Midpeninsula Regional Open Space District

Memorandum

DATE: May 25, 2022

MEMO TO: Board of Directors

THROUGH: Ana Ruiz, General Manager

FROM: Jared Hart, Senior Planner
Julie Andersen, Senior Resource Management Specialist
Aaron Peth, Real Property Planner III

SUBJECT: Highway 17 Crossings Design Aesthetics

BACKGROUND

The Highway 17 Wildlife and Regional Trails Projects (collectively the Highway 17 Project): MAA20-001 (Wildlife Crossing) and MAA20-002 (Regional Trail Crossing) were the highest ranked priority actions during the Vision Plan Process in 2014. The Project supports the Midpeninsula Regional Open Space District's (District) goal of providing safe, regional wildlife and trail access across Highway 17 near the Lexington Reservoir just south of the towns of Monte Sereno and Los Gatos. A total of $14 million in Measure AA funds is allocated to the two projects.

District staff began working on the project in 2014, and completed the Caltrans Project Initiation Document phase, including finalization of the Project Study Report-Project Development Support (PSR-PDS) process in October 2019. At that time, the Board of Directors (Board) approved moving forward with the environmental analysis of four crossing alternatives for the Highway 17 Project (R-19-136) as part of the Caltrans Project Approval and Environmental Document (PA&ED) phase. Work on the PA&ED phase is underway, and staff is currently working with the District's consultant (AECOM) to complete preliminary engineering designs and environmental review. In January 2022, one of the wildlife undercrossing alternatives was removed from consideration because it was found to be infeasible to construct. The remaining wildlife undercrossing alternative (Alternative 2) and the two trail overcrossing alternatives (Alternatives 3a and 5a) appear feasible and are continuing into environmental review and design. For locations, see Attachment 1 Project Area Map.

During the PSR-PDS phase, the Board expressed interest in incorporating aesthetic and interpretive/educational enhancements into the highway crossing structures. To address this topic, AECOM has prepared a technical memorandum that identifies design enhancement options and associated cost implications (Attachment 2). Design enhancements to improve aesthetics and incorporate interpretive/educational elements can be achieved while maintaining Caltrans' standard structural design elements and staying within the PSR-PDS generated cost estimates for the project. Potential design enhancements generally include improved fencing, concrete stamping, and murals, as described further below.

DISCUSSION

The Highway 17 Project includes construction of a trail overcrossing and a separate wildlife undercrossing across State Highway 17, making the project highly visible by the public. The structure renderings developed during the PSR-PDS phase, included in AECOM's technical memo, represent typical Caltrans structures. However, as the project moves through the next two phases of the Caltrans process, PA&ED and Plans, Specifications and Estimates (PS&E), there are opportunities for incorporating visual enhancements without triggering design exceptions that may not be feasible and/or approved by Caltrans. These enhancements will improve aesthetics and function as interpretive/educational elements.

The engineering designs for the two trail overcrossing alternatives include precast concrete bridge structures with safety curbs and chain-link safety fencing. Design for the wildlife undercrossing includes a precast concrete arch culvert with standard sound walls along the roadway above the undercrossing connecting to wildlife directional fencing. Aesthetic enhancements, including examples and cost considerations, are as follows.

Fencing

Caltrans typically allows flexibility in fencing design. Decorative types of fencing, including the use of alternative materials such as wrought iron or installation of metal cutouts can improve aesthetics, provide visual interest, and incorporate interpretive elements. Examples, including pictures, are provided in the technical memo prepared by AECOM (Attachment 2) and include:

- Curved ornamental lines along the fencing.
- Metal cutouts of native animal and plant species attached to the fencing that serve as a public education element.
- Fencing resembling the profile of surrounding mountains.

Incorporating enhanced fencing elements for the Highway 17 Project overcrossings (not including the wildlife directional fencing) would be visible to recreational trail users and passing motorists and would cost up to approximately $45,000 for Alternative 3a and $145,000 for Alternative 5a in 2022 dollars.

Concrete Stamping

Concrete stamping creates an aesthetic design using special liners to layer architectural concrete in custom shapes and designs on top of structural concrete. For the Project, concrete stamping could occur along the overcrossing structures and/or on the sound walls above the wildlife undercrossing. Some examples highlighted in the attached technical memo include concrete stamping with designs that reflect the surrounding landscapes and local heritage. Costs for concrete stamping on the wildlife undercrossing sound walls (which would be visible to passing motorists) could range from approximately $192,000 to $432,000 in 2022 dollars. For an additional cost, stamping can also be applied to the overcrossing and retaining wall structures associated with connecting trails.

Murals

Murals are another form of aesthetic enhancements that can be applied directly onto structures or created offsite and then digitally transferred to panels that are secured to the structure. Murals range in complexity and can be created by professional artists, graphic design specialists, or

community artists such as school children. For the Highway 17 Project, murals could be applied to elements of the structures such as the concrete piers of the bridge and wildlife crossing sound walls. Examples as highlighted in the attached technical memo include:

- Panels painted by children that reflect the surrounding landscape and history.
- Paintings of wildlife on overpass columns.
- A mural on the underside of an overpass that captures the connection between features in the mural with the surrounding natural and built environment.

Costs for murals would range based on complexity, size, installation methods, and the artist(s) chosen to create the mural(s). Murals may also entail policy decisions by the District or could be subject to other agencies' public art policies and programs related to procedures such as selection of an artist and ownership and maintenance of the artwork.

The examples listed above (fencing, concrete stamping, and murals) are all enhancements that can be incorporated while maintaining Caltrans' standard structural design and staying within the current schedule and total estimated budget of the Project. There are other overcrossing designs that, if feasible, could technically be implemented but are not recommended because they would require additional time to design, substantially increase Project costs, and may not be ultimately approved by Caltrans. Redesign options could include curving features or a completely different structure such as a cable-stayed overcrossing. Several examples of these nonstandard designs are included in the attached technical memo for reference.

CONCLUSION AND NEXT STEPS

To enhance the aesthetics of the over and under crossings, one or more of the three enhancements described above (fencing, concrete stamping, and/or murals) could be added to the structures and stay within the overall Project cost estimates. These aesthetic enhancements provide an opportunity to educate the community, trail users, and motorists of the District's mission of protection and preservation of the natural environment, the use of publicly supported Measure AA funds, and highlight the project goals related to wildlife and human connectivity.

The Project is currently in the Caltrans PA&ED phase, which includes preliminary engineering designs and environmental review. As part of the environmental review process, aesthetic and visual impact minimization measures, including structural design enhancements, may be incorporated into final designs in the next phase of the project (PS&E). Additionally, AECOM will create updated renderings of the over and under crossing structures during the PA&ED phase that will include visual representations of one or more of the design enhancements described above. Updated renderings are anticipated in fall 2022 and will be provided to the Board and public as part of the CEQA/NEPA document review process. Prior to preparation of the renderings, District staff will return to the Board for consideration of design criteria that will serve as guiding principles for the project's design team. The criteria would be used to inform conceptual design of aesthetic enhancements during the PA&ED phase and more detailed design in the PS&E phase.

The PS&E phase will include development of final engineering drawings and is the time when specific design enhancements are formally incorporated into the project. During the PS&E phase, it is anticipated that the Santa Clara Valley Transportation Authority (VTA) will be the project lead through a future Project Delivery Partner Agreement as described in the February 9, 2022 Project Status Update Informational Report. As part of the PS&E process, project design

elements can be included in the Request for Proposals (RFP) issued by VTA for an engineering design consultant, which would ensure PA&ED identified aesthetic enhancements are incorporated into the final project. During the PS&E phase, staff recommends collaborating with VTA, Caltrans, the County of Santa Clara and other project partners, and seeking input from the Board and the public to further refine the design elements for the highway crossing structures that will serve as both aesthetic enhancements and interpretive elements. All structural aesthetic enhancements within the Caltrans right-of-way must be approved by and meet Caltrans requirements.

The current Highway 17 Project schedule for construction of the multi-use trail overcrossing, connecting trails, wildlife undercrossing, and associated directional fencing is as follows:

Milestones	Tentative Timeline
Board consideration of CEQA Caltrans PA&ED approval	Summer/Fall 2023
PS&E	2023 - 2025
Bidding and Construction	2025 - 2027

Attachment:

1. Project Area Map
2. AECOM Aesthetics Memorandum dated April 4, 2022

Path: G:\Projects\a_DistrictwideHwy17_Wildlife_Crossing_Maps\OverviewMaps\Hwy17_OverviewforBoardReport_wRavineCreekFootnote_20220427.mxd

Created By: apeth

While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

AECOM
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Project Name:
Highway 17 Wildlife and Regional Trail Crossings and Trail Connections

Project Reference:
60635999

To:
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CC:
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From:
Kristin Tremain Davis and Abhijeet Bhoi

Date:
April 4, 2022

Aesthetics Memo

Subject: Overcrossing and Sound Wall Design Aesthetics and Cost Examples

Purpose

Midpeninsula Regional Open Space District's (Midpen's) Highway 17 Wildlife and Regional Trail Crossings and Trail Connections Project (project) will provide a multiuse pedestrian, equestrian, and bicycle bridge overcrossing along with a separate wildlife undercrossing that will connect over 30,000 acres of open space currently divided by California State Route (Highway) 17. In addition to the crossings, the project also includes installation of wildlife directional fencing and sound walls along the roadway above the wildlife undercrossing. The purpose of this technical memorandum (memo) is to present the current draft design plans for the multiuse trail overcrossing and sound walls, and to provide a suite of aesthetic design options that could be added to these current Caltrans standard designs for additional scope and budget.

The aesthetic enhancements may also serve as interpretive and educational elements and/or as public art, providing information about area wildlife, the surrounding environment, and the importance of wildlife corridor linkages. This suite of aesthetic enhancement options may include interpretive elements such as interpretive panels approaching the overcrossing landing area on the east side (northbound direction) of Highway 17.

The project is currently in Caltrans' Project Approval and Environmental Document (PA&ED) phase. Aesthetic enhancements are typically described and depicted at a conceptual level during PA&ED to allow for public input and are then incorporated during the detailed design phase (the Plans, Specifications, and Estimates [PS&E] phase). For this project, it is intended that Midpen, Midpen's Board, and the public will have the opportunity to provide input on the aesthetic enhancements developed during the PA&ED phase.

Current Engineering Designs and Plans

AECOM engineers are developing engineering designs that meet Caltrans design standards, and which represent typical Caltrans structures. These include precast concrete bridge structures with safety curbs and chain-link safety fencing, as described in further detail below. Creative latitude can be achieved while still maintaining these standard structural design elements by adding aesthetic decorative enhancements to the fencing and concrete stamping and pigment on the structure. In addition to aesthetic enhancements, a wide range of different bridge structure types could be designed to meet Caltrans design standards but would significantly increase the cost of this project, as described further below.

The project includes two alternatives for a multiuse trail connection overcrossing: Alternative 3a – Southern Overcrossing and Alternative 5a – Northern Overcrossing. The proposed alternatives are described below, and layout plans and profiles for

both alternatives are included in Appendix A. The project includes one alternative for a wildlife undercrossing: Alternative 2 – Trout Creek. Design of the sound walls for Alternative 2 is currently under development.

Alternative 3a Overcrossing

The Southern Overcrossing would be a precast concrete bridge with a span of 150 feet over Highway 17 and a minimum vertical clearance of 28 feet, 10 inches over the roadway. The structure depth would be 4 feet, 11.75 inches and would have a 6-inch tall and 6-inch wide concrete curb above the bridge deck that would serve as a safety feature for wheelchair users. A chain-link safety fence would sit on top of the concrete curb.

Pre-PA&ED Rendering of the Alternative 3a Trail Overcrossing

Alternative 5a Overcrossing

The Northern Overcrossing would be a precast concrete bridge with a span of 119 feet over Highway 17 and a minimum vertical clearance of 22 feet, 11 inches over the roadway. The structure depth would be 6 feet, 4.75 inches and would also include a 6-inch concrete curb with a standard chain-link safety fence. On the east side of Highway 17, the overcrossing would provide a 364-foot-ramp to connect to the existing Los Gatos Creek Trail, for a total of 483 feet of structure length.

Pre-PA&ED Rendering of the Alternative 5a Trail Overcrossing

Sound Walls at Alternative 2 Trout Creek Undercrossing

Alternative 2 would include a precast concrete arch culvert with a natural bottom beneath Highway 17. The culvert would be 90 ft long, 36 ft wide and 9 to 12 feet tall, supported by wingwalls. Sound walls would be added along the roadway above the wildlife undercrossing (Alternative 2) at Trout Creek. They would serve to diminish traffic noise around the Trout Creek underpass and to improve the approach by wildlife in the creek corridor. Design for the sound walls is currently under development. The sound walls would be 10-12 feet in height and would extend approximately 800-900 feet in length. Sound walls would be masonry above concrete.

Pre-PA&ED Rendering of the Alternative 2 Wildlife Undercrossing

Example Aesthetic Designs and Cost Considerations

This section provides an overview of aesthetic enhancements from a diverse array of real-world highway designs. Enhancements range in complexity from those that could be added to the existing overcrossing designs (aesthetic enhancements), to those that would require completely new designs (new overcrossing designs). Aesthetic enhancement examples include a range of designs for fencing above the bridge deck, concrete treatments in the form of stamping and coloring for the bridge sides and retaining walls, and murals. Additional details including costs are provided where available.

The memo is subdivided into the following sections:

1) Modifications to Current Design:

- Aesthetic Enhancement Examples: Fencing
- Aesthetic Enhancement Examples: Concrete Stamping (bridges and/or walls)
- Aesthetic Enhancement Examples: Murals

2) Examples that would require New Design

1) Modifications to Current Design

Aesthetic Enhancements Examples: Fencing

The Caltrans structures group typically allows flexibility in fencing design. Decorative types of wrought iron fencing have been used on past overcrossing projects designed by AECOM. The fencing could be molded into desired patterns. A color theme could be used which integrates well with the desired aesthetic vision. Typical costs for fencing depend on the complexity of designs and could vary from around $50 to $300 per linear foot.

Alternative 3a is currently being designed as a 150-foot overcrossing. Based on the above example costs, typical estimated costs for fencing enhancement raw costs could range approximately $7,500 to $45,000 in current 2022 dollars.

Alternative 5a is currently being designed as a 119-foot overcrossing with a 364-foot-ramp to connect to the existing Los Gatos Creek Trail, for a total of 483 feet of structure length. Based on the above example costs, typical estimated costs for fencing enhancement for 119 feet of fencing could range approximately $5,950 to $35,700 in current 2022 dollars and for all 483 feet could range an estimated $24,150 to $145,000 in current 2022 dollars.

A suite of fencing examples ranging in complexity is provided below.

Native Birds and Curved Lines on Fencing: Casilada Pedestrian Overcrossing, Sacramento, California

Image Source: Google.com/maps

The Casilada Way Pedestrian Overcrossing is part of the Sacramento Interstate 5 “SAC 5” Corridor Enhancement project in Sacramento, California. On this project, metal cutouts of native birds, along with the curved background lines, were added to

the safety fencing, along with curved fencing along the pedestrian walkway bridge approach. The elevated and offset bird tails and heads above the fence height in some locations provides additional visual interest to the standard safety fencing. Additionally, the bird cutouts may serve as a public education element, illustrating different native bird species common to the project area.

The overcrossing was replaced to meet current Americans with Disabilities Act (ADA) standards and is part of a larger effort to rehabilitate 67 lane miles, construct 23 miles of carpool lanes, and improve existing electrical and drainage systems along the Highway 5 corridor between Elk Grove and Sacramento, California. The total project cost is $370 million. The cost of the overcrossing itself was not found in available information online. Construction began in July 2019 and is expected to be complete in summer 2022.

Historic Themed Fencing and Aspen Trees: Fairview Drive and Koontz Lane Overpasses, Carson City, Nevada

Image sources: Google.com/maps

In a multiphase project effort sponsored by the Nevada Department of Transportation (NDOT), the Fairview Drive and Koontz Lane overpasses were constructed to relieve traffic congestion, provide flood control protection, and streamline the U.S. 395 corridor. The aesthetic treatments pay tribute to the Sierra Nevada Mountains and visual themes of the American West. At Fairview Drive, metal cutouts secured to the safety fence depict native plants and pack animals to visually reference Carson City's frontier history and geographic location as the gateway to the Sierra Nevada Mountains.

At Koontz Lane, the pillars of the overpass are decorated to look like the trunks of the iconic aspen tree, and the overpass itself has 1,500 metal leaves along the safety fencing. And on the side of the freeway, the aspen tree sculptures continue with

a metal shepherd guiding a flock of sheep down one side of the freeway and up the other. The total project cost for the construction of the two overpasses was approximately $200 million. The aesthetic components of both projects were a small portion of the overall project cost and used local materials and artists to support the local economy and art community.

Mountain Pass Pedestrian Overcrossing, Phoenix, Arizona

Images Source: laurielundquist.com

The Mountain Pass pedestrian overcrossing is located at Nisbet Road spanning Arizona State Highway 51 in Phoenix. The design was inspired by the nearby Squaw Peak range and the safety fencing resembles the jagged profile of the mountain peaks. It was built in 1997. The overcrossing is 300 feet in length and 16 feet high. It is made from concrete, steel, and chain link fencing, and meets safety requirements for pedestrian overcrossings. Each peak was individually detailed and fabricated using galvanized pipe. The design was created in partnership with Laurie Lundquist, SVR Inc. and HDR Engineers. The project was a joint partnership project between the City of Phoenix and Arizona Department of Transportation.

Air Force Jet Metal Figures on Overpass in Moreno Valley, California

Image Source: pe.com

The Air Force jet metal figures on the overpass at the I-215 and Van Buren Blvd. in Moreno Valley show metal cutouts placed along the outside of the overcrossing safety fencing, which varies in height along the crossing. Concrete stamping is present on the overcrossing structure beneath each jet.

Aesthetic Enhancements Examples: Concrete Stamping

In the concrete stamping process, an architectural concrete layer is placed on top of structural concrete by using special formliners. The forms create a stamped pattern on concrete which could be repeated to create an aesthetic design. The formliners are produced using a CADD design as input and thus offer flexibility in producing intricate design patterns. Costs typically depend on the complexity of designs and could range from $40 to $90 per square foot.

For the Hwy 17 project, concrete stamping could occur along the overcrossing structures (119 – 150 ft in length) and/or the sound walls above the undercrossing (approximately 800 - 900 ft in length). For example, a 200 ft long concrete stamping design 12 ft in height along one sound wall could range approximately $96,000 to $216,000 in current 2022 dollars. Stamping on both sound walls of this size would range from approximately $192,000 to $432,000. More complex and larger stamping along the sound walls could cost over $1M. A suite of concrete stamping examples is provided below.

Perris Recreation, Perris, California

Images Source: pe.com

This project is located along I-215 in Perris, California. The design includes concrete stamping along sound walls that reflect the community's focus on recreation. The stamping includes images of parachutists, trains, and boats. The aesthetics component of the project, which was overseen by Riverside County Transportation Commission, cost over $1M in 2011. As part of the design, near Fourth Street Bridge, laser-cut, powder-coated aluminum panels were installed above a concrete stamped train to represent smoke rising from the train's smoke stack.

Strawberries and Artichokes: Salinas Road Bridge, Monterey County, California

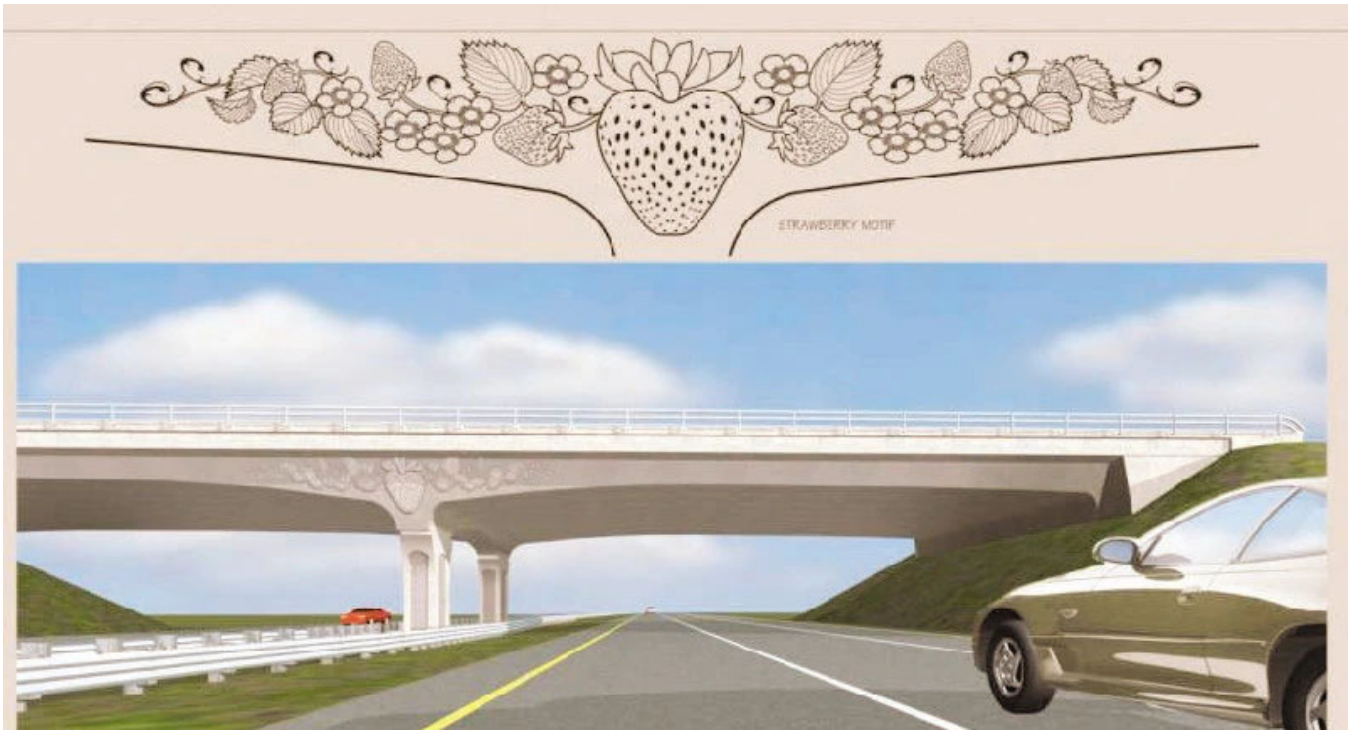

Image Source: santacruzsentinel.com

Image source: Google.com/maps

The Salinas Bridge Road overpass was constructed in 2012 to ease traffic congestion between the Monterey Bay and Pajaro Valley. The overpass features a stamped concrete design in the overpass footing to honor the heritage of this agricultural region. A sculptural detail of strawberries is visible to drivers entering Watsonville, and an elaborate artichoke is visible to drivers heading toward Castroville.

Other features of the underpass include a slight arching on the underside of the bridge and a ribbed concrete surface on the columns, both of which are intended to mimic sand dunes and pay tribute to the topography of the Central Coast. The 10-year planning effort for this project included a community advisory group that presented several ideas for the motif before the final design was selected. The total cost of the bridge was approximately $30 million.

Stone Detailing and Rest Areas: Elk Grove Creek Trail Overcrossing, State Route 99, Elk Grove, California

Image Source: Google Earth

Image Source: roadsbridges.com

The Elk Grove Creek Trail Crossing at State Route (SR) 99 provides connectivity to the existing trail systems on either side of the freeway. Design elements were added to the 1,280-foot-long multi-use bridge to help break up the continuous concrete surface and add visually interesting elements. These include the City of Elk Grove's City Seal, trapezoidal cut-outs showing textured stone, and similar stone detailing on the columns.

Two resting areas elevate out beyond the typical width of the bridge and are both functional and serve to break up the long expanse of concrete for an added aesthetic element. Long approach landing areas on either side contain switchbacks to provide connections to the existing trail system as well as to local streets that parallel the freeway. The total cost of the project was $8 million, and construction was completed between May 2013 and April 2014.

Awards received:

- Sacramento Section 2014 American Society of Civil Engineering (ASCE) Outstanding Bridge & Bikeway Project

Additional Examples to Illustrate Concrete Stamping

 Image Source: Google.com/maps	Color and texture added to retaining walls for more natural look *Location: Highway 12 between Cordelia and American Canyon in the Bay Area, California*
 Image Source: AECOM	Oak leaf and hill motif using dark and light shades of grey concrete on retaining wall mimicking oak-dotted hills in the surrounding landscape *Location: Paloma Way at I-680/Calaveras Road Interchange in eastern Alameda County, California*
 Image Source: Google.com/maps	Grapevine detail on retaining wall to honor wine region. Aesthetic stamping estimated cost was $1.2M in 2013*. This included stamping along three approximately 1200 ft long and 25 ft high concrete retaining walls. *Location: SR 84 (Isabel Avenue) in Livermore, California* **Note costs are not current to 2022.*
 Image Source: AECOM	Tree Pattern on retaining wall to honor Burlingame's "City of Trees" moniker. *Location: US 101 (Broadway) in Burlingame, California*

  Image Source: http://www.lindapattersondesign.com	Images of native wildlife on concrete retaining walls *Location: San Tomas Aquino/Saratoga Creek Trail in Santa Clara, CA*
 Image Source: Scott Systems; https://www.concretenetwork.com/anne_balogh/concrete_walls.htm	Images of native buffalo on concrete sound barrier walls *Location: Denver, CO* The T-REX (Transportation Expansion Project) in Denver includes 19 miles of highway expansion and light-rail construction on Interstate Highways 25 and 225. Concrete sound-barrier walls were installed with design elements depicting Colorado's geography and wildlife, including giant buffalo, swallows, and aerial views of farmland. Surface Strategy LLC and Big 3D Productions of Colorado created the art for the project.
  Image Source: Scott Systems; https://www.concretenetwork.com/anne_balogh/concrete_walls.htm	Images of giant lizards and cacti on concrete wall *Location: Pima Freeway, connecting Phoenix to Scottsdale, AZ* The desert wall that runs along the Pima Freeway, called *The Path Most Traveled*, ranges in height from 20 to 60 feet and includes almost 100 abstract and representational desert-inspired motifs, including 40-foot-tall prickly pear cacti and 67-foot-long giant lizards.

Aesthetic Enhancement Examples: Murals

Murals are another form of aesthetic enhancement, and can be painted directly onto project structures or created offsite and then digitally transferred to panels that are then secured to the structure. This can include on the inside of the crossing structures, as well as on the outside of the structures and the concrete piers and sound walls. Murals range in cost and complexity. They can be painted by professional artists or in the case of the example below, school children. Note that policy implications may be present with the inclusion of public art in Midpen-funded improvements.

Forbes Mill Bridge, Los Gatos, California

Image Source: New Museum Los Gatos

The Forbes Mill Footbridge Mural in Los Gatos, CA is located along the inside of the pedestrian overcrossing. The project consists of children's artwork. The murals were painted by Los Gatos youth and reflect the surrounding landscape and history. To create the murals, children painted artwork offsite, which was then digitized and transferred onto vinyl panels that were added to the overcrossing structure. The crossing includes 156 panels in total. The project began in 1994, with panels painted between 1996 and 1998. Refurbishment of the panels as a result of chipping, cracking, and vandalism began in 2002 and was completed in 2013[1].

Giraphics Mural, Harrison Street and I-580, Oakland, CA

Image Source left: Google.com/maps; Image Source right: Giraphics mural - Oakland - LocalWiki: https://localwiki.org/oakland

[1] Los Gatos Forbes Mill Footbridge Murals to Be Re-Dedicated | Los Gatos, CA Patch

The Giraphics Mural in downtown Oakland where I-580 crosses over Harrison Street features paintings of giraffes on the concrete overpass piers. They were painted by Dan Fontes in 1983. The paintings were repainted in part in 1994 due to seismic retrofit work to the structure and the remainder in 2016. The giraffes are based on the photography of Rick Mannshardt of the Oakland Zoo[2].

Transformation Mural beneath Overpass in Newburg, NY

Transformation is a three-dimensional full-immersion mural by Chilean-born street artist Dasic Fernández, which spans the length of a bridge underpass and encompassing over 7,500 square feet of wall space. It is located on the South Street side of Downing Park in Newburgh, NY. The complete mural features a profile of a woman merging with the Hudson River and transforming into the building blocks of a revitalized city, capturing the intimate connection between the individual and the built environment[3].

Images source: Dasic Fernández, graffiti street murals artist (dasicfernandez.com) https://dasicfernandez.com

[2] Giraphics mural - Oakland - LocalWiki: https://localwiki.org/oakland/Giraphics_mural?msclkid=5f666e76b17511ec894eb5b5c1b83f6a
[3] Street Art by Dasic in Newburgh, New York, USA | Chilean-bor… | Flickr: https://www.flickr.com/photos/bobbyzny/11538173433

Voz Libre: Pedro J. Gonzalez Freeway Pier Mural, Chicano Park, San Diego, CA

Images source: Todd Stands

This mural, titled ""Voz Libre: Pedro J. Gonzalez" was painted by lead Chicano Park mural artist Michael Schnorr. It mural was later restored by Michael Schnorr, Victor Ochoa, Guillermo Rosette, Yasue Goudera and Todd Stands[4].

[4] Chicano Park Map and Mural Restoration Project (chicano-park.com): http://chicano-park.com/cpmap.html

2) Examples that would require New Design

In this section, new overcrossing design examples are provided, which would require redesign from the current alternatives engineering designs. In addition, the custom nature of these structures would typically require additional costs, considerations, such as additional permitting or Caltrans approvals, and overall project schedule impacts beyond the alternatives structures currently being designed for the project.

U.S. Highway 101/Ralston Avenue Pedestrian/Bicycle Bridge

Image Source: tylin.com; Photo Credit: Tom Paiva

Image Source: BKF Engineers

The 2,460-foot-long Ralston Avenue Pedestrian and Bicycle Bridge crosses over U.S. Highway 101 north of Ralston Avenue in San Mateo County. Color is the most immediately striking feature of this bridge with bright blue handrail and barrier, and a clean, bright white for the base. The curves and flowing lines of this bridge are reflective of the curves in the adjacent freeway off-ramp. The project features a Class 1, at-grade bikeway along the north side of Ralston Avenue, as well as an overcrossing bridge across U.S. Highway 101 for connections to the Bay Trail, Redwood Shores, and the Belmont Sports Complex. This bridge opened in November 2011 and the total cost of construction was $7.9 million, with $0.6 million coming from San Mateo County Measure A, and the remainder mostly from federal funds.

Awards received:

- 2012 Project of the Year (American Public Works Association's Silicon Valley Public Works)
- 2012 Small Project of the Year – Bridge Engineering Project of the Year (ASCE San Francisco Section)
- 2012 Outstanding Pedestrian Bridge Project Award (ASCE Region 9)

T.Y. Lin International served as prime engineering consultant and provided bridge engineering services from initial concept through construction. BKF was responsible for civil engineering design and surveying services for conceptual and final civil designs for the pathways.

Clarke Avenue U.S. Highway 101 Bicycle/Pedestrian Overcrossing Project

Image Source: Biggs Cardosa Associates Inc.

The Clarke Avenue Pedestrian Overcrossing at U.S. Highway 101 provides residents of East Palo Alto access to shopping centers, schools, churches, city government offices, parks and open spaces. The bridge features a Class 1 pedestrian and bicycle overcrossing structure and officially opened in 2019. The curving serpentine shape breaks up the linear features of the surrounding urbanized area while maximizing protection of trees and landscaped areas. The overcrossing features lighting at night with lights pointing downward onto the pavement to reduce glare for highway and frontage road traffic.

The overpass cost approximately $14 million, and much of the funding came from California's Active Transportation Program ($8.6 million) with additional funds from a combination of local sources. This project was considered to be the second-most expensive project (at the time) that was recommended for Caltrans funding from the new consolidated Active Transportation Program. Biggs Cardosa provided structural design consultation services throughout the feasibility study phase of the project and provided project management and structural design services for the bridge PS&E portion.

Highway 101 Pedestrian/Bike Bridge Project (Adobe Creek)

Image Source: City of Palo Alto

The U.S. Highway 101 Pedestrian/Bike Bridge Project at Adobe Creek is located in the City of Palo Alto and connects major technology and research-based companies (such as Google, Intuit, and Space Systems) to regional trails and bike facilities in the Baylands. The bridge features a Class 1 trail connection using a design that is reminiscent of a railroad trestle. The bridge replaces an underpass that was open only seasonally due to flooding. The project was outlined in the City of Palo Alto's Infrastructure Plan and was completed in November 2021. Funding came from a collection of local, state and federal sources including a $5.5 million grant from the County of Santa Clara's Stanford Recreation Mitigation Fund, $4.35 million form the Metropolitan Transportation Commission's One Bay Area Grant Program and $1 million from Google. The City of Palo Alto identified the project value as approximately $23 million.

Biggs Cardosa Associates, Inc, in association with FMG Architects, Callander Associates Landscape Architecture, and BKF provided the design and engineering services, and Granite Construction Company held the construction contract.

Don Burnett Bicycle/Pedestrian Bridge (Mary Avenue Footbridge)

Image Source: structurae.net

The Don Burnett Bicycle-Pedestrian Bridge (renamed from Mary Avenue Bridge) is the first cable-stayed overcrossing over a freeway in California. The bridge design is aesthetically modern and geometric, with repeated linear features and bright silver color. The 325-ft-bridge provides a bicycle and pedestrian connection between the City of Cupertino and the City of Sunnyvale. The cost of the project was $14.8 million and it was completed in 2009.

Awards received:

- 2009 Helen Putnam Award for Excellence from the League of California's Cities for design and construction

Schwager Davis Inc. carried out project scoping for all design collaboration, material furnishing, and technical support of the stay cables. The contractor was Golden State Bridge, and architecture was completed by HNTB Corporation.

Conclusion

The project structures are currently being designed to meet Caltrans design standards as typical concrete slab bridges with chain-link safety fencing. The project is in the PA&ED phase, and conceptual design of aesthetic enhancements can be achieved during this phase through collaboration with Caltrans, project partners, Midpen's board, and the public. Aesthetic enhancements can be added to improve the overall aesthetic value of the project's structural elements and can serve to provide educational value to the project's purpose. Aesthetic enhancement opportunities range from fencing modifications, concrete stamping and pigment for bridges, bridge piers, and sound walls, murals, as well as new overcrossing structures requiring new design.

As demonstrated in several examples provided, close collaborations with departments of transportation and project stakeholders resulted in aesthetic treatments that successfully met the project needs. Costs range widely from mural painting at the lower end to complete structure redesign at the upper end. It is important to note that new structures would not only require new design, but would also require additional time, project costs, schedule delays, and other considerations. For this project's aesthetic enhancements, interpretive and education elements could be added that relate to Midpen's mission and project themes, including local wildlife and corridor connectivity. These elements would require Midpen staff to work closely with designers to develop content and graphics for interpretive elements and panels.

Appendix A – Alternative 3A

ATTACHMENT 2

Dist	COUNTY	ROUTE	TOTAL PROJECT	POST MILE PREFIX	NO.	SHEETS
04	SCL	17	R4.1/R5.8			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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NOTE:

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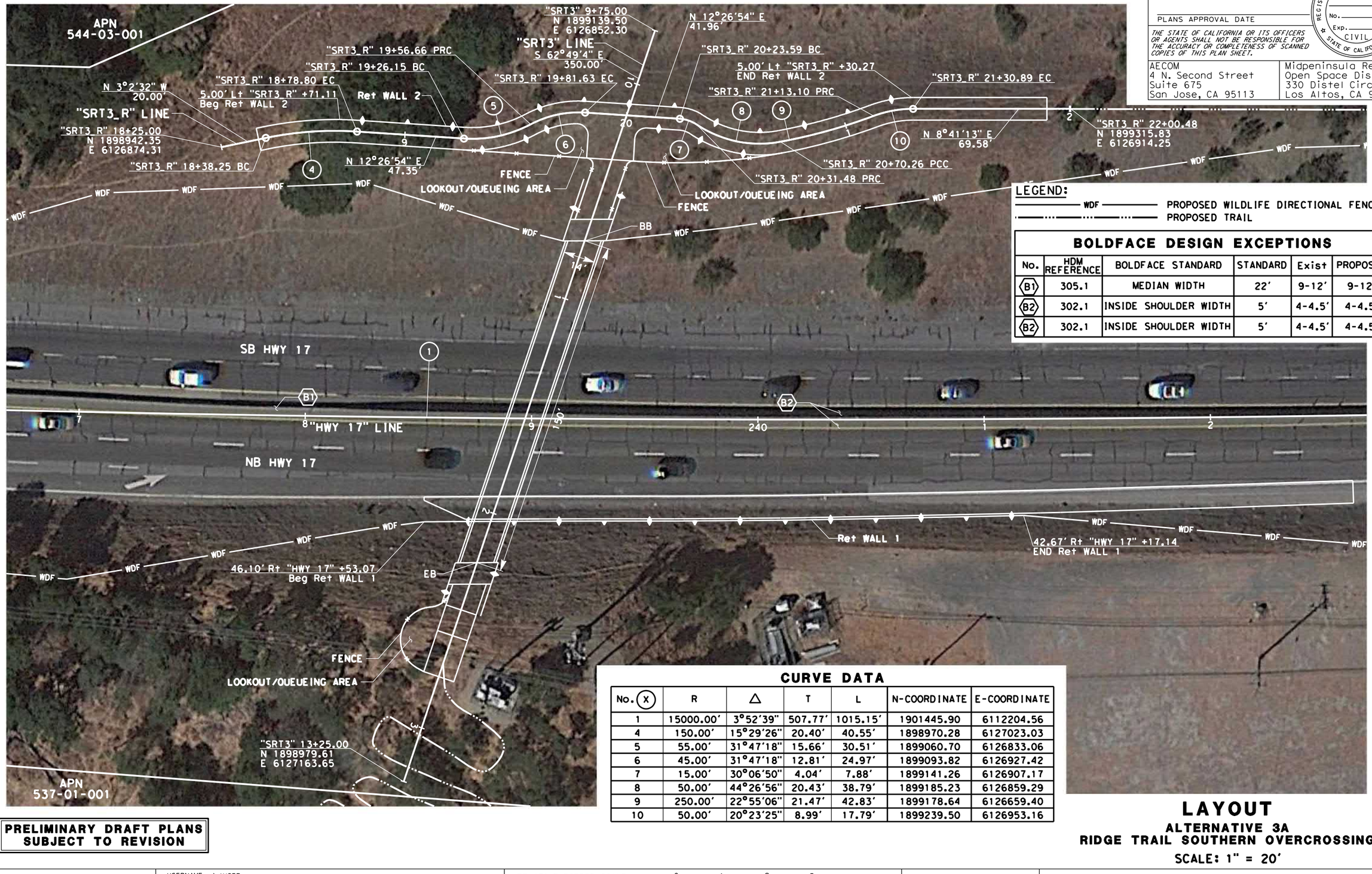

LEGEND:

WDF — PROPOSED WILDLIFE DIRECTIONAL FENCING

PROPOSED TRAIL

BOLDFACE DESIGN EXCEPTIONS

No.	HDM REFERENCE	BOLDFACE STANDARD	STANDARD	Exist	PROPOSED
B1	305.1	MEDIAN WIDTH	22'	9-12'	9-12'
B2	302.1	INSIDE SHOULDER WIDTH	5'	4-4.5'	4-4.5'
B2	302.1	INSIDE SHOULDER WIDTH	5'	4-4.5'	4-4.5'

CURVE DATA

No. (X)	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	15000.00'	3°52'39"	507.77'	1015.15'	1901445.90	6112204.56
4	150.00'	15°29'26"	20.40'	40.55'	1898970.28	6127023.03
5	55.00'	31°47'18"	15.66'	30.51'	1899060.70	6126833.06
6	45.00'	31°47'18"	12.81'	24.97'	1899093.82	6126927.42
7	15.00'	30°06'50"	4.04'	7.88'	1899141.26	6126907.17
8	50.00'	44°26'56"	20.43'	38.79'	1899185.23	6126859.29
9	250.00'	22°55'06"	21.47'	42.83'	1899178.64	6126659.40
10	50.00'	20°23'25"	8.99'	17.79'	1899239.50	6126953.16

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

LAYOUT

ALTERNATIVE 3A
RIDGE TRAIL SOUTHERN OVERCROSSING

SCALE: 1" = 20'

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: ABHIJEET R. BHOI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

$FREQUEST

LAST REVISION | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME
09-29-20

BORDER LAST REVISED 7/2/2010 | USERNAME => $USER | DGN FILE => $REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0733 | PROJECT NUMBER & PHASE 0416000453

ATTACHMENT 2

Dist	COUNTY	ROUTE	TOTAL PROJECT	NO.	SHEETS
04	SCL	17	R4.1/R5.8		

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

LICENSED LANDSCAPE ARCHITECT — Name & License No. — Signature — Renewal Date — Date — STATE OF CALIFORNIA

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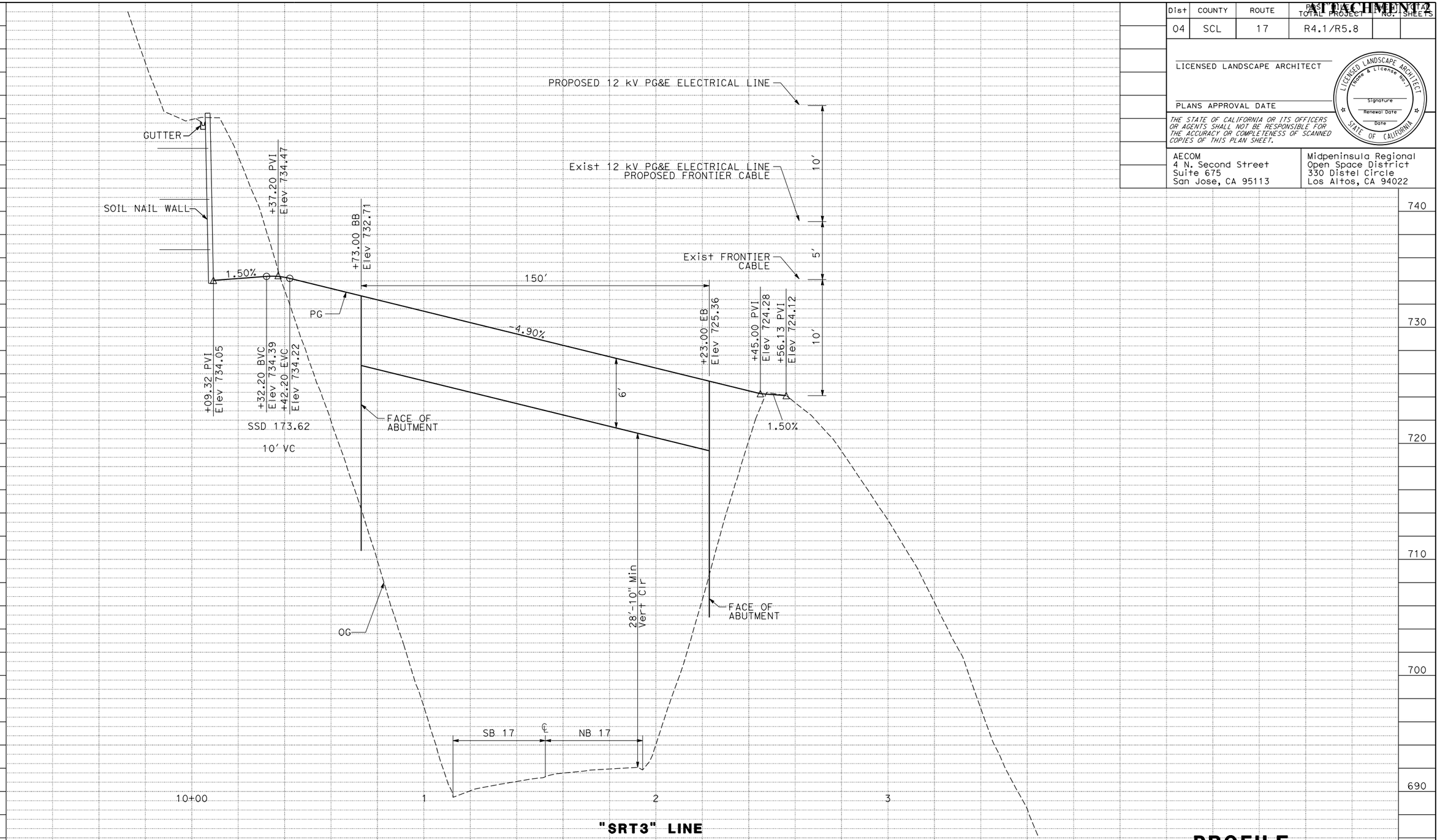

"SRT3" LINE

RIDGE TRAIL SOUTHERN OVERCROSSING

Min VERTICAL CLEARANCE =	28'-10"
FALSEWORK DEPTH =	3'-5"
DURING CONSTRUCTION =	25'-5" >15.0'

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

PROFILE
ALTERNATIVE 3A
RIDGE TRAIL SOUTHERN OVERCROSSING

SCALE: Horiz 1" = 20'
Vert 1" = 4'

P-1

STATION		TOTAL
CY	Exc	
	Emb	

REVISED BY: AB — DATE REVISED: 10/31/19
CALCULATED-DESIGNED BY: ABHIJEET BHOI
CHECKED BY: ELIE ABI-JAOUDE
CONSULTANT SENIOR LANDSCAPE ARCHITECT: SCOTT C. KELSEY
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION: DATE PLOTTED => 20-OCT-2021
10-26-20 TIME PLOTTED => 11:22

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ATTACHMENT 2

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCL	17	R4.1/R5.8		

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

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Midpeninsula Regional Open Space District
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Los Altos, CA 94022

REVISED BY	DATE REVISED
AB	10/31/19

CALCULATED-DESIGNED BY	CHECKED BY
ABHIJEET BHOI	ELIE ABI-JAOUDE

CONSULTANT SENIOR LANDSCAPE ARCHITECT: SCOTT C. KELSEY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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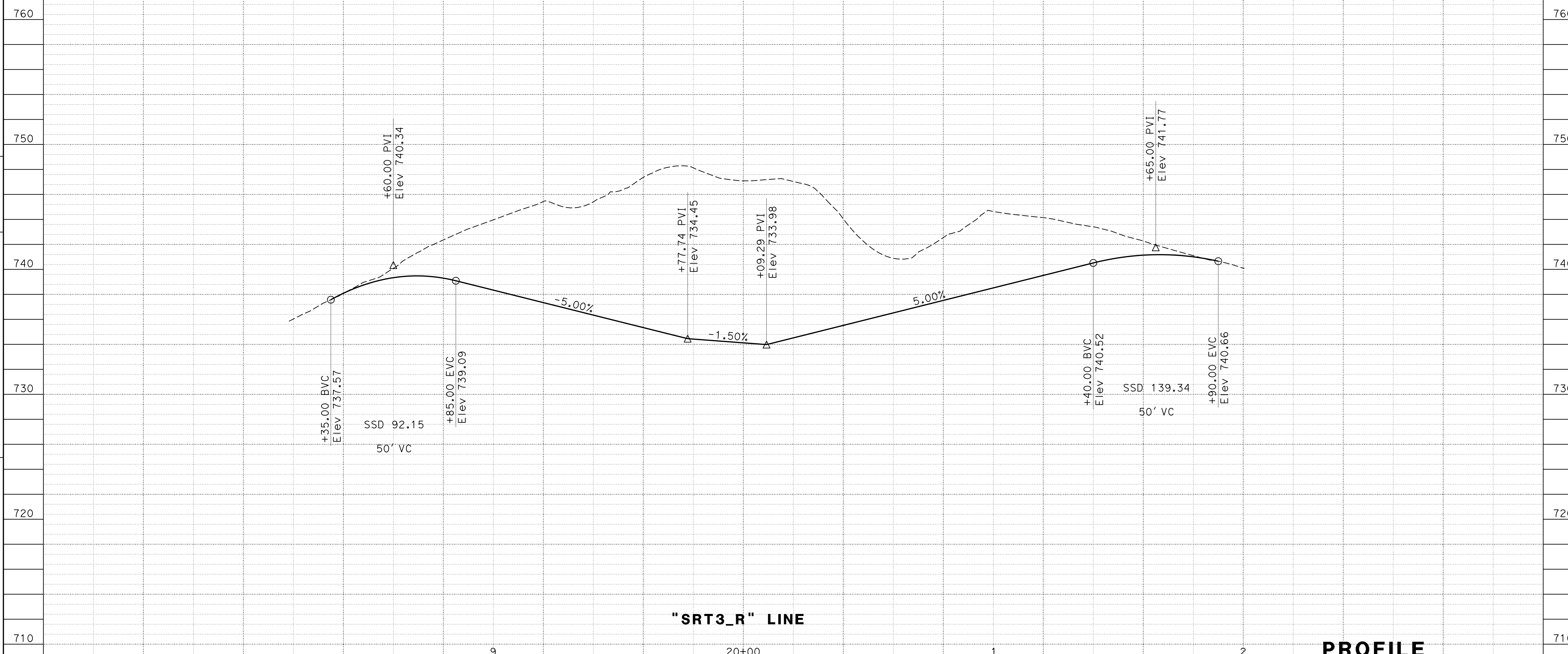

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

PROFILE

ALTERNATIVE 3A RIDGE TRAIL SOUTHERN OVERCROSSING

SCALE: Horiz 1" = 20'
Vert 1" = 4'

P-2

STATION		TOTAL
CY Exc		
CY Emb		

DATE PLOTTED => 20-OCT-2021
TIME PLOTTED => 11:22
LAST REVISION 10-26-20

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Alternative 5A

ATTACHMENT 2

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

WDF — PROPOSED WILDLIFE DIRECTIONAL FENCING
Exist TRAIL
PROPOSED TRAIL

Dist	COUNTY	ROUTE	TOTAL PROJECT	POST MILE PREFIX	TOTAL SHEETS
				NO.	
04	SCL	17	R4.1/R5.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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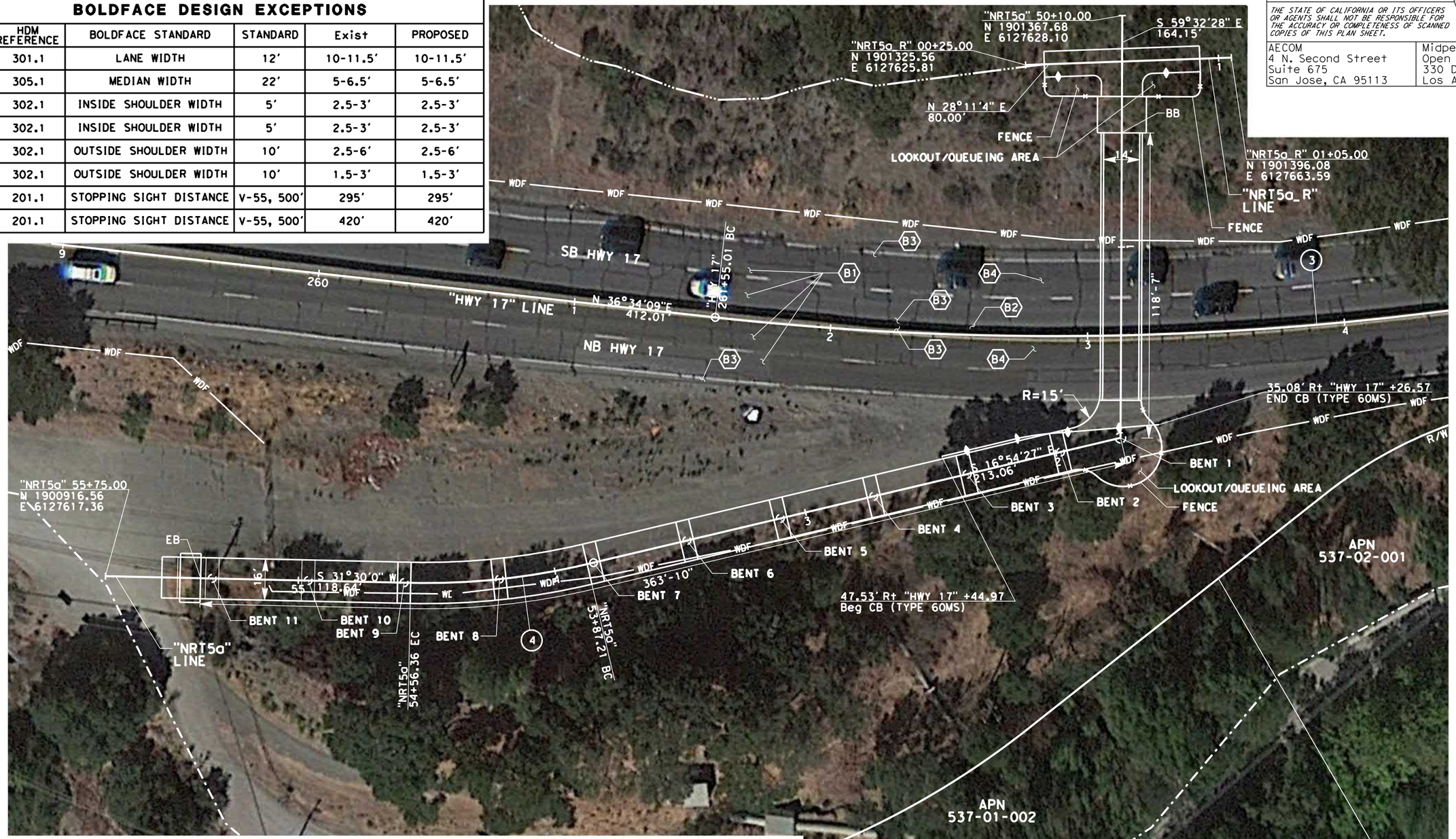
Los Altos, CA 94022

BOLDFACE DESIGN EXCEPTIONS

No.	HDM REFERENCE	BOLDFACE STANDARD	STANDARD	Exist	PROPOSED
B1	301.1	LANE WIDTH	12′	10-11.5′	10-11.5′
B2	305.1	MEDIAN WIDTH	22′	5-6.5′	5-6.5′
B3	302.1	INSIDE SHOULDER WIDTH	5′	2.5-3′	2.5-3′
B3	302.1	INSIDE SHOULDER WIDTH	5′	2.5-3′	2.5-3′
B3	302.1	OUTSIDE SHOULDER WIDTH	10′	2.5-6′	2.5-6′
B3	302.1	OUTSIDE SHOULDER WIDTH	10′	1.5-3′	1.5-3′
B4	201.1	STOPPING SIGHT DISTANCE	V-55, 500′	295′	295′
B4	201.1	STOPPING SIGHT DISTANCE	V-55, 500′	420′	420′



CURVE DATA

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4	271.52′	14°35′33"	34.76′	69.15′	1901159.59	6127447.85

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

LAYOUT

ALTERNATIVE 5A
RIDGE TRAIL NORTHERN OVERCROSSING

SCALE: 1" = 20′

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: ABHIJEET R. BHOI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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ATTACHMENT 2

Dist	COUNTY	ROUTE	PAST PROJECT	TOTAL PROJECT	NO.	SHEETS
04	SCL	17	R4.1/R5.8			

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

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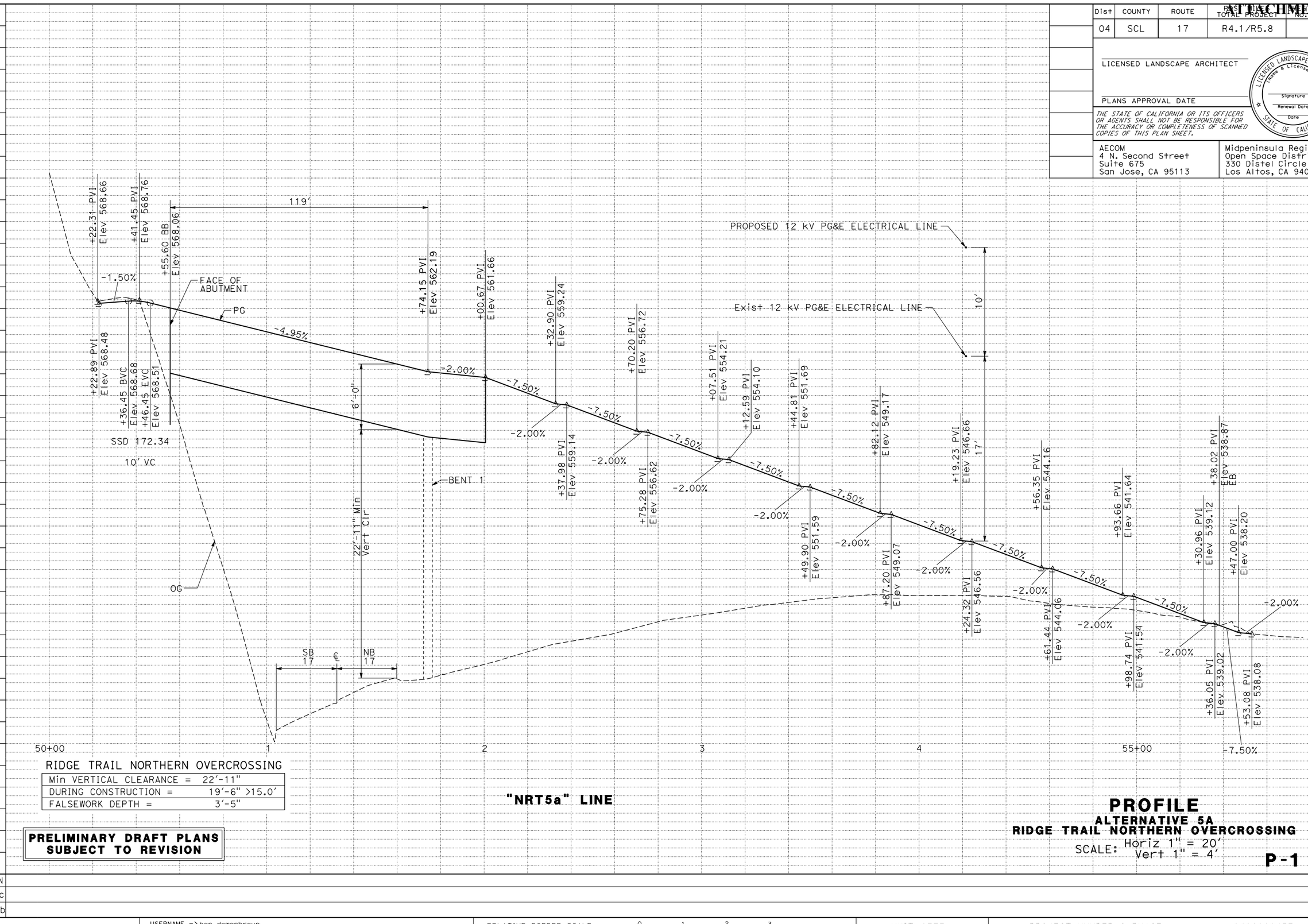

RIDGE TRAIL NORTHERN OVERCROSSING

Min VERTICAL CLEARANCE =	22'-11"
DURING CONSTRUCTION =	19'-6" >15.0'
FALSEWORK DEPTH =	3'-5"

"NRT5a" LINE

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

PROFILE
ALTERNATIVE 5A
RIDGE TRAIL NORTHERN OVERCROSSING

SCALE: Horiz 1" = 20'
Vert 1" = 4'

P-1

STATION		TOTAL
CY	Exc	
	Emb	

REVISED BY: AB
DATE REVISED: 10/31/19
CALCULATED-DESIGNED BY: ABHIJEET BHOI
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CONSULTANT SENIOR LANDSCAPE ARCHITECT: SCOTT C. KELSEY
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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ATTACHMENT 2

Dist	COUNTY	ROUTE	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCL	17	R4.1/R5.8		

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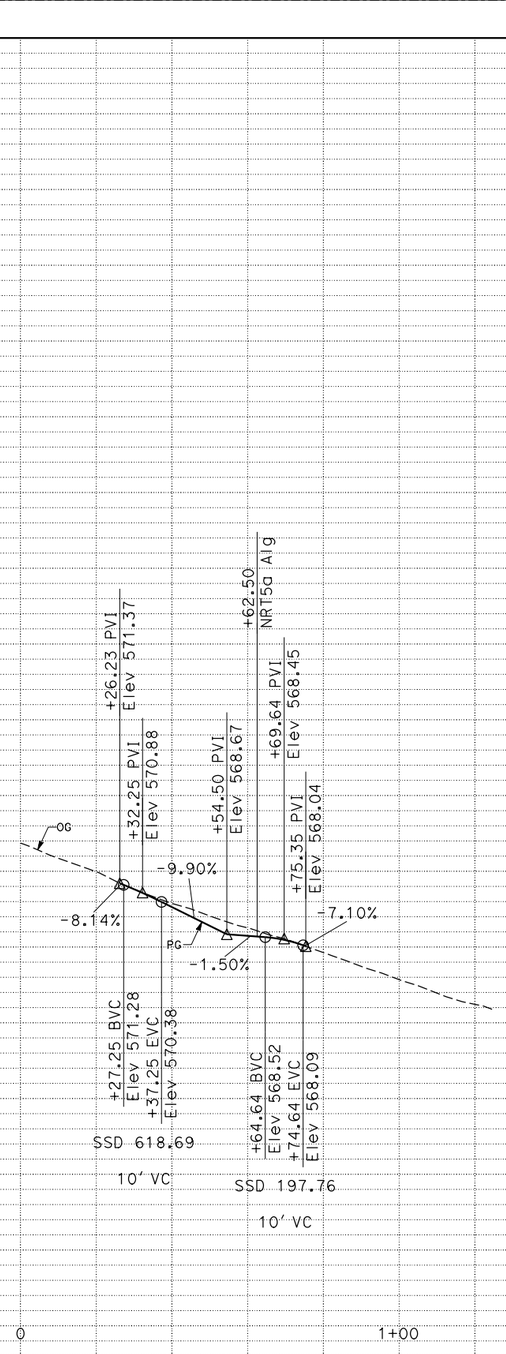

"NRT5a_R" LINE

PRELIMINARY DRAFT PLANS SUBJECT TO REVISION

PROFILE
ALTERNATIVE 5A
RIDGE TRAIL NORTHERN OVERCROSSING

SCALE: Horiz 1" = 20'
Vert 1" = 4'

P-2

STATION		TOTAL
CY	Exc	
	Emb	

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CALCULATED-DESIGNED BY: ABHIJEET BHOI
CHECKED BY: ELIE ABI-JAOUDE

REVISED BY: AB
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UNIT 0733

PROJECT NUMBER & PHASE 0416000453