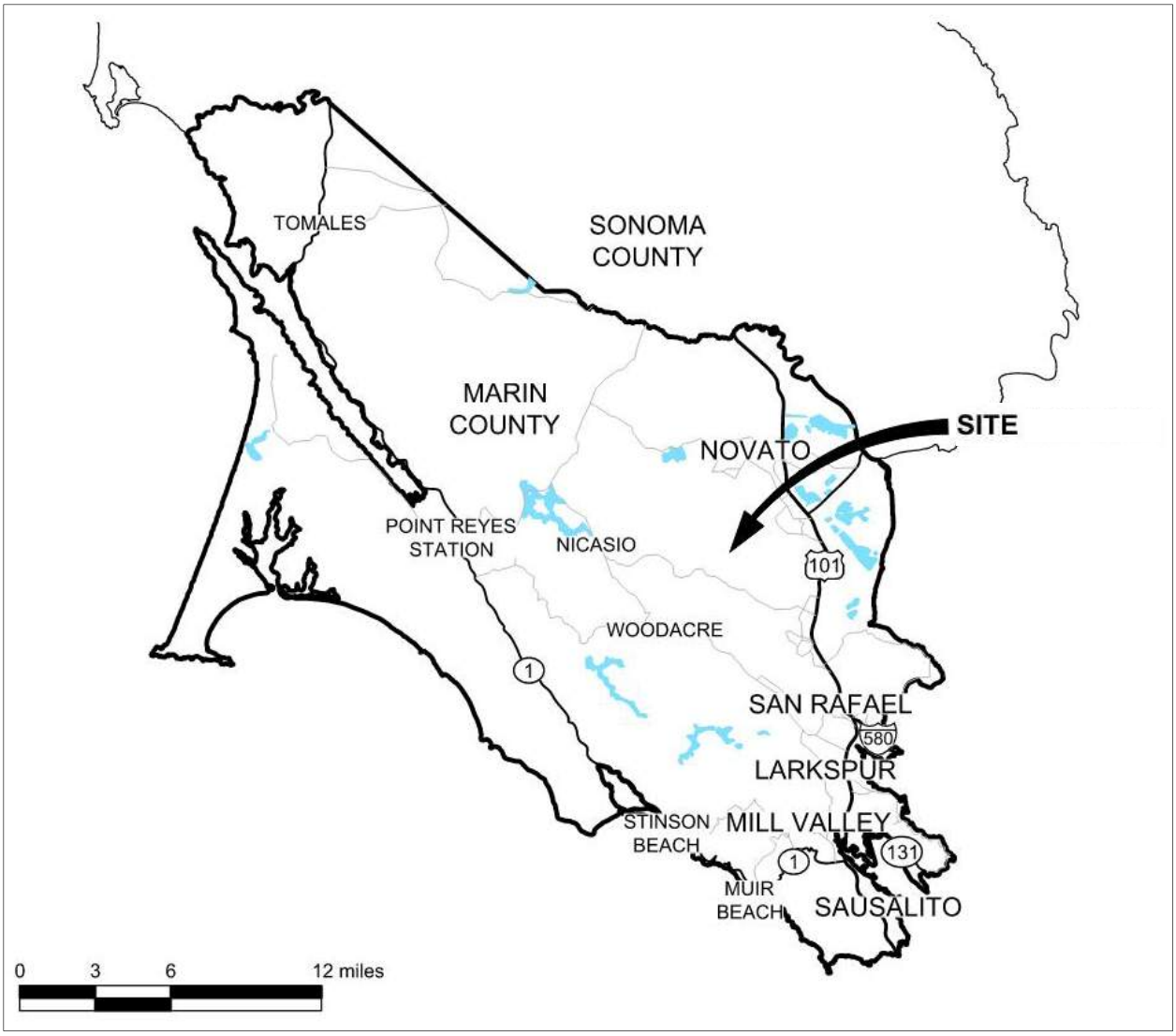


Figure 1. Vicinity Map

Figure 2. Location Map

Summary of Existing Conditions and Data

PCI conducted a detailed topographic field survey within the study area of the trees, existing ground surface, streambanks near the existing trail, and other notable features that contribute to the determination of site accessibility. The survey was detailed enough to account for obstacles that may impact accessibility like large boulders, tree roots, and other topography constraints required for trail feasibility planning. The Existing Trail Assessment (See Appendix A) displays this data along with the existing trail slopes color coded on the plan. Low limbed trees are noted to ensure adequate vertical clearance. The significant population of yellow Douglas iris *(Iris douglasiana)*, which flourish in the oak understory along the existing trail, is also included. The analysis indicates that 41.9 percent of the existing trail has a slope profile that exceeds 8 percent. According to the standards outlined in the following section, the length of trail with slopes above 8 percent is limited.

Following an initial analysis of the existing slopes and other natural features, PCI determined the trail from the beginning of the study area to the proposed bridge location is better suited for supporting a fully accessible trail in accordance with the guidelines outlined later in this study. It features more naturally flat sections, provides sufficient space for grading, allows for access by construction equipment, and has fewer trees in proximity to the trail. The segment of the trail upstream of the proposed bridge is characterized by a narrower trail corridor, with a steep incline on one side and the creek in close proximity on the other side. This area is marked by denser tree cover, the presence of larger boulders, and a steep ascent leading to a vantage point for viewing the waterfall. Consequently, this section presents more significant challenges regarding accessibility and constructability compared to the initial part of the trail. The two segments are designated as Segment 1 and Segment 2 for the purposes of this study (see Figure 3).

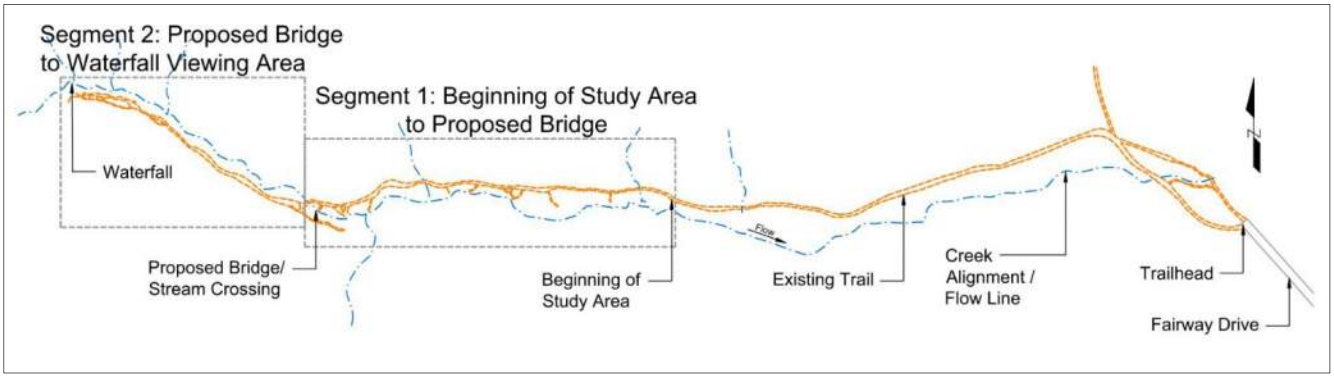


Figure 3. Trail Segments

Soils in the study area are mapped as Tocaloma-McMullin complex (NRCS 2021). These are well-drained loam and/or gravelly loam soils derived from residuum weathered from sandstone, shale, and conglomerate. Depth to bedrock ranges from 18 to 43 inches. The soil type is particularly important when evaluating benching trails into steep hillsides, as it directly impacts trail long-term durability and safety.

Following are a few photos showing obstacles and trail conditions for general context.

Photo 1. Existing trail near beginning of study area looking east

Photo 2. Overhanging tree limbs in Trail Segment 1

Photo 3. Boulder within trail in Segment 1 to be worked around

Photo 4. Existing trees, slope and creek adjacent to waterfall in Segment 2

Photo 5. Approach to Waterfall Viewing Area looking upstream in Segment 2

2 Trail Design Principles

The study area features annual and perennial grasslands, shrublands, riparian scrub and forest, and woodlands (Biological Resources Assessment 2021). The area necessitates a design that considers the appropriate width and slope to accommodate a diverse range of users while also addressing potential environmental impacts, including ground disturbance, tree removal, habitat loss, as well as costs associated with trail construction and maintenance.

Marin County Parks' Inclusive Access Plan incorporates two tiers of accessible trail design strategies that adhere to the standards outlined in the Accessibility Guidelines for Outdoor Developed Areas (AGODA), as established by the Architectural Barriers Act, the California State Building Code, and the best practices employed by Marin County Parks. The standards applied for this feasibility study are the MCP Trail Standards, supplemented by AGODA standards when more specific guidance was required.

Marin County Parks Access and Discovery Trail

The **Marin County Parks Access and Discovery Trail** standards for trails include the following features:

- **Surface:** To be maintained firm and stable to the greatest extent possible.
- **Width:** Maintained at 60" minimum.
- **Slopes:** Maintained at minimum necessary to provide drainage; slopes to comply with AGODA standards below; the cross slope shall not be steeper than 1:48.
- **Resting Intervals and Passing Spaces:** Resting spaces provided to allow users to rest after vertical changes in elevation.

- **Amenities:** Seating at resting intervals is a helpful amenity to provide periodic resting opportunities along the trail.

Marin County Parks Improved Access Trails

The **Marin County Parks Improved Access Trails** standards include the following features:

- **Surface:** To greatest extent possible, the trail surface is to be firm and stable. When not achievable it will be identified on the trailhead sign and on the website.
- **Width:** Maintained at 48" minimum. It may be reduced to 36" for lengths of 48", separated by 48" segments.
- **Slopes:** Maintained at minimum necessary to provide drainage and to comply with AGODA standards below; if slopes exceed the standards they will be listed on trailhead sign and website.
- **Amenities:** Benches should be provided at locations longer than one-half mile where it does not impact natural resources.

Accessibility Guidelines for Outdoor Developed Areas (AGODA) Standards

The **AGODA standards** (US Access Board 2013) for trails contained in Section 1017 include the following key features:

- **§1017.2 - Surface** – Firm and stable
- **§1017.3 - Clear Tread Width** – 36" minimum
- **§1017.4 - Passing Spaces** – 60" x 60" at intervals of 1,000 feet maximum.
- **§1017.5 - Tread Obstacles** – Not to exceed ½ inch
- **§1017.6 - Openings** – Does not allow the passage of a sphere more than 1/2 inch in diameter.
- **§1017.7 - Slopes** – Not more than 30 percent of the total length of a trail shall have a running slope steeper than 1:12 (8.33 percent). The running slope of any segment of a trail shall not be steeper than 1:8 (12 percent). Where the running slope of a segment of a trail is steeper than 1:20 (5 percent), the maximum length of the segment shall be in accordance with Table 1017.7.1, and a resting interval complying with §1017.8 shall be provided at the top and bottom of each segment.

Table §1017.7.1

Running Slope of Trail Segment		Maximum Length of Segment
Steeper than	But not Steeper than	
1:20 (5%)	1:12 (8.33%)	200 feet
1:12 (8.33%)	1:10 (10%)	30 feet
1:10 (10%)	1:8 (12%)	10 feet

- **§1017.8 Resting Intervals** – 60" long minimum; at least as wide as the widest segment of the trail tread leading to the resting interval; slopes not steeper than 1:48 in any direction.

Outdoor Developed Areas Standards Exceptions

The Outdoor Developed Area Standards include Conditions for Exceptions. Some conditions include:

- Compliance is not practicable due to terrain.
- Compliance cannot be accomplished with prevailing construction practices.
- Compliance would fundamentally alter the function or purpose of the facility or the setting.
- Compliance is limited or precluded by any of the following laws, or by decisions or opinions issued or agreements executed pursuant to any of the following laws:
    - Endangered Species Act (16 U.S.C. §§ 1531 et seq.);
    - National Environmental Policy Act (42 U.S.C. §§ 4321 et seq.);
    - National Historic Preservation Act (16 U.S.C. §§ 470 et seq.);
    - Wilderness Act (16 U.S.C. §§ 1131 et seq.); or
    - Other federal, state, or local laws the purpose of which is to preserve threatened or endangered species; the environment; or archaeological, cultural, historical, or other significant natural features.

See AGODA (ABA 2013) for the full list of exceptions. The Arroyo de San Jose Creek corridor hosts some steep terrain that will potentially be a limiting factor to gain full accessibility to the waterfall.

3 Trail Design Alternatives

Designing accessible trails in natural environments presents the challenge of creating pathways that are both environmentally sustainable and enjoyable for a diverse range of users while adhering to the established accessibility guidelines stated above. The trail study area has been divided into two segments, because the two segments have different existing conditions and require varying degrees of required treatment to increase accessibility. Figure 3 illustrates the different segments discussed below.

Segment 1: Beginning of Study Area to Proposed Bridge

This first segment predominantly supports coyote brush scrub and coast live oak woodland vegetation communities (Biological Resources Assessment 2021) with 46 percent of the existing trail slopes measuring 5 percent or less. The remaining breakdown of this segment of existing trail grade is as follows:

Trail Slope	**% of Overall Trail**
5% and under	46.0%
5% - 8%	26.7%
8% - 10%	12.6%
10% - 12%	6.8%
Over 12%	7.8%
% of trail over 8%	**27.2%**

The design objective for this segment of the trail was to maintain a clear width of 60“, without obstructions (both at the ground and from overhanging tree limbs), while also reducing the steepness of the most challenging areas in order to meet the MCP Access and Discovery Trail Standards. This can be achieved by incorporating meanders that create the necessary distance to reduce the overall slope, resulting in a gradual incline while offering a varied pathway. The extension of the trail length would

affect adjacent vegetated areas; however, it aims to minimize the removal of existing trees and native vegetation as much as possible. Two small tributaries draining from the north are located in the first reach of trail. Flows from the tributaries would be conveyed through culverts where they intersect with a rock wall or armored fill crossings where they do not. Small rocked wet crossings set with an accessible cobble stone surface can be considered as an alternative design in these locations.

Alternative A: Creek Trail to Proposed Bridge with Walls

This design alternative can successfully meet accessibility compliance by utilizing stacked rock walls, which minimizes the grading footprint to maintain the existing grade outside the trail corridor. These walls also provide stabilization for cut and fill slopes and facilitate climbing turns along trail segments. They can be aesthetically harmonious with the natural environment and are straightforward to engineer and construct. Furthermore, this method minimizes soil disturbance and the removal of existing vegetation overall. The approach to the bridge extends into the native iris area; however, the impact on the iris area can be reduced through the construction of a rock wall. These walls also establish a physical barrier that delineates boundaries, such as separating the user from the creek zone and forest understory to enhance ecosystem protection, or designating specific areas for rest such as a pullout with views of the creek. The earthwork requirements in this alternative would require 86 cubic yards of fill and 153 cubic yards of cut and all walls would be kept to a height of less than three feet. Figure 3 illustrates a typical retaining wall.

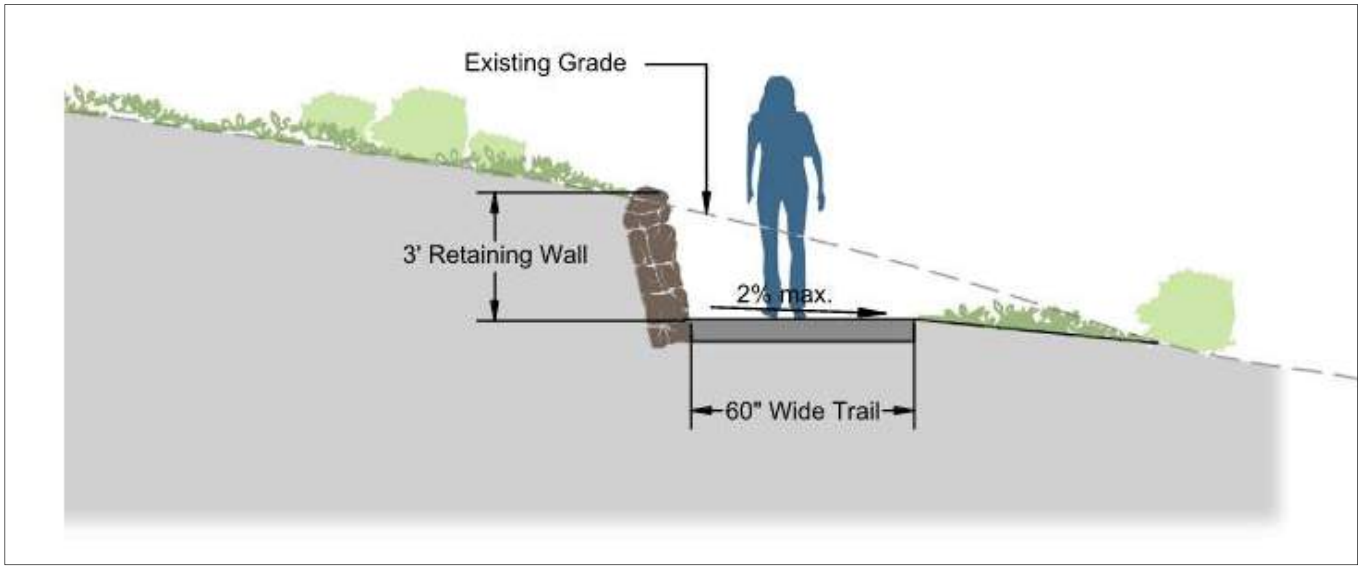
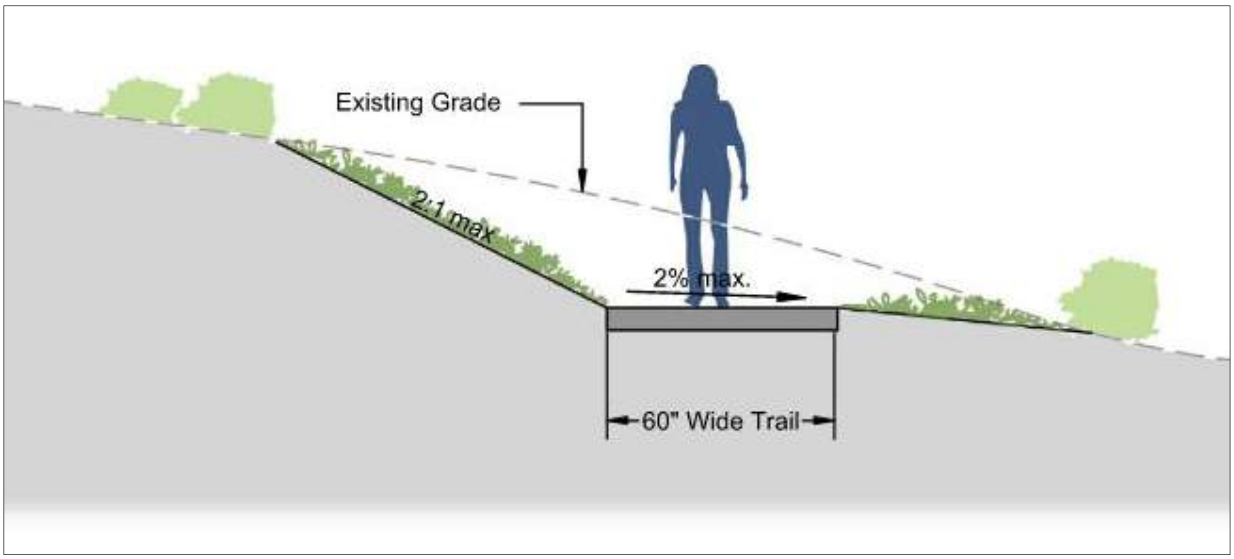


Figure 3. Trail with Rock Retaining Wall

Alternative B: Creek Trail to Proposed Bridge without Walls

This alternative would reduce the number of rock retaining walls required by laying back areas upslope of the trail, with slopes varying from 3:1 to 2:1. This approach would expand the grading footprint and would disturb more ground and more vegetation removal; although, it may lower construction costs. Nevertheless, it remains a feasible and straightforward solution with comparable cut/fill requirements to Alternative A. Both options would comply with the accessibility requirements established by the MCP Access and Discovery Trail Standards. The distinction between them lies in their construction costs and grading footprint. A combination of both approaches could be considered during future design refinement.

Figure 4. Trail with Slope to meet Existing Grade



Segment 2: Proposed Bridge to Waterfall Viewing Area

The second segment is characterized by Big Leaf Maple Forest and Coast Live Oak Woodland (Biological Resources Assessment 2021), with 24 percent of the existing slopes sloped at 5 percent or less and 19 percent of the trails exceeding a steepness of 12 percent. The remaining breakdown of this segment of existing trail grade is as follows:

Trail Slope	**% of Overall Trail Total**
5% and under	24.1%
5% - 8%	15.3%
8% - 10%	26.3%
10% - 12%	14.7%
Over 12%	19.6%
% of trail over 8%	**60.6%**

The trail on the west side of the proposed bridge presents several challenges due to specific environmental constraints, including steep hillsides, more confined trail corridor (near the creek), large boulders, and a greater number of existing native trees in proximity to the trail. These factors

complicate the construction process. Unlike the first segment where meandering trails could be incorporated to increase trail length and accommodate slopes, this segment offers less space for such adjustments. Consequently, it would require more substantial earthwork, increased edge protection measures, and the removal of more trees. Overall, these factors contribute to a greater construction effort and environmental impact in making the trail accessible.

Alternative A: Creek Trail with Boardwalk and Stairs

This design alternative would comply with the MCP Access and Discovery Trail Standards; however, implementation would require substantial fill soil (up to 360 CY) and grading to meet the necessary specifications (see Figure 6). Nonetheless, it effectively optimizes the limited available space for the required grading. The design incorporates meanders and/or small switchbacks, which help to decrease the overall slope. Additionally, the use of stacked rock walls would be critical in certain areas to support the fill needed to achieve proper slope stability. The most challenging section of the trail is the last 45 feet just before arriving at the waterfall. This alternative proposes the construction of a boardwalk that spans the creek and large boulders; negating the need for grading an accessible trail into the existing topography (see Figure 5). This approach aims to improve visitor access to the waterfall viewing area. While the complexity of this construction may pose challenges, it is expected to significantly enhance the overall user experience. In addition to the boardwalk, a set of timber stairs would be constructed behind the existing boulders to provide an alternative route to the waterfall viewing area.

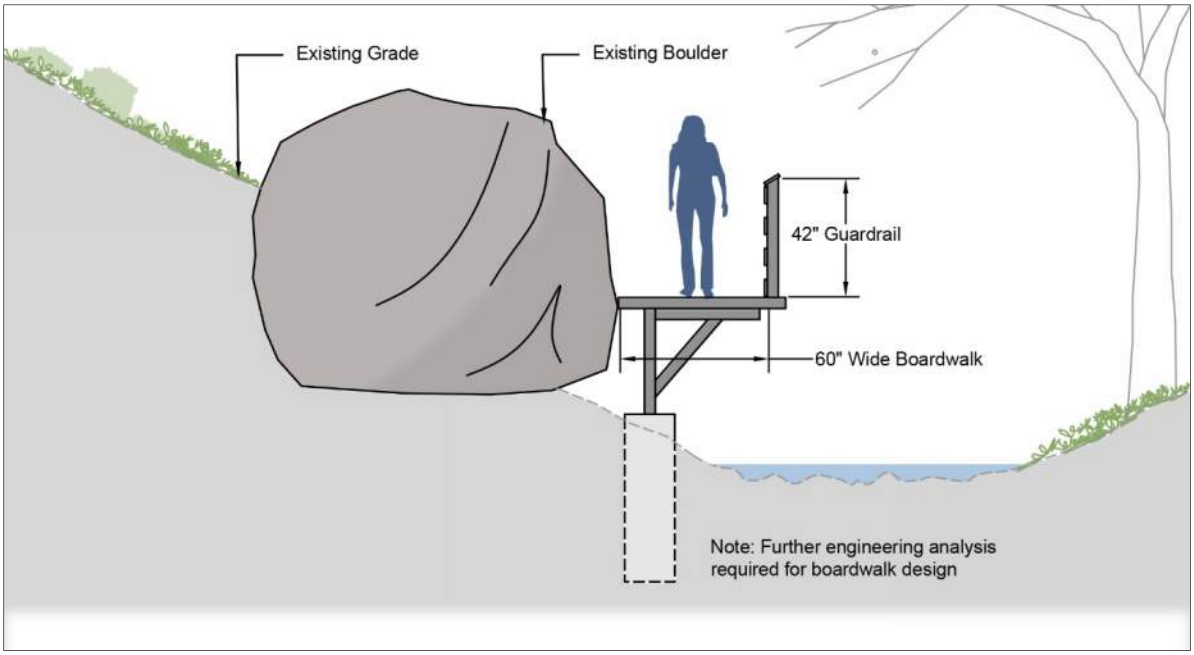


Figure 5. Boardwalk Over Creek at Boulder

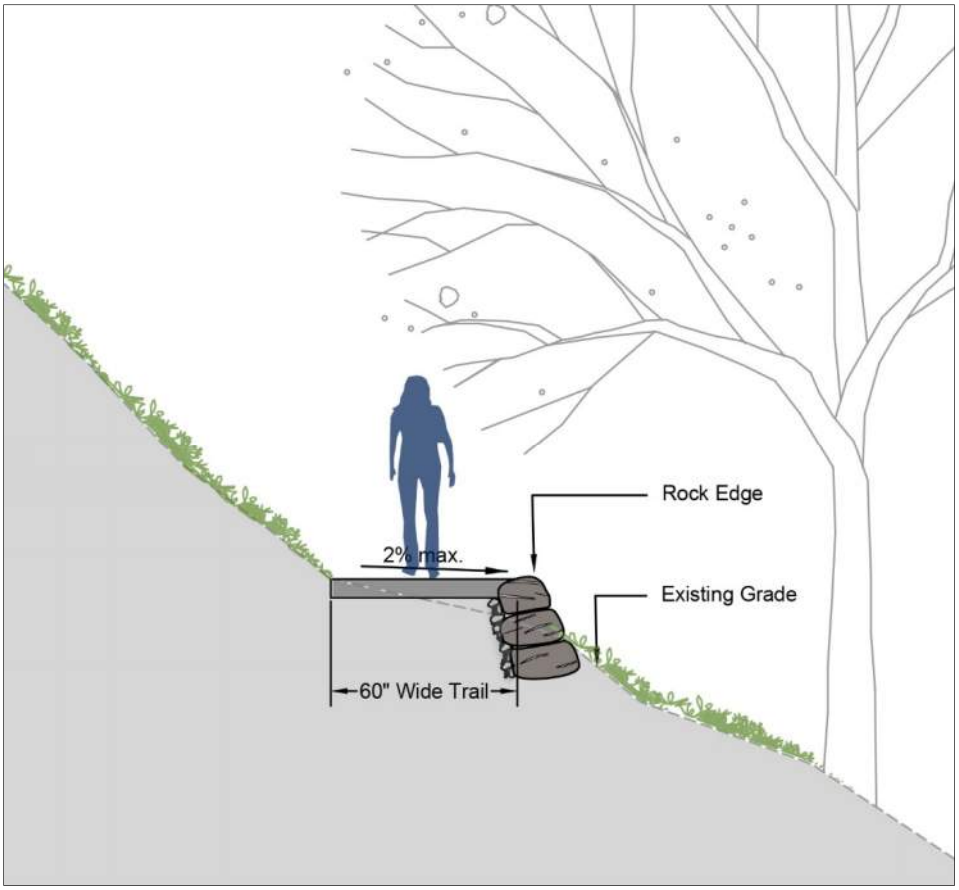


Figure 6. Trail at Slope with Fill and Rock Edge

Alternative B: Toe of Slope Trail with Boardwalk + Stairs

Another viable trail option, which closely resembles the previous alternative and would also be compliant, involves a slightly benched route into the adjacent hillside for approximately 410 feet from the bridge toward the waterfall. Although some trees will need to be removed, this design would provide greater separation between visitors and the creek, thereby facilitating more effective restoration/revegetation efforts and minimizing disruption to creek vegetation and habitat over time. This option is recommended if the objective is to enhance restoration efforts along the creek; however, this option is limited in length due to changes in the topography beyond its end point.

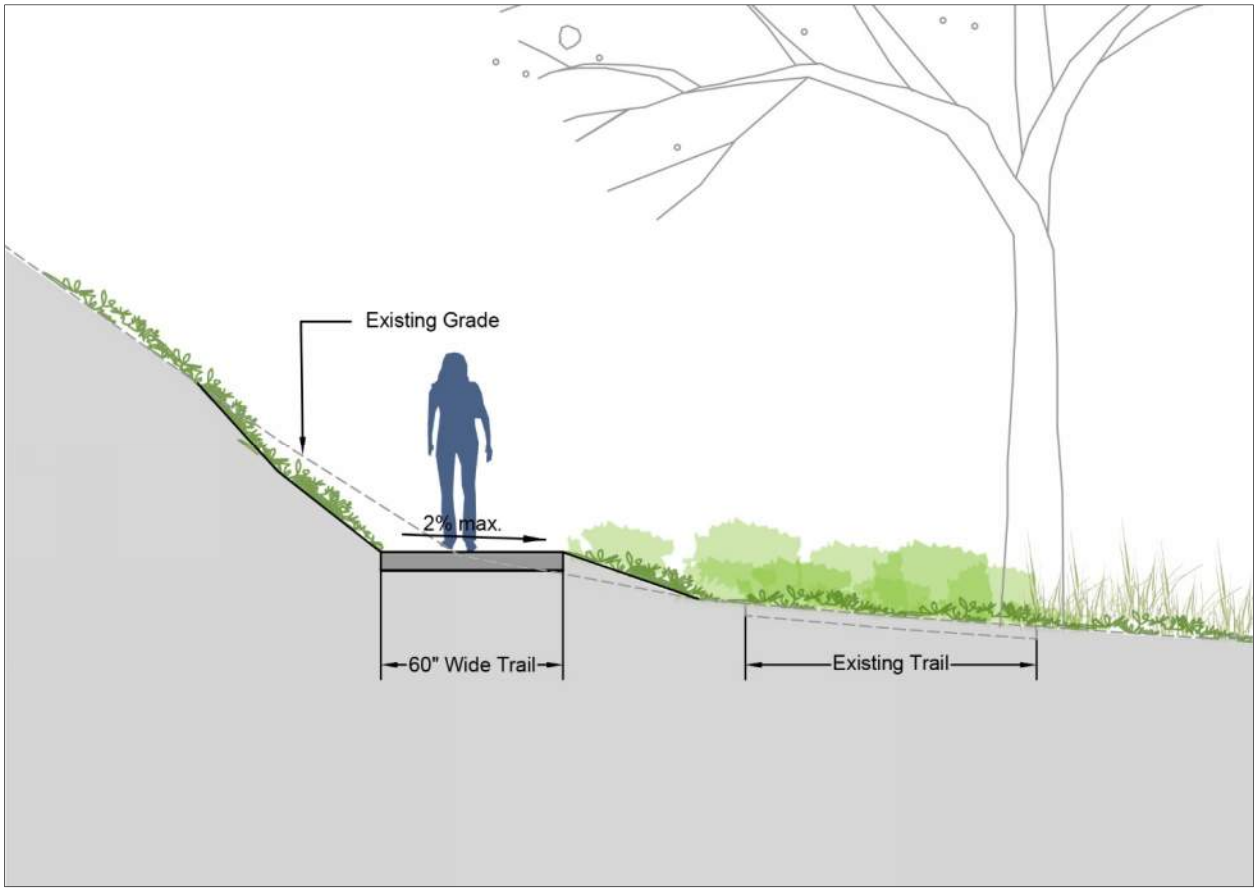


Figure 7. Trail at Toe of Slope / Revegetation at Existing Trail

Alternative C: Mid-Slope Trail to Waterfall

The third alternative was explored with the goal of creek restoration and protection in mind. This trail option would guide users away from the creek and up onto the hillside through a short series of switchbacks. When a trail must navigate or ascend a steep slope, it is essential to consider various design factors and trade-offs to ensure accessibility for a broad range of users while preserving natural resources and managing costs and maintenance effectively. This option satisfies the slope requirements and width specifications outlined in the MCP Improved Access Trail Standards, with a trail width maintained at 48“, see Figure 8.

While a wider trail can accommodate more users, it also tends to increase construction and maintenance costs, site disturbance, and tree removal when built into a steep slope. Additionally, when on a steep slope, the edges of the trail and hillside tend to erode over time, complicating efforts to maintain that width. Furthermore, at climbing turns, retaining walls are required to ensure a stable trail, which further increases tree removal and the area that requires grading. This leads to the removal of additional existing trees and vegetation that play a vital role in stabilizing the soil on the hillside. If adequate bedrock is present for slope stability, a trail in all cut maybe possible without the need for rock walls. The trail portion close to the waterfall viewing point would require guardrails and robust edge support, particularly to accommodate users with diverse mobility needs.

While this choice is appealing for creek restoration and protection, there are considerable challenges related to construction costs, maintenance, feasibility, and the preservation of existing habitats. Additionally, there is the possibility for public use in the creek area regardless of efforts aimed at encouraging users to stay on the hillside, which influences the overall effectiveness over time.

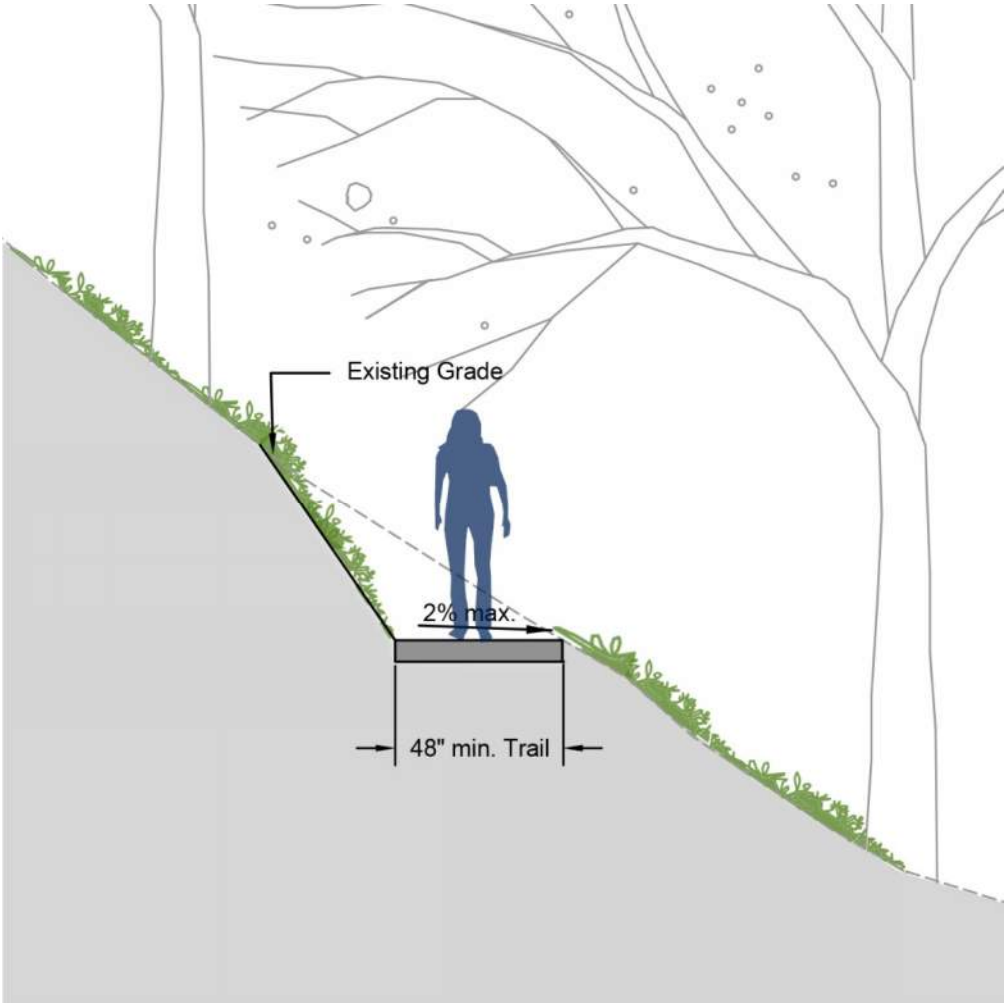


Figure 8. Mid-Slope Trail in all cut if bedrock is present

4 Cost Estimates

This section presents cost estimates for implementation of treatments by trail segments and alternatives. Several assumptions were made concerning construction quantities and trail lengths. The trail length is based on the anticipated alignment based on the concept drawings. However, unforeseen constructability constraints may lead to adjustments in the trail alignment that could affect material quantities. Given that there is currently no defined timeframe for implementation, it is essential to adjust costs to reflect current year values during the design and construction phases. Construction costs should ultimately be based on the complete construction documentation for the selected alternative(s).

Trail Segment	Estimated Cost
Segment 1 - Alt A: Creek Trail to Proposed Bridge with Walls	$360,000 – $530,000
Segment 1 - Alt B: Creek Trail to Proposed Bridge without Walls	$265,000 – $380,000
Segment 2 - Alt A: Creek Trail with Boardwalk and Stairs	$410,000 – $590,000
Segment 2 - Alt B: Toe of Slope Trail with Boardwalk and Stairs	$490,000 - $705,000
Segment 2 - Alt C: Mid-Slope Trail to Waterfall	$1,110,000 - $1,600,000

5 Conclusion

The District is currently evaluating the feasibility of improving the Buck Gulch Trail to meet the MCP Access and Discovery Trail standards. To support this assessment, the District partnered with PCI Ecological to gather insights that will guide future initiatives aimed at converting the existing trail into an accessible trail. The feasibility study concludes that full accessibility is attainable for both trail segments. However, the existing topography and site constraints result in varying implications for constructability and construction and maintenance costs. Ultimately, the trail can be accessible under different accessibility standards to the waterfall; however, the accessibility would vary by trail segment.

The design alternatives have been presented in two segments, each containing various options. Segment 1 presents more practical and straightforward construction options, necessitating less removal of trees and vegetation while still providing sufficient access for construction equipment. Both alternatives in Segment 1 could adhere to the MCP Access and Discovery Trail standards by ensuring a width of 60” is maintained and by meeting the necessary slope requirements throughout the entire segment. The primary distinction between alternatives A and B for Segment 1 lies in the overall grading footprint, specifically the presence or absence of walls to maintain grade. Both options in Segment 1 would follow the same trail alignment.

In contrast, Segment 2 poses greater challenges due to the increased grading requirements, higher construction costs, and more difficult access for construction equipment. As a result, several options were evaluated to identify the most effective solution to provide the highest possible level of accessibility. Alternative A (Creek Trail with Boardwalk and Stairs) maintains the existing trail alignment near the creek and implements trail cut and fill to adhere to the accessibility standards outlined in the MCP Access and Discovery Trail Standards. Alternative B (Toe of Slope Trail with Boardwalk and Stairs) would also meet these standards while offering the advantage of creating separation from the creek. This alternative allows for enhancing creek restoration and revegetation efforts. Alternative C (Mid-Slope Trail) aligns with the MCP Improved Access Trail guidelines, featuring a 48” trail width and required slopes. However, it requires considerable grading and rockwork. Due to the extensive grading

required for Segment 2, there is the option to only implement straightforward trail improvements and have the accessible trail end at the proposed bridge location.

Regardless of which alternative is chosen in Segment 1 and 2, comprehensive construction documentation and a geotechnical assessment will be necessary. The geotechnical assessment will determine the feasibility of a mid-slope trail and the results of the assessment may require changes to the concept presented in this memo. The geotechnical study will also inform the design requirements for the footings of the boardwalk option, establish the maximum allowable slopes for cut and fill and determine the maximum height of the rock walls and whether they require footings or additional reinforcement. The final decision will prioritize considerations related to the budget, construction schedule, and the preservation of trees and vegetation, among other factors, before proceeding to next steps.

6 References

US Access Board (ABA). 2013. Accessibility Guidelines for Outdoor Developed Areas, 36 CFR Part 1191 (AGODA)

Appendix A

NATIVE IRIS

EPHEMERAL TRIBUTARY

LOW LIMBED TREE

LOW LIMBED TREE

EPHEMERAL TRIBUTARY

BEGINNING OF TRAIL ASSESSMENT

SOCIAL TRAIL, TYPICAL

FLOW

CREEK RESTORATION AREA

MATCHLINE SEE SHEET 2

NARROW TRAIL / BRANCH OVERHANG

N

0 20 40 80

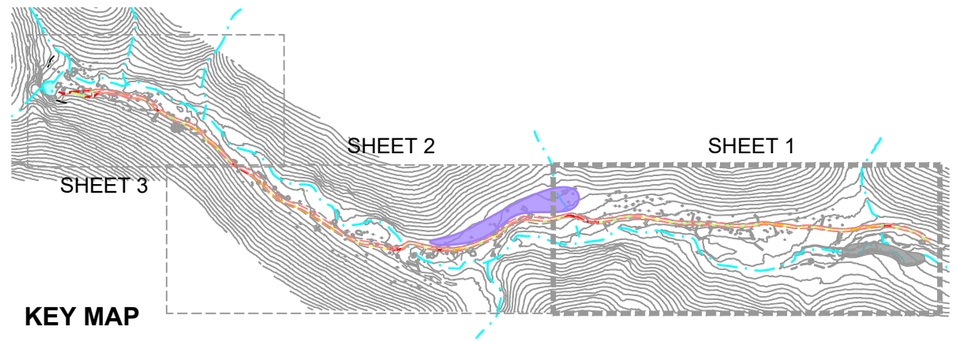
EXISTING TRAIL SLOPES

Symbol	Slope	% of Total	Total LF
	5% AND BELOW	36.4%	574 LF
	5% - 8%	21.7%	342 LF
	8% - 10%	18.6%	293 LF
	10% - 12%	10.3%	161 LF
	OVER 12%	13.0%	205 LF
	60" WIDE TRAIL REFERENCE LINES		

Note: 41.9% of existing trail (1,575 LF) is over 8%
Percent Total And Total LF reflect the entire length of trail in the study area.

LEGEND

- EDGE OF TRAIL
- TREE
- TREE WITH LOW LIMB
- BOULDER
- ALIGNMENT / FLOW LINE
- 100 CONTOUR LINE



KEY MAP

MARIN COUNTY OPEN SPACE DISTRICT
BUCK GULCH EXISTING TRAIL ASSESSMENT

PREPARED FOR:

PREPARED BY:

PCI ECOLOGICAL

SHEET 1

EXISTING TRAIL SLOPES

Symbol	Slope	% of Total	Total LF
	5% AND BELOW	36.4%	574 LF
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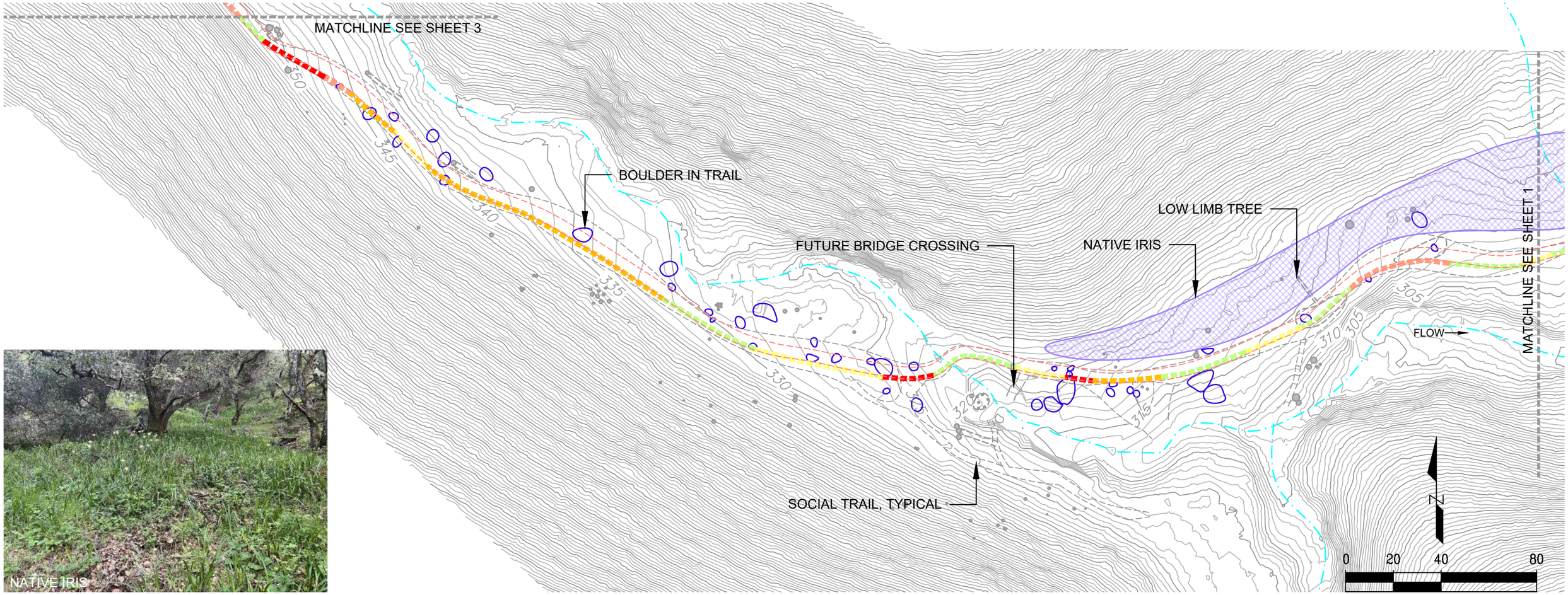
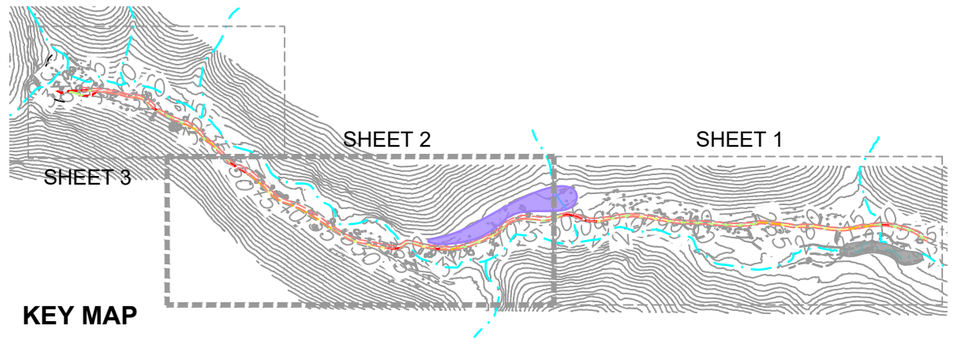




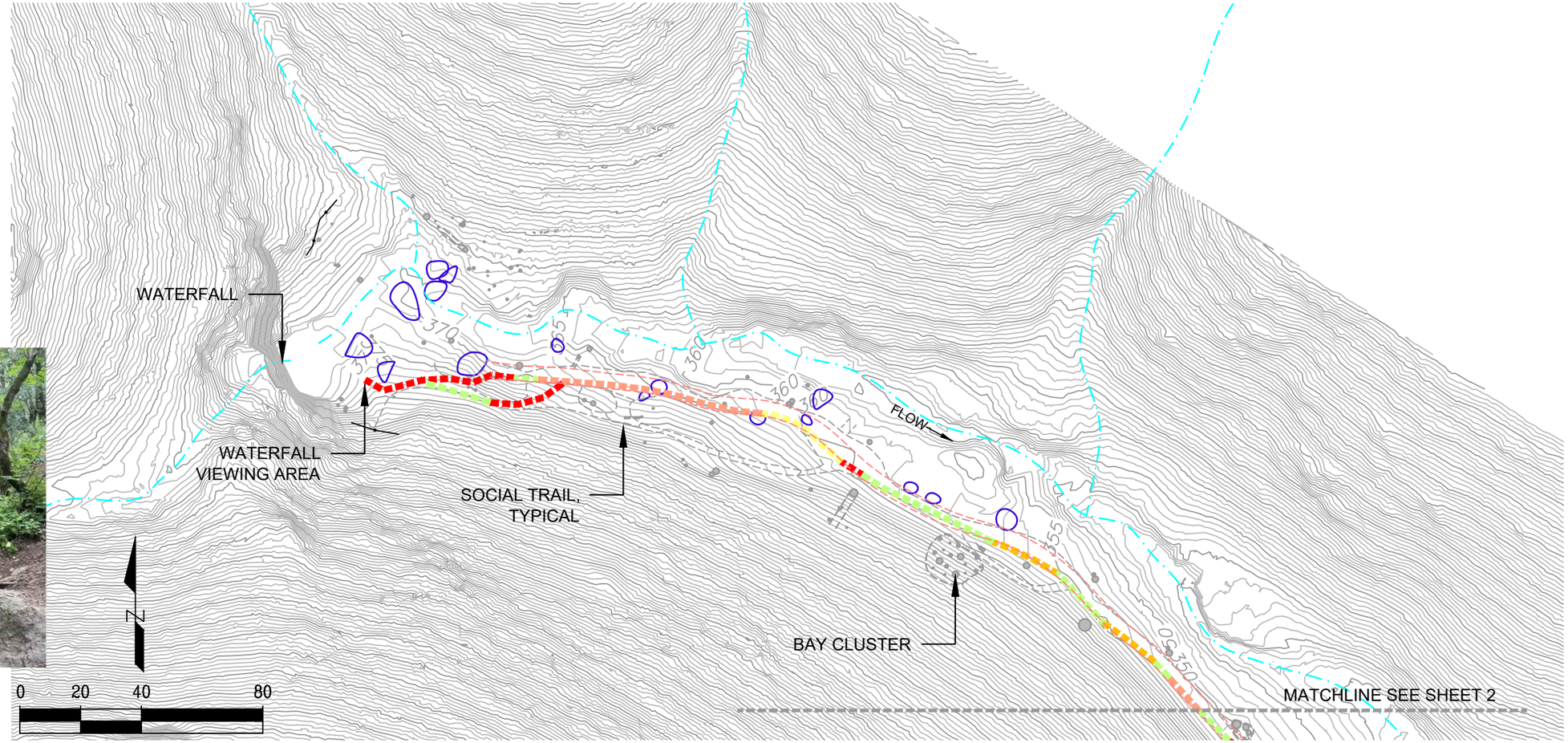
KEY MAP

MARIN COUNTY OPEN SPACE DISTRICT
BUCK GULCH EXISTING TRAIL ASSESSMENT

PREPARED FOR: MARIN COUNTY PARKS

PREPARED BY: PCI ECOLOGICAL

SHEET 2



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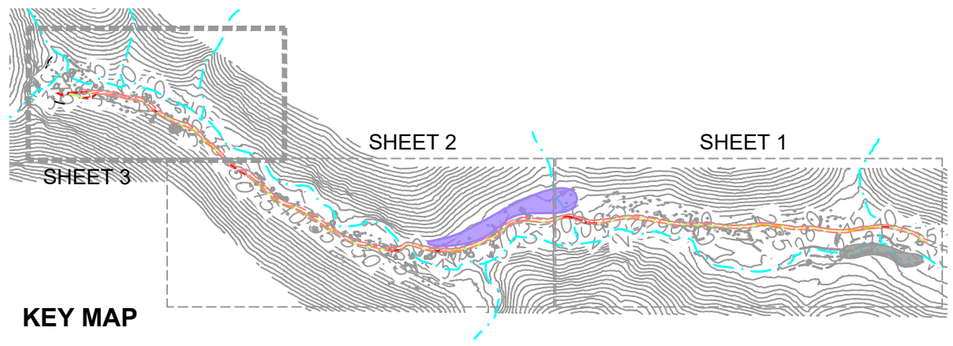


KEY MAP

MARIN COUNTY OPEN SPACE DISTRICT
BUCK GULCH EXISTING TRAIL ASSESSMENT

PREPARED FOR: MARIN COUNTY PARKS PRESERVATION RECREATION

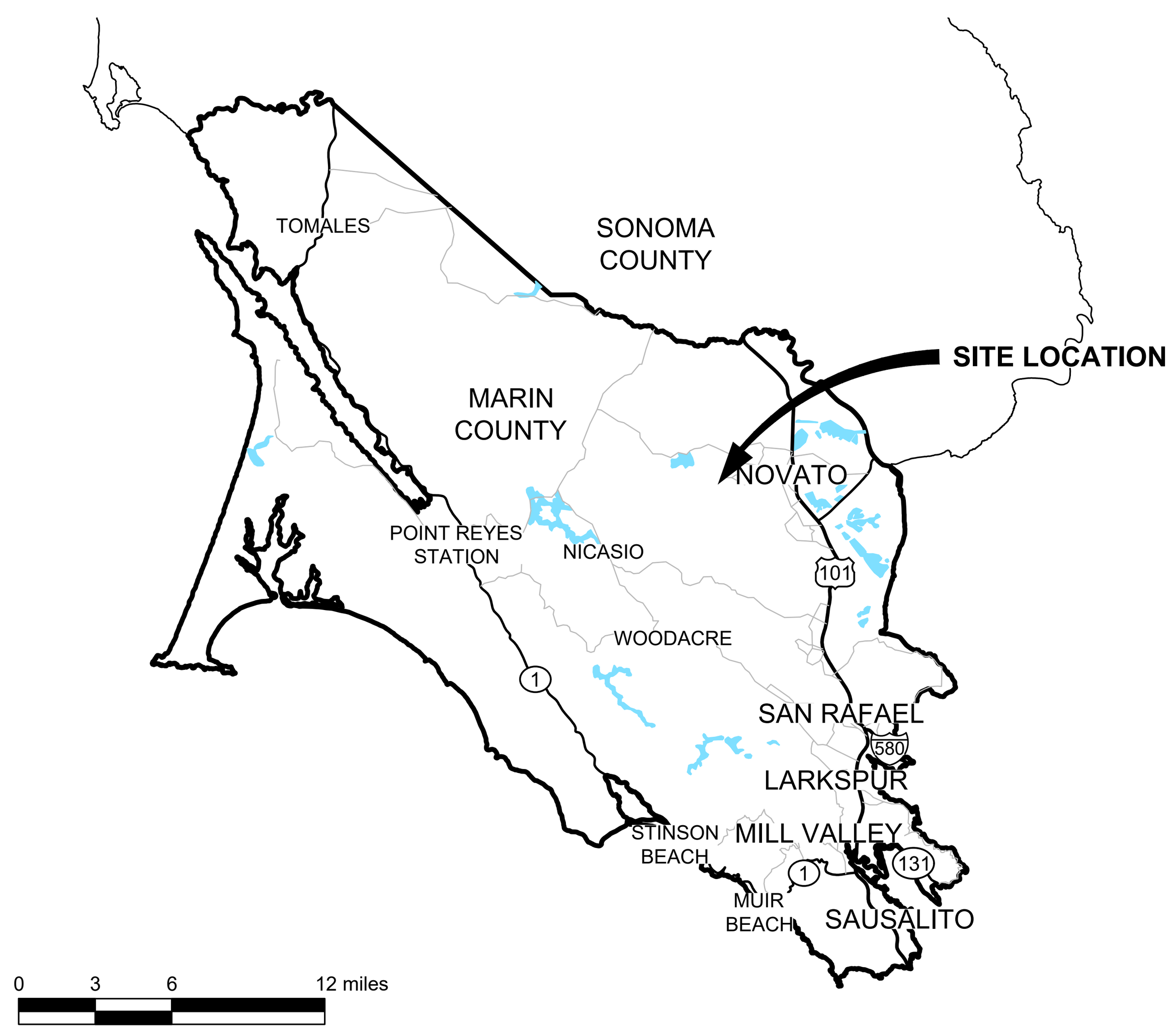
PREPARED BY:

SHEET 3

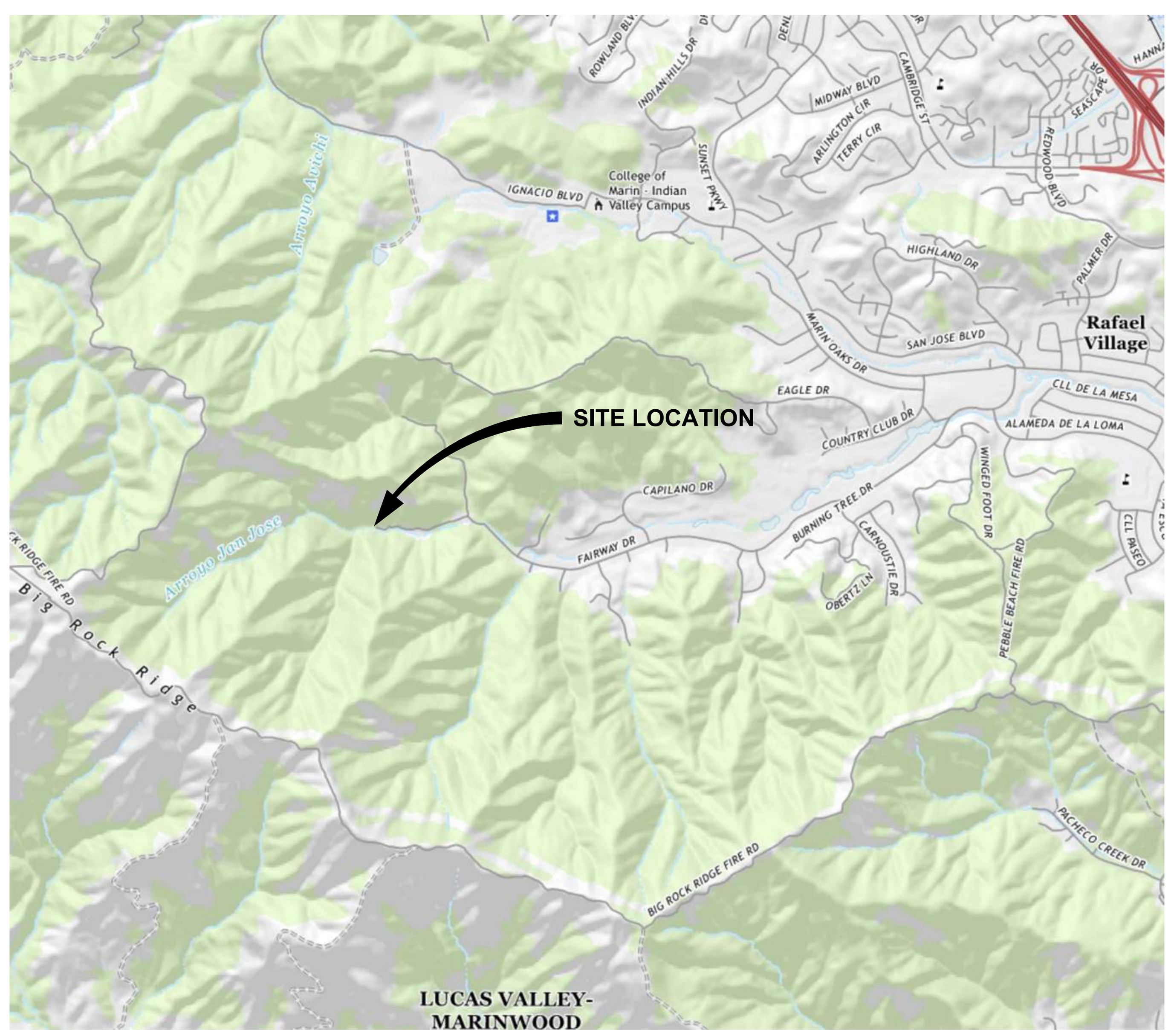
Appendix B

BUCK GULCH FALLS
ACCESSIBLE TRAIL FEASIBILITY STUDY

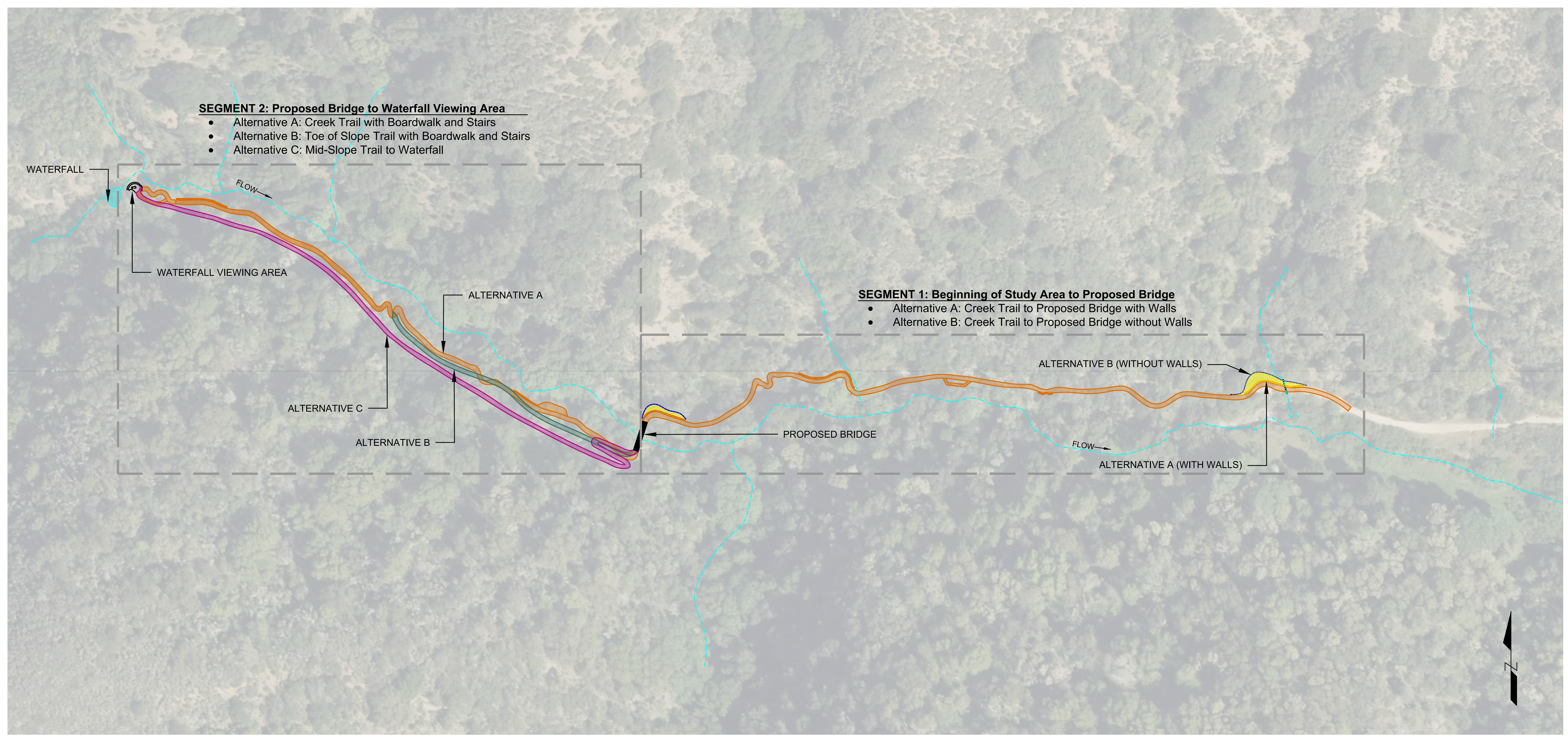
PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT



VICINITY MAP
SCALE: AS SHOWN



LOCATION MAP
SCALE: 1" = 2,000'
USGS



SITE LAYOUT
SCALE: 1" = 80'

Sheet List Table	
Sheet Number	Sheet Title
1	TITLE SHEET
2	SEGMENT 1 (A & B)
3	SEGMENT 1 (A & B)
4	SEGMENT 2 ALTERNATIVE A
5	SEGMENT 2 ALTERNATIVE A
6	SEGMENT 2 ALTERNATIVE B
7	SEGMENT 2 ALTERNATIVE C

SURVEY NOTES

TOPOGRAPHIC GROUND SURVEY PERFORMED BY PCI. MARCH/APRIL 2024. SURROUNDING TOPOGRAPHIC LIDAR DATA OBTAINED FROM NOAA AND IS APPROXIMATE ONLY.

HORIZONTAL DATUM: NAD83 CALIFORNIA STATE PLANE (ZONE 3)
VERTICAL DATUM: NAVD 1988

△ HORIZONTAL AND VERTICAL CONTROL AS SHOWN

SITE LOCATION: LAT: 38° 3'43.73"N LONG: 122°35'7.83"W

ADDRESS: 651 FAIRWAY LANE
NOVATO, CA 94949

VERIFY SCALES
ONE INCH

103 MORRIS STREET, SUITE A-5
SEBASTOPOL, CA 95472
(707) 824-4600

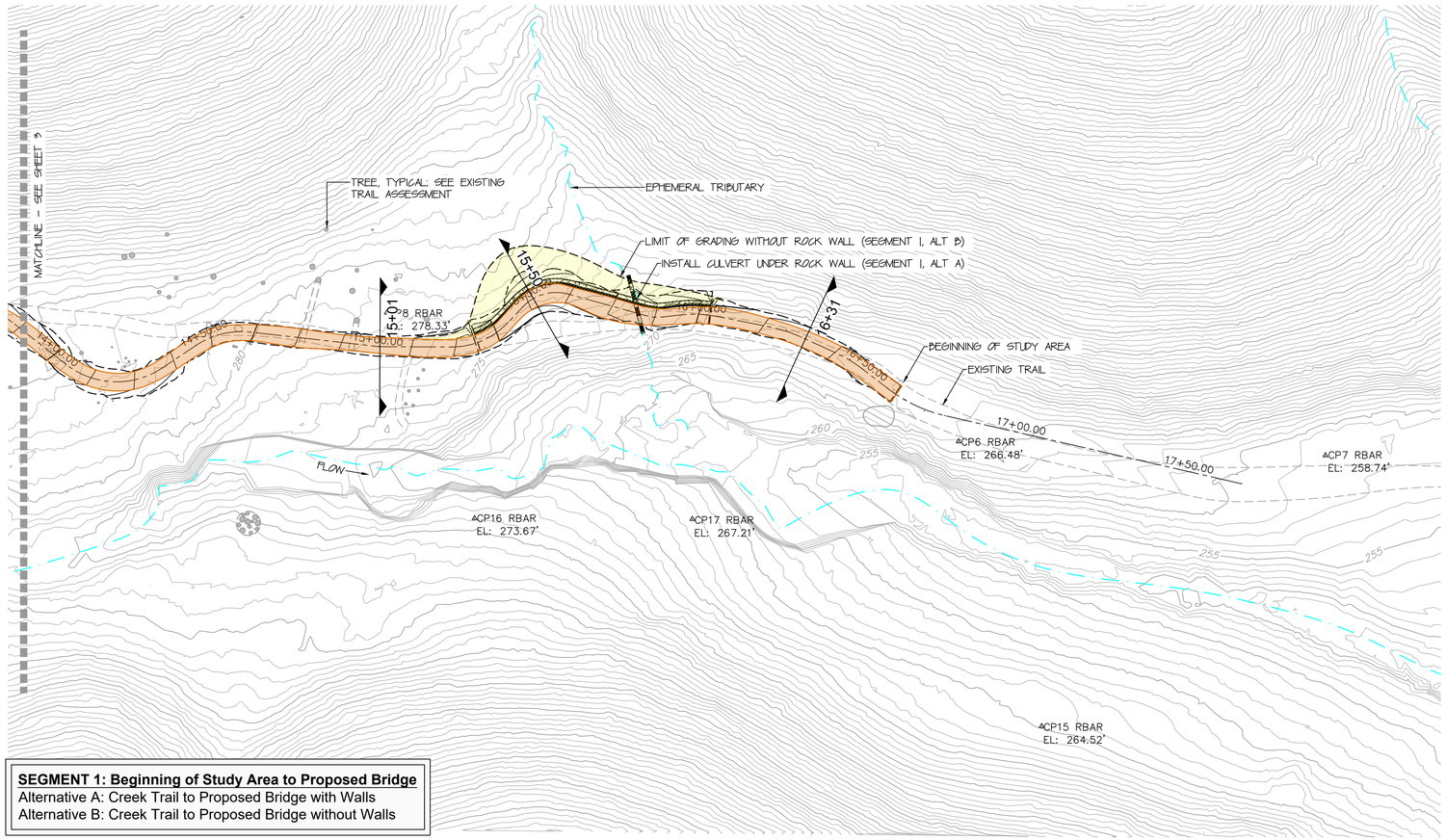
PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT
3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

PRELIMINARY
DATE: Dec 03, 2024

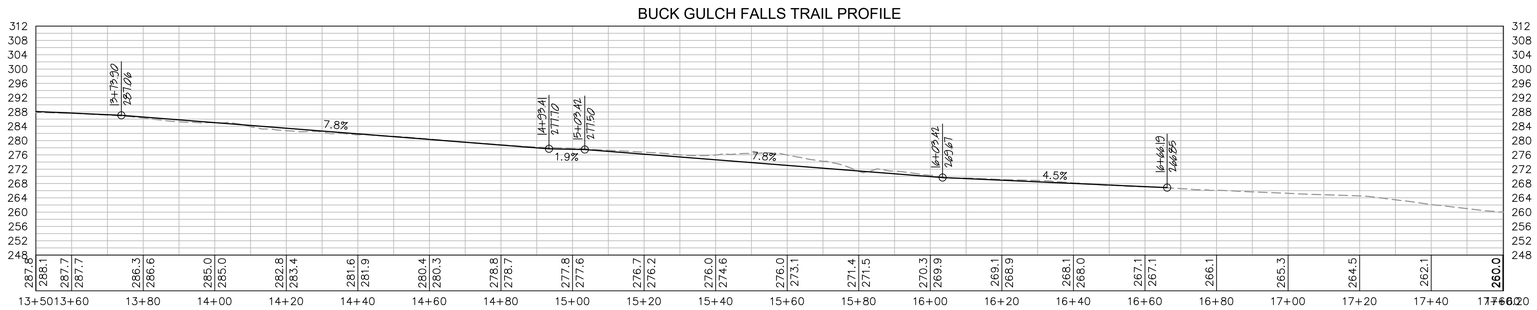
REVISIONS	DATE	BY

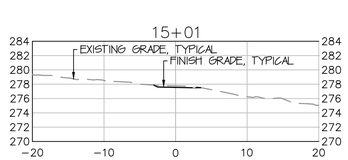
DATE: 12/3/2024
SCALE: AS SHOWN
MAPPING BY: EC
DESIGNED BY: MJ, EM
DRAFTED BY: EC, EM
CHECKED BY: MJ

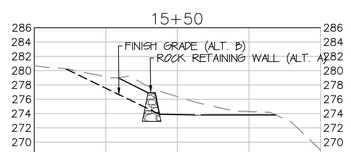
BUCK GULCH FALLS TRAIL
TITLE SHEET

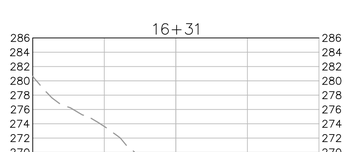


SEGMENT 1: Beginning of Study Area to Proposed Bridge
Alternative A: Creek Trail to Proposed Bridge with Walls
Alternative B: Creek Trail to Proposed Bridge without Walls









VERIFY SCALES
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103 MORRIS STREET, SUITE A-5
SEBASTOPOL, CA 95472
(707) 824-4600

PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT
3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

PRELIMINARY
DATE : Dec 02, 2024

REVISIONS	DATE	BY

DATE: 12/2/2024
SCALE: VARIES
MAPPING BY: EC
DESIGNED BY: MJ, EM
DRAFTED BY: EC, EM
CHECKED BY: MJ

BUCK GULCH FALLS TRAIL

SEGMENT 1 (A & B)

SHEET
2
OF 7

Acad File Name:G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MCOSDBGFALLS\Dwgs\PP1.dwg
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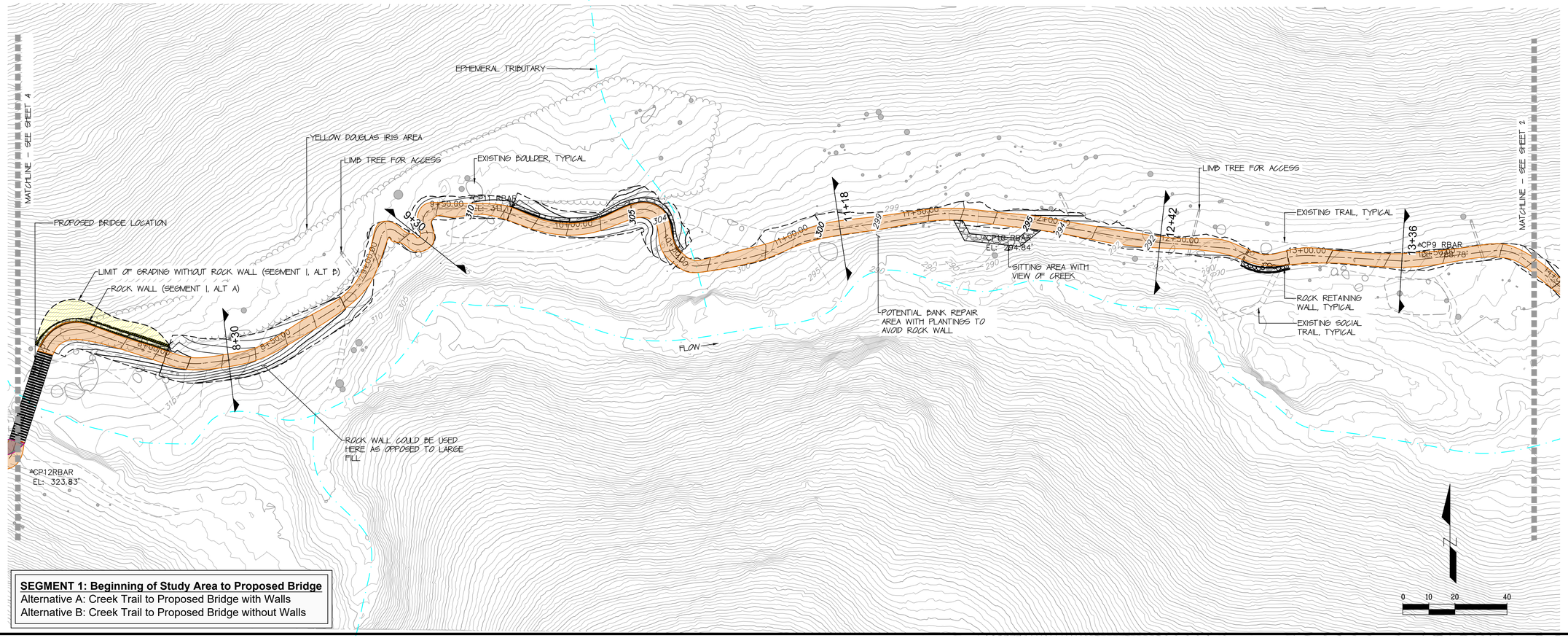
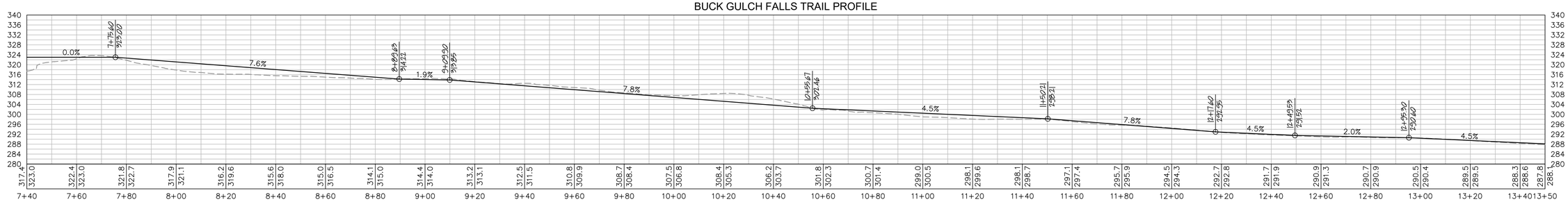
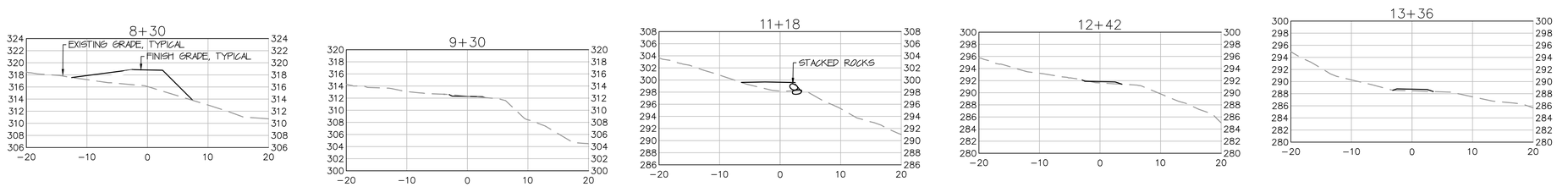


SEGMENT 1: Beginning of Study Area to Proposed Bridge
Alternative A: Creek Trail to Proposed Bridge with Walls
Alternative B: Creek Trail to Proposed Bridge without Walls





VERIFY SCALES
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SEBASTOPOL, CA 95472
(707) 824-4800

PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT
3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

PRELIMINARY
DATE: Dec 02, 2024

REVISIONS	DATE	BY

DATE:	12/2/2024
SCALE:	VARIES
MAPPING BY:	EC
DESIGNED BY:	MJ, EM
DRAFTED BY:	EC, EM
CHECKED BY:	MJ

BUCK GULCH FALLS TRAIL

SEGMENT 1 (A & B)

SHEET
3
OF 7

Acad File Name:G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MOOSDBGFALLS\Dwgs\PP1.dwg
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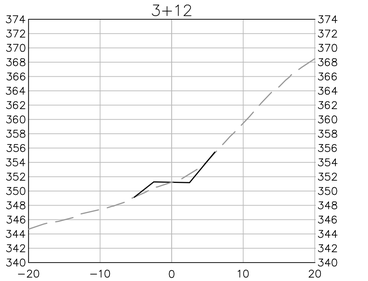
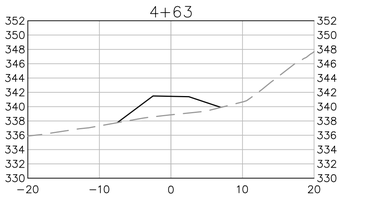
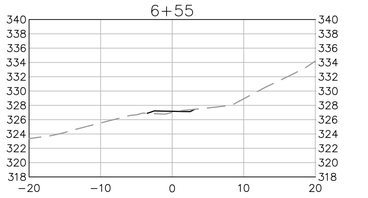
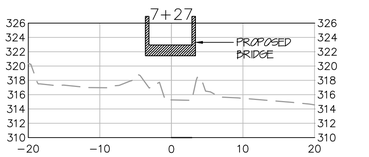
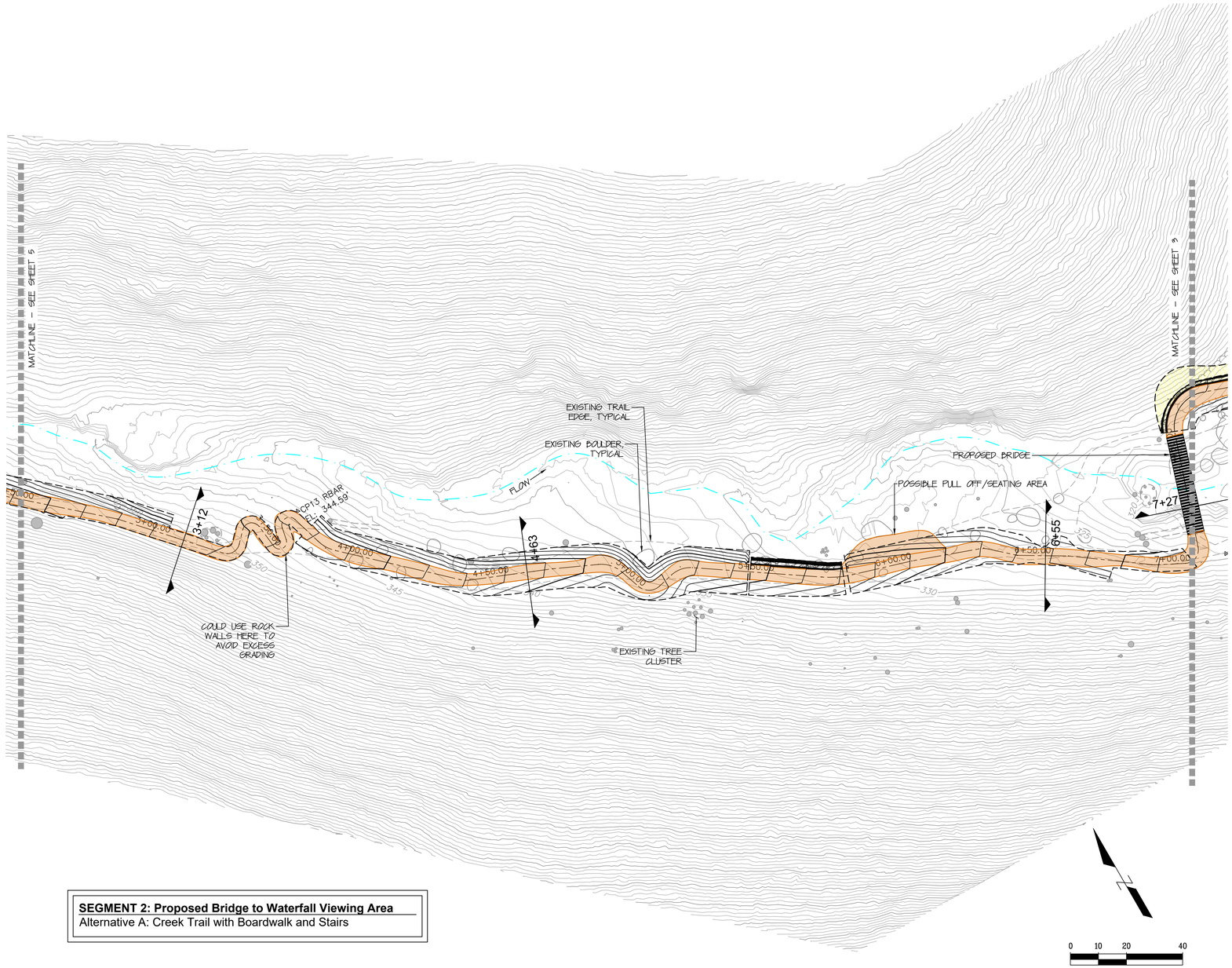


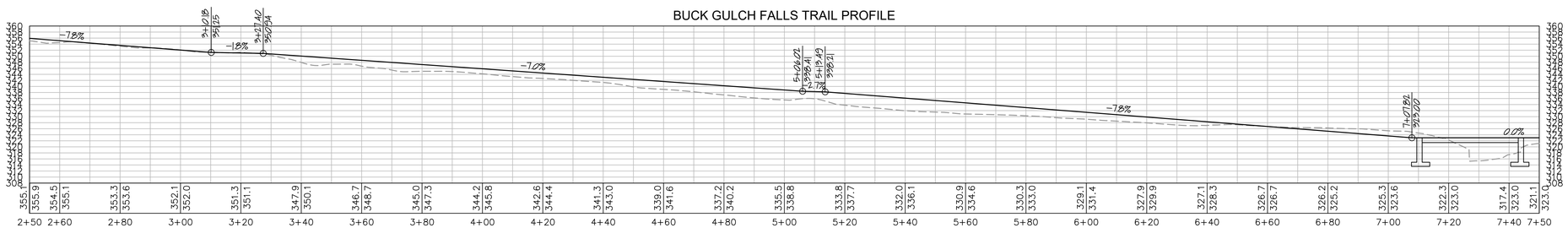








SEGMENT 2: Proposed Bridge to Waterfall Viewing Area
Alternative A: Creek Trail with Boardwalk and Stairs



VERIFY SCALES
ONE INCH

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103 MORRIS STREET, SUITE A-5
SEBASTOPOL, CA 95472
(707) 824-4800

PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT
3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

REVISIONS	DATE	BY

PRELIMINARY
DATE: Dec 02, 2024

DATE:	12/2/2024
SCALE:	VARIES
MAPPING BY:	EC
DESIGNED BY:	MJ, EM
DRAFTED BY:	EC, EM
CHECKED BY:	MJ

BUCK GULCH FALLS TRAIL

SEGMENT 2 ALTERNATIVE A

SHEET
4
OF 7

Acad File Name:G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MCOSDBGFALLS\Dwgs\PP2.dwg
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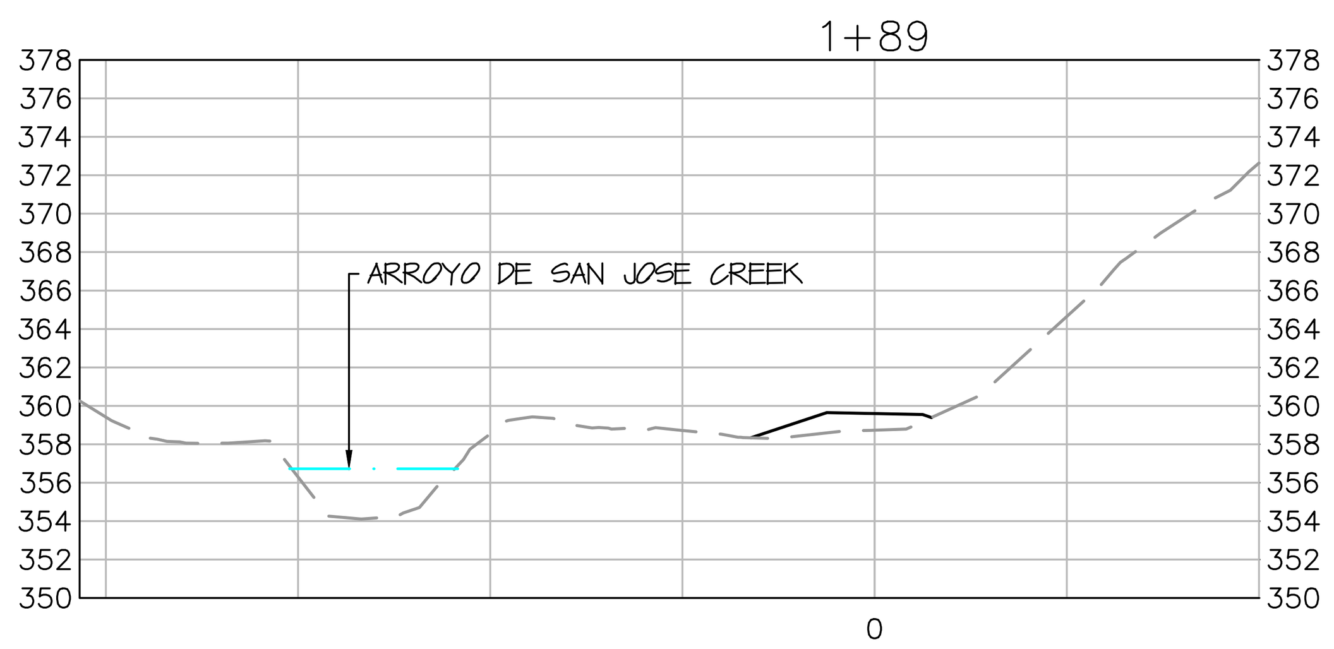
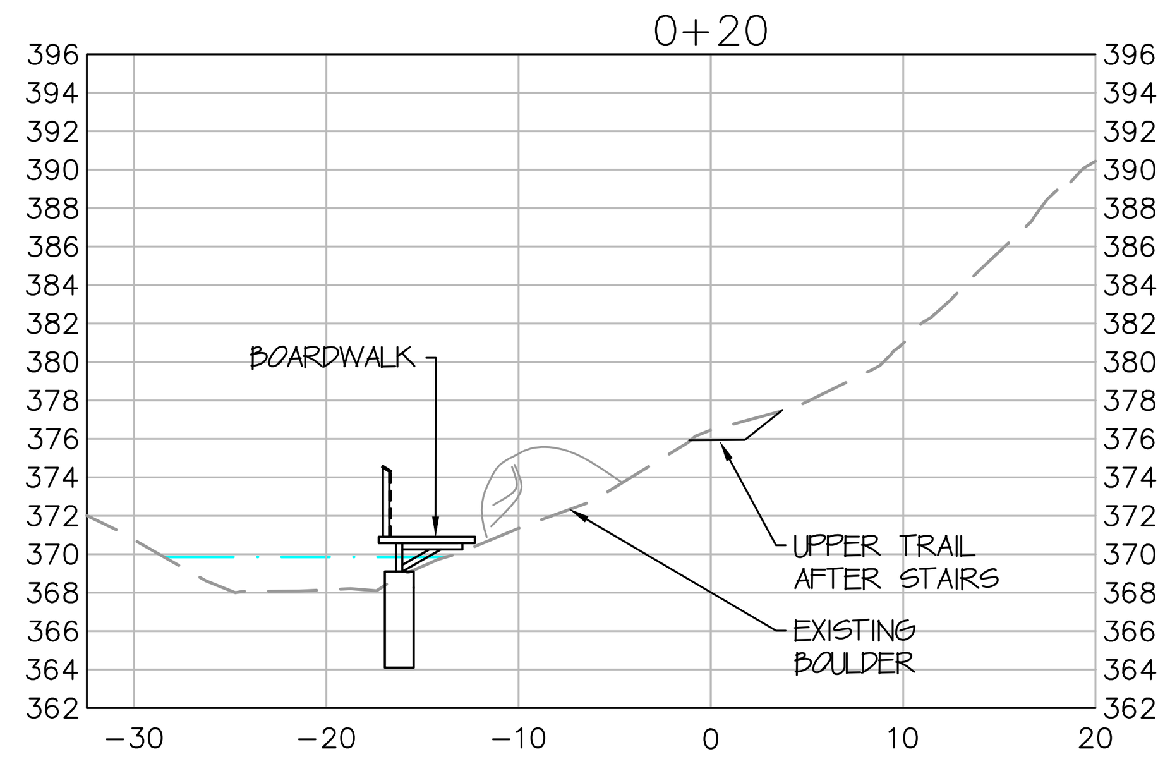
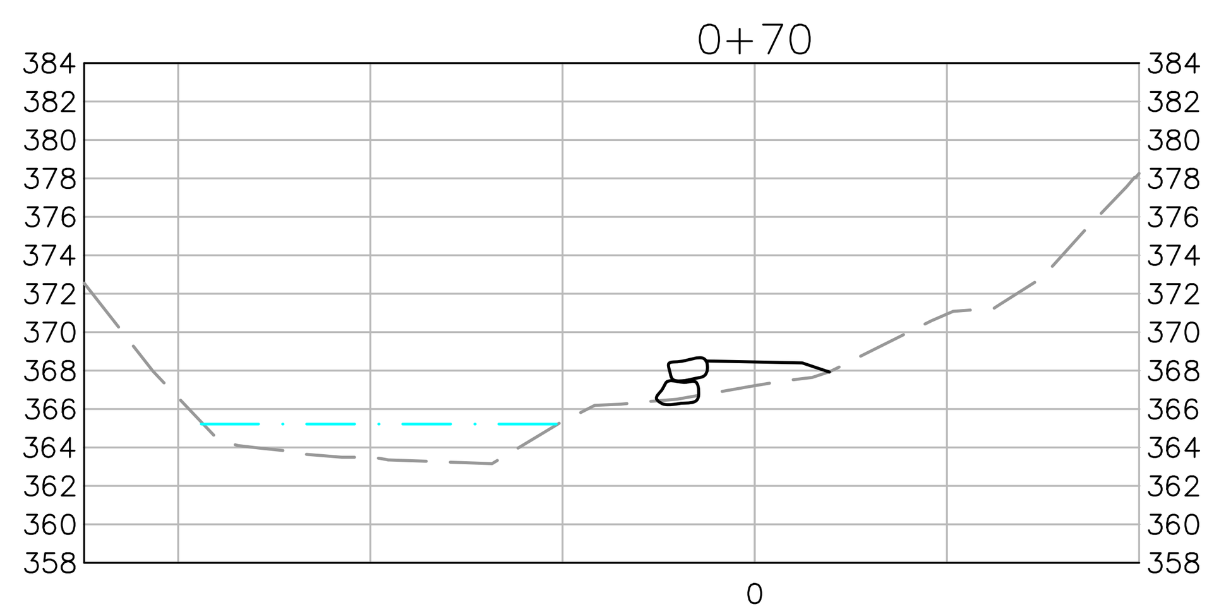
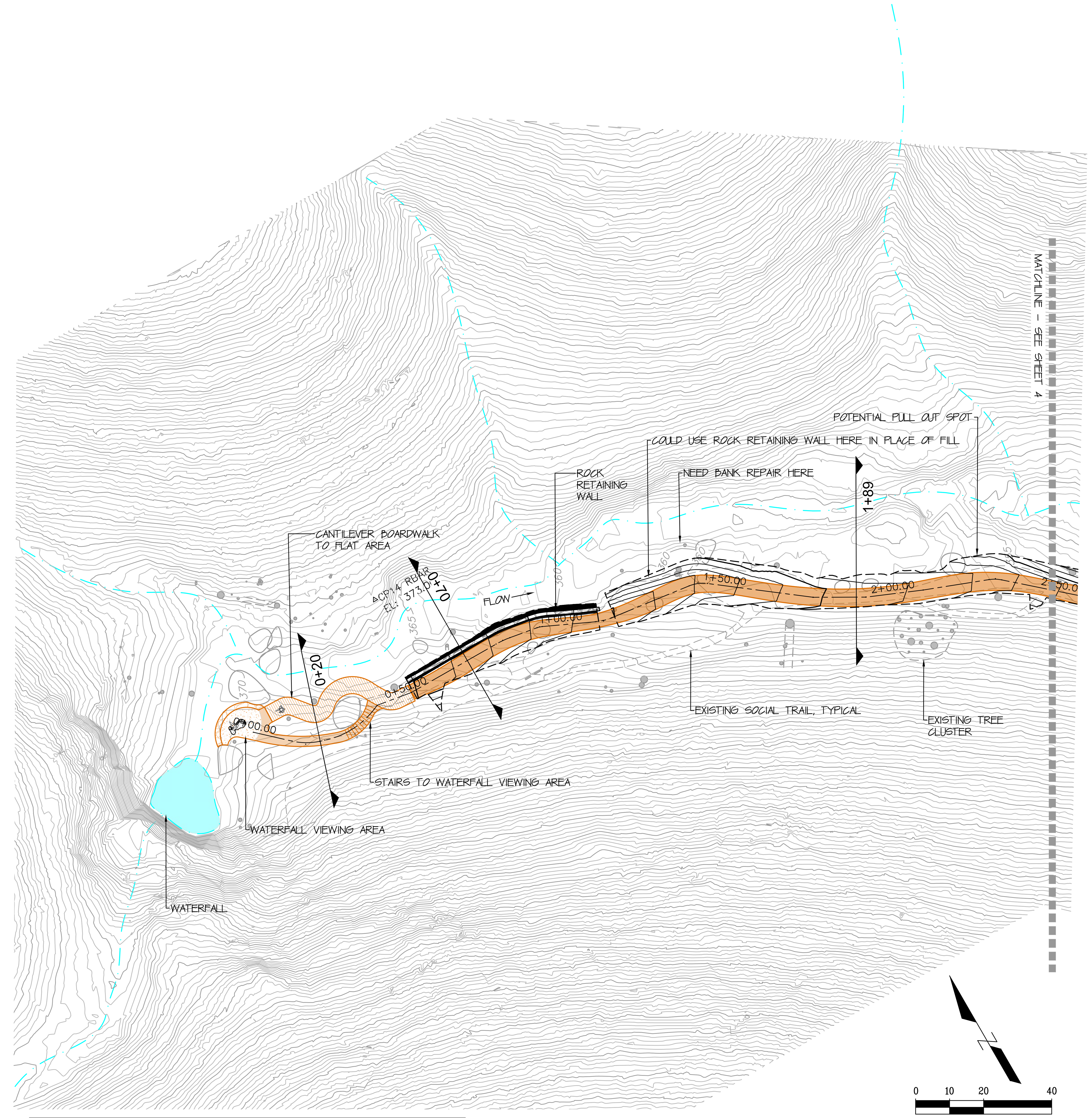
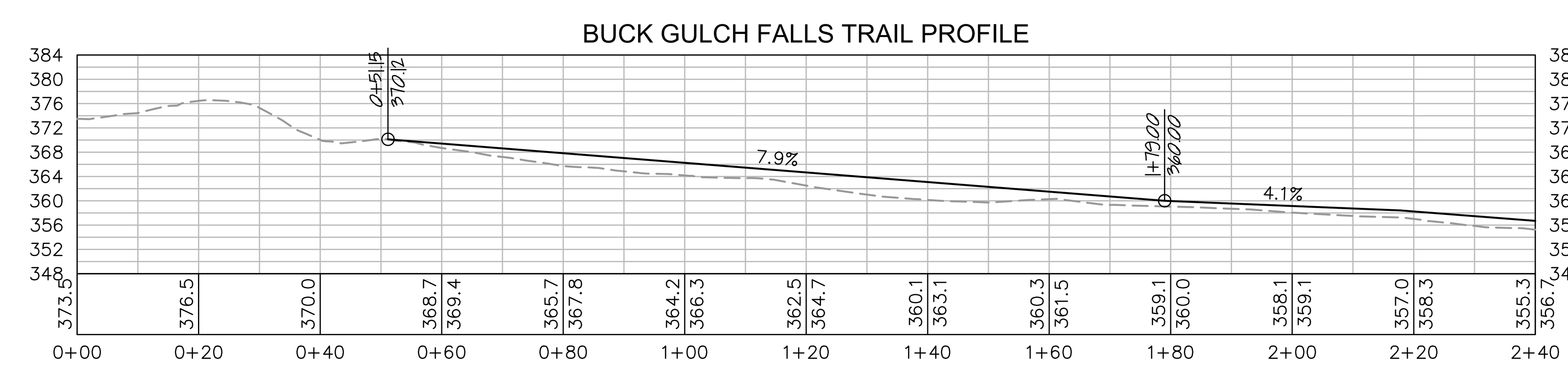








SEGMENT 2: Proposed Bridge to Waterfall Viewing Area
Alternative A: Creek Trail with Boardwalk and Stairs



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3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

PRELIMINARY
DATE: Dec 02, 2024

REVISIONS	DATE	BY

DATE: 12/2/2024
SCALE: VARIES
MAPPING BY: EC
DESIGNED BY: MJ, EM
DRAFTED BY: EC, EM
CHECKED BY: MJ

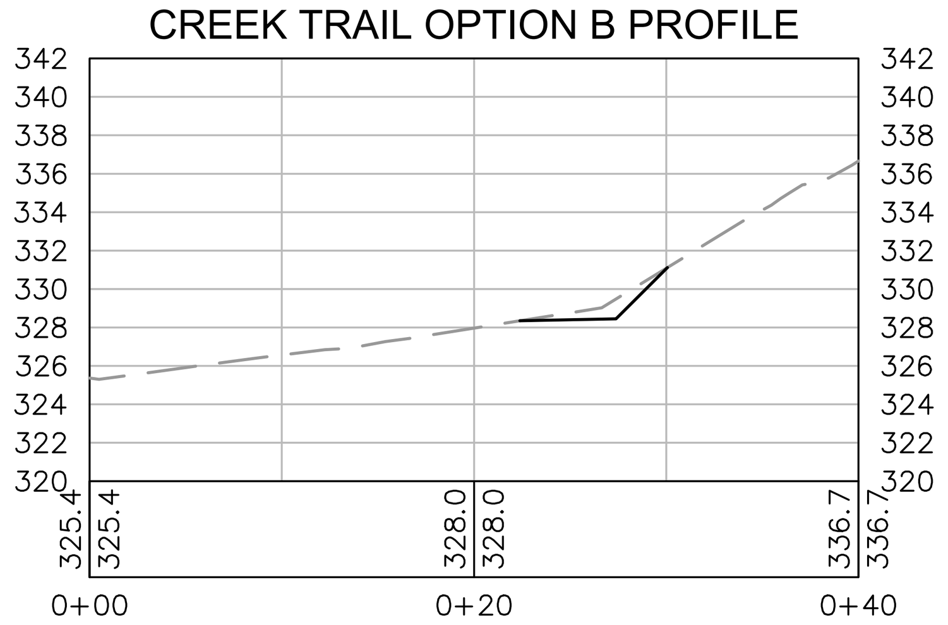
BUCK GULCH FALLS TRAIL
SEGMENT 2 ALTERNATIVE A

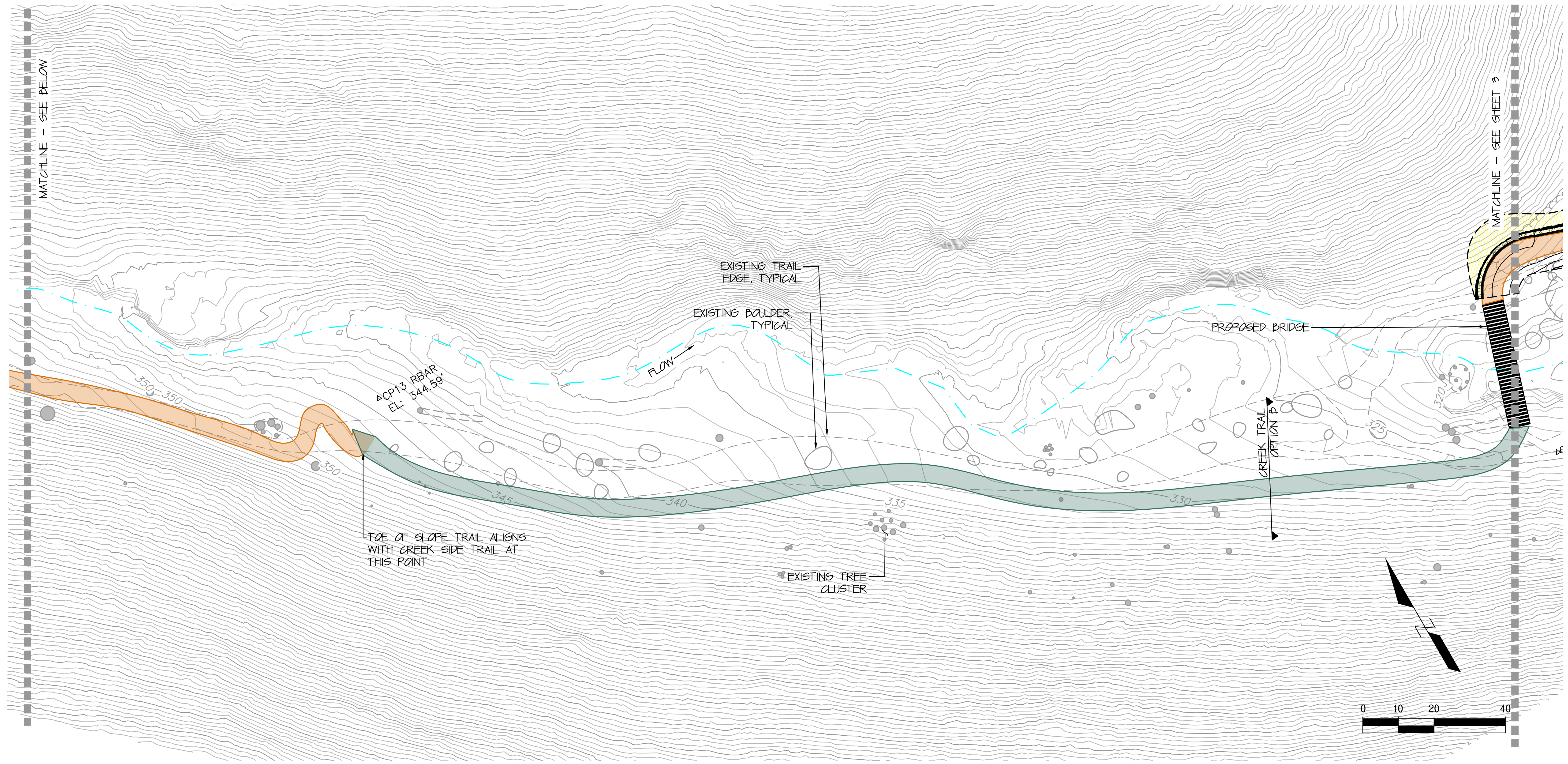
SHEET 5 OF 7

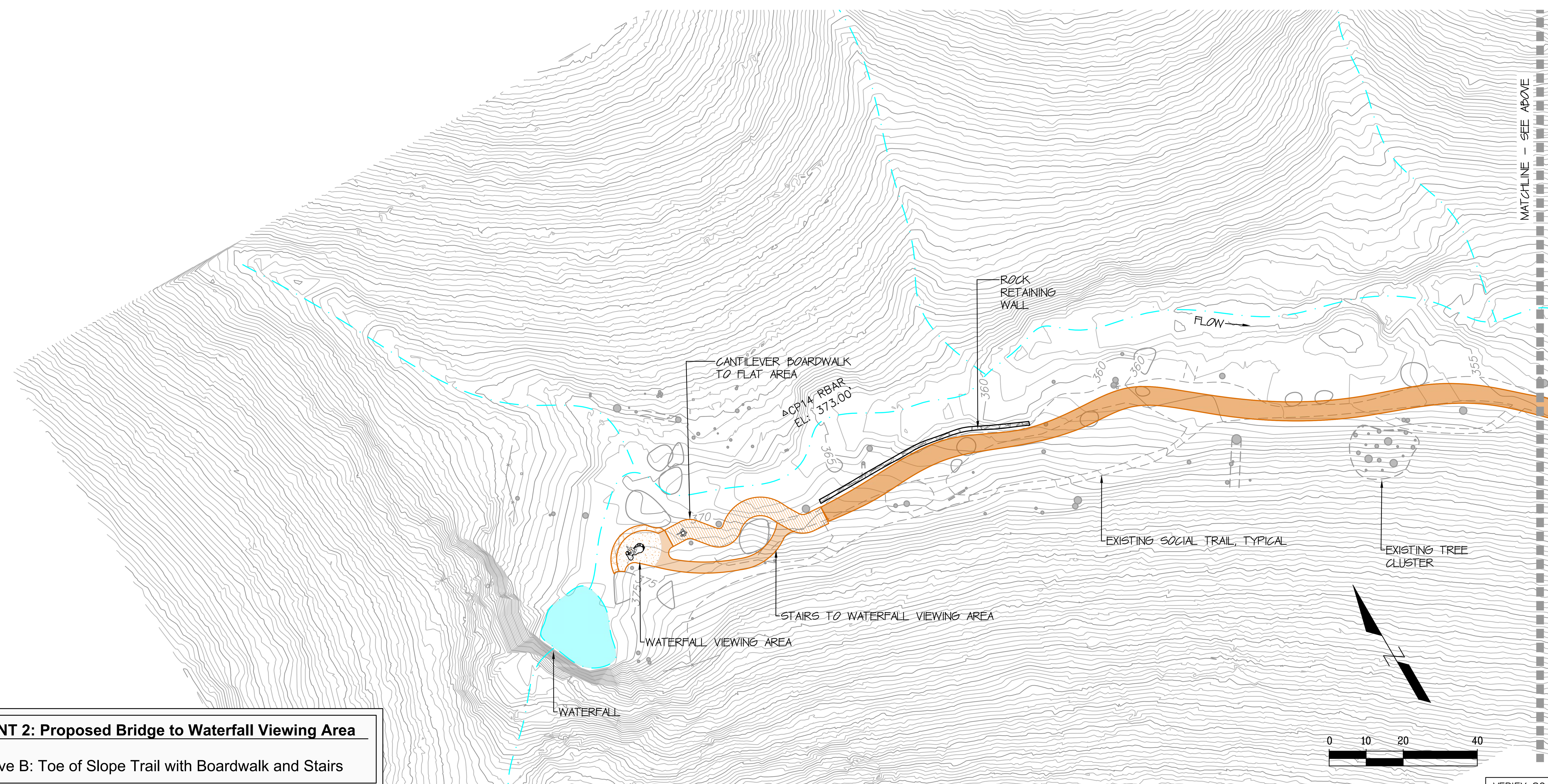
VERIFY SCALES
ONE INCH

Acad File Name: G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MCOSDBGFALLS\Dwgs\PP3.dwg
Plot date: 12/2/2024 5:21 PM Layout: 5

CREEK TRAIL OPTION B PROFILE







SEGMENT 2: Proposed Bridge to Waterfall Viewing Area

Alternative B: Toe of Slope Trail with Boardwalk and Stairs

VERIFY SCALES
ONE INCH

Acad File Name: G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MCOSDBGFALLS\Dwgs\PP2.dwg
Plot date: 12/3/2024 4:27 PM Layout: 6

103 MORRIS STREET, SUITE A-5
SEBASTOPOL, CA 95472
(707) 824-4600

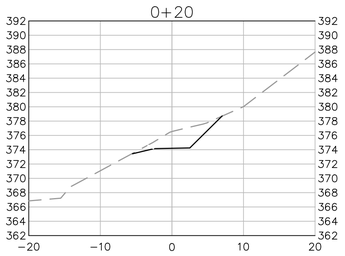
PREPARED FOR:
MARIN COUNTY OPEN SPACE DISTRICT
3501 CIVIC CENTER DRIVE, SUITE 260
SAN RAFAEL, CA 94903

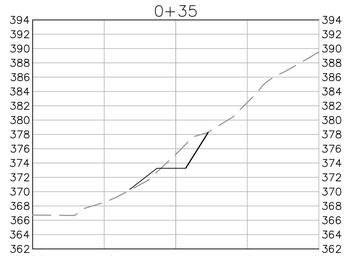
PRELIMINARY
DATE: Dec 03, 2024

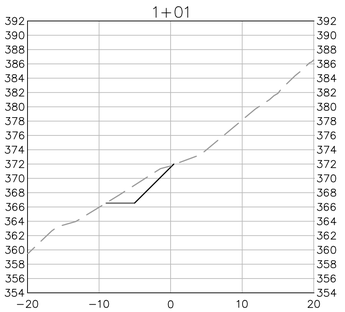
REVISIONS	DATE	BY

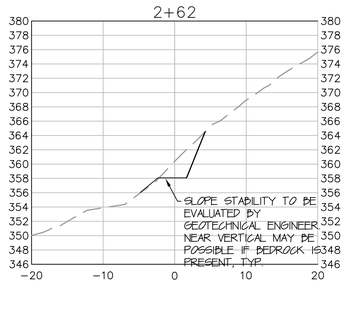
DATE: 12/3/2024
SCALE: VARIES
MAPPING BY: EC
DESIGNED BY: MJ, EM
DRAFTED BY: EC, EM
CHECKED BY: MJ

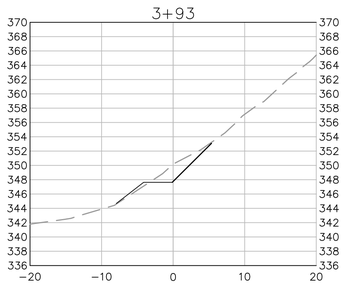
BUCK GULCH FALLS TRAIL
SEGMENT 2 ALTERNATIVE B

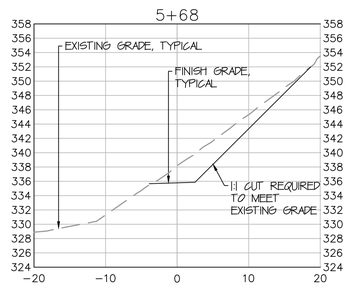












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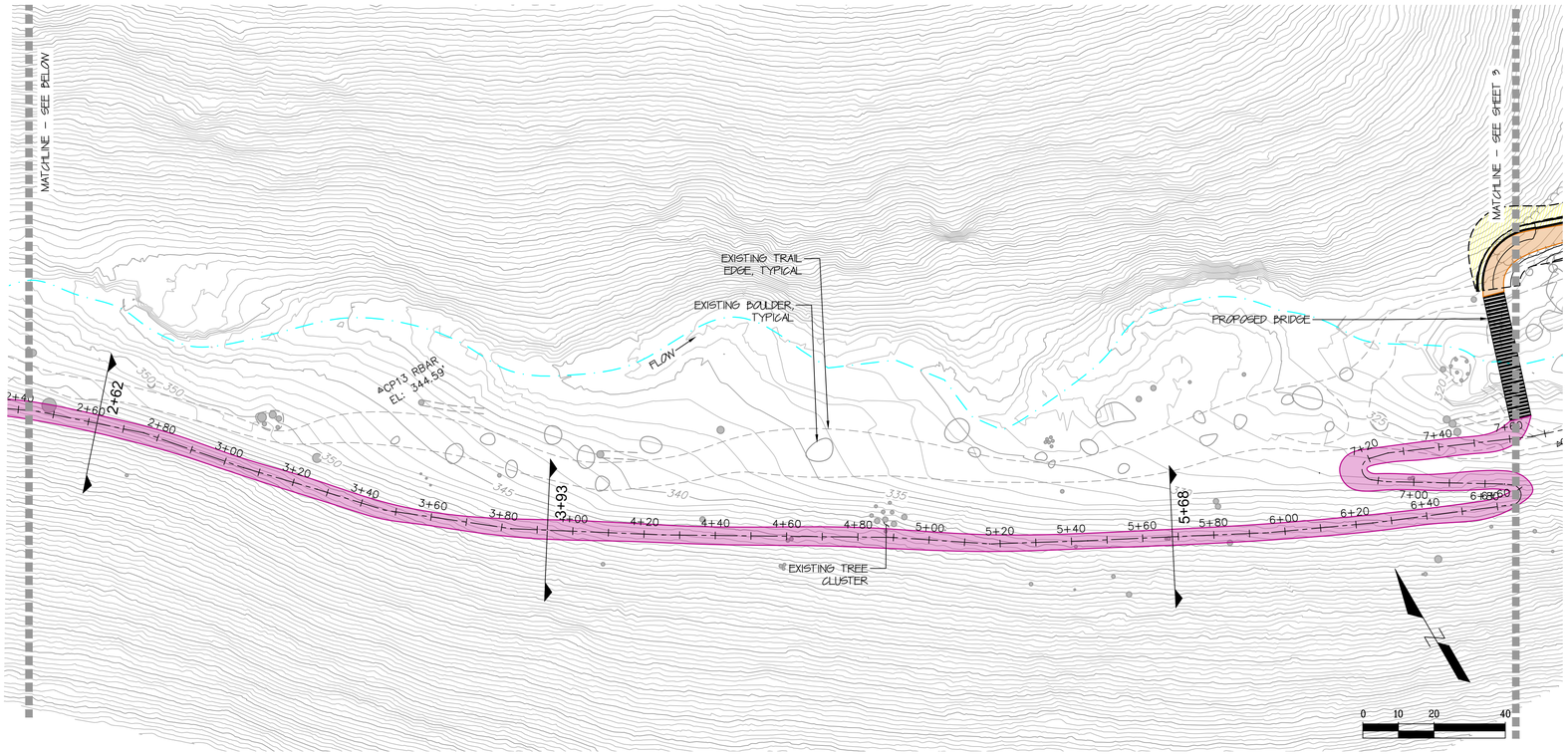
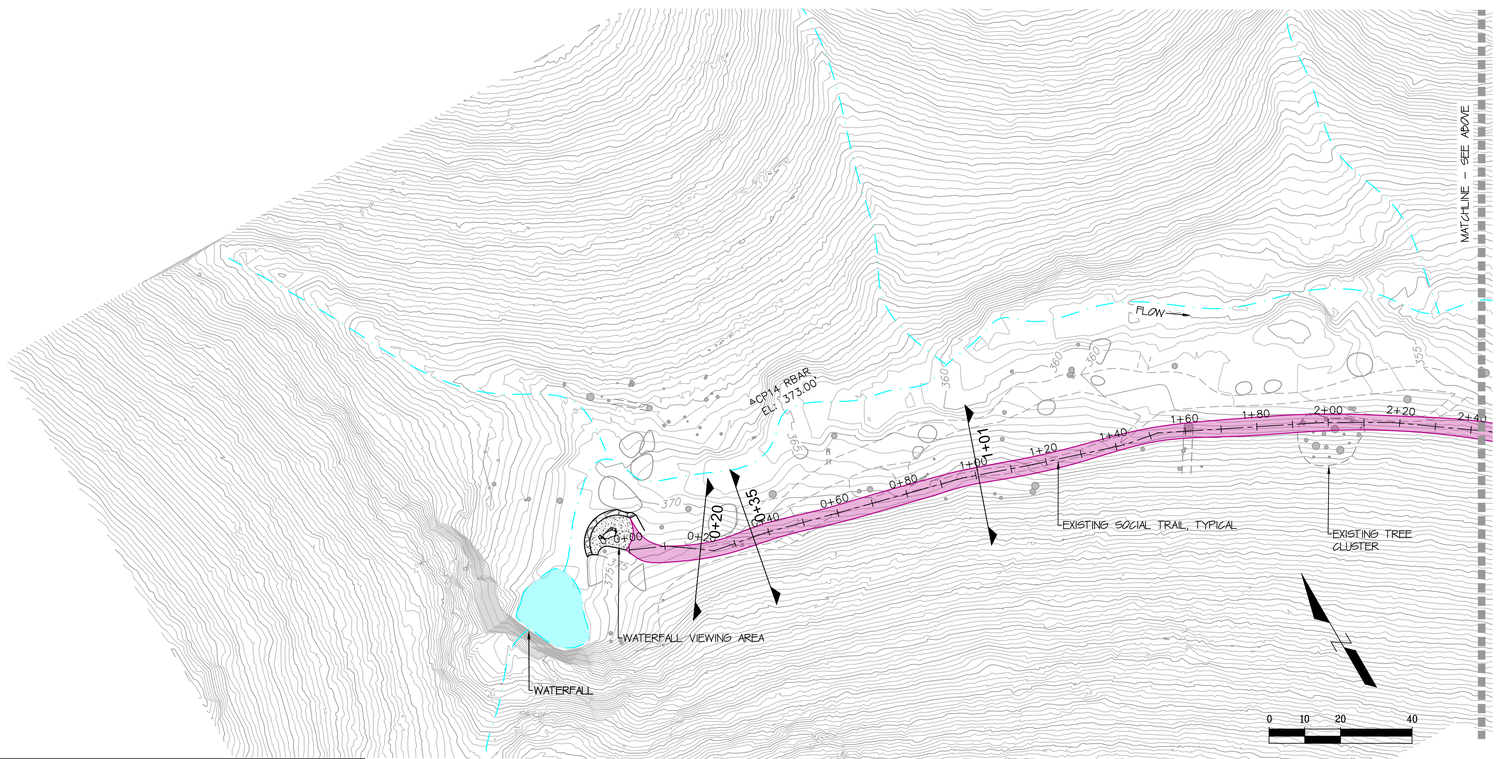
NOTE: SECTIONS ARE CONCEPTUAL IN NATURE TO SHOW DESIGN CONSTRAINTS FOR CONSIDERATION AND DO NOT NECESSARILY MATCH THE PROFILE ALIGNMENT EXACTLY.





SEGMENT 2: Proposed Bridge to Waterfall Viewing Area

Alternative C: Mid-Slope Trail to Waterfall

0 10 20 40 VERIFY SCALES ONE INCH

PCI ECOLOGICAL
103 MORRIS STREET, SUITE A-5
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(707) 824-4800

PREPARED FOR:
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SAN RAFAEL, CA 94903

PRELIMINARY
DATE: Dec 02, 2024

REVISIONS	DATE	BY

DATE: 12/2/2024
SCALE: VARIES
MAPPING BY: EC
DESIGNED BY: MJ, EM
DRAFTED BY: EC, EM
CHECKED BY: MJ

BUCK GULCH FALLS TRAIL
SEGMENT 2 ALTERNATIVE C

SHEET 7 OF 7

Acad File Name:G:\CAD2020\MarinCoOpenSpaceDistrict\BuckGulch\03_MOOSDBGFALLS\Dwgs\PP2.dwg
Plot date:12/2/2024 5:23 PM Layout:7