COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: August 23, 2017

TO: Planning Commission

FROM: Planning Staff

SUBJECT: EXECUTIVE SUMMARY: Consideration of a Timberland Preserve Permit, a Grading Permit, and an Architectural Review Permit to construct a new multi-use recreational trail, which will include 810 cubic yards of grading, the installation of five puncheons, two trail bridges, and one 5-ft. tall retaining wall, at the El Corte de Madera Creek Open Space Preserve located west of Skyline Boulevard, between Star Hill Road and Bear Gulch Road, in the unincorporated Woodside area of San Mateo County. The project site is located within the Skyline State Scenic Corridor.

County File Number: PLN 2016-00084

PROPOSAL

The applicant proposes to construct a new public multi-use recreational trail to extend the Oljon Trail at El Corte de Madera Creek Open Space Preserve. The new trail will include converting 800 feet of existing road and constructing 6,050 feet of new, 3- to 4-ft. wide multi-use trail. The project also involves abandoning 3,300 linear feet of old tractor/logging roads and trails, installing two trail bridges, five new puncheons (boardwalk style) crossings, one 3-ft. tall retaining wall, and drainage dips along the new trail. The project involves a combined total of 810 cubic yards of grading (400 cubic yards of cut and 410 cubic yards of fill), and portions of the project are within the Skyline State Scenic Corridor; no trees will be removed.

RECOMMENDATION

Approve the Timberland Preserve Permit, Grading Permit, and Architectural Review Permit, County File Number PLN 2016-00084, by adopting the required findings and conditions of approval listed in Attachment A.

SUMMARY

Staff has reviewed the proposal against the applicable policies of the San Mateo County General Plan, Timberland Preserve Zone District Review Criteria, County Grading Ordinance, and Standards for Architectural and Site Control within the Skyline Scenic Corridor and found the project to be consistent with each applicable set of policies, criteria, and standards. Midpeninsula Regional Open Space District, acting as lead agency, has prepared its own environmental review document in the form of a Mitigated Negative Declaration and the District filed a Notice of Determination with the State Clearinghouse on February 17, 2010. The County is a Responsible Agency for purposes of the California Environmental Quality Act. Mitigation measures have been included as recommended project conditions of approval to ensure minimal adverse effects on the environment, including pre-construction plant and wildlife surveys, erosion and sediment control measures, fire safety measures, and cultural and historical preservation measures.

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COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: August 23, 2017

TO: Planning Commission

FROM: Planning Staff

SUBJECT: Consideration of a Timberland Preserve Permit pursuant to Section 6750 of the San Mateo County Zoning Regulations, a Grading Permit pursuant to Section 9280 of the County Ordinance Code, and an Architectural Review Permit pursuant to Section 261 of the California Streets and Highways Code to construct a new multi-use recreational trail, which will include 810 cubic yards of grading, the installation of two trail bridges, five puncheons, and two 3-ft. tall retaining walls, at the El Corte de Madera Creek Open Space Preserve located west of Skyline Boulevard, between Star Hill Road and Bear Gulch Road, in the unincorporated Woodside area of San Mateo County. The project site is located within the Skyline State Scenic Corridor.

County File Number: PLN 2016-00084
(Midpeninsula Regional Open Space District)

PROPOSAL

The applicant proposes to construct an extension to the Oljon multi-use trail to connect the Spring Board Trail to the Steam Donkey Trail at El Corte de Madera Creek Open Space Preserve. The new trail will include converting 800 feet of existing road into a 4-ft. wide trail and constructing 6,050 feet of a new, 3- to 4-ft. wide multi-use trail. The project also involves abandoning 3,300 linear feet of old tractor/logging roads and trails, installing two trail bridges, five new puncheons (boardwalk style) watercourse crossings, two 3-ft. tall retaining walls, and drainage dips along the new trail. The project requires a combined total of 810 cubic yards of grading (400 cubic yards of cut and 410 cubic yards of fill), and portions of the project are within the Skyline State Scenic Corridor; no trees will be removed.

RECOMMENDATION

Approve the Timberland Preserve Permit, Grading Permit, and Architectural Review Permit, County File Number PLN 2016-00084, by adopting the required findings and conditions of approval listed in Attachment A.

BACKGROUND

Report Prepared By: Angela Chavez, Project Planner, Telephone: 650/599-7217

Owner/Applicant: Midpeninsula Regional Open Space District (Attention: Zachary Alexander)

Location: El Corte de Madera Creek Open Space Preserve, Unincorporated Woodside

APNs: 072-320-200 and 072-320-320

Parcel Size: 2.24 and 293.83 acres (respectively)

Parcel Legality: The project parcels were legalized through previous County subdivisions (County File Nos. SMN76-65, SMN77-8, and SMN77-9).

Existing Zoning: TPZ (Timberland Preserve Zone)

General Plan Designation: Open Space and Timber Production

Existing Land Use: Open Space Preserve

Water Supply: N/A

Sewage Disposal: N/A

Flood Zone: Not mapped

Environmental Evaluation: An Initial Study and Mitigated Negative Declaration were prepared and circulated by the Midpeninsula Regional Open Space District (MROSD), acting as the lead agency for California Environmental Quality Act (CEQA) purposes. San Mateo County is acting as a responsible agency. MROSD filed a Notice of Determination for this project with the State Clearinghouse on February 17, 2010. A copy of the Mitigated Negative Declaration is included as Attachment H.

Setting: The project site is located within the El Corte de Madera Creek Open Space Preserve (Preserve), a 2,817-acre preserve owned and managed by MROSD, which consists of approximately 34 miles of multi-use/recreational trails. The Preserve is managed for resource protection and ecologically sensitive public recreational use, in keeping with the MROSD's mission statement. Since 2004, MROSD has been actively implementing a Watershed Protection Program for the Preserve that focuses primarily on improving the Preserve's road and trail system and drainage crossings. The current proposed project is divided between two phases (Phases 3 and 4 of the El Corte de Madera Creek Parking/Staging Area and Trails Project) for the extension of Oljon Trail, but both phases will be covered by the requested permits.

The project area is west of Skyline Boulevard, between Star Hill Road and Bear Gulch Road. The surrounding rural area consists of rolling hills and open space with areas of scattered residential development along Skyline Boulevard. The proposed trail will extend downslope from the existing Oljon Trail, dropping at a 5% to 15% grade across 20% to 80% gradient sideslopes. Existing topography and vegetation provide screening of the project area from Skyline Boulevard and any residential dwellings in the area.

DISCUSSION

A. KEY ISSUES

1. Conformance with the San Mateo County General Plan

Staff has determined that the project complies with all applicable County General Plan Policies, as discussed below:

a. Vegetative, Water, Fish, and Wildlife Resources

Policies 1.22 through 1.26 seek to protect vegetation, water, fish, and wildlife resources by regulating the location and design of development. Additionally, the Sensitive Habitats Section, Policies 1.27 through 1.32, regulates development within and adjacent to sensitive habitats in order to protect critical vegetative, water, fish, and wildlife resources.

A search of the California Natural Diversity Database (CNDDB) identified no special-status plant species within the project area. Several special-status plant species (Kings Mountain Manzanita, Santa Cruz Manzanita, Arcuate bush mallow, Dudley's lousewort, Clustered Lady's slipper, Mountain Lady's slipper, and California bottle-brush grass) may potentially be present in or near the project area, although none were observed during reconnaissance-level surveys. However, a condition of approval is included to require focused plant surveys prior to any construction activities.

Several special-status animal species were identified as having the potential to occur within the project area, including marbled murrelet, Cooper's hawk, Sharp-shinned hawk, San Francisco dusky-footed woodrat, and migratory bird species. No suitable habitat was determined to exist for the California red-legged frog or the marbled murrelet in the vicinity of the project area. While no trees are proposed for removal, the area does contain habitat that could support Cooper's hawk, Sharp-shinned hawk, and San Francisco dusky-footed woodrat species. Thus, the project could have a potential to impact nesting and migrating habitat for any Cooper's hawk and Sharp-shinned hawk species, and nesting habitat for San Francisco dusky-footed woodrat. Appropriate mitigation measures, as identified in the

Mitigated Negative Declaration, have been incorporated into the conditions of approval in Attachment A to minimize the potential impact to any special-status animal species, including a requirement for pre-construction surveys prior to construction.

b. Soil Resources

Policies 2.17 through 2.23 seek to regulate development (including grading and land clearing activities) to minimize soil erosion and sedimentation, and promote and protect soil protective uses.

The project area is classified as soils with timber capability under the Productive Soil Resources Map of the County General Plan. The project scope includes a total of 810 cubic yards of grading (400 cubic yards of cut and 410 cubic yards of fill) within the Skyline State Scenic Corridor and no tree removal. The project plans, prepared by Timothy C. Best, Certified Engineering Geologist, incorporate appropriate Best Management Practices as erosion and sediment control measures to be implemented throughout project construction, including the use of native mulch material to stabilize disturbed areas. Currently, the Midpeninsula Regional Open Space District does not conduct timber harvesting activities within the Preserve.

c. Visual Quality

Policies 4.14, 4.15, and 4.20 through 4.22, and the Rural Site Planning, Scenic Roads and Corridors, Architectural Design Standards for Rural Scenic Corridors, and Site Planning for Rural Scenic Corridors policies seek to protect and enhance the natural visual character of scenic areas by promoting good design, site relationships, and other aesthetic considerations. The Visual Quality Policies' goals and objectives include minimizing grading and vegetation removal.

A portion of the proposed trail is within the Skyline State Scenic Corridor. Minimal grading is necessary to complete the project and no tree removal is proposed. Reverse grade dips will be constructed along the trail for improved drainage. New boardwalk style crossings will allow the trail to pass over natural drainage channels, shallow gullies, and other sensitive habitats. Additionally, two 28-ft. long trail bridges will be added to cross wider/deeper channels. Two 3-ft. tall retaining walls will be installed in the steeper sloped area (Steep Slope No. 7 of Phase 3 plans and Steep Swale No. 3 on Phase 4 plans in Attachments C and D) portions of the trail. The portions of old logging roads/trails which are to be abandoned will undergo work to remove and rehabilitate two watercourse crossings, remove unstable fill, and to re-contour slopes, where feasible, in an effort to return the roads to

a more natural and stable state. Due to the surrounding forest environment and trail locations, the project will not be visible from Skyline Boulevard or detract from any scenic qualities of the area.

d. Historical and Archaeological Resources

Policies 5.20 (*Site Survey*) and 5.21 (*Site Treatment*) require that the applicant take appropriate precautions to avoid damage to archaeological resources.

No known historical or cultural resources have been identified in the project area. Despite the applicant citing a history of timber harvesting at the Preserve by previous owners in the 1980s, there are no recorded historic sawmill sites within the project area. Nonetheless, conditions of approval have been added to ensure that should any resources be discovered during construction, the job will be stopped and further consultation with an archaeologist would be required.

e. Park and Recreation Resources

The Park and Recreation Resources Policies, including Policy 6.47 (*Role of the Midpeninsula Regional Open Space District*), encourage MROSD to acquire, protect, and make available for public use open space lands in rural areas.

The applicant, MROSD, is a public agency that seeks to protect and provide public open space areas. The subject Preserve was established in 1985 and is maintained and operated by MROSD. The proposed project scope is intended to improve the trail and drainage system within the Preserve, which will benefit both the environment and users of the Preserve.

f. Rural Land Use

Policy 9.23 (*Land Use Compatibility in Rural Lands*), Policy 9.34 (*Development Standards to Minimize Land Use Conflicts with Timber Production Lands*), and Policy 9.42 (*Development Standards for Land Use Compatibility in General Open Space Lands*) seek to encourage land use compatibility to maintain the scenic and harmonious nature of rural lands and to locate non-timber uses in areas of timber parcels which cause the least disturbance to existing feasible timber harvesting operations.

The project area is classified as soils with timber capability under the Productive Soil Resources Map of the County General Plan. MRSOD does not conduct timber harvesting within the Preserve and no tree removal is necessary for the proposed trail. MROSD has developed a

watershed protection program that involves protection and restoration of resources to minimize erosion and sedimentation, thereby improving the surrounding environment and waterways of the Preserve. The proposed project will not adversely impact the scenic nature of the rural area and will not disturb any existing feasible timber harvesting operations. Rather, the project has been designed to complement and improve the existing natural environment with no impacts to scenic views.

g. Fire Hazard

Fire Hazard Policies 15.28 through 15.31 seek to limit new development in fire hazard areas, except when reviewed and approved by the appropriate fire protection agency.

According to the Fire Hazard Severity Zone Maps from the California Department of Forestry, the project site is within a High and Very High Fire Hazard Severity Zone. The project plans have been reviewed and approved by the San Mateo County Fire Department. While the proposed trail is intended for public use, it is not expected to change the degree of exposure to wildfires. Nonetheless, construction activities may increase the risk for fires. Therefore, conditions of approval have been included to reduce the risk of fire hazards throughout project construction.

2. Conformance with the Zoning Regulations

The project parcels are located within the Timberland Preserve Zone (TPZ). Staff has reviewed and determined that the project complies with all applicable standards of the TPZ District, as discussed below:

a. Minor Development Permit

The management of land for recreational purposes is considered a "Compatible Use" in the TPZ District under Section 6710.1(3) of the County Zoning Regulations. A compatible use is one that does not significantly detract from the use of the property for growing and harvesting timber. Construction of a compatible use requires the securing of a Minor Development Permit, as required by Section 6752 of the Zoning Regulations.

b. General Design Criteria

Proposed development within the TPZ District requires compliance with the General Design Criteria set forth in Section 6760 of the Zoning Regulations. Staff has reviewed and determined that the

project complies with all applicable design criteria, as discussed below:

(1) Environmental Design Criteria

The *Environmental Design Criteria* seek to conserve energy, minimize air pollutants, exclude significant levels of noxious odors, exclude long-term noise levels, avoid extensive changes of vegetation, avoid adverse impacts on wildlife habitat, and minimize impacts on perennial streams and riparian habitat.

Aside from standard construction impacts, the project will not involve significant levels of air pollution, noxious odors or create long-term noise levels. In addition, there will be no long-term energy consumption associated with the project. The project will involve minimal grading and no tree removal. Furthermore, conditions of approval have been included to ensure that no identified special-status plant or animal species having the potential to occur within the project area will be disturbed. Mitigation measures from the Mitigated Negative Declaration have been included as conditions of approval that require focused, pre-construction plant and animal surveys, worker education, and implementation of erosion and sediment control measures to minimize any potential environmental impacts. Refer to Section A.1.a for further discussion.

(2) Site and Building Design Criteria

The *Site and Building Design Criteria* require development to be subordinate to and compatible with the surroundings, fit structures to the natural topography without undue grading or change to existing landforms, minimize design and construction impacts on adjacent property owners, maintain soil stability on- and off-site, minimize increase in fire risk and hazard, and minimize vegetation and tree removal.

The project will involve minimal grading and no tree removal. No portion of the project (i.e., trails, boardwalks, trail bridges, retaining walls) will be visible from Skyline Boulevard or any adjacent properties. The project area is within a High and Very High Fire Hazard Severity Zone, as determined by the California Department of Forestry and Fire Protection; however, there are no structures proposed for human habitation, nor will the project change the degree of exposure to wildfires. Furthermore, the County's Geotechnical Section has reviewed and approved (with conditions) the proposed plans and supporting documents.

(3) Cultural Resources Design Criteria

See Section A.1.d for discussion.

(4) Public Safety Design Criteria

The *Public Safety Design Criteria* require development to avoid off-site damage to life and property and avoid construction of any structures on hazardous areas as defined in the County's General Plan.

As previously mentioned, the project does not include any structures for human occupancy; however, the new trail is intended for use by the public. While the project is not expected to change the degree of the public's exposure to wildfires, conditions of approval have been included to reduce the risk of fire hazards throughout project construction. Additionally, the proposed plans and supporting documents have been reviewed and conditionally approved by the County's Fire Department and Geotechnical Section.

c. Primary Resource Areas Design Criteria

In addition, the site complies with the applicable supplemental primary resource areas design criteria of Section 6761 of the Zoning Regulations, as discussed below:

(1) Scenic Corridors and Other Scenic Resource Areas Design Criteria

The criteria set forth in Section 6761.1 seek to protect and enhance public views within scenic corridors and minimize visual impacts on scenic corridors.

The proposed trails are partially located within the Skyline State Scenic Corridor; however, grading will be minimal and no tree removal is proposed. Due to its location within the Preserve and existing surrounding topography and vegetative screening, the trail will not be visible from Skyline Boulevard.

(2) Fish and Wildlife Habitat Areas Design Criteria

The criteria set forth in Section 6761.2 require all development to be designed to prevent reduction or removal of habitat areas and ensure that any spawning and nesting areas or wetlands are not developed, altered, filled, or dredged.

Several special-status animal species were identified as having the potential to occur within the project area, including marbled murrelet, Cooper's hawk, Sharp-shinned hawk, San Francisco dusky-footed woodrat, and migratory bird species. Mitigation measures from the Mitigated Negative Declaration have been incorporated into the conditions of approval in Attachment A to minimize potential project impacts to any special-status animal species. Furthermore, the project is not expected to interfere with wildlife or fish movement corridors as it is unlikely that suitable habitat exists to support these special-status animal species. Steelhead trout, while known to spawn in the lower areas of El Corte de Madera Creek, are not within the project area due to natural passage barriers downstream. Furthermore, the project will include erosion and sediment control measures that will minimize any construction generated erosion and sediment that could enter nearby waterways. See Section A.1.a for further discussion.

(3) Forest Resources Design Criteria

The criteria set forth in Section 6761.3 seek to minimize development that uses Site I, II, or III soils for any use other than growing and harvesting timber. Based on the County's General Plan Map (General Soil Types), the Preserve is located on Type IV soils.

d. Timber Management Plan

A Timber Management Plan is required for development within the TPZ District. The plan is required to ensure that a proposed project use is compatible with the growing and harvesting of timber.

MROSD seeks to protect and preserve forest resources and provide low intensity recreational and environmental education opportunities to the public. MROSD does not conduct timber management or harvesting activities within the Preserve. Based on the compatibility of the proposed use with the TPZ District standards and the purpose of MROSD, the Timber Management Plan requirement is not applicable to the proposed project. Furthermore, the project does not propose any tree removal. However, should future harvesting activities be proposed, these activities would require that a Timber Management Plan be submitted.

3. Conformance with the Grading Regulations

The project includes a combined total of 810 cubic yards of grading (400 cubic yards of cut and 410 cubic yards of fill). In order to approve a

Grading Permit within the Skyline State Scenic Corridor, the Planning Commission must make the following findings pursuant to Section 9290.1 of the San Mateo County Ordinance Code:

a. The granting of the permit will not have a significant adverse effect on the environment.

Proposed grading is necessary to implement the project. An Initial Study and Mitigated Negative Declaration have been prepared by MROSD, acting as the CEQA lead agency. Staff has included the mitigation measures associated with the Mitigated Negative Declaration as recommended conditions of approval. These measures include focused plant surveys prior to ground-breaking activities, pre-construction surveys for special-status animal species that have the potential to occur within the project area, fire safety measures, and cultural and historical preservation measures. In addition, the County's Geotechnical Section and Department of Public Works have reviewed and approved the project with conditions. Therefore, staff has determined that the project, as proposed and conditioned, will not have a significant adverse impact on the environment.

b. The project conforms to the criteria of Chapter 5, Division VII, of the San Mateo County Ordinance Code, including the standards referenced in Section 9296.

The project, as proposed and conditioned, conforms to the standards in the Grading Ordinance, including those relative to an erosion and sediment control plan, dust control plan, fire safety, and the timing of grading activity. The project plans have been reviewed and recommended for approval by both the Geotechnical Section and the Department of Public Works. Conditions of approval have been included in Attachment A to ensure compliance with the County's Grading Ordinance.

c. The project is consistent with the General Plan.

The project has been reviewed against the applicable policies of the San Mateo County General Plan and found to be consistent with its goals and objectives. Please refer to Section A.1 of this report for a detailed discussion regarding the project's compliance with General Plan Policies.

4. Architectural Review Permit

The proposed project includes a grading permit for 810 cubic yards of grading (partially within the Skyline State Scenic Corridor); therefore,

architectural review and approval by the Planning Commission is required. The project, as proposed and conditioned, is consistent with the Standards for Architectural and Site Control within the Skyline State Scenic Corridor. The proposed trails, boardwalks, trail bridges, and retaining walls will not be visible from Skyline Boulevard due to their location within the Preserve and existing surrounding topography and vegetative screening. Proposed grading associated with the project has been kept to a minimum and no tree removal is proposed. Furthermore, the project is consistent with all General Plan Visual Quality Policies as discussed in Section A.1.c of this report.

B. ENVIRONMENTAL REVIEW

An Initial Study and Mitigated Negative Declaration were prepared and circulated by MROSD, acting as the CEQA lead agency. San Mateo County is acting as a responsible agency. MROSD filed a Notice of Determination for this project with the State Clearinghouse on February 17, 2010.

C. REVIEWING AGENCIES

San Mateo County Building Inspection Section
San Mateo County Department of Public Works
San Mateo County Geotechnical Section
San Mateo County Fire Department

ATTACHMENTS

A. Recommended Findings and Conditions of Approval
B. Vicinity Map
C. Oljon Trail Phase 3 Plans
D. Oljon Trail Phase 4 Plans
E. Mitigated Negative Declaration prepared by Midpeninsula Regional Open Space District, dated October 6, 2009
F. Engineering Geologic Review for Phases 3 and 4, dated December 23, 2015 and April 6, 2016

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Attachment A

County of San Mateo
Planning and Building Department

RECOMMENDED FINDINGS AND CONDITIONS OF APPROVAL

Permit or Project File Number: PLN 2016-00084 Hearing Date: August 23, 2017

Prepared By: Angela Chavez, Project Planner For Adoption By: Planning Commission

RECOMMENDED FINDINGS

Regarding the Environmental Review, Find:

1. That San Mateo County, acting as a responsible agency, has reviewed and considered the Mitigated Negative Declaration prepared by Midpeninsula Regional Open Space District as the lead agency.

Regarding the Timberland Preserve Zone Permit, Find:

2. That the project is consistent with the goals, objectives, and regulations of the Timberland Preserve Zone District including the General Design Criteria and Supplemental Primary Resource Areas Design Criteria. The project is considered a compatible use (management of land for recreational purposes) subject to a Minor Development Permit, pursuant to Section 6752 of the Zoning Regulations. Furthermore, the Midpeninsula Regional Open Space District seeks to protect forest resources and does not conduct timber harvesting within the Preserve. Specifically, the project complies with the following:

   General Design Criteria

   The *Environmental Design Criteria* seek to conserve energy, minimize air pollutants, exclude significant levels of noxious odors, exclude long-term noise levels, avoid extensive changes of vegetation, and avoid adverse impacts on plant and wildlife habitat. The project will not involve significant levels of air pollution, noxious odors, or create long-term noise levels. There will be no long-term energy consumption associated with the project. Grading will be kept to a minimum and conditions of approval have been included to minimize any potential adverse impacts on plant and wildlife species.

   The *Site and Building Design Criteria* require development to be subordinate to and compatible with the surroundings. The project will involve minimal grading and no tree removal. No portion of the project (i.e., trails, boardwalks, trail

bridges, and/or retaining walls) will be visible from Skyline Boulevard or any adjacent property owners. The project area is within a High and Very High Fire Hazard Severity Zone, as determined by the California Department of Forestry and Fire Protection; however, there are no structures proposed for human habitation, nor will the project change the degree of exposure to wildfires.

The *Cultural Resources Design Criteria* seek to avoid damage to archaeological resources. No known historical or cultural resources have been identified in the project area. Nonetheless, conditions of approval have been added to ensure that should any resources be discovered during construction, construction activities would cease and further consultation with an archaeologist would be required.

The *Public Safety Design Criteria* require development to avoid off-site damage to life and property and avoid construction of any structures on hazardous areas as defined in the County's General Plan. The proposed project does not include any structures for human occupancy; however, it is within a High and Very High Fire Hazard Severity Zone. While the proposed project is not expected to change the degree of the public's exposure to wildfires, construction activities may increase the risk for occurrence. Therefore, conditions of approval have been included to reduce the risk of fire hazards throughout project construction.

Primary Resource Areas Design Criteria

The *Scenic Corridors and Other Scenic Resource Areas Design Criteria* seek to protect and enhance public views within scenic corridors. The proposed trail is partially located within the Skyline State Scenic Corridor; however, grading will be minimal and no tree removal is proposed. Due to its location within the Preserve and existing surrounding topography and vegetative screening, the trail or supporting structures (i.e., boardwalk and retaining wall) will not be visible from Skyline Boulevard.

The *Fish and Wildlife Habitat Areas Design Criteria* require all development to be designed to prevent reduction or removal of habitat areas and ensure that any spawning and nesting areas or wetlands are not developed, altered, filled, or dredged. The project is not expected to interfere with wildlife or fish movement corridors as it is unlikely that suitable habitat exists to support any special-status animal species. Furthermore, the proposed improvements will include erosion and sediment control measures that will minimize any construction generated erosion and sediment that could enter nearby waterways. Additionally, project conditions include pre-construction surveys to minimize any adverse impacts to wildlife habitat.

The *Forest Resources Design Criteria* seek to minimize development that uses Site I, II, or III soils for any use other than growing and harvesting timber. Based on the County's General Plan Map (General Soil Types), the Preserve is located on Type IV soils.

Regarding the Grading Permit, Find:

3. That the granting of the permit will not have a significant adverse effect on the environment. A Mitigated Negative Declaration was prepared by Midpeninsula Regional Open Space District, acting as lead agency. Proposed grading is the minimum necessary to complete the project. Staff has included mitigation measures associated with the Mitigated Negative Declaration as recommended conditions of approval to ensure that the project has no adverse impacts on any potential plant or wildlife species. In addition, the County's Geotechnical Section and Department of Public Works have reviewed and approved the project with conditions.

4. That the project conforms to the criteria of Chapter 8, Division VII, of the San Mateo County Ordinance Code, including the standards referenced in Section 9296. The project, as proposed and conditioned, conforms to standards in the Grading Ordinance, including those regarding an erosion and sediment control plan, dust control plan, fire safety, and the timing of grading activity.

5. That the project is consistent with the San Mateo County General Plan. The project has been reviewed against the applicable policies of the General Plan and found, as proposed and conditioned, to be consistent with its goals and objectives. Specifically, the proposal is consistent with the Vegetative, Water, Fish, and Wildlife Resources, Soil Resources, Visual Quality, Historical and Archaeological Resources, Park and Recreation Resources, Rural Land Use, and Fire Hazard Policies, as discussed in Section A.1 of the staff report.

Regarding the Architectural Review Permit, Find:

6. That the project is consistent with the Standards for Architectural and Site Control within the Skyline State Scenic Corridor and Visual Quality Policies of the General Plan. Proposed project improvements within the Skyline State Scenic Corridor will not be visible from public views due to existing topography and vegetation along Skyline Boulevard, grading will be minimal, and no tree removal is proposed.

RECOMMENDED CONDITIONS OF APPROVAL

Current Planning Section

General Conditions

1. This approval applies only to the proposal, documents, and plans described in this report and approved by the Planning Commission on August 23, 2017. The Community Development Director may approve minor revisions or modifications to the project if they are consistent with the intent of, and in substantial conformance with, this approval.

2. The Timberland Preserve Zone Permit, Grading Permit, and Architectural Review Permit final approval shall be valid for one (1) year from the date of approval in which time a building permit and grading permit shall be issued concurrently. If the grading permit (issued as the "hard card" with all necessary information filled out and signatures obtained) has not been issued within this time period, the Timberland Preserve Zone Permit, Grading Permit, and Architectural Review Permit approval will expire. The Community Development Director will consider an extension of this approval upon written request and payment of the applicable fees sixty (60) days prior to the permits' expiration.

3. Noise sources associated with the demolition, construction, repair, remodeling, or grading shall be limited to the hours from 7:00 a.m. to 6:00 p.m., weekdays and 9:00 a.m. to 5:00 p.m., Saturdays. Said activities are prohibited on Sundays, Thanksgiving, and Christmas (San Mateo Ordinance Code Section 4.88.360).

4. No trees are approved for removal. Removal of any trees within 100 feet of the Skyline State Scenic Corridor shall require review and approval by the Community Development Director and may require a modification or amendment to this project approval.

Mitigation Measures from the Mitigated Negative Declaration:

5. BIO-1: Focused plant surveys for Kings Mountain Manzanita, Santa Cruz Manzanita, Arcuate bush mallow, Dudley's lousewort, Clustered Lady's slipper, Mountain Lady's slipper, and California bottle-brush grass shall be conducted prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth movement activities. If any special-status plant species are found, areas supporting the species shall be avoided where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with the California Department of Fish and Game (CDFG). Construction work may start once such plan has been approved by the CDFG. Kings Mountain manzanita individuals (or Santa Cruz manzanita individuals, if observed) within 30 feet of any project area shall be flagged. Individuals located in the immediate area where ground disturbance will occur shall be demarcated with protective fencing to prevent disturbance.

6. BIO-2: The 3- to 4-month construction period for each project component will occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus will overlap the raptor breeding season (April through August). Therefore, pre-construction surveys shall be conducted by a qualified biologist after breeding season has begun, and no more than 30 days prior to construction, to determine if raptors are nesting in the project area. If nests of these species are found, no noise-generating construction activities shall occur within 1/4 mile of the nest. Activities will be postponed until all young are fledged.

7. BIO-3: The 3- to 4-month construction period for each project component will occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus will overlap the migratory bird breeding season (April through August). If suitable avian nesting trees are proposed for removal during the breeding season, a qualified biologist shall conduct pre-construction nesting bird surveys within 30 days of the onset of any construction activity. The pre-construction survey shall search all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged.

8. BIO-4: A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior to initial ground breaking to determine the presence or absence of nests in the areas that would be disturbed by construction and earth movement activities. If feasible, disturbance of woodrat nests shall be avoided by routing the trail and by staging construction-related equipment and materials away from known nest sites. If avoidance of San Francisco dusky-footed woodrat nests is not feasible, the California Department of Fish and Game will be consulted regarding the possibility of relocating the nests outside of the work area.

9. CULT-2: Implementation of the following measures will reduce potential impacts to cultural and historical resources, including buried and unknown archaeological, paleontological, and human remains, to a less than significant level:

    a. If cultural and/or historical resources are encountered during construction, every reasonable effort shall be made to avoid the resources. Work shall stop within 50 feet of the find until a qualified cultural and/or historical resources expert can assess the find. The applicant shall notify the Current Planning Section immediately. Upon review of the archaeologist's report, the Community Development Director, in consultation with the applicant and archaeologist, will determine the steps to be taken before construction may continue.

    b. A reasonable effort will be made by the MROSD to avoid or minimize harm to the discovery until the significance is determined and an appropriate treatment can be identified and implemented. Methods to protect finds include fencing and covering remains with protective material such as culturally sterile soil or plywood.

    c. If vandalism is a threat, 24-hour security shall be provided.

    d. Construction operations outside of the find location can continue during the significance evaluation period and while mitigation for cultural and/or historical resources is being carried out, preferably with a qualified cultural and/or historical resources expert monitoring any subsurface excavations.

e. If a resource cannot be avoided, a qualified cultural and/or historical resources expert will develop an appropriate action plan for treatment to minimize or mitigate the adverse effects. The MROSD will not proceed with construction activities within 100 feet of the find until the action plan has been reviewed and approved.

f. The treatment effort required to mitigate the inadvertent exposure of significant cultural and/or historical resources will be guided by a research design appropriate to the discovery and potential research data inherent in the resource in association with suitable field techniques and analytical strategies. The recovery effort will be detailed in a professional report in accordance with current professional standards. Any non-grave associated artifacts will be curated with an appropriate repository.

g. Project construction documents shall include a requirement that project personnel shall not collect cultural and/or historical resources encountered during construction. This measure is consistent with Federal Guideline 36 CFR 800.13(a) for invoking unanticipated discoveries.

10. CULT-3: If human remains are uncovered during project construction, the MROSD will immediately halt work, contact the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387). No further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. If the remains are determined to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty in locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

11. HAZ-1 thru HAZ-3: To minimize fire hazard during construction, the following measures shall be implemented:

a. All equipment used during construction must have an approved spark arrester.

b. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

c. Minimize use of mechanical construction equipment during hot, dry, and/or windy weather.

12. HAZ-4: Hired contractors shall be required to:

    a. Provide water to suppress potential fires caused by the work performed.

    b. Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.

    c. Maintain working ABC fire extinguishers on all vehicles in the work area.

    d. Contact both Mountain View Dispatch at 650/968-4411 and the California Department of Forestry, Skylonda, at 650/851-1860 for emergency response in the event of a fire (these numbers are to report emergencies only).

Grading Permit Conditions

13. No site disturbance shall occur, including any grading or tree removal, until the grading permit "hard card" has been issued.

14. Unless approved in writing and in advance by the Community Development Director, no grading shall be allowed during the winter season (October 1 to April 30) to avoid potential soil erosion. The applicant shall submit a letter to the Current Planning Section, prior to the issuance of the hard card, which illustrates the approximate grading schedule, including start and end dates.

15. The provisions of the San Mateo County Grading Ordinance shall govern all grading activities on the project site.

16. All grading activities shall be according to the approved plans prepared by the project engineer of record, Timothy C. Best.

17. The engineer who prepared the approved grading and drainage plans shall be responsible for the inspection and certification of the grading as required by Sections 9297.1 and 9297.2 of the Grading Ordinance. The engineer's responsibilities shall include those relating to non-compliance detailed in Section 9297.4 of the Grading Ordinance.

18. It shall be the responsibility of the applicant's engineer to regularly inspect the erosion control measures and determine that they are functioning as designed and that proper maintenance is being performed. Deficiencies shall be immediately corrected.

19. For final approval of the grading permit, the applicant shall ensure the performance of the following activities, within thirty (30) days of the completion of grading:

    a. The engineer shall submit written certification to the Department of Public Works and the Current Planning Section that all grading, lot drainage, and drainage facilities have been completed in conformance with the approved plans, as conditioned, and the Grading Ordinance.

    b. The geotechnical consultant shall submit to the Building Inspection Section's Geotechnical Engineer and the Current Planning Section a signed Section II of the Geotechnical Consultant Approval form indicating that they have observed all grading activities and that the work conforms to the approved plans.

    Please include the Geotechnical File Number, 15F-27, in all correspondence with the Geotechnical Section of the Planning and Building Department.

20. Prior to beginning any construction activities, the applicant shall implement the approved erosion and sediment control plan, which shall be maintained throughout the duration of the project. Erosion control measure deficiencies, as they occur, shall be immediately corrected. The goal is to prevent sediment and other pollutants from leaving the project site and to protect all exposed earth surfaces from erosive forces. Said plan shall adhere to the San Mateo Countywide Stormwater Pollution Prevention Program "General Construction and Site Supervision Guidelines," including:

    a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

    b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with stormwater.

    c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges to storm drains and watercourses.

    d. Using sediment controls or filtration to remove sediment when dewatering the site and obtaining all necessary permits.

    e. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

f. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

g. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

h. Performing clearing and earth-moving activities only during dry weather.

i. Limiting and timing applications of pesticides and fertilizers to prevent polluted runoff.

j. Limiting construction access routes and stabilizing designated access points.

k. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

l. The contractor shall train and provide instructions to all employees and subcontractors regarding the construction Best Management Practices including, but not limited to, those listed above.

m. Additional Best Management Practices, in addition to those shown on the plans, may be required by the Building Inspector to maintain effective stormwater management during construction activities and for post-construction site stabilization. Any water leaving the site shall be clear and running slowly at all times.

21. Prior to any grading activities, the applicant shall implement and maintain, throughout the duration of the project, minimum dust control measures:

a. Water all construction and grading areas at least twice daily.

b. Cover all truck hauling soil, sand, and other loose materials, or require all trucks to maintain at least 2 feet of freeboard.

c. Pave, apply water two times daily, or apply non-toxic soil on all unpaved access roads, parking areas, and staging areas at the project site.

d. Sweep streets daily (with water sweepers) if visible soil material is carried onto any public street(s).

e. Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).

22. For work conducted in or adjacent to waterways, the following guidelines shall be incorporated to reduce potential construction-related erosion that could affect downstream steelhead:

    a. Schedule ground disturbing activities adjacent to any waterway or wetland during the dry season (May 1 to September 30).

    b. Minimize vegetation removal between the work area and any waterway or wetland to filter construction-related sediment before it enters waterways or wetland areas.

    c. Prohibit the maintenance of construction equipment within 100 feet of any waterways or wetlands.

    d. Install silt fencing, fiber rolls, or other protective structures between work areas and waterways or wetland areas to intercept sediment where intervening vegetation is insufficient.

    e. Reseed, plant, or otherwise stabilize areas of bare soil as soon as possible after work has ceased and prior to the onset of the rainy season (October 1).

    f. Prohibit storage of any hazardous materials within 100 feet of waterways or wetland areas.

23. The site is considered a Construction Stormwater Regulated Site. Any grading and/or ground disturbance activities conducted during the wet weather season (October 1 to April 30) will require monthly erosion and sediment control inspections by the Building Inspection Section. The applicant shall apply for and be issued a building permit concurrently with the grading permit “hard card” to track (potential) wet weather inspections.

24. Pursuant to San Mateo County Ordinance Section 9296.5, all equipment used in grading operations shall meet spark arrester and firefighting tool requirements, as specified in the California Public Resources Code.

Building Inspection Section

25. The applicant shall obtain a valid building permit prior to the start of any construction and/or ground disturbing activities.

Geotechnical Section

26. The applicant shall comply with all Geotechnical Section requirements at the building permit stage.

Department of Public Works

27. Prior to the issuance of the building permit or planning permit (for Provision C3 Regulated Projects), the applicant shall have prepared, by a registered civil engineer, a drainage analysis of the proposed project and submit it to the Department of Public Works for review and approval. The drainage analysis shall consist of a written narrative and a plan. The flow of the stormwater onto, over, and off of the property shall be detailed on the plan and shall include adjacent lands as appropriate to clearly depict the pattern of flow. The analysis shall detail the measures necessary to certify adequate drainage. Post-development flows and velocities shall not exceed those that existed in the pre-developed state. Recommended measures shall be designed and included in the improvement plans and submitted to the Department of Public Works for review and approval.

28. Prior to issuance of the building permit, the applicant shall provide hydrology calculations, and hydrology map to check culverts, and culvert sizing.

29. Should the intensification of use of the preserve create spill over parking outside the parking lots provided, the applicant shall submit a parking analysis study project to the California Department of Transportation (Caltrans) and the Department of Public Works for review and approval. In the event that the findings of the study determine that there are impacts to parking elements, the applicant shall apply for the necessary permits and incorporate measures which address the identified impacts.

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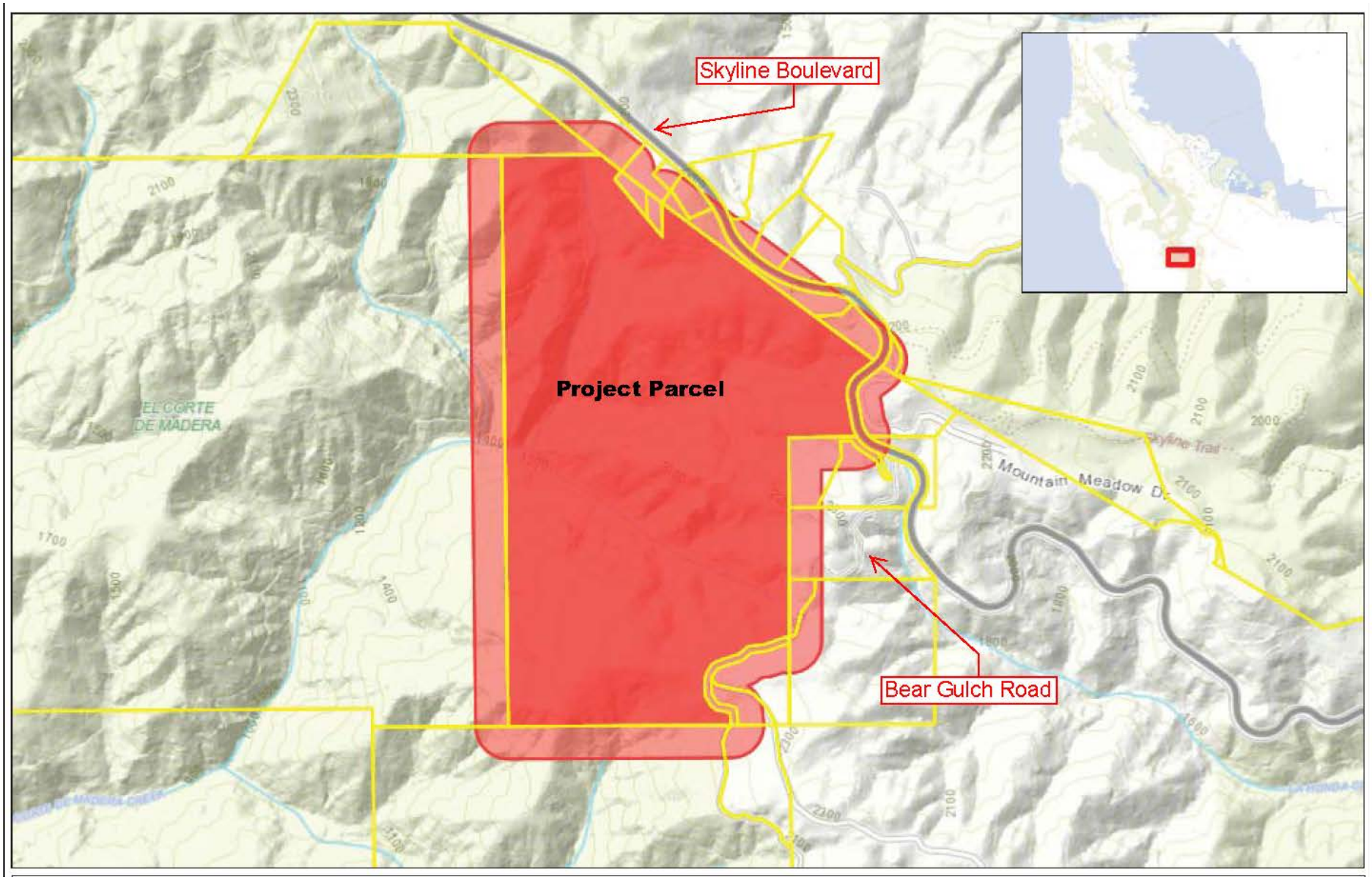


San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **B**

File Numbers: **PLN2016-00084**

OLJON TRAIL
PHASE 3 PROJECT
EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE
COUNTY OF SAN MATEO, CA

PHASE 3: PROJECT DESCRIPTION/SCOPE

The project proposes to construct a new 4700-foot-long multi-use trail to connect Spring Board and Steam Donkey Trails. The proposed work includes the following:

- Construct 4,700 feet of new four foot wide trail
- Convert 500 feet of existing road to trail use
- Install 4 new puncheons
- Abandon up to 500 feet of old tractor road.

The trail will be routed across moderate to steep (20% to 80+%) sideslopes at 5% to 15% grade, the majority of which is located in an upper hillslope position. The proposed trail will be constructed at 4 foot width, mainly on balanced cut and fill. Cuts are expected to be between 1 and 4 feet high with fill less than 2 feet deep.

APPROXIMATE EARTHWORK QUANTITIES

Cut:	305 CY
Fill: Spread	305 CY
TOTAL	610 CY

Maximum fill: < 3 feet deep
Maximum cut: < 4 feet high

Disturbed area: 0.85 acres

Note: Excavation volumes are approximate and may differ based on conditions encountered during crossing and fill removal.

CONTACTS

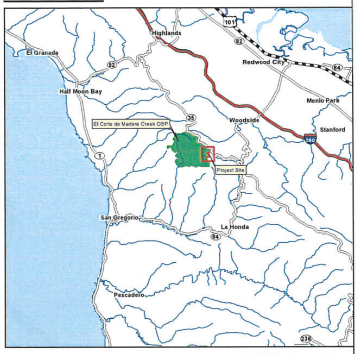
OWNER
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
330 DISTEL CIRCLE
LOS ALTOS, CA 94022
(650) 691-1200
CONTACT: ZACHARY ALEXANDER

ENGINEERING GEOLOGIST/PLAN PREP
TIMOTHY C BEST, CEG
1002 COLUMBIA STREET
SANTA CRUZ, CA 95060
(831) 425-5832
CONTACT: TIM BEST

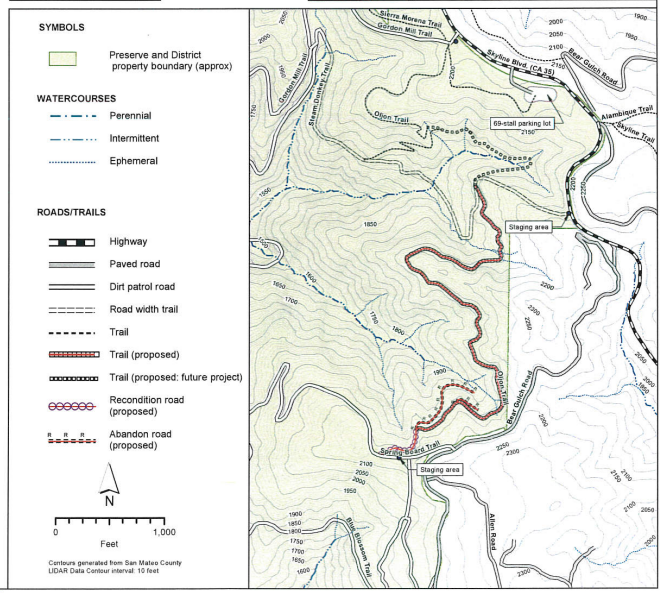
STRUCTURAL ENGINEER
MAYONE STRUCTURAL ENGINEERING, INC.
187-B EL DORADO STREET
MONTEREY, CA 93940
(831) 372-4455
CONTACT: STEVE MAYONE

SHEET INDEX

VICINITY MAP



PROJECT LOCATION



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PROJECT
OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
TITLE SHEET AND LOCATION MAP

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

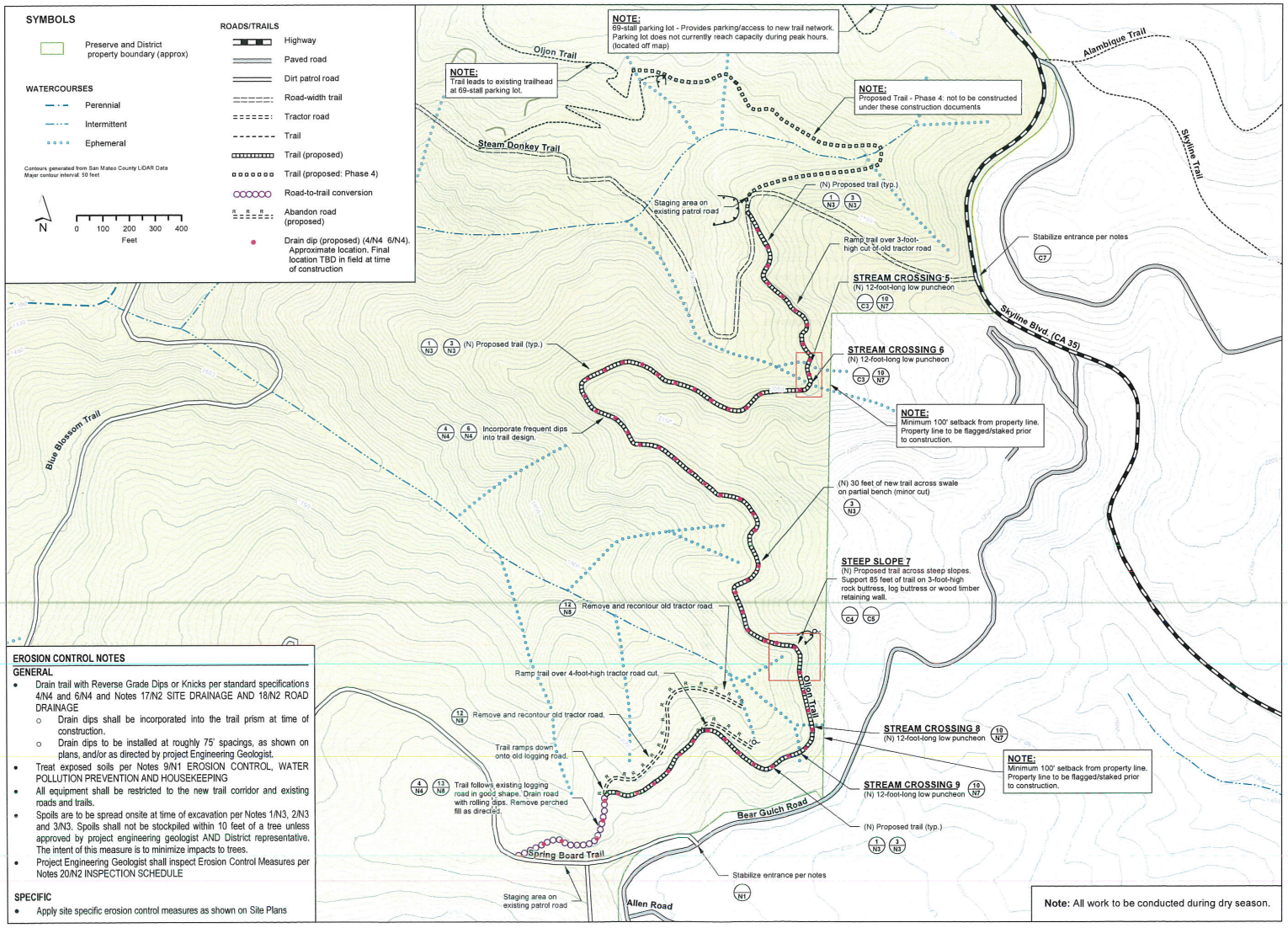
PROJECT
MPEN-OLJON-PH3-645

SHEET NUMBER
C1

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **C**

File Numbers: **PLN2016-00084**



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PROJECT
OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
TRAIL LAYOUT MAP and GENERAL EROSION CONTROL PLAN

Date	Description
12/3/2015	
Revised: 08/20/2016	

DRAWN
TCB

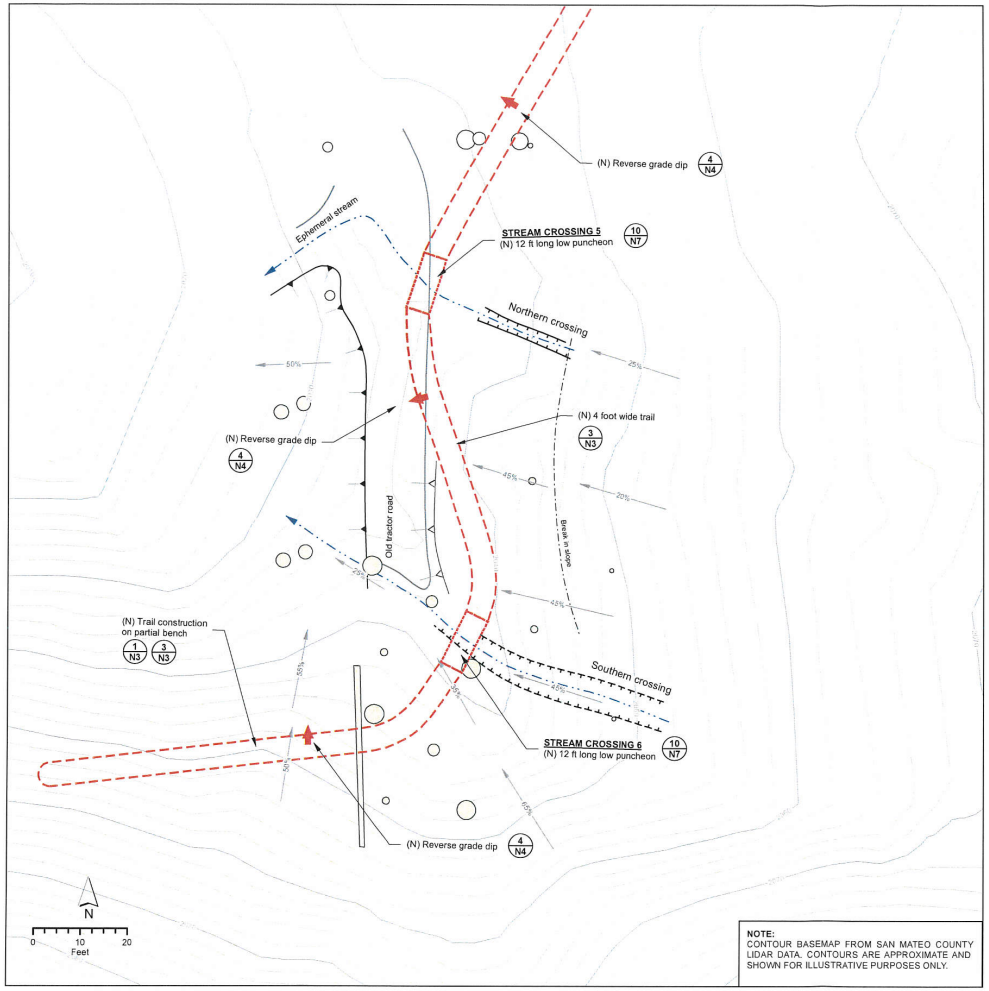
PROJECT
MPEN-OLJON-PH3-645

SHEET NUMBER
C2

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **C**

File Numbers: **PLN2016-00084**



CROSSINGS 5 AND 6: SITE MAP

SYMBOLS

- Tractor road
- Trail
- Cutslope
- Fill slope
- Landslide scarp (dashed where approximate)
- Scarp (dashed where approximate)
- Gully
- Channel bank (dashed where approximate)
- Drainage Channel
- 45% Slope gradient
- Cross-section
- Tree / log
- Stump
- Seep
- (N) Puncheon
- (N) 4 foot wide trail
- (N) Culvert
- (N) Retaining wall
- (N) Rock placement
- (N) Limit of fill removal
- (N) Straw roll
- (N) Reverse grade dip

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PROJECT
OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
SITE PLAN

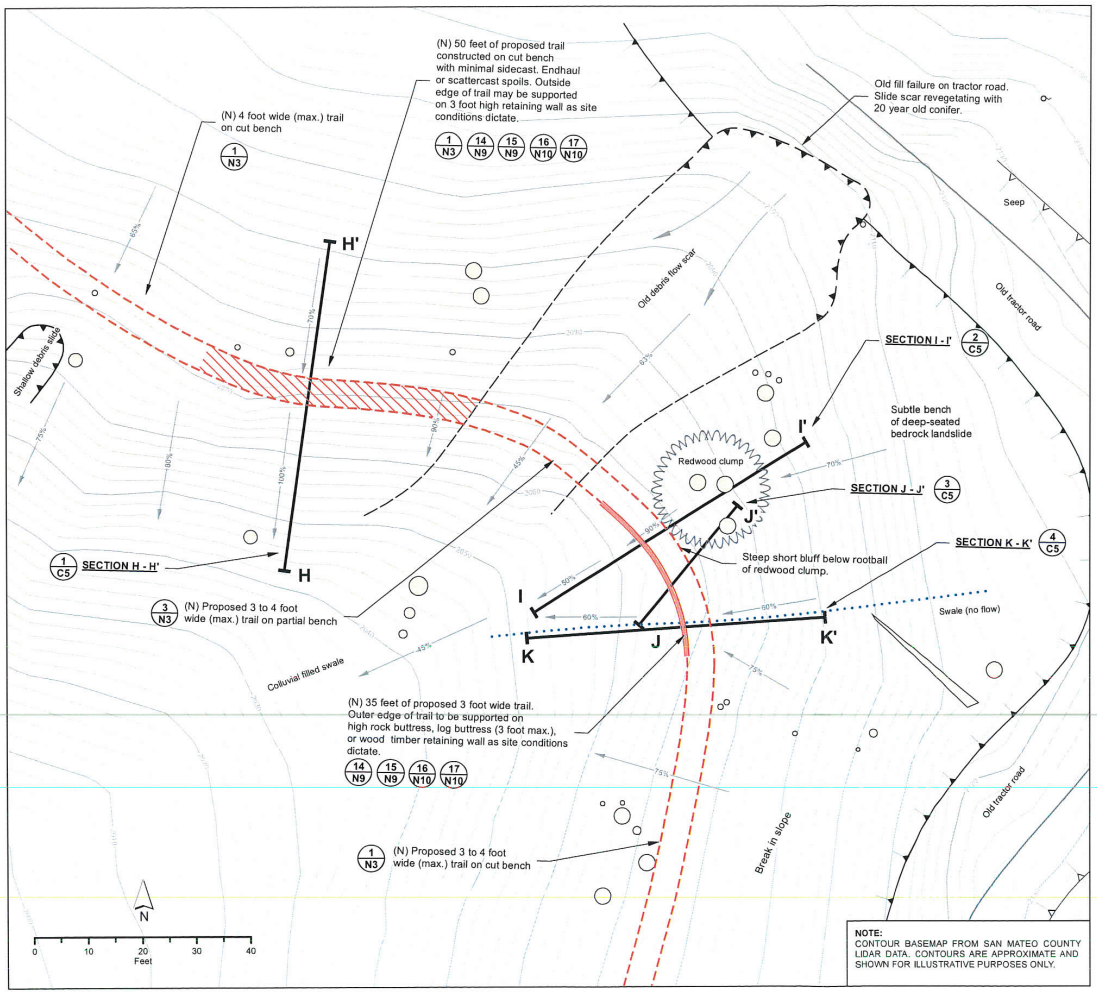
CROSSINGS 5 AND 6

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-PH3-645

SHEET NUMBER
C3



STEEP SLOPE 7: SITE MAP

SYMBOLS

- Tractor road
- Trail
- Cutslope
- Fill slope
- Landslide scarp (dashed where approximate)
- Scarp (dashed where approximate)
- Gully
- Channel bank (dashed where approximate)
- Drainage Channel
- 45% Slope gradient
- Cross-section
- Tree / log
- Stump
- Seep
- (N) Puncheon
- (N) 4 foot wide trail
- (N) Culvert
- (N) Retaining wall
- (N) Rock placement
- (N) Limit of fill removal
- (N) Straw roll
- (N) Reverse grade dip
- (N) Cut bench

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PROJECT
OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
SITE PLAN

STEEP SLOPE 7

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

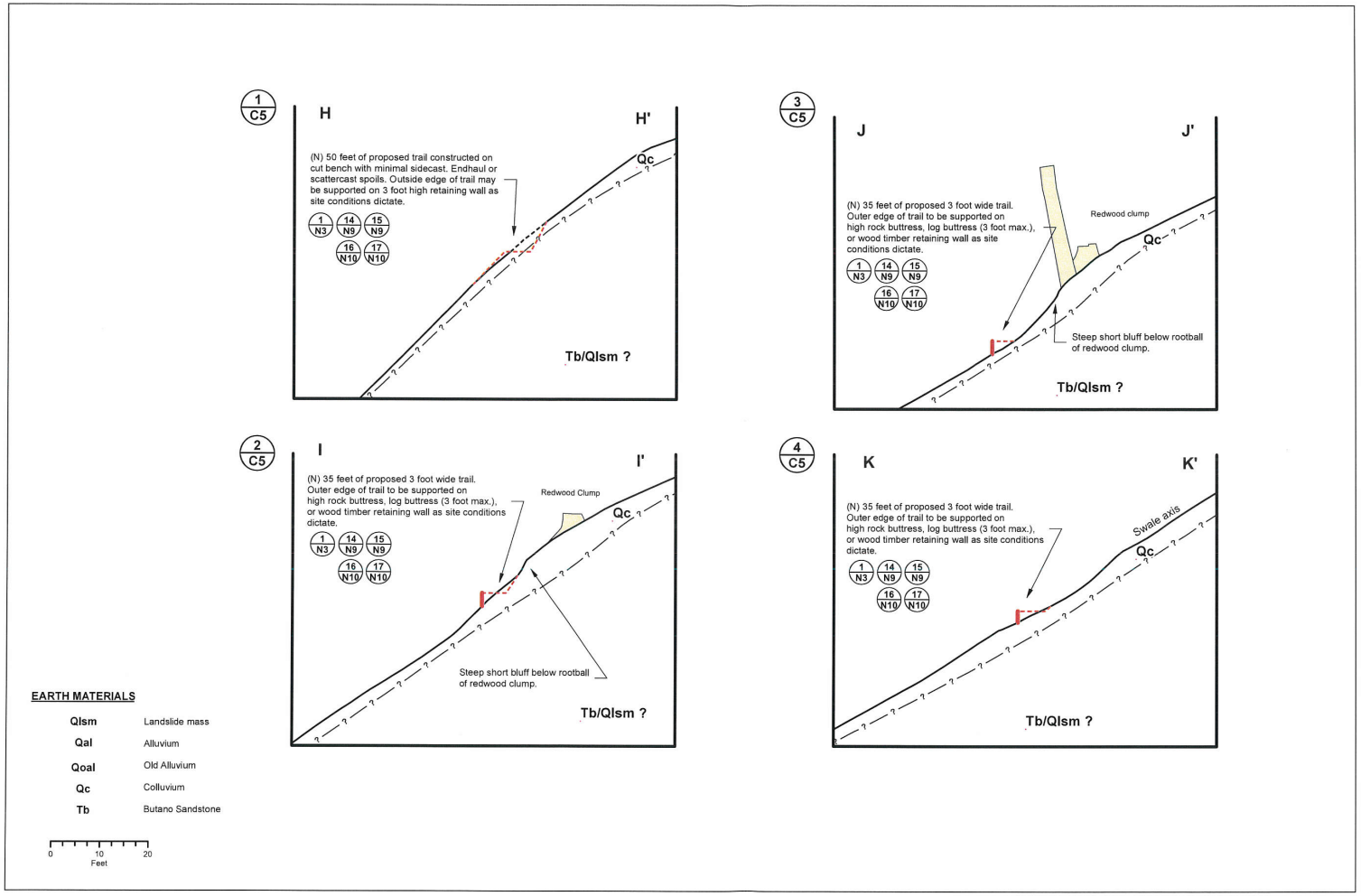
PROJECT
MPEN-OLJON-PH3-645

SHEET NUMBER
C4

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **C**

File Numbers: **PLN2016-00084**



STEEP SLOPE 7: CROSS SECTIONS

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PROJECT
OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
CROSS SECTIONS

STEEP SLOPE 7

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-PH3-645

SHEET NUMBER
C5

GENERAL

1) GENERAL NOTES
   b) The "District" shall be Midpeninsula Regional Open Space District , the "engineering geologist" (CEG) shall be Timothy C. Best, the "structural engineer" shall be Mayone Structural Engineering, Inc., and the "contractor" shall be the District or independent contractor to perform the work described herein. The engineering geologist has been retained by the District and is not affiliated with the contractor.
   c) All materials and workmanship shall conform to the project documents and applicable requirements.
   d) The contractor shall be responsible for coordinating the project documents with conditions at the site and shall verify existing grades, elevations and conditions prior to commencing work. Any discrepancies shall be reported to the engineering geologist and shall be resolved before proceeding with the work. Any deviation, substitution or alteration to the trail layout shall be subject to review by the engineering geologist.
   e) The contractor shall be responsible for the safety of the construction area during construction and shall provide necessary safety measures in accordance with all state and local safety ordinances. This requirement shall apply continuously and not be limited to normal working hours.
   f) The contractor shall notify the project engineering geologist a minimum of 7 days prior to commencement of work and a minimum of 7 days in advance of required inspections.
   g) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.
   h) The contractor shall provide the District and engineering geologist with the name and telephone number of the responsible person to contact, with regard to this project, 24 hours a day.
   i) Contractor shall be responsible for following any requirements of the permitting agencies including California Department of Fish and Wildlife 1600 agreement. Any discrepancies between permits and plans shall be brought to the attention of the engineering geologist prior to construction.
   j) Contractor shall be responsible for site clean-up to the satisfaction of the District.
   k) All construction equipment shall avoid contact with stream waters.
   l) The engineering geologic report prepared by Timothy C. Best shall be considered part of the plans.
   m) Unapproved over-excavation shall be considered a permanent construction defect with potential significant risks and hazards for the owner and downslope properties.

2) EXAMINATION OF JOB SITE, PLANS AND SPECIFICATIONS
   a) The documents indicate general and typical details of construction.
   b) The Contractor shall examine carefully the site of work and the Plans and Specifications. The submission of a bid shall be conclusive evidence that the Contractor has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of this Investigation and the Plans and Specifications.
   c) The contractor shall recognize that the plans used for the drawings may differ from the actual physical site. Dimensions are approximate. Before proceeding with the work, it shall be the Contractor's responsibility to check the site in relation to the drawings and specifications. Report any discrepancies to the Owner and the Engineering Geologist.
   d) The Contractor must attend a pre-bid meeting with the Engineer prior to submitting a proposal to complete the proposed work. The Contractor may be required to attend a pre-construction meeting with the Engineer prior to the commencement of construction. The purpose of these meetings is so the Contractor may ask questions concerning the work and to make sure the Contractor understands the permit conditions and environmental constraints.
   e) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction

3) TRAIL LAYOUT
   a) New trail, bridge and culvert shall be constructed as shown on these plans. Modifications to the alignment may be made based on onsite conditions. Contact Timothy Best, CEG (831-425-5832) for trail, bridge and culvert locations.
   b) Final flagged trail alignment shall be reviewed by the project engineering geologist prior to any earthwork.
   c) New trail shall be laid out to conform to natural terrain to create an aesthetically pleasing alignment. The alignment should avoid long straight reaches. The alignment should incorporate natural terrain features to form required reverse grades to the extent feasible.
   d) Trail shall incorporate reverse grade dips per plans as specified and/or as directed by project engineering geologist.
   e) Any modifications to the alignment shall be reviewed and approved by the project engineering geologist and District representative prior to the commencement of that work.
   f) New trail over sloping terrain shall be laid out at 10% sustained grade and up to 20% grade for short reaches, unless otherwise specified or directed by project CEG.

4) VEGETATION CLEARING
   a) The trail corridor extends 3 feet to either side of the trail bed. The trail corridor shall be cleared of all vegetation including trees and logs less than 6 inches DBH. Trees greater than 6 inches DBH within the trail bed shall be removed only if indicated on the plans or with the authorization of the District representative.
   b) All roots exposed during construction shall be clean cut to avoid tree damage.
   c) Trim branches that extend into the trail corridor to leave 8 foot (minimum) to 12 foot (maximum) high vertical clearance.
   d) When pruning, prevent branches from damaging tree or stripping the bark when the branch falls to the ground.
   e) Lop vegetation into less than 6 foot pieces as necessary and scatter on ground at least 15 feet away from trail, out of sight, at height no more than 18 inches. Do not cover existing vegetation with debris.

5) TRAIL GRADING & EXCAVATION
   a) The proposed trail shall be constructed along the mapped alignment represented in the attached sheets.
   b) Trail shall be constructed at 5-foot max trail width on full bench with spoils spread or broadcast below trail at depth less than 8 inches, unless otherwise specified or directed by engineering geologist
   c) Areas to receive structural or broadcast fill shall be stripped to remove all vegetation, roots, brush, highly organic soils and other unsuitable fill material (~ 4' depth).
   d) Structural fill placed greater than 6 inches deep shall be compacted to minimum 85 percent relative compaction (per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary. Structural fill shall be placed no steeper than 1.5H:1V(unless otherwise specified or directed).
   e) Cuts shall be inclined 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils unless otherwise specified on plans.
   f) The contractor shall exercise due care to preserve existing vegetation outside of grading.
   g) Contractor shall treat all disturbed areas with erosion control measures, as provided under erosion control in these notes.
   h) All deleterious spoils from site excavation not used as structural fill shall be spread onsite per plans as directed by project engineering geologist.
   i) In the event that any unusual conditions not covered by the plans and specifications are encountered during excavation operation, the engineering geologist shall be immediately contacted for directions. It shall be the contractor's responsibility to immediately notify the engineering geologist upon discovery of any field conflicts.
   j) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, planting etc., and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.

6) ROAD AND TRAIL ABANDONMENT
   a) Road abandonment shall be made in accordance with plans and typical design specification.
   b) Final limits of excavation to be identified by project engineering geologist at time of construction
   c) Place and compact excavated spoils along inside edge of tractor road to recontour slope. Excess spoils to be endhauled to approved stable location as directed by project engineering geologist.
   d) Apply erosion control measures per notes. Where exposed area exceeds 20 feet in slope distance install erosion control blanket (Tensar Rollmax C125BN or equivalent) per manufactures guidelines.

7) ROCK
   a) All rock used for rock energy dissipaters shall conform to applicable Caltrans standards.

8) BRIDGES and ENGINEERING
   a) Crossings 5,6,8 and 9 are 12 foot long wood puncheons. Refer to Sheet C2 for puncheon locations and Sheet N7 for details.

9) EROSION CONTROL, WATER POLLUTION PREVENTION AND HOUSEKEEPING
   a) During project construction, the contractor shall be responsible for implementing appropriate and necessary erosion control measures to minimize storm water runoff from the construction site, pursuant to applicable regulations and permits. The following strategies to ensure that storm water pollution is prevented shall be employed:
      - Minimize erosion and sedimentation during construction.
      - Eliminate pollution of storm runoff by chemicals and materials used in the construction process.
      - All temporary erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each work day. At a minimum, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction related runoff and/or sediment from entering into the watercourses.
      - The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm events.
   b) Exposed mineral soils outside of the trail running surface greater than 50 square feet (sf) and with exposed slope distance exceeding 10 feet and with less than 80% ground coverage of natural vegetation shall receive mulch, straw rolls or netting (as specified) in order to reduce the potential for short-term sheet and rill erosion.
      - Mulching:
        - Use native mulch where feasible.
        - Where native mulch is unavailable and/or as directed by the engineering geologist or designee, mulch using 1-1/2" to 2" of approved certified weed-free straw mulch.
      - Straw roll:
        - Install where slope distance > 20' per standard specifications unless otherwise specified or directed.
      - Netting:
        - Install on slopes >50% grade (2H:1V) and where slash pack is not done. Apply jute netting and anchor per manufacturer's recommendations.
        - Use approved rolled erosion control product (RECP) conforming to Caltrans RECP netting (Type 3).
   c) Unnecessary grading and disturbance of soil shall be avoided.
   d) All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction.
   e) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

10) TIMING
   a) Work shall be conducted during the dry season and as permitted. All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction

11) HOUSEKEEPING
   a) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

12) STAGING AND ACCESS
   a) Construction staging areas will be restricted to existing roads or other areas where permitted by District representative.
   b) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.
   c) Upon completion of construction of the crossings the access route and staging areas shall be restored to their original condition.
   d) The contractor shall carefully preserve the surrounding property by confining operations within the limits of work. Construction work or equipment operations shall not be conducted outside the designated work area boundary without approval of the engineer.

13) PROPERTY BOUNDARY
   a) District shall be responsible for verifying the location of all property lines and easement areas.

14) SUPPLEMENTAL RECOMMENDATIONS
   a) If undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at this time, Timothy C. Best shall be notified so that supplemental recommendations can be given.

15) CONSTRUCTION MANAGEMENT PLAN PROVISIONS
   a) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.
   b) Upon completion of construction of the trail the access route and staging area shall be restored to their original condition.
   c) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.
   d) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction.

16) UNDERGROUND UTILITIES
   a) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water lines. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PROJECT SPECIFICATIONS 1

Date	Description
12/23/2015	
Revised: 08/20/2016	

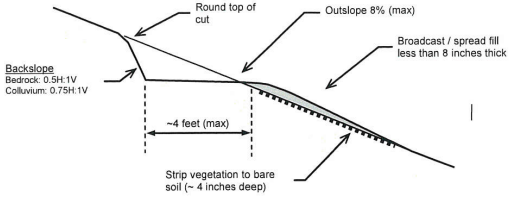
DRAWN
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

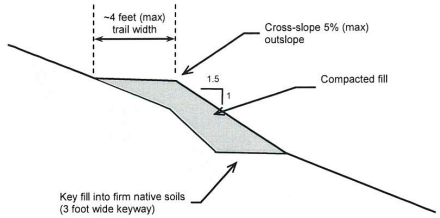
N1

1 N3 CUT BENCH TRAIL
NTS



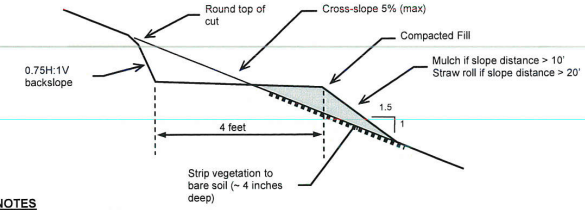
NOTES
- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width.
- Trail shall be constructed on full bench with fill broadcasted below the trail to a depth less than 8 inches.
- Areas to receive broadcast fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Broadcast fill shall be not be spread within 25 feet of a watercourse.
- Cutbank backslope shall be inclined at 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils.
- Disturbed areas outside trail tread shall be treated to control erosion per specifications. Where feasible exposed ground shall be slash packed
- Specifications are indented only as guideline, modifications may be made in the field by engineering geologist or designee

2 N3 FILL BENCH TRAIL
NTS



NOTES
1. Trail shall be constructed at 4 foot maximum width unless otherwise specified in plans, or as directed.
2. Areas to receive fill shall be stripped to remove vegetation, near-surface roots, brush, highly organic soils and other unsuitable fill material. Depth of stripping is assumed to be 6 inches.
3. Fill shall be keyed and benched into firm native soils. Keyways shall be minimum 3 feet wide and inclined 5% into slope.
4. Onsite soils may be reused as fill. Fill shall be adequately moisture conditioned and compacted to a level equal to or greater than the surround materials (minimum 85 percent relative compaction per ASTM D 1557); During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
5. Fill embankment shall be inclined no steeper than 1.5:1 unless otherwise specified or directed.
6. All disturbed areas shall be treated to control erosion per specifications. Place slash or straw roll below base of fill unless otherwise directed.
7. Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee.

3 N3 PARTIAL BENCH TRAIL CONSTRUCTION
NTS



NOTES
- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width on balanced cut and fill.
- Areas to receive fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Onsite soils may be reused as fill. Fill shall be compacted to a level equal or greater than the surrounding native materials (approximately 85 percent relative compaction per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
- Fill shall be a maximum of 24 inches thick unless otherwise specified.
- Fill embankment shall be inclined no steeper than 1.5:1 (unless otherwise specified).
- Cutbank backslope shall be inclined at 0.75H:1V slope. Where cuts are steeper than 6 feet or where seepage of water or unsuitable earth materials are encountered, the backslope shall be selected by the project geotechnical consultant.
- All disturbed areas shall be treated to control erosion per specifications.
- Specifications are intended only as guidelines. Modifications may be made in the field by engineering geologist or designee.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

CUT/FILL AND PARTIAL BENCH SPECIFICATIONS

Date	Description
12/23/2015	
Revised: 08/20/2016	

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TCB

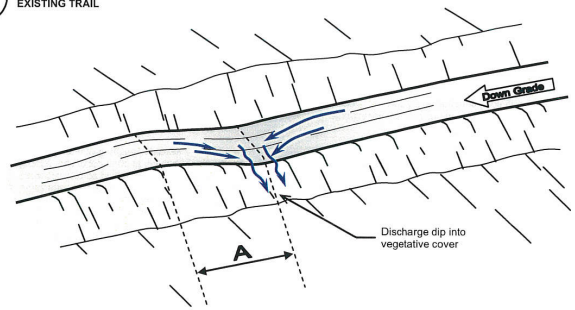
PROJECT
MPEN-OLJON-P3-645

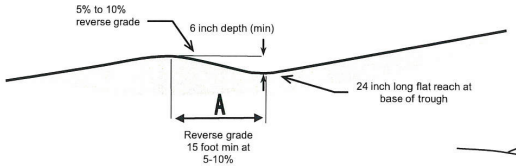
SHEET NUMBER

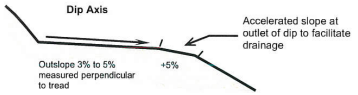
N3

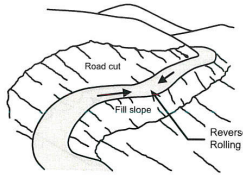
4 N4 REVERSE-GRADE DIP (Typical)

EXISTING TRAIL









TRAIL GRADE (%)	TROUGH	A: REVERSE GRADE	
	Minimum depth below downslope crest	Minimum distance from trough axis to down trail crest (ft)	Grade (%)
0-5%	6 inches	15	-5%
0-15%	6 inches	15	-10%
>15%	As directed		

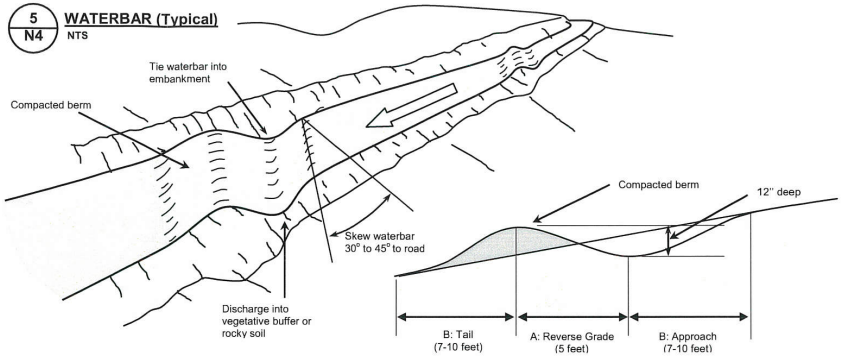
NOTES

- A reverse-grade dip (or rolling dip) is a broad, long, permanent dip constructed into native soils. The dip is long to prevent breaking down over time. On new trails the dip is incorporated into the trail at the time of construction.
- The dip shall be a minimum of 6 inches deep and incorporate a 2 foot long flat reach at the base of the trough (unless otherwise directed).
- The reverse grade shall be sloped 5-10% for a minimum of 15 feet to form the minimum 6 inch deep dip.
- The dip axis should be outsloped (measured perpendicular to trail) 3% to 10% unless otherwise specified or directed.
- Dip outlets should be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, slash, brush, etc. Where specified, the bottom of the outfall of the dip will be surface-rocked.
- Dips shall be placed as directed or specified in the plans. If not specified, then dips shall be placed at maximum 100 foot spacings.

MAXIMUM GRADE OF DIP OUTLET PER SOIL TYPE			
SOIL:	Maximum allowable velocity (fps)	Maximum dip spacing	Maximum grade of dip outlet
Sandy Loam	1.8	100'	10%
Silt Loam	2.0	100'	12%
Firm Loam	2.5	100'	18%

5 N4 WATERBAR (Typical)

NTS



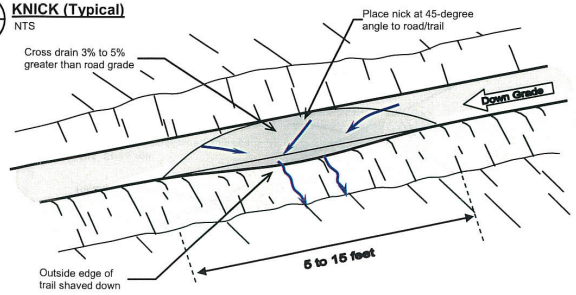
NOTES

- Waterbars are short abrupt dips constructed into native soils. Unlike a reverse grade dip, they are much more abrupt.
- Identify waterbar locations that take advantage of natural drainage features and minimize the amount of disturbance required for waterbar construction.
- On existing trails the dip is cut into the existing tread with the downroad dip built up on compacted fill.
- On existing trails the dip shall be a minimum of 12 inches deep.
- Acceptable waterbars shall be skewed 45 degrees.
- All waterbars shall have free-flowing outlets with minimum 3% grade steeper than trail grade.

ROAD GRADE (%)	TROUGH	A: REVERSE GRADE	B: UP ROAD APPROACH DOWN ROAD TAIL
	Minimum depth below downslope crest	Minimum distance and grade from trough axis to downroad crest (ft)	Distance from up-road start of rolling dip to trough axis (ft)
<5%	12 inches	5 feet at 20% (Unless otherwise directed)	7
10%			8
15%			9
>15%			10

6 N4 KNICK (Typical)

NTS



NOTES

- A knick is a semi-circular, shaved-down section of the outside edge of the road/trail.
- Knick is installed at a 45-degree angle to road/trail.
- The center of the nick is outsloped 3 to 5% greater than road grade.
- Dip outlets should be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, slash, brush, etc.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

REVERSE GRADE DIP, WATERBAR AND KNICK SPECIFICATIONS

Date	Description
12/23/2015	
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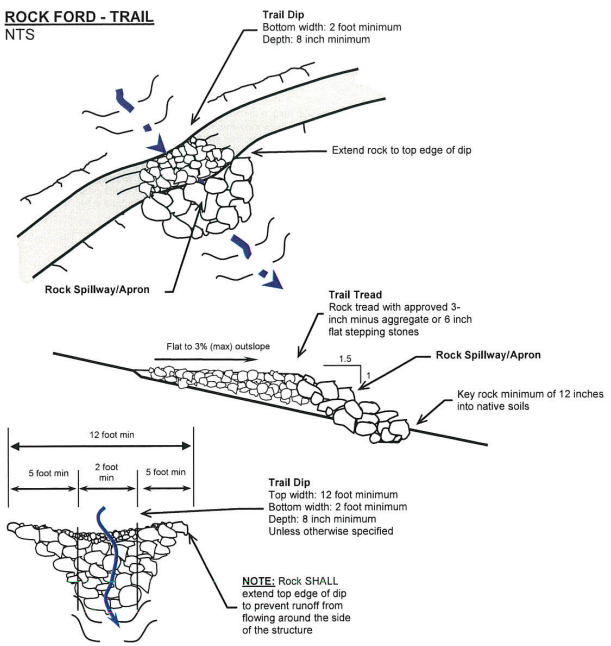
DRAWN
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N4

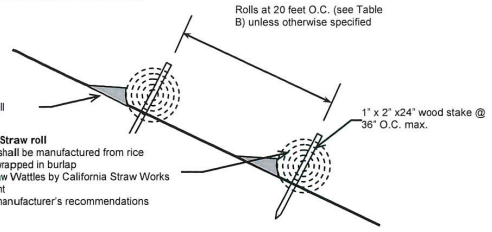
7 N5 **ROCK FORD - TRAIL**
NTS



NOTES

- **Dip**
  - Dip trail through watercourse
  - Depth: 8 inch minimum
  - Bottom width: 2 foot minimum
  - Top width: 12' minimum
- **Rock spillway / apron**
  - Armor outside trail edge with rock to form apron in the spillway
  - Rock shall consist of approved sound, durable, angular rock
  - 50% (D_{50}) of rock shall be greater than 12 inches minimum diameter (unless otherwise specified)
  - Rock should generally be well-graded (incorporating mix of sizes)
  - Voids shall be filled with smaller rock to prevent piping around the larger rock
  - Larger rock to be placed at base of apron
  - Extend rock to top edge of dip or above anticipated edge of high water to prevent high flows from eroding around the edge of the rock; place rock to form a well-defined spillway
- **Trail tread**
  - Armor trail tread with rock
  - Use 3 inch minus sound durable rock (unless otherwise specified); alternatively use 6 inch flat rock to form stepping stones.
- Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee

8 N5 **STRAW ROLL (Typical)**
NTS



6" to 8" DIA. Straw roll

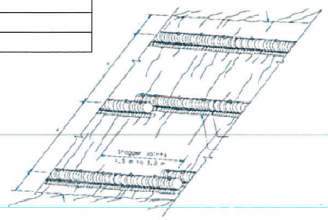
- Straw rolls shall be manufactured from rice straw and wrapped in burlap
- BIO-12 Straw Wattles by California Straw Works or equivalent
- Install per manufacturer's recommendations

NOTES:

- Location
  - Install at base of disturbed areas and at outlets of new or reconstructed reverse grades/rolling dips unless otherwise specified
  - Rolls to extend across entire width of disturbed area unless otherwise specified or directed
- Placement
  - Install per manufacturer's recommendations
  - Rolls to be placed on slope contour
  - Adjacent rolls to overlap; turn ends of rolls up
  - Runoff must not be allowed to run under or around the roll

TABLE B

Slope percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet



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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

ROCK FORD AND STRAW ROLL SPECIFICATIONS

Date	Description
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Revised: 08/20/2016	

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TCB

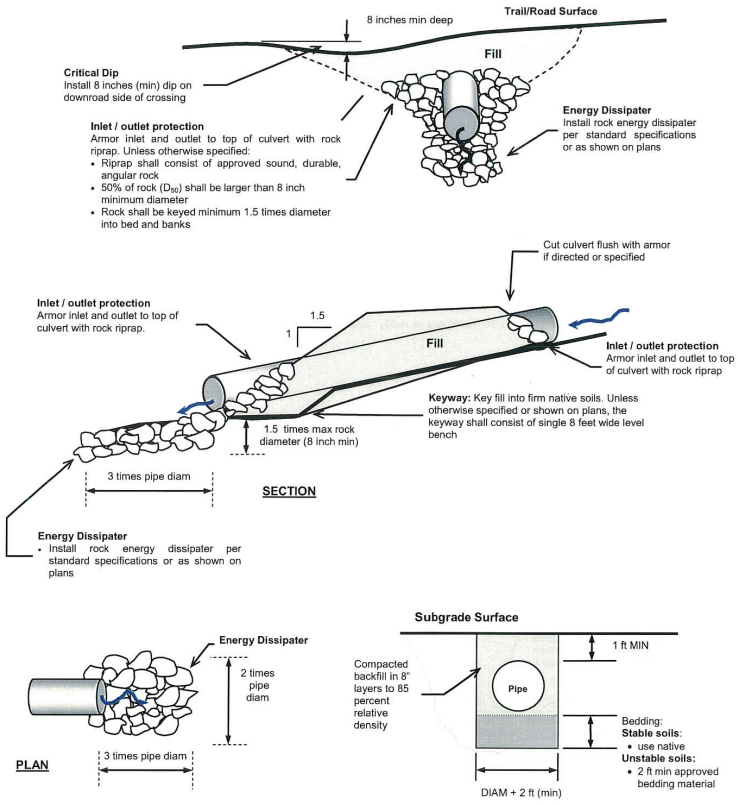
PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N5

9
N6

PERMANENT CULVERT
NTS



NOTES

- **Culvert Orientation**
  - Culvert should be installed along natural stream orientation.
  - Embed culvert bottoms 6 inches below stream grade so that the water falls into the culvert inlet.
- **Culvert bed**
  - The width of trenches shall permit satisfactory joining and thorough tamping of the backfill material.
  - The culvert bed shall be clean and free of large woody debris and large rocks. Unsuitable material shall be replaced with selected granular foundation material and compacted to obtain uniform bed.
  - Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 1 foot and a width of at least 2 feet plus the culvert diameter. This material shall be replaced with selected engineered fill.
- **Laying Pipe**
  - Culvert shall be laid in center of trench on uniform grade line to conform to the flow line of the stream. The entire length of pipe shall be in contact with the culvert bedding.
  - Culvert shall be joined and anchored per manufacturer's guidelines.
- **Backfill**
  - Fill shall be keyed and benched into firm native soils. Areas to receive fill shall be stripped to remove vegetation, near-surface roots, brush, highly organic soils, and other unsuitable fill material.
  - Select mineral soil shall be used for culvert backfill. The backfill shall have no rocks greater than 3 inches in any dimensions placed closer than 1 foot to the culvert.
  - Backfill shall be adequately compacted throughout the entire process to a degree greater than the surrounding materials (approximately 85 percent relative compaction). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained.
  - Fill shall be brought up to grade at a 1.5:1 slope unless otherwise specified.
- **Culverts**
  - Culverts shall be smooth bore, double wall (ASTM D3350 and AASHTO M294, Type S).
  - Culverts distorted more than 10% of normal dimension, ruptured, or broken shall be replaced.
  - Culverts shall be cut flush with armored embankment/headwall if directed or specified.
- **Inlet/outlet protection**
  - Armor inlet and outlet to top of culvert with rock riprap.
  - Riprap shall consist of approved well-graded, sound, durable, angular rock unless otherwise specified.
  - 50% of rock (D_{50}) shall be larger than 8 inch minimum diameter unless otherwise specified.
  - Rock shall be keyed minimum 1.5 times diameter into bed and banks unless otherwise specified.
- **Energy dissipater**
  - Culvert shall discharge onto rock energy dissipater / apron aligned with native channel as shown on plans or as directed
  - Armor shall consist of approved sound, durable, angular rock inches in diameter
  - Rock apron shall extend a minimum of feet downstream of outlet and be a minimum of 4 feet wide
  - Rock shall be embedded into channel a minimum of 18 inches; subexcavate channel bed and banks in areas to receive rock
  - Rock shall be placed to form a uniform grade at the pipe outlet in a manner to prevent flow from eroding around the edge of the apron
  - Compact loose soils adjacent to rock riprap
- **Erosion Control**
  - If stream if flowing at time of operations, water shall be pumped or diverted past the crossing and into the downstream channel during the construction process. R
  - Critical dip (8 inch min) shall be installed on the downroad side of crossing.
  - Exposed soils shall be mulched per standard specification. Install coir roll at base of exposed soils.
- **California Department of Fish and Wildlife Agreement**
  - Conform to CDFW Fish and Wildlife Code 1600 where applicable.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

CULVERT SPECIFICATIONS

Date	Description
12/23/2015	
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TCB

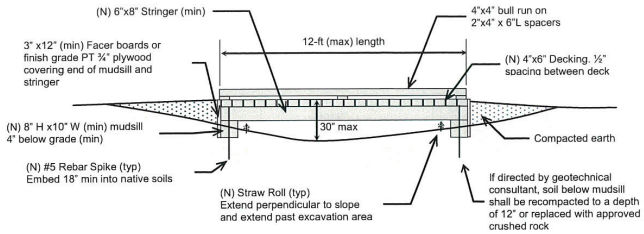
PROJECT
MPEN-OLJON-P3-645

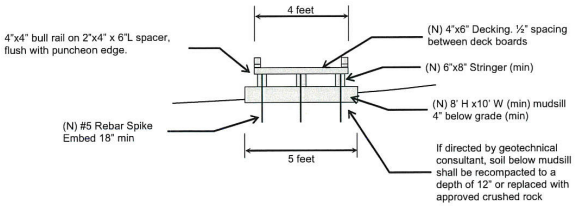
SHEET NUMBER

N6

10 / N7 LOW PUNCHEON (BOARDWALK)

MROSD STANDARD SPECIFICATIONS (NTS)





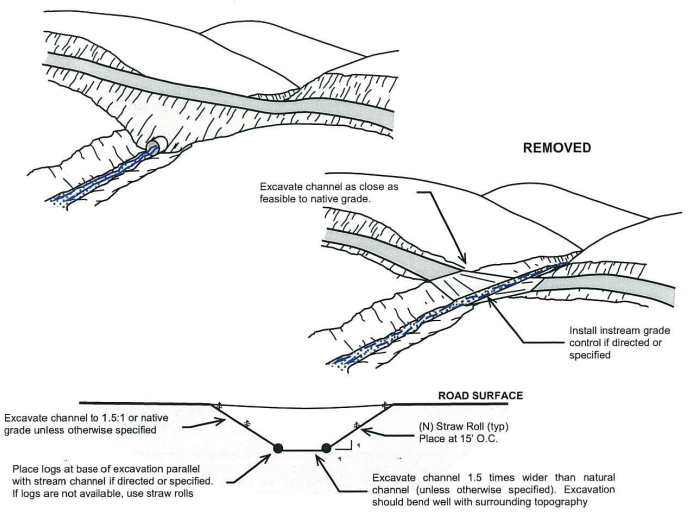
NOTES:

- Standard puncheon width shall be 4 feet. Refer to site plan if narrower puncheon is proposed.
- All decking, beams, mudsills and wood in contact with earth or within 1 foot of earth shall be Con Heart redwood or approved plastic.
- If directed by geotechnical consultant, soil below mudsill shall be recompacted to a depth of 12" or replaced with approved crushed rock.
- All hardware shall be galvanized.
- Anchor decking with (2) 3/8" x 8" galvanized wire spikes (typ); predrill holes for spikes.
- Anchor bull rail with (2) 3/8" x 10" galvanized wire spikes (typ); predrill holes for spikes.
- Maintain 2% maximum slope on puncheon.

11 / N7 STREAM CROSSING REMOVAL

NTS

EXISTING CROSSING



NOTES

- Excavate a channel that is 1.5 times wider than the natural channel (unless otherwise specified).
  - Excavated channel shall be as close as feasible to the grade and orientation of the natural channel.
  - Channel banks shall be excavated to a 1.5:1 slope or native grade (whichever is steepest) unless otherwise specified in the plan or directed.
  - Excavation should blend well with surrounding natural topography.
  - Spoils shall be placed and compacted along a stable portion of the inboard edge of the road, unless otherwise specified.
  - Fill shall be placed in a manner to prevent future erosion. Fill shall be compacted to 85% relative compaction unless otherwise specified or directed.
- Install instream grade control if specified in the plan or directed. Grade control shall consist of large wood or rock and is intended to prevent stream down-cutting. See general specifications.
- Place logs at base of excavated channel if directed. Logs to be placed parallel with stream with upstream log overlapping downstream log. Logs to be embedded into channel bank to minimize stream bank erosion. Log diameter to be determined by project geotechnical consultant or designee.
- Mulch disturbed ground per standard specifications.
  - If available and directed by project geotechnical consultant, the excavated channel banks and spoil sites may be slash mulched using 6-inch minus woody debris with 90% coverage. Slash should be packed using a dozer or the bucket of the excavator.
- Install a straw roll at 15' O.C. and as directed by geotechnical consultant and/or District representative.
- Conform to requirements of CDFW Fish and Wildlife Code 1600 where applicable.
- Specifications are intended only as guidelines; modifications may be made in the field by geotechnical consultant or designee.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PUNCHEON AND STREAM CROSSING REMOVAL SPECIFICATIONS

Date	Description
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Revised: 08/20/2016	

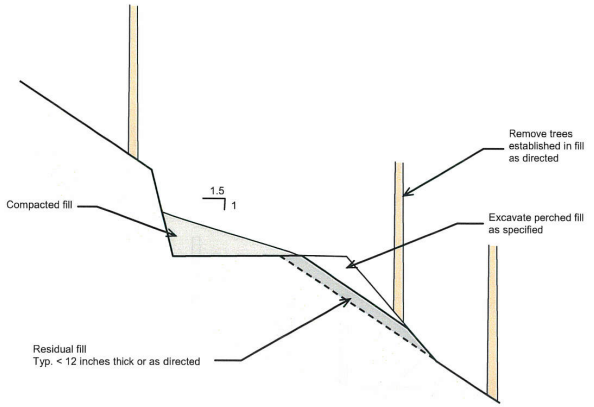
DRAWN
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N7

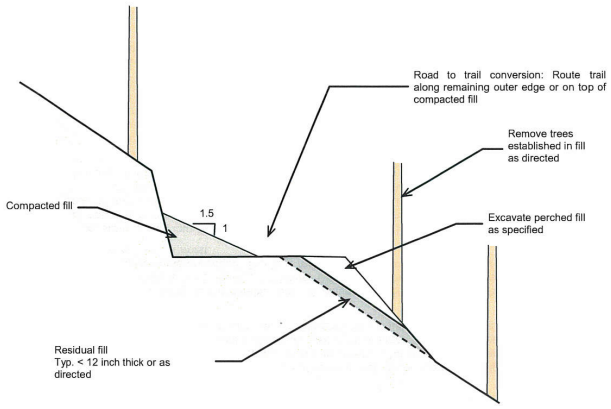
12 N8 PERCHED FILL REMOVAL
NTS



NOTES

- Remove trees established in roadway and in fill as directed.
  - Trees greater than 6 inch diameter shall be marked by District prior to removal.
- Excavate perched fill as specified and directed.
  - Limits of fill removal to be identified in the field by project geologist or designee.
- Spoils shall be compacted along inboard edge of road.
  - Spoils shall not be placed in any areas where seasonal bank seeps or wet areas are present.
  - Areas to receive fill shall be cleared of vegetation.
  - Spoils shall be placed in thin lifts (not to exceed 8 inches in maximum thickness) and compacted (minimum 85 percent relative compaction). Compacting may employ track walking with a dozer, bucket of the excavator, roller or hand tamper. Spoils shall be moisture conditioned to achieve a suitable level of compaction.
  - Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 1.5:1 (65%) unless otherwise directed or specified.
  - Project geotechnical consultant or designee shall approve all spoil sites prior to fill placement.
- Specifications are intended only as guidelines; modifications may be made in the field by project geotechnical consultant or designee.

13 N8 ROAD TO TRAIL CONVERSION
NTS



NOTES

- Remove trees established in roadway and in fill as directed.
  - Trees greater than 6 inch diameter shall be marked by District prior to removal.
- Excavate perched fill as specified and directed.
  - Limits of fill removal to be identified in the field by project geologist or designee.
- Spoils shall be compacted along inboard edge of road.
  - Spoils shall not be placed in any areas where seasonal bank seeps or wet areas are present.
  - Areas to receive fill shall be cleared of vegetation.
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  - Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 1.5:1 (65%) unless otherwise directed or specified.
  - Project geotechnical consultant or designee shall approve all spoil sites prior to fill placement.
- Specifications are intended only as guidelines; modifications may be made in the field by project geotechnical consultant or designee.

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PERCHED FILL REMOVAL AND ROAD TO TRAIL CONVERSION SPECIFICATIONS

Date	Description
12/23/2015	
Revised: 08/20/2016	

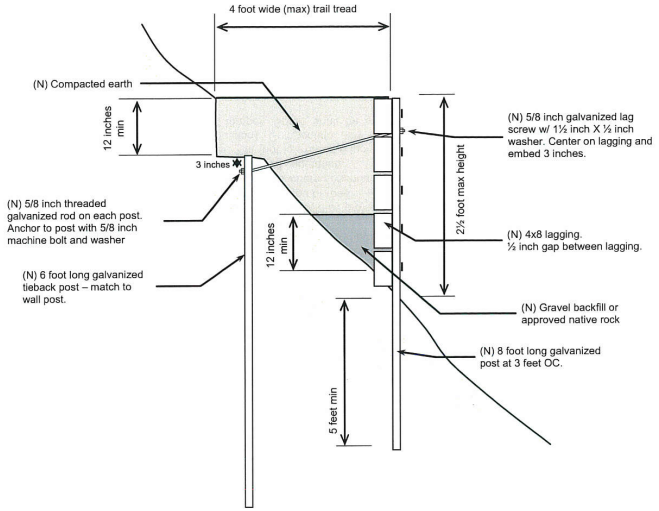
DRAWN
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N8

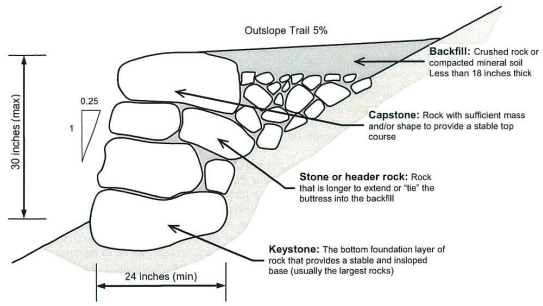
14 N9 WOOD RETAINING WALL- TRAIL (Typical)



NOTES

- Post shall be 8 foot x 2.0 lbs/ft galvanized U-Channel conforming to ASTM A4999, Grade 60.
- Final depth of post embedment to be determined in field by project engineering geologist based on on-site soil conditions.
- All wood shall be pressure-treated Douglas-fir or clear heart redwood unless otherwise specified or approved.

15 N9 ROCK BUTTRESS - TRAIL (Typical)



NOTES

- Excavate a keyway footing to firm, stable dirt or to solid rock. Slope the footing slightly into the hillside (***batter***) so the rock buttress will lean into the hill and dig footing deep enough to support the foundation tier of rocks (these are usually the largest rocks in the buttress). The footing is dug so that the foundation tier is embedded for the full thickness of the first layer of rocks.
- Construct buttress using sound durable rock. A minimum of 50% of the rock shall be larger than 18 inches (130 lb min). Ideally, the bigger the rock, the better, since big rocks are less likely to shift or become dislodged. The best rock is rectangular with flat surfaces on all sides. Round river rock is the worst.
- The ***keystone*** is laid into the footing and successive tiers are laid. For each tier, overlap the gaps between rocks in the next lower tier, called breaking the joints. Each tier should be staggered slightly into the hill to create the desired amount of batter. ***Header rocks*** are long rocks turned and placed so that they extend deep into the hillside. Using header rocks is particularly important if the buttress's cross section widens as the buttress gets higher. The ***capstone*** is the top rock layer with sufficient mass to provide a stable trail tread.
- Rocks in each successive tier should be set so they have at least three points of good contact with the rocks below. Good contact is defined as no wobble or shifting under a load, without relying on shims (or chinking) to eliminate movement. Shims are prone to shifting and should not be used to establish contact, especially on the face of the buttress, where they can fall out. Add backfill and tamp crushed rocks into the cracks as you build.
- Project engineering geologist or District designee shall flag the location of the rock buttress prior to construction
- Specifications modified from U.S. Forest Service Trail Construction and Maintenance Notebook, 2007 Edition (Hesselbarth et al., 2007).

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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

RETAINING WALL SPECIFICATIONS

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

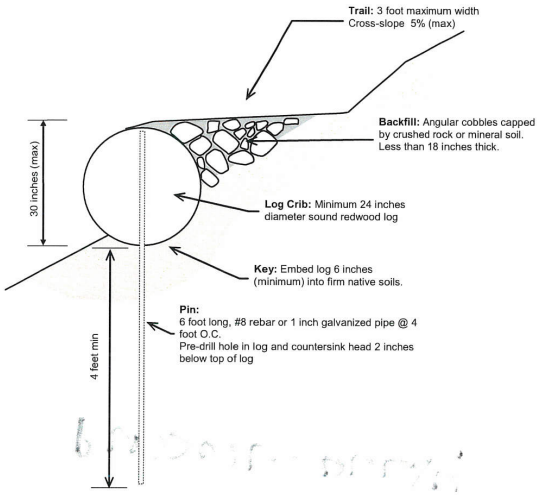
PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N9

16 / N10 SINGLE LOG CRIB WALL - TRAIL (Typical)

(NTS)

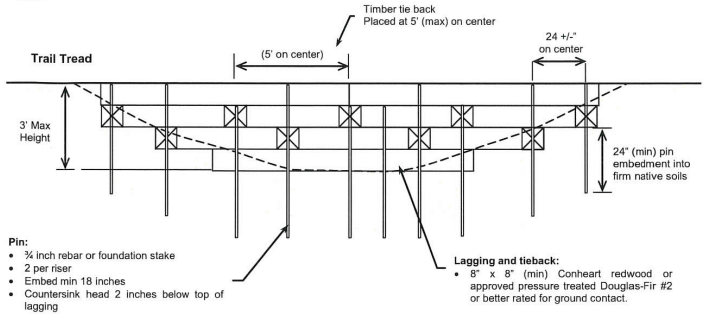


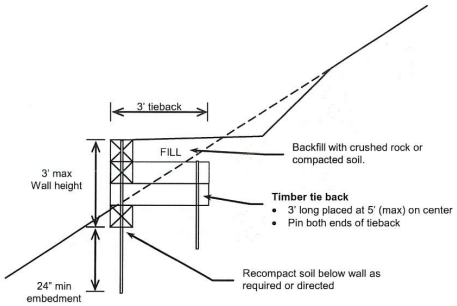
NOTES

- Log shall be a 24 inch (min) diameter sound durable redwood log. On-site logs used for the buttress shall be approved by District representative and the project engineering geologist prior to construction.
- Log shall be placed in a minimum 6 inch deep keyway. Where possible key the log upslope and against existing trees.
- Backfill behind log with crushed angular cobbles and cap trail tread with crushed aggregate or compacted mineral soil.
- Pin log using 6 foot long # 8 rebar or 1 inch galvanized pipe. Predrill hole in log and countersink head 2 inches below top of log. Pins to be installed at 4 feet O.C. unless otherwise specified or directed.
- Project engineering geologist or designee shall flag the location of the log buttress prior to construction.

17 / N10 TIMBER TIE BACK CRIB WALL

NTS





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PROJECT

OLJON TRAIL PHASE 3 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

RETAINING WALL SPECIFICATIONS

Date	Description
12/23/2015	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N10

OLJON TRAIL
PHASE 4 PROJECT
EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE
COUNTY OF SAN MATEO, CA

PHASE 4: PROJECT DESCRIPTION/SCOPE

The project proposes to construct a new 1,600-foot-long multi-use trail to connect the Phase 2 and Phase 3 portions of the Oljon Trail. The proposed work includes the following:

- Construct 1,350 feet of new three to four foot wide trail
- Convert 300 feet of existing road to trail use
- Install 1 new puncheon and 2 new trail bridges at proposed watercourse crossings
- Abandon up to 2,800 feet of the Steam Donkey Trail (old logging road).

The trail will be routed across moderate to steep (20% to 75+%) sideslopes at 5% to 15% grade. The proposed trail will be constructed at 3 to 4 foot width, mainly on balanced cut and fill. Cuts are expected to be between 1 and 3 feet high with fill less than 2 feet deep.

APPROXIMATE EARTHWORK QUANTITIES

Cut:	95 CY
Fill: Spread	95 CY
Import rock	10 CY
TOTAL	200 CY

Maximum fill: < 3 feet deep
Maximum cut: < 4 feet high

Disturbed area: 0.25 acres

Note: Excavation volumes are approximate and may differ based on conditions encountered during crossing and fill removal.

SHEET INDEX

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CONTACT: TIM BEST

STRUCTURAL ENGINEER
MAYONE STRUCTURAL ENGINEERING, INC.
187-B EL DORADO STREET
MONTEREY, CA 93940
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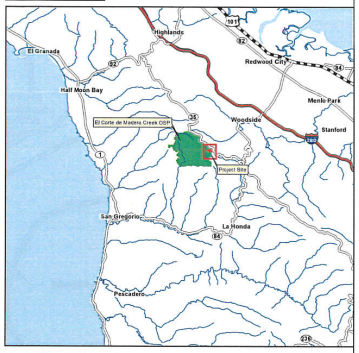
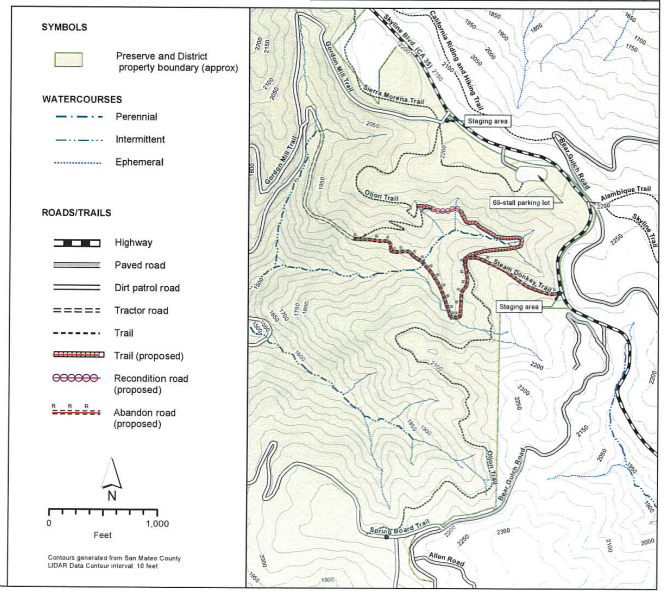
CONTACT: STEVE MAYONE

VICINITY MAP



PROJECT LOCATION



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PROJECT
OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
TITLE SHEET AND LOCATION MAP

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

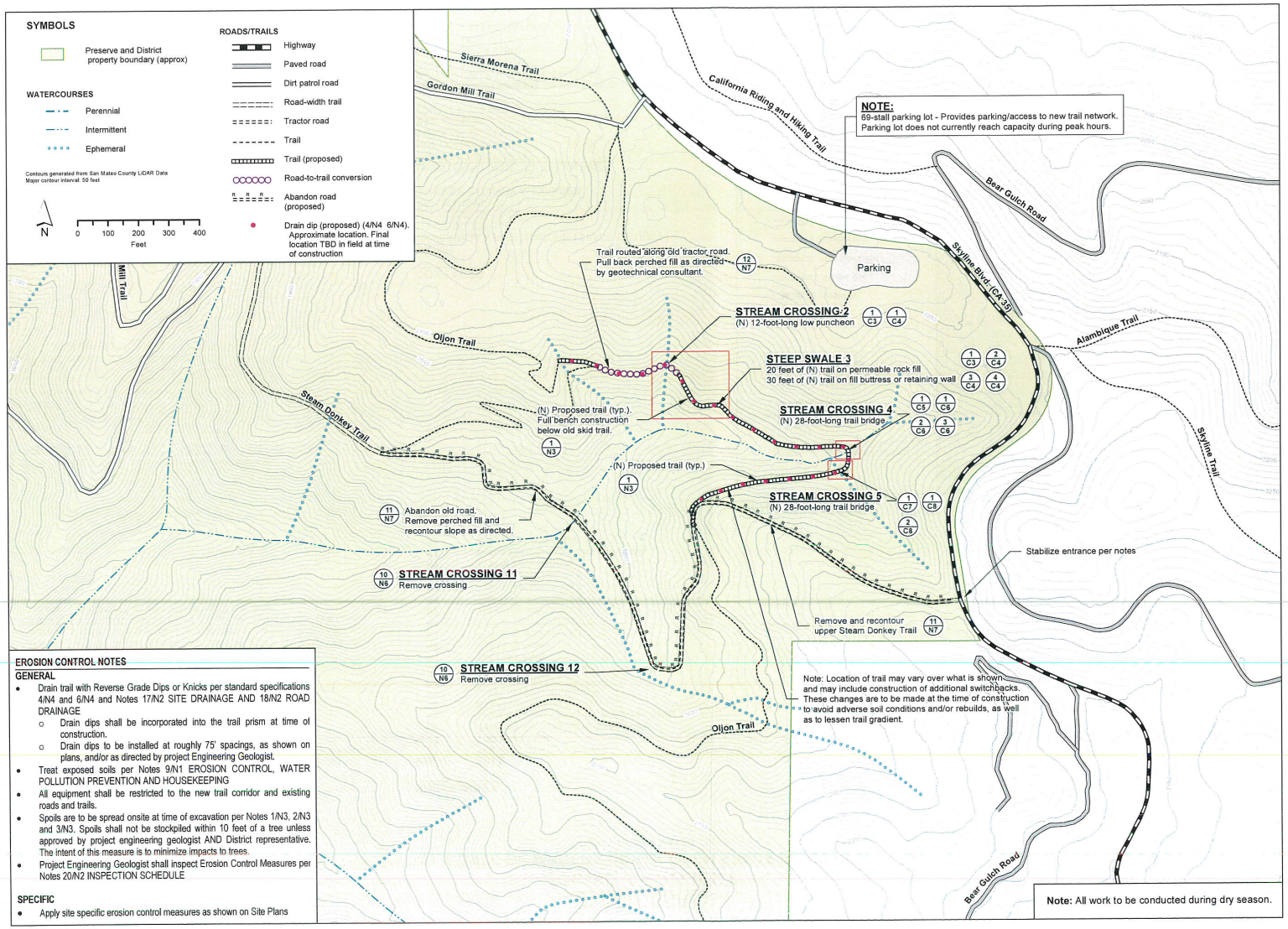
PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C1

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**



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PROJECT
OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
TRAIL LAYOUT MAP and GENERAL EROSION CONTROL PLAN

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

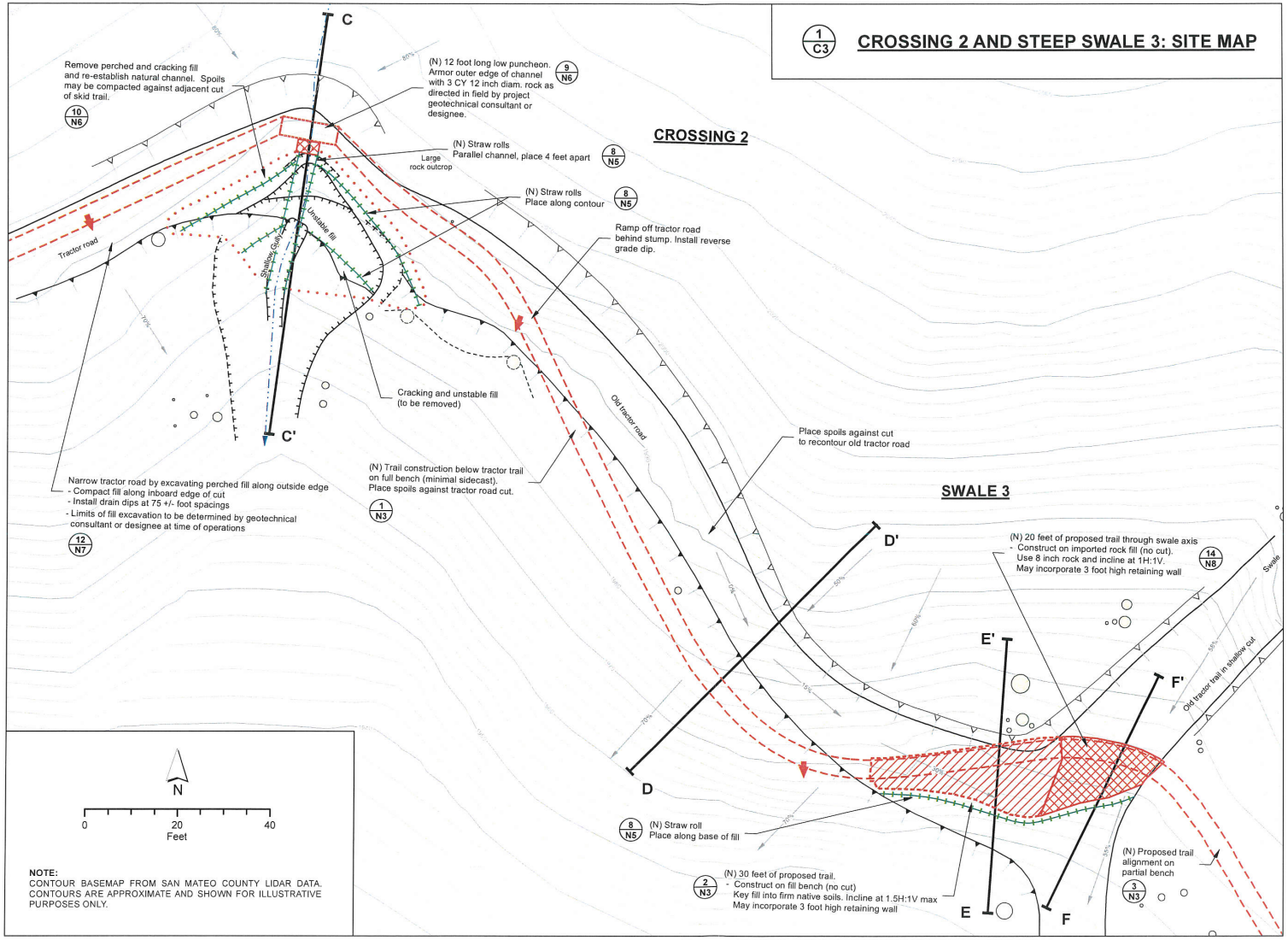
PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C2

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**



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PROJECT
OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
SITE PLAN

CROSSING 2

STEEP SWALE 3

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

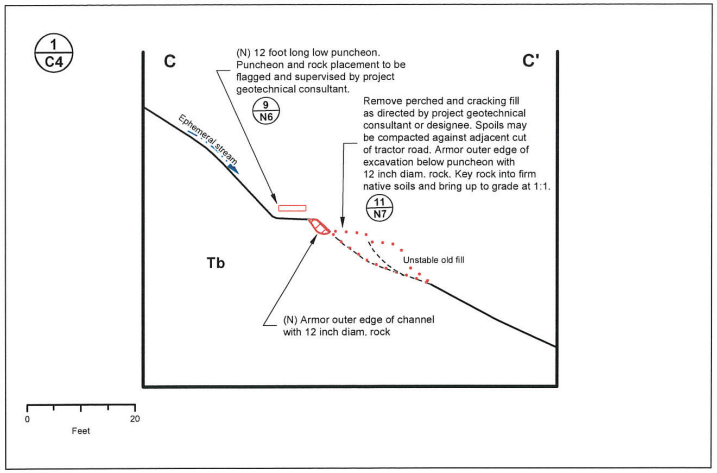
PROJECT
MPEN-OLJON-PH4-649

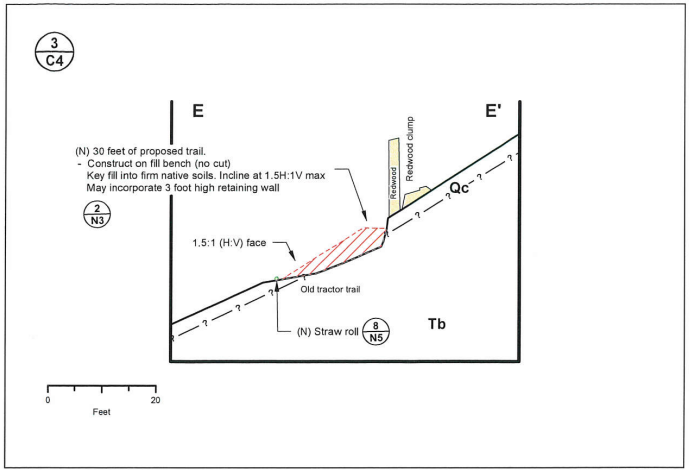
SHEET NUMBER
C3

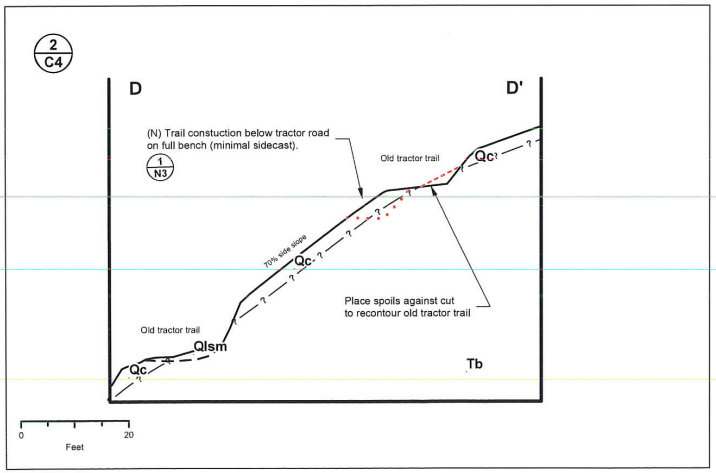
San Mateo County Planning Commission Meeting

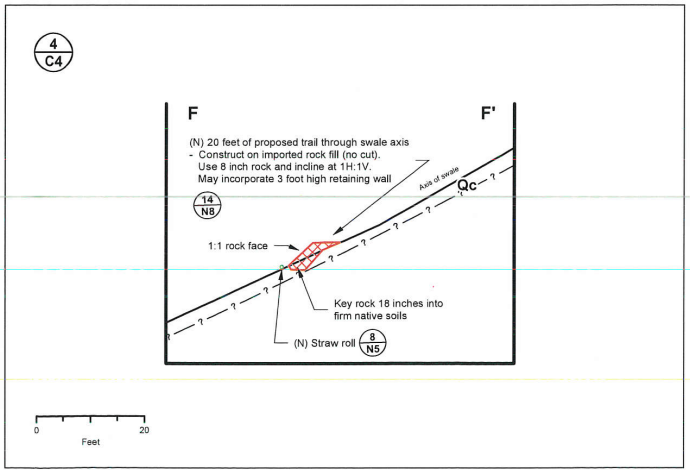
Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**









CROSSING 2 AND STEEP SWALE 3: CROSS SECTIONS

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OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
CROSS SECTIONS

CROSSING 2

STEEP SWALE 3

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

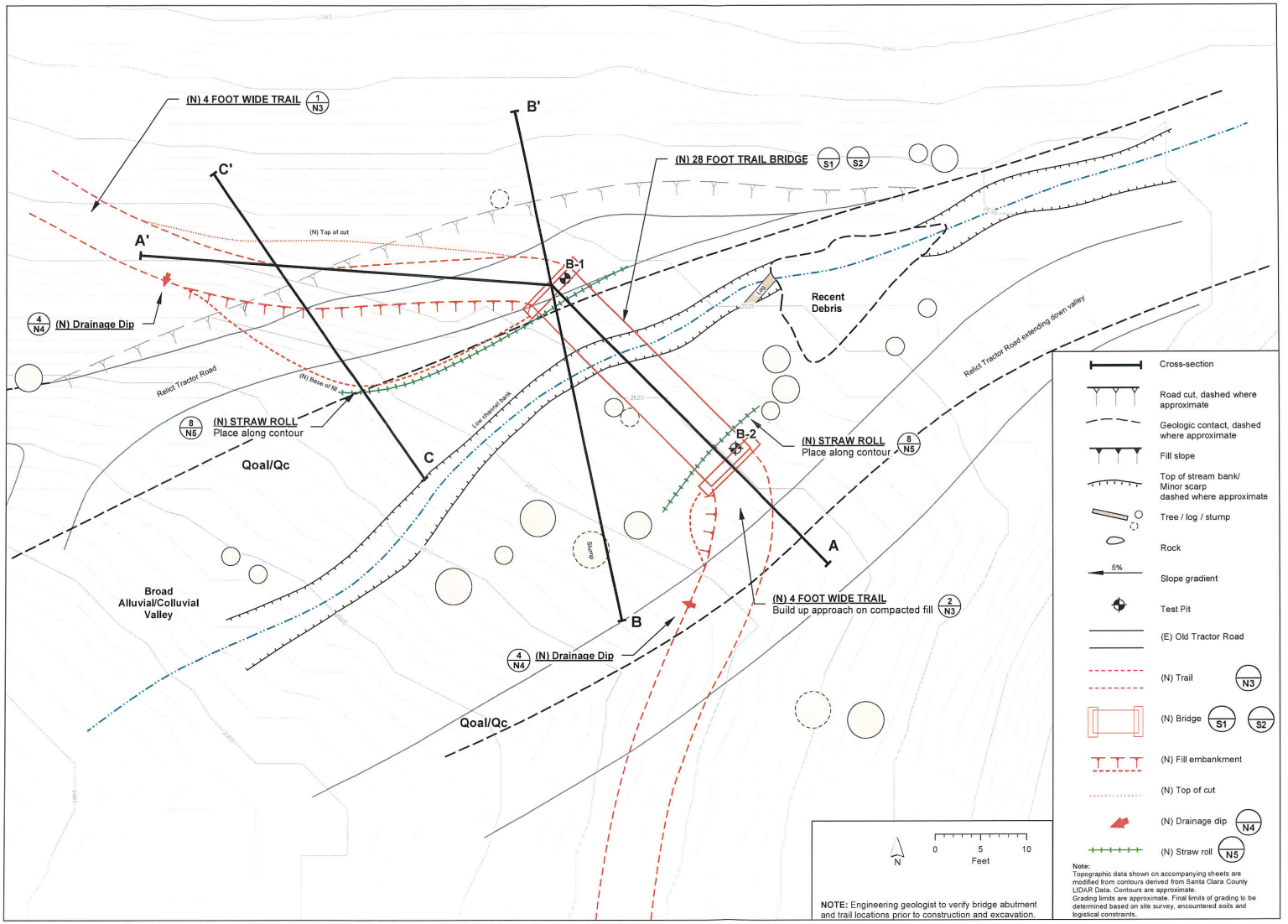
PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C4

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**



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PROJECT
OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
SITE PLAN

CROSSING 4

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

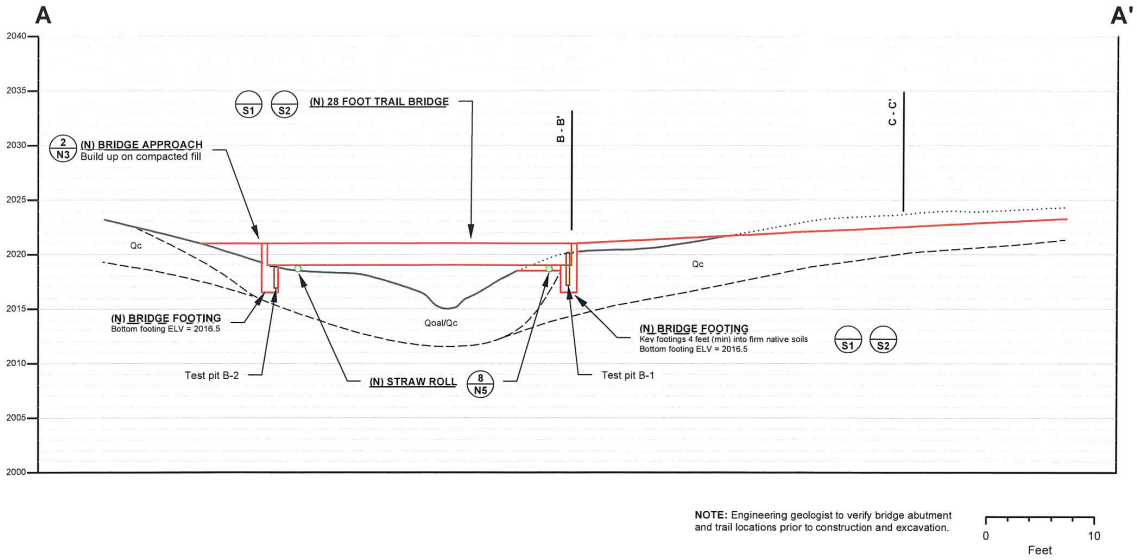
PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C5

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**



NOTE: Engineering geologist to verify bridge abutment and trail locations prior to construction and excavation.

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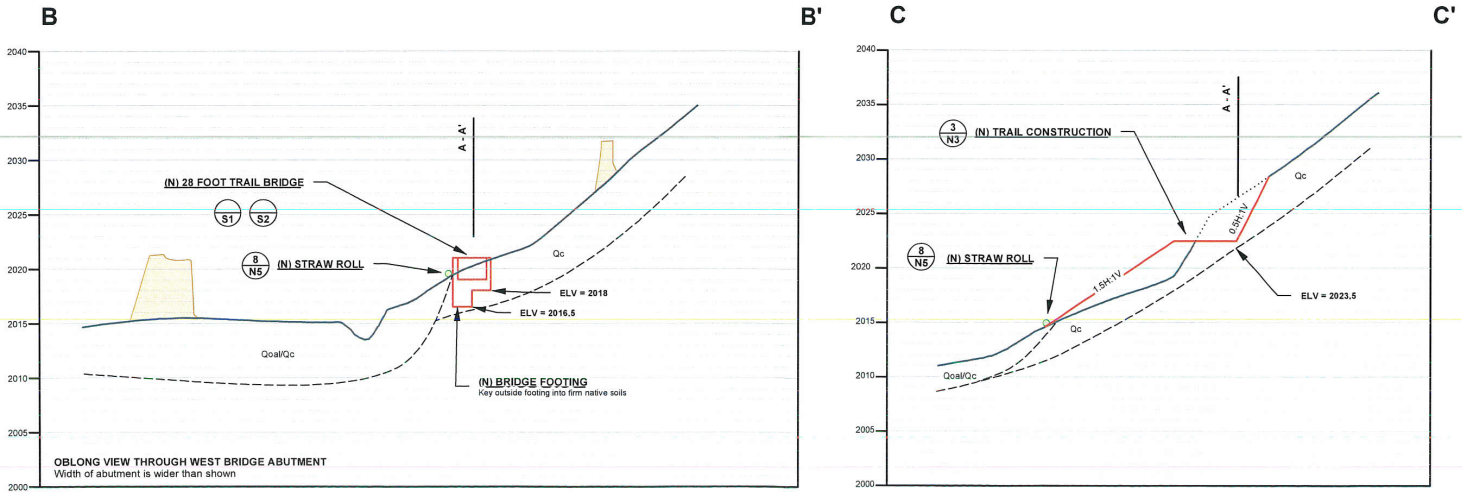
Feet



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EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
CROSS SECTION

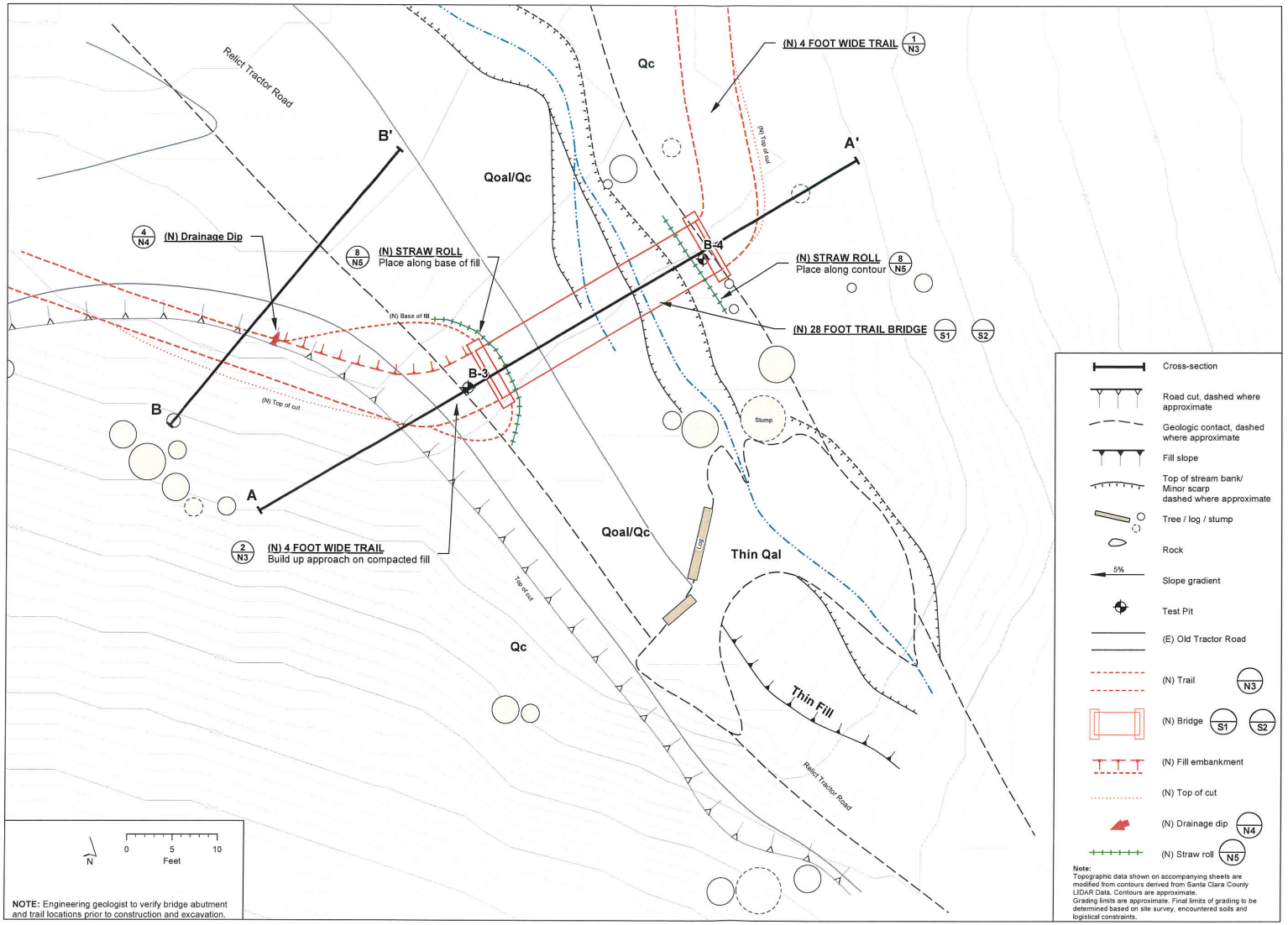
CROSSING 4

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C6



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PROJECT
OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
SITE PLAN

CROSSING 5

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

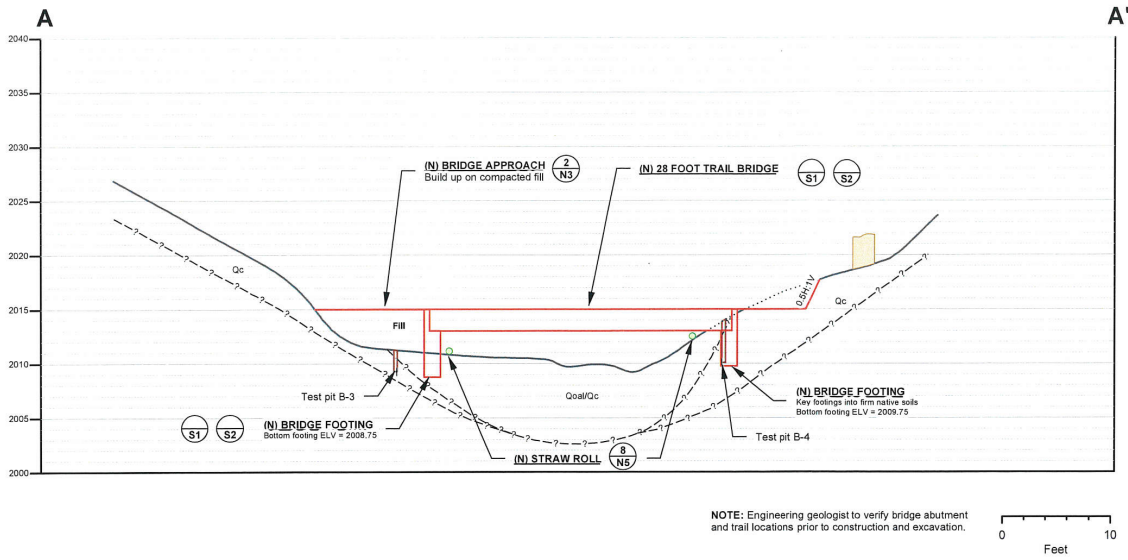
PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C7

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**



NOTE: Engineering geologist to verify bridge abutment and trail locations prior to construction and excavation.

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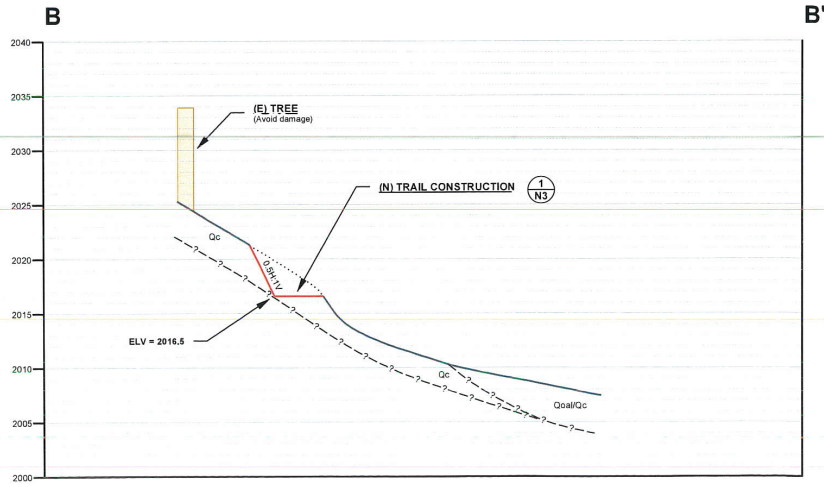
Feet



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EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
CROSS SECTIONS

CROSSING 5

Date	Description
04/06/2016	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-PH4-649

SHEET NUMBER
C8

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District** Attachment: **D**

File Numbers: **PLN2016-00084**

GENERAL

1) GENERAL NOTES
   a) The "District" shall be Midpeninsula Regional Open Space District , the "engineering geologist" (CEG) shall be Timothy C. Best, the "structural engineer" shall be Mayone Structural Engineering, Inc., and the "contractor" shall be the District or independent contractor to perform the work described herein. The engineering geologist has been retained by the District and is not affiliated with the contractor.
   b) All materials and workmanship shall conform to the project documents and applicable requirements.
   c) The contractor shall be responsible for coordinating the project documents with conditions at the site and shall verify existing grades, elevations and conditions prior to commencing work. Any discrepancies shall be reported to the engineering geologist and shall be resolved before proceeding with the work. Any deviation, substitution or alteration to the trail layout shall be subject to review by the engineering geologist.
   d) The contractor shall be responsible for the safety of the construction area during construction and shall provide necessary safety measures in accordance with all state and local safety ordinances. This requirement shall apply continuously and not be limited to normal working hours.
   e) The contractor shall notify the project engineering geologist a minimum of 7 days prior to commencement of work and a minimum of 7 days in advance of required inspections.
   f) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.
   g) The contractor shall provide the District and engineering geologist with the name and telephone number of the responsible person to contact, with regard to this project, 24 hours a day.
   h) Contractor shall be responsible for following any requirements of the permitting agencies including California Department of Fish and Wildlife 1600 agreement. Any discrepancies between permits and plans shall be brought to the attention of the engineering geologist prior to construction.
   i) Contractor shall be responsible for site clean-up to the satisfaction of the District.
   j) All construction equipment shall avoid contact with stream waters.
   k) The engineering geologic report prepared by Timothy C. Best shall be considered part of the plans.
   l) Unapproved over-excavation shall be considered a permanent construction defect with potential significant risks and hazards for the owner and downslope properties.

2) EXAMINATION OF JOB SITE, PLANS AND SPECIFICATIONS
   a) The documents indicate general and typical details of construction.
   b) The Contractor shall examine carefully the site of work and the Plans and Specifications. The submission of a bid shall be conclusive evidence that the Contractor has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of this Investigation and the Plans and Specifications.
   c) The contractor shall recognize that the plans used for the drawings may differ from the actual physical site. Dimensions are approximate. Before proceeding with the work, it shall be the Contractor's responsibility to check the site in relation to the drawings and specifications. Report any discrepancies to the Owner and the Engineering Geologist.
   d) The Contractor must attend a pre-bid meeting with the Engineer prior to submitting a proposal to complete the proposed work. The Contractor may be required to attend a pre-construction meeting with the Engineer prior to the commencement of construction. The purpose of these meetings is so the Contractor may ask questions concerning the work and to make sure the Contractor understands the permit conditions and environmental constraints.
   e) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction

3) TRAIL LAYOUT
   a) New trail, bridge and culvert shall be constructed as shown on these plans. Modifications to the alignment may be made based on onsite conditions. Contact Timothy Best, CEG (831-425-5832) for trail, bridge and culvert locations.
   b) Final flagged trail alignment shall be reviewed by the project engineering geologist prior to any earthwork.
   c) New trail shall be laid out to conform to natural terrain to create an aesthetically pleasing alignment. The alignment should avoid long straight reaches. The alignment should incorporate natural terrain features to form required reverse grades to the extent feasible.
   d) Trail shall incorporate reverse grade dips per plans as specified and/or as directed by project engineering geologist.
   e) Any modifications to the alignment shall be reviewed and approved by the project engineering geologist and District representative prior to the commencement of that work.
   f) New trail over sloping terrain shall be laid out at 10% sustained grade and up to 20% grade for short reaches, unless otherwise specified or directed by project CEG.

4) VEGETATION CLEARING
   a) The trail corridor extends 3 feet to either side of the trail bed. The trail corridor shall be cleared of all vegetation including trees and logs less than 6 inches DBH. Trees greater than 6 inches DBH within the trail bed shall be removed only if indicated on the plans or with the authorization of the District representative.
   b) All roots exposed during construction shall be clean cut to avoid tree damage.
   c) Trim branches that extend into the trail corridor to leave 8 foot (minimum) to 12 foot (maximum) high vertical clearance.
   d) When pruning, prevent branches from damaging tree or stripping the bark when the branch falls to the ground.
   e) Lop vegetation into less than 6 foot pieces as necessary and scatter on ground at least 15 feet away from trail, out of sight, at height no more than 18 inches. Do not cover existing vegetation with debris.
   f) It is the intent of this project to minimize any damage to native vegetation. Only if needed for logistical or safety considerations would small trees (less than 12 inches in diameter at breast height) or larger trees (exceeding 12 inches in diameter) be removed. Where any tree is removed the ground will be reshaped per 5 (g) and (j): Trail Grading and Excavation on the construction document. These notes states: *g) Contractor shall treat all disturbed areas with erosion control measures, as provided under erosion control in these notes* and *j) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, planting etc., and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.* These recommendations are intended to ensure that resulting holes or cavities are back filled and the slope regraded smooth. Backfilled holes will be compacted to level equal to surrounding native soils – over compaction is not recommended as it could impede vegetation regrowth.

5) TRAIL GRADING & EXCAVATION
   a) The proposed trail shall be constructed along the mapped alignment represented in the attached sheets.
   b) Trail shall be constructed at 5-foot max trail width on full bench with spoils spread or broadcast below trail at depth less than 8 inches, unless otherwise specified or directed by engineering geologist
   c) Areas to receive structural or broadcast fill shall be stripped to remove all vegetation, roots, brush, highly organic soils and other unsuitable fill material (~ 4" depth).
   d) Structural fill placed greater than 6 inches deep shall be compacted to minimum 85 percent relative compaction (per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary. Structural fill shall be placed no steeper than 1.5H:1V(unless otherwise specified or directed).
   e) Cuts shall be inclined 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils unless otherwise specified on plans.
   f) The contractor shall exercise due care to preserve existing vegetation outside of grading.
   g) Contractor shall treat all disturbed areas with erosion control measures, as provided under erosion control in these notes.
   h) All deleterious spoils from site excavation not used as structural fill shall be spread onsite per plans as directed by project engineering geologist.
   i) In the event that any unusual conditions not covered by the plans and specifications are encountered during excavation operation, the engineering geologist shall be immediately contacted for directions. It shall be the contractor's responsibility to immediately notify the engineering geologist upon discovery of any field conflicts.
   j) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, planting etc., and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.

6) ROAD AND TRAIL ABANDONMENT
   a) Road abandonment shall be made in accordance with plans and typical design specification.
   b) Final limits of excavation to be identified by project engineering geologist at time of construction
   c) Place and compact excavated spoils along inside edge of tractor road to recontour slope. Excess spoils to be endhauled to approved stable location as directed by project engineering geologist.
   d) Apply erosion control measures per notes. Where exposed area exceeds 20 feet in slope distance install erosion control blanket (Tensar Rollmax C125BN or equivalent) per manufactures guidelines.

7) ROCK
   a) All rock used for rock energy dissipaters shall conform to applicable Caltrans standards.

8) BRIDGES and ENGINEERING
   a) Crossing 2 is a 12 foot long wood puncheon and crossings 4 and 5 are 28 foot long pedestrian trail bridges with concrete abutments. Puncheon, bridge and abutments designed by Mayone Structural Engineering Inc. Refer to Sheet C2 for puncheon and bridge location and Sheets S1 and S2 for details.

9) EROSION CONTROL, WATER POLLUTION PREVENTION AND HOUSEKEEPING
   a) During project construction, the contractor shall be responsible for implementing appropriate and necessary erosion control measures to minimize storm water runoff from the construction site, pursuant to applicable regulations and permits. The following strategies to ensure that storm water pollution is prevented shall be employed:
      - Minimize erosion and sedimentation during construction.
      - Eliminate pollution of storm runoff by chemicals and materials used in the construction process.
      - All temporary erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each work day. At a minimum, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction related runoff and/or sediment from entering into the watercourses.
      - The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm events.
   b) Exposed mineral soils outside of the trail running surface greater than 50 square feet (sf) and with exposed slope distance exceeding 10 feet and with less than 80% ground coverage of natural vegetation shall receive mulch, straw rolls or netting (as specified) in order to reduce the potential for short-term sheet and rill erosion.
      - Mulching:
        - Use native mulch where feasible.
        - Where native mulch is unavailable and/or as directed by the engineering geologist or designee, mulch using 1-1/2" to 2" of approved certified weed-free straw mulch.
      - Straw roll:
        - Install where slope distance > 20' per standard specifications unless otherwise specified or directed.
      - Netting:
        - Install on slopes >50% grade (2H:1V) and where slash pack is not done. Apply jute netting and anchor per manufacturer's recommendations.
        - Use approved rolled erosion control product (RECP) conforming to Caltrans RECP netting (Type 3).
   c) Unnecessary grading and disturbance of soil shall be avoided.
   d) All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction.
   e) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

10) TIMING
   a) Work shall be conducted during the dry season and as permitted. All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction

11) HOUSEKEEPING
   a) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

12) STAGING AND ACCESS
   a) Construction staging areas will be restricted to existing roads or other areas where permitted by District representative.
   b) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.
   c) Upon completion of construction of the crossings the access route and staging areas shall be restored to their original condition.
   d) The contractor shall carefully preserve the surrounding property by confining operations within the limits of work. Construction work or equipment operations shall not be conducted outside the designated work area boundary without approval of the engineer.

13) PROPERTY BOUNDARY
   a) District shall be responsible for verifying the location of all property lines and easement areas.

14) SUPPLEMENTAL RECOMMENDATIONS
   a) If undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at this time, Timothy C. Best shall be notified so that supplemental recommendations can be given.

15) CONSTRUCTION MANAGEMENT PLAN PROVISIONS
   a) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.
   b) Upon completion of construction of the trail the access route and staging area shall be restored to their original condition.
   c) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.
   d) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction.

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PROJECT SPECIFICATIONS 1

Date	Description
04/06/16	
Revised: 08/20/2016	

DRAWN
TCB

PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER

N1

16) UNDERGROUND UTILITIES
   a) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water lines. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.

17) SITE DRAINAGE
   a) Water runoff must not be allowed to pond adjacent to the top of the fillslopes.
   b) Surface runoff naturally flows downhill. Drainage improvements should include provisions to intercept surface water from flowing toward new cut/fill grading.
   c) Collected water may be discharged downslope from improvements in a way so as not to induce erosion. Do not discharge collected water at the top of a slope.
   d) Where cuts expose seepage then provisions must be made for its control and discharge in a way so as not to cause erosion.

18) ROAD DRAINAGE
   a) Rolling dips, knicks, waterbars and ditch relief culverts shall be as specified on plans.
   b) Rolling dips may be constructed using approved onsite or imported engineered fill
   c) Ditch relief culverts shall be installed per standard specifications.
   d) Road prism shall be reshaped as necessary to drain to dips and culverts.

19) INSPECTIONS
   a) The project engineering geologist (CEG) shall be provided an opportunity to review project plans with the contractor during the pre-construction meeting to evaluate if recommendations have been properly interpreted. They shall also provide foundation excavation observations and earthwork observations and testing during construction. This allows them to confirm anticipated soil conditions and evaluate conformance with our recommendations and project plans. If they do not review the plans and provide observation and testing services during the earthwork phase of the project, they assume no responsibility for misinterpretation of the recommendations.
   b) Regulatory Agencies may require a final grading compliance letter. We can only offer this letter if we are called to the site to observe and test, as necessary, any grading and excavation operations **from the start of construction**. We cannot prepare a letter if we are not afforded the opportunity of observation from the **beginning of the grading operation**. The contractor must be made aware of this and earthwork testing and observation must be scheduled accordingly. Please contact our office: Tim Best (831) 425-5832 (office) (831) 332-7791 (mobile)

20) INSPECTION SCHEDULE
   a) As required to allow observations and testing of:
      i. Trail and bridge alignments
      ii. Culvert positions
      iii. Limits of excavation
      iv. Keyway
      v. Fill placement
      vi. Energy dissipater shape and position
      vii. Finish grades
      viii. Trail drainage (dips, knicks, etc)
      ix. Erosion control

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PROJECT SPECIFICATIONS 2

Date	Description
04/06/2016	
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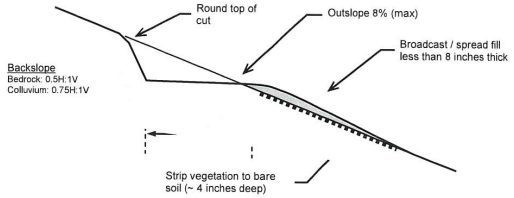
TCB

PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER

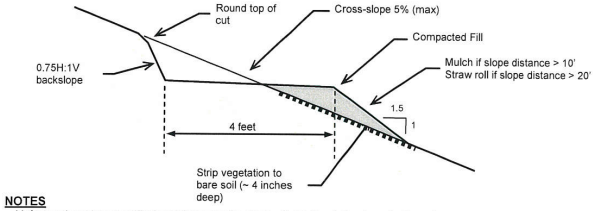
N2

1 / N3 CUT BENCH TRAIL
NTS



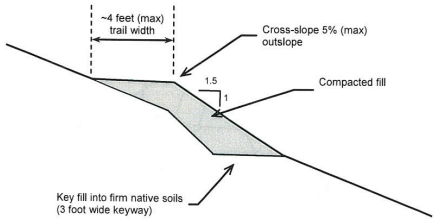
NOTES
- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width.
- Trail shall be constructed on full bench with fill broadcasted below the trail to a depth less than 8 inches.
- Areas to receive broadcast fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Broadcast fill shall be not be spread within 25 feet of a watercourse.
- Cutbank backslope shall be inclined at 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils.
- Disturbed areas outside trail tread shall be treated to control erosion per specifications. Where feasible exposed ground shall be slash packed
- Specifications are indented only as guideline, modifications may be made in the field by engineering geologist or designee

3 / N3 PARTIAL BENCH TRAIL CONSTRUCTION
NTS



NOTES
- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width on balanced cut and fill.
- Areas to receive fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Onsite soils may be reused as fill. Fill shall be compacted to a level equal or greater than the surrounding native materials (approximately 85 percent relative compaction per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
- Fill shall be a maximum of 24 inches thick unless otherwise specified.
- Fill embankment shall be inclined no steeper than 1.5:1 (unless otherwise specified).
- Cutbank backslope shall be inclined at 0.75H:1V slope. Where cuts are steeper than 6 feet or where seepage of water or unsuitable earth materials are encountered, the backslope shall be selected by the project geotechnical consultant.
- All disturbed areas shall be treated to control erosion per specifications.
- Specifications are intended only as guidelines. Modifications may be made in the field by engineering geologist or designee.

2 / N3 FILL BENCH TRAIL
NTS



NOTES
1. Trail shall be constructed at 4 foot maximum width unless otherwise specified in plans, or as directed.
2. Areas to receive fill shall be stripped to remove vegetation, near-surface roots, brush, highly organic soils and other unsuitable fill material. Depth of stripping is assumed to be 6 inches.
3. Fill shall be keyed and benched into firm native soils. Keyways shall be minimum 3 feet wide and inclined 5% into slope.
4. Onsite soils may be reused as fill. Fill shall be adequately moisture conditioned and compacted to a level equal to or greater than the surround materials (minimum 85 percent relative compaction per ASTM D 1557); During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
5. Fill embankment shall be inclined no steeper than 1.5:1 unless otherwise specified or directed.
6. All disturbed areas shall be treated to control erosion per specifications. Place slash or straw roll below base of fill unless otherwise directed.
7. Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee.

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PROJECT
OLJON TRAIL PHASE 4 PROJECT
EL CORTE DE MADERA OPEN SPACE PRESERVE
Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE
CUT/FILL AND PARTIAL BENCH SPECIFICATIONS

Date	Description
04/06/2016	
Revised: 08/20/2016	

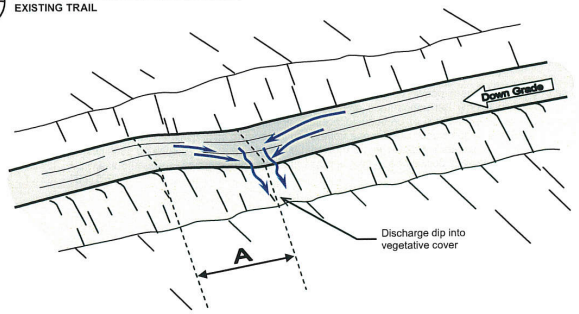
DRAWN
TCB

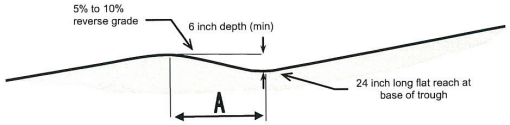
PROJECT
MPEN-OLJON-P4-649

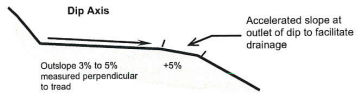
SHEET NUMBER
N3

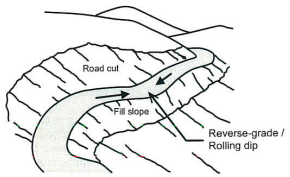
4 N4 REVERSE-GRADE DIP (Typical)

EXISTING TRAIL









TRAIL GRADE (%)	TROUGH	A: REVERSE GRADE	
	Minimum depth below downslope crest	Minimum distance from trough axis to down trail crest (ft)	Grade (%)
0-5%	6 inches	15	-5%
0-15%	6 inches	15	-10%
>15%	As directed		

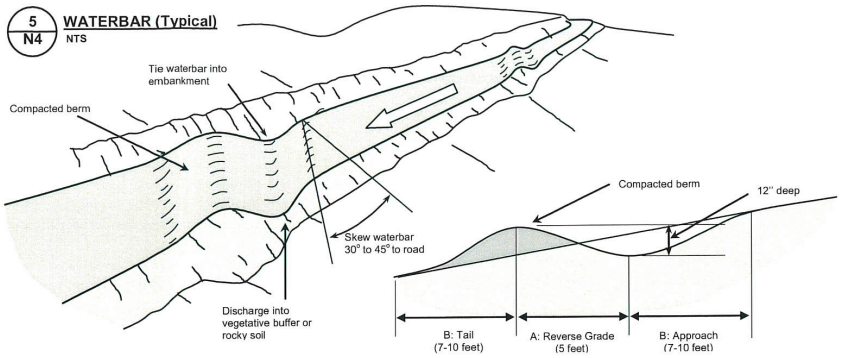
NOTES

- A reverse-grade dip (or rolling dip) is a broad, long, permanent dip constructed into native soils. The dip is long to prevent breaking down over time. On new trails the dip is incorporated into the trail at the time of construction.
- The dip shall be a minimum of 6 inches deep and incorporate a 2 foot long flat reach at the base of the trough (unless otherwise directed).
- The reverse grade shall be sloped 5-10% for a minimum of 15 feet to form the minimum 6 inch deep dip.
- The dip axis should be outsloped (measured perpendicular to trail) 3% to 10% unless otherwise specified or directed.
- Dip outlets should be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, slash, brush, etc. Where specified, the bottom of the outfall of the dip will be surface-rocked.
- Dips shall be placed as directed or specified in the plans. If not specified, then dips shall be placed at maximum 100 foot spacings.

MAXIMUM GRADE OF DIP OUTLET PER SOIL TYPE			
SOIL:	Maximum allowable velocity (fps)	Maximum dip spacing	Maximum grade of dip outlet
Sandy Loam	1.8	100'	10%
Silt Loam	2.0	100'	12%
Firm Loam	2.5	100'	18%

5 N4 WATERBAR (Typical)

NTS



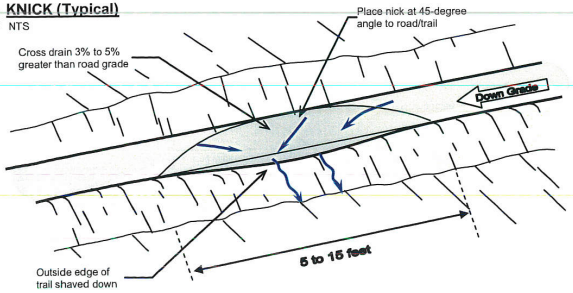
NOTES

- Waterbars are short abrupt dips constructed into native soils. Unlike a reverse grade dip, they are much more abrupt.
- Identify waterbar locations that take advantage of natural drainage features and minimize the amount of disturbance required for waterbar construction.
- On existing trails the dip is cut into the existing tread with the downroad dip built up on compacted fill.
- On existing trails the dip shall be a minimum of 12 inches deep.
- Acceptable waterbars shall be skewed 45 degrees.
- All waterbars shall have free-flowing outlets with minimum 3% grade steeper than trail grade.

ROAD GRADE (%)	TROUGH	A: REVERSE GRADE	B: UP ROAD APPROACH DOWN ROAD TAIL
	Minimum depth below downslope crest	Minimum distance and grade from trough axis to downroad crest (ft)	Distance from up-road start of rolling dip to trough axis (ft)
<5%	12 inches	5 feet at 20% (Unless otherwise directed)	7
10%			8
15%			9
>15%			10

6 N4 KNICK (Typical)

NTS



NOTES

- A knick is a semi-circular, shaved-down section of the outside edge of the road/trail.
- Knick is installed at a 45-degree angle to road/trail.
- The center of the nick is outsloped 3 to 5% greater than road grade.
- Dip outlets should be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, slash, brush, etc.

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

REVERSE GRADE DIP, WATERBAR AND KNICK SPECIFICATIONS

Date	Description
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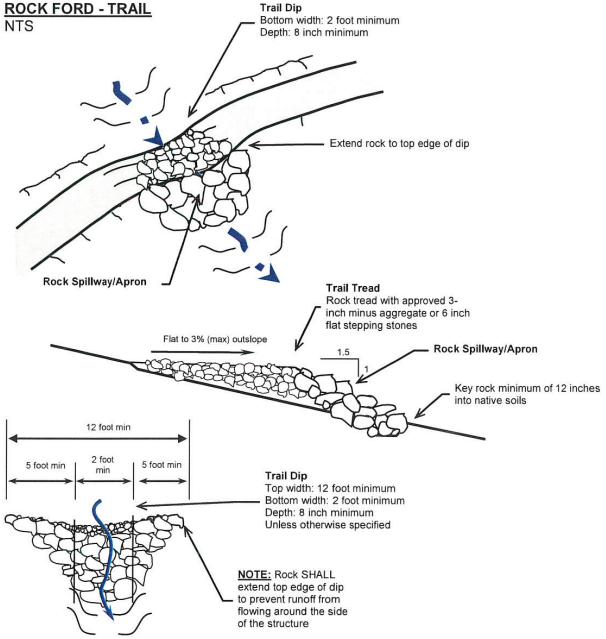
TCB

PROJECT
MPEN-OLJON-P3-645

SHEET NUMBER

N4

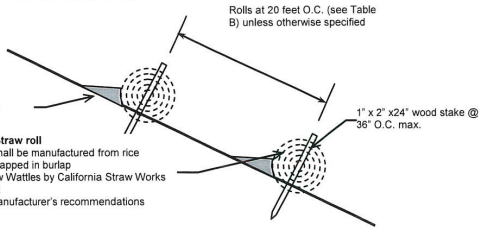
7 / N5 ROCK FORD - TRAIL
NTS



NOTES

- **Dip**
  - Dip trail through watercourse
  - Depth: 8 inch minimum
  - Bottom width: 2 foot minimum
  - Top width: 12' minimum
- **Rock spillway / apron**
  - Armor outside trail edge with rock to form apron in the spillway
  - Rock shall consist of approved sound, durable, angular rock
  - 50% (D_{50}) of rock shall be greater than 12 inches minimum diameter (unless otherwise specified)
  - Rock should generally be well-graded (incorporating mix of sizes)
  - Voids shall be filled with smaller rock to prevent piping around the larger rock
  - Larger rock to be placed at base of apron
  - Extend rock to top edge of dip or above anticipated edge of high water to prevent high flows from eroding around the edge of the rock; place rock to form a well-defined spillway
- **Trail tread**
  - Armor trail tread with rock
  - Use 3 inch minus sound durable rock (unless otherwise specified); alternatively use 6 inch flat rock to form stepping stones.
- Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee

8 / N5 STRAW ROLL (Typical)
NTS



6" to 8" DIA. Straw roll

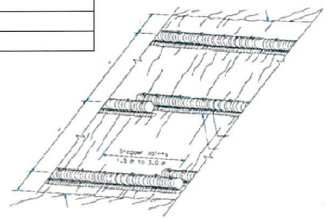
- Straw rolls shall be manufactured from rice straw and wrapped in burlap
- BIO-12 Straw Wattles by California Straw Works or equivalent
- Install per manufacturer's recommendations

NOTES:

- Location
  - Install at base of disturbed areas and at outlets of new or reconstructed reverse grades/rolling dips unless otherwise specified
  - Rolls to extend across entire width of disturbed area unless otherwise specified or directed
- Placement
  - Install per manufacturer's recommendations
  - Rolls to be placed on slope contour
  - Adjacent rolls to overlap; turn ends of rolls up
  - Runoff must not be allowed to run under or around the roll

TABLE B

Slope percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet



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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

ROCK FORD AND STRAW ROLL SPECIFICATIONS

Date	Description
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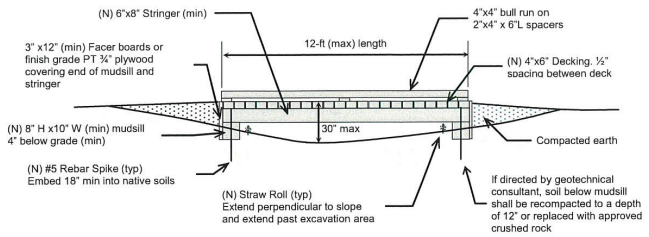
PROJECT
MPEN-OLJON-P4-649

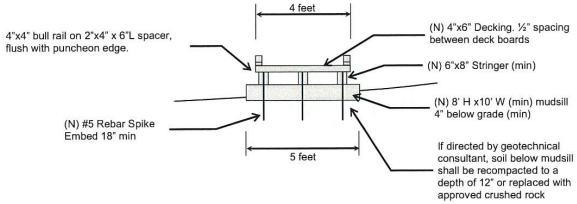
SHEET NUMBER

N5

9 / N6 LOW PUNCHEON (BOARDWALK)

MROSD STANDARD SPECIFICATIONS (NTS)





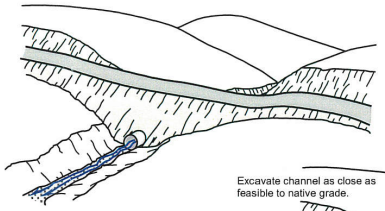
NOTES:

- Standard puncheon width shall be 4 feet. Refer to site plan if narrower puncheon is proposed.
- All decking, beams, mudsills and wood in contact with earth or within 1 foot of earth shall be Con Heart redwood or approved plastic.
- If directed by geotechnical consultant, soil below mudsill shall be recompacted to a depth of 12" or replaced with approved crushed rock.
- All hardware shall be galvanized.
- Anchor decking with (2) 3/8" x 8" galvanized wire spikes (typ); predrill holes for spikes.
- Anchor bull rail with (2) 3/8" x 10" galvanized wire spikes (typ); predrill holes for spikes.
- Maintain 2% maximum slope on puncheon.

10 / N6 STREAM CROSSING REMOVAL

NTS

EXISTING CROSSING



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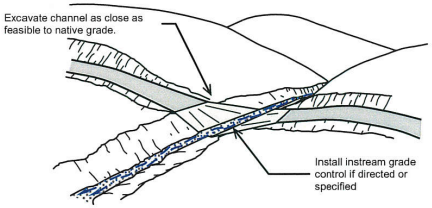

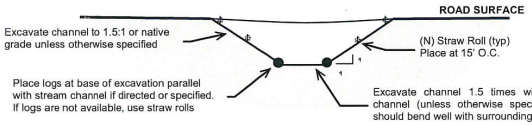

NOTES

- Excavate a channel that is 1.5 times wider than the natural channel (unless otherwise specified).
  - Excavated channel shall be as close as feasible to the grade and orientation of the natural channel.
  - Channel banks shall be excavated to a 1.5:1 slope or native grade (whichever is steepest) unless otherwise specified in the plan or directed.
  - Excavation should blend well with surrounding natural topography.
  - Spoils shall be placed and compacted along a stable portion of the inboard edge of the road, unless otherwise specified.
  - Fill shall be placed in a manner to prevent future erosion. Fill shall be compacted to 85% relative compaction unless otherwise specified or directed.
- Install instream grade control if specified in the plan or directed. Grade control shall consist of large wood or rock and is intended to prevent stream down-cutting. See general specifications.
- Place logs at base of excavated channel if directed. Logs to be placed parallel with stream with upstream log overlapping downstream log. Logs to be embedded into channel bank to minimize stream bank erosion. Log diameter to be determined by project geotechnical consultant or designee.
- Mulch disturbed ground per standard specifications.
  - If available and directed by project geotechnical consultant, the excavated channel banks and spoil sites may be slash mulched using 6-inch minus woody debris with 90% coverage. Slash should be packed using a dozer or the bucket of the excavator.
- Install a straw roll at 15' O.C. and as directed by geotechnical consultant and/or District representative.
- Conform to requirements of CDFW Fish and Wildlife Code 1600 where applicable.
- Specifications are intended only as guidelines; modifications may be made in the field by geotechnical consultant or designee.

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PUNCHEON AND STREAM CROSSING REMOVAL SPECIFICATIONS

Date	Description
04/06/2016	
Revised: 08/20/2016	

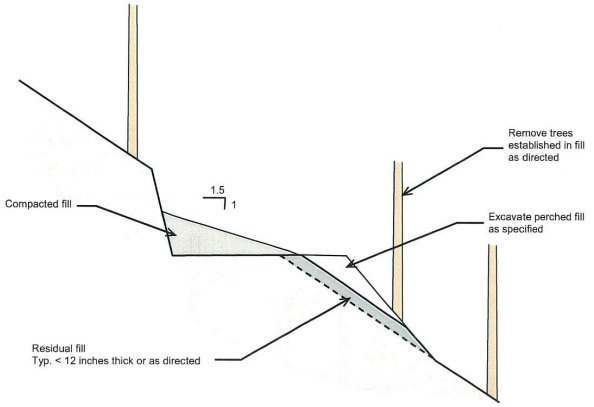
DRAWN
TCB

PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER

N6

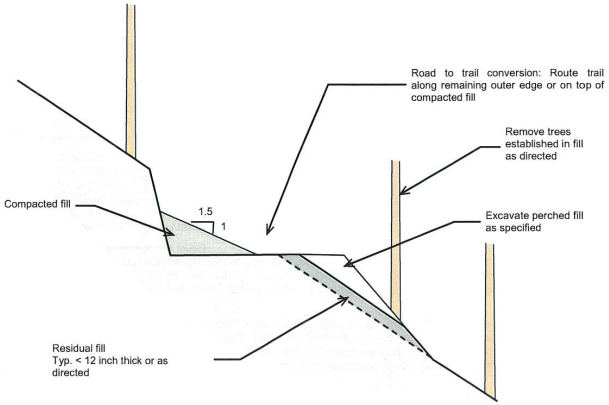
11 N7 PERCHED FILL REMOVAL
NTS



NOTES

- Remove trees established in roadway and in fill as directed.
  - Trees greater than 6 inch diameter shall be marked by District prior to removal.
- Excavate perched fill as specified and directed.
  - Limits of fill removal to be identified in the field by project geologist or designee.
- Spoils shall be compacted along inboard edge of road.
  - Spoils shall not be placed in any areas where seasonal bank seeps or wet areas are present.
  - Areas to receive fill shall be cleared of vegetation.
  - Spoils shall be placed in thin lifts (not to exceed 8 inches in maximum thickness) and compacted (minimum 85 percent relative compaction). Compacting may employ track walking with a dozer, bucket of the excavator, roller or hand tamper. Spoils shall be moisture conditioned to achieve a suitable level of compaction.
  - Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 1.5:1 (65%) unless otherwise directed or specified.
  - Project geotechnical consultant or designee shall approve all spoil sites prior to fill placement.
- Specifications are intended only as guidelines; modifications may be made in the field by project geotechnical consultant or designee.

12 N7 ROAD TO TRAIL CONVERSION
NTS



NOTES

- Remove trees established in roadway and in fill as directed.
  - Trees greater than 6 inch diameter shall be marked by District prior to removal.
- Excavate perched fill as specified and directed.
  - Limits of fill removal to be identified in the field by project geologist or designee.
- Spoils shall be compacted along inboard edge of road.
  - Spoils shall not be placed in any areas where seasonal bank seeps or wet areas are present.
  - Areas to receive fill shall be cleared of vegetation.
  - Spoils shall be placed in thin lifts (not to exceed 8 inches in maximum thickness) and compacted (minimum 85 percent relative compaction). Compacting may employ track walking with a dozer, bucket of the excavator, roller or hand tamper. Spoils may need to be moisture conditioned to achieve a suitable level of compaction.
  - Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 1.5:1 (65%) unless otherwise directed or specified.
  - Project geotechnical consultant or designee shall approve all spoil sites prior to fill placement.
- Specifications are intended only as guidelines; modifications may be made in the field by project geotechnical consultant or designee.

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PERCHED FILL REMOVAL AND ROAD TO TRAIL CONVERSION SPECIFICATIONS

Date	Description
04/06/2016	
Revised: 08/20/2016	

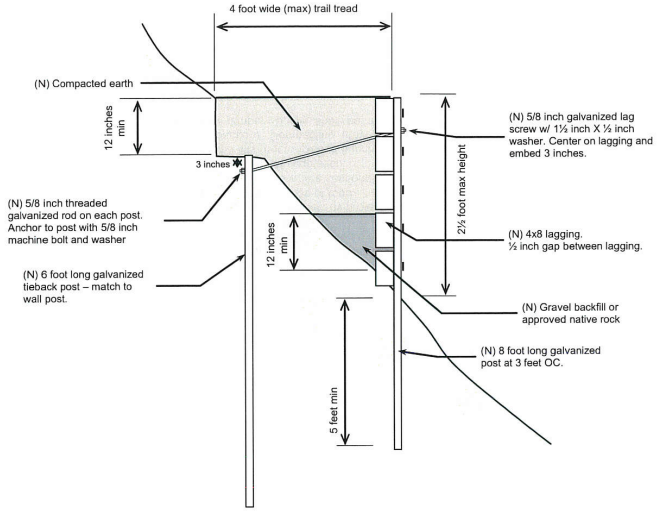
DRAWN
TCB

PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER

N7

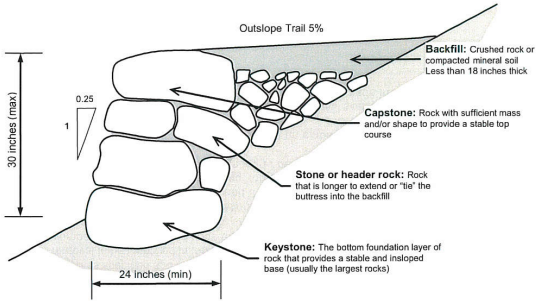
13 N8 WOOD RETAINING WALL- TRAIL (Typical)



NOTES

- Post shall be 8 foot x 2.0 lbs/ft galvanized U-Channel conforming to ASTM A4999, Grade 60.
- Final depth of post embedment to be determined in field by project engineering geologist based on on-site soil conditions.
- All wood shall be pressure-treated Douglas-fir or clear heart redwood unless otherwise specified or approved.

14 N8 ROCK BUTTRESS - TRAIL (Typical)



NOTES

- Excavate a keyway footing to firm, stable dirt or to solid rock. Slope the footing slightly into the hillside (***batter***) so the rock buttress will lean into the hill and dig footing deep enough to support the foundation tier of rocks (these are usually the largest rocks in the buttress). The footing is dug so that the foundation tier is embedded for the full thickness of the first layer of rocks.
- Construct buttress using sound durable rock. A minimum of 50% of the rock shall be larger than 18 inches (130 lb min). Ideally, the bigger the rock, the better, since big rocks are less likely to shift or become dislodged. The best rock is rectangular with flat surfaces on all sides. Round river rock is the worst.
- The ***keystone*** is laid into the footing and successive tiers are laid. For each tier, overlap the gaps between rocks in the next lower tier, called breaking the joints. Each tier should be staggered slightly into the hill to create the desired amount of batter. ***Header rocks*** are long rocks turned and placed so that they extend deep into the hillside. Using header rocks is particularly important if the buttress's cross section widens as the buttress gets higher. The ***capstone*** is the top rock layer with sufficient mass to provide a stable trail tread.
- Rocks in each successive tier should be set so they have at least three points of good contact with the rocks below. Good contact is defined as no wobble or shifting under a load, without relying on shims (or chinking) to eliminate movement. Shims are prone to shifting and should not be used to establish contact, especially on the face of the buttress, where they can fall out. Add backfill and tamp crushed rocks into the cracks as you build.
- Project engineering geologist or District designee shall flag the location of the rock buttress prior to construction
- Specifications modified from U.S. Forest Service Trail Construction and Maintenance Notebook, 2007 Edition (Hesselbarth et al., 2007).

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PROJECT

OLJON TRAIL PHASE 4 PROJECT

EL CORTE DE MADERA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

RETAINING WALL SPECIFICATIONS

Date	Description
04/06/2016	
Revised: 08/20/2016	

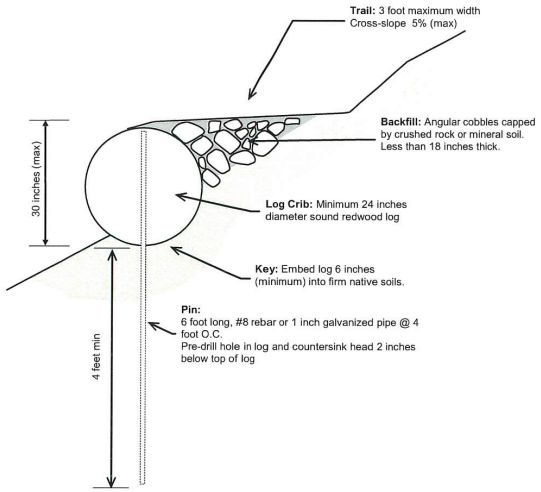
DRAWN
TCB

PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER

N8

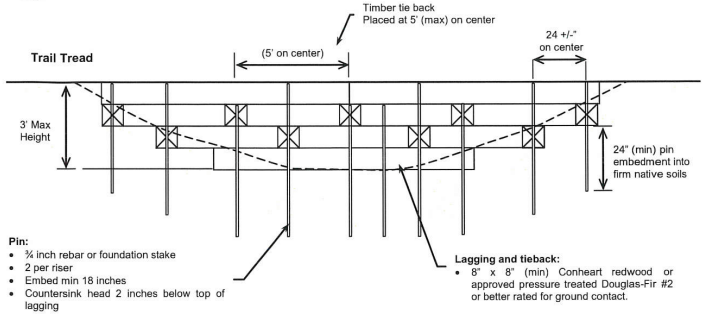
15 N9 **SINGLE LOG CRIB WALL - TRAIL (Typical)**
(NTS)

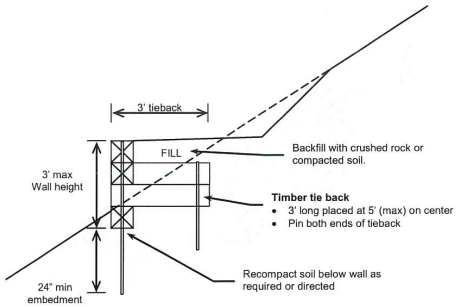


NOTES

- Log shall be a 24 inch (min) diameter sound durable redwood log. On-site logs used for the buttress shall be approved by District representative and the project engineering geologist prior to construction.
- Log shall be placed in a minimum 6 inch deep keyway. Where possible key the log upslope and against existing trees.
- Backfill behind log with crushed angular cobbles and cap trail tread with crushed aggregate or compacted mineral soil.
- Pin log using 6 foot long # 8 rebar or 1 inch galvanized pipe. Predrill hole in log and countersink head 2 inches below top of log. Pins to be installed at 4 feet O.C. unless otherwise specified or directed.
- Project engineering geologist or designee shall flag the location of the log buttress prior to construction.

16 N9 **TIMBER TIE BACK CRIB WALL**
NTS





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PROJECT
OLJON TRAIL PHASE 4 PROJECT
EL CORTE DE MADERA OPEN SPACE PRESERVE
Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE
RETAINING WALL SPECIFICATIONS

Date	Description
04/06/2016	
Revised: 08/20/2016	

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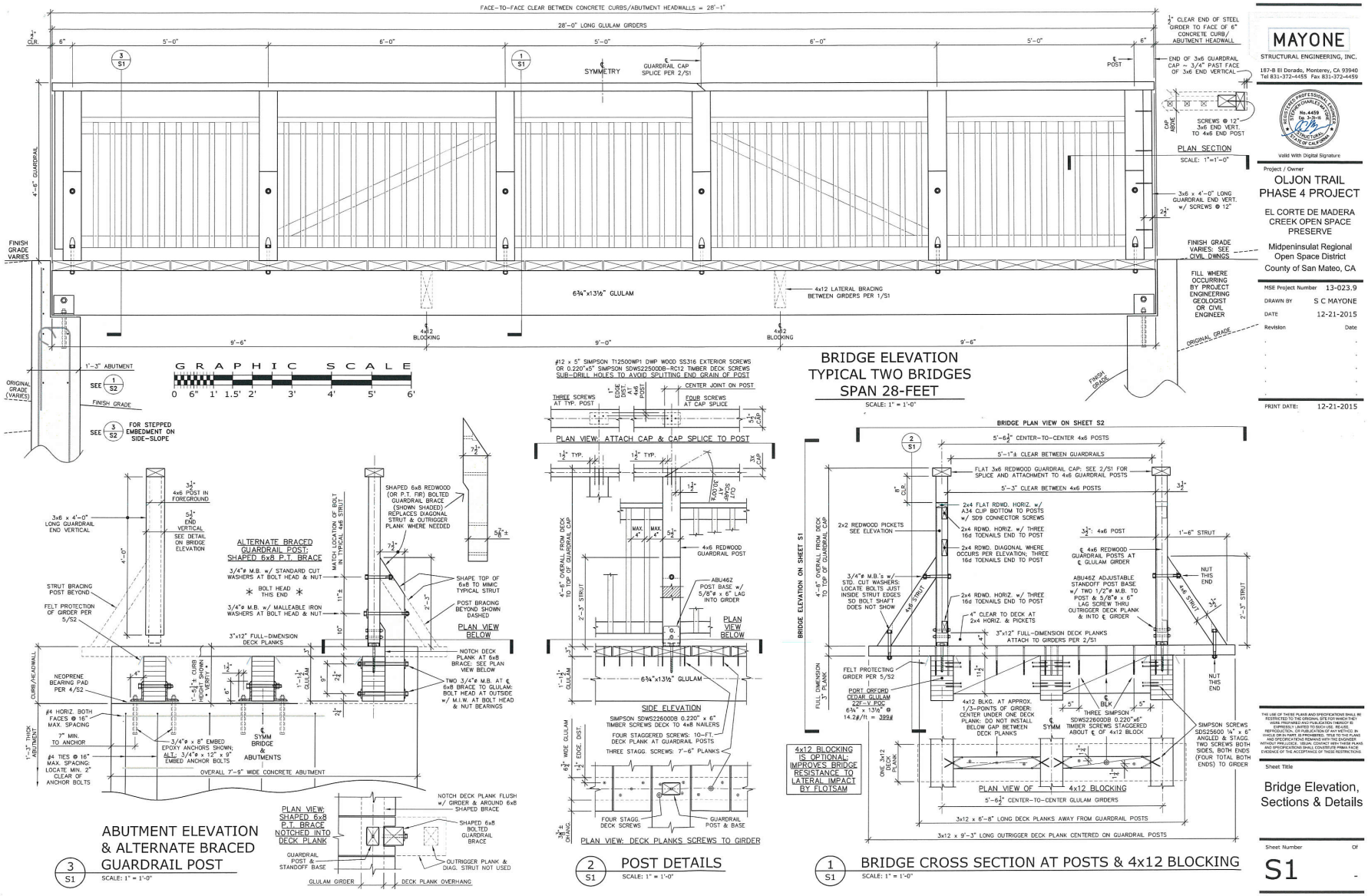
PROJECT
MPEN-OLJON-P4-649

SHEET NUMBER
N9

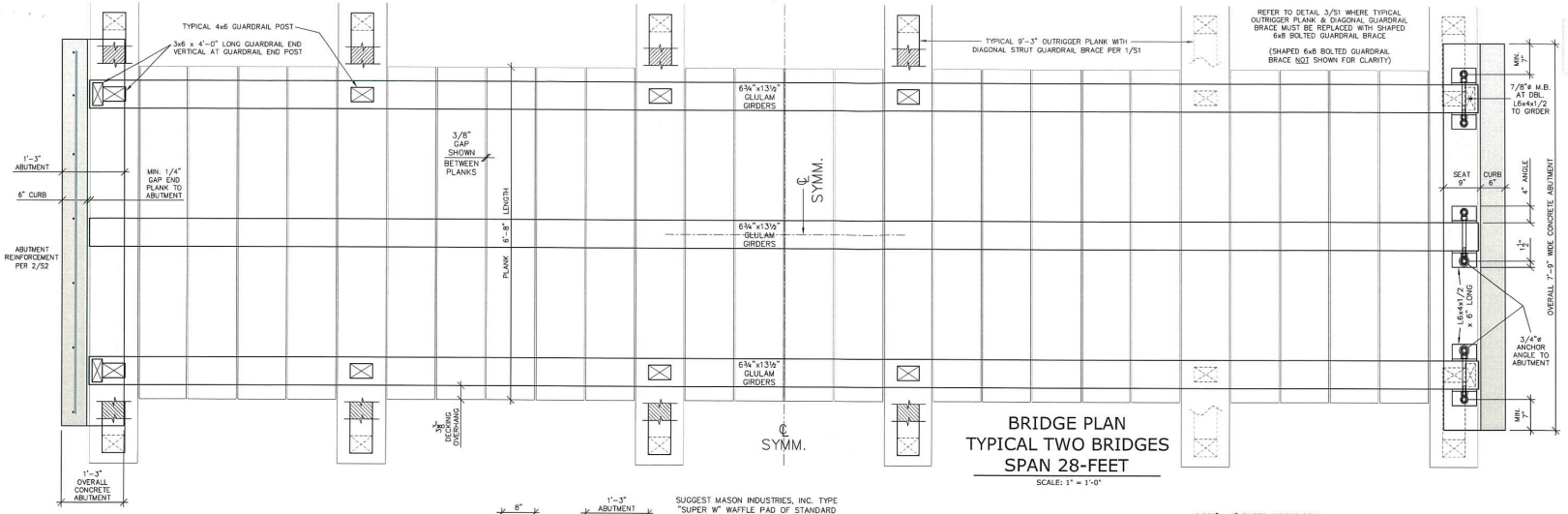


San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District**

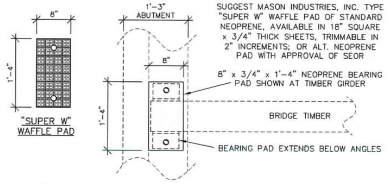
Attachment: **D**

File Numbers: **PLN2016-00084**

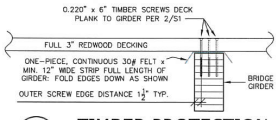


BRIDGE PLAN
TYPICAL TWO BRIDGES
SPAN 28-FEET
SCALE: 1" = 1'-0"

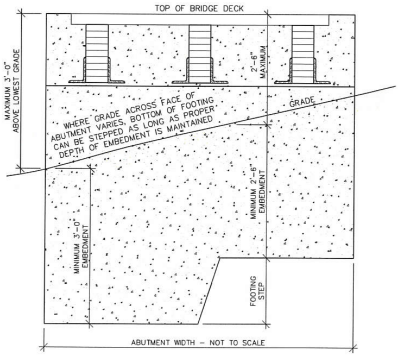
GRAPHIC SCALE
0 6" 1' 1.5' 2' 3' 4' 5' 6'



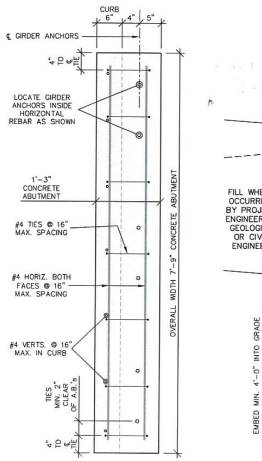
4 S2 NEOPRENE TIMBER BEARINGS
SCALE: 1" = 1'-0"



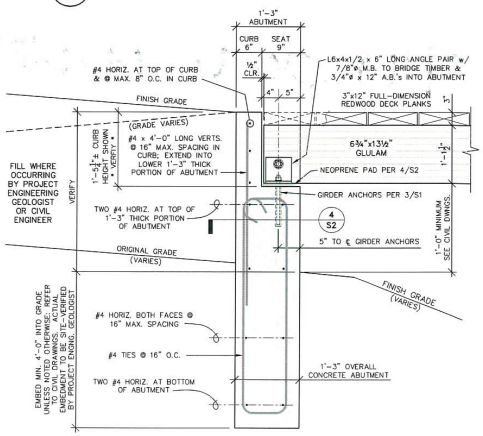
5 S2 TIMBER PROTECTION
SCALE: 1" = 1'-0"



3 S2 ABUTMENT STEPPED EMBEDMENT
NOT TO SCALE



2 S2 ABUTMENT PLAN SECT.
SCALE: 1" = 1'-0"



1 S2 ABUTMENT CROSS SECTION
SCALE: 1" = 1'-0"

STRUCTURAL ENGINEERING NOTES & SPECS.

1. ALL CONSTRUCTION NOT SPECIFICALLY DETAILED SHALL BE BUILT TO CONFORM TO THE REQUIREMENTS OF THE 2013 CALIFORNIA BUILDING CODE (C.B.C.) AND ANY LOCAL ORDINANCES.

2. ALL DETAILS, SECTIONS AND NOTES SHOWN ON DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS ELSEWHERE, UNLESS OTHERWISE NOTED. ALL DIMENSIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO BEGINNING CONSTRUCTION. ACTUAL SITE DIMENSIONS SHALL TAKE PRECEDENCE OVER DIMENSIONS SHOWN ON THE DRAWINGS. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

3. CONCRETE SHALL HAVE A 28-DAY MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 2,500 PSI. PROTECT CONCRETE FROM PREMATURE DRYING & MAINTAIN CURING AND PROTECTION FOR A TOTAL PERIOD OF NOT LESS THAN 28-DAYS. REINFORCEMENT SHALL BE ASTM A-615 DEFORMED GR 40.

4. STEEL ANGLES, ANCHOR BOLTS & EPOXY ANCHORS SHALL BE HOT-DIPPED ZINC-COATED STEEL (MIN. G90) OR STAINLESS STEEL. ANCHOR BOLTS SHALL HAVE A BOLT HEAD OR AN EQUAL DEFORMITY AT THE EMBEDDED END. EPOXY ANCHORS SHALL BE "SIMPSON EPOXY-TIE, TYPE ET22" OR OTHER OF EQUAL CAPACITY, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. EPOXY ANCHORS, IF USED, SHALL BE "SIMPSON EPOXY-TIE, TYPE ET22" OR OTHER APPROVED BY ENGINEER.

6. CARPENTRY AND TIMBER:
   A. STRUCTURAL TIMBER GRADING SHALL BE WCLB STANDARD GRADING RULES FOR WEST COAST LUMBER.
   B. BRIDGE TIMBERS SHALL BE PRESSURE-TREATED, KILN-DRIED DOUGLAS FIR #1 OR BETTER; OR PORT ORFORD CEDAR GLULAM 22F-V POC.
   C. DECK PLANKS & BLOCKING, AND GUARDRAIL POSTS, HORIZONTALS & CAP SHALL BE CONSTRUCTION GRADE REDWOOD OR BETTER. GUARDRAIL CAP MAY ALTERNATELY BE PORT ORFORD CEDAR & MAY BE GLUE-LAMINATED. GUARDRAIL POSTS, HORIZONTALS & CAP SHALL BE S4S.
   D. BOLTS, NUTS & ALL WASHERS SHALL BE HOT-DIPPED GALVANIZED STEEL (MIN. G90). BOLTS IN WOOD SHALL CONFORM TO ASTM A-307. BOLT HOLES SHALL BE DRILLED 1/16" OVERSIZE OF BOLT. USE MALLEABLE IRON WASHERS (M.I.W.) ON ALL BEARING OF HEADS & NUTS AGAINST WOOD. USE STANDARD CUT WASHERS ON ALL BEARING OF HEADS & NUTS AGAINST STEEL.
   E. BOLT TIGHTENING: ALL NUTS SHALL BE TIGHTENED WHEN PLACED AND RE-TIGHTENED AT COMPLETION OF PROJECT, OR IMMEDIATELY BEFORE FINISHING OF CONSTRUCTION WHICH WILL MAKE THEM INACCESSIBLE.
   F. FRAMING SCREWS SHALL BE EXTERIOR, CORROSION-PROTECTED. #12 x 5" DECK SCREWS SHALL BE "R4 MULTI PURPOSE SCREW," SIZE 12/14 x 4¾" LONG (OR LONGER), BY GRK FASTENERS, THUNDER BAY, ONTARIO, CANADA (800) 474-4300 www.grkfasteners.com. SMALLER SCREWS MAY BE "GRABBER EXTERIOR WOOD" BUGLE HEAD, COARSE THREAD, WITH "GRABBERGARD" COATING; OR ALTERNATE WITH ENGINEER'S APPROVAL.
   H. FRAMING HARDWARE SHALL BE AS MANUFACTURED BY SIMPSON COMPANY AND SHALL BE HOT-DIP GALVANIZED. ITEMS SHALL BE INSTALLED WITH THE FASTENERS SPECIFIED IN THEIR CURRENT CATALOG. IF OTHER BRANDS ARE USED, THEY MUST BE EQUIVALENT IN ALL STRUCTURAL ASPECTS.

MAYONE
STRUCTURAL ENGINEERING, INC.
167-B El Dorado, Monterey, CA 93940
Tel 831-372-4455 Fax 831-372-4459

REGISTERED PROFESSIONAL ENGINEER No. 4459 Exp. 3-31-16 STRUCTURAL STATE OF CALIFORNIA
Valid With Digital Signature

Project / Owner
OLJON TRAIL
PHASE 4 PROJECT
EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE
Midpeninsulat Regional Open Space District
County of San Mateo, CA

MSE Project Number	13-023.9
DRAWN BY	S C MAYONE
DATE	12-21-2015
Revision	Date

PRINT DATE: 12-21-2015

Sheet Title
Bridge Plan & Details

Sheet Number S2 Of -

San Mateo County Planning Commission Meeting

Owner/Applicant: **Midpeninsula Regional Open Space District**

Attachment: **D**

File Numbers: **PLN2016-00084**

ATTACHMENT: E

Midpeninsula Regional Open Space District

MITIGATED NEGATIVE DECLARATION

El Corte de Madera Creek Parking/Staging Area and Trails Project
El Corte de Madera Creek Open Space Preserve
San Mateo County, CA

October 6, 2009

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022
650-691-1200

Table of Contents

Midpeninsula Regional Open Space District
PROPOSED MITIGATED NEGATIVE DECLARATION

A notice, pursuant to the California Environmental Quality Act of 1970, as amended (Public Resources Code 21,000, et seq.) that the Midpeninsula Regional Open Space District proposes to determine that the El Corte de Madera Creek Parking/Staging Area and Trails Project (Project), when implemented, will not have a significant impact on the environment.

PROJECT DESCRIPTION

The project consists of the construction of a new 65-vehicle, four-horse trailer parking and staging area at El Corte de Madera Creek Open Space Preserve (Preserve), a 0.25-mile connector trail, a 1.75-mile perimeter trail, a 0.2-mile trail realignment, and restoration of 0.7 miles of abandoned trail; installation of "No Parking" signs to remove approximately 40 roadside parking spaces on Skyline Boulevard; and relocation of an existing Skyline Boulevard trail/pedestrian crossing.. The proposed parking area would serve as the Preserve's first dedicated parking area. All current parking occurs along the Skyline Boulevard roadside or at a Caltrans vista point parking lot known as Skeggs Point Lot. The proposed trails would connect the new parking area to the existing trail system, enhance public access in the eastern part of the Preserve, and address erosion issues on an existing trail alignment. The "No Parking" signs would eliminate deficient roadside parking spaces with poor lines of sight and insufficient shoulder width. The purpose of relocating the roadway trail/pedestrian crossing would be to improve trail user and traffic safety as trail users travel between the Preserve and the Bay Area Ridge Trail. The proposed project components are described in more detail below:

(1) A new paved parking lot for 65 vehicles and four horse trailers that includes:
   a. A large preserve entrance sign
   b. A two-stall, unisex, ADA-accessible, self-contained vault restroom facility
   c. Two ADA-accessible parking spaces (part of the 65 vehicles spaces)
   d. Two trailhead signboards with brochure holders
   e. A bicycle tire and hiking boot cleaning station
   f. Split-rail wood fencing
   g. A new 20-foot wide driveway entry
   h. Designating the Gate CM04 access road as a service road only (no public use)
   i. A series of bioretention basins where stormwater runoff is collected and allowed to percolate into the soil

   The parking lot will be constructed using earth-moving equipment such as a compact bulldozer and mini-excavator and will incorporate best management practices for erosion control from the District's Watershed Protection Program and Details and Specifications Guidelines.

(2) A "connector" trail approximately five feet wide and 0.25 miles in length. This proposed trail connects the southwestern end of the new parking area to the Gordon Mill Trail. The trail travels along the upper reaches of the Preserve at a gentle grade, first going under the canopy of a mixed evergreen forest, then across an open grassy hillside, and finally again through mixed evergreen forest until reaching the trail junction. The trail will be constructed using small earth-moving equipment such as a compact bulldozer and mini-excavator at an average 10% gradient and will incorporate best management practices for erosion control from the District's Watershed Protection Program and Details and Specifications Guidelines.

(3) Completion of the "perimeter" trail, three to five-feet wide and approximately 1.75 miles in length. This proposed trail traverses steep forested canyons of the upper northeastern reaches of the Preserve, beginning near the Gordon Mill trailhead and gradually descending and crossing numerous swales to first connect with the Steam Donkey Trail, then extending further south to connect with upper Springboard Trail. This trail would be designated as part of the regional Bay Area Ridge Trail (referenced as "BART" in the enclosed figures). The trail will cross approximately six ephemeral streams and one intermittent stream, requiring the installation of small diameter culverts, rock fords, and/or low puncheons. This trail

contours across 20 to 75% side slopes and crosses a variety of habitats, including Douglas fir-redwood forest, redwood stands, and California bay-tanoak forest. The trail will be constructed using small earth-moving equipment such as a compact bulldozer and mini-excavator at an average 10% gradient and incorporate best management practices for erosion control from the District's Watershed Protection Program and Details and Specifications Guidelines.

(4) A realignment of the Steam Donkey Trail, three to five-feet wide and approximately 0.2 miles in length. This trail will be constructed on moderate side slopes of 20 to 50% at a trail gradient between 5% and 10% and cross a mixed redwood and tanoak forest. The realignment will require one ephemeral stream crossing using a small culvert. The preferred alternative for the stream crossing is a culvert, but if field conditions change, a puncheon or rock ford would be considered. The realignment will allow for the closure and decommissioning of approximately 0.5 miles of existing steep and poorly drained trail, which will involve the removal of two culvert crossings across intermittent streams. An additional 0.2 miles of old logging roads and skid trails located within close vicinity will also be decommissioned and the native slope restored to the greatest extent possible. The work will be performed using small earth-moving equipment such as a compact bulldozer and mini-excavator at an average 10% gradient and incorporate best management practices for erosion control from the District's Watershed Protection Program and Details and Specifications Guidelines.

(5) Installation of "No Parking Any Time" signs along Skyline Boulevard, between Swett Road and Bear Gulch Road East at key locations where roadside parking is deficient due to poor line of sight and inadequate clearances. Approximately 40 roadside parking spaces would be removed through this signage program.

(6) Relocation of the Skyline Boulevard trail/pedestrian crossing from its current site near Preserve Gate CM04 to a new location approximately 1,000 feet south of Preserve Gate CM02 that offers longer sight distances that improve traffic and trail user safety. The relocation would include installation of signs and barriers to redirect visitors to the new crossing and to limit access through Preserve Gate CM04 to service vehicles only (no public access). The relocation work would also include construction of approximately 350 feet of new narrow trail and installation of new signs and stiles on either side of the roadway to connect to existing trail systems on the east and west of Skyline Boulevard. The crossing is important for continuity of the Bay Area Ridge Trail and connects trail users traveling between Huddart/Wunderlich County Parks and El Corte de Madera Creek Open Space Preserve. This crossing also connects neighbors along the east side of Skyline Boulevard to the Preserve.

(7) Construction of each project component will cover a three to four month period between the months of April and October due to County restrictions on the timing of earthwork operations. Construction operations and procedures would include:
   a. Pre-construction nesting bird surveys conducted by a qualified biologist within 30 days of construction. Discovery of nesting birds will result in the establishment of an appropriate buffer zone or postponement of construction activity until all young have fledged;
   b. Compliance with basic and enhanced control measures for construction emissions of PM 10 per the Bay Area Air Quality Management District's CEQA Guidelines;
   c. Minimizing removal of woody vegetation within 50 feet of active stream channels and installation of protective fencing around trees;
   d. Implementation of all applicable Best Management Practices from the District's Watershed Protection Program and Details and Specifications Guidelines;
   e. Best management practices to reduce the potential for release of construction-related fuels and other hazardous materials into the environment.

Since 2004, the District has been working through a watershed protection program for the Preserve, upgrading roads and trails to improve drainage, reduce sedimentation, and improve water quality, so that the Preserve is able to accommodate projected visitor use while protecting the aquatic environment. Over the long term, functions

and values of wetlands and other waters are expected to vastly improve due to the reduction in sediment entering aquatic ecosystems both within the project area and throughout the El Corte de Madera Creek watershed.

FINDINGS AND BASIS FOR MITIGATED NEGATIVE DECLARATION

The Planning Department of the Midpeninsula Regional Open Space District, based upon substantial evidence in the record, finds that:

1. The mitigation measures, as listed below and incorporated into the project, are adequate to mitigate the environmental effects to a less than significant level.

2. The project will not adversely affect agricultural resources, mineral resources, population and housing, and public services in that such impacts simply do not apply to the proposed project, given the rural, vegetated environment of the project, the low-intensity recreational uses that are associated with the project, and the minor construction disturbance expected by the project.

3. The project will not adversely affect land use or public services, based on project-specific factors that allow the project to avoid potentially significant impacts.

4. The project will not adversely affect air quality, aesthetics, geology & soils, hydrology and water quality, noise, recreation, or utilities and service systems based on project-specific factors that reduce impacts to a less than significant level.

5. The project will not adversely affect biological resources, cultural resources, hazards and hazardous materials, or traffic and transportation because the incorporation of mitigation measures into the project has reduced the impacts to a less than significant level.

6. In addition, the project will not:
   - Create impacts that degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, due to the project's fundamentally small scale, localized nature.
   - Create impacts that are individually limited, but cumulatively considerable, based on project-specific factors that reduce these impacts to a less than significant level.
   - Create environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly, based on project-specific factors that reduce these impacts to a less than significant level.

Therefore, the Midpeninsula Regional Open Space District has determined that the project will have no significant effect on the environment.

MITIGATION MEASURES incorporated into the project

Mitigation in Section I(b):	*AESTH-1.* Replace trees that need to be removed, which are both larger than 12 inches in diameter at breast height and located within 100 feet from Skyline Boulevard, at a 1:1 ratio using 5-gallon size redwood trees. Based on field analysis and the survey map prepared for the project, three trees have been identified that require replacement: one Douglas fir and two redwoods measuring 36, 20 and 18 inches in diameter at breast height, respectively. The new trees will be incorporated into the landscaping plan for the parking lot.

Mitigation in Section IV(a):

BIO-1. Focused plant surveys for each species listed in Table IV(1) shall be conducted prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth movement activities. If any special-status plant species are found, areas supporting the species shall be avoided, where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with CDFG. Construction work may start once such plan has been approved by CDFG.

BIO-2. The three to four month construction period for each project component would occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus would overlap the raptor breeding season (April through August). Therefore, pre-construction surveys shall be conducted by a qualified biologist after breeding season has begun and no more than 30 days prior to construction to determine if raptors are nesting in the project area. If nests of these species are found, no noise-generating construction activities shall occur within ¼ mile of the nest. Activities will be postponed until all young are fledged.

BIO-3. The three to four month construction period for each project component would occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus would overlap the migratory bird breeding season (April through August). If suitable avian nesting trees are proposed for removal during the breeding season, a qualified biologist should conduct pre-construction nesting bird surveys within 30 days of the onset of any construction activity. The pre-construction survey should search all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged.

BIO-4. A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior to initial ground breaking to determine the presence or absence of nests in areas that would be disturbed by construction and earth movement activities. If feasible, disturbance of woodrat nests shall be avoided by routing the trail and by staging construction-related equipment and materials away from known nest sites. If avoidance of San Francisco dusky-footed woodrat nests is not feasible, CDFG will be consulted regarding the possibility of relocating the nests outside of the work area.

Mitigation in Section V(b):

CULT-1. Implementation of the following measure will reduce potential impacts to cultural and historical resources in the proposed driveway area, including buried and unknown archeological, paleontological, and human remains, to a less-than-significant level:

- Due to the observation of one isolated lithic artifact and two potential lithic artifacts within the vicinity of the proposed driveway, all initial ground disturbance activities during construction of the driveway shall be monitored by a qualified archaeological professional. If cultural and/or historical resources are encountered during construction, the measures outlined in CULT-2 shall be followed.

CULT-2. Implementation of the following measures will reduce potential impacts to cultural and historical resources, including buried and unknown archeological, paleontological, and human remains, to a less-than-significant level:

- If cultural and/or historical resources are encountered during construction, every reasonable effort shall be made to avoid the resources. Work shall stop within 50 feet of the find until a qualified cultural and/or historical resources expert can assess the

- A reasonable effort will be made by the District to avoid or minimize harm to the discovery until significance is determined and an appropriate treatment can be identified and implemented. Methods to protect finds include fencing and covering remains with protective material such as culturally sterile soil or plywood.
- If vandalism is a threat, 24-hour security shall be provided.
- Construction operations outside of the find location can continue during the significance evaluation period and while mitigation for cultural and/or historical resources is being carried out, preferably with a qualified cultural and/or historical resources expert monitoring any subsurface excavations.
- If a resource cannot be avoided, a qualified cultural and/or historical resources expert will develop an appropriate Action Plan for treatment to minimize or mitigate the adverse effects. The District will not proceed with construction activities within 100 feet of the find until the Action Plan has been reviewed and approved.
- The treatment effort required to mitigate the inadvertent exposure of significant cultural and/or historical resources will be guided by a research design appropriate to the discovery and potential research data inherent in the resource in association with suitable field techniques and analytical strategies. The recovery effort will be detailed in a professional report in accordance with current professional standards. Any non-grave associated artifacts will be curated with an appropriate repository.
- Project construction documents shall include a requirement that project personnel shall not collect cultural and/or historical resources encountered during construction. This measure is consistent with federal guideline 36 CFR 800.13(a) for invoking unanticipated discoveries.

Mitigation in Section V(d):

CULT-3. If human remains are uncovered during project construction, the District will immediately halt work, contact the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in §15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387). No further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. If the remains are determined to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

The mitigation under section V(b) calls for stopping work and evaluating significance if an artifact find is made, which will also reduce the potential for disturbance of human remains.

Mitigation in Section VII(h):

HAZ-1. All equipment to be used during construction must have an approved spark arrestor.

HAZ-2. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

HAZ-3. Minimize use of mechanical construction equipment during hot, dry, windy weather.

HAZ-4. Hired contractors shall be required to:

i) Provide water to suppress potential fires caused by the work performed.
ii) Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.
iii) Maintain working ABC fire extinguishers on all vehicles in the work area.
iv) Contact both Mountain View Dispatch at (650) 968-4411 and the California Department of Forestry, Skylonda, at (650) 851-1860 for emergency response in the event of a fire (these numbers are to report emergencies only).

RESPONSIBLE AGENCY CONSULTATION

California Department of Fish and Game (also a Trustee Agency)
California Department of Transportation
San Francisco Bay Regional Water Quality Control Board
San Mateo County
U.S. Army Corps of Engineers

INITIAL STUDY

A copy of the initial study is attached.

REVIEW PERIOD

The Review Period is October 6, 2009 through November 6, 2009. If you have any comments about the proposed Mitigated Negative Declaration or Initial Study, have information that should be included, and/or disagree with the findings of our study as set forth in the proposed Mitigated Negative Declaration, please submit your comments in writing no later than 5 p.m. on October 27, 2009 to Midpeninsula Regional Open Space District, 330 Distel Circle, Los Altos, CA 94022.

CONTACT PERSON

Tina Hugg, Open Space Planner II, 650-691-1200

Ana Ruiz, Planning Manager
Midpeninsula Regional Open Space District

Midpeninsula Regional Open Space District
INITIAL STUDY

Project title: El Corte de Madera Creek Staging Area and Trails Project

Lead agency name and address: Midpeninsula Regional Open Space District (District)
330 Distel Circle, Los Altos, CA 94022

Contact person and phone number: Tina Hugg, (650) 691-1200

Project location: The project is situated in and adjacent to El Corte de Madera Creek Open Space Preserve (Preserve), a 2,817-acre public preserve located in unincorporated San Mateo County, adjacent to the Town of Woodside, generally west of Skyline Boulevard (Highway 35), between Star Hill Road and Bear Gulch Road East. The project area encompasses a new 65-car, four-horse trailer parking lot, 2.0 miles of new trail, 0.2 miles of trail realignment, decommissioning 0.7-miles of abandoned trail and old logging roads, installation of "No Parking" signs along Skyline Boulevard, and relocation of a Skyline Boulevard trail/pedestrian crossing.

Project APN: 072-320-200 (parking lot);072-320-320 (trail improvements); 072-320-160 and 072-320-210 ("No Parking" signs on Skyline Boulevard);072-320-160 (trail/pedestrian crossing)

Project sponsor's name and address: Midpeninsula Regional Open Space District
330 Distel Circle, Los Altos, CA 94022

General plan designation: Timber Production, General Open Space

Zoning: Timberland Preserve District (TPZ), Resource Management District (RM)

Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

The general location of the project is shown in Figure 1. The proposed parking area would serve as the Preserve's first dedicated parking area. All current parking occurs along the Skyline Boulevard roadside or at a Caltrans vista point parking lot known as Skeggs Point Lot. A diagram showing the features of the parking component is included in Figure 2. The proposed trails would connect the new parking area to the existing trail system, enhance public access in the eastern part of El Corte de Madera Creek Open Space Preserve (Preserve), and address erosion issues on an existing trail alignment. The location of the proposed trails is shown in Figure 3. The "No Parking" signs would eliminate deficient roadside parking spaces with poor lines of sight and insufficient clearances. The new roadway trail/pedestrian crossing location would have greater sight distances to improve trail user and traffic safety; its approximate location is shown in Figure 4. The proposed project components are explained in more detail below:

1. A new parking area for 65 vehicles and four horse trailers that includes:
   a. A large preserve entrance sign
   b. A two-stall, unisex, ADA-accessible, self-contained vault restroom facility
   c. Two ADA-accessible parking spaces (part of the 65 vehicles spaces)
   d. Two trailhead signboards with brochure holders
   e. A bicycle tire and hiking boot cleaning station
   f. Split-rail wood fencing

g. A new 20-foot wide driveway entry
h. Designating the Gate CM04 access road as a service road only (no public use)
i. A series of bioretention basins where stormwater runoff is collected and allowed to percolate into the soil

The parking lot will be constructed using earth-moving equipment such as a compact bulldozer and mini-excavator and will incorporate best management practices for erosion control from the District's Watershed Protection Program and Details and Specifications Guidelines.

2. A "connector" trail approximately five feet wide and 0.25 miles in length. This proposed trail connects the southwestern end of the new parking area to the Gordon Mill Trail. The trail travels along the upper reaches of the Preserve at a gentle grade, first going under the canopy of a mixed evergreen forest, then across an open grassy hillside, and finally again through mixed evergreen forest until reaching the trail junction. The trail will be constructed using small earth-moving equipment such as a compact bulldozer and mini-excavator at an average 10% gradient and will incorporate best management practices for erosion control.

3. Completion of the "perimeter" trail, three to five-feet wide and approximately 1.75 miles in length. This proposed trail traverses the steep forested canyons of the upper northeastern reaches of the Preserve, beginning near the Gordon Mill trailhead and gradually descending and crossing numerous swales to first connect with the Steam Donkey Trail, then extending further south to connect with upper Springboard Trail. This trail would be designated as part of the regional Bay Area Ridge Trail. The trail will cross approximately six ephemeral streams and one intermittent stream, requiring the installation of small diameter culverts, rock fords, and low puncheons. This trail contours across 20 to 75% sideslopes and crosses a variety of habitats, including Douglas fir-redwood forest, redwood stands, and California bay-tanoak forest. The trail will be constructed using small earth-moving equipment such as a compact bulldozer and mini-excavator at an average 10% gradient and incorporate best management practices for erosion control.

4. A realignment of the Steam Donkey Trail, three to five-feet wide and approximately 0.2 miles in length. This trail will be constructed on moderate side slopes of 20 to 50% at a trail gradient between 5 and 10% and cross a mixed redwood and tanoak forest. The realignment will require one ephemeral stream crossing using a small culvert, low puncheon, or rock ford. This realignment will allow for the closure and decommissioning of approximately 0.5 miles of existing steep and poorly drained trail, which will involve the removal of two culvert crossings across intermittent streams. An additional 0.2 miles of old logging roads and skid trails located within close vicinity will also be decommissioned and the native slope restored to the greatest extent possible.

5. Installation of "No Parking Any Time" signs along Skyline Boulevard, between Swett Road and Bear Gulch Road East at key locations where roadside parking is deficient due to poor line of sight and inadequate clearances. Approximately 40 roadside parking spaces would be removed through this signage program.

6. Relocation of the Skyline Boulevard trail/pedestrian crossing from its current site near Preserve Gate CM04 to a new location approximately 1,000 feet south of Preserve Gate CM02 that offers longer sight distances that improve traffic and trail user safety. The relocation would include installation of signs and barriers to redirect visitors to the new crossing and to limit access through Preserve Gate CM04 to service vehicles only (no public access). The relocation work would also include construction of approximately 350 feet of new narrow trail and installation of new signs and stiles on either side of the roadway to connect to existing trail systems on the east and west of Skyline Boulevard. The crossing is important for continuity of the Bay Area Ridge Trail and connects trail users traveling between Huddart/Wunderlich County Parks and El Corte de Madera Creek Open Space Preserve. This crossing also connects neighbors along the east side of Skyline Boulevard to the Preserve.

7. Construction of each project component will take place over a three to four month period between the months of April and October due to County restrictions on the timing of earthwork operations and thus would overlap the raptor and migratory bird breeding seasons. Construction operations and procedures would include:
   a. Pre-construction nesting bird surveys conducted by a qualified biologist within 30 days of construction. Discovery of nesting birds will result in the establishment of an appropriate buffer zone or postponement of construction activity until all young have fledged;
   b. Compliance with basic and enhanced control measures for construction emissions of PM 10 per the Bay Area Air Quality Management District's CEQA Guidelines;
   c. Minimizing removal of woody vegetation within 50 feet of active stream channels and installation of protective e fencing around trees;
   d. Implementation of all applicable Best Management Practices from the District's Watershed Protection Program and Details and Specifications Guidelines;
   e. Best management practices to reduce the potential for release of construction-related fuels and other hazardous materials into the environment.

Since 2004, the District has been working through a watershed protection program for the Preserve, upgrading roads and trails to improve drainage, reduce sedimentation, and improve water quality, so that the Preserve is able to accommodate projected visitor use while protecting the aquatic environment. Over the long term, functions and values of wetlands and other waters are expected to vastly improve due to the reduction in sediment entering aquatic ecosystems both within the project area and throughout the El Corte de Madera Creek watershed.

A detailed project description is on file at the District's administrative office.

SUBSEQUENT ACTIONS

Upon District Board certification of this negative declaration, the following actions will occur:

1. Application for California Department of Transportation Encroachment Permit for Parking Lot ingress/egress and installation of No Parking signs
2. Application for San Mateo County Grading and Building Permit for a New Parking Lot and Trail Improvements
3. Application for California Department of Fish and Game (CDFG) Streambed Alteration Permits.
4. Application for Clean Water Act Section 404 Nationwide permit from the U.S. Army Corps of Engineers (USACE)
5. Application for Clean Water Act Section 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board
6. Enter into a trail easement agreement with California Water Service Company to relocate the Skyline Boulevard pedestrian/trail crossing
7. Release of bid package, bid opening, Board of Directors authorization for award of bid
8. Construction of the project

Surrounding land uses and setting: Briefly describe the project's surroundings:

The project is located within and adjacent to El Corte de Madera Creek Open Space Preserve, a 2,817-acre preserve owned and managed by Midpeninsula Regional Open Space District, containing more than 35 miles of predominantly multiple-use (hiking, mountain biking, and equestrian use) trails. The Preserve is located in unincorporated San Mateo County, adjacent to the limits of the Town of Woodside along Skyline Boulevard (Highway 35), between Star Hill Road and Bear Gulch Road East.

The project is bounded to the north by Skyline Boulevard and its right of way, and beyond by Wunderlich County Park, California Water Service watershed lands, and the Bear Gulch Road East neighborhood. The remainder of the project lies within the 2,817-acre Preserve.

Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

- California Department of Fish and Game Streambed Alteration Permit
- California Department of Transportation Encroachment Permit
- Clean Water Act Section 404 Nationwide permit from the U.S. Army Corps of Engineers
- Clean Water Act Section 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board
- San Mateo County Grading and Building Permit

Document availability:

All documents referenced in the Initial Study are available for review from 8:30 a.m. to 5:00 p.m. Monday through Friday at the Midpeninsula Regional Open Space District administrative office at the address listed above.

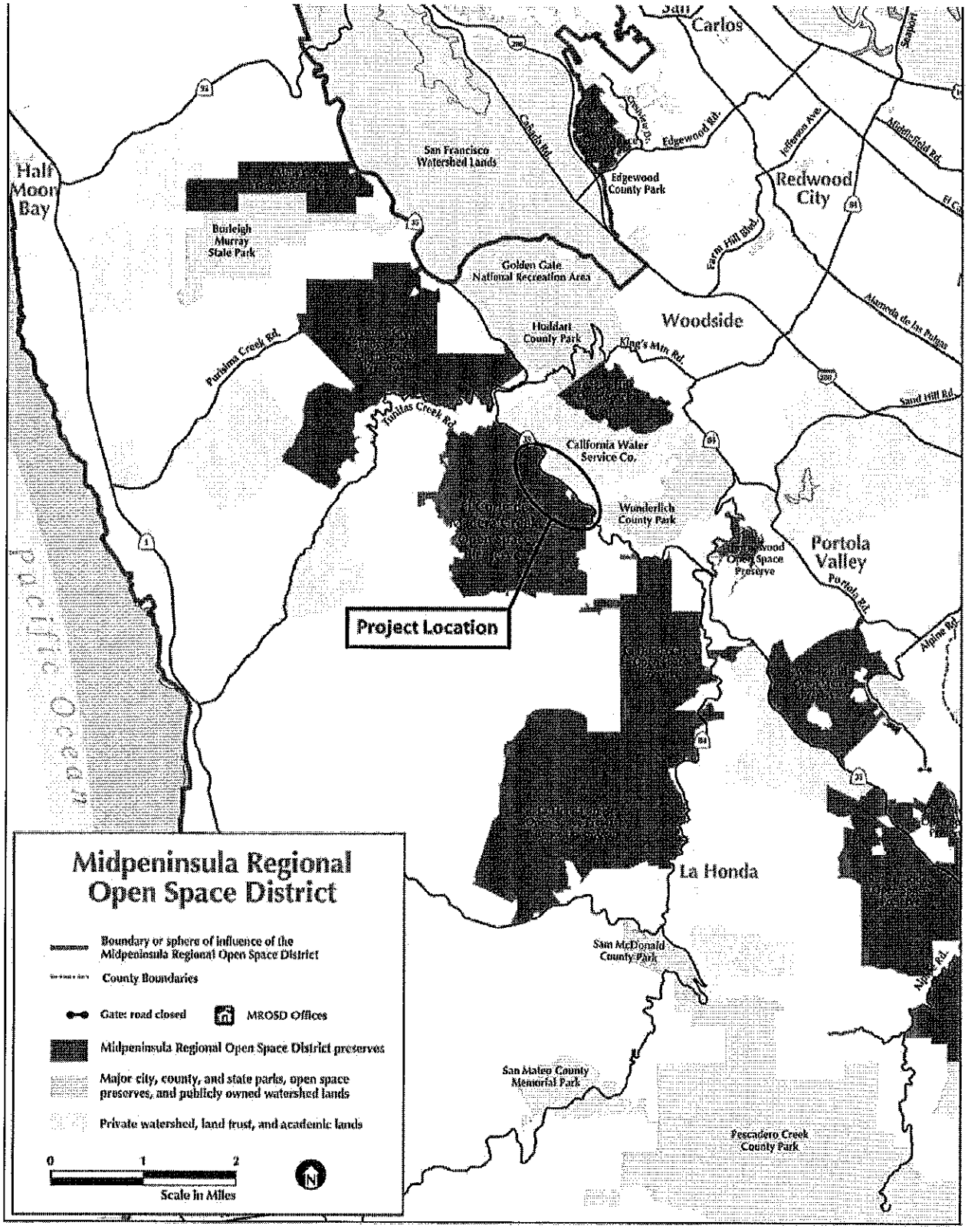


Figure 1: Regional Location Map

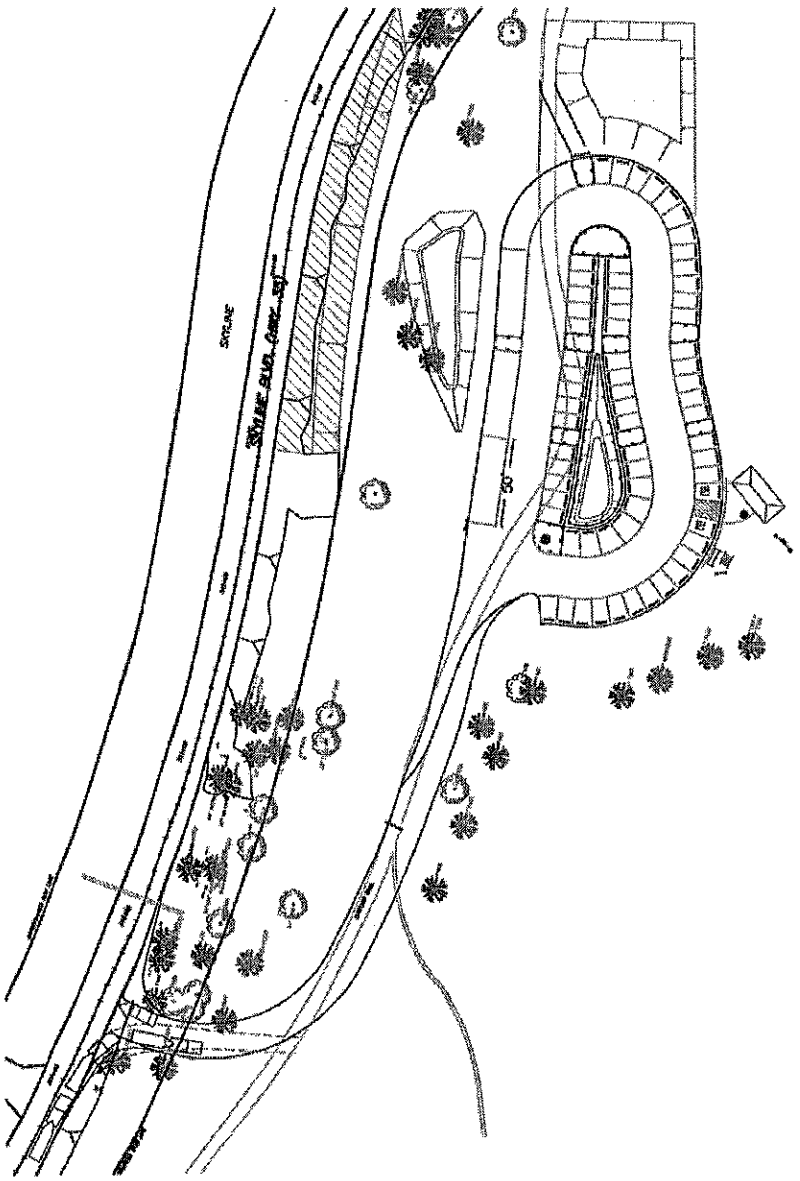


Figure 2: Staging Area Component

Figure 3: Project Map

Figure 4: Trail Crossing Approximate Location Map

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION:
(To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Ana Ruiz
Signature

10/06/09
Date

Ana Ruiz, Planning Manager
Printed Name

Midpeninsula Regional Open Space District
For

INSTRUCTIONS FOR EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL IMPACTS

Issues:

I. AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
I(a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

Explanation: (Sources: 4, 5, 6). The project is located in the 2,817-acre El Corte de Madera Creek Open Space Preserve (Preserve) approximately 2,100 feet above mean sea level at the crest of the Santa Cruz Mountains, and about four miles west of Woodside, San Mateo County, California. The project includes an asphalt, 65-car, four-equestrian trailer space parking lot with a self-contained, vault restroom facility and a staging area; a driveway leading to the parking lot; approximately 2.2 miles of new narrow trail (including a 0.2-mile trail realignment); the closure and decommissioning of approximately 0.7 miles of existing steep trail; installation of "No Parking" signs to remove approximately 40 roadside parking spaces on Skyline Boulevard; and relocation of the Skyline Boulevard trail/pedestrian crossing.

A new trail segment within the Preserve will connect the new parking lot to the junction of the Gordon Mill Trail, Sierra Morena Trail, and new Bay Area Ridge Trail. The connecting trail will traverse mixed evergreen forest and grassland and provide access to one of the most prominent viewpoints in the Preserve. At five to six feet wide near the parking lot, the trail will not have an adverse effect on the viewpoint itself. The trail's width and orientation along a natural contour line will prevent it from being visible outside the immediate vicinity, so it will not have a significant impact on views looking into the Preserve. The new Bay Area Ridge Trail and realignment of Steam Donkey Trail will traverse a variety of habitats, including Douglas fir-redwood forest, redwood stands, and California bay-tanoak forest. The trails will be constructed to be three to six feet wide. The steep topography and dense surrounding vegetation will restrict views within the project area to the trail corridors and the immediate surroundings. These factors will also prevent views into the project area from surrounding locations. These new trails will therefore have a less than significant impact on views within or into the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I(b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☒	☐	☐

Explanation: (Sources: 1 through 6, 8 through 13). Skyline Boulevard is designated as a State Scenic Highway and County Scenic Corridor. The mixed-evergreen forest landscape along Skyline Boulevard extends throughout much of the corridor, particularly in areas north of the Highway 84 intersection and south of the Page Mill Road intersection.

The parking lot is located on a flat, previously disturbed one acre site, approximately 25 feet higher in elevation and 100 feet from the edge of Skyline Boulevard. Prior to District ownership, the site was cleared for use as a logger's campground during past timber harvest operations. The site is now overgrown with non-native invasive French broom and periwinkle and is surrounded by mixed-evergreen forest. The nearby Skyline Boulevard corridor (also known as Highway 35) is a two-lane paved road that is designated as a State Scenic Highway and County Scenic Corridor. The existing topography and surrounding vegetation limit views from both within and

outside of the parking lot site. Views are constrained to the immediate surrounding foreground and to the driveway that connects the parking lot to Skyline Boulevard. The topography and vegetation will serve to screen the parking lot from the view of motorists traveling on Skyline Boulevard.

In addition, at least 200 feet of thick, vegetated buffer exist between the parking lot and two nearby residential properties: about 100 feet between the site and the roadway and another 100 feet between the roadway and the closest house. The two nearest residences are located 250 to 500 feet north of the proposed parking lot, across from Skyline Boulevard and about 25 to 50 feet below the roadway, with views oriented away from the project area. The parking lot site is located another 25 feet above the roadway. A District owned residence is located approximately 300 feet southeast from the proposed parking lot and is buffered from it by dense, forested vegetation. The parking lot will therefore not have a significant adverse effect on the views from Skyline Boulevard or nearby residences.

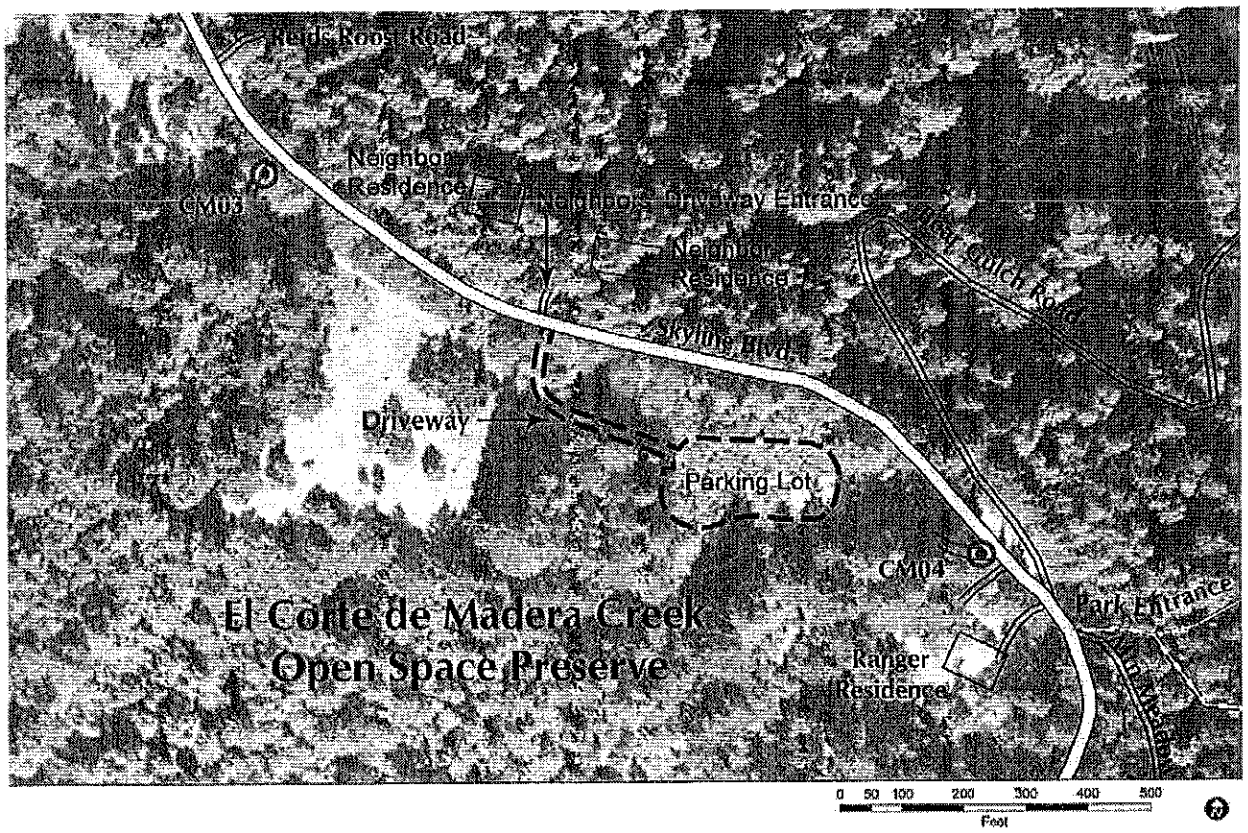


Figure 1: Staging Area and Surrounds

A paved driveway will connect the parking lot to Skyline Boulevard. The majority of the driveway is laid out along the alignment of an existing interior unpaved access road that is surrounded and screened from Skyline Boulevard by mixed-evergreen forest. The existing topography and surrounding vegetation will limit views from the driveway to the immediate foreground. The portion of the driveway that will run parallel to Skyline Boulevard will not be visible from the roadway or the nearby residences. Approximately 75 feet of the driveway that connects the parking lot to Skyline Boulevard will be visible from both the roadway and a private driveway located on the opposite side of the roadway. The parking lot's driveway will intersect Skyline Boulevard perpendicularly and its narrow 20-foot width and Caltrans standard flared connection will have a minimal

footprint. Common views along Skyline Boulevard include overhead utility lines, private paved driveways, paved road intersections, pullouts, mailbox clusters, fencing, gates, and residences. Though portions of the driveway, a standard District gate, and preserve signage will be visible from Skyline Boulevard, these improvements will not be vivid elements in the overall setting and are typical of what is already commonly found along the roadway corridor. The driveway and miscellaneous roadside furnishings will thus have a less than significant impact on views from Skyline Boulevard and nearby residences.

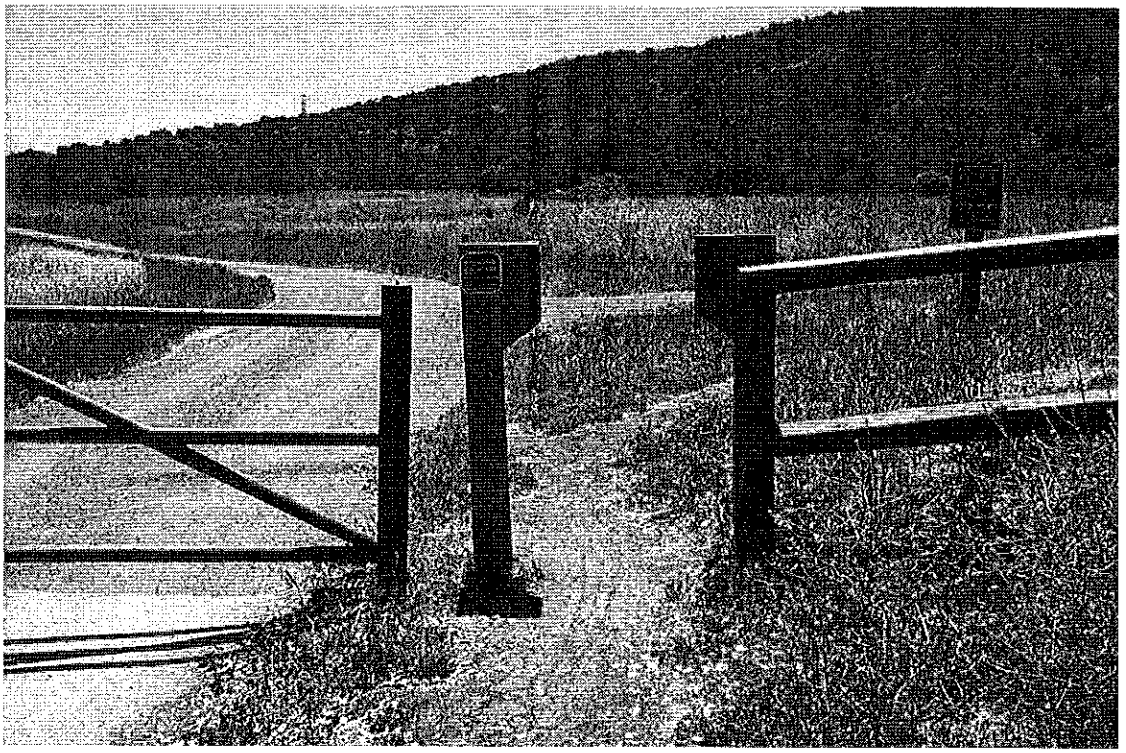


Figure 2: Typical District Gate, Fence, Stile, and Signage

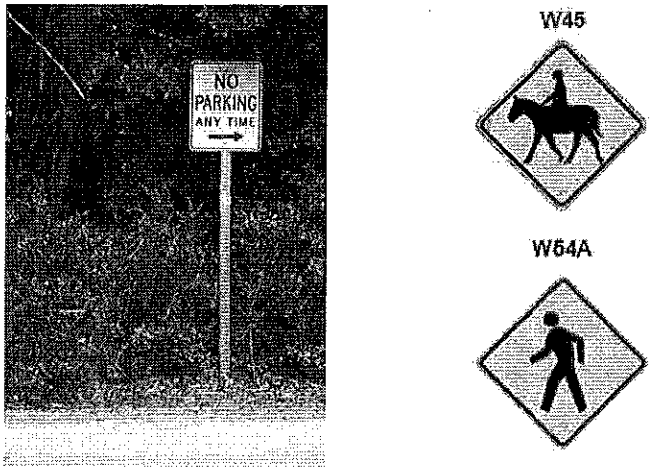


Figure 3: Typical Roadway Signage

Proposed "No Parking Any Time" signs and the relocated pedestrian crossing will be visible to motorists traveling on Skyline Boulevard. The signs will be installed along Skyline Boulevard between Swett Road and Bear Gulch Road East, at up to ten locations where roadside parking is deficient due to poor lines of sight, and inadequate, narrow shoulder widths. The sign design and installation will follow Caltrans standards.

The elements of the relocated pedestrian crossing will include "Trail Crossing" signs, stiles, and approximately 350 feet of new, narrow trail, most of which will be below and out of sight of the roadway. The trail as it connects to the Skyline Boulevard will be perpendicular to it, and its narrow width will result in a minimal visible footprint. The "No Parking Any Time" and "Trail Crossing" signs and connecting trail will not be vivid elements in the Skyline Boulevard corridor. They will therefore have a less than significant impact on views from Skyline Boulevard.

Construction of the parking lot driveway will require the removal of three large trees within the Scenic Corridor: two redwoods and one Douglas fir. The Douglas fir is approximately 36 inches in diameter measured at breast height; the two redwoods are between 18 and 20 inches in diameter measured at breast height. These trees are typical of the surrounding vegetation and of mixed evergreen forests found in the canyons and east-facing slopes of the Santa Cruz Mountains. The trees to be removed are not landmark trees under the terms of the San Mateo County tree protection ordinance, nor do they form a distinctive group. Up to as many as 24 small trees, between four and twelve inches in diameter, may also be removed.

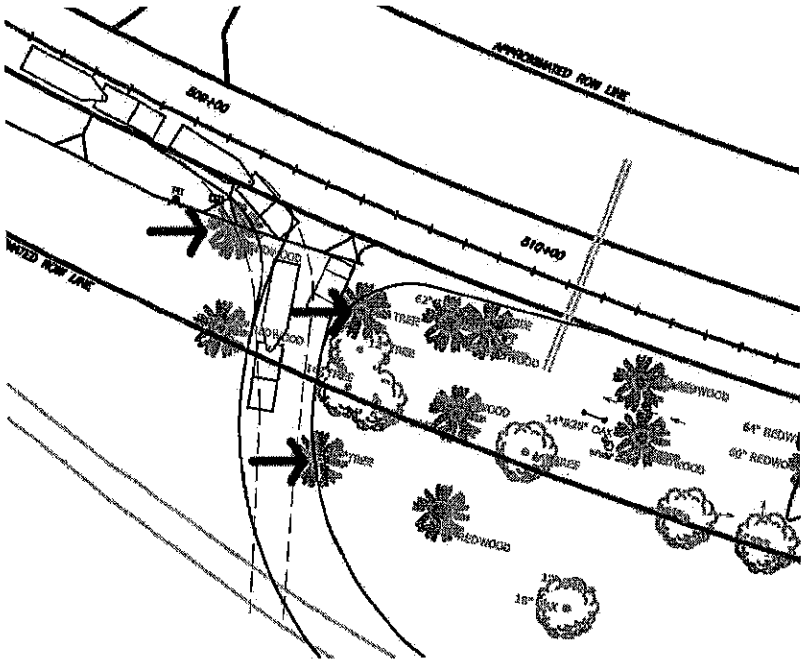


Figure 4: Plan Showing Large Trees to be Removed along Scenic Corridor

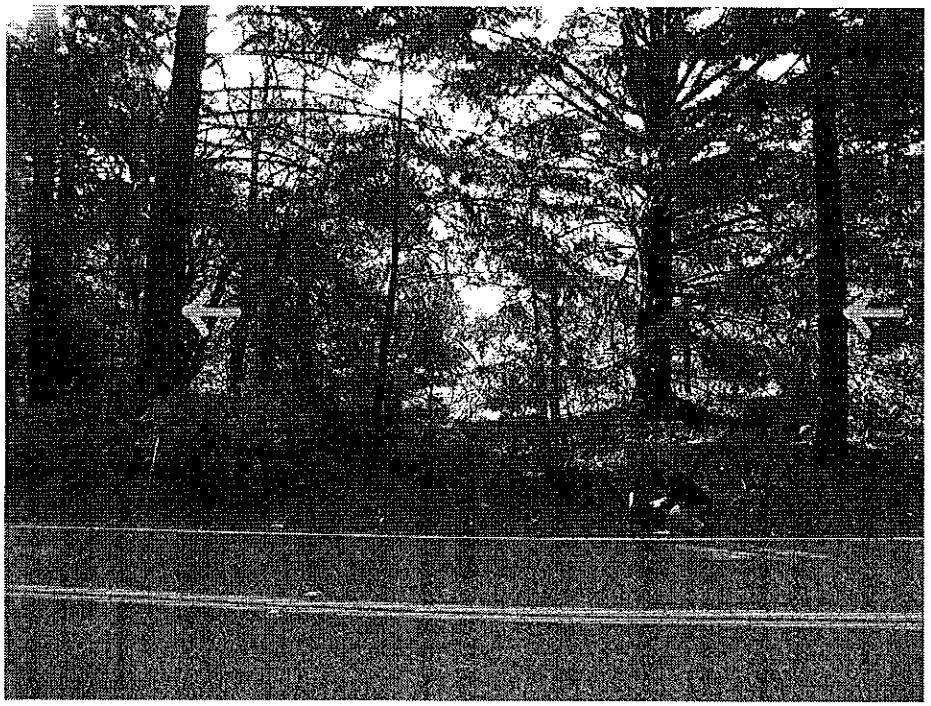


Figure 5: Large Trees to be Removed along Scenic Corridor (third tree obscured by leftmost tree)

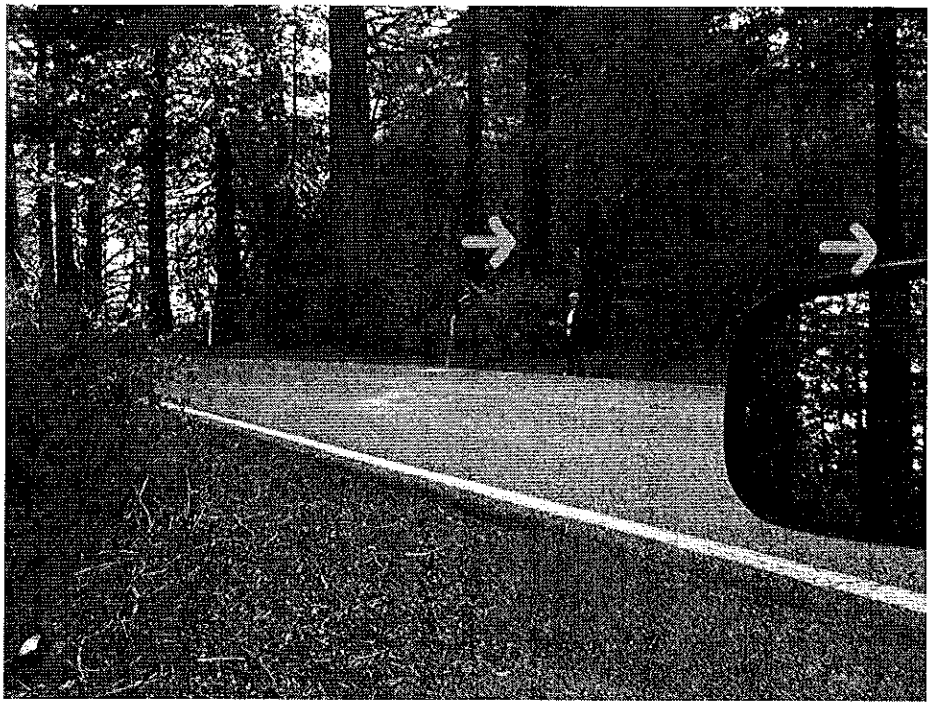


Figure 6: Roadway Environment at Proposed Driveway (large trees to be removed shown in yellow, third tree obscured)

Views of the driveway will be limited to the 20-foot wide, 75-foot long section perpendicular to Skyline Boulevard, which will be visible only momentarily to motorists traveling on the roadway. The visible segment of the driveway will be similar to the other commonly existing residential and commercial driveways located in the forested areas off Skyline Boulevard. Views of the remaining length of driveway and the parking lot will be obscured by the topography and surrounding vegetation. Because the parking lot and driveway are screened from view so that most of the vehicles and pavement are not visible from the roadway, Appendix E of Caltrans Scenic Highway Guidelines provides that they constitute only, a minor visual intrusion on the scenic qualities of the roadway.

There are no unique or massive rock formations, historic buildings, or other scenic resources in the parking lot site or along the driveway alignment. The new connecting trail, Ridge Trail, Steam Donkey realignment, and relocated pedestrian crossing will pass near interesting rock outcroppings, groves of scenic trees, and/or vista points.

The new trails will allow the public to access and enjoy these visual resources, thus providing a public benefit. The narrow three- to five-foot wide trails will be constructed so as to not damage these scenic resources through avoidance, e.g. routing the trail around large trees, minimal grading, and following natural contours to the greatest extent possible. Two to four trees exceeding the 12-inch diameter (38-inch circumference) threshold of the County's Significant Tree Ordinance may be harvested for on-site building materials to construct trail support. This would require a permit from the County. These trees are located in a densely vegetated area of the Preserve along a section of proposed trail that is remote and not visible from adjacent properties. The location is in the interior of the Preserve where access to building material is limited and technically difficult to transport in.

In addition, the pruning of larger trees and the removal of small trees may be needed as part of the trail construction. Pruning will be done in accordance with District standard practices to minimize potential damage to trees and to meet the 12-foot high clearance requirements for multiple-use trails. Only if needed, trees less than 12 inches in diameter at breast height would be removed. These trees would be scattered across the trail corridor in an already heavily forested environment. Any small tree removal associated with the trail construction will occur in the interior of the Preserve, more than 100 feet from Skyline Boulevard.

Impacts

No heritage or protected tree or community of trees, as defined by San Mateo County, will be removed as a result of the project. San Mateo County defines significant trees as "any live woody plant rising above the ground with a single stem or trunk of a circumference of 38 inches or more measured at 4.5 feet vertically above the ground." Removal of significant trees within the Timberland Preserve Zone (TPZ) does not require a permit, unless the trees are located within 100 feet of a County or State scenic road or highway. The three large trees that will need to be removed to accommodate the driveway as described above are greater than 38 inches in circumference and considered significant trees due to their location within the County Scenic Corridor. Section 12000 of the County's Ordinance Code, The Significant Tree Ordinance of San Mateo County, requires the replacement of trees removed within the Skyline County Scenic Corridor at a 1:1 ratio using minimum 5-gallon size trees as a condition of approval for tree removal permits. The following is a list of allowable replacement trees: redwood, coast live oak, big leaf maple, black oak, California bay laurel, valley oak, islay or wild cherry, or madrone.

Mitigation incorporated into project:

AESTH-1. Replace trees that need to be removed, which are both larger than 12 inches in diameter at breast height and located within 100 feet from Skyline Boulevard, at a 1:1 ratio using 5-gallon size redwood

trees. Based on field analysis and the survey map prepared for the project, three trees have been identified that require replacement: one Douglas fir and two redwoods measuring 36, 20 and 18 inches in diameter at breast height, respectively. The new trees will be incorporated into the landscaping plan for the parking lot.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

I(c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Explanation: (Sources: 5). The parking lot is located on a flat one acre previously disturbed site. The site is overgrown with non-native invasive French broom and periwinkle. The French broom is so thick that views in the project area are heavily constrained to the existing unpaved access road and to the mixed evergreen overstory that surrounds the parking lot site. As part of the project, the non-native plants will be eradicated and native plant and tree species will be used in the proposed landscaping. It is therefore expected that the project will actually improve the visual character of the site by opening up views in the parking lot and removing undesirable views of a thicket of non-native vegetation.

The majority of the proposed driveway will be laid out along the alignment of an existing interior unpaved access road, which is partially surrounded by mixed-evergreen forest. The section of driveway that will connect perpendicularly to Skyline Boulevard requires the removal of three large trees and up to 24 small trees (see Section I(b) for more information). The required tree removal will not significantly impact the visual character of the site given the area's surrounding forest environment and abundant tree cover. See section I(b) for more information.

The proposed "No Parking Any Time" and "Trail Crossing" signs and connecting trail associated with the pedestrian crossing will not be vivid elements in the Skyline Boulevard corridor. The signs will be in keeping with Caltrans standards, few in number, and similar in nature to those currently located along the roadway. The 350-foot long trail will connect to Skyline Boulevard perpendicularly, and its narrow width will result in a minimal visible footprint (see Section I(a) for more information). The "No Parking Any Time" and "Trail Crossing" signs and connecting trail will therefore not significantly impact the visual character of the site given the area's surrounding environment.

The new connecting trail, Ridge Trail, and Steam Donkey realignment will be constructed according to District standards to, in part, minimize potential impacts on the visual character of the surrounding Preserve. The trails will be between three and six feet wide, and will generally follow natural contours. The trails will traverse and meander through mixed-evergreen forest. Trail construction may require the removal of small trees, but the meandering nature and narrow width of the trail will allow the District to avoid tree removal to the greatest extent possible. Only if needed, small trees (less than 12 inches in diameter at breast height) and up to 4 larger trees (exceeding 12 inches in diameter) would be removed and trees pruned to accommodate a narrow multiple-use trail. The installation of trail signs and small drainage structures (rocked fords, puncheons, and small culverts) will result in only localized changes that are not expected to significantly alter the scenic qualities of the trail or drainage corridors. The project's design ensures that man-made structures and construction materials will be visually compatible with typical District trail construction and the open space surroundings. The new trails will therefore result in less than significant impact the visual character of the site.

The abandoned steep section of Steam Donkey Trail will be closed and decommissioned to restore natural surface drainage flow and prevent further erosion. The decommissioned area will be partially re-contoured, fill within the drainages will be removed, and the disturbed surfaces will be mulched and/or re-seeded using native seed, which will have a positive effect on the visual character of the site.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I(d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Explanation: (Sources: 5, 7). The project does not include exterior lighting fixtures. The vault restroom facility will not include windows or other fixtures that may produce glare. Flat, non-reflective paint or integrated coloring that will blend with the characteristic landscape will be used in all exterior building materials associated with the restroom. District Ordinance 93-1, Section 805.2 prohibits the use of the Preserve by the public between one-half hour after sunset and sunrise. Preserve users and their vehicles that are parked in the parking lot will therefore vacate the premises by one-half hour after sunset, while still light, after which time the driveway entrance gate will be closed and locked to prevent vehicles from accessing the site when the Preserve is closed. The project will therefore not create a new source of substantial light or glare.

Aesthetics Section Sources:

1. San Mateo County. *Zoning Regulations. Chapter 34: Timberland Preserve Zone (TPZ) District, Section 6102.71.1 Skyline Area, 6325.1 Primary Scenic Resources Areas Criteria.* July 1999. http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/9441580Zregs-wp.pdf
2. Freyer and Laureta, Inc. *El Corte de Madera Creek Staging Area Survey.* June 14, 2005.
3. Midpeninsula Regional Open Space District Details and Specifications Committee. *Pruning Procedures Detail.* December 17, 2001.
4. California Department of Transportation. *California Scenic Highway Mapping System.* Updated 12-07-2007. http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm. Accessed on May 1, 2008.
5. LFR Inc. *El Corte de Madera Creek Open Space Preserve Public Access Improvements Plans.* August 2007.
6. San Mateo County. *General Plan. Chapter 4: Visual Quality Policies.* 1986.
7. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
8. California Department of Transportation. *Scenic Highway Guidelines. Appendix E Parking Lots.* http://www.dot.ca.gov/hq/LandArch/scenic/guidelines/scenic_hwy_guidelines.pdf. Accessed on May 13, 2008.
9. California Department of Transportation. *Standard Environmental Reference. Chapter 27: Visual and Aesthetics Review.* http://www.dot.ca.gov/ser/vol1/sec3/community/ch27via/chap27via.htm#project. Accessed on May 13, 2008.
10. San Mateo County. *San Mateo County Ordinance Code. Section 11000. Regulation of the Removal and Trimming of Heritage Trees.* April 5, 1977.
11. San Mateo County. *San Mateo County Ordinance Code. Section 12000. The Significant Tree Ordinance of San Mateo County.* May 15, 1990.
12. San Mateo County. Application Form for *Permit to Trim or Remove (Heritage Tree(s) or Significant Tree(s))* and *Recommended Species of Replacement Trees.* May 10, 2007.
13. San Mateo County. *Zoning Maps. Sheet 27.* May 1992 Edition.

II. AGRICULTURAL RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
II(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
II(b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
II(c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒

Explanations for a, b, and c: (Sources: 1, 2, 3). The subject parcels (072-320-320, 072-320-200, 072-320-160, and 072-320-210) that would be affected by the project are part of a larger collection of land holdings totaling 2,817 acres that together create the El Corte de Madera Creek Open Space Preserve. This Preserve is managed for resource protection and ecologically sensitive public recreational use, in keeping with the District's mission state. No change in land management or use of the Preserve is proposed as part of this project.

The California Department of Conservation Farmland Mapping and Monitoring Program maps for the project vicinity indicate that no prime farmland, unique farmland, or farmland of statewide importance would be disturbed by the project.

The properties are not under Williamson Act contracts. The project area is zoned Timberland Preserve Zone (TPZ). Allowable uses for TPZ Districts in San Mateo County include outdoor public recreation and development to support recreation. The parking component of the project aims to establish a formal parking lot for the Preserve to offer visitors a better parking alternative that does not require them to park on the roadside, in highway pullouts, or at an offsite Caltrans vista point rest stop. The trails component of the project will improve Preserve trail circulation and enhance the visitors' overall recreational experience. The relocated pedestrian crossing across Skyline Boulevard (also known as Highway 35) will provide a crossing location with better lines of sight, and the posting of "No Parking" signs will prevent parking along the roadway where shoulders are narrow and lines of sight are an issue. These changes will occur at and adjacent to a preserve that is already open to the public. The project does not conflict with the permitted land uses per the San Mateo Zoning Ordinance and will not involve or create changes in the existing environment that could result in conversion of Farmland.

Agricultural Resources Section Sources:

1. California Department of Conservation. *Farmland Mapping and Monitoring Program maps for San Mateo County.* 2004. http://www.consrv.ca.gov/dlrp/fmmp.
2. San Mateo County. *Zoning Regulations. Chapter 34: Timberland Preserve Zone.* July 1999. http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/9441580Zregs-wp.pdf
3. San Mateo County. *Zoning Maps. Sheet 27.* January 1, 1990.

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
III(a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
III(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
III(c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

Explanation: (Source: 1 through 11). Ambient air quality standards for criteria pollutants have been established by both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (ARB). The EPA sets national standards for six criteria pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. The EPA also oversees state air quality programs to meet these standards. The ARB makes state area designations for ten criteria pollutants: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. These standards represent levels of air quality considered to be safe with an adequate margin of safety to protect public health and safety. They are designed to protect "sensitive receptors," those people who are most susceptible to further respiratory stress, such as asthmatics, the elderly, very young children, people already weakened by disease or illness, and people who are engaged in strenuous work or exercise. At a local and regional level, the Bay Area Air Quality Management District (BAAQMD) regulates and monitors levels of air pollutants in the San Francisco Bay Area Basin (Bay Area) and the Bay Area's attainment status.

Project

The project is located in a 2,817-acre preserve approximately 2,100 feet above mean sea level at the crest of the Santa Cruz Mountains, and about four miles west of Woodside, San Mateo County, California. The prevailing winds are from the west and average from 5 to 10 mph. The project includes an asphalt, 65-car, four-equestrian trailer space parking lot with a self-contained, vault restroom facility and a staging area; a driveway leading to the parking lot; approximately 2.2 miles of new narrow trail (including a 0.2-mile trail realignment); the closure and decommissioning of approximately 0.5 miles of existing steep trail; installation of "No Parking" signs to remove approximately 40 roadside parking spaces on Skyline Boulevard; and relocation of the Skyline Boulevard trail crossing.

Due to the anticipated short construction period of three to four months for each project component, the proposed control measures to be implemented, the projected low emissions generated by the parking lot, and the

low amount of dust generated by the parking lot's asphalt surface and the Preserve's trail system, the project's construction and operations emissions are not anticipated to conflict with or obstruct implementation of the applicable air quality plan or produce levels of emissions that violate any air quality standard or contribute substantially to an existing or projected air quality violation. The project is not expected to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Construction

The nature of particulates is that larger, coarser material settles out quickly and closer to the emission source whereas smaller particulates are in suspension for a longer period of time and are able to travel further. Due to the dense vegetative buffer and the discrete, small-scale area of the one acre parking lot construction zone, any potential dust emissions created by the project's construction activities would tend to remain more localized and limited to the short-term, three to four month construction period for each project component.

The trail work is small-scale in nature as well, approximately one acre in size when its length and width are considered, so that any potential dust emissions resulting from the project would also be localized and limited to three to four month construction period for each project component. In addition, the proposed trail work corridor is narrow, the majority being three to five feet in width, and is primarily located within dense vegetation and tree canopy that would buffer the construction zone from winds. Due to the narrowness and inaccessibility of the trail work area, the number and size of construction equipment is limited and also small-scale in nature, reducing the level of potential dust emissions.

Moreover, construction-related earthmoving activities that will occur during the daylight hours of summer will avoid the high PM10 levels generally recorded in the evening and night hours and during the winter, when increased use of wood burning stoves and fireplaces occur, cool temperatures, low wind speeds, low inversion layers, and high humidity favor the buildup of PM levels.

In addition, the control measures listed below from the BAAQMD CEQA Guidelines will be implemented during construction to minimize PM emissions from both trail work and parking lot construction. Finally, as part of the project, mobile source control measures related to ozone precursor emissions will include limiting idling time for diesel powered construction equipment and limiting hours of operation for construction equipment.

Measures Based on Basic and Enhanced Control Measures for Construction Emissions of PM10 from BAAQMD 1999 CEQA Guidelines:

- Water all active construction areas at least twice daily where needed, based on site and ambient conditions, to reduce dust emissions.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites where needed, based on site and ambient conditions, to reduce dust emissions.
- Sweep daily all paved access roads, parking areas and staging areas at construction sites if visible soil material is accumulating on surfaces.
- Sweep streets daily if visible soil material is carried onto adjacent public streets.
- Enclose, cover, water daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

- Replant vegetation in disturbed areas as quickly as possible.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

Modeling

Estimates for the proposed parking lot's construction and operational emissions (pounds per day) were prepared using two methods. The first was the ARB program named URBEMIS2007 Version 9.2.4, which estimates the emissions that result from various land use development projects. The second is a spreadsheet, the Sacramento Metropolitan Air Quality Management District (SMAQMD)'s Roadway Construction Emissions Model, Version 5.2, prepared by Jones & Stokes under the financial support and direction of SMAQMD.

Both models were used for the emissions estimates of the proposed parking lot, so as to form as complete an estimate as possible. The two modeling methods overlap in the paving and grading components of the construction phase. Nevertheless, even added together, the estimated emissions for grading and paving are below BAAQMD's thresholds of significance for ROG, NOx, and PM10. Under both models, construction emissions from for ROG, NOx, and PM10 were each found to be in the range of 3 to 40 pounds per day, well below 80 pounds per day, BAAQMD's thresholds of significance for these pollutants. Under the URBEMIS2007 model, operational emissions for ROG, NOx, and PM10 were also each found to be less than 5 pounds per day, also below 80 pounds per day. Levels of CO emissions were estimated to be below BAAQMD's threshold of significance, and generation of SO_2 and lead emissions is not anticipated.

Operations

Visitors reach the Preserve primarily through vehicular modes of transportation, as there is currently no mass transit system that provides access along its length and there are no present plans to provide such a system. Access via bike transportation is technically possible, but the steep routes and long distances required to reach Skyline Boulevard and the Preserve make this option less feasible and less likely compared to access by vehicle.

Although the Preserve is primarily reached via personal vehicle, a significant increase in vehicular traffic and related emissions as a result of the project is not anticipated. The District's rangers and staff's historical experience is that the highest use of the Preserve occurs on the weekend. It is estimated that the maximum number of peak hour trips the parking lot would generate is 70 peak hour trips on the weekend, based on a June 2009 traffic analysis that used highway capacity methodology, parking analysis, and trip generation estimation. Traffic counts were conducted in the summer from 5:00 AM to 12:00 AM midnight over one weekend at the Skeggs Point parking lot which is currently used by visitors of the Preserve. Based on the traffic analysis of these counts, it is estimated that there will be a maximum of approximately 315 vehicle trips generated by the new parking lot per day on the weekend.

Under the worst-case scenario used for analysis in this initial study, all of the trips generated by the parking lot would be new (in reality, some vehicles that currently park along the roadside would relocate to the lot, as the project includes removal of 40 roadside parking spaces along Skyline Boulevard due to unsafe parking conditions such as inadequate, narrow shoulder widths and poor lines of sights). Emissions modeling estimates that incorporate this maximum number of new vehicle trips indicate that operational emissions for ROG, NOx, and PM10 are less than 5 pounds per day, below BAAQMD's threshold of significance of 80 pounds per day. For discussion of modeling results, refer to the Modeling section above.

The type of uses in the Preserve, namely hiking, mountain biking, and horse-riding, generally require a long duration of stay, and thus generate a low turnover in parking. Due to the amount of emissions that are calculated to fall below BAAQMD's thresholds of significance and the minimal amount of dust that is generated by vehicles driving on asphalt surfacing, future use of the paved parking lot and driveway is not anticipated to conflict with applicable air quality plans, regulations, or programs.

The new trail alignments that are part of the project will be constructed per District trail standards at an average 10% grade with frequent grade reversals and an outsloped trail surface. The trail tread will be narrow, ranging from five to six feet nearest the parking lot to three to five feet elsewhere. These trails will largely traverse a mixed evergreen forest that is dominated by Douglas fir, redwood, and Tanoak, which will provide a source of forest duff on the trail surface to minimize soil exposure.

In the Preserve itself, the proposed expansion of the Preserve's trail system is not anticipated to generate odors, dust, or other air pollutant emissions that conflict with the above applicable air quality plans, regulations, or programs. The project's proposed trail system does not involve an increase in motor vehicle operation within the Preserve itself. Operationally, the trails will attract non-motorized recreational uses such as hiking, mountain biking, and horse-riding, which do not produce emissions. In addition, as described in III (a), under District Ordinance 96-1, operation of motor vehicles by the public within the Preserve itself is prohibited, thus limiting motor vehicle emissions within the Preserve to ranger patrol and maintenance vehicles. However, no expansion of patrol levels would be required by the project. Maintenance work on the trail will be infrequent and limited to small-scale equipment and hand tools. Therefore, the project is not expected to significantly increase operational emissions within the Preserve and trail system itself.

Due to the design and minimal footprint of the new trails, future use of the new trails is not anticipated to conflict with applicable air quality plans, regulations, or programs. In addition, the project's operations are not expected to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

III(d) Expose sensitive receptors to substantial pollutant concentrations?

Explanation: (Sources: 3, 5, 8, 11). According to the BAAQMD, sensitive receptor groups include people who are most susceptible to further respiratory stress, such as asthmatics, the elderly, very young children, people already weakened by disease or illness, and people who are engaged in strenuous work or exercise. Such receptor groups are particularly vulnerable to the harmful effects of air pollutants. The ARB has indicated that a correlation has been found between the proximity of sensitive land uses (residences, schools, day care centers, playgrounds, or medical facilities) to specific air pollution sources (freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities).

Due to the projected short construction period of three to four months for each project component and given the nature of the project, namely a trail system and small-scale parking lot for an open space preserve whose uses will not be significant sources of emissions, it is expected that the project will not expose sensitive receptors or sensitive land uses to substantial pollutant concentrations.

Individuals who are visiting the Preserve for recreation and exercise may be considered at a higher risk of suffering adverse health effects from the inhalation of minute dust particles classified as particulate matter, which are small enough to be inhaled into the deepest part of the lungs. However, since the project area would be closed to all public use during construction activities, persons recreating and exercising in the Preserve would be restricted from accessing the construction site and therefore would not be exposed to any potentially localized elevations of particulate matter levels.

Dust emissions from construction activities can also affect properties adjacent to project sites. The nature of

particulates is that larger, coarser material settles out quickly and closer to the emission source whereas smaller particulates are in suspension for a longer period of time and are able to travel further. However, due to the vegetative buffer surrounding the construction zones, any potential dust emissions created by the project's construction activities would tend to remain more localized and limited to the short-term, three to four month construction period for each project component. A District owned residence is located approximately 300 feet southeast from the proposed parking lot and is buffered from it by dense, forested vegetation. Two residential properties are located approximately 250 to 500 feet north of the proposed parking lot, across from Skyline Boulevard. At least 200 feet of thick, vegetated buffer exist between the parking lot site and the two residential properties: about 100 feet between the site and the roadway and another 100 feet between the roadway and the closest house. In addition, the site is situated about 25 feet above the roadway and the closest houses are located between 25 and 50 feet below the roadway. Other properties are located over 500 to 1000 feet away from the project and with the dense, vegetated buffer, should not be significantly impacted by the construction activities.

To address emissions from construction activities, control measures as listed above under III(a-c) from the BAAQMD CEQA Guidelines will be implemented during construction to minimize PM emissions from both the trail work and parking lot construction. Examples of control measures include watering active construction areas, limiting traffic speeds on unpaved roads, and limiting grading and excavating activity during periods of high wind gusts. In addition, mobile source control measures related to ozone precursor emissions will include limiting idling time for diesel powered construction equipment and limiting hours of operation for construction equipment. Thus, the project is not expected to have a significant construction impact on the exposure of sensitive receptors to substantial pollutant concentrations.

The parking lot's operational impact to sensitive receptors is expected to be insignificant as well due to the projected low emissions generated by the parking lot and the low amount of dust generated by the parking lot's asphalt surface and the Preserve's trail system. The project's proposed trail system does not involve an increase in motor vehicle operation within the Preserve itself. As described in III (a-c), motorized vehicles are prohibited under District ordinance except for ranger patrol and maintenance vehicles. No expansion of patrol levels would be required by the project and therefore, no increase in related emissions is expected within the trail system itself. Maintenance work on the trail will be infrequent and be limited to small-scale equipment and hand tools. Thus, the project is not expected to have a significant operational impact on the exposure of sensitive receptors to substantial pollutant concentrations.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
III(e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Explanation: The intent of the trail work is to provide low-intensity, non-motorized recreational uses of the Preserve. These uses do not emit objectionable odors, and would not contribute to a significant impact. In addition, as described above in III(a-c), due to the small-scale nature of the project area and projected low emissions generated, the parking lot is also not expected to create any objectionable odors affecting a substantial number of people.

In addition, construction activities for both the parking lot and the trail system will be localized and phased with each project component limited to a short-term, three to four month construction period. As described in III(d) public access to the construction site will be restricted and a wide, densely vegetated buffer exists between adjacent residential properties and the site.

Operationally, only the self-contained, vault restroom facility has the potential to generate odors. However, any

odors would not affect a substantial number of people, as the restroom's black ventilation stack is heated by the sun to draw potential odors up and out where they will dissipate. In the event that odors sink before dissipating, they would remain localized around and within the unit itself, and, from District Ranger staff experience with complaints, would not impact a substantial number of people in the Preserve or, on neighboring properties.

Air Quality Section Sources:

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4. San Mateo County Transit District (samTrans). *Bus route map for samTrans 85 Community Service.* Effective December 23, 2007 (revise A).
5. Bay Area Air Quality Management District. *BAAQMD CEQA Guidelines.* December 1999
6. Bay Area Air Quality Management District. *Bay Area 2005 Ozone Strategy.* Final adopted January 4, 2006.
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8. Bay Area Air Quality Management District. *Ambient Air Quality Standards & Bay Area Attainment Status.* http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed September 20, 2009.
9. Bay Area Air Quality Management District. *Air Quality Plans – Planning for the Future.* http://www.baaqmd.gov/pln/plans/index.htm. Last updated January 4, 2007.
10. Hexagon Transportation Consultants, Inc. *El Corte de Madera Staging Area Traffic and Site Access Review.* June 30, 2009.
11. LFR Inc. *Email correspondence with Nick Cartagena, Senior Staff Civil Engineer.* November 21, 2007.

IV. BIOLOGICAL RESOURCES

Would the project:

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☒	☐	☐

IV(a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS)?

Explanation: (Sources: 1 through 9, 18 through 20). A number of special-status species surveys and resource inventory projects have been completed within the Preserve. Most recently, Albion Environmental, Inc. conducted a thorough biological assessment of the Preserve in order to identify special status species and other sensitive biological resources such as riparian resources and wetlands, and to identify mitigation measures to avoid potential impacts, if warranted.

The parking lot, trail construction, trail realignment, and trail closure will be located in a variety of habitats, including mixed-evergreen forest, Douglas fir-redwood forest, redwood stands, and California bay-tanoak forest. The project will not have a significant impact on special status species through significant habitat removal, landscape alteration, or food chain modification. Potential adverse impacts to sensitive species, as well as sensitive habitats, would be generally limited to temporary construction impacts. All potential adverse impacts can be either avoided or reduced to insignificant levels through incorporation of the mitigation measures listed in this section.

The parking lot is located on a flat, previously disturbed one acre site, approximately 25 feet higher in elevation and 100 feet from the edge of Skyline Boulevard. Prior to District ownership, the site was cleared for use as a logger's campground during past timber harvest operations. The site is now overgrown with non-native invasive French broom and periwinkle and is surrounded by mixed-evergreen forest.

1. SPECIAL STATUS PLANT SPECIES

A search of US Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and California Native Plant Society (CNPS) special status plant species lists indicated no known special status plant occurrences in the project area. The nearest recorded special status plant species, Kings Mountain Manzanita (*Arctostaphylos regismontana*), is found north of the new connector trail and west of the new Ridge Trail alignment. Six other special-status species may potentially be present in or near the project area though none were observed based on reconnaissance-level surveys of the project sites; see table IV(1) below. The proposed parking area site is heavily disturbed and is dominated by French broom. Furthermore, no individuals of western leatherwood (*Dirca occidentalis*) or Kings Mountain Manzanita (*Arctostaphylos regis-montana*) shrubs were observed at the site or along the proposed trail corridor.

Table IV(1): Special Status Plant Species Potentially Present in the Project Area

Plant Species Common Name	Plant Community	Habitat	Blooming Period
Santa Cruz Manazanita (*Arctostaphylos andersonii*) *CNPS list (1B)*	Broadleaf upland forest, chaparral	Open, exposed areas, usually 60-730 meters elevation	November-April

Arcuate bush mallow (*Malocothamnus arcuatus*) *CNPS list (1B)*	Chaparral	Chaparral, 15-335 m.	April - September
Dudley's lousewort (*Pedicularis dudleyi*) *CNPS list (1B)*	Maritime chaparral, cismontane woodland, North Coast coniferous forest	Open areas, 60-900 m.	April - June
Clustered Lady's slipper *(Cypripedium* sp.) *CNPS list (4)*	Broadleaf upland forest, mixed evergreen forest	Wooded communities with 60-80% canopy closure, near streambanks, 100-2435 m.	March - July
Mountain Lady's slipper *(Cypripedium* sp.) *CNPS list (4)*	Broadleaf upland forest, mixed evergreen forest	Wooded communities with 60-80%canopy closure, 185-2225 m.	March - August
California bottle-brush grass *(Elymus californicus) CNPS list (4)*	Broadleaf upland forest, cismontane woodland, riparian woodland	North Coast Coniferous forest, Riparian habitats, 15-470 m.	May-November

Impacts to special-status plant species:
Ground disturbance associated with the project could potentially result in adverse impacts to the above special-status species, if they occur within the project area.

Mitigation incorporated into project for impacts to special-status plants species:
BIO-1. Focused plant surveys for each species listed in Table IV(1) shall be conducted prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth movement activities. If any special-status plant species are found, areas supporting the species shall be avoided, where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with CDFG. Construction work may start once such plan has been approved by CDFG.

2. SPECIAL STATUS ANIMAL SPECIES

Special status animal species that have the potential to occur within the project area include the marbled murrelet, Cooper's hawk, Sharp-shinned hawk, and the San Francisco dusky-footed woodrat. Other sensitive animal species that could occur within the project area include a variety of migratory bird species protected under the Migratory Bird Treaty Act. The California Central Coast steelhead trout is not present within the project area, but could be indirectly impacted through sediment-generating construction activities. No suitable habitat exists for the California red-legged frog (*Rana aurora draytonii*) in the vicinity of the parking lot and trail system.

Central California Coast Steelhead

CCC steelhead, a federally listed threatened species, are known in the lower reaches of El Corte de Madera Creek, but not in the project area due to natural downstream passage barriers. Consequently, the project would not directly affect steelhead.

Optimal steelhead spawning and rearing habitat consists of clear, cold, well-oxygenated fresh water with a silt-free gravel substrate. Desirable spawning streams typically offer ample cover in the form of substrate, woody debris, overhanging vegetation and/or overhanging banks. Project erosion control and water quality

considerations are discussed extensively in Sections VIII(a), (c), and (f). Because the project avoids and minimizes the potential for water quality degradation, it is not expected to result in any indirect adverse impacts to downstream steelhead. Moreover, the project would provide close and restore 0.7 miles of steep, erosion-prone existing trail, improving conditions for aquatic species such as steelhead.

California red-legged frog

California red-legged frog (CRLF) is a federally listed threatened species and California species of special concern that is known to occur in western San Mateo County. CRLFs are generally found along marshes, streams, ponds, and other permanent sources of water where dense scrubby vegetation such as willows, cattails, and bulrushes dominate, and water quality is good. Breeding sites occur along watercourses with pools that remain long enough for breeding (usually between late November and April depending on winter rains) and the development of larvae. Appropriate refugia for CRLF include small mammal burrows, downed logs or vegetation, or dense forest litter.

Red-legged frog surveys conducted in 1999 and 2000 (Seymore and Westphal) failed to locate any CRLF or breeding sites in the 2,817-acre preserve. According to the California Natural Database (CNDDB) they are not present in the vicinity of the project area, nor were they observed during the 2003 biological assessment conducted by Albion Environmental, Inc. Due to high levels of past disturbance, deep shade, and/or other factors, the Preserve lacks significant development of hardwood species normally associated with mature, structurally complex riparian vegetation in the Santa Cruz Mountains, such as red alder, big-leaf maple, box elder, western creek dogwood, and other species. No suitable habitat for CRLF exists within the project vicinity. The project therefore is not expected to result in any direct impacts to CRLF. Project effects on habitat are discussed under IV(b) below.

Potential indirect impacts to CRLF, if present in this area, could include temporary increase in turbidity and downstream sedimentation during construction activities. However, the project includes water quality protection measures that reduce the potential for such impacts to a less than significant level. Erosion control and water quality considerations are discussed further in Sections VIII(a), (c), and (f). Therefore, the project would avoid direct and indirect impacts to California red-legged frogs.

Marbled Murrelet

The marbled murrelet, a federally listed threatened species, is dependent on old growth coniferous forests for nesting and near-shore marine waters for foraging. No observations of marbled murrelet have been recorded in the Preserve. In the Santa Cruz Mountains, and redwood forests in general, most murrelet nests occur in large branches, or structures associated with large branches of old growth trees. USFWS describes individual marbled murrelet nest trees as large trees, generally more than 32 inches in diameter at breast height (dbh) with the presence of potential nest platforms or deformities sufficient in size to support adult murrelets. In California, murrelets begin nesting from early April to early July. Adults usually fly from ocean feeding areas to nest sites at dusk and dawn to feed their young.

For suitable habitat to occur, nest trees (platform trees) must be present and need to be surrounded by other large trees (a nest tree cannot be an isolated tree). The surrounding trees need not be platform trees, but really serve more to provide shelter to the platform tree. Due to extensive logging of the Preserve before the District acquired the property, only three old growth trees are known to remain in the Preserve. In addition, a marbled murrelet habitat assessment was prepared in March 2007 and found that there was no suitable habitat located within 0.5 miles from the project sites. Due to the short-term nature of the project and the distance to potential

suitable habitat, the minimal equipment involved in project construction, and the distance to potential nest trees, no indirect adverse noise-related impacts to nesting marbled murrelets would occur as a result of the project.

The project avoids tree removal to the extent practicable by constructing the parking lot in a previously disturbed site and winding the proposed new trail segment around trees where possible. Nonetheless, the project will require the removal of three large trees. Of these, only one is larger than 32 inches dbh. However, that tree does not provide suitable nesting habitat and lacks deformities or platforms suitable for nesting use. No suitable habitat exists within the entire Preserve for the marbled murrelet.

Cooper's and sharp-shinned hawks

The Cooper's hawk and sharp-shinned hawk are both State species of special concern that are considered rare breeders in the Santa Cruz Mountains. Cooper's hawks prefer forested habitats in mountainous regions, but also use lowland riparian woodlands and forage in both dense cover and open habitats. In California, nests are usually constructed in oak trees. The local breeding season spans from March through July. Sharp-shinned hawks prey mostly on small songbirds and breed from April through July. Potentially suitable breeding habitat for sharp-shinned hawks occurs over much of the forested mountainous terrain of the Santa Cruz Mountains. Nesting sharp-shinned hawks typically inhabit dense coniferous forests adjacent to foraging habit. Densely foliaged conifers that are surrounded by dense canopy cover are considered prime nesting trees.

Impacts to Cooper's and sharp-shined hawks

The project area may offer potential nesting and migrating habitat for Cooper's and sharp-shinned hawks. Temporary construction noise may create a disturbance to nesting hawks and potentially result in nest abandonment and mortality of young. Removal of trees containing hawk nests may potentially result in the loss of an active nest and mortality of young.

Mitigation incorporated into project for impacts to Cooper's and sharp-shinned hawks:

BIO-2. The three to four month construction period for each project component would occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus would overlap the raptor breeding season (April through August). Therefore, pre-construction surveys shall be conducted by a qualified biologist after breeding season has begun and no more than 30 days prior to construction to determine if raptors are nesting in the project area. If nests of these species are found, no noise-generating construction activities shall occur within ¼ mile of the nest. Activities will be postponed until all young are fledged.

Migratory Bird Species

The Migratory Bird Treaty Act (MBTA), amended in 1992, includes all migratory bird species. MBTA generally prohibits the taking, killing, possession of, or harm to migratory birds species listed in Title 50 code of federal regulation (CFR) Section 10.13. Section 3513 of the California Fish and Game Code supports the MTBA. Nesting habitat for different species may occur in the project area. Cavity nesters such as acorn woodpeckers (Melanerpes formicivorus), pygmy nuthatches (Sitta pygmaea) and chestnut-backed chickadees (Parus rufescens) may occur in snags and debris left from past logging operations.

Impacts to migratory bird species:

Removal of trees, shrubs or snags suitable for avian nesting (trees and snags greater than 6 inches dbh or woody shrubs greater than 8 feet tall) within the project area during the breeding season (February 1 to August 1) could destroy active nest sites or stress nesting adults and result in nest abandonment or failure.

Mitigation incorporated into project for migratory bird species:

BIO-3. The three to four month construction period for each project component would occur between the months of April and October due to County restrictions on the timing of earthwork operations and thus would overlap the migratory bird breeding season (April through August). If suitable avian nesting trees are proposed for removal during the breeding season, a qualified biologist should conduct pre-construction nesting bird surveys within 30 days of the onset of any construction activity. The pre-construction survey should search all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged.

San Francisco dusky-footed woodrat

The San Francisco dusky-footed woodrat is a State species of concern. Woodrats are small mammals that build nests made of sticks typically at the base of trees and shrubs. The species prefers forested habitat with a moderate canopy and brushy understory, particularly on the upper banks of riparian forests. The dusky-footed woodrat is known to feed on a variety of woody plants, fungi, flowers and seeds. No suitable habitat exists in the vicinity of the proposed parking lot. There is potential for woodrat nests to be present in the undisturbed areas where new trails are proposed. Woodrat nest surveys were not performed; however, even if they had been, they would need to be repeated immediately prior to construction to ensure validity after the passage of time.

Impacts to San Francisco dusky-footed woodrat:

Given that there is a potential that suitable habitat for woodrats occurs in the undisturbed areas where new trails are proposed, ground disturbance and temporary equipment and material staging may potentially result in the removal and loss of woodrat nests.

Mitigation incorporated into project for impacts to San Francisco dusky-footed woodrat:

BIO-4. A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior to initial ground breaking to determine the presence or absence of nests in areas that would be disturbed by construction and earth movement activities. If feasible, disturbance of woodrat nests shall be avoided by routing the trail and by staging construction-related equipment and materials away from known nest sites. If avoidance of San Francisco dusky-footed woodrat nests is not feasible, CDFG will be consulted regarding the possibility of relocating the nests outside of the work area.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

IV(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

Explanation: (Source: 1, 5, 21, 22). Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection, e.g. critical habitat designated by the USFWS under the Endangered Species Act, §404 of the Clean Water Act, and/or the CDFG §1600 *et seq.* of the California Fish and Game Code. The California Natural Diversity Database has also

designated a number of natural communities as rare. Riparian habitats are considered to be sensitive and declining resources by CDFG and the USFWS. The San Mateo County Local Coastal Plan also discusses sensitive habitat.

The riparian corridor of Lawrence Creek tributaries extends through the project area. Lawrence Creek is a spring-fed perennial creek that drains the Preserve. The headwaters begin at the northern end of the Preserve near Skyline Boulevard. The project's erosion control measures allow the project to avoid adverse erosion and water quality degradation impacts to riparian areas as a result of ground-disturbing construction activities. Refer to Sections VI(b) and VIII(c) for further discussion.

The project specific guidelines to minimize removal of woody vegetation within 50 feet of active stream channels and install protective fencing around trees will minimize potential adverse impacts to riparian areas resulting from the parking lot and trail construction. These guidelines are more protective than California Forest Practice Rules and buffers required by adjacent Bay Area counties.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

IV(c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Explanation: (Sources: 1, 10). The Clean Water Act is a broad statute with the goal of maintaining and restoring waters of the United States. Among many provisions for the control of water pollution, Section 404 of the Act requires permits for filling of or discharge of dredged materials into wetlands and waters of the United States.

Impacts to wetlands:
The project includes eight small stream crossings along the new trail alignments. Proposed crossings will consist of rock fords, low puncheons, and small diameter culverts. Installation of these structures may result in minimal fill entering jurisdictional wetlands. However, given the minor extent of disturbance and the abundance of wetlands within the larger project area, the project would not have a substantial adverse impact on the federally protected wetland resources of the Preserve. Consequently, the project is not expected to result in a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

IV(d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Explanation: (Source: 1, 10, 11, 12). The project would not interfere with wildlife movement corridors or impede wildlife movement, including movements of any fish, or impede the use of wildlife nursery sites. The parking lot and trails will not be fenced, and will not act as a barrier to wildlife movement. Installation of the stream crossings will occur within small intermittent drainages that are dry the majority of the year and do not

support resident fish populations. Natural and man-made fish barriers along El Corte de Madera Creek, inventoried by California Fish and Game, obstruct the ability for anadromous fish species to migrate upstream in the vicinity of the project sites.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

IV(e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Explanation: (Source: 13, 14, 15) The project area is located in a densely forested setting within the Timberland Preserve-Coastal Zone (TPZ-CZ), which is exempt from permitting requirements for tree removal under San Mateo County's Significant Tree Ordinance. Removal of non-significant trees within the Timberland Preserve Zone does not require a permit, unless the trees are located within 100 feet of a County or State scenic road or highway. The aesthetic impact of the project as it pertains to a County scenic highway is addressed in Section I. The project avoids tree removal to the extent practicable by constructing the parking lot in a previously disturbed site and winding the proposed new trail segment around trees where possible. The project will require the removal of several trees, only one of which would meet San Mateo County's definition of a heritage tree if the tree ordinance were applicable in the project area. As discussed in section I(b), the three large trees to be removed will be replaced per the County's Zoning Ordinance. Therefore, tree removal will remain consistent with local tree ordinances. Since the project includes tree protection and revegetation of disturbed areas, the project would remain consistent with local ordinances protecting other biological resources.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

IV(f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Explanation: (Source: 16, 17). No Habitat Conservation Plan or Natural Community Conservation Plan applies to the project area.

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20. R.N. Rosenfield and J. Bielefeldt. *Cooper's Hawk (*Accipiter cooperii). In *The Birds of North America, No. 75* (A. Poole and F. Gill, Eds.). 1993.
21. Richard R. Harris, Susan D. Kocher, and Kallie Marie Kull. *Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and Their Habitats.* Final Report. January 2001.
22. California Department of Forestry and Fire Protection. *California Forest Practice Rules.* January 2007.

V. CULTURAL RESOURCES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒

Explanation: (Source: 1, 2, 3). No above-grade structures (historic or otherwise) are present within the project area. A literature review and records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University conducted in 2003 indicates that the project area contains no recorded Native American or historic cultural resources. Although there is a history of timber harvesting at this Preserve, there are no recorded historic sawmill sites within the project area. District staff observed no significant historic materials in the proposed driveway, staging area, or trail alignment. The proposed staging area and driveway location was also highly disturbed from use of the site by the previous owner, who used the area for equipment storage, disposal, and labor to support logging on the property.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Explanation: (Source: 1 through 4). The records search performed by NWIC of the California Historical Resources Information System at Sonoma State University did not identify any archaeological or historic resources in the project area. However, there is a possibility that Native Americans may have inhabited the project area prehistorically or at the time of Spanish entry into the Bay region. This region of the Santa Cruz mountains was also developed for timber harvesting and residential purposes during the 19th and 20th centuries, and it is possible that there are unknown archaeological remains from this historic period.

District staff surveyed the proposed trail alignment and the proposed driveway and staging area for cultural resources. No surface artifacts were observed along the proposed Bear Gulch trail alignment. No artifacts were observed in the proposed staging area location, and historic aerial photographs of the area show that it was highly disturbed by use of the site for equipment storage and logging support operations in the 1980s. Therefore, the potential for discovery of intact archaeological deposits during construction of the staging area location is low.

District staff observed one chert artifact and two non-diagnostic, potentially anthropogenic lithic fragments in the vicinity of the proposed driveway. After observing these fragments, staff intensively surveyed the driveway area but did not observe any additional surface artifacts. The driveway area has also been disturbed by a historic roadbed and a Caltrans drainage area.

Impacts:

Given the sparse distribution of the artifacts in the vicinity of the proposed driveway and the disturbed nature of the site, the chances of finding an intact archaeological deposit there are small, and further archaeological testing of the site is not warranted. However, all ground initial disturbance activities during the construction of the driveway should be monitored by a qualified archaeological professional for the unlikely event that intact significant archaeological resources could be discovered in this area.

Since the construction of the parking lot and trails involves ground disturbance in an area with the possibility of containing unknown cultural resources, the project may accidentally disturb or unearth archaeological resources. Archeological resources include buried features such as stone or adobe foundations or walls, wooden remains with square nails, other historic artifacts, chert or obsidian flakes, projectile points, mortars and pestles, dark

friable soil containing shell and bone dietary debris, and heat-affected rock.

Mitigation incorporated into project:

CULT-1. Implementation of the following measure will reduce potential impacts to cultural and historical resources in the proposed driveway area, including buried and unknown archeological, paleontological, and human remains, to a less-than-significant level:

- Due to the observation of one isolated lithic artifact and two potential lithic artifacts within the vicinity of the proposed driveway, all initial ground disturbance activities during construction of the driveway shall be monitored by a qualified archaeological professional. If cultural and/or historical resources are encountered during construction, the measures outlined in CULT-2 shall be followed.

CULT-2. Implementation of the following measures will reduce potential impacts to cultural and historical resources, including buried and unknown archeological, paleontological, and human remains, to a less-than-significant level:

- If cultural and/or historical resources are encountered during construction, every reasonable effort shall be made to avoid the resources. Work shall stop within 50 feet of the find until a qualified cultural and/or historical resources expert can assess the significance of the find.
- A reasonable effort will be made by the District to avoid or minimize harm to the discovery until significance is determined and an appropriate treatment can be identified and implemented. Methods to protect finds include fencing and covering remains with protective material such as culturally sterile soil or plywood.
- If vandalism is a threat, 24-hour security shall be provided.
- Construction operations outside of the find location can continue during the significance evaluation period and while mitigation for cultural and/or historical resources is being carried out, preferably with a qualified cultural and/or historical resources expert monitoring any subsurface excavations.
- If a resource cannot be avoided, a qualified cultural and/or historical resources expert will develop an appropriate Action Plan for treatment to minimize or mitigate the adverse effects. The District will not proceed with construction activities within 100 feet of the find until the Action Plan has been reviewed and approved.
- The treatment effort required to mitigate the inadvertent exposure of significant cultural and/or historical resources will be guided by a research design appropriate to the discovery and potential research data inherent in the resource in association with suitable field techniques and analytical strategies. The recovery effort will be detailed in a professional report in accordance with current professional standards. Any non-grave associated artifacts will be curated with an appropriate repository.
- Project construction documents shall include a requirement that project personnel shall not collect cultural and/or historical resources encountered during construction. This measure is consistent with federal guideline 36 CFR 800.13(a) for invoking unanticipated discoveries.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Explanation: No unique paleontological resources are known to exist within the project area. The mitigation under section V(b) calls for stopping work and evaluating significance if an artifact find is made, which will also reduce potential impacts and inadvertent damage to unknown paleontological resources to a less than significant level.

There are no known unique geologic features within the project area. The proposed project will not substantially change the overall landform and therefore the uniqueness of any geologic feature will not be significantly impacted by the project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Explanation: (Source: 1, 4, 5). No human remains are known to exist within the project area. However, given the possibility of prehistoric resources, as discussed under V(b) above, unknown human remains may be present in the project area and may be discovered during project construction.

Impacts:
Since the construction of the project involves ground disturbance in an area with a possibility of cultural and historical resources, the project may accidentally disturb unknown human remains.

Mitigation incorporated into project:

CULT-3. If human remains are uncovered during project construction, the District will immediately halt work, contact the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in §15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387). No further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. If the remains are determined to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

The mitigation under section V(b) calls for stopping work and evaluating significance if an artifact find is made, which will also reduce the potential for disturbance of human remains.

Cultural Resources Section Sources:

1. Haydu, Damon. *Literature Review for El Corte de Madera Creek. Northwest Information Center, California Historical Resources Information System.* Rohnert Park, California. November 3, 2003.
2. Stanger, Frank M. *Sawmills in the Redwoods: Logging in the San Francisco Peninsula, 1849-1967.* San Mateo County Historical Association. San Mateo, California. 1967.
3. Midpeninsula Regional Open Space District. Photographs of previous land use at proposed staging area. June 1, 1983 and October 1, 1986.
4. CEQA Guidelines, Section 15064.5. http://ceres.ca.gov/ceqa/guidelines/. Accessed on May 6, 2008.
5. California Law. Official California Legislative Information website. California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387; State Health and Safety Code Section 7050.5; Public Resources Code Section 5097.98 http://www.leginfo.ca.gov/calaw.html. Accessed on May 6, 2008.

VI. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
VI(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐

Explanation for a and c: (Sources: 2, 3, 4, 7, 8). The project includes: an asphalt, 65-car, four-equestrian trailer space parking lot with a self-contained, vault restroom facility and a staging area; a driveway leading to the parking lot; approximately 2.2 miles of new three to five-foot wide recreational trail; the closure and decommissioning of approximately 0.7 miles of existing steep trail; installation of "No Parking" signs to remove approximately 40 informal roadside parking spaces on Skyline Boulevard; and relocation of the Skyline Boulevard pedestrian crossing. The proposed project is located within a near-wilderness rural mountain setting. No structures for human occupancy are proposed. A 2009 engineering-geologic evaluation of the project was conducted to identify engineering methods to reduce the potential for trail erosion, and the project's civil engineer has included on-site bioretention basins for the parking lot as explained in the project description.

The project site lies in a tectonically active region of the coast range in northern California high in the Santa Cruz Mountains. Compression associated with the nearby San Andreas Fault Zone has caused a high rate of tectonic uplift, resulting in relatively high denudation rates. The geomorphology of the project area is consistent with both shallow and deep-seated landsliding. El Corte de Madera Creek Open Space Preserve (Preserve) is located in this region of high seismic activity, approximately five miles southwest of the active San Andreas Fault zone, which is the closest fault to the property with a high probability of generating a large magnitude earthquake in the next 50 years. The San Francisco Peninsula Segment of the San Andreas Fault has been assigned a slip rate that results in a M_W 7.3 earthquake with a recurrence interval of 400 years. Other faults in the vicinity include the Pilarcitos fault, which lies 2.5 miles northeast of the site; the La Honda fault, 2 miles to the southwest; and the San Gregorio fault, 5.5 miles to the southeast. According to the Woodside Quadrangle of the Alquist-Priolo Fault-Rupture Hazard Zone Map, the project area is not in a known hazard zone for earthquake fault ruptures. Mean Peak Ground Acceleration (PGA) on firm rock at the subject site with a 10% probability of exceedance in 50 years is reported to be 0.72g. High ground accelerations associated with fault rupture along this fault system is likely a contributing factor if not a dominant factor for movement on many of the deep-seated landslides found in the area. Due to the presence of surface and shallow bedrock in the project area, the risk of liquefaction at this site is very low.

Shallow landsliding and stream bank erosion are locally present along the steep streamside slopes within the Preserve. These rainfall-activated failures include shallow debris slides, debris flows, channel bank failures, and

road fill failures. They are characterized by rapid, shallow movement of surficial soil, colluvium, and weathered bedrock and are generally less than ten feet thick. Most of the observed shallow landslides occurred on slopes over 60%. The proposed parking lot location and access road are on a relatively flat slope and are not in danger of steep bank erosion.

The proposed trails avoid steep slopes to the greatest extent feasible. Nonetheless, where the proposed trail will be required to cross the head of an old/relic shallow landslide scar or will cross slopes greater than 60%, there is a potential for small scale shallow slope failures during adverse climatic or seismic events. A 2002 inventory (Best, 2002) of roads and trails in the Preserve identified slope failures along old logging roads and skid roads due to thick fill that was loosely side-casted onto steep slopes, overly steep trail alignments, and poor road drainage. This inventory created the basis for the 2004 Watershed Protection Program (WPP), a project designed to reduce erosion and sedimentation potential to the aquatic environment from the 35-mile network of unpaved roads within the Preserve. The WPP was developed in cooperation with San Mateo County Planning, Regional Water Quality Control Board, NOAA Fisheries, and CA Dept of Fish and Game, among other agencies. The inventory recommends design upgrades and physical improvements for the road network. These recommendations, coupled with the District's Details and Specifications Guidelines, provide direction for implementing road upgrades while protecting the aquatic environment from sedimentation.

Examples of some of the Best Management Practices (BMPs) from the WPP and the District's Details and Specifications Guidelines include permanent practices such as frequent rolling dips, built-in grade reversals, insloping/ outsloping cross slopes, rocking, and other trail design techniques designed to properly drain roads and trails to be resilient to large storm events without causing erosion. Temporary construction BMPs include practices such as proper application of silt fence, straw and/or native mulch, native plantings, bioengineering techniques, and application of water for dust control and appropriate compaction. The new trails have been designed to minimize the potential for erosion that may arise from future trail use. The new trails will maintain an average trail grade of 10% and will be constructed with an outsloped pitch where appropriate, incorporating frequent cross drains such as rolling dips, reverse grades, and nicks to allow for proper drainage and avoid concentrating water on the trail surface. The project will incorporate BMPs described in the WPP to minimize the potential for erosion arising from trail construction activities, including compacting loose fill, scatter casting (placing loose material at a stable location where sediment transport will not occur) versus side-casting excess soil, end hauling additional spoils, and watering the construction site as needed.

The most likely scenario for geologic failures will be small surface slumps occurring along the cutbank, requiring the trail tread to be cleared of debris. Large-scale slope failures are not expected. Future slide movement is unlikely to result in harm to users of the parking lot or trails and is not expected to result in substantial sediment delivery to streams.

There are several known deep-seated landslides in the region surrounding the project area, including along segments of the proposed new and realigned trails. The slides were identified in the aerial photographs and elevation models for the site and on the ground surface by benched topography, landslide scarps, and juvenile drainage patterns. The larger slides are comprised of several smaller slide blocks that coalesce or are nested together to form a larger landslide complex. Many of these slides appear to be periodically initiated or reactivated by long duration rainfall, undercutting of slopes by drainages, and strong ground motions during earthquakes such as the1989 Loma Prieta earthquake. Some landslides in the Preserve appear weathered and dormant, with straight-standing second growth trees. Others show signs of recent small-scale movement, such as localized, discontinuous scarps and poor- to moderately-incised drainages. The morphology of these slides indicates that they have been periodically active for centuries. Future slide movement caused by heavy rainfall or intense ground shaking due to earthquakes is expected in the project area, but catastrophic slides are not expected.

Future landslides on this Preserve will occur regardless of land use activities. Given the nature of low-intensity

recreational use and the infrequency of experiencing seismic and landslide hazards as discussed above, visitors using the trails or the parking lot would not be subject to substantial adverse effects from geologic hazards beyond a reasonable level. A reasonable level of geologic risk is defined as where damage to the trail may occur during adverse geologic events, e.g. intense storms and high ground accelerations during earthquakes, but unlikely to result in significant harm or death to recreational users. In accordance with the design recommendations of a Certified Engineering Geologist, trails will be designed and constructed to minimize future erosion and geologic failures. The narrow, three to five-foot width footprint of the trails will result in small cuts and fills with little impact on these slides since the mass balance and hydrology of each slide will not be substantially altered. Therefore, the potential for an increased risk of deep-seated landsliding as a result of the trail construction is considered to be low. In addition, the District routinely patrols trails and provides maintenance to avoid and minimize public exposure to hazardous geologic conditions. Therefore, the likelihood for adverse effects to people or structures from seismic ground shaking or surface failure is less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

Explanation: (Sources: 1 through 8). The Preserve is located in the headwaters of the 33,379-acre San Gregorio Creek watershed. Precipitation in the watershed is highly seasonal, with 90% falling between October and April. Based on site-specific mapping and field observations, the site soils are naturally well drained and highly susceptible to erosion. The parking lot will include on-site drainage improvements in the form of interconnected bioretention basins, as recommended by the project civil engineers, to collect and retain storm water onsite and allow for natural percolation, thus preventing offsite erosion. Little to no storm water is anticipated to exit the site as a result of this project.

Trail construction will incorporate drainage improvements, as recommended by the project engineering geologist, for proper surface drainage to minimize the potential for soil erosion and sedimentation. The new trails will maintain an average trail grade of 10% and will be constructed with an outsloped pitch where appropriate, incorporating frequent cross drains such as rolling dips, reverse grades, and nicks to allow for proper drainage and avoid concentrating water on the trail surface. The new trails will include eight small drainage crossings in ephemeral channels or springs using rock fords, low puncheons, and small culverts to prevent sedimentation to the aquatic environment.

The realignment of the Steam Donkey Trail will result in the closure and decommissioning of a poor culvert crossing and an overly steep section of trail with slopes ranging between 15% and 30%. The realignment will reduce future erosion in a location that was identified as a high priority for sediment reduction in the 2004 Watershed Protection Program (WPP) specifically prepared for the Preserve.

Since 2004, as part of the WPP, the District has made upgrades ten miles of roads and trails to improve drainage, reduce sedimentation, and improve water quality, so that the Preserve is able to accommodate projected visitor use while protecting the aquatic environment. The project will incorporate BMPs from the WPP and the District's Details and Specifications Guidelines to minimize the potential for erosion arising from trail construction activities, including compacting loose fill, scatter casting (placing loose material at a stable location where sediment transport will not occur) versus side-casting excess soil, end hauling additional excess spoils, and watering the construction site as needed. Following construction, disturbed areas beyond the trail tread and parking lot will be re-seeded with native seed and/or mulched. Most importantly, project construction will take place during the typical dry season (April to October), and erosion control measures will be installed prior to the onset of rains to minimize erosion. The combination of employing ecologically-sensitive trail construction standards and erosion control/dust suppression measures will reduce the potential for substantial soil erosion and

the loss of topsoil resulting from the project to less than significant levels. Moreover, the decommissioning and realignment of a poorly aligned trail segment and removal of in-stream fill will reduce the potential for future sedimentation resulting from existing conditions in the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒

Explanation: (Source: 2). Based on site observations, the site soils have low plasticity, and have a low potential for expansion. No signs of highly expansive soils, e.g. shrinkage cracks, were observed. The project does not include the construction of structures that could be significantly affected by expansive soils. Given the open space setting of the project area and the lack of habitable structures, no substantial risk to Preserve users or property is expected due to expansive soils.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Explanation: The project area is located in a heavily vegetated, unimproved area, and no septic tanks or disposal systems are proposed as part of the project. The self-contained, vault restroom that will be installed adjacent to the parking lot does not use a septic system, but stores effluent waste in a contained, concrete vault. This waste will be pumped out of the restroom vault at least two to three times per year and will be properly disposed of. No effluent waste will be discharged as a result of this project. Effluent waste will be transported via a service truck to an appropriate offsite wastewater receiving facility.

Geology and Soils Section Sources:

1. San Mateo County Department of Public Works. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards.* April 14, 2004.
2. Best, Timothy C., CEG. *Engineering Geologic Review of the Proposed Bear Gulch Trail Project, El Corte de Madera Creek Open Space Preserve.* February 26, 2009.
3. California Division of Mines and Geology CD-ROM 2000-004 (2000). *Official Map of Alquist-Priolo Earthquake Fault Zones, Woodside Quadrangle.* 1974, revised 2000.
4. Best, Tim, CEG. *Road and Trail Erosion Inventory: El Corte de Madera Creek Open Space Preserve, Final Report.* November 2002.
5. Midpeninsula Regional Open Space District. *El Corte de Madera Creek Open Space Preserve Watershed Protection Program.* January 2004.
6. Weaver, William, and Hagans, Danny. Pacific Watershed Associates. *Handbook for Forest and Ranch Roads.* June 1994.
7. LFR Inc. *El Corte de Madera Creek Open Space Preserve Public Access Improvements Plans.* August 2007.
8. Midpeninsula Regional Open Space District. *Details and Specifications Guidelines.* September 2009.

VII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VII(a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒

Explanation: (Source: 1). This project will not result in the routine transport, use, or disposal of hazardous materials. The District does not currently routinely transport, use, or dispose of hazardous materials at the Preserve, and District Ordinance 93-1, Section 409.2 prohibits persons from possessing or using harmful substances on District lands. Potential risks associated with releases during the construction process are discussed in section (b), below.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VII(b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

Explanation: (Source: 1, 6, 7). Under District Ordinance 93-1, the operation of unauthorized motor vehicles within the interior of the Preserve is prohibited. General public use of the Preserve is limited to low-intensity, non-motorized, and non-emitting uses, including hiking, bicycling, and equestrian use. The possibility of the incidental release of motor vehicle oil, grease, or fuel is therefore limited to the infrequent use of the interior Preserve trails and roads by District patrol and maintenance vehicles and occasional emergency responders, the vehicles and machinery used during the construction process, and the vehicles that will park in the parking area.

The project will not result in a significant increase in maintenance, patrol, or emergency response use of the Preserve. The project includes less than 2.2 miles of new narrow trail and restoration of 0.7 miles of existing trail, which amounts to a small increase in the total available mileage of public trails (approximately 35 miles) in the Preserve. These new trails will not be wide enough to accommodate standard patrol, maintenance, and emergency vehicles. Instead, smaller-scale equipment such as All Terrain Vehicles (ATV), Multi-Use Lightweight Equipment (MULE) utility vehicles, and SWECO small trail dozers will be able to access most new trail segments.

Construction activities will include best management practices (BMPs), based on the Regional Water Quality Control Board's *Erosion and Sediment Control Field Manual,* to reduce the potential for release of construction-related fuels and other hazardous materials into the environment, as follows:

BMP Category	BMP Description	Timing	Inspection and Maintenance
Solid Waste Management	Remove all trash and construction-related waste to a secured, covered location at the end of each working day to maintain a clean worksite. Dispose of hazardous materials according to all specified regulations.	Implement during construction.	Inspect for trash on a daily basis.

Materials Storage	Store chemicals in a non-reactive container. Store bagged, dry reactive materials in a secondary container. Protect all material storage areas from vandalism.	Implement during construction.	Inspect storage areas daily to ensure no leaks or spills have occurred.
Spill Prevention and Control	Good housekeeping practices shall be followed to minimize storm water contamination from any petroleum products or other chemicals. Maintain spill cleanup materials where readily accessible during use.	Implement during construction.	Clean up leaks and spills immediately using absorbent materials and as little water as possible.
Vehicle and Equipment Maintenance & Fueling	Conduct proper and timely maintenance of vehicles and equipment. Cleaning or equipment maintenance shall be prohibited except in designated areas located near the entrance to the Preserve. If fueling must occur on-site, use designated areas located away from drainage courses and use a drip pan to catch spills. Place drip pans under heavy equipment stored onsite overnight.	Implement during construction.	Inspect on-site vehicles and equipment for leaks on a routine basis; periodically check incoming vehicles for leaking oil and fluids while on paved roads near the entrance to the Preserve.
Training	All personnel shall be instructed regarding the correct procedure for spill prevention and control, waste disposal, use of chemicals, and storage of materials.	Implement during construction.	None.

The parking lot is designed to drain the storm water runoff from the pavement into a series of three engineered bioretention basins. The storm water will then percolate into the ground, thus preventing runoff, including contaminated runoff, from flowing into drainage ways (refer to Section VIII, Hydrology and Water Quality for more information).

The risk of accidental release of hazardous materials into the environment is therefore considered less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VII(c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

Explanation: (Source: 2). The project area is not located within one-quarter mile of an existing or proposed school. The nearest school, Kings Mountain Elementary School, is located approximately two miles northwest of the project area.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

VII(d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Explanation: (Source: 3). The project site is not located on the list of hazardous materials sites. No EPA regulated facilities are found in the project area or the Preserve.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

VII(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

☐	☐	☐	☒

VII(f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Explanation for e and f: (Source: 4). The project is not within an airport land use plan, within two miles of an airport, or within the vicinity of a private airstrip.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

VII(g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Explanation: The project will not interfere with any adopted emergency response plans and evacuation plans, as there are none for the area. The project will not add a significant number of users to the area and therefore will not increase resources required for emergency response or evacuation. An existing emergency helicopter landing zone is located on a grassy knoll near the parking lot and connecting trail. This landing zone and its access points will not be affected by the project. The parking lot will provide de facto overflow parking for emergency vehicles in the event that multiple emergency responders access the site simultaneously.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☒	☐	☐

VII(h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Explanation: (Sources: 1, 5). The project area is located in a minimally developed portion of unincorporated San Mateo County in the Santa Cruz Mountains. The California Department of Forestry and Fire Protection (CAL FIRE) designates the project area as lying within a zone of high fire hazard severity, based on local

vegetation type (fuel loading), slope and weather. However, the project will not change the degree of exposure to wildfires, because the Preserve is already open to public use. The Preserve has approximately 35 miles of trails and unpaved roads open to hiking, mountain bicycling, and equestrian use, including trails that are located within the project area. The project includes approximately 2.2 new miles of trail and the decommissioning of 0.7 miles of existing trail. The 1.5 net miles of new trails will not change the level of exposure to wildfires from or to the visiting public and trail-related structures.

The paved parking lot will include physical barriers, including split-rail fencing, tall vegetation, and boulders, to prevent vehicles from driving onto other areas of the Preserve or from parking on surrounding grass areas. The District's current operational practice is to keep vegetation adjacent to and in all parking areas cleared and trimmed to manage fuels in higher risk areas. These measures reduce the potential for fire ignitions due to the presence of parked vehicles to a less than significant level.

District Ordinance 93-1 Section 404 prohibits fires and smoking on District lands. In addition, District Rangers, who are trained in fire-fighting techniques and carry fire suppression equipment, regularly patrol the Preserve. District staff generally serve as first responders to fire emergencies within the preserves, with the primary fire protection responsibility falling to CAL FIRE, County Fire Departments, and municipal fire protection agencies. The District's radio and repeater system combined with ranger patrols and staff on call 24 hours per day enable prompt and effective communication with emergency service providers in the event of a wildland fire or an emergency response call.

During project construction, the most likely source of ignition is by mechanical activities such as chain saw operations, re-fueling, or mowing. The chance for an ignition can be greatly reduced through equipment features, fuel treatment, and management of behavior.

Mitigation incorporated into project:

HAZ-1. All equipment to be used during construction must have an approved spark arrestor.

HAZ-2. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

HAZ-3. Minimize use of mechanical construction equipment during hot, dry, windy weather.

HAZ-4. Hired contractors shall be required to:

i) Provide water to suppress potential fires caused by the work performed.
ii) Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.
iii) Maintain working ABC fire extinguishers on all vehicles in the work area.
iv) Contact both Mountain View Dispatch at (650) 968-4411 and the California Department of Forestry, Skylonda, at (650) 851-1860 for emergency response in the event of a fire (these numbers are to report emergencies only).

Hazards and Hazardous Materials Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
2. Google Maps. www.google.com/maps. Search of project site and school locations. Information accessed on September 21, 2009.
3. United States Environmental Protection Agency. Regulated Sites Map for 94062. www.epa.gov/enviro/wme/. http://134.67.99.109/wme/myWindow.asp?xl=-122.319305&yb=37.391434&xr=-122.270995&yt=37.427666.

4. United States Geological Survey. Woodside 7.5-minute series quadrangle map. 1991.
5. CAL FIRE. *Maps of Fire Hazard Severity Zones in the State Responsibility Area of California, San Mateo County.* Adopted November 7, 2007.
6. Midpeninsula Regional Open Space District. *Details and Specifications Guidelines.* September 2009.
7. Regional Water Quality Control Board. *Erosion and Sediment Control Field Manual.* August 2002.

VIII. HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
VIII(c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
VIII(f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

Explanation for a, c, and f: (Sources: 1 through 6). These three items are interrelated and therefore are being discussed together to avoid repetition. These three items also relate directly to the District's Watershed Protection Program (WPP) for El Corte de Madera Creek Open Space Preserve (Preserve). Since 2004, as part of the WPP, the District upgraded ten miles of roads and trails to improve drainage, reduce sedimentation, and improve water quality, so that the Preserve is able to accommodate projected visitor use while protecting the aquatic environment.

This project involves the construction of a connector trail system and trail realignment; an asphalt parking lot; a driveway; and a self-contained, vault restroom facility. The parking lot will be sloped to follow the existing topography of the site, and will drain into a series of three engineered bioretention basins that will collect storm water runoff. The basins are connected via pipe or overland swale. The soil matrix at the bottom of each basin will act to treat the water as it percolates into the ground. Because of these design features little to no storm water is anticipated to exit the site as a result of this project.

Effluent waste will be pumped out of the restroom vault at least two to three times per year and will be properly disposed of at an appropriate offsite wastewater receiving facility. No effluent waste would be discharged as a result of this project.

As part of the existing WPP, a section of a steep existing trail will be re-aligned to a more gentle alignment in order to reduce the potential for sedimentation. In addition, the connector trail system includes a number of trail drainage improvements and erosion prevention measures according to the District's standard details and specifications and as outlined in the engineering geologic investigation report. All exposed soil surfaces in the parking lot construction area will be seeded and mulched. Disturbed areas along the proposed trail system will be seeded and mulched as appropriate. During the construction phase, which is expected to last three to four months, erosion control measures, as specified in the WPP, will be implemented to minimize storm water runoff from the construction site.

Alteration of drainage patterns can be of concern where the project would disturb or grade steep lands adjacent to the trail, where the trail crosses existing drainages (i.e. ephemeral creeks or swales), or where trails have the potential to collect and concentrate stormwater, such as steep pitches or inside ditches. The drainage improvement and erosion prevention features proposed in the project include cross drains such as frequent built-in reverse grades, rolling dips, and nicks. These improvements prevent the concentration of surface runoff that could result in erosion or siltation and allow the project to avoid substantial erosion on-site or siltation off-site, thus reducing the potential impact under item VIII(c) to a less than significant level.

Sedimentation can also result from wind and water erosion. As discussed in Section III(b), the project's dust

suppression measures and the dense vegetation and tree canopy buffering the construction zone from winds will minimize the potentially negative water quality effects of wind erosion. As discussed in Section VI(b), the project will be constructed in the dry season (April to October), and erosion control measures will be installed prior to the onset of rains to avoid erosion due to surface runoff. Potential negative water quality impacts from construction involving the accidental release of hazardous materials are discussed in Section VII(b).

The project also includes a number of additional erosion control guidelines from the WPP to reduce the potential for water quality degradation. The new trail system will be laid out along contours at a trail gradient between 5% and 10%, and will be constructed with an outsloped pitch where appropriate, incorporating frequent cross drains such as rolling dips, reverse grades, and nicks to allow for proper drainage and avoid concentrating runoff water on the trail and causing erosion. Therefore, potential for the project to otherwise substantially degrade water quality is reduced to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

Explanation: Water is not provided on District trails. The project will not pump groundwater and therefore does not interfere with groundwater recharge and has no impact on groundwater supplies.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	☐	☐	☒	☐
VIII(e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
VIII(h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☒	☐
VIII(i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐

Explanation for d, e, h, and i: (Source: 5). These four checklist items are interrelated and therefore are being discussed together to avoid repetition. The Preserve is located in the upper headwaters of El Corte de Madera Creek watershed approximately four miles west of Woodside, California. Precipitation in the watershed is highly seasonal, with 90% falling between October and April. The extensive open space lands surrounding the project provide a vegetated buffer for the project and allow rain to percolate into the ground rather than running

off rapidly.

The project involves construction of a connector trail system and trail realignment following existing topography; an asphalt parking lot; a driveway; and a self-contained, vault restroom facility. The parking lot will be sloped to follow the existing topography of the site, and will drain into a series of three engineered bioretention basins that will collect storm water runoff. The basins are connected via pipe or overland swale. The soil matrix at the bottom of each basin will treat the water as it percolates into the ground. Because of these design features little to no storm water is anticipated to exit the site as a result of this project. The project would not substantially alter the site drainage patterns or increase the amount of runoff.

The connector trail system will be required to cross approximately seven intermittent to ephemeral streams, and will involve the construction of eight watercourse crossings consisting of culverts, rock fords, and/or low puncheons (boardwalks). All proposed stream crossings have been designed to accommodate a 100-year flood flow. The proposed trails are unlikely to have any impact on peak flows. The proposed project will not place any structures within the 100-year floodplain that might impede flood flows. In addition, trail decommissioning or removal will improve drainage by restoring the original hydrology that was altered at the time of original road construction.

Per standard District practice, District personnel regularly check drainage structures during and after storms, provide signage and barricades if needed, and perform maintenance as needed to ensure proper functioning of drainage structures and reduce the possibility that the project would expose people to significant flood risks. Therefore, potential for the project to result in flooding, expose people to flooding risks, exceed the capacity of drainage systems, or impede flood flows is reduced to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

Explanation: The project does not involve housing.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Explanation: (Sources: 4, 5). The project is situated at approximately 2,100 feet above mean sea level at the crest of the Santa Cruz Mountains. Seiche or tsunamis would have no impact on the site.

Landslides are common in the Santa Cruz Mountains and are one of the dominant geologic forces shaping the current landscape. Oversteepened slopes due to tectonic uplift and rapid downcutting of streams coupled with high intensity rainfall or intense seismic activity have resulted in a number of large and small-scale landslides.

Large, deep-seated bedrock landslides are also common in the Santa Cruz Mountains, and typically appear to be initiated or reactivated by strong ground motions during earthquakes. These failures are characterized by benched topography and are formed by translational movement of a relatively intact mass with a failure plane that extends below the colluvial layer into the underlying bedrock layer.

Natural slide movement is attributed to weak earth materials that underlie much of the slopes in conjunction with

high groundwater conditions. The rate of deep-seated slide movement is considered to be slow and episodic and in response to long duration rainfall, undercutting of the slope by stream bank erosion, and/or seismic ground shaking from nearby faults. Future movement should be expected to be in response to intense, extended rainfall events or intense ground shaking during earthquakes, and most likely as small scale displacements similar to what has occurred in the past. Catastrophic failure of large slides is not expected.

Mudflows are a form of shallow-seated landsliding known as debris flows. Shallow-seated landsliding is common throughout the Santa Cruz Mountains and is characterized by rapid, shallow downslope movement of surficial soil, colluvium, and weathered bed rock. Generally located on steep to very steep hillsides, most shallow slides are a result of a loss of soil tension due to the over-saturation of the soil profile from extended or intense storm events, and travel down slope in existing drainages.

Very few landslides have occurred along the existing narrow recreational trails, which is attributed to the low cuts and fills along the trails and the frequent drainage dips that prevent runoff from being concentrated. Old failures along old logging roads and skid trails are attributed to thick fill that was loosely sidecasted onto steep slopes, poor drainage, or failure of oversteepened cuts. Few failures have occurred in recent years, in part due to current, improved management practices. Future shallow landslides will occur within the Preserve during adverse climatic or seismic conditions regardless of land use activities.

Debris or mudflows could expose District personnel and the public to a life-threatening event if a flow occurred while people were present. The proposed project will not increase or decrease the hazard level from such an event. However, the low probability of such an event and the limited likelihood of District personnel or the public to be in harm's way during an intense storm necessary to precipitate such an event reduce this potential impact to a less than significant level.

Hydrology and Water Quality Section Sources:

1. San Mateo County Department of Public Works. *Endangered Species and Watershed Protection Program, Volume I: Maintenance Standards*. February 20, 2001.
2. Weaver, William, and Hagans, Danny. Pacific Watershed Associates. *Handbook for Forest and Ranch Roads*. June 1994.
3. Association of Bay Area Governments. *Manual of Standards for Erosion and Sediment Control*. May 1995.
4. United States Geological Survey. *Woodside 7.5-minute series quadrangle map*. 1991.
5. Best, Timothy C., CEG. *Engineering Geologic Review of the Proposed Bear Gulch Trail Project, El Corte de Madera Creek Open Space Preserve*. February 26, 2009.
6. Midpeninsula Regional Open Space District. *El Corte de Madera Creek Open Space Preserve Watershed Protection Program*. January 2004.

IX. LAND USE AND PLANNING

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(a) Physically divide an established community?	☐	☐	☐	☒

Explanation: The project is located in an existing 2,817-acre open space preserve in unincorporated San Mateo County near the Town of Woodside and adjacent to Skyline Boulevard (also known as Highway 35). The project scope is largely contained within the Preserve with the exception of the following: installation of "No Parking" signs along the Skyline Boulevard right-of-way in areas where roadside parking is deficient due to poor lines of sight and inadequate, narrow shoulder widths, and relocation of the existing roadway trail/pedestrian crossing from Preserve Gate CM04 to Gate CM02 with installation of related "Trail Crossing" signs and construction of approximately 350 feet of new, narrow trail to connect to the new crossing. The new pedestrian crossing would be located approximately 4,100 feet (0.78 miles) to the north of Gate CM04 and 1,000 feet south of Gate CM02, and maintain connectivity between the Preserve and the current Bay Area Ridge Trail alignment. The project components will enhance public access to a popular Preserve, remove unsafe roadside parking, redirect vehicles into a new District parking lot, and improve trail user and traffic safety along Skyline Boulevard. The project will not physically divide an established community.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Explanation: (Sources: 1 through 7, 10).

San Mateo County Zoning

The project area is located within unincorporated San Mateo County and the land is zoned Timberland Preserve Zone District (TPZ). The TPZ District was in part established to protect timberlands within the County and the ecological balance of such timberlands. Compatible land uses in a TPZ that would not inhibit the growing and harvesting of timber include "management of land for wildlife habitat" and "management for recreation," including "outdoor recreation requiring some development." Therefore, the addition of trails, a parking facility, roadside signage, and relocation of a trail/pedestrian roadway crossing to enhance outdoor public recreation is consistent with San Mateo County's zoning ordinance.

San Mateo County General Plan

The designated land use throughout most of the project site, including the parking lot and trails, per the San Mateo County General Plan and the Skyline Area Amendment to the General Plan, is "Timber Preserve/Production," consistent with the TPZ. The designated land use of the remaining locations along the Skyline Boulevard frontage is "Open Space." The General Plan specifically states that some of the lands owned and managed by Midpeninsula Regional Open Space District are zoned for Timberland Production to reflect the current recreational land use and prior timber harvesting activities on the property. The District will continue to manage the Preserve for public recreation and resource protection, which is compatible with the land use designation.

San Mateo County Trails Plan

The 2001 San Mateo County Trails Plan (Trails Plan) identifies the Bay Area Ridge Trail as a multiple-use regional trail that would extend for approximately 400 miles along the ridges of the San Francisco Bay. The

Trails Plan includes an extension of the Bay Area Ridge Trail through the project area to close one of the gaps along this long distance regional trail corridor. Therefore, the Bay Area Ridge Trail extension, as included in the project description, is consistent with the policies and goals identified in the Trails Plan.

San Mateo County is currently updating the 2001 Trails Plan Policies, Design, Use and Management Guidelines. As of June 2009, a final version of the 2007 Trails Plan Update was not available. As such, this document will apply the guidelines and standards set forth in the currently available and published 2001 Trails Plan Policies, Design, Use and Management Guidelines.

Local Coastal Program Area
The project area is located outside the local coastal program area.

County Scenic Roadways and Caltrans Scenic Highway Guidelines
Refer to Section I(b) for discussion.

Midpeninsula Regional Open Space District Use and Management Plans
The Board of Directors of Midpeninsula Regional Open Space District has taken prior actions that support the goals and proposed elements of the project. These include the following.

On March 24, 1999, the Board adopted a Use and Management Plan Amendment for the Study Area 2 Trail Use Plan (Trail Use Plan) for El Corte de Madera Creek Open Space Preserve. The Trail Use Plan included various new trail alignments and proposed an onsite parking and staging area off Skyline Boulevard located south of the Gordon Mill trailhead, between Gates CM03 and CM04.

On January 21, 2004, the Board approved the El Corte de Madera Creek Open Space Preserve Watershed Protection Program. That program is briefly described in Section VI. The Watershed Protection Program identifies the feasibility study and design of the proposed parking lot as a key project. The proposed parking lot would establish a centralized staging location where interpretive signs and Preserve notices can be posted to disseminate information about the Watershed Protection Program.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Explanation: (Sources: 8 and 9). No Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP) applies to the project area.

Land Use and Planning Section Sources:

1. San Mateo County. *General Plan. Section 6 Park and Recreation Resources Policies, Section 9 Rural Land Use Policies.* 1986.
2. San Mateo County. *Zoning Maps. Sheet 27.* May 1992 Edition.
3. San Mateo County. *Zoning Regulations. Chapter 34: Timberland Preserve Zone (TPZ) District.* July 1999.
4. San Mateo County Parks and Recreation Commission. MHA Environmental Consulting, Inc. *San Mateo County 2001 Trails Plan.* 2001.
5. Midpeninsula Regional Open Space District, *Board Report R-99-45*, March 24, 1999.
6. Midpeninsula Regional Open Space District, *Board Report R-04-10*, January 21, 2004.
7. Midpeninsula Regional Open Space District, *Board Report R-08-56*, April 9, 2008.

8. California Department of Fish and Game, *Habitat Conservation Branch*, http://www.dfg.ca.gov/habcon/nccp/status.html, accessed on April 22, 2008.
9. United States Fish and Wildlife Service, *Conservation Plans and Agreements Database*, http://ecos.fws.gov/conserv_plans/public.jsp, accessed on April 22, 2008.
10. San Mateo County. *Local Coastal Program.* June 1998.

X. MINERAL RESOURCES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
X(a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
X(b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Explanation for questions a and b: (Sources: 1, 2). The project would not result in the loss of availability of a known or locally important mineral resource. The site has not been classified as a Mineral Resource Zone, nor is it included in a Resource Sector in the *Update of Mineral Land Classification* or the mineral resources section of the San Mateo County General Plan. Field observations by District staff have revealed no evidence of the presence of mineral resources in the project area.

Mineral Resources Section Sources:

1. San Mateo County. *General Plan. Chapter 3: Mineral Resources.* 1986.
2. California Division of Mines and Geology. *Update of Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region.* Open File Report 96-03. 1996.

XI. NOISE

Would the project result in:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XI(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
XI(b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

Explanation: (Source: 1, 4 through 10). The standard unit of measurement for sound is the decibel (dB). Sounds can range from 0 decibels (threshold of hearing) to 160 dB (instant perforation of eardrum). Normal conversation at three feet is roughly 60 dB, busy street traffic is 70 dB, and the threshold of pain is 130 dB. The Community Noise Equivalent Level (CNEL) is another unit of measure for noise that is used as a standard for San Mateo County. CNEL measurements represent an average of measured noise levels obtained over a 24-hour period of time. A time-weighted factor is applied to account for the increased sensitivity of humans to noise in the morning, evening, and nighttime hours. This factor adds 5 dB to sounds occurring in the evening (7 p.m. to 10 p.m.) and 10 dB to sounds occurring in the late evening and early morning hours (between 10 p.m. and 7 a.m.).

According to the County's General Plan Noise Policies, noise impact areas are defined as areas with noise levels of 60 CNEL or greater. The General Plan does not specify where noise levels are measured nor for what land uses. Exterior noise exposure levels of 70 CNEL or greater are considered significant for residential developments according to the State of California. Measured in decibels, exterior noise levels in quiet residential areas are typically 40 dB or 45 to 50 CNEL. Within the Preserve and the project area, current ambient noise levels are expected to be less than 60 CNEL, similar to exterior noise levels in quiet residential areas. Conversations among users in the parking lot and the non-motorized, low-intensity recreational uses of the project are not expected to generate noise in excess of local agency standards or generate ground borne noise or vibration.

The County's General Plan Noise Policies promote measures which incorporate noise abatement into the design of roadway projects. Such measures can include smooth road surfaces and noise barriers. Slow speeds over the surface of the proposed asphalt parking lot (which would be quiet when driven over as compared to the gravel lots typical to District preserves) and the low volume of traffic anticipated would not generate noise in excess of local agency standards or generate ground borne noise or vibration. Similarly, engine starts and cars entering the roadway are not expected to generate noise in excess of local agency standards or generate ground borne noise or vibration.

The construction phase of each project component is expected to last three to four months and would include demolition, earthmoving, and parking lot and trail construction activities. During construction, trail and parking lot construction machinery may generate temporary increases in noise to levels as high as 95 dB. Short-term construction noise impacts would occur in discrete phases and would occur during the daylight hours of summer and fall, located in an area that would be closed to public use during construction and buffered from adjacent properties by distance, elevation, and dense vegetation. The parking lot will be located approximately 25 feet above Skyline Boulevard, outside the line of sight between it and the adjacent houses, and is set back between 80 and 120 feet from the highway's edge.

Since the project is small-scale in nature, any potential generation of noise levels in excess of 70 CNEL resulting from the project would be localized and limited to the short-term construction period. Any potential exposure to and generation of excessive vibration or noise resulting from the project would also be localized and limited to the short-term, three to four month construction period of each project component.

XI. NOISE

Would the project result in:

XI(c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

Explanation: (Source: 2, 4 through 7). Within the Preserve and project area, current ambient noise levels are under 60 CNEL. The connector trail portion of the project involves non-motorized low-intensity recreational uses, which would not generate substantial noise. In addition, under District Ordinance 96-1, operation of motor vehicles by the public within the Preserve itself is prohibited, thus limiting motor vehicle activity within the Preserve to ranger patrol and maintenance vehicles. No expansion of maintenance or patrol levels would be required by the project and therefore, potential vehicular noise generated by District patrol vehicles would be localized and intermittent. The parking lot portion of the project is small-scale in nature and is located within the Preserve, approximately 25 feet above Skyline Boulevard and set back between 80 and 120 feet from the highway's edge and away from other properties. Since asphalt is relatively quiet when driven over and a low volume of traffic is anticipated, vehicular traffic or engine starts are not expected to generate a permanent, substantial increase in ambient noise. Moreover, District Ordinance 93-1 prohibits after-hours use of the Preserve.

XI(d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

Explanation: (Source: 8, 9, 10). Within the Preserve and project area, current ambient noise levels are under 60 CNEL. During the construction phase, which is expected to last three to four months for each project component, trail and parking lot construction machinery may generate temporary increases in noise levels. However, short-term construction noise impacts would occur in discrete phases and would occur during the daylight hours of summer and fall, located in an area that would be closed to public use during construction and buffered from adjacent properties by distance, elevation, and dense vegetation. In addition, both the trail construction and parking lot work would occur within the Preserve, 25 feet above Skyline Boulevard, set back at least 80 and 120 feet from the highway's edge and away from other properties, and in an area that would be closed to public use during construction. Therefore, the temporary increase in noise is not expected to be substantial.

XI. NOISE

Would the project result in:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XI(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XI(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Explanation for e and f: (Source: 3). The project is neither located within an airport land use plan, within two miles of an airport, nor within the vicinity of a private airport.

Noise Section Sources:

1. San Mateo County. *General Plan. Chapter 16 Man-Made Hazards Policies, Noise Policies.* 1986.
2. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
3. United States Geological Survey. *Woodside 7.5-minute series quadrangle map.* 1991.
4. Hexagon Transportation Consultants, Inc. *El Corte de Madera Staging Area Traffic and Site Access Review.* June 2009.
5. LFR Inc. *Email correspondence with Nick Cartagena, Senior Staff Civil Engineer.* November 21, 2007.
6. Roger L. Wayson, Ph.D., P.E. *National Cooperative Highway Research Program. NCHRP Synthesis 268. Relationship Between Pavement Surface Texture and Highway Traffic Noise.* 1998.
7. California Department of Transportation. *Pavement Advisory PSTPA-02: Designing Quieter Pavements.* September 6, 2005.
8. California Department of Transportation. *Typical Noise Levels, Intensity and the Decibel Scale Chart.* http://www.dot.ca.gov/hq/esc/Translab/ope/NoiseLevels.html. Accessed September 16, 2009.
9. California Department of Transportation. *Safety Manual. Chapter 13 Hearing Protection Program.* June 2008. http://www.dot.ca.gov/hq/opo/safety/safetymanual_toc.htm
10. CPWR (The Center to Protect Workers' Rights). *Construction Noise Hazard Alert.* December 29, 2003.

XII. POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XII(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
XII(b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XII(c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Explanation for questions a, b and c: The project neither induces population growth nor displaces housing or people. The project also does not include the construction or removal of habitable structures or the construction of new public vehicular roadways or utility lines.

XIII. PUBLIC SERVICES

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

XIII(a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection? Police protection? Schools? Parks? Other public facilities?

Explanation: The District's Operations Department already provides ranger patrol in the Preserve and maintenance staff to care for trails. The District collaborates with other local agencies in providing public services, including police and fire protection. District Staff is responsible for enforcing District regulations and certain selected sections of California code pertaining to vandalism, bicycle helmets, and parking. The San Mateo County Sheriff's Office is involved in enforcement of all other code sections. District staff serves as a possible first responder for fire emergencies, with California Department of Forestry and Fire Protection (CAL FIRE) acting as the responsible agency for fire fighting at El Corte de Madera Open Space Preserve. Because the project will not substantially increase usage of the Preserve, no new or altered governmental facilities will be needed to provide public services to the Preserve as a result of the project.

XIV. RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XIV(a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
XIV(b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Explanation for questions a and b: (Source: 1, 2, 3). The construction of the proposed parking lot will not increase the use of El Corte de Madera Open Space Preserve or Wunderlich County Park (located across Skyline Boulevard to the east of the Preserve) to a level that would result in a substantial physical deterioration of the Preserve or county park, the natural resources, or the existing trail systems.

The 2,817-acre Preserve is currently open to the public and offers approximately 35 miles of mostly multiple-use trail (with the exception of a 0.1-mile hiking-only destination trail). Preserve visitors currently park on roadside shoulders and pullouts along Skyline Boulevard, at the nearby Caltrans vista point parking lot (Skeggs Point), and at a small, informal, roadside parking area north of the project site (near Gate CM02). Forty roadside parking spaces along Skyline Boulevard will be removed due to unsafe parking conditions where shoulders are inadequate and narrow and lines of sight are poor. The project calls for signing problematic roadside parking areas as "No Parking" zones to prevent visitors from parking in those areas. These actions will improve traffic safety along the highway, but also reduce the overall roadside parking capacity. The new parking lot will address the loss of roadside parking capacity by providing 65 car parking spaces and four equestrian spaces to the general public. The District expects that many visitors who currently park at the Skeggs Point parking lot and along the roadside will prefer to park in the new District parking lot given visitor amenities such as restrooms, trailhead signs, and boot and tire cleaning stations, ample staging area, ease of access, a safe and convenient connection to the Preserve's trail system, and multiple loop opportunities that will be offered just off the new parking lot.

As observed by District Ranger staff, highest visitation occurs on weekends and holidays in the summer months. For the purpose of analyzing the project's effects on use of the Preserve, this analysis assumes the worst-case scenario that all users of the parking lot would be new park users. (This is a worst-case assumption because it is reasonable to expect that at least half if not more of the vehicles that will utilize the parking lot will contain existing users who would have otherwise parked elsewhere, as current parking patterns indicate.) Based on District observations at other preserves and a count performed at the Skeggs Point parking lot, each vehicle is expected to transport an average of two visitors (some vehicles will have solo drivers and others will contain users who carpool to the Preserve). According to a 2009 traffic study and report done for the Skeggs Point parking lot, the highest number of total trips per day occurred on the weekend. Based on these use patterns, the proposed parking lot could in theory add 315 total vehicle trips per day. Averaging two visitors per vehicle, 630 individuals would be added to the Preserve per day (a mix of hikers, mountain bicyclists, and equestrians). Due to the almost 35 miles of trail system and the subsequent dispersal of users throughout the Preserve, this increase is not expected to result in substantial impacts to the trail system or to the natural resources in the Preserve.

Since 2004, the District has been actively implementing a Watershed Protection Program prepared for the Preserve that focuses primarily on improving the Preserve's road and trail system and drainage crossings to

reduce upland erosion and creek sedimentation for the benefit of watershed integrity. To date, more than ten miles of trail have been improved, realigned, or narrowed using state-of-the-art trail construction standards. These changes not only improve surface drainage and reduce the potential for erosion, but also reduce long-term maintenance by stabilizing the trail tread. In addition, off-trail hiking is not permitted at this Preserve, and trails are routinely closed to mountain bicycling and horses during the winter months to reduce erosion.

The new parking lot is also not expected to significantly increase the use of Wunderlich County Park, located across Skyline Boulevard to the east of the Preserve. The lot will not provide direct access to Wunderlich County Park. The parking lot is designed to discourage visitors from parking in the new parking lot with the intention of crossing Skyline Boulevard near Gate CM04 to enter Wunderlich County Park. The trailhead, restroom, and other visitor amenities are located toward the interior of the Preserve and away from the County Park. In addition, the project includes closing an access road that connects the new parking lot with Gate CM04; this road will be closed to the public, gated and signed as a "service road only." The Preserve's layout, amenities and maps are designed to be focused on the Preserve itself. The project will therefore have a less than significant impact on the use of the County Park.

The project also involves the relocation of the Skyline Boulevard pedestrian crossing that connects the Preserve and the Bay Area Ridge Trail to the east. This will further serve to limit impact to the use of Wunderlich County Park. It is also not expected to significantly increase the use of the Preserve. The existing pedestrian crossing near Gate CM04 will be closed, and a new pedestrian crossing will be constructed just south of Gate CM02. The new pedestrian crossing will have better lines of sight than the existing crossing, which will improve traffic and user safety. The new crossing will be a safer alternative that allows for the continuation of existing use patterns, but it is not expected to attract a significant number of new users to the Preserve, the County Park, or the Bay Area Ridge Trail.

The project as designed will not have a significant adverse physical effect on the environment nor would it significantly increase the use of the Preserve, Wunderlich County Park, or the Bay Area Ridge Trail such that substantial physical deterioration in any of the three would occur or be accelerated.

For a discussion on trail design and construction and the potential impacts to water quality or loss of topsoil, please refer to Section VI and Section VIII.

Recreation Section Sources:

1. Midpeninsula Regional Open Space District. *Visitor Estimate Survey Project Counts completed by the Public Affairs Department.* June 25, 2007 – July 8, 2007.
2. Midpeninsula Regional Open Space District. *Visitor Counts.* 1995 through 1997.
3. Midpeninsula Regional Open Space District. *El Corte de Madera Creek Open Space Preserve Visitor Count.* June 5 and 7, 2003.

XV. TRANSPORTATION/TRAFFIC

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XV(a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
XV(b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐

Explanation for a and b: (Source: 4). The project is located in a 2,817-acre preserve approximately 2,100 feet above mean sea level at the crest of the Santa Cruz Mountains, and about four miles west of Woodside, San Mateo County, California. The project includes an asphalt, 65-car, four-equestrian trailer space parking lot with a self-contained, vault restroom facility; a driveway leading to the parking lot; and a connector trail system. The type of uses in the Preserve namely, hiking, mountain biking, and horse-riding, generally require a long duration of stay, and thus generate a low turnover in visitors and associated parking demand. In addition, the proposed new trails will serve existing Preserve users and possibly additional users who desire public recreation. The anticipated increase in use from the public is expected to be minimal to moderate and will not substantially increase the amount of traffic or cause congestion within the area. A traffic study was undertaken in the summer of 2008 and a final report prepared in June 2009.

The amount of traffic that might be generated by the proposed parking lot was estimated based on traffic generated by an existing nearby parking lot, Skeggs Point (a Caltrans vista point), already used by Preserve users as well as other visitors stopping to take in the view or take a rest stop. The peak-hour trip generation rate for Skeggs Point's parking lot was the highest on the weekend (with the actual peak occurring on Sunday), in keeping with Preserve usage patterns observed by District Ranger staff. The rate was determined to be 1.02 trips per parking stall during the Sunday peak hour. The proposed parking lot contains a total of 69 parking spaces, which includes four equestrian parking spaces, and using the above trip generation rate, would generate a maximum of 70 peak hour trips.

Under the worst-case scenario, all of the trips generated by the parking lot would be new. In reality, some vehicles that currently park along the roadside would likely relocate to the lot, as 40 roadside parking spaces along Skyline Boulevard will be removed due to unsafe parking conditions such as inadequate, narrow shoulder widths and poor lines of sight.

Per the 2007 San Mateo County Congestion Management Program and Caltrans, Skyline Boulevard is calculated to have the capacity of 2,240 vehicles per hour, 1,120 vehicles per hour in each direction. A roadway operating at its capacity would be perceived as congested by the driving public and it would be difficult to enter the roadway from cross streets.

According to Caltrans traffic data, the peak hour of traffic volume on Skyline Boulevard occurs on Sunday afternoon and in the vicinity of the Preserve is 120 vehicles during that peak hour, both directions combined (directional volume is not published). This is less than six percent (6%) of the roadway's capacity of 2,240 vehicles per hour. While the peak hour on Skyline Boulevard might not necessarily coincide with the peak hour of the project's traffic, for the purposes of this document, they are assumed to occur at the same time.

The new parking lot would add up to 70 new trips during the Sunday peak hour whereas during other times of

the day and on other days, the additional number of trips would be less. Using the Sunday peak hour, the peak hour volume in the vicinity of the Preserve would be about 190 vehicles per hour (120 plus 70), which is less than ten percent (10%) of Skyline Boulevard's capacity of 2,240 vehicles per hour. Therefore, it can be concluded that the new traffic generated by the parking lot will not have a substantial impact on the existing traffic load and capacity of Skyline Boulevard.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

XV(c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Explanation: The project has no effect on air traffic patterns.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

XV(d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Explanation: (Sources: 1, 3, 4). The project includes an asphalt parking lot with 65 car parking spaces and four end-to-end equestrian trailer spaces. A 380-foot long driveway leads from Skyline Boulevard to the parking lot and incorporates a Caltrans standard flared driveway approach, designed to accommodate a 24-foot gooseneck four-horse trailer and a full size standard pickup truck entering and exiting the parking lot. The project also includes the relocation of a Skyline Boulevard trail/pedestrian crossing that connects the Preserve and the Bay Area Ridge Trail. The purpose of relocating the crossing would be to improve trail user and traffic safety as trail users travel between the Preserve and the Bay Area Ridge Trail. The 2009 traffic study and report included sight distance analysis of both the proposed driveway and pedestrian crossing as well as an analysis of the driveway itself.

Sight distance

To comply with Caltrans requirements, the driveway must meet minimum sight requirements, which are a function of vehicle speed, which in turn is a function of the radius of the horizontal curve of the roadway. Horizontal curvatures near the project driveway and near the proposed pedestrian crossing were obtained from Caltrans roadway plans for Skyline Boulevard. The required minimum stopping distance was calculated to be 415 feet to the north of the proposed driveway and 280 feet to the south of the proposed driveway. For left-turning vehicles entering the proposed driveway, the minimum stopping distance is approximately 447 feet. For vehicles exiting and making left and right turns from the proposed driveway, the minimum stopping distance is 512 feet. To the south, the minimum stopping distance is 498 feet. Based on these findings, it was determined that the driveway entrance has adequate stopping distances and meets Caltrans sight distance requirements.

At the proposed pedestrian crossing, located approximately 4,100 feet (0.78 miles) north of Gate CM04 and approximately 1,000 feet south of Preserve gate CM02, the required minimum stopping sight distance was calculated to be 415 feet to the north and 600 feet to the south. Sight distances were measured from both the east and west sides of the crossing, towards the north and south, respectively. From the east side of the crossing, sight distances were measured to be 1,135 feet to the north and 625 to the south. From the west side of the crossing, sight distances were measured to be 1,000 feet to the north and 605 feet to the south, respectively. Based on these findings, the sight distances at the proposed pedestrian crossing were found to meet the stopping distance requirements.

Driveway analysis

Near the proposed parking lot is a private driveway that provides access to two residences on the east side of Skyline Boulevard. The traffic study considered the extent to which use of the parking lot would potentially affect the private driveway. Field reconnaissance found that drivers in vehicles in both driveways would be able to see each other and therefore take measures to avoid accidents.

Preserve Use

Within the Preserve and trail system, motorized vehicles are not allowed per District ordinance. Motor vehicle access within the Preserve will be limited to ranger patrol and maintenance vehicles, and no expansion on the number of patrol vehicles accessing the Preserve would be required by the project. The project is expected to result in a minimal expansion on the number of maintenance vehicles accessing the Preserve to transport small-scale equipment and hand tools to conduct infrequent trail and staging area maintenance. Additionally, the trails will not include any hazards such as blind, sharp curves or dangerous intersections. Finally, there will be no glare or light impact on Skyline Boulevard from vehicles exiting the parking lot, as the project does not include exterior lighting fixtures and the parking lot will be locked when still light, one-half hour after sunset per District Ordinance 93-1, Section 805.2. District Ordinance 93-1, Section 805.2 prohibits the use of the Preserve by the public between one-half hour after sunset and sunrise.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

XV(e) Result in inadequate emergency access?

Explanation: (Source: 2, 3). The parking lot turning radii and the Caltrans standard flared driveway configuration have been designed to accommodate required emergency vehicle access. In addition, an existing emergency landing zone is located approximately 500 feet northwest of the proposed parking lot and will remain accessible from the lot via an existing access road and Preserve gates. The landing zone is maintained regularly by the District and kept clear of vegetation.

The trail system is located in a Preserve where emergency access needs are limited to fire fighting and evacuation in the event of injury. The tread width along existing trail segments within the Preserve already limit access by large firefighting and rescue vehicles. However, existing trail widths allow access by all-terrain vehicles (ATVs) throughout the Preserve if vehicular emergency access is required.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

XV(f) Result in inadequate parking capacity?

Explanation: (Source: 3). The project involves new trail construction with no changes to currently allowed uses. In addition, the project includes a new parking lot to address existing parking issues and equestrian access issues caused by a lack of horse trailer parking. The Preserve does not presently have equestrian parking spaces.

Parking for the Preserve is currently accommodated by an existing Caltrans vista point parking lot (Skeggs Point) at the northern area of the Preserve as well as a small, informal, roadside parking area near Gate CM02. Additional parking occurs along the roadside shoulders in addition to roadside pullouts along Skyline Boulevard. Due to the location of existing available parking, access to the Preserve is primarily limited to the northern area of the Preserve. A parking lot to the south of the Preserve would disperse visitor use across three main trailhead entrances to the Preserve.

The proposed 65-car parking lot is anticipated to relieve some of the pressure on the Skeggs Point parking lot and on roadside parking along Skyline Boulevard. The new trails proposed may draw additional users to the Preserve, and it is expected that approximately 40 roadside parking spaces along Skyline Boulevard will be removed due to unsafe parking conditions such as inadequate, narrow shoulder widths and poor lines of sights. The proposed lot would provide visitors with a better alternative to parking along the roadway where shoulders are narrow and lines of sight are an issue. In addition, the proposed lot will help offset the removal of the roadside parking as well as provide a net increase in new parking spaces at the Preserve. The lot would also provide four equestrian spaces where none currently exist.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XV(g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Explanation: (Source: 5, 6). The project includes new trail construction and a proposed parking lot with no changes to currently allowed uses. The project is discrete and does not impact alternative modes of transportation along Skyline Boulevard. There is currently no existing bus service along Skyline Boulevard except for samTrans' Community Service bus line 85 which ascends La Honda Road and stops at the intersection of Skyline Boulevard before descending back to the Towns of Woodside and Portola Valley. Alternative congestion relief programs in San Mateo County do not currently include a program for Skyline Boulevard. Therefore, the project will not conflict with any adopted policies, plans, or programs supporting alternative transportation.

Transportation/Traffic Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
2. LFR Inc. Management and Consulting Engineering. *El Corte de Madera Creek Open Space Preserve Public Access Improvements Drainage and Grading Plan.* August 2007.
3. LFR Inc. *Email correspondence with Nick Cartagena, Senior Staff Civil Engineer.* January 17, 2008; February 4, 6, and 7, 2008.
4. Hexagon Transportation Consultants, Inc. *El Corte de Madera Staging Area Traffic and Site Access Review.* June 2009.
5. San Mateo County Transportation Authority. *2007 Progress Report.*
6. San Mateo County Transit District (samTrans). *Bus route map for samTrans 85 Community Service.* Effective December 23, 2007 (revise A).

XVI. UTILITIES AND SERVICE SYSTEMS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
XVI(b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Explanation for a and b: The project does not provide water services, would not consume water, and would not generate wastewater. The project thus does not include new or increased needs for wastewater treatment or wastewater treatment facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐

Explanation: (Sources: 2, 3). The proposed parking lot is located on an existing, previously disturbed area on the Preserve, limiting impact on the surrounding environment. The project involves the construction of three engineered bioretention basins to collect and treat storm water runoff from the parking lot. The uppermost basin located within the parking lot area will be connected via a riser pipe and 12-inch diameter pipe to a second basin, which will then connect via an overland swale to the third basin. In a 100-year storm event (a "100-year storm" is an event of the magnitude that has a 1% chance of occurrence in any given year), minor overflow would exit the third basin via an overland swale to an existing Caltrans storm water culvert at the edge of Skyline Boulevard. However, as the basins are designed to collect and treat typical storm water runoff, it is not anticipated that runoff will enter the existing Caltrans storm water drainage system. Based on the project's design features, runoff water is expected to remain on site and be treated as it percolates into the ground through a soil matrix specified for storm water filtration. In addition, the construction of the three basins and connecting pipe system are located in an existing, previously disturbed area on the Preserve or outside the limits of existing trees, and are thus not anticipated to cause significant environmental effects.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
XVI(e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒

Explanation for d and e: The project does not provide water services, would not consume water, and would not generate wastewater.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
XVI(g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Explanation for questions f and g: (Source: 1). The amount of solid waste generated by the project would be insignificant. The project includes a self-contained, vault restroom facility, which is not connected to the public utility system. A black, built-in ventilation stack is heated by the sun which serves to draw air up and out and also provides air circulation which, coupled with heat, desiccates the effluent. The waste effluent is removed and properly disposed of at least two to three times per year. The District does not provide regular trash collection services, as District ordinances require users to dispose of any refuse brought to the Preserve and prohibit public littering or dumping of any material onto the Preserve. Illegal trash is removed from the Preserve by District maintenance crews and properly disposed of.

Utilities and Service Systems Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
2. LFR Inc. Management and Consulting Engineering. *El Corte de Madera Creek Open Space Preserve Public Access Improvements Drainage and Grading Plan.* August 2007.
3. LFR Inc. *Email correspondence with Bill Beaman, Senior Associate Civil Engineer.* December 13, 2007.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

Explanation: As previously discussed in other sections of this document, the project (including mitigation measures incorporated into the project) would not degrade the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The implementation of the mitigation measures set forth in this document (all of which have been incorporated into the project) would reduce any potential impacts to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐

Explanation: As previously discussed in other sections of this document, the impact analysis identifies possible future open space management projects that may produce related impacts, and then examines how the proposed project and these possible future open space management actions may combine to act cumulatively. In general, the fundamentally low intensity, dispersed nature of the open space management program minimizes the potential for cumulative impacts, since any less than significant impact would generally be site-specific, localized, and not expected to have the potential for considerable combined cumulative impacts throughout the region. The possibility of cumulatively considerable impacts is minimized by the overall lack of disturbance to the watershed as a whole associated with open space use.

Unlike residential and economic development projects in urban or suburban areas, the District only implements minimal improvements such as parking lots, unpaved roads, and natural surface trails) within its open space lands. The proposed project, along with similar land management actions by the District or other open space and recreation agencies, would tend to support regional resource protection and enhance public recreational opportunities for local and regional residents and as such have a beneficial combined cumulative impact.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

XVII(c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Explanation: The purpose of the project is four-fold: (1) to enhance and (2) accommodate low-intensity recreation through new trail construction and a new parking lot, (3) enhance traffic safety by providing an improved parking alternative and redirecting roadside parking into an established formal parking lot, and (4) reduce the potential erosion originating from one steep trail segment through a realignment and trail decommissioning.

The project improvements aimed to enhance and accommodate low-intensity recreation in open space lands, improve traffic safety along Skyline Boulevard, and reduce trail erosion will not result in environmental effects that will cause substantial adverse effects on human beings.

ATTACHMENT: F

ENGINEERING GEOLOGIC REVIEW
PROPOSED OLJON TRAIL
PHASE 3 PROJECT
FINAL REPORT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE
SAN MATEO COUNTY

December 23, 2015

Prepared for:
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Job No: MPEN-ECDM-OLJON PH3-645

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December 23, 2015

Mr. Zachary Alexander
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

JOB: MPEN-ECDM-OLJON PH3-645

REFERENCE: ENGINEERING GEOLOGIC REVIEW: FINAL REPORT
OLJON TRAIL PHASE 3 PROJECT

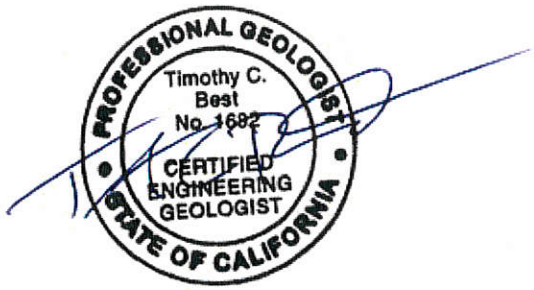
Dear Mr. Alexander:

This report presents the results of my Engineering Geologic Review of the proposed Oljon Trail located on the northeastern portion of El Corte de Madera Creek Open Space Preserve, San Mateo County, CA. I understand that the project proposes to construct a 1-mile-long multi-use recreational trail and abandon up to 1,000 feet of old tractor road that is in poor condition and will no longer be needed. The purpose of this study was to evaluate the geologic conditions at the site and assess the implications of the proposed project with respect to erosion and hillslope stability. Included in this report and accompanying plan documents are recommendations for trail construction to mitigate the potential geologic risks associated with the project to an acceptable level for the intended low-intensity recreational use of the trail.

I am of the opinion that the proposed trail improvement project is acceptable from a geologic and erosional standpoint if all recommendations outlined in this report and accompanying plan set are properly implemented and maintained. The users of the trail, if exercising reasonable common sense, should not be subject to risks from natural occurring geologic hazards beyond a reasonable level of risk. Although some damage to the trail or trail structures may occur during adverse geologic events (e.g. intense storms and high ground accelerations during earthquakes) it is unlikely that those geologic hazards will result in significant harm to hikers and recreational users, provided that the trail and trail structures are routinely inspected, maintained and repaired as needed.

Please give me a call if you have any questions.

Very truly yours,



Timothy C. Best
Certified Engineering Geologist #1682

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INTRODUCTION

This report presents the results of an Engineering Geologic Review of the proposed Oljon Trail Phase 3 project within El Corte de Madera Creek Open Space Preserve, San Mateo County, California (Figure 1). The project proposes to construct a new 1-mile-long multi-use trail to connect Spring Board Trail to Steam Donkey Trail. The project is part of the long-term management plan to upgrade the trail network within the preserve. Project planning was funded by a grant from the Bay Area Ridge Trail Council.

The purpose of this study was to evaluate the geologic conditions at the site and assess the implications of the proposed project with respect to erosion and hillslope stability. Included in this report and accompanying plan sheets are recommendations designed to mitigate the potential geologic and erosional risks associated with the proposed trail to an acceptable level for the intended use of the trail for infrequent recreational use.

PROPOSED PROJECT

As currently proposed the project will consist of the following:

- Construct 4,700 feet of new four foot wide trail
- Convert 500 feet of existing road to trail use
- Install 4 new puncheons
- Abandon up to 500 feet of old tractor roads.

SCOPE OF SERVICES

Work performed during this investigation included:

1. Review of available published and unpublished reports pertinent to this study
2. Review of five sets of aerial photographs
3. Review of bare earth LiDAR imagery
4. Field reconnaissance and mapping
5. Data analysis
6. Discussions with Meredith Manning, Craig Beckman, and Zachary Alexander (Midpeninsula Regional Open Space District)
7. Preparation of this report and the accompanying plan sheets.

This analysis relied on the visual recognition of landscape features from field and aerial photograph and LiDAR observations. Geotechnical drilling was not undertaken as part of this project due to the proposed shallow grading associated with the trail construction. It is my understanding that a drilling permit is not required where no drilling takes place.

PHYSICAL ENVIRONMENT

GEOGRAPHIC SETTING

El Corte de Madera Creek Open Space Preserve occupies 2,817 acres in the upper headwaters of El Corte de Madera Creek watershed about four miles west of Woodside, CA (Figure 1). The area is characterized by steep mountainous terrain dissected by narrow and steep gradient ephemeral to perennial streams. Slopes range from 20% near ridge tops and along valley bottoms to 80+% on steeper sideslopes. Hillslopes tend to be slightly convex, rounded towards the ridge top with steep streamside slopes. The geomorphology of the area is consistent with both shallow and deep-seated landsliding. Elevations within the preserve range from 800 feet along the valley bottom to 2100 feet along the ridge crest at Skyline Boulevard.

The climate is Mediterranean, with cool, rainy winters and dry, warm summers. The study area is vegetated with advanced second growth redwood, Douglas-fir and a scattered understory of hardwood and brush.

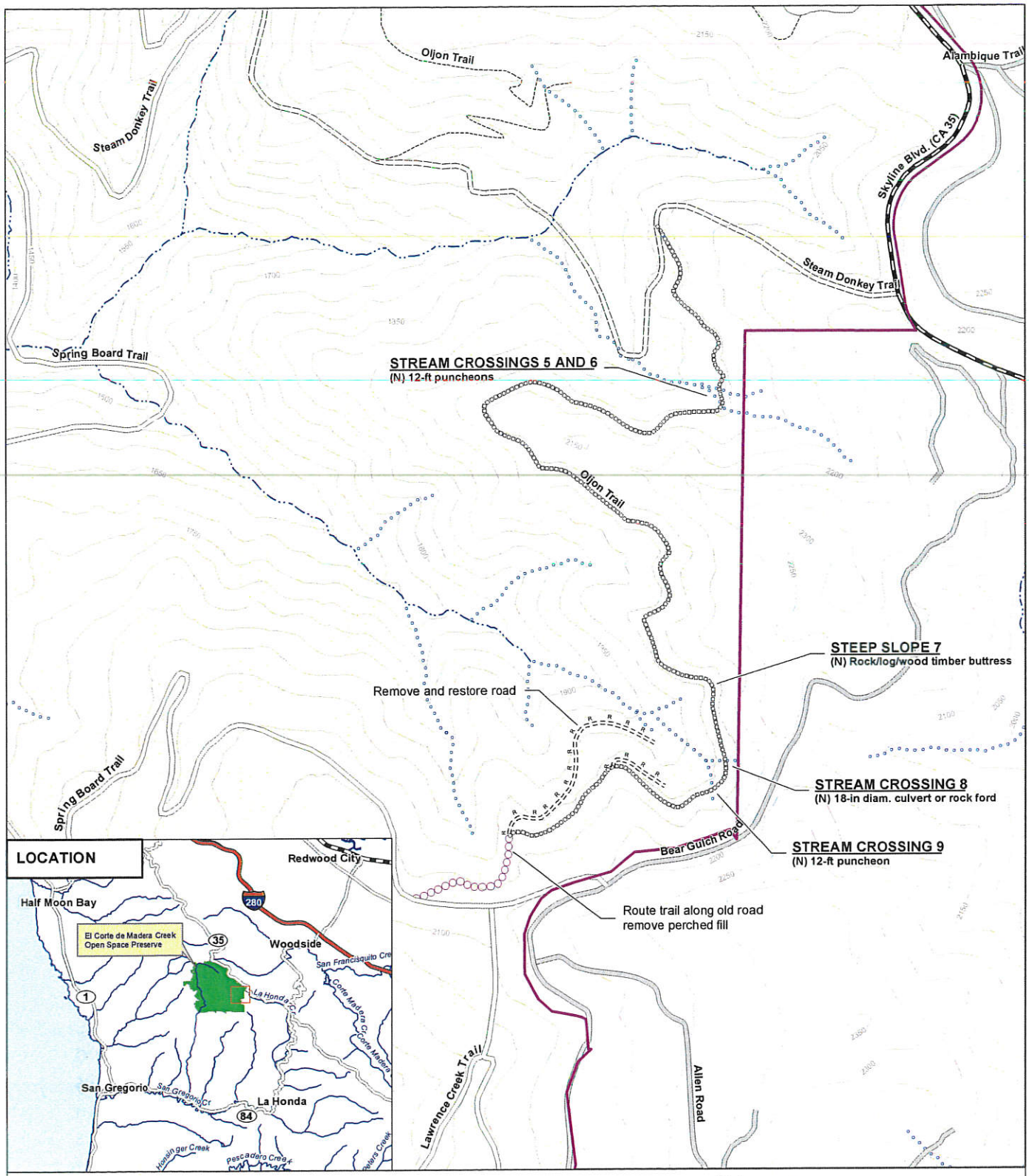
The proposed Phase 3 trail will extend one mile to connect the Steam Donkey Trail with the Spring Board Trail. The proposed trail will traverse moderate to steep (20% to 80% gradient) slopes and cross four small watercourses.

Past Landuse

The major landuse in the watershed during the past 100 years has been timber production with associated road and tractor trail construction. Most of El Corte de Madera Creek basin was logged as a clear-cut around the turn of the last century. The preserve was most recently logged in the late 1970s and 1980s as a selection harvest with the logs removed by both tractor and cable yarding. Records pertaining to these harvests are on file at California Department of Forestry.

Many of the earlier tractor trails extended up the bottom of the small stream channels which resulted in infilling of the channels with sediment. Over time these drainages have slowly incised through these deposits. In addition to timber harvesting, the preserve was also used as a motorcycle park in the 1970s. Surrounding landuse includes rural residences and open space.

The District purchased the property in 1986 and it is currently used for year round hiking, mountain bicycling and equestrian use with limited vehicular access for maintenance and enforcement. Most of the roads and trails follow the old logging haul roads and tractor trails with less than five miles consisting of new trail construction. As part of the long-term management plan for the preserve, the District is actively upgrading these old roads and trails to minimize future erosion and sediment delivery to watercourses. The proposed trail is part of the El Corte de Madera Creek Preserve long-term management plan.



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SITE MAP
PROPOSED OLJON TRAIL: PHASE 3
Midpeninsula Regional Open Space District

FIGURE 1
Job: MPEN-OLJON-P3-645
Date: 12/23/2015

REGIONAL GEOLOGIC SETTING

The plan area is situated on the western flank of the Coast Range Physiographic Province of Northwest California, a series of coastal mountain chains paralleling the pronounced northwest-southeast structural grain of northwest California. The San Andreas Fault Zone is the major geologic feature of the region located about 5 miles northeast from the site.

Bedrock Geology

The project area is underlain by Tertiary-age clastic marine sedimentary rocks of the Butano and Lambert Shale formations (Brabb, 1970; Brabb et al., 1998) (Figure 2). The Butano formation, which underlies the majority of the project area, is described as very fine- to very coarse-grained arkosic sandstone in thin to very thick beds interbedded with dark-gray to brown mudstone and shale. Bedrock exposed in road cuts is consistent with regional bedrock descriptions. Lambert Shale overlies the Butano Sandstone along the ridge crest of Skyline Boulevard and Bear Gulch Road. This rock is described as moderately well-cemented mudstone, siltstone, and claystone. Where exposed, the rock of both units is competent and able to form steep blocky bluffs and cuts. Sandstone units are prone to erosion in areas where the rock is broken down by vehicular traffic.

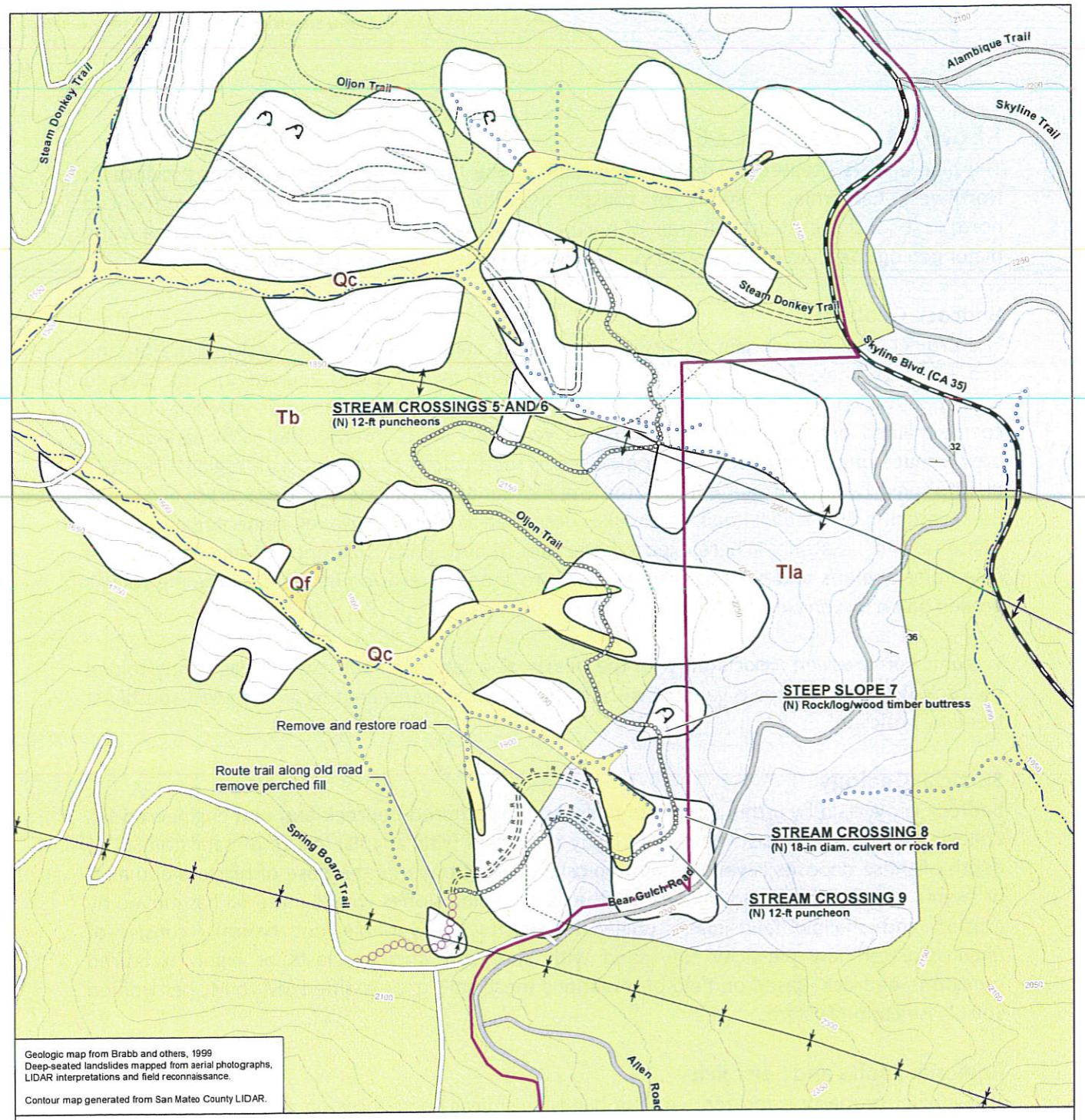
Tectonic compression associated with the nearby San Andreas Fault system has tightly folded the rock. Bedding attitude is variable with the project area transected by a northwest-southeast trending anticline.

Surficial Geology

Bedrock is overlain by a thin mantle of colluvium, weathered bedrock and non-engineered fill. Colluvial sediments consist mainly of clayey silty sand with angular clasts of sandstone. The depth of these deposits is variable but typically thickest towards the base of hillsides and axes of swales and drainages and thinnest on the steeper side slopes where material has moved by erosion and shallow landsliding. Colluvial deposits are variable but typically consist of unconsolidated low plasticity silty sand with abundant angular clasts of highly fractured sandstone bedrock. Based on field observations these soils are classified SM to ML per Unified Soil Classification System.

Regional Faults and Seismicity

The subject property is located within a highly seismically-active region of California. A broad system of inter-related northwest-southeast trending strike-slip faults represents a segment of the boundary between the Pacific and North American crustal plates. For approximately the past 15 million years (mid-Miocene) the Pacific plate has been slipping northwestward with respect to the North American plate (Atwater, 1970; Graham and Dickinson, 1978). The majority of movement has been taken up by the San Andreas Fault itself; however, there are other faults within this broad system that have also experienced movement at one time or another.



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GEOLOGIC and LANDSLIDE MAP
PROPOSED OLJON TRAIL: PHASE 3
Midpeninsula Regional Open Space District

FIGURE 2
Job: MPEN-OLJON-P3-645
Date: 12/23/2015

The regional faults of significance include the San Andreas, Pilarcitos, La Honda, and San Gregorio Faults. The subject site is located approximately 5 miles southwest of the active San Andreas Fault zone. The Pilarcitos Fault is located about 2.5 miles northeast of the site, the La Honda Fault lies 2 miles to the southwest and the San Gregorio Fault 5.5 miles to the southwest. However, the San Andreas Fault is the closest fault to the property with a high probability of generating a large magnitude earthquake in the next 50 years.

San Andreas Fault: The San Andreas Fault is an active, northwest-trending right lateral strike slip fault zone located about 5 miles northeast of the project site. The main trace of the fault trends northwest-southeast and extends over 700 miles from the Gulf of California through the Coast Ranges to Point Arena, where the fault extends offshore. The San Andreas Fault was responsible for the 1906 San Francisco earthquake (M_w 7.9) and the 1989 Loma Prieta earthquake (M_w 7.0).

The San Andreas fault system can be divided into segments with earthquakes of different magnitudes and recurrence intervals (WGONCEP, 1996). The great 1906 earthquake, the predominant historic seismic event of the San Andreas fault system in northern California, ruptured all currently locked segments of the fault (from near the Mendocino triple junction to San Juan Bautista.) The 1906 rupture overlaps the independent subsegments (Peninsula Segment and Santa Cruz Mountains Segment). Research into prehistoric events along the northern San Andreas fault indicates that a similar great event probably occurred most recently in the 17th century (Schwartz et al., 1986).

The San Francisco Peninsula Segment is the closest segment of the fault to the site. This segment of the San Andreas Fault has been assigned a slip rate that results in a M_w 7.3 earthquake with a recurrence interval of 400 years (WGONCEP, 1996). The 1906 segment of the fault has been assigned a slip rate that results in a larger M_w 7.9 earthquake with a recurrence interval of 210 years.

Seismic Shaking: Intense ground shaking is expected in the event of a major earthquake on nearby faults. The possibility of seismically induced landsliding and potential liquefaction exists. Trail repairs may be necessary in the event of a severe earthquake.

Expected ground motion parameters at the site were calculated from ground motion maps prepared by the California Geologic Survey and U.S. Geologic Survey (Cao et al., 2003; CGS, 2002; Petersen et al., 1996). These maps show an estimate of the likelihood of earthquake ground motions based on a probabilistic seismic hazard analysis. Such analysis incorporates seismic and geologic information to consider the probability of all possible damaging earthquakes, calculates the potential range of ground motions for each potential earthquake, and arrives at a level of ground shaking that has a given probability.

These maps form the basis for earthquake shaking potential in the regional assessment of liquefaction and seismically-induced landslides for zonation purposes. Ground motions shown on the maps are expressed as maximum horizontal accelerations having a 10-percent

probability of being exceeded in a 50-year period (corresponding to a 475-year return period) in keeping with the UBC-level of hazard.

Mean Peak Ground Acceleration on rock (shear wave velocity (V_s^{30} = 560 m/s)) with a 10% probability of exceedance in 50 years is reported to be 0.57 (CGS, 2008).

Regional Landsliding

Landslides are common throughout the central Santa Cruz Mountains and are one of the dominant geologic forces shaping the modern landscape. Oversteepened slopes from tectonic uplift and rapid downcutting of streams, in concert with high intensity rainfall and intense seismic shaking have resulted in a number of large and small-scale landslides. Many landslides have occurred in recent years as a result of high intensity rainstorms, such as the January 1982 and February 1986 storms. These rainfall-activated landslides are typically shallow debris flows and soil slides triggered by elevated hydraulic pore pressures and/or hydrostatic loads. Such shallow landslides are generally restricted to the axis of shallow ravines and swales where surface and groundwaters are concentrated, and incorporate only the thin surface mantle of soil, colluvium and weathered bedrock. Large, deep-seated bedrock landslides are also common in the Santa Cruz Mountains, and typically appear to be initiated or reactivated by strong ground motions during earthquakes, most recently during the 1989 Loma Prieta earthquake.

Deep-Seated Landsliding: Review of the historic set of aerial photographs and interpretations of LiDAR imagery reveal that portions of the preserve are underlain by a series of relatively slow moving deep-seated translational block slides (Figure 2). These failures are characterized by benched topography and are formed by translational movement of a relatively intact mass with a failure plane that extends below the colluvial layer into the underlying bedrock. The slides typically consist of several smaller secondary blocks that coalesce together to form a larger landslide complex. These deep-seated landslides exceed 50 acres with a failure plane extending 50 feet or more into bedrock. Several sequences of internal scarps are often present between the ridge top and valley bottom.

The landslides within the preserve demonstrate varying levels of activity. Many appear weathered and subdued and are forested with straight-standing second growth conifers and old growth stumps. These slides correspond to the "dormant-young" to "dormant-mature" morphological age classification of Keaton and DeGraff (1996). Other slides show signs of relatively recent small-scale incipient movement based on “soft terrain features”, localized discontinuous scarps, and juvenile drainage patterns. Many of the watercourses are poorly to moderately incised into the landscape indicating that slide movement is continuing to infill the stream channel. In general, movement appears to be greatest along the toe of the slide complexes with the upper portions demonstrating a comparatively higher level of stability. Slide morphology suggests many of the slides have been periodically active for centuries.

Natural slide movement is attributed to the weak earth materials that underlie much of the hillside in concert with high groundwater conditions. The rate of deep-seated slide movement is considered to be slow and episodic, in response to long duration rainfall, undercutting of the

hillslope by stream bank erosion and/or ground shaking from earthquakes on nearby faults. Due to the proximity of the San Andreas Fault to the watershed, high ground accelerations experienced during earthquakes are a significant contributing factor in the reactivation of many of the deep-seated failures within the watershed. Future slide movement should be expected in response to significant rainfall events or intense ground shaking during earthquakes. Future movement will most likely be small-scale displacements similar to what has occurred in the past. Catastrophic failure of the large slides is not expected.

Movement on deep-seated landslide slides could result in damage to the proposed trail requiring repairs to reopen the trail. Because of the small cuts and fills, new trail construction is unlikely to significant increase this risk. The proposed trail is unlikely to have a significant impact on slide stability since the mass balance and hydrology of the slides will not be substantially altered. The proposed cuts will be less than 4 feet and fills less than 2 feet deep, and therefore will have negligible to no impact on the slides where the failure plane is expected to exceed 30 feet in depth.

Shallow-Seated Landsliding: The geomorphology of the hillslopes surrounding the area is also consistent with infrequent shallow landsliding. Shallow-seated landslides are present throughout the preserve. These include debris slides, debris flows, channel bank failures, and road fill failures, and are characterized by rapid, shallow (generally less than 10 feet thick) downslope movement of surficial soil, colluvium, and weathered bedrock. Most natural shallow slides are located on steep slopes and are triggered by elevated porewater pressures resulting from high intensity and/or long duration rainfall or from being undercut by stream bank erosion. Future shallow landslides will occur within the preserve during adverse climatic or seismic conditions regardless of landuse activities.

An inventory of erosion and stability problems along 35 miles of designated roads and trails within the preserve (Best, 2002) revealed several old fill and cutslope failures along the old logging roads and tractor trails. Most of these were attributed to thick fill loosely sidecasted onto steep slopes, poor road drainage, or failure of oversteepened cuts. Few failures have occurred in recent years, in part due to improved management practices. In addition, very few landslides occurred along the narrow (5-foot) wide recreational trails, even where those trails cross steep slopes exceeding 70% gradient. The low incidence of trail failures is attributed to the low cuts and fills along the trail, and frequent dips that prevents runoff from being concentrated.

Portions of the proposed trail will need to cross steep ground and several debris flow runout paths, and therefore may be subject to impact from upslope debris slides and debris flows. Future debris slides and debris flows could result in damage to the trail requiring trail reconstruction. Because of the small cuts and fills, new trail construction is unlikely to significant increase this risk.

OBSERVATIONS

OLJON TRAIL OVERVIEW (BAY AREA RIDGE TRAIL)

The Oljon Trail will extend 1.75 miles from an existing staging area off Skyline Boulevard to the Spring Board Trail (Figure 1). The trail will be part of the Bay Area Ridge Trail and will provide a necessary eastern perimeter route to the El Corte de Madera Open Space Preserve trail system. The trail will be constructed in four phases. The first two phases have already been constructed; this report details Phase 3.

OLJON TRAIL PHASE 3

The Phase 3 portion of the trail will extend 1 mile from Steam Donkey Trail to the Spring Board Trail. This segment of trail is routed across moderate to steep (20% to 80+%) sideslopes at 5% to 15% grade. The proposed trail will be constructed at a 4 foot width, mainly on balanced cut and fill. Cuts are expected to be between 1 and 4 feet high with fill less than 2 feet deep.

About 500 feet of the trail will follow remnants of an old intact tractor road that is in good condition given its age and lack of maintenance. Perched fill may be pulled back to narrow the old road to trail width. Four low puncheons will be installed at watercourse crossings.

Crossings 5 and 6: Ephemeral streams

The proposed trail, routed along or adjacent to an existing old tractor trail will need to cross two small ephemeral streams located in close proximity to one another and both draining the same broad valley. The site is located along the southern lateral margin of a large (9± acre) deep-seated landslide complex that exhibits benched and slightly hummocky topography consistent with slow progressive slide movement. The crossing sites are located on a narrow gently sloping midslope bench at the base of a steeper short 45% gradient slope.

Northern Crossing (5): The northern watercourse, draining a small 3± acre basin, is very shallow becoming somewhat indistinct upslope on a prominent midslope bench. A shallow 6 inch deep and 12 inch wide gully is evident on the steeper 45% slopes immediately upslope of the crossing location which may have resulted from diverted runoff from the upslope neighboring property. I did not inspect the upslope ground off District property to confirm this, however. The downslope old tractor trail diverts stream flow for about 10 feet but little erosion is apparent.

The proposed crossing will consist of a low 12 foot long puncheon to be located along the back edge of the old tractor trail at the base of the short 45% gradient slope. The diversion downstream of the crossing is to be corrected by excavating a short 15 foot long shallow 1 foot deep trench.

Southern Crossing (6): The southern watercourse crossing is located in a more defined channel draining a 6 acre basin. Channel banks are about 3 feet high; the channel gradient about 25% steepening to 45% upslope. The channel bed appears stable with little active

erosion. The crossing will consist of a low 12 foot long puncheon. The southern approach will need to be built up on about 12 inches of compacted fill and the northern approach constructed on a full bench with minimal sidecast.

Site 7: Steep slopes

About 85 feet of trail will cross two narrow and steep gradient swales and adjacent steep sideslopes. Slope gradients within the swales are between 45% and 60% with adjacent sideslopes of greater than 80%. Hard silty sandstone/siltstone bedrock is found at a shallow depth and is probably responsible for the relatively steep slopes found in the area. Bedrock exposed in an upslope tractor trail dips moderately steeply (47 degrees) to the northeast (into the slope).

The two swales appear to form the lateral margins of a secondary deep-seated landslide block. The slide block is established with advanced second growth redwoods and old growth stumps that appear straight and undisturbed by slide movement. Overall the rate of slide movement appears low.

The northern and smaller of the two swales is an old debris flow scar that initiated from fill along an old tractor trail about 75 feet upslope of the proposed trail (see Plan set for map). This tractor trail was constructed at a 14 to 16 foot width with fill loosely sidecasted onto the steep slopes. About 35 feet of old fill prism failed generating a debris flow that extended over 100 feet downslope. The failure appears old and has partially revegetated with 20 year old redwood trees. The proposed trail will traverse across the runout path of the slide on about 45% gradient sideslopes. Proposed partial bench trail construction appears reasonable from a slope stability and erosion standpoint. The southern swale shows no signs of recent instability.

Between the two swales the proposed trail will need to cross steep 80+% slopes immediately below a large clump of redwoods. The steep slopes are attributed, in part, to the root ball of the redwood clump. To avoid cutting into the root ball, about 35 feet of the trail will need to be constructed at ~3 foot width partially supported by a low 2 to 3 foot high rock or log buttress or wood retaining wall. Underlying earth materials generally appear competent and suitable for a buttress or low trail retaining wall. There are several similar trail structures within El Corte de Madera Creek and other Open Space preserves, and those that were constructed to the District's current specifications have performed well.

An additional 50 feet of trail north of the two swales will need to traverse steep 80+% gradient planar slopes before reaching gentler ground. No recent landslides were observed along the alignment although a couple of small surficial failures were apparent downslope on somewhat steeper slopes.

Where the trail crosses slopes greater than 75% gradient, it will be constructed using a mini-excavator on a full bench. Spoils will be either "scatter casted" below the trail or

used in the fill prism supported by the low retaining wall between the two swales. To minimize the amount of grading, the outside of the trail may also be supported on a low 2± foot high rock or log buttress or wood lag retaining wall. The resulting cut is expected to be less than 4 feet high.

Construction of the proposed trail across these steep slopes could result in shallow small cutbank failures that could deposit small amounts of debris on the trail tread. Periodic maintenance will be required to remove any debris that has sloughed onto the trail. Large-scale slope failure are unlikely to occur.

Crossing 8: Minor ephemeral stream

The proposed trail will cross a shallow (< 1 foot deep) channel formed by runoff from Bear Gulch Road. Slope gradients average about 50%. The crossing site is located where the proposed trail crosses an old tractor trail. A 12 foot long low puncheon is proposed at this location.

Crossing 9: Minor ephemeral stream

The proposed trail will cross a very small, questionable ephemeral stream/wet area draining a roughly 2 acre basin. The crossing site is located on 40% gradient slopes along what appears to be the lateral margin of a secondary deep-seated landslide block. A 4 foot high subdued bank is found on the south approach; the north approach is fairly flat. The principal concern at this site is wet ground which may lead to rutting with winter use. The best treatment alternative will be to install a 12 foot long low puncheon.

Trail Abandonment

The project also proposes to abandon and restore up to 1,100 feet of old logging road and tractor trail located adjacent to the proposed project. These trails are to be abandoned to restore native slope configuration and to discourage unauthorized trail use.

DISCUSSION

The potential impact of the proposed trail on erosion and hillslope stability was evaluated based on qualitative field, air photo and LiDAR observations. A subsurface investigation was not undertaken and was outside the scope of this investigation. Recommendations for trail layout and design are based, in part, on the Road and Trail Erosion Inventory for El Corte de Madera Creek OSP (Best, 2002) which identified and evaluated erosion and stability problems along the 35 miles of designated roads and trails within the preserve. It is assumed that by avoiding those areas and practices which have been shown to result in trail instability, significant adverse cumulative impacts associated with the proposed trail are unlikely to occur.

During the course of this investigation several alternative trail routes were considered and evaluated. The trail alignments outlined in this report are designed to provide the greatest level of stability while meeting the goal of achieving an eastern access route. The principal geologic

constraints with the proposed trails are local steep slopes, deep-seated landsliding, trail erosion, and watercourse crossings.

Steep Slopes

Portions of the proposed trail will need to be constructed across steep sideslopes that may exceed 80% gradient in places. These steep slopes are generally smooth and straight without signs of recent or active natural shallow landsliding. The majority of the project trail does not cross debris flow source areas but does cross debris flow runout paths and therefore could be impacted from upslope debris slides or flows.

The proposed trail will be constructed at a 4 foot width generally resulting in a maximum 4 foot high cut with less than 2 feet of fill. Earth materials are mainly thin colluvial soils (sandy loam to silty sand with clasts of sandstone bedrock) overlying weathered bedrock at a shallow depth. The steeper slopes tend to be underlain by more competent bedrock at shallower depth. The trail will be constructed on a cut bench using standard trail construction techniques with fill scatter casted downslope at shallow depth.

Stability of the proposed trail across these steep slopes is evaluated based on qualitative field observations and empirical comparison to the performance of other roads and trails constructed across similar slopes. For the most part nearby old tractor trails and haul roads constructed across similar steep slopes with much greater fill depth and cutbank heights have fared well with few significant failures. Failures that have occurred were generally the result of thick fill sidecasted onto steep slopes, diversion of road runoff or oversteepened cuts. No significant problems have been observed or reported on existing narrow 5 foot wide trails, even where those trails cross steep slopes exceeding 75% gradient. The low incidence of trail failures is attributed to the low cuts and fills, and frequent dips that prevent runoff from being concentrated.

Based on the foregoing the stability of the proposed trail appears reasonable. Small scale cut bank instability and settling of fill is possible during infrequent large storms but unlikely to result in significant offsite impacts. Portions of the trail that cross debris flow runout paths could be impacted from upslope debris flows. This could result in damage to the trail requiring trail reconstruction or repair. This would most likely entail removing debris deposited onto the trail surface. Because of the small cuts and fills, new trail construction is unlikely to significant increase the landslide risk. The risk to users of the trail is considered small and is consistent with recreational trail use.

Deep-seated Landsliding

Portions of the trail will need to be routed across several large-scale deep-seated landslides. All of these landslides appear dormant without signs of recent or active movement, such as fresh cracks, leaning trees or offset road and tractor trail prisms.

The trail will not have any measurable impact on the stability of the larger landslides since the mass balance and hydrology of the slides will not be significantly altered. The proposed cuts

and fills will be less than 4 feet which will have negligible to no impact on the slides where the failure plane exceeds 50 feet. This conclusion is supported by existing roads and tractor trails that were constructed across the slides with much larger cuts and fills and which have not demonstrated accelerated slide activity over time.

Trail Erosion

The Road and Trail Erosion Inventory for El Corte de Madera Creek OSP (Best, 2002) identified the most serious erosion problems occurring in areas where the road/trail gradient exceeded 15% making the road/trail difficult to adequately drain. Additional problems were observed on steep road pitches underlain by sandstone bedrock, where the exposed sandstone bedrock is broken down into loose sand by the tires of motor vehicles and bicycles. Most past problems occurred on older roads and trails that were not laid out with effective drainage structures.

To mitigate for the risk of accelerated erosion, the proposed trails have generally been laid out at less than 15% grade and will be constructed with an outsloped pitch incorporating frequent cross drains (e.g. rolling dips, reverse grades, nicks). Recommendations outlined in this report and accompanying plan sheets are intended to stabilize the trail tread and reduce the risk of trail related erosion to a level generally consistent with recreational trail use. Ongoing trail maintenance will be required.

Stream Crossings

There are four proposed low puncheons at small stream crossings. All of the crossings have been designed to accommodate 100 year flood flows. The potential impact of the crossings on sediment production is expected to be less than significant.

Seismic Shaking

The project site is in a seismically active area and is very close to the San Andreas Fault Zone; a major potential source of severe seismic shaking. Trail damage is possible in the event of a major earthquake on a nearby segment of the San Andreas Fault. The possibility of seismically induced landsliding and potential liquefaction exists. Trail repairs may be necessary in the event of a severe earthquake.

CONCLUSIONS

I am of the opinion that the proposed trail is acceptable from a geologic and erosional standpoint if all recommendations outlined in this report and accompanying plan set are properly implemented and maintained. The users of the trail, if exercising reasonable common sense, should not be subject to risks from naturally occurring geologic hazards beyond a reasonable level of risk. Although some damage to the trail or trail structures may occur during adverse geologic events (e.g. intense storms and high ground accelerations during earthquakes) it is unlikely that those geologic hazards will result in significant harm to hikers and recreational users provided that the trail and trail structures are routinely inspected, maintained and repaired as needed.

RECOMMENDATIONS

Refer to recommendations outlined in the plan sheets.

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APPENDIX 1: STREAM CROSSING SIZING

Proposed stream crossings were sized to pass the expected 100-year flood flow and associated debris. Crossings are sized based on methodologies outlined in Designing watercourse crossings for passage of 100-year flood flows, wood, and sediment (Cafferata et al., 2004), incorporating field observations of channel geomorphology and office-based calculations of flood flow.

Crossing	Basin Area (acres)	Basin Length (feet)	Basin Relief (feet)	Tc (min) (a)	100 year precipitation ("/hr) for Tc (b)	Runoff Coefficient C	Method (c)	Q 100 (cfs)	Proposed Crossing
5	3	670	200	15.0	3.2	0.3	Rational	3	12 foot long low puncheon
6	6	765	260	15.0	3.2	0.3	Rational	6	12 foot long low puncheon
8	1	300	140	15.0	3.2	0.3	Rational	1	12 foot long low puncheon
9	2	500	140	15.0	3.2	0.3	Rational	2	12 foot long low puncheon

NOTES

(a) Time of Concentration: Calculated using methodology outlined in Dunne and Leopold (1978). Minimum 15 minute Tc per Cafferata et al. (2004);

(b) From California Department of Water Resources preliminary depth-duration-frequency data: Skyloma:

(c) Q100: Basins < 200 acres: based on rational method outlined in Dunne and Leopold (1978) and Cafferata et al. (2004); Basins > 200 acres based on Magnitude Frequency method outlined in Cafferata et al. (2004);

INVESTIGATIVE LIMITATIONS

1 The purpose of this study was to evaluate the implications of the proposed trail with respect to erosion and hillslope stability for its intended use as an infrequently used recreation trail.

2 My observations were limited to surface expressions and limited natural and artificial exposures of subsurface materials at and adjacent to the project site. For the above reasons, the conclusions should be considered limited in extent. The plan does not guarantee stability of the trail; rather it is intended to provide recommendations that will reduce the likelihood of future erosion. Unforeseen drainage conditions may result in additional erosion.

3 This written report comprises all of my professional opinions, conclusions and recommendations. This report supersedes any previous oral or written communications concerning my opinions, conclusions and recommendations.

4 The conclusions and recommendations noted in this report are based on probability and in no way imply the site will not possibly be subjected to ground failure or seismic shaking so intense that structures or roads will be severely damaged or destroyed.

5 This report is issued with the understanding that it is the duty and responsibility of the client, or his or her representative or agent, to ensure that the recommendations contained herein are fully implemented.

6 The findings of this report are valid as of the present date. However, changes in the conditions of a property or landform can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside my control.

ENGINEERING GEOLOGIC REVIEW
PROPOSED OLJON TRAIL
PHASE 4 PROJECT
FINAL REPORT

EL CORTE DE MADERA CREEK OPEN SPACE PRESERVE
SAN MATEO COUNTY

April 6, 2016

Prepared for:
Midpeninsula Regional Open Space District
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Job No: MPEN-ECDM-OLJON PH4-649

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April 6, 2016

Mr. Zachary Alexander
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JOB: MPEN-ECDM-OLJON PH4-649

REFERENCE: ENGINEERING GEOLOGIC REVIEW: FINAL REPORT
OLJON TRAIL PHASE 4 PROJECT

Dear Mr. Alexander:

This report presents the results of my Engineering Geologic Review of the proposed Oljon Trail located on the northeastern portion of El Corte de Madera Creek Open Space Preserve, San Mateo County, CA. I understand that the project proposes to construct a 1650-foot-long multi-use recreational trail and abandon up to 2,800 feet of the Steam Donkey Trail that is in poor condition and will no longer be needed. The purpose of this study was to evaluate the geologic conditions at the site and assess the implications of the proposed project with respect to erosion and hillslope stability. Included in this report and accompanying plan documents are recommendations for trail construction to mitigate the potential geologic risks associated with the project to an acceptable level for the intended low-intensity recreational use of the trail.

I am of the opinion that the proposed trail improvement project is acceptable from a geologic and erosional standpoint if all recommendations outlined in this report and accompanying plan set are properly implemented and maintained. The users of the trail, if exercising reasonable common sense, should not be subject to risks from naturally occurring geologic hazards beyond a reasonable level of risk. Although some damage to the trail or trail structures may occur during adverse geologic events (e.g. intense storms and high ground accelerations during earthquakes) it is unlikely that those geologic hazards will result in significant harm to hikers and recreational users, provided that the trail and trail structures are routinely inspected, maintained and repaired as needed.

Please give me a call if you have any questions.

Very truly yours,

Timothy C. Best
Certified Engineering Geologist #1682

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of an Engineering Geologic Review of the proposed Oljon Trail Phase 4 within El Corte de Madera Creek Open Space Preserve, San Mateo County, California (Figure 1). The project proposes to construct a new 1600-foot-long multi-use trail to connect the Phase 2 and Phase 3 portions of the trail (Figure 1). The project is part of the long-term management plan to upgrade the trail network within the preserve. Project planning was funded by a grant from the Bay Area Ridge Trail Council.

The purpose of this study was to evaluate the geologic conditions at the site and assess the implications of the proposed project with respect to erosion and hillslope stability. Included in this report and accompanying plan sheets are recommendations designed to mitigate the potential geologic and erosional risks associated with the proposed trail to an acceptable level for the intended use of the trail for infrequent recreational use.

PROPOSED PROJECT

As currently proposed the project will consist of the following:

- Construct 1,350 feet of new four foot wide trail
- Convert 300 feet of existing road to trail use
- Install 2 new trail bridges and 1 new puncheon at proposed watercourse crossings
- Abandon up to 2,800 feet of the Steam Donkey Trail (old logging road).

SCOPE OF SERVICES

Work performed during this investigation included:

1. Review of available published and unpublished reports pertinent to this study
2. Review of five sets of aerial photographs
3. Review of bare earth LiDAR imagery
4. Field reconnaissance and mapping
5. Data analysis
6. Discussions with Meredith Manning, Craig Beckman, and Zachary Alexander (Midpeninsula Regional Open Space District)
7. Preparation of this report and the accompanying plan sheets.

This analysis relied on the visual recognition of landscape features from field and aerial photograph and LiDAR observations. Geotechnical drilling was not undertaken as part of this project due to the proposed shallow grading associated with the trail construction. It is my understanding that a drilling permit is not required.

PHYSICAL ENVIRONMENT

GEOGRAPHIC SETTING

El Corte de Madera Creek Open Space Preserve occupies 2,817 acres in the upper headwaters of El Corte de Madera Creek watershed about four miles west of Woodside, CA (Figure 1). The area is characterized by steep mountainous terrain dissected by narrow and steep gradient ephemeral to perennial streams. Slopes range from 20% near ridge tops and along valley bottoms to 80+% on steeper sideslopes. Hillslopes tend to be slightly convex, rounded towards the ridge top with steep streamside slopes. The geomorphology of the area is consistent with both shallow and deep-seated landsliding. Elevations within the preserve range from 800 feet along the valley bottom to 2100 feet along the ridge crest at Skyline Boulevard.

The climate is Mediterranean, with cool, rainy winters and dry, warm summers. The study area is vegetated with advanced second growth redwood, Douglas-fir and a scattered understory of hardwood and brush.

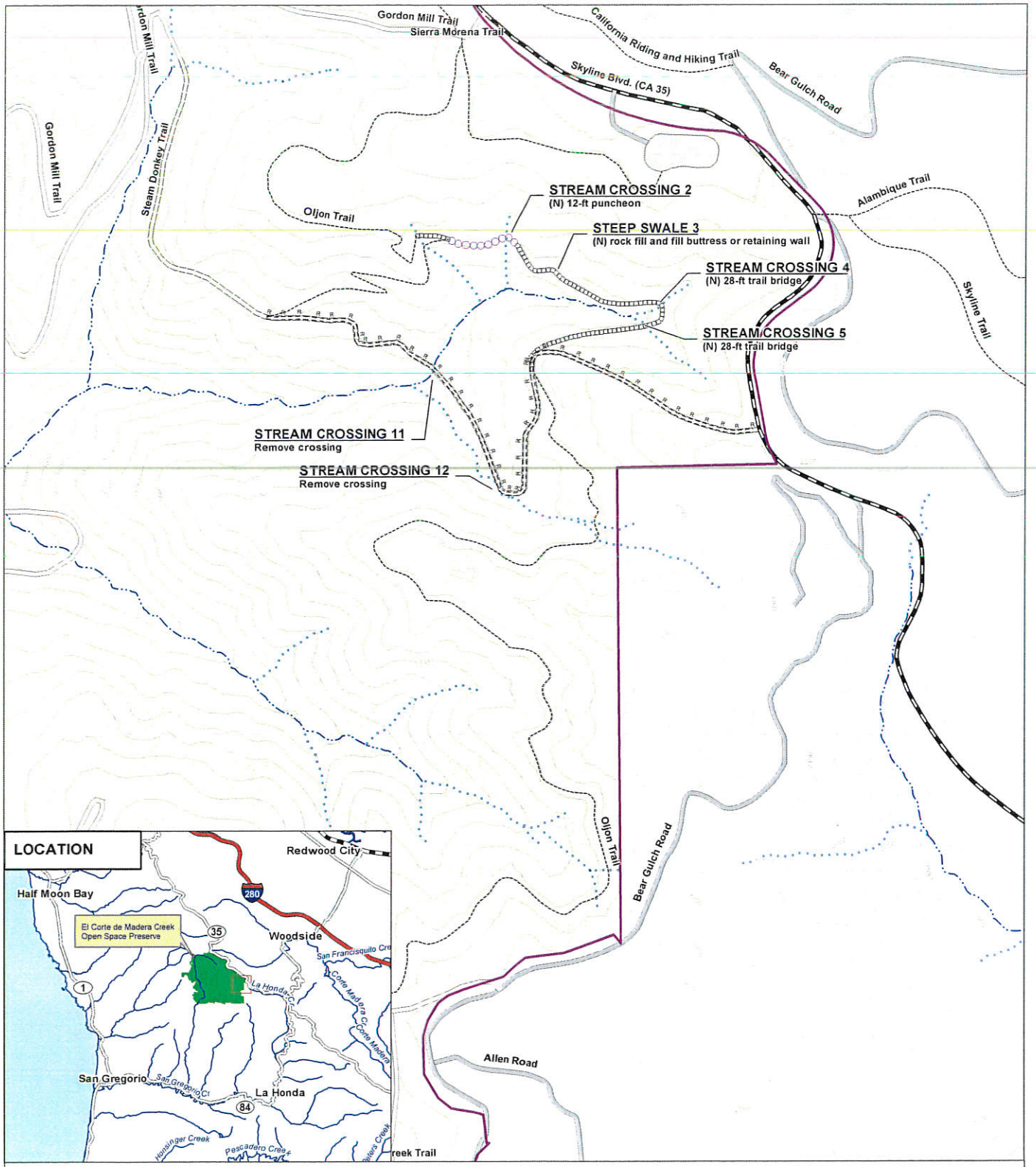
The proposed Phase 4 trail will extend 1650 feet to connect the Phase 2 and Phase 3 portions of the trail (Figure 1). The proposed trail will traverse moderate to steep (20% to 70% gradient) slopes and cross three small watercourses.

Past Landuse

The major landuse in the watershed during the past 100 years has been timber production with associated road and tractor trail construction. Most of El Corte de Madera Creek basin was logged as a clear-cut around the turn of the last century. The preserve was most recently logged in the late 1970s and 1980s as a selection harvest with the logs removed by both tractor and cable yarding. Records pertaining to these harvests are on file at California Department of Forestry.

Many of the earlier tractor trails extended up the bottom of the small stream channels which resulted in infilling of the channels with sediment. Over time these drainages have slowly incised through these deposits. In addition to timber harvesting, the preserve was also used as a motorcycle park in the 1970s. Surrounding landuse includes rural residences and open space.

The District purchased the property in 1986 and it is currently used for year round hiking, mountain bicycling and equestrian use with limited vehicular access for maintenance and enforcement. Most of the roads and trails follow the old logging haul roads and tractor trails with less than five miles consisting of new trail construction. As part of the long-term management plan for the preserve, the District is actively upgrading these old roads and trails to minimize future erosion and sediment delivery to watercourses. The proposed trail is part of the El Corte de Madera Creek Preserve long-term management plan.



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SITE MAP
PROPOSED OLJON TRAIL: PHASE 4
Midpeninsula Regional Open Space District

FIGURE 1
Job: MPEN-OLJON-P4-649
Date: 04/06/2016

REGIONAL GEOLOGIC SETTING

The plan area is situated on the western flank of the Coast Range Physiographic Province of Northwest California, a series of coastal mountain chains paralleling the pronounced northwest-southeast structural grain of northwest California. The San Andreas Fault Zone is the major geologic feature of the region located about 5 miles northeast from the site.

Bedrock Geology

The project area is underlain by Tertiary-age clastic marine sedimentary rocks of the Butano formation (Brabb, 1970; Brabb et al., 1998) (Figure 2). The Butano formation, which underlies the majority of the project area, is described as very fine- to very coarse-grained arkosic sandstone in thin to very thick beds interbedded with dark-gray to brown mudstone and shale. Bedrock exposed in road cuts is consistent with regional bedrock descriptions. Where exposed the rock of both units is competent and able to form steep blocky bluffs and cuts. Sandstone units are prone to erosion in areas where the rock is broken down by vehicular traffic.

Tectonic compression associated with the nearby San Andreas Fault system has tightly folded the rock. Bedding attitude is variable with the project area transected by a northwest-southeast trending anticline.

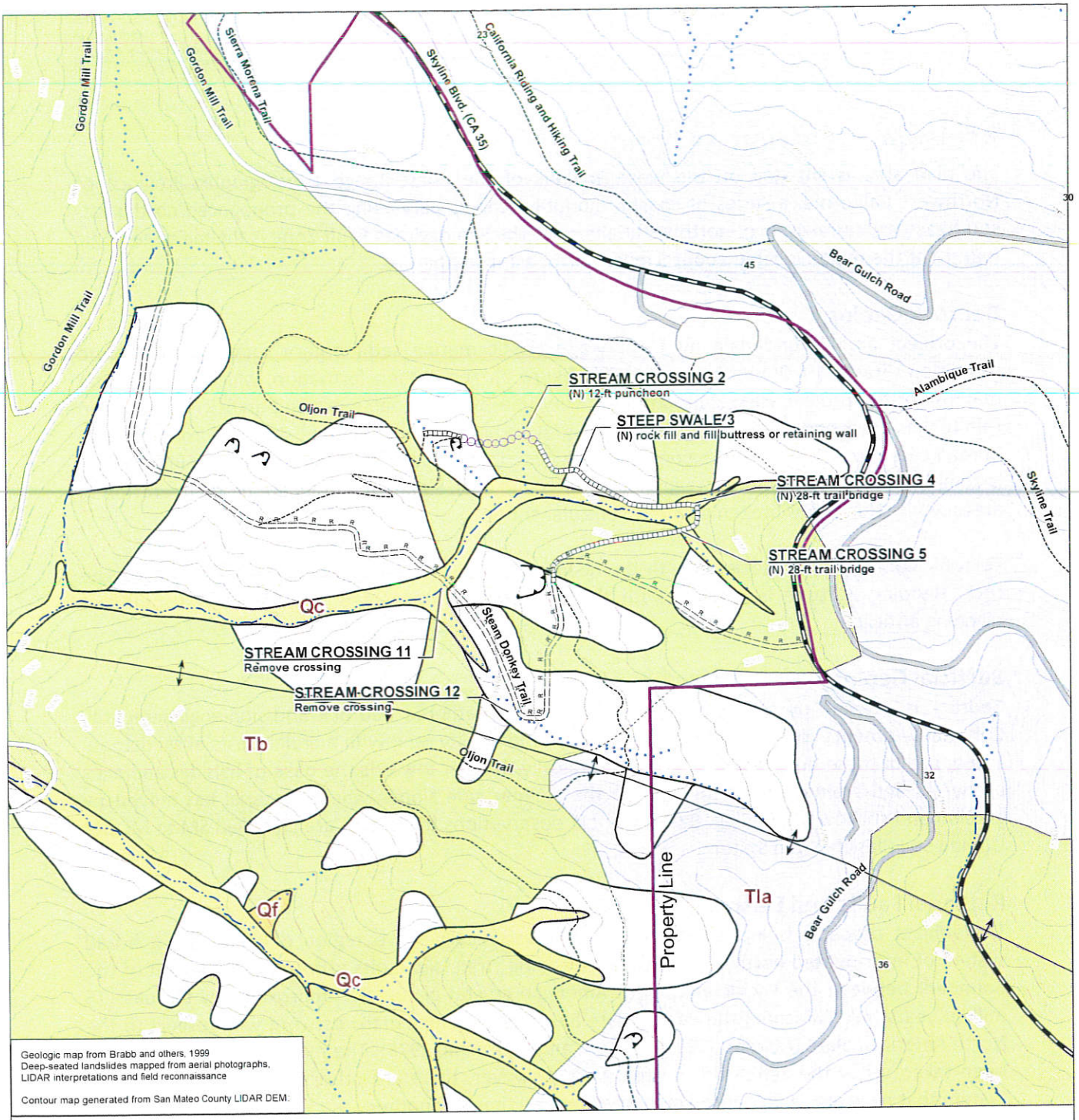
Surficial Geology

Bedrock is overlain by a thin mantle of colluvium, weathered bedrock and non-engineered fill. Colluvial sediments consist mainly of clayey silty sand to silty sand with angular clasts of sandstone. The depth of these deposits is variable but typically thickest towards the base of hillsides and axes of swales and drainages and thinnest on the steeper side slopes where material has moved by erosion and shallow landsliding. Based on field observations these soils are classified SM to ML per Unified Soil Classification System.

Regional Faults and Seismicity

The subject property is located within a highly seismically-active region of California. A broad system of inter-related northwest-southeast trending strike-slip faults represents a segment of the boundary between the Pacific and North American crustal plates. For approximately the past 15 million years (mid-Miocene) the Pacific plate has been slipping northwestward with respect to the North American plate (Atwater, 1970; Graham and Dickinson, 1978). The majority of movement has been taken up by the San Andreas Fault itself; however, there are other faults within this broad system that have also experienced movement at one time or another.

The regional faults of significance include the San Andreas, Pilarcitos, La Honda, and San Gregorio Faults. The subject site is located approximately 5 miles southwest of the active San Andreas Fault zone. The Pilarcitos Fault is located about 2.5 miles northeast of the site, the La Honda Fault lies 2 miles to the southwest and the San Gregorio Fault 5.5 miles to the southwest. However, the San Andreas Fault is the closest fault to the property with a high probability of generating a large magnitude earthquake in the next 50 years.



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GEOLOGIC and LANDSLIDE MAP
PROPOSED OLJON TRAIL: PHASE 4
Midpeninsula Regional Open Space District

FIGURE 2
Job: MPEN-OLJON-P4-649
Date: 04/06/2016

San Andreas Fault: The San Andreas Fault is an active, northwest-trending right lateral strike slip fault zone located about 5 miles northeast of the project site. The main trace of the fault trends northwest-southeast and extends over 700 miles from the Gulf of California through the Coast Ranges to Point Arena, where the fault extends offshore. The San Andreas Fault was responsible for the 1906 San Francisco earthquake (M_w 7.9) and the 1989 Loma Prieta earthquake (M_w 7.0).

The San Andreas fault system can be divided into segments with earthquakes of different magnitudes and recurrence intervals (WGONCEP, 1996). The great 1906 earthquake, the predominant historic seismic event of the San Andreas fault system in northern California, ruptured all currently locked segments of the fault (from near the Mendocino triple junction to San Juan Bautista.) The 1906 rupture overlaps portions of the independent subsegments (San Francisco Peninsula Segment and Santa Cruz Mountains Segment). Research into prehistoric events along the northern San Andreas fault indicates that a similar great event probably occurred most recently in the 17th century (Schwartz et al., 1986).

The San Francisco Peninsula Segment is the closest segment of the fault to the site. This segment of the San Andreas Fault has been assigned a slip rate that results in a M_w 7.3 earthquake with a recurrence interval of 400 years (WGONCEP, 1996). The 1906 segment of the fault has been assigned a slip rate that results in a larger M_w 7.9 earthquake with a recurrence interval of 210 years.

Seismic Shaking: Intense ground shaking is expected in the event of a major earthquake on nearby faults. The possibility of seismically induced landsliding and potential liquefaction exists. Trail repairs may be necessary in the event of a severe earthquake.

Expected ground motion parameters at the site were calculated from ground motion maps prepared by the California Geologic Survey and U.S. Geologic Survey (Cao et al., 2003; CGS, 2002; Petersen et al., 1996). These maps show an estimate of the likelihood of earthquake ground motions based on a probabilistic seismic hazard analysis. Such analysis incorporates seismic and geologic information to consider the probability of all possible damaging earthquakes, calculates the potential range of ground motions for each potential earthquake, and arrives at a level of ground shaking that has a given probability.

These maps form the basis for earthquake shaking potential in the regional assessment of liquefaction and seismically-induced landslides for zonation purposes. Ground motions shown on the maps are expressed as maximum horizontal accelerations having a 10-percent probability of being exceeded in a 50-year period (corresponding to a 475-year return period) in keeping with the UBC-level of hazard.

Mean Peak Ground Acceleration on rock (shear wave velocity (V_s^{30} = 560 m/s)) with a 10% probability of exceedance in 50 years is reported to be 0.57 (CGS, 2008).

Regional Landsliding

Landslides are common throughout the central Santa Cruz Mountains and are one of the dominant geologic forces shaping the modern landscape. Oversteepened slopes from tectonic uplift and rapid downcutting of streams, in concert with high intensity rainfall and intense seismic shaking have resulted in a number of large and small-scale landslides. Many landslides have occurred in recent years as a result of high intensity rainstorms, such as the January 1982 and February 1986 storms. These rainfall-activated landslides are typically shallow debris flows and soil slides triggered by elevated hydraulic pore pressures and/or hydrostatic loads. Such shallow landslides are generally restricted to the axis of shallow ravines and swales where surface and groundwaters are concentrated, and incorporate only the thin surface mantle of soil, colluvium and weathered bedrock. Large, deep-seated bedrock landslides are also common in the Santa Cruz Mountains, and typically appear to be initiated or reactivated by strong ground motions during earthquakes, most recently during the 1989 Loma Prieta earthquake.

Deep-Seated Landsliding: Review of the historic set of aerial photographs and interpretations of LiDAR imagery reveal that portions of the preserve are underlain by a series of relatively slow moving deep-seated translational block slides (Figure 2). These failures are characterized by benched topography and are formed by translational movement of a relatively intact mass with a failure plane that extends below the colluvial layer into the underlying bedrock. The slides typically consist of several smaller secondary blocks that coalesce together to form a larger landslide complex. These deep-seated landslides exceed 50 acres with a failure plane extending 50 feet or more into bedrock. Several sequences of internal scarps are often present between the ridge top and valley bottom.

The landslides within the preserve demonstrate varying levels of activity. Many appear weathered and subdued and are forested with straight-standing second growth conifers and old growth stumps. These slides correspond to the "dormant-young" to "dormant-mature" morphological age classification of Keaton and DeGraff (1996). Other slides show signs of relatively recent small-scale incipient movement based on “soft terrain features”, localized discontinuous scarps, and juvenile drainage patterns. Many of the watercourses are poorly to moderately incised into the landscape indicating that slide movement is continuing to infill the stream channel. In general, movement appears to be greatest along the toe of the slide complexes with the upper portions demonstrating a comparatively higher level of stability. Slide morphology suggests many of the slides have been periodically active for centuries.

Natural slide movement is attributed to the weak earth materials that underlie much of the hillside in concert with high groundwater conditions. The rate of deep-seated slide movement is considered to be slow and episodic, in response to long duration rainfall, undercutting of the hillslope by stream bank erosion and/or ground shaking from earthquakes on nearby faults. Due to the proximity of the San Andreas Fault to the watershed, high ground accelerations experienced during earthquakes are a significant contributing factor in the reactivation of many of the deep-seated failures within the watershed. Future slide movement should be expected in response to significant rainfall events or intense ground shaking during earthquakes. Future movement will most likely be small-scale displacements similar to what has occurred in the past. Catastrophic failure of the large slides is not expected.

Movement on deep-seated landslide slides could result in damage to the proposed trail requiring repairs to reopen the trail. Because of the small cuts and fills, new trail construction is unlikely to significant increase this risk. The proposed trail is unlikely to have a significant impact on slide stability since the mass balance and hydrology of the slides will not be substantially altered. The proposed cuts will be less than 4 feet and fills less than 2 feet deep, and therefore will have negligible to no impact on the slides where the failure plane is expected to exceed 50 feet in depth.

Shallow-Seated Landsliding:
The geomorphology of the hillslopes surrounding the area is also consistent with infrequent shallow landsliding. Shallow-seated landslides are present throughout the preserve. These include debris slides, debris flows, channel bank failures, and road fill failures, and are characterized by rapid, shallow (generally less than 10 feet thick) downslope movement of surficial soil, colluvium, and weathered bedrock. Most natural shallow slides are located on steep slopes and are triggered by elevated porewater pressures resulting from high intensity and/or long duration rainfall or from being undercut by stream bank erosion. Future shallow landslides will occur within the preserve during adverse climatic or seismic conditions regardless of landuse activities.

An inventory of erosion and stability problems along 35 miles of designated roads and trails within the preserve (Best, 2002) revealed several old fill and cutslope failures along the old logging roads and tractor trails. Most of these were attributed to thick fill loosely sidecasted onto steep slopes, poor road drainage, or failure of oversteepened cuts. Few failures have occurred in recent years, in part due to improved management practices. In addition, very few landslides occurred along the narrow (5-foot) wide recreational trails, even where those trails cross steep slopes exceeding 70% gradient. The low incidence of trail failures is attributed to the low cuts and fills along the trail, and frequent dips that prevent runoff from being concentrated. The proposed trail has been laid out to minimize crossing steep ground.

However, some portions of the proposed trail will need to cross steep ground and several debris flow runout paths, and therefore may be subject to impact from upslope debris slides and debris flows. Future debris slides and debris flows could result in damage to the trail requiring trail reconstruction.

SITE OBSERVATIONS

OLJON TRAIL OVERVIEW (BAY AREA RIDGE TRAIL)

The Oljon Trail will extend 1.75 miles from an existing staging area off Skyline Boulevard to the Spring Board Trail (Figure 1). The trail will be part of the Bay Area Ridge Trail and will provide a necessary eastern perimeter route to the El Corte de Madera Open Space Preserve trail system. The trail will be constructed in four phases. The first two phases have already been constructed; this report details Phase 4.

PROPOSED OLJON TRAIL PHASE 4

The final phase of the project (Phase 4) is a 1650-foot-long new trail to connect the two previously completed segments of the Oljon Trail. This segment of trail is routed across moderate to steep (20% to 70+%) sideslopes at 5% to 15% grade. The proposed trail will be constructed at a 4 foot width, mainly on balanced cut and fill. Cuts are expected to be between 1 and 4 feet high with fill less than 2 feet deep.

About 500 feet of the trail will follow remnants of an old intact tractor road that is in good condition given its age and lack of maintenance. Perched fill may be pulled back to narrow the old road to trail width. One low puncheon and two trail bridges are proposed at watercourse crossings.

Approximately 2,800 feet of the old Steam Donkey Trail are to be abandoned by pulling back perched fill and partially recontouring the hillside.

Crossing 2: Ephemeral stream crossing - Puncheon

This is a partially washed out and failing earth ford crossing located where an old 15 foot wide tractor trail crosses a narrow and steep gradient ephemeral watercourse draining a small (3 acre) watershed. The crossing was initially constructed for timber operations on fill loosely sidecasted onto steep slopes within the stream. Crossing volume is estimated to be less than 15+ cy with fill a maximum of 4 feet thick. Channel gradient is about 65% with adjacent sideslopes up to 75%. Past debris flow activity has likely occurred within the upper reaches of the drainage although none has occurred recently and little sediment has been deposited on the old tractor trail.

About 35 feet of the outer fill prism has partially failed and down-dropped about 12 to 18 inches, narrowing the tractor trail to about 7 feet. In addition, stream flow has eroded a shallow gully into the outer edge of the failing slide block. Displacement appears to be restricted to loose sidecast fill and some of the underlying loose colluvial soils. The age of the failure is unknown and presently the incipient scarps are partially vegetated over. Failure is attributed to saturation of thick loose fill that was sidecasted into the stream. The failing fill is judged to be unstable and will need to be removed.

The failure did not extend the full distance into the tractor trail prism with about 6 to 8 feet of the inside edge of the old tractor trail intact. This portion of the trail is founded on native soils that appear to consist of relatively competent Butano Sandstone. A large block of hard sandstone is located immediately east of the crossing. The competent nature of the underlying bedrock probably accounts for the steep slopes that characterize the local area. Routing the trail along the inboard edge of the crossing is appropriate from a geologic standpoint.

The District proposes to remove the failing fill (~ 20 cy) to form a channel that is as close as feasible to the natural watercourse grade and orientation. The proposed recreational trail will be rerouted along the intact inboard edge of the old tractor trail that is founded on native intact soils and cross the stream on a 12 foot long low puncheon. Onsite rock (12±inch diameter) will be used to help stabilize the excavated channel.

Site 3: Steep swale

New trail construction is proposed across a steep (55%) gradient swale immediately upslope of the junction of two old logging tractor trails. One of the tractor trails drops down the axis of the swale to the valley bottom occupying a shallow through-cut. The ground within the swale is wet with shallow gravely soils. No signs of recent instability or erosion were observed. The other tractor trail, on which the proposed trail is routed, contours across 55% to 75% sideslopes to the north. Although the tractor trail incorporates loose fill side casted onto steep slopes, outside of minor raveling there are no signs of gross instability.

The new recreational trail has been laid out to cross the swale at a location that minimizes the trail grade to less than 15%, avoids the wetter ground within the swale, and minimizes the number of large trees that would need to be removed on the adjacent approaches. About 50 feet of the trail will be built up on a full fill prism to avoid having to cut into the hillside at the swale axis where shallow seasonal groundwater would likely be encountered. Fill will be a maximum of 4 feet thick and keyed into firm native soils on the surface of an old tractor trail. The fill embankment will be inclined at 1.5H:1V slope. Based on my empirical review of other similar fill prisms in the preserve, fill instability is not expected; minor settling may occur over time but this will not affect the intended use of the trail.

At the axis of the swale about 20 feet of the trail will be constructed on either 1) a 3 foot high wood or rock retaining wall or 2) permeable rock fill (8 inch to 12 inch diameter rock imported to the site).

To avoid climbing at greater than a 15% pitch, about 90 feet of the recreational trail to the north of the swale will need to be constructed on a full excavated bench just downslope of the tractor trail. Excavated spoils may be used onsite to construct the compacted earth fill bench. To the south of the swale the recreational trail will traverse 50% slopes and may be constructed on balanced cut and fill.

Crossing 4: Ephemeral stream –Bridge

At this site the project proposes a 28-foot long wood foot bridge to span a small ephemeral watercourse draining a 12 acre forested watershed. The site is located within a broad (30 to 40 foot wide) moderate gradient (20%) alluvium/colluvium filled valley. Sideslopes are moderately steep ranging between 40% and 60% gradient. Slopes tend to be smooth and straight without signs of recent or active instability.

The valley bottom has been modified by past tractor operations associated with timber harvesting in the 1980s. Remnants of several legacy tractor roads (skid trails) are evident extending down the valley bottom and the stream channel appears to have been infilled by these operations. The active stream channel is presently moderately incised 1 to 2 feet though the old alluvial/colluvial sediments. Based on field observations it appears that the channel may be overtopped in some areas during large runoff events, particularly if the channel becomes blocked with woody debris. As such, there is the potential for the stream to meander within the valley bottom. The present channel bottom is vegetated with scattered mature redwoods and with scattered old growth stumps.

Photo looking downstream at bridge site. Remnants of an old tractor road is found to the right side of the photo. Center line of the bridge is marked by the two pink stakes.

The native subsurface profile generally consists of older alluvial / colluvial deposits overlying sandstone bedrock. Two shallow test pits hand augured to a depth of 3 feet reveal near surface soils to consist of medium brown silty sand with clay binder and clasts of sandstone up to 2" (SM per Unified Soil Classification System). Soils were medium dense at depth and based on field observations acceptable for bridge footings.

Groundwater was not observed at the time of my site visit in late summer 2015. However, seasonally high groundwater conditions likely exist.

The project proposes a 28-foot long foot bridge founded on concrete abutments. Abutments are to be embedded a minimum of 2 feet below native grade.

Geologic Hazards

Landsliding: Review of LiDAR bare earth imagery and field reconnaissance did not identify any recent or historic landslides of significance in the immediate vicinity of the bridge site. The proposed bridge site does not appear to be subject to landsliding.

Stream Flow and Flooding: Expected 100 year peak stream discharge of 24 cfs was calculated using the "rational method" as outlined in Cafferata et al. (2004) (See Appendix 1). This technique is often used in developing flow estimates for culvert sizing and other hydraulic design problems. The rational method utilizes a simple formula, Q = C I A, where instantaneous stream discharge, Q (cfs) is the product of a coefficient pertaining to the character of the watershed C, the precipitation rate I (in/hr), and the drainage area A (ac).

The bottom of the proposed bridge is to be elevated a minimum of 3.5 feet above the active stream channel with both abutments located well outside the active stream channel. Due to the thin veneer of alluvium/colluvium upstream and the shallow, broad profile across the drainage, it is

possible that the stream could migrate due to upstream blockage from debris and overtop the channel banks. The potential risk of this was not quantified but is believed to be low. Based on field observations the overall potential risk from flooding at the bridge site appears low.

Channel bank erosion: The ephemeral stream occupies a shallow 1 to 2 foot deep channel. Based on field observations the rate of channel incision appears low. Both bridge abutments are offset a minimum of 5 feet from the active stream channel. The potential risk from stream bank erosion at the bridge site appears low.

Intense Ground shaking: The proposed bridge site is located in close proximity to the San Andreas Fault. High ground accelerations would be expected during a large earthquake on this fault or other nearby faults. See subsequent Seismic Shaking section for a more detailed discussion of faulting and seismic hazards.

Liquefaction: Based on the clay-rich granular nature of the underlying soils, in conjunction with non-saturated conditions, liquefaction is not expected to pose a significant risk to the proposed structure.

Log Jam: Log jams are a natural phenomenon in narrow mountain streams. Future log jams could develop anywhere along the stream during large discharge events and could potentially impact the bridge site either directly or indirectly by diverting stream flow. This potential is difficult to quantify. It is my understanding that the bridge is not being designed to mitigate future log jams.

Tree Fall: Tree fall is common in forested areas. There are a number of factors that can cause trees to fall including disease, heavy precipitation, undercutting of the tree roots by stream bank erosion or grading, or even by intense shaking during earthquakes. Tree fall hazard is difficult to quantify and was not evaluated as part of this project.

Summary: Based on our limited analysis, there is a potential that the proposed bridge could be affected and/or damaged by several geologic hazards as previously discussed. It is our opinion that the bridge will be subject to a low to moderate level of risk during its lifetime. It is also our opinion that this level of risk is reasonable considering its intended use. The bridge may be damaged, but there is little risk to trail users. The proposed bridge and trail upgrade will not increase the geologic hazards.

Crossing 5: Ephemeral stream - Bridge

At this site the project proposes a 28-foot long wood foot bridge to span a second small and shallow ephemeral watercourse.

The site is located within a broad (20 to 40 foot wide) moderate gradient (20%) alluvium/colluvium filled valley bounded by moderately steep sideslopes ranging between 30% and 60% gradient. A remnant of a 1980's tractor road (skid trail) extends down the southwest side (left bank) of the valley bottom where it appears to have partially infilled the channel with thin fill. The valley bottom is vegetated with scattered mature redwoods and with scattered old growth stumps.

Photo looking upstream at bridge site. Center line of bridge abutments are marked by the pink stakes. Tractor trail is on the right side of the photos, the shallow watercourse on the left

The ephemeral stream drains a 7 acre forested watershed. At the bridge site the active stream channel is shallow (<2' deep) and poorly confined. Upstream of the crossing is a thin 1 foot thick veneer of recent sediment that has backed up behind a couple of logs, a redwood tree and a stump. It is quite likely that the stream migrates across the valley bottom in response to high storm flows and deposition events.

The native subsurface profile generally consists of older alluvial / colluvial deposits overlying sandstone bedrock. Shallow test pits were hand augured on both side of the crossing. On the west (left) bank of the crossing soils were a medium brown lean silty sand with cay binder (SM Unified Soil Classification System). Based on field observations the soils were medium dense and suitable for the bridge abutments. On the east (right) bank of the crossing, soils consisted on loose, organic rich silty sand with abundant roots becoming more competent at a depth greater than 3 feet. Total depth of the test pits was 4 feet. Based on field observations and bridge abutment depth of 4 feet appears appropriate. The project engineering geologist shall inspect the footing prior to placement of steel and concrete.

Ground was not observed at in either boring the time of my site visit in late summer 2015. However, seasonally high groundwater conditions likely exist.

The project proposes a 28-foot long foot bridge founded on concrete abutments. Abutments are to be embedded a minimum of 2 to 4 feet below native grade. Both abutments are to be located outside the active stream channel. About 10 feet of the left (southwest) bridge approach is to be built up on about 4 feet of compacted; after this the trail will be situated on a full bench as it climbs the hillside to the west.

Geologic Hazards

Landsliding: Review of LiDAR bare earth imagery and field reconnaissance did not identify recent or historic landslides of significance in the immediate vicinity of the bridge site.

The geomorphology of the steep slopes in the upper portion of the drainage is consistent with infrequent shallow debris flow and debris slide landsliding. Though no recent landslides were observed, the potential for a future failure cannot be ruled out. Based on qualitative field observations it is our opinion that there is a low to moderate potential for a debris flow to originate within the upper headwaters of the drainage within the design life of the bridge. If this slide is large enough it could extend downstream to the bridge site potentially damaging the crossing requiring the bridge to be repaired or replaced.

Stream Flow and Flooding: Expected 100 year peak stream discharge of 9 cfs was calculated using the "rational method" as outlined in Cafferata et al. (2004) (See Appendix 1). This technique is often used in developing flow estimates for culvert sizing and other hydraulic design problems. The rational method utilizes a simple formula, Q = C I A, where instantaneous stream discharge, Q (cfs) is the product of a coefficient pertaining to the character of the watershed C, the precipitation rate I (in/hr), and the drainage area A (ac).

The bottom of the proposed bridge is to be elevated a minimum of 3.5 feet above the active stream channel with both abutments located well outside the active stream channel. Based on field observations the potential risk from flooding at the bridge site appears low.

Channel bank erosion: The ephemeral stream occupies a shallow 1 to 2 foot deep channel. Based on field observations the rate of channel incision appears low. Both bridge abutments are offset a minimum of 5 feet from the active stream channel. The potential risk from stream bank erosion at the bridge site appears low.

Intense Ground shaking: The proposed bridge site is located in close proximity to the San Andreas Fault. High ground accelerations would be expected during a large earthquake on this fault or other nearby faults. See subsequent Seismic Shaking section for a more detailed discussion of faulting and seismic hazards.

Liquefaction: Based on the clay-rich granular nature of the underlying soils, in conjunction with non-saturated conditions, liquefaction is not expected to pose a significant risk to the proposed structure.

Log Jam: Log jams are a natural phenomenon in narrow mountain streams. Future log jams could develop anywhere along the stream during large discharge events and could potentially impact the bridge site either directly or indirectly by diverting stream flow. This potential is difficult to quantify. It is my understanding that the bridge is not being designed to mitigate future log jams.

Tree Fall: Tree fall is common in forested areas. There are a number of factors that can cause trees to fall including disease, heavy precipitation, undercutting of the tree roots by stream bank erosion or grading, or even by intense shaking during earthquakes. Tree fall hazard is difficult to quantify and was not evaluated as part of this project.

Summary: Based on our limited analysis, there is a potential that the proposed bridge could be affected and/or damaged by several geologic hazards as previously discussed. It is our opinion that the bridge will be subject to a low to moderate level of risk during its lifetime. It is also our opinion that this is reasonable considering its intended use. The bridge may be damaged, but there is little risk to trail users. The proposed bridge and trail upgrade will not increase the geologic hazards.

UPPER STEAM DONKEY TRAIL ABANDONMENT:

The project proposes to abandon and restore 2,800 feet of the upper Steam Donkey Trail. This segment of trail follows old logging roads and tractor trails that descend from Skyline Boulevard at locally steep 15+% grade. The steep grade, heavy use and aggressive braking by mountain bikes have caused most of the drainage structures (e.g. dips) to break down and fail allowing water to become concentrated. As a result portions of the trail have eroded several inches to nearly a foot. The trail is steep and prone to further erosion.

Because of the poor condition of this trail segment and difficulty to adequately maintain, the District proposes to abandon the trail. Trail abandonment will include removing and rehabilitating two watercourse crossings, removing perched and potentially unstable fill and recontouring the slope where feasible.

Crossing 11: Intermittent stream crossing removal

This is a 24 inch by 30 foot CMP located at an intermittent stream draining a 40± acre basin. The watercourse occupies a broad, low gradient (< 12%) alluvial valley and is entrenched a couple of feet. The culvert is functioning but will no longer be needed once the trail is abandoned. The project proposes to excavate the channel to native gradient (~ 10 cy of spoils) to form a 6 foot wide channel bottom with banks laid back to a 1.5:1 or gentler slope. Spoils will be compacted into the old trail prism on the north side of the crossing to minimize the potential for a stream diversion. Removing the crossing will ultimately restore natural channel function.

Crossing 12: Intermittent stream crossing removal

This is an 18± inch CMP located where an old tractor trail crosses a small ephemeral watercourse draining a 14± acre basin. The crossing volume is less than 10 cy with fill a maximum of 4 feet thick. The project proposes to remove the crossing and associated fill which will restore natural channel function.

DISCUSSION

The potential impact of the proposed trail on erosion and hillslope stability was evaluated based on qualitative field, air photo and LiDAR observations. A subsurface investigation was not undertaken and was outside the scope of this investigation. Recommendations for trail layout and design are based, in part, on the Road and Trail Erosion Inventory for El Corte de Madera Creek OSP (Best, 2002) which identified and evaluated erosion and stability problems along the 35 miles of designated roads and trails within the preserve. It is assumed that by avoiding those areas and

practices which have been shown to result in trail instability, significant adverse cumulative impacts associated with the proposed trail are unlikely to occur.

During the course of this investigation several alternative trail routes were considered and evaluated. The trail alignments outlined in this report are designed to provide the greatest level of stability while meeting the goal of achieving an eastern access route. The principal geologic constraints with the proposed trails are local steep slopes, deep-seated landsliding, trail erosion, and watercourse crossings.

STEEP SLOPES

Portions of the proposed trail will need to be constructed across steep sideslopes that may exceed 80% gradient in places. These steep slopes are generally smooth and straight without signs of recent or active natural shallow landsliding. The majority of the project trail does not cross debris flow source areas but does cross debris flow runout paths and therefore could be impacted from upslope debris slides or flows.

The proposed trail will be constructed at a 4 foot width generally resulting in a maximum 4 foot high cut with less than 2 feet of fill. Earth materials are mainly thin colluvial soils (sandy loam to silty sand with clasts of sandstone bedrock) overlying weathered bedrock at a shallow depth. The steeper slopes tend to be underlain by more competent bedrock at shallower depth. The trail will be constructed on a cut bench using standard trail construction techniques with fill scatter casted downslope at shallow depth.

Stability of the proposed trail across these steep slopes is evaluated based on qualitative field observations and empirical comparison to the performance of other roads and trails constructed across similar slopes. For the most part nearby old tractor trails and haul roads constructed across similar steep slopes with much greater fill depth and cutbank heights have fared well with few significant failures. Failures that have occurred were generally the result of thick fill sidecasted onto steep slopes, diversion of road runoff or oversteepened cuts. No significant problems have been observed or reported on existing narrow 5 foot wide trails, even where those trails cross steep slopes exceeding 75% gradient. The low incidence of trail failures is attributed to the low cuts and fills, and frequent dips that prevent runoff from being concentrated.

Based on the foregoing the stability of the proposed trail appears reasonable. Small scale cut bank instability and settling of fill is possible during infrequent large storms but unlikely to result in significant offsite impacts. Portions of the trail that cross debris flow runout paths could be impacted from upslope debris flows. This could result in damage to the trail requiring trail reconstruction or repair. This would most likely entail removing debris deposited onto the trail surface. The risk to users of the trail is considered small and is consistent with recreational trail use.

DEEP-SEATED LANDSLIDING

Portions of the trail will need to be routed across several large-scale deep-seated landslides. All of these landslides appear dormant without signs of recent or active movement, such as fresh cracks, leaning trees or offset road and tractor trail prisms.

The trail will not have any measurable impact on the stability of the larger landslides since the mass balance and hydrology of the slides will not be significantly altered. The proposed cuts and fills will be less than 4 feet which will have negligible to no impact on the slides where the failure plane exceeds 50 feet. This conclusion is supported by existing roads and tractor trails that were constructed across the slides with much larger cuts and fills and which have not demonstrated accelerated slide activity over time.

TRAIL EROSION

The Road and Trail Erosion Inventory for El Corte de Madera Creek OSP (Best, 2002) identified the most serious erosion problems occurring in areas where the road/trail gradient exceeded 15% making the road/trail difficult to adequately drain. Additional problems were observed on steep road pitches underlain by sandstone bedrock, where the exposed sandstone bedrock is broken down into loose sand by the tires of motor vehicles and bicycles. Most past problems occurred on older roads and trails that were not laid out with effective drainage structures.

To mitigate for the risk of accelerated erosion, the proposed trails have generally been laid out at less than 15% grade and will be constructed with an outsloped pitch incorporating frequent cross drains (e.g. rolling dips, reverse grades, nicks). Recommendations outlined in this report and accompanying plan sheets are intended to stabilize the trail tread and reduce the risk of trail related erosion to a level generally consistent with recreational trail use. Ongoing trail maintenance will be required.

STREAM CROSSINGS

There is one proposed low puncheon and two trail bridges at small stream crossings. All of the crossings have been designed to accommodate 100 year flood flows. The potential impact of the crossings on sediment production is expected to be less than significant.

SEISMIC SHAKING

The project site is in a seismically active area and is very close to the San Andreas Fault Zone, which is a major potential source of severe seismic shaking. Trail damage is possible in the event of a major earthquake on a nearby segment of the San Andreas Fault. The possibility of seismically induced landsliding and potential liquefaction exists. Trail repairs may be necessary in the event of a severe earthquake.

CONCLUSIONS

I am of the opinion that the proposed trail is acceptable from a geologic and erosional standpoint if all recommendations outlined in this report and accompanying plan set are properly implemented and maintained. The users of the trail, if exercising reasonable common sense, should not be subject to risks from naturally occurring geologic hazards beyond a reasonable level of risk. Although some damage to the trail or trail structures may occur during adverse geologic events (e.g. intense storms and high ground accelerations during earthquakes) it is unlikely that those geologic hazards will result in significant harm to hikers and recreational users provided that the trail and trail structures are routinely inspected, maintained and repaired as needed.

RECOMMENDATIONS

The following recommendations are also included in the plan sheets.

GENERAL

1) GENERAL NOTES
   a) The "District" shall be Midpeninsula Regional Open Space District , the "engineering geologist" (CEG) shall be Timothy C. Best, the "structural engineer" shall be Mayone Structural Engineering, Inc., and the "contractor" shall be the District or independent contractor to perform the work described herein. The engineering geologist has been retained by the District and is not affiliated with the contractor.
   b) All materials and workmanship shall conform to the project documents and applicable requirements.
   c) The contractor shall be responsible for coordinating the project documents with conditions at the site and shall verify existing grades, elevations and conditions prior to commencing work. Any discrepancies shall be reported to the engineering geologist and shall be resolved before proceeding with the work. Any deviation, substitution or alteration to the trail layout shall be subject to review by the engineering geologist.
   d) The contractor shall be responsible for the safety of the construction area during construction and shall provide necessary safety measures in accordance with all state and local safety ordinances. This requirement shall apply continuously and not be limited to normal working hours.
   e) The contractor shall notify the project engineering geologist a minimum of 7 days prior to commencement of work and a minimum of 7 days in advance of required inspections.
   f) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.
   g) The contractor shall provide the District and engineering geologist with the name and telephone number of the responsible person to contact, with regard to this project, 24 hours a day.
   h) Contractor shall be responsible for following any requirements of the permitting agencies including California Department of Fish and Wildlife 1600 agreement. Any discrepancies between permits and plans shall be brought to the attention of the engineering geologist prior to construction.
   i) Contractor shall be responsible for site clean-up to the satisfaction of the District.
   j) All construction equipment shall avoid contact with stream waters.
   k) Unapproved over-excavation shall be considered a permanent construction defect with potential significant risks and hazards for the owner and downslope properties.

2) EXAMINATION OF JOB SITE, PLANS AND SPECIFICATIONS
   a) This report and accompanying construction documents indicate general and typical details of construction.
   b) The Contractor shall examine carefully the site of work and the Plans and Specifications. The submission of a bid shall be conclusive evidence that the Contractor has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of this Investigation and the Plans and Specifications.
   c) The contractor shall recognize that the plans used for the drawings may differ from the actual physical site. Dimensions are approximate. Before proceeding with the work, it shall be the Contractor's responsibility to check the site in relation to the drawings and specifications. Report any discrepancies to the Owner and the Engineering Geologist.
   d) The Contractor must attend a pre-bid meeting with the Engineer prior to submitting a proposal to complete the proposed work. The Contractor may be required to attend a pre-construction meeting with the Engineer prior to the commencement of construction. The purpose of these meetings is so the

Contractor may ask questions concerning the work and to make sure the Contractor understands the permit conditions and environmental constraints.

e) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction

3) TRAIL LAYOUT

a) New trail, bridge and culvert shall be constructed as shown on these plans. Modifications to the alignment may be made based on onsite conditions. Contact Timothy Best, CEG (831-425-5832) for trail, bridge and culvert locations.

b) Final flagged trail alignment shall be reviewed by the project engineering geologist prior to any earthwork.

c) New trail shall be laid out to conform to natural terrain to create an aesthetically pleasing alignment. The alignment should avoid long straight reaches. The alignment should incorporate natural terrain features to form required reverse grades to the extent feasible.

d) Trail shall incorporate reverse grade dips per plans as specified and/or as directed by project engineering geologist.

e) Any modifications to the alignment shall be reviewed and approved by the project engineering geologist and District representative prior to the commencement of that work.

4) VEGETATION CLEARING and TREE REMOVAL

a) The trail corridor extends 3 feet to either side of the trail bed. The trail corridor shall be cleared of all vegetation including trees and logs less than 6 inches DBH. Trees greater than 6 inches DBH within the trail bed shall be removed only if indicated on the plans or with the authorization of the District representative.

b) All roots exposed during construction shall be clean cut to avoid tree damage.

c) Trim branches that extend into the trail corridor to leave 8 foot (minimum) to 12 foot (maximum) high vertical clearance.

d) When pruning, prevent branches from damaging tree or stripping the bark when the branch falls to the ground.

e) Lop vegetation into less than 6 foot pieces as necessary and scatter on ground at least 15 feet away from trail, out of sight, at height no more than 18 inches. Do not cover existing vegetation with debris.

f) It is the intent of this project to minimize any damage to native vegetation. Only if needed for logistical or safety considerations would small trees (less than 12 inches in diameter at breast height) or larger trees (exceeding 12 inches in diameter) be removed. Where any tree is removed the ground will be reshaped per 5 (g) and (j): Trail Grading and Excavation on the construction document. These notes states: *g) Contractor shall treat all disturbed areas with erosion control measures, as provided under erosion control in these notes* and *j) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, planting etc., and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.* These recommendations are intended to ensure that resulting holes or cavities are back filled and the slope regraded smooth. Backfilled holes will be compacted to level equal to surrounding native soils – over compaction is not recommended as it could impede vegetation regrowth.

5) TRAIL GRADING & EXCAVATION

a) The proposed trail shall be constructed along the mapped alignment represented in the attached sheets.

b) Trail shall be constructed at 5-foot max trail width on full bench with spoils spread or broadcast below trail at depth less than 8 inches, unless otherwise specified or directed by engineering geologist

c) Areas to receive structural or broadcast fill shall be stripped to remove all vegetation, roots, brush, highly organic soils and other unsuitable fill material (~ 4" depth).

d) Structural fill placed greater than 6 inches deep shall be compacted to minimum 85 percent relative compaction (per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary. Structural fill shall be placed no steeper than 1.5H:1V(unless otherwise specified or directed).
e) Cuts shall be inclined 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils unless otherwise specified on plans.
f) The contractor shall exercise due care to preserve existing vegetation outside of grading.
g) Contractor shall treat all disturbed areas with erosion control measures, as provided under erosion control in these notes.
h) All deleterious spoils from site excavation not used as structural fill shall be spread onsite per plans as directed by project engineering geologist.
i) In the event that any unusual conditions not covered by the plans and specifications are encountered during excavation operation, the engineering geologist shall be immediately contacted for directions. It shall be the contractor's responsibility to immediately notify the engineering geologist upon discovery of any field conflicts.
j) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, planting etc., and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.

6) ROAD AND TRAIL ABANDONMENT
a) Road abandonment shall be made in accordance with plans and typical design specification.
b) Final limits of excavation to be identified by project engineering geologist at time of construction
c) Place and compact excavated spoils along inside edge of tractor road to recontour slope. Excess spoils to be endhauled to approved stable location as directed by project engineering geologist.
d) Apply erosion control measures per notes. Where exposed area exceeds 20 feet in slope distance install erosion control blanket (Tensar Rollmax C125BN or equivalent) per manufactures guidelines.

7) ROCK
a) All rock used for rock energy dissipaters shall conform to applicable Caltrans standards.

8) BRIDGES and ENGINEERING
a) Crossing 2 is a 12 foot long wood puncheon and crossings 4 and 5 are 28 foot long pedestrian trail bridges with concrete abutments. Puncheon, bridge and abutments designed by Mayone Structural Engineering Inc. Refer to Sheet C2 for puncheon and bridge location and Sheets S1 and S2 for details.

9) EROSION CONTROL, WATER POLLUTION PREVENTION AND HOUSEKEEPING
a) During project construction, the contractor shall be responsible for implementing appropriate and necessary erosion control measures to minimize storm water runoff from the construction site, pursuant to applicable regulations and permits. The following strategies to ensure that storm water pollution is prevented shall be employed:
- Minimize erosion and sedimentation during construction.
- Eliminate pollution of storm runoff by chemicals and materials used in the construction process.
- All temporary erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each work day. At a minimum, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction related runoff and/or sediment from entering into the watercourses.
- The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm events.

b) Exposed mineral soils outside of the trail running surface greater than 50 square feet (sf) and with exposed slope distance exceeding 10 feet and with less than 80% ground coverage of natural vegetation shall be mulched in order to reduce the potential for short-term sheet and rill erosion.

- Mulching:
  - Use native mulch where feasible.
  - Where native mulch is unavailable and/or as directed by the engineering geologist or designee, mulch using 1-1/2" to 2" of approved certified weed-free straw mulch.

c) Unnecessary grading and disturbance of soil shall be avoided.

d) All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction.

e) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

10) TIMING

a) Work shall be conducted during the dry season and as permitted. All erosion control measures shall be implemented by October 15 or prior to inclement weather, whichever comes first. Erosion control measures shall be installed & maintained continuously during construction

11) HOUSEKEEPING

a) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.

12) STAGING AND ACCESS

a) Construction staging areas will be restricted to existing roads or other areas where permitted by District representative.

b) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.

c) Upon completion of construction of the crossings the access route and staging areas shall be restored to their original condition.

d) The contractor shall carefully preserve the surrounding property by confining operations within the limits of work. Construction work or equipment operations shall not be conducted outside the designated work area boundary without approval of the engineer.

13) PROPERTY BOUNDARY

a) District shall be responsible for verifying the location of all property lines and easement areas.

14) SUPPLEMENTAL RECOMMENDATIONS

a) If undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at this time, Timothy C. Best shall be notified so that supplemental recommendations can be given.

15) CONSTRUCTION MANAGEMENT PLAN PROVISIONS

a) Construction access shall be as directed by owner. Impacts to the access route must be minimized and disturbance along the access route must be restored to pre-construction conditions upon project completion.

b) Upon completion of construction of the trail the access route and staging area shall be restored to their original condition.
c) The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain (including covering exposed piles of soil and wastes); dispose of all wastes properly, place trash receptacles on site for that purpose, cover open trash receptacles during wet weather, remove all construction debris from the site.
d) At all times during project construction activities, copies of the approved final plans, copies of permits, and a copy of this report shall be maintained at the construction job site (where such copies shall be available for public review) and all persons involved with the construction shall be briefed on the content and meaning of each prior to commencement of construction.

16) UNDERGROUND UTILITIES
a) Contractor shall assume all responsibility for location and avoidance or repair of all utilities, including, but not limited to water lines. Contractor shall verify location of all utilities whether shown on the drawings or not. If the contractor fails to adequately protect the utilities, any resulting damage shall be repaired at contractor's cost.

17) SITE DRAINAGE
a) Water runoff must not be allowed to pond adjacent to the top of the fillslopes.
b) Surface runoff naturally flows downhill. Drainage improvements should include provisions to intercept surface water from flowing toward new cut/fill grading.
c) Collected water may be discharged downslope from improvements in a way so as not to induce erosion. Do not discharge collected water at the top of a slope.
d) Where cuts expose seepage then provisions must be made for its control and discharge in a way so as not to cause erosion.

18) ROAD DRAINAGE
a) Rolling dips, knicks, waterbars and ditch relief culverts shall be as specified on plans.
b) Rolling dips may be constructed using approved onsite or imported engineered fill
c) Ditch relief culverts shall be installed per standard specifications.
d) Road prism shall be reshaped as necessary to drain to dips and culverts.

19) INSPECTIONS
a) The project engineering geologist (CEG) shall be provided an opportunity to review project plans with the contractor during the pre-construction meeting to evaluate if recommendations have been properly interpreted. They shall also provide foundation excavation observations and earthwork observations and testing during construction. This allows them to confirm anticipated soil conditions and evaluate conformance with our recommendations and project plans. If they do not review the plans and provide observation and testing services during the earthwork phase of the project, they assume no responsibility for misinterpretation of the recommendations.
b) Regulatory Agencies may require a final grading compliance letter. We can only offer this letter if we are called to the site to observe and test, as necessary, any grading and excavation operations **from the start of construction**. We cannot prepare a letter if we are not afforded the opportunity of observation from the **beginning of the grading operation**. The contractor must be made aware of this and earthwork testing and observation must be scheduled accordingly. Please contact our office: Tim Best (831) 425-5832 (office) (831) 332-7791 (mobile)

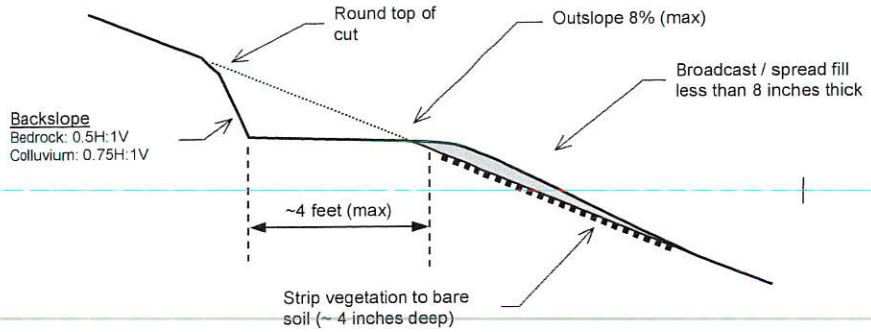
20) INSPECTION SCHEDULE

a) As required to allow observations and testing of:

i. Trail and bridge alignments
ii. Culvert positions
iii. Limits of excavation
iv. Keyway
v. Fill placement
vi. Energy dissipater shape and position
vii. Finish grades
viii. Trail drainage (dips, knicks, etc)
ix. Erosion control

TYPICAL GRADING SPECIFICATIONS

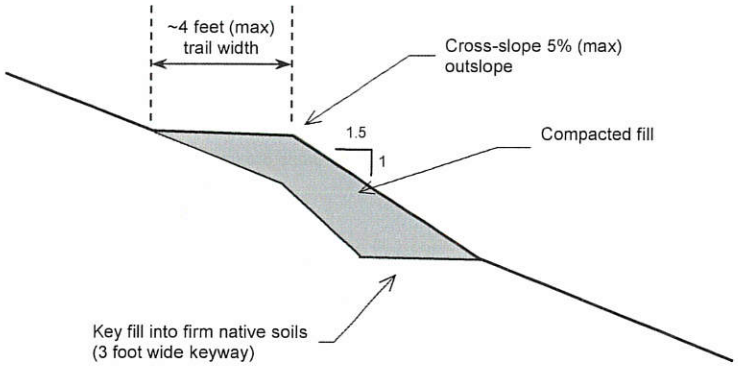
1/N3 **CUT BENCH TRAIL**
NTS



NOTES

- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width.
- Trail shall be constructed on full bench with fill broadcasted below the trail to a depth less than 8 inches.
- Areas to receive broadcast fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Broadcast fill shall be not be spread within 25 feet of a watercourse.
- Cutbank backslope shall be inclined at 0.5H:1V in competent bedrock and 0.75H:1V in colluvial soils.
- Disturbed areas outside trail tread shall be treated to control erosion per specifications. Where feasible exposed ground shall be slash packed
- Specifications are indented only as guideline, modifications may be made in the field by engineering geologist or designee

2/N3 **FILL BENCH TRAIL**
NTS

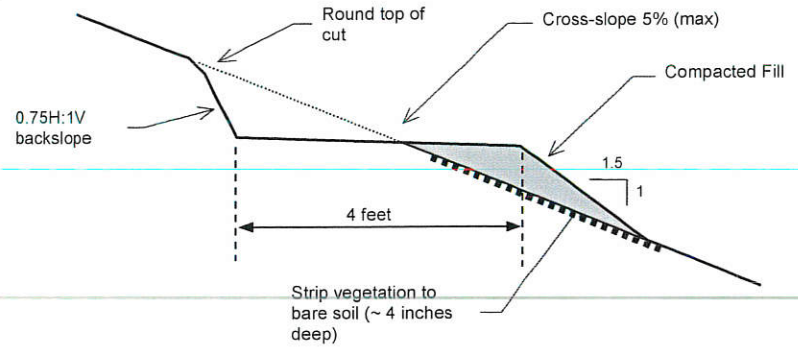


NOTES

- Trail shall be constructed at 4 foot maximum width unless otherwise specified in plans, or as directed.
- Areas to receive fill shall be stripped to remove vegetation, near-surface roots, brush, highly organic soils and other unsuitable fill material. Depth of stripping is assumed to be 6 inches.
- Fill shall be keyed and benched into firm native soils. Keyways shall be minimum 3 feet wide and inclined 5% into slope.
- Onsite soils may be reused as fill. Fill shall be adequately moisture conditioned and compacted to a level equal to or greater than the surround materials (minimum 85 percent relative compaction per ASTM D 1557); During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
- Fill embankment shall be inclined no steeper than 1.5:1 unless otherwise specified or directed.
- All disturbed areas shall be treated to control erosion per specifications. Place slash or straw roll below base of fill unless otherwise directed.
- Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee.

FROM SHEET N3: CUT/FILL AND PARTIAL BENCH SPECIFICATIONS

3/N3 **PARTIAL BENCH TRAIL CONSTRUCTION**
NTS



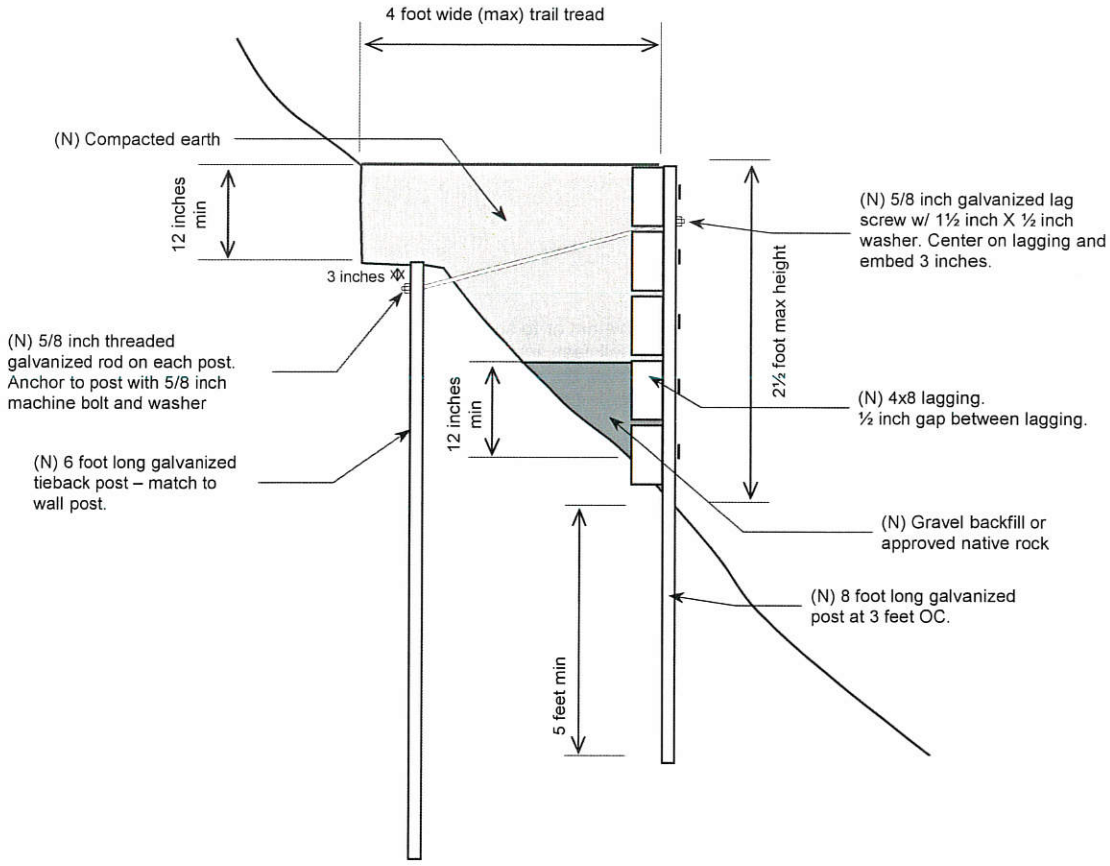
NOTES

- Unless otherwise specified on plans or directed in field, the following shall apply.
- Trail shall be constructed at 4 foot maximum width on balanced cut and fill.
- Areas to receive fill shall be stripped of vegetation and highly organic soil (~ 4" depth).
- Onsite soils may be reused as fill. Fill shall be compacted to a level equal or greater than the surrounding native materials (approximately 85 percent relative compaction per ASTM D 1557). During placement and compaction of fill, the moisture content of the materials being placed shall be maintained as necessary.
- Fill shall be a maximum of 24 inches thick unless otherwise specified.
- Fill embankment shall be inclined no steeper than 1.5:1 (unless otherwise specified).
- Cutbank backslope shall be inclined at 0.75H:1V slope. Where cuts are steeper than 6 feet or where seepage of water or unsuitable earth materials are encountered, the backslope shall be selected by the project geotechnical consultant.
- All disturbed areas shall be treated to control erosion per specifications.
- Specifications are intended only as guidelines. Modifications may be made in the field by engineering geologist or designee.

TYPICAL TRAIL RETAINING WALL SPECIFICATIONS

All retaining walls are low structures (less than 36 inches high). Their design is based on the standard of practice for trail construction including design criteria outlined in California State Parks Trails Handbook, US Forest Service Trail Construction and Maintenance Notebook (2007) and International Mountain Bike Association Trail Solutions (2004). They also rely heavily on what has worked well on District lands and that can be readily constructed in a remote region.

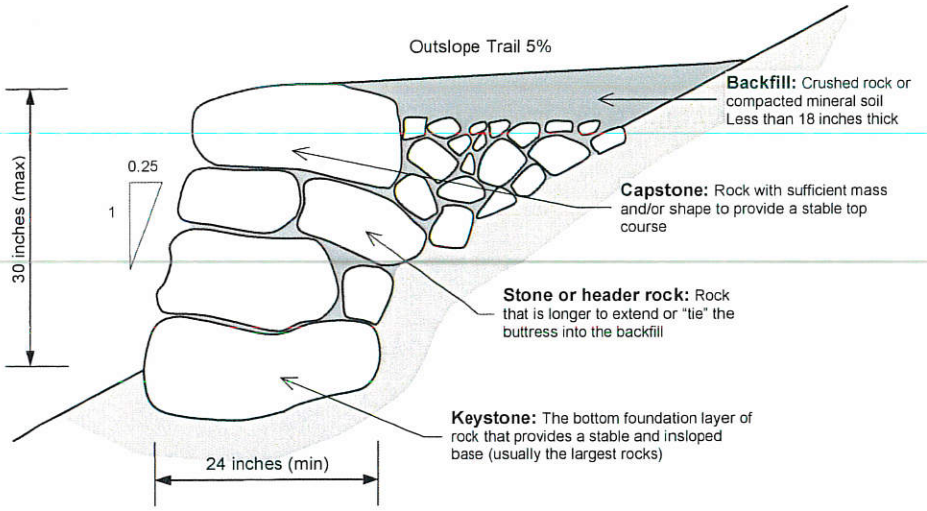
13/N8 **WOOD RETAINING WALL- TRAIL (Typical)**



NOTES

- Post shall be 8 foot x 2.0 lbs/ft galvanized U-Channel conforming to ASTM A4999, Grade 60.
- Final depth of post embedment to be determined in field by project engineering geologist based on on-site soil conditions.
- All wood shall be pressure-treated Douglas-fir or clear heart redwood unless otherwise specified or approved.

14/N8 ROCK BUTTRESS - TRAIL (Typical)

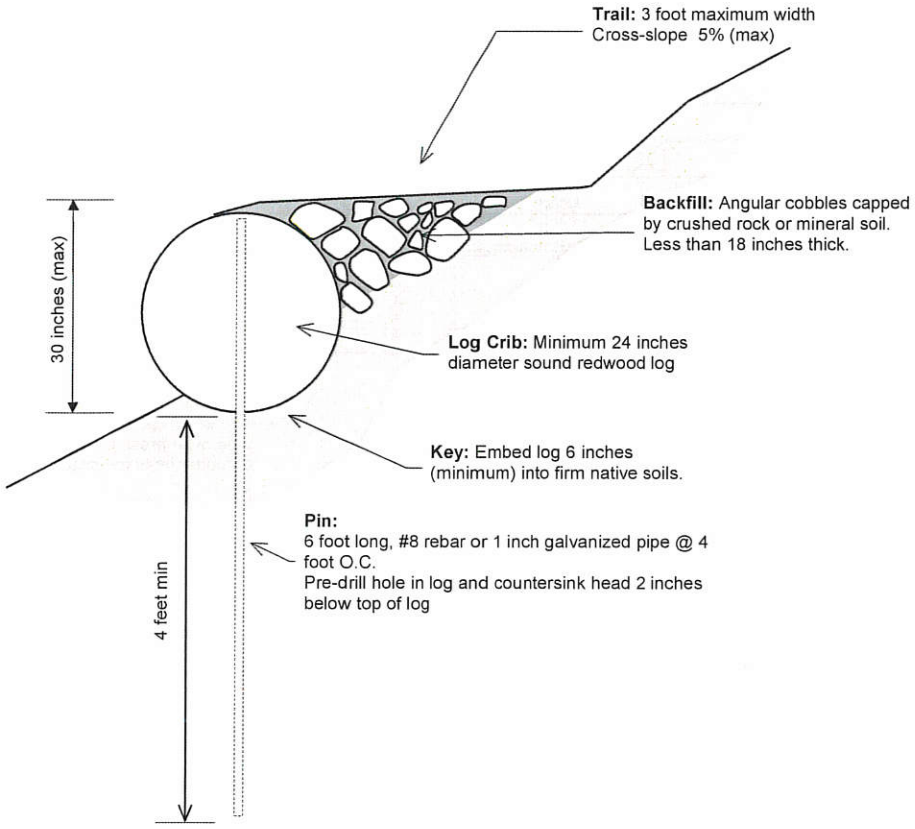


NOTES

- Excavate a keyway footing to firm, stable dirt or to solid rock. Slope the footing slightly into the hillside (*batter*) so the rock buttress will lean into the hill and dig footing deep enough to support the foundation tier of rocks (these are usually the largest rocks in the buttress). The footing is dug so that the foundation tier is embedded for the full thickness of the first layer of rocks.
- Construct buttress using sound durable rock. A minimum of 50% of the rock shall be larger than 18 inches (130 lb min). Ideally, the bigger the rock, the better, since big rocks are less likely to shift or become dislodged. The best rock is rectangular with flat surfaces on all sides. Round river rock is the worst.
- The ***keystone*** is laid into the footing and successive tiers are laid. For each tier, overlap the gaps between rocks in the next lower tier, called breaking the joints. Each tier should be staggered slightly into the hill to create the desired amount of batter. ***Header rocks*** are long rocks turned and placed so that they extend deep into the hillside. Using header rocks is particularly important if the buttress's cross section widens as the buttress gets higher. The ***capstone*** is the top rock layer with sufficient mass to provide a stable trail tread.
- Rocks in each successive tier should be set so they have at least three points of good contact with the rocks below. Good contact is defined as no wobble or shifting under a load, without relying on shims (or chinking) to eliminate movement. Shims are prone to shifting and should not be used to establish contact, especially on the face of the buttress, where they can fall out. Add backfill and tamp crushed rocks into the cracks as you build.
- Project engineering geologist or District designee shall flag the location of the rock buttress prior to construction
- Specifications modified from U.S. Forest Service Trail Construction and Maintenance Notebook, 2007 Edition (Hesselbarth et al., 2007).

15 / N9 SINGLE LOG CRIB WALL - TRAIL (Typical)

(NTS)



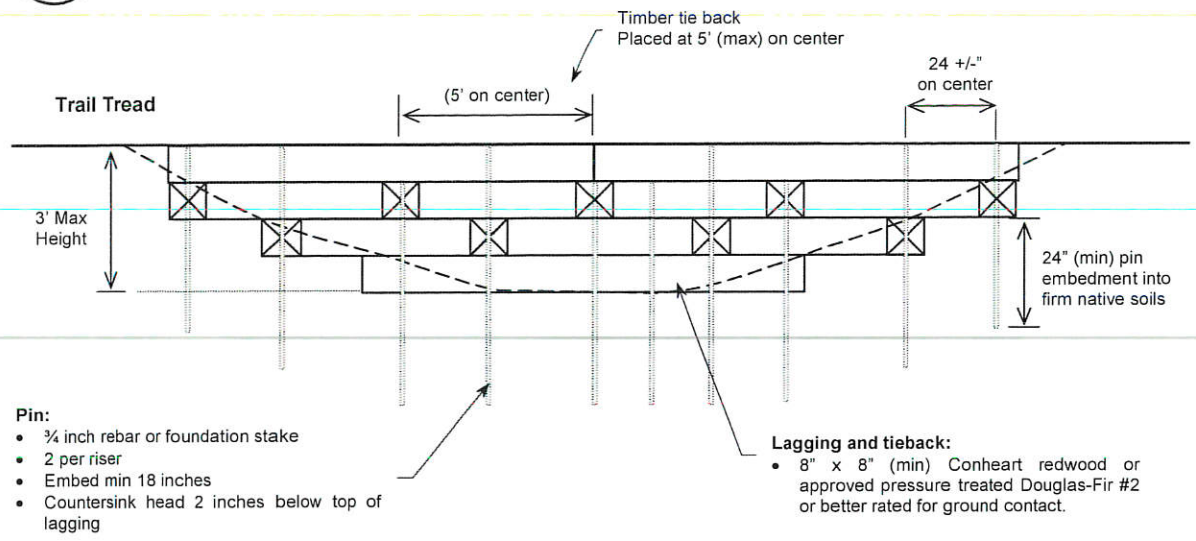
NOTES

- Log shall be a 24 inch (min) diameter sound durable redwood log. On-site logs used for the buttress shall be approved by District representative and the project engineering geologist prior to construction.
- Log shall be placed in a minimum 6 inch deep keyway. Where possible key the log upslope and against existing trees.
- Backfill behind log with crushed angular cobbles and cap trail tread with crushed aggregate or compacted mineral soil.
- Pin log using 6 foot long # 8 rebar or 1 inch galvanized pipe. Predrill hole in log and countersink head 2 inches below top of log. Pins to be installed at 4 feet O.C. unless otherwise specified or directed.
- Project engineering geologist or designee shall flag the location of the log buttress prior to construction.

16
N9

TIMBER TIE BACK CRIB WALL

NTS

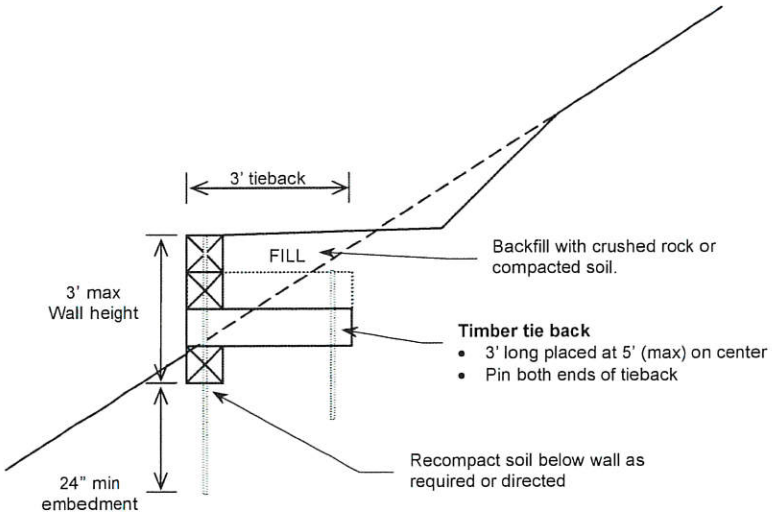


Pin:

- ¾ inch rebar or foundation stake
- 2 per riser
- Embed min 18 inches
- Countersink head 2 inches below top of lagging

Lagging and tieback:

- 8" x 8" (min) Conheart redwood or approved pressure treated Douglas-Fir #2 or better rated for ground contact.



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APPENDIX 1: STREAM CROSSING SIZING

Proposed stream crossings were sized to pass the expected 100-year flood flow and associated debris. Crossings are sized based on methodologies outlined in Designing watercourse crossings for passage of 100-year flood flows, wood, and sediment (Cafferata et al., 2004), incorporating field observations of channel geomorphology and office-based calculations of flood flow. To accommodate sediment and woody debris, culverts were generally oversized based on field observations.

Culvert size for 100 year design flood flow is based on Normann et al. (2001). Calculations assume corrugated metal pipe, rocked headwall and headwater height to pipe diameter (H/W) of 0.9.

STN	Basin Area (acres)	Basin Length (feet)	Basin Relief (feet)	Tc (min) (a)	100 year precipitation ("/hr) for Tc (b)	Runoff Coefficient C	Method (c)	Q 100 (cfs)	Calculated Culvert Diameter (in) (d)	Proposed Crossing
C2	3	500	200	15.0	4.3	0.3	Rational	4	18	12 foot long low puncheon
C3	12	1200	270	15.0	4.3	0.3	Rational	15	30	28 foot long bridge
C4	12	670	270	15.0	4.3	0.3	Rational	9	24	28 foot long bridge

NOTES

(a) Time of Concentration: Calculated using methodology outlined in Dunne and Leopold (1978). Minimum 15 minute Tc per Cafferata et al. (2004);

(b) Rainfall Intensity: From NOAA Atlas 14, Volume 6, Version 2

(c) Q100: Basins < 200 acres: based on rational method outlined in Dunne and Leopold (1978) and Cafferata et al. (2004); Basins > 200 acres based on Magnitude Frequency method outlined in Cafferata et al. (2004);

(d) From Normann et al. (2001) HW/D ratio of 0.9 and rocked headwall. 18 inch minimum culvert diameter.

INVESTIGATIVE LIMITATIONS

1 The purpose of this study was to evaluate the implications of the proposed trail with respect to erosion and hillslope stability for its intended use as an infrequently used recreation trail.

2 My observations were limited to surface expressions and limited natural and artificial exposures of subsurface materials at and adjacent to the project site. For the above reasons, the conclusions should be considered limited in extent. The plan does not guarantee stability of the trail, rather it is intended to provide recommendations that will reduce the likelihood of future erosion. Unforeseen drainage conditions may result in additional erosion.

3 This written report comprises all of my professional opinions, conclusions and recommendations. This report supersedes any previous oral or written communications concerning my opinions, conclusions and recommendations.

4 The conclusions and recommendations noted in this report are based on probability and in no way imply the site will not possibly be subjected to ground failure or seismic shaking so intense that structures or roads will be severely damaged or destroyed.

5 This report is issued with the understanding that it is the duty and responsibility of the client, or his or her representative or agent, to ensure that the recommendations contained herein are fully implemented.

6 The findings of this report are valid as of the present date. However, changes in the conditions of a property or landform can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside my control.