San Mateo County Resource Conservation District

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625 Miramontes Street, Suite 103, Half Moon Bay, CA 94019
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Minutes of the Regular Meeting of the Board of Directors
June 24, 2015
Location: RCD Office

Directors present:	Dave Holland, Barbara Kossy, TJ Glauthier, Jim Reynolds, and Neal Kramer
Staff present:	RCD – Kellyx Nelson, Renee Moldovan, Adria Arko
	NRCS – Jim Howard
Guests:	Matt Baldzikowski (Midpeninsula Open Space District), Neal Sharma (Peninsula Open Space Trust)

1 Call to Order

- Meeting called to order 6:31pm.

2 Introduction of Guests and Staff

- Guests and board members introduced themselves.

3 Public Comment

- None

4 Approval of Agenda

- Glauthier moved to approve Agenda and Consent Agenda, Kossy seconded the motion, unanimous approval of Agenda and Consent Agenda.

5 Consent Agenda

- May 21, 2015 Draft Regular Meeting Minutes
- April 2015 Draft Financial Statements
- Memorandum to Farm Bureau Providing Agricultural Ombudsman Updates
- Announcement of departure of Mark Nechodom from California Department of Conservation

6 Action Items

The considerations of the Grading Permit Exemptions were moved to the beginning of the agenda.

There was discussion about the Grading Permit Exemption program and potential areas for improvement of the program prior to deciding on Action Items. Some recipients of exemptions have said that it didn't streamline the process. Arko will follow up with applicants to assess how the program worked this time. Nelson and Arko are also working with the County to improve the program to ensure consistency, transparency, and regulatory compliance. Holland agreed to participate in that process.

- **Consideration of approval of Grading Permit Exemption for Midpeninsula Regional Open Space District for Driscoll Ranch Road Erosion Improvement Project and Pond Embankment Repair.**
    - Baldzikowski presented the project on behalf of MROSD and responded to questions.
    - Glauthier moved to approve the Grading Permit Exemption, Kossy seconded the motion, unanimous approval.
- **Consideration of approval of Grading Permit Exemption for Peninsula Open Space Trust for Driscoll Apple Orchard Site 3 Culvert Replacement in La Honda.**
    - Sharma presented the project on behalf of POST with additional information provided by Baldzikowski, as MROSD manages the property.
    - Glauthier moved to approve the Grading Permit Exemption, Kramer seconded the motion, unanimous approval.

7 Discussion Items

- **Directors' Reports**
    - Kossy asked how the Stanford archiving project was going. Nelson said the RCD hasn't gotten to it yet. Kossy offered her help.
    - Reynolds said he went to the Pescadero Municipal Advisory Council meeting, and that they seem to be doing well. There was participation from lots of people and stakeholders. Thinks it is good for them and RCD.
    - Glauthier said that the Finance Committee worked on the FY 2016 budget.
    - Holland said that the Personnel Committee looked at 9 different RCDs' personnel and operational policies as potential models as we revise our own. Most of the existing ones have been upgraded in last year, so they are up to date on standards and processes. Should have something to share by August.
    - Kramer- no updates.
- **Statewide Perspective – Kellyx Nelson**
    - Mark Nechodom is stepping down from the Department of Conservation (DOC), which is significant for RCDs. He was involved with the development of the new CARCD Vision and Standards. He understood RCDs and was an advocate. He will be replaced by Jason Marshall in the interim.
- **Executive Director Report – Kellyx Nelson**
    - RCD staff is not applying for the grants that have been released this summer. The timing is bad for us to apply and staff needs to focus on projects.
        - Our work to develop our application of Quickbase project management software is underway. Chelsea Moller is still working on it, remotely. A professional software developer is working with Chelsea as a volunteer. He was referred by the Silicon Valley Community Foundation. The project was delayed because of staff turnover here and at Sympo.
        - Kossy asked if we could sell this program to other RCDs. Nelson hopes to be able to eventually have an umbrella license shared with other RCDs or CARCD if the software works well. It wouldn't be something we could sell because it is so tailored to our projects.

        - Kramer asked how long it will be. Nelson said hopefully a few months.
    - If all goes as planned RCD will be going to construction between 11-13 sites this summer. There are 7 residences for construction for low impact development BMPs. There are 2 different road sites. Two sites in Memorial Park for fish passage habitat. Potentially 2 roads in Pilarcitos (submitted permit application to the Army Corps application last November, but they still haven't started reviewing it).
    - Department of Conservation came to fill the funding gap for the biochar project! The project will be completed this calendar year.
    - Our Drought Relief Program was selected for the second round of IRWMP for $1.4 million for farm ponds and irrigation efficiency.
    - We hosted an agency meeting for the Pescadero Marsh that resulted in consensus on some next steps. Since then over $200K has been committed for a conceptual model and decision tool for the marsh.
    - RCD is co-hosting a workshop tomorrow about small-scale hog production. Partners are UCCE, NRCS, Alameda RCD, and Root Down Farm.
    - Roads workshop was a very big success. 40 people there and there were very positive reviews. NRCS Dan Little said it was one of the best road trainings he had attended. Tim Best did the workshop for us. Irina Kogan and Sara Polgar did a really great job pulling it together.
    - Kossy asked what would happen to the County and work of RCD if marijuana was legalized. Nelson thinks that greenhouses might be used pretty quickly. She doesn't know about BMPs for marijuana production.
        - Howard said the NRCS just had a meeting where the issue came up. NRCS is taking the policy that they do not support it in any way, since its illegal.
        - Both agreed that it is a serious resource consideration, as marijuana farms are large water diverters in other parts of the state.

8 **Action Items**

- **Consideration of approval of FY2016 budget.**
    - Moldovan, Glauthier and Nelson met to go through the budget.
    - Nelson reviewed differences between the draft review budget in May and the proposed budget as well as a discussion budget table recommended by Glauthier to isolate and needs for RCD personnel and operations.
    - This year the RCD only hit half of the projected revenues in the budget. Historically we have not been impacted that much. Nelson explained it was because we now have bigger projects and grants, so when they don't come through it is a bigger hit.
    - Holland and Glauthier said they feel it's a good mix of projects so risk is spread out.
    - Nelson wants to create table of proportion of funds from what agencies, and their sources. We can set goals by percentage of funds.
    - Glauthier recommended passing the budget on behalf of the Finance Committee.
    - Kramer moved approving the FY 2016 budget, Reynolds seconds the motion, the motion passed with unanimous approval.
- **Consideration of approval of contractor selection for Memorial Park Fish Passage Project.**
        - Kramer asked where they are located. Nelson said they are located in the Bay Area.

- After some discussion, Holland moved to approve the contractor selection for Memorial Park Fish Passage project, Reynolds seconded the motion, passed with unanimous support.
- After passage of the motion, Glauthier asked when the project was taking place. Nelson said September-October and that early rains would cause problems. Glauthier asked who would take the risk. Nelson said that the contractor, RCD, and County Parks would all take elements of risk and that RCD staff is developing our plan with the County, contractor, and regulators in case of early rains.
- Reynolds asked if the project would affect marbled murrelet. Nelson said murrelets are assumed to be present and that avoiding impact to them is why the construction window is so restricted (beginning no sooner than September 15th).

9 Adjourn

- July meeting will be canceled because there will not be a quorum.
  - The next Regular Meeting of the Board of Directors will be August 20th, 2015.
- Adjourned 8:30

TIMOTHY C. BEST, CEG

ENGINEERING GEOLOGY AND HYDROLOGY

1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5832 ● Fax: (831) 425-5830 ● e-mail: timbest@coastgeo.com

June 16, 2015

Ms. Julie Andersen
Natural Resources Department
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022-1404

RE: DESIGN STANDARDS
DRISCOLL RANCH ROADS SEDIMENT REDUCTION AND POND RESTORATION PROJECT

Dear Ms. Andersen:

The proposed road improvements for the Driscoll Ranch Roads Sediment Reduction and Pond Restoration Project are detailed in plan sheets dated June 1, 2015. The design specifications are generally conform to California Department and Fish and Wildlife (CDFW) applicable design standards outlined in Part X of the California Salmonid Stream Habitat Restoration Manual (CDFG, 2006) and Handbook for Forest, Ranch and Rural Roads (Weaver et al., 2014). Where necessary, engineered approved modifications to these standards have been made to address onsite conditions.

Please feel free to contact me if you have any questions.

Sincerely,

Timothy C. Best, CEG

REFERENCES

CDFG, 2006, California Salmonid Stream Habitat Restoration Manual: Part X Upslope Erosion Inventory and Sediment Control Guidance, California Department of Fish and Game, http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp, p. 207.

Weaver, W. E., Weppner, E., and Hagans, D. K., 2014, Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads, Mendocino County Resource Conservation District, Ukiah, California, 416 p.:

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. SM10823
1 May 2015

JULIE ANDERSEN, PLANNER II
Natural Resources Dept.
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Subject: Geotechnical Investigation

Reference: Culvert Replacements Sites 9, 16 and 36
Driscoll Ranch Road Erosion Prevention Project
La Honda Open Space Preserve
Midpeninsula Regional Open Space District
San Mateo County, California

Dear Ms. Andersen:

This report presents geotechnical design criteria for roadway improvements along Driscoll Ranch Road, San Mateo County, California. It is our understanding the proposed project will consist of rehabilitating eroded portions of a two mile long stretch of the rural roadway and installing 3 new culverts in deep fill at sites designated: Site 9, Site 16 and Site 36, Borings Haro, Kasunich and Associates, Inc. B1, B2, B3 respectively.

Field Exploration

On 17 March 2015, we explored the subsurface soil conditions with three (3) machine powered borings, advanced 16 to 21 feet below grade. The boring were advanced in locations close to the proposed three new culvert locations. The site plan in the Timothy C. Best and Associates plan set shows the specific boring locations. The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2488, Visual-Manual Proceeding).

The borings were advanced with 6-inch diameter continuous flight auger drilling equipment. Representative soil samples were obtained from the exploratory boring at selected depths, or at major strata changes. These samples were recovered using a 3.0 inch O.D. Modified California Sampler (L), or by a Standard Terzaghi Sampler (T). Stratification lines shown on the log represent the approximate boundaries between soil types. The actual soil layer transitions may be gradual.

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The penetration blow counts noted on the boring log was obtained by driving a sampler into the soil with a 140-pound hammer dropping through a 30-inch fall. The sampler was driven up to 18 inches into the soil and the number of blows counted for each 6-inch penetration interval. The numbers indicated on the log are the total number of blows that were recorded for the second and third 6-inch intervals, or the blows that were required to drive the penetration depth shown if high resistance was encountered. The soil boring logs are included in the Appendix of this report.

Laboratory Testing

Soil samples obtained from the boring at selected depths were taken to our laboratory for further examination and laboratory testing. The laboratory testing program was directed toward determining pertinent engineering properties of soil underlying the project site.

Moisture Content and Dry Unit Weight

Moisture content and dry unit weight tests were performed to evaluate soil overburden pressures and relative soil strength and compressibility. Moisture content was evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937.

Direct Shear

Direct shear analysis was performed to determine the strength parameters of the underlying embankment fill materials. Samples from each embankment fill were then compacted to 80 or 85 percent relative compaction and shear tests were performed on each of the samples. Tests were performed in general accordance with ASTM Test Method D 3080.

The results of the laboratory testing appear on the boring logs opposite the sample tested.

Subsurface Conditions

We encountered fill soil to depths of 15 to 16 feet in all three borings. The fill consisted of a loose to medium dense mixture of clay, sand and sandstone gravels. Woody debris was encountered in B-2 at 8 feet below grade. Soil moisture in the fill ranged from 17 to 35 percent. The fill appears to be mixed native material placed during roadway construction. Below the fill very dense rock material was encountered. In B-1 the rocky material was described as Mindego Basalt and in B-2 the rock material was described as a fine grained sandstone. Both bedrock types are present in the area. Groundwater was not encountered in the exploratory borings, however very moist soil conditions were present above the bedrock contact. It should be noted that groundwater levels may

fluctuate due to variations in stream flow, rainfall or other factors not evident during our investigation. Contrasts in permeability between soil and bedrock strata could allow perched groundwater conditions to develop. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes to the conditions observed or inferred from our investigation.

Results of direct shear analysis performed on samples 1-1 (B-1) and 2-1 (B-2), collected at 5.0 and 10.0 feet below the ground surface, respectively and within clayey fill soil, indicates the insitu fill soil has cohesive strengths of 724 and 535 psf (pounds per square foot) and internal friction angles of 58 and 63 degrees, respectively.

Results of direct shear analysis performed on sample 3-1 (B-3), collected at 5.0 below the ground surface, and within gravelly clayey sand fill, indicates the insitu fill soil has cohesive strength of 1,315 psf and an internal friction angle of 47 degrees.

Spoils from each of the borings were collected in separate buckets for bulk sample analysis. We compacted the spoils from B-1 and B-3 to 85% relative compaction and we compacted the spoils from B-2 to 80% relative compaction (per ASTM D1557) to determine optimum soil moisture and dry density at the designated percent compaction. Refer to compact test curve results in the attached appendix. Loose soil from each bulk sample was mixed with water to achieve the optimum water content and was then carefully compacted in direct shear mold ring until the weight of the ring and the soil matched the desired wet unit weight. The ring samples were then sheared per ASTM D3080. The B-1 bulk sample was classified as a light brown clayey sand with gravels. Moisture in the sample at 85% relative compaction was 17.9%. This sample was sheared with in-situ moisture and had test results indicating the soil has cohesive strength of 1,886 psf and an internal friction angle of 32 degrees at 85% relative compaction. The B-3 bulk sample was classified as a dark brown clayey sand. This sample was saturated for 24 hours prior to shearing. Test results indicate the soil has cohesive strength of 147 psf and an internal friction angle of 26 degrees at 85% relative compaction under saturated conditions. The B-2 bulk sample was classified as a tan silty clayey sand. Moisture in the sample at 80% relative compaction was 16.3%. This sample was sheared with in-situ moisture and had test results indicating the soil has cohesive strength of 623 psf and an internal friction angle of 39 degrees at 85% relative compaction.

Quantitative Slope Stability Analysis

Discussion and General Methodology

Slope failures or landslides can cause problems, including encroachment and

undermining of engineered structures (roadway). Slope failures occur when stresses acting on the soil mass are greater than its internal strength (shear strength). A slope is considered stable when the strength of its soil mass is greater than the stress field acting within it. Some common variables influencing stress are gravity (steeper slopes), hydrostatic pressure (perched groundwater), bearing pressures (engineered structures), and seismic surcharge (earthquake shaking).

Various methods of analyzing stability of slopes yield a factor of safety (FS). A FS is determined by dividing the resisting forces within the slope soils by the driving forces within the slope (stress field). When a FS less than one is determined, a slope failure is likely. When a FS equal to one is determined, the slope is in a state of equilibrium. When a FS greater than one is determined, the slope is considered stable. Local jurisdictions require a seismic slope stability analysis to yield a FS equal to or greater than 1.2, and a static FS equal to or greater than 1.5.

The subsurface profile soil properties and strength parameters are generalized to develop the working model used in our analyses. Calculations are performed using the computer program GSTABL7 with STEDwin, developed by Garry H. Gregory, P.E. and Harald W. Van Aller, P.E. GSTABL7 is a computer program for analysis of slope stability problems by two dimensional limiting equilibrium methods. GSTABL7 program uses the Modified Bishop, Simplified Janbu or GLE Method of Slices to determine normal and resistive forces in each slice. The forces in each slice are then summed up to a total force acting on the mass.

A quantitative slope stability analysis was performed on Cross Sections at Site 9 and Site 16. This sections show projected boundaries between geologic units found in exploratory borings located in the field and proposed final gradients of the roadway embankment. Strength of the geologic units were determined from the laboratory shear testing of fill soils compacted to 80 and 85 percent. A slope stability model was developed based on conservative parameters derived above from the shear testing described above.

Circular failure surfaces were evaluated using the Modified Bishop Method. At least hundreds of trial surfaces were evaluated between a wide range of possible toe and scarp locations along the section. The 10 slip surfaces yielding the lowest factors of safety were evaluated and are presented in the Appendix to this report.

Soil Properties

In general the cross sections were modeled using two predominant soil types. Reduced strength values were assigned to the soil types on the basis of direct shear testing of

both the in-situ soils and the recompacted fill samples using conservative engineering judgement.

Seismic Coefficient

Horizontal forces generated by a design seismic event are typically modeled by applying a seismic coefficient value (K) to the analysis intended to represent earthquake induced ground motion. The following seismic accelerations were determined for the site:

PGA = 0.59g
K = 0.290

We used the same seismic accelerations presented in Bauldry Engineering's Jan. 2012 Geotechnical Investigation Report for the same property.

Groundwater

Soil moisture levels (pheratic surface) that conform to the proposed culvert alignments were incorporated into our analysis.

Slope Stability Results and Conclusions:

For Site 9, the results of our slope stability analysis with a 1.5:1 (H:V) outboard embankment slope indicate seismic and static factors of safety equal to or greater than 1.8 and 3.2, respectively. For Site 9, the results of our slope stability analysis with a 1:1 (H:V) outboard embankment slope indicate seismic and static factors of safety equal to or greater than 1.7 and 2.7, respectively. For Site 16, the results of our slope stability analysis with a 1.5:1 (H:V) outboard embankment slope indicate seismic and static factors of safety less than 1.4 and 2.2, respectively. For site 16, the results of our slope stability analysis with a 1:1 (H:V) outboard embankment slope indicate seismic and static factors of safety equal to or greater than 1.2 and 1.8, respectively. Graphical presentations of our analysis are included in the Appendix of this report.

Based on the results of our analysis, the proposed outboard embankment gradients should be safe from landsliding as long as the recommendations of this report are adhered to in terms of relative compaction of redensified onsite material.

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our investigation, the proposed roadway culvert replacement improvement project appears compatible with site conditions, from a geotechnical standpoint, provided our recommendations are closely followed during the design and construction phases of the project.

The following recommendations should be used as guidelines for preparing project plans and specifications, and assume that **Haro, Kasunich & Associates** will be commissioned to review project grading and foundation plans before construction and to observe, test and advise during earthwork and foundation construction. This additional opportunity to examine the site will allow us to compare subsurface conditions exposed during construction with those inferred from this investigation. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

General

1) The geotechnical engineer should be notified at least four (4) working days prior to any site clearing or grading, so that the work in the field can be coordinated with the grading contractor and arrangements for testing and observation services can be made. The recommendations of this report are based on the assumption that the geotechnical engineer will perform the required testing and observation services during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2) Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.

3) Temporary cuts of 1:1 (H:V) are acceptable from a geotechnical standpoint as long as saturated soil conditions are not encountered. If saturated soils are exposed during any excavation the soil engineer or his representative should be notified immediately and scheduled for a site visit observation.

4) Final fill slope gradients are not to be steeper the 1.5:1 (H:V).

5) Soil moistures to achieve 85% relative compaction in the onsite soil should range from approximately 12 to 28 percent. The results of the laboratory compaction tests are included in the Appendix of this report.

Site Grading

EXCAVATION

a) Excavate crossing fill to native grade or as directed in field by project CEG. The approximate limits of excavation are shown on plans.
b) Areas to be graded should be cleared of all obstructions, including trees not designated to remain and other unsuitable material.
c) In areas to receive engineer fill it will likely be necessary to over-excavate the subgrade soil an average of 2 feet below buried native grade to remove additional unsuitable earth materials. Limits of over-excavation to be determined in field by the CEG.
d) In areas where stream channel is to be restored excavated stream channel shall be a minimum of 4 feet wide with banks shall be laid back to 1.5:1 or flatter unless otherwise directed.

2) SEPARATE EXCAVATED SOILS

a) Separate clean excavated soils from deleterious soils and stumps and vegetation.
b) Deleterious soils including topsoil, fat clay soils, organic rich soils, decayed woody debris rich soils, and other material, as identified by the CEG, shall be placed in an approved stable location as directed by the CEG or District representative and as specified in Item 10.
c) Granular clayey soils may be used as engineered fill as approved by the CEG. This material may be temporarily stockpiled on site in approved areas.
d) Soils suitable for engineered fill and not used at crossings may be used to form rolling dips.

3) ENGINEERED FILL PLACEMENT

a) Reconstruct crossing with engineered fill
b) The on-site granular-clayey soil generated from the site is suitable for use as engineered fill.
c) Engineered fill shall be free of highly expansive clay, organic material, and contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches. Soil should also have a Plasticity Index (P.I.) less than 18.
d) Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.
e) Areas to receive engineered fill should be scarified 6 inches, moisture conditioned and compacted to 85 percent relative compaction. Engineered fill should be placed in thin lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted to a minimum of 85 percent relative compaction.

f) The upper 6 inches of subgrade and aggregate roadbed sections shall be moisture conditioned and compacted to at least 85 percent relative compaction.
g) If grading is performed in a wet condition, compaction may be difficult, pumping bringing water to the surface may occur. If such conditions are encountered soils shall not be used until reconditioned to conform to specifications outlined here and as approved by project geotechnical engineer.
h) Engineered fill shall be inspected and tested by project geotechnical engineer or designee

4) FILL SLOPE CRITERIA

a) Fill slopes should be inclined no steeper than 1.5:1 (horizontal to vertical) without approval of the project CEG or Geotechnical Engineer. Where shown on plans at the transitions to existing slopes that are steeper gradients fill slopes may be blended with natural grades.

i) Fills situated on slopes greater than 20% in gradient shall be keyed and benched into firm native material, unless otherwise directed by project CEG
ii) All keys and benches shall be adequately drained as directed by project CEG or geotechnical engineer.

b) Cut and fill slopes should be protected from erosion by intercepting runoff and not allowing spill onto graded slopes unless otherwise directed by project CEG. V-ditches and/or berms may be considered to accomplish this.

5) DELETERIOUS SPOILS

a) Spoils not used for engineered fill shall be placed in an approved location.
b) Project geotechnical engineering geologist or designee shall approve all spoil sites prior to fill placement. In most cases spoils are expected to be spread and compacted along inboard road edge, in some cases deleterious and excess soils may need to be end hauled to open slopes where slope gradients are less than 30%.
c) Areas to receive fill shall be cleared of vegetation and ripped to a depth of 6 inches.
d) Spoils placed along inside edge of road 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 spread on open slopes shall be placed loose to allow for revegetation and spread to have smooth uniform grade.
e) Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 3:1 (35%) unless otherwise directed or specified.

f) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.
g) Apply erosion control per notes
h) CEG shall approve all spoil sites prior to fill placement.

6) EXCESS ENGINEERED FILL
Spoils suitable for use as engineered fill may be used to form rolling dips.

7) OTHER CRITERIA
a) 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 CEG upon discovery of any conflicts between plans and field conditions.
b) Cut slopes in rock may be inclined at a 0.75:1 (H:V) slope for heights up to 12 feet. Natural slopes exposing soil may be temporarily cut no steeper than 1:1 or flatter for heights of 12 feet as directed by CEG. Steeper inclinations may be acceptable based on site review by CEG and/or geotechnical engineer.
c) The contractor should be aware that slope height, inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state or federal safety regulations, i.e. OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 Subpart P, or successor regulations.
d) Following grading, exposed bare slopes and soil should be planted or covered as soon as possible with erosion resistant vegetation or erosion control fabric installed in accordance with the manufactures specifications.
e) After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the geotechnical engineer.
f) Contractor shall be responsible for grade staking.

Drainage

8) 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 graded slopes.

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.

Erosion Control

9) Exposed slopes greater than 2H:1V and where exposed shall be covered with approved erosion control blanket (Tensar Rollmax C125BN or equivalent) in accordance with the manufacturer's recommendations and as directed by the engineering geologist or designee.

Should you have any questions concerning this letter report, please call our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

John E. Kasunich
G.E. 455

JEK/dk

Attachments

Copies: 1 to Addressee, via email
1 to Tim Best CEG, via email
1 to File

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property 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 our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX

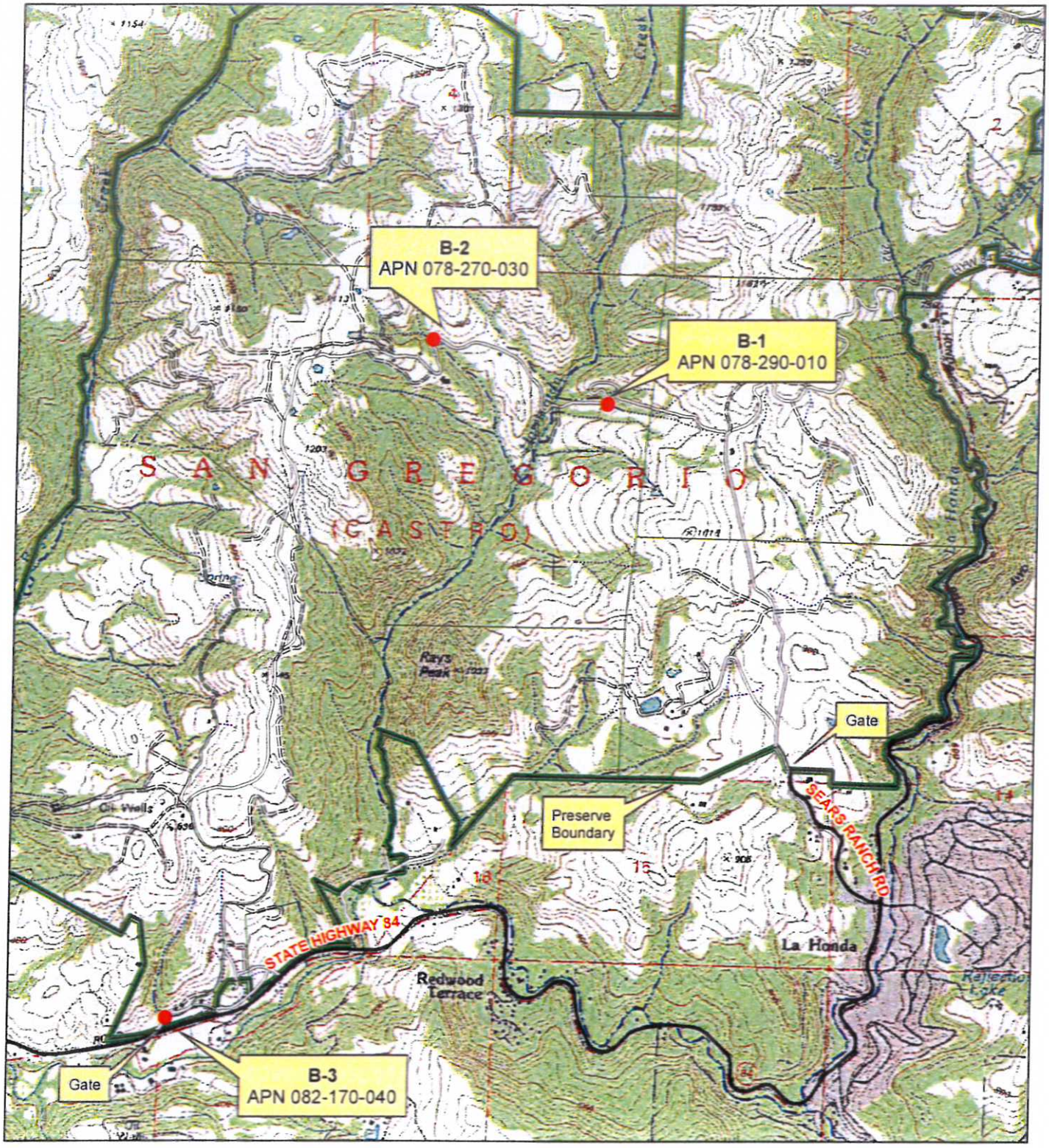
Boring Site Plan

Key to Logs

Boring Logs

Laboratory Results

Slope Stability Results



	DRILLING LOCATION MAP DRISCOLL RANCH Midpeninsula Regional Open Space District	FIGURE: 1 Date: March 12, 2015

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

U.S STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	3"	12"	
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FT*
VERY LOOSE	0 - 4
LOOSE	4-10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH**	BLOWS/FT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D) split spoon (ASTM D-1586)

* *Unconfined compressive strength in tons/ft^2 as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

HARO, KASUNICH & ASSOCIATES | FIGURE NO. KEY TO LOGS

Haro, Kasunich & Associates, Inc.
Geotechnical Engineering

Driscoll Site 9

PROJECT NO. SM10823

LOGGED BY MF | DATE DRILLED 3/17/15 | BORING DIAMETER 6" | BORING NO. B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Rocky road base						
	B		Medium, gravell Clayey SAND, damp, loose, FILL	GC				17.3	
5	1-1 (L)				14		85.7	18.8	Direct Shear In-Situ C = 724 psf 0 = 58
			Medium brown Sandy CLAY, damp, loose, FILL	CL					
10	1-2 (L)				14		79.4	35.2	
			Tan sandstone fragments in Sandy CLAY, moist, loose	CL					
15	B (T)		Same as above		9			29.0	Bucket sample mixed 0' - 17'
			NATIVE at 17 feet	BR					
			Rocky at 18 feet, Mindego Basalt refusal trace water on top of bedrock						
20			Boring terminated at 18						
25									
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SM10823 Driscoll Site 9.log Date: 5/1/2015

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | FIGURE NO. 1

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

Driscoll Site 16

PROJECT NO. SM10823

LOGGED BY MF | DATE DRILLED 3/17/15 | BORING DIAMETER 6" | BORING NO. B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Light brown clayey fine grained SAND, very damp, medium dense, FILL	SC					
	B							21.9	
5	B (T)		Same as above, FILL	SC	10			23.2	
			Woody debris at 8 feet						
10	2-1 (L)		Mottled silty fine grained SAND with CLAY binder, very damp, medium dense, FILL	SC	18		89.2	19.6	Direct Shear In-Situ C = 535 psf $\phi = 63^{o}$
15	B (T)		Fine grained sandstone bedrock, very damp, very dense	SM	50			22.0	
			Clayey fine grained sandstone, very damp, very dense sandstone chunk in shoe	SC					
20	2-2 (L)				50/6"		90.4	28.9	
			Boring terminated at 21 feet						
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | FIGURE NO. 2

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SM10823 Driscoll Site 9.log Date: 5/7/2015

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

Driscoll Site 36

PROJECT NO. SM10823

LOGGED BY MF | DATE DRILLED 3/17/15 | BORING DIAMETER 6" | BORING NO. B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			1" old asphalt						
			Dark brown clayey fine grained SAND, FILL	SC					
5	3-1 (L)		Dark brown Clayey SAND with sandstone, very damp, medium dense, FILL		15		81.9	31.4	Direct Shear In-Situ C = 1315 psf ϕ = 47°
10	? (T)		Dark brown Sandy CLAY, very damp, stiff, FILL	CL	12			28.6	
15	3-2 (L)		Black brown CLAY, very damp, stiff, NATIVE	CL	12		96.9	27.7	
			Boring terminated at 16 feet						
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

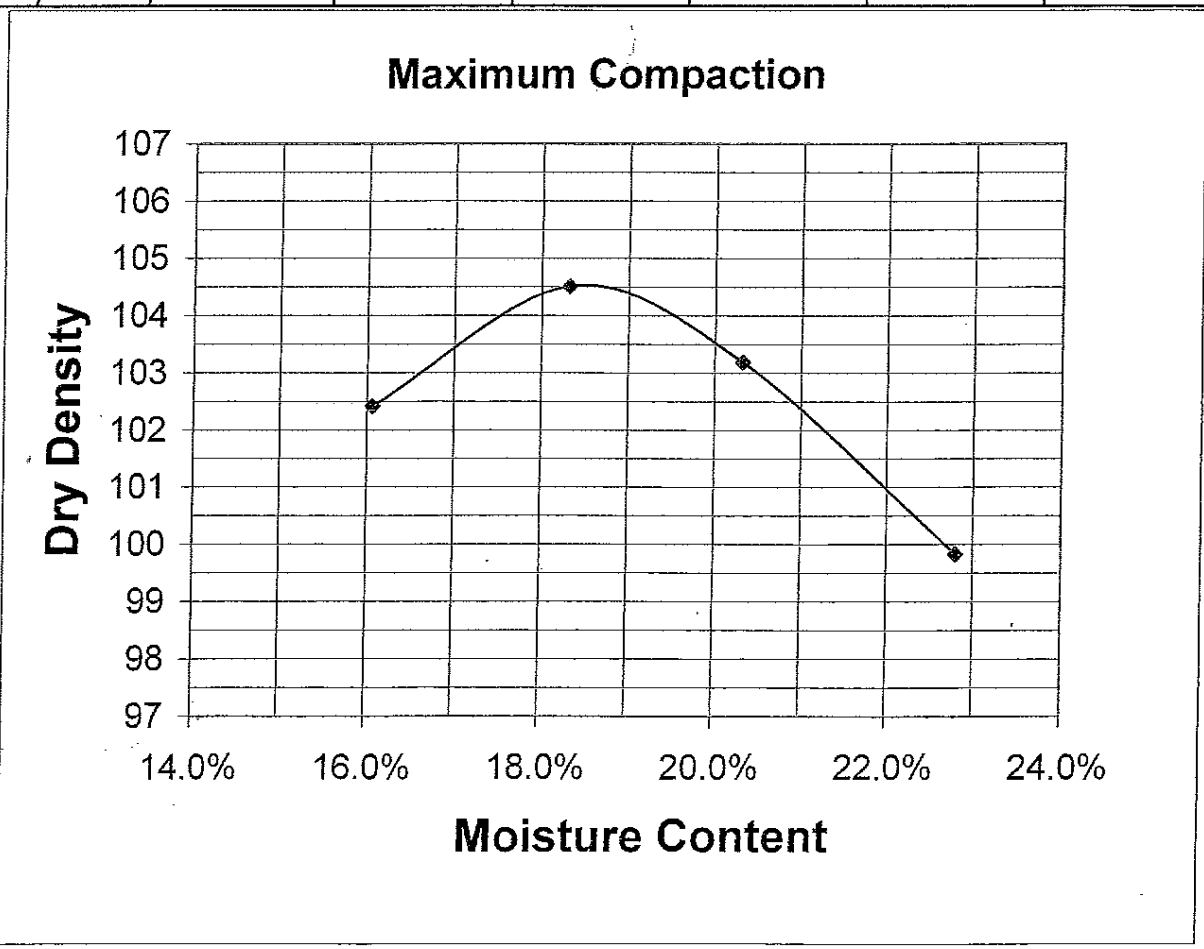
BY: sr | FIGURE NO. 3

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SM10823 Driscoll Site 9.log Date: 5/7/2015

Compaction Test

Project:	Driscoll	**Project #**	SM 10823
Descriptn:	Lt Tan Brwn Clayey Sand w/grvls	**Date:**	April 6, 2015
B-1, Existing Fill 0'-17' mix, Site 9		**Tested By:**	MA
Type:	4" mold **Curve:** 1	**Sample Wt.**	2300 gr.

Moisture		+4	+6	+8	+10		
Wt. Mold+Comp. Soil		3907.0	3979.6	3987.1	3963.4		
Wt. of Mold	2106.0	2106.0	2106.0	2106.0	2106.0		
Vol. Factor:	0.066	0.066	0.066	0.066	0.066		
Tare No.:		20	3	124	9		
Wet Wt.+Tare:		1152.1	1079.6	1081.0	1143.1		
Dry Wt.+Tare:		1008.0	929.5	912.1	951.3		
Wt. Comp. Soil		1801.0	1873.6	1881.1	1857.4		
Tare Wt.		110.9	110.2	81.0	110.0		
Net Dry Wt.		897.1	819.3	831.1	841.3		
Wt. of Water		144.1	150.1	168.9	191.8		
Wet Density		118.9	123.7	124.2	122.6		
Water Content		0.161	0.183	0.203	0.228		
Water Content %		16.1%	18.3%	20.3%	22.8%		
Dry Density		102.4	104.5	103.2	99.8		



Laboratory
Max D.D. **104.5**
Opt Moist. **18.3%**

Corrected
Max D.D. **105.0**
Opt Moist. **18.0%**

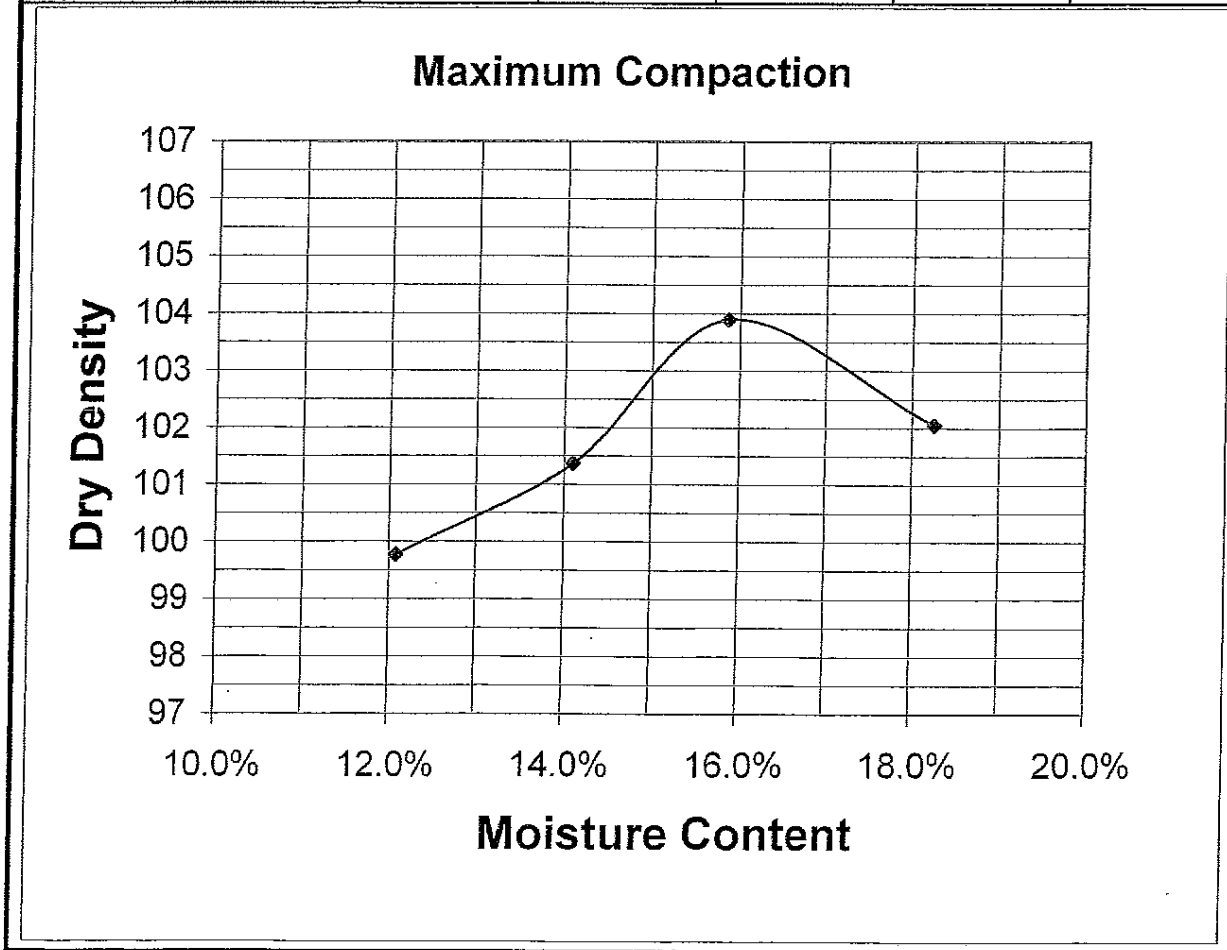
Engineer
JK

Tech

Compaction Test

Project:	Driscoll	**Project #**	SM 10823
Descriptn:	Tan Silty Clayey Sand	**Date:**	April 7, 2015
B-2, 0'-18',	Site 16	**Tested By:**	MA
Type:	4" mold **Curve:** 2	**Sample Wt.**	2100 gr.

Moisture		+8	+10	+12	+14		
Wt. Mold+Comp. Soil		3800.4	3858.5	3929.8	3934.5		
Wt. of Mold	2106.0	2106.0	2106.0	2106.0	2106.0		
Vol. Factor:	0.066	0.066	0.066	0.066	0.066		
Tare No.:		120	399	16	130		
Wet Wt.+Tare:		1110.4	1080.8	1195.0	1114.7		
Dry Wt.+Tare:		998.9	956.2	1046.4	954.8		
Wt. Comp. Soil		1694.4	1752.5	1823.8	1828.5		
Tare Wt.		75.8	72.7	109.5	78.8		
Net Dry Wt.		923.1	883.5	936.9	876.0		
Wt. of Water		111.5	124.6	148.6	159.9		
Wet Density		111.8	115.7	120.4	120.7		
Water Content		0.121	0.141	0.159	0.183		
Water Content %		12.1%	14.1%	15.9%	18.3%		
Dry Density		99.8	101.4	103.9	102.1		



Laboratory
Max D.D. **103.9**
Opt Moist. **15.9%**

Corrected
Max D.D. **104.0**
Opt Moist. **16.0%**

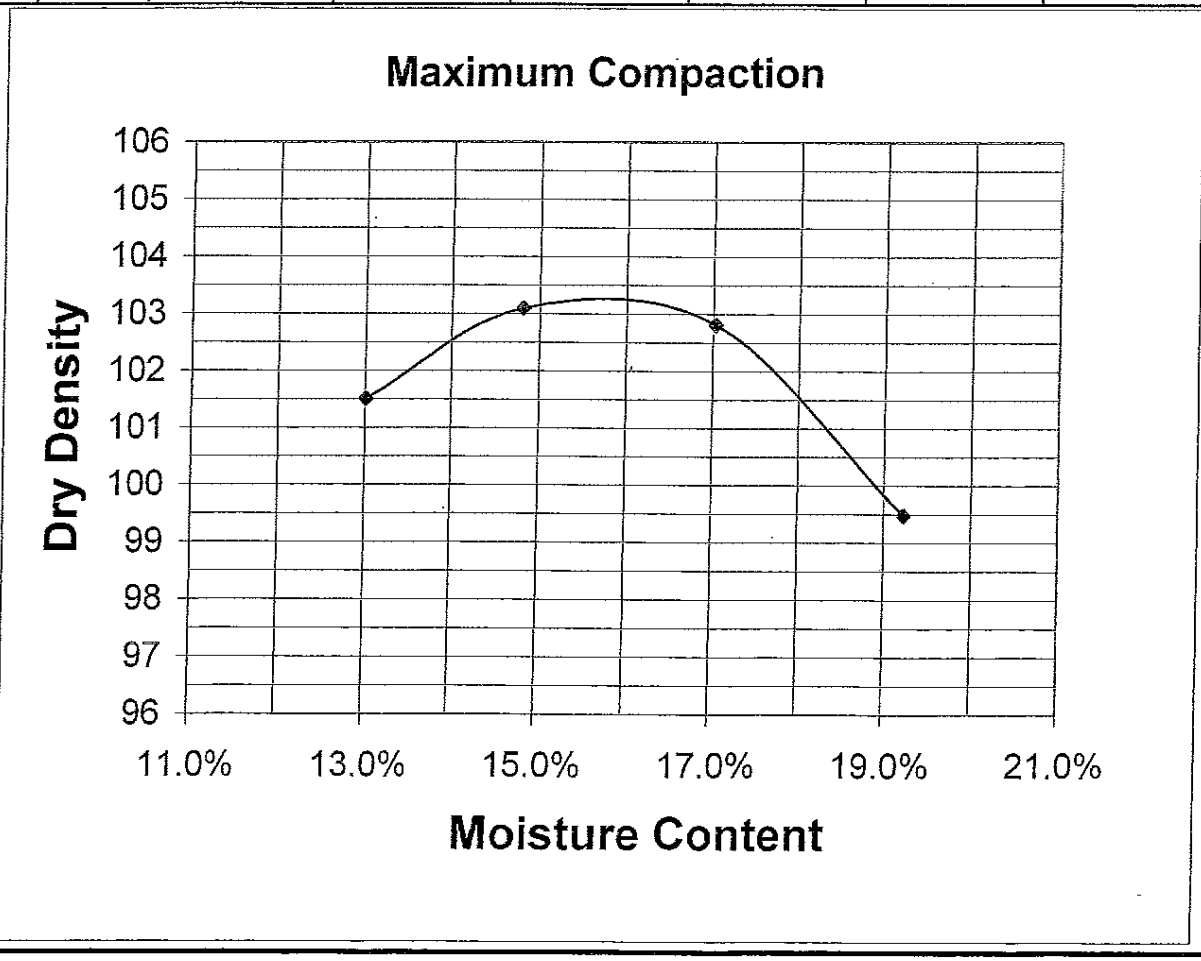
Engineer
JK

Tech

Compaction Test

Project:	Driscoll	**Project #**	SM 10823
Descriptn:	Dk Brown Clayey Sand	**Date:**	April 8, 2015
B-3, Existing Fill 1' to 15' mix, Site 36		**Tested By:**	MA
Type:	4" mold **Curve:** 3	**Sample Wt.**	2100 gr.

Moisture		+8	+10	+12	+14		
Wt. Mold+Comp. Soil		3844.1	3899.5	3929.0	3903.0		
Wt. of Mold	2106.0	2106.0	2106.0	2106.0	2106.0		
Vol. Factor:	0.066	0.066	0.066	0.066	0.066		
Tare No.:		1C	15	184	118		
Wet Wt.+Tare:		1014.1	1098.5	999.2	1088.1		
Dry Wt.+Tare:		906.7	970.9	864.3	925.5		
Wt. Comp. Soil		1738.1	1793.5	1823.0	1797.0		
Tare Wt.		81.3	109.5	72.1	79.5		
Net Dry Wt.		825.4	861.4	792.2	846.0		
Wt. of Water		107.4	127.6	134.9	162.6		
Wet Density		114.7	118.4	120.3	118.6		
Water Content		0.130	0.148	0.170	0.192		
Water Content %		13.0%	14.8%	17.0%	19.2%		
Dry Density		101.5	103.1	102.8	99.5		



Laboratory

Max D.D. **103.1**
Opt Moist. **14.8%**

Corrected

Max D.D. **103.0**
Opt Moist. **15.0%**

Engineer: JK

Tech:

Direct Shear

Project:	Driscoll
Sample #	B-1 (Site 9)
Description	Lt Tan Brown Clayey Sand w/ gravels

Date	4/9/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	1030	2030	4030	8030
Max Shear Stress	90.4	100.2	151.4	
Shear Stress (PSF)	2658.2	2946.2	4453.9	

Equation of Trendline	
Intercept	Slope
1885.7	0.6208

C (PSF)	PHI
1886	32

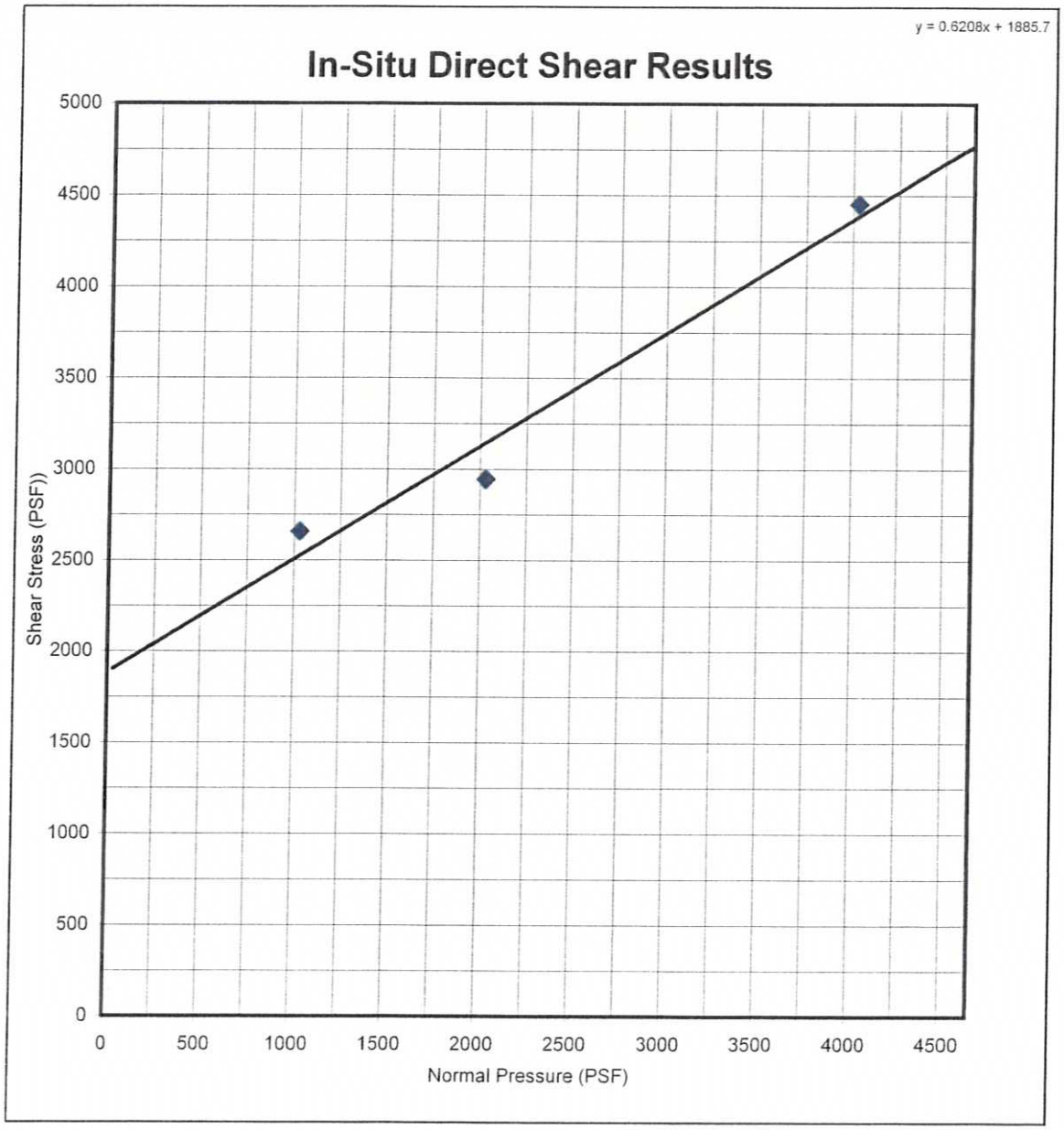


Figure No.

Direct Shear

Project:	Driscoll
Sample #	B-2 (Site 16)
Description	Tan Silty Clayey Sand

Date	4/10/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	31.8	55	74.5	
Shear Stress (PSF)	934.6	1617.1	2191.7	

Equation of Trendline	
Intercept	Slope
623.29	0.8004

C (PSF)	PHI
623	39

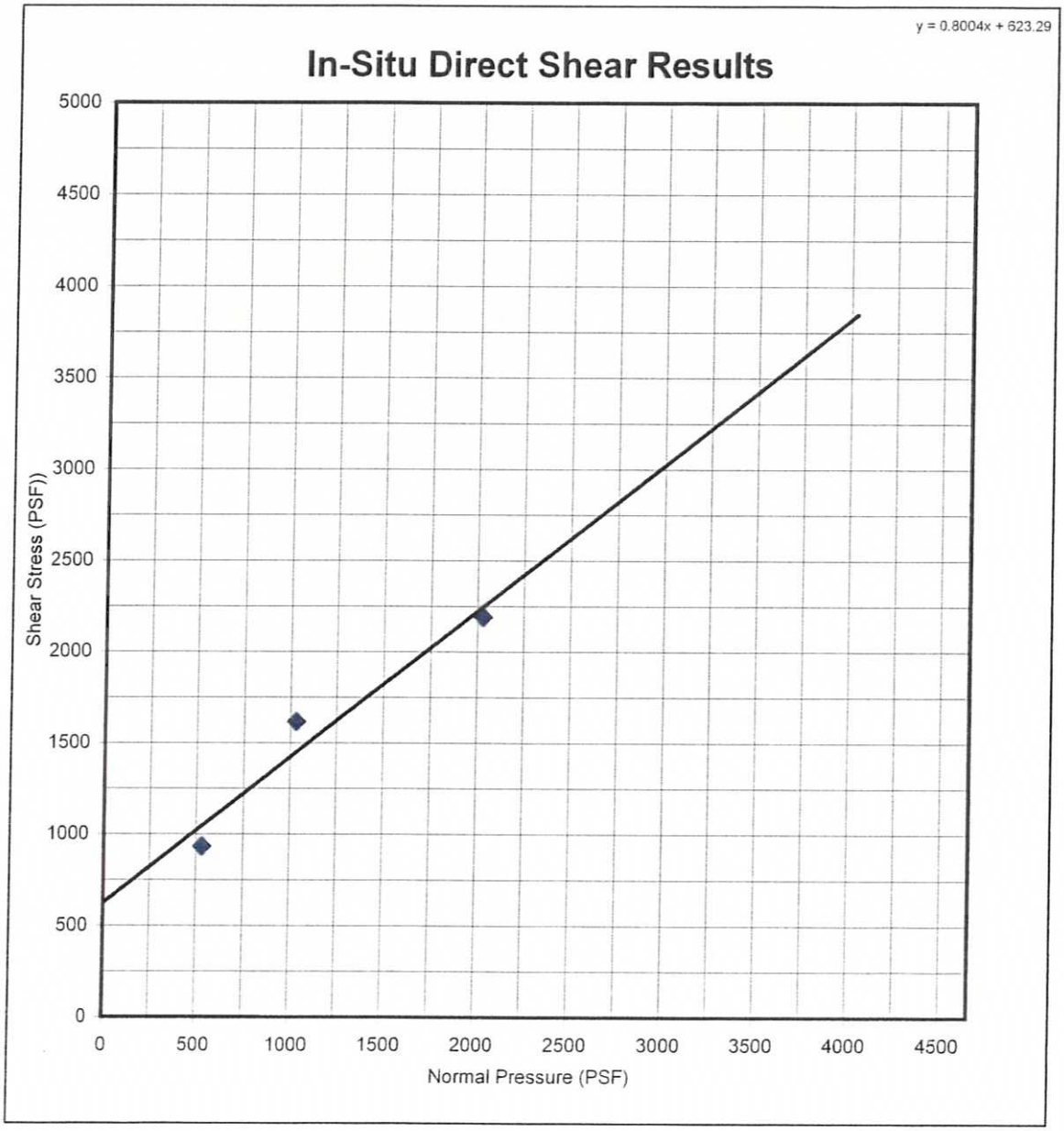


Figure No.

Direct Shear

Project:	Driscoll
Sample #	B-3 (Site 36)
Description	Dk Brown Clayey Sand

Date	4/12/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	14.6	20.5	38.8	
Shear Stress (PSF)	430.6	603.4	1141.9	

Equation of Trendline	
Intercept	Slope
146.85	0.4834

C (PSF)	PHI
147	26

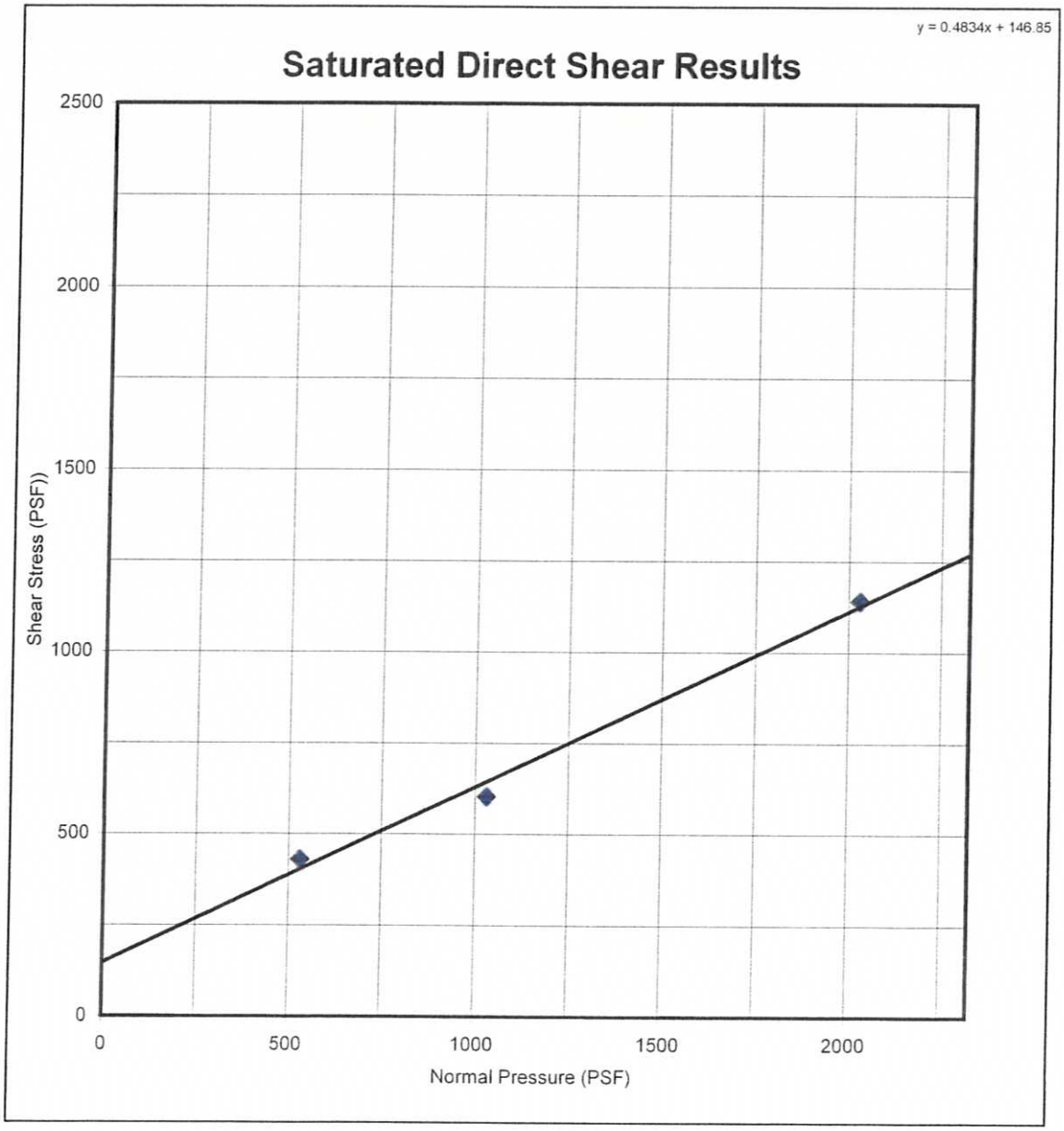


Figure No.

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Figure No.

Direct Shear

Project:	Driscoll
Sample #	B-1-1 (Site 9)
Description	Lt Brown Clayey Sand w/ gravels

Date	4/15/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	52.5	83	135.6	
Shear Stress (PSF)	1545.1	2442.2	3987.4	

Equation of Trendline	
Intercept	Slope
724.01	1.6163

C (PSF)	PHI
724	58

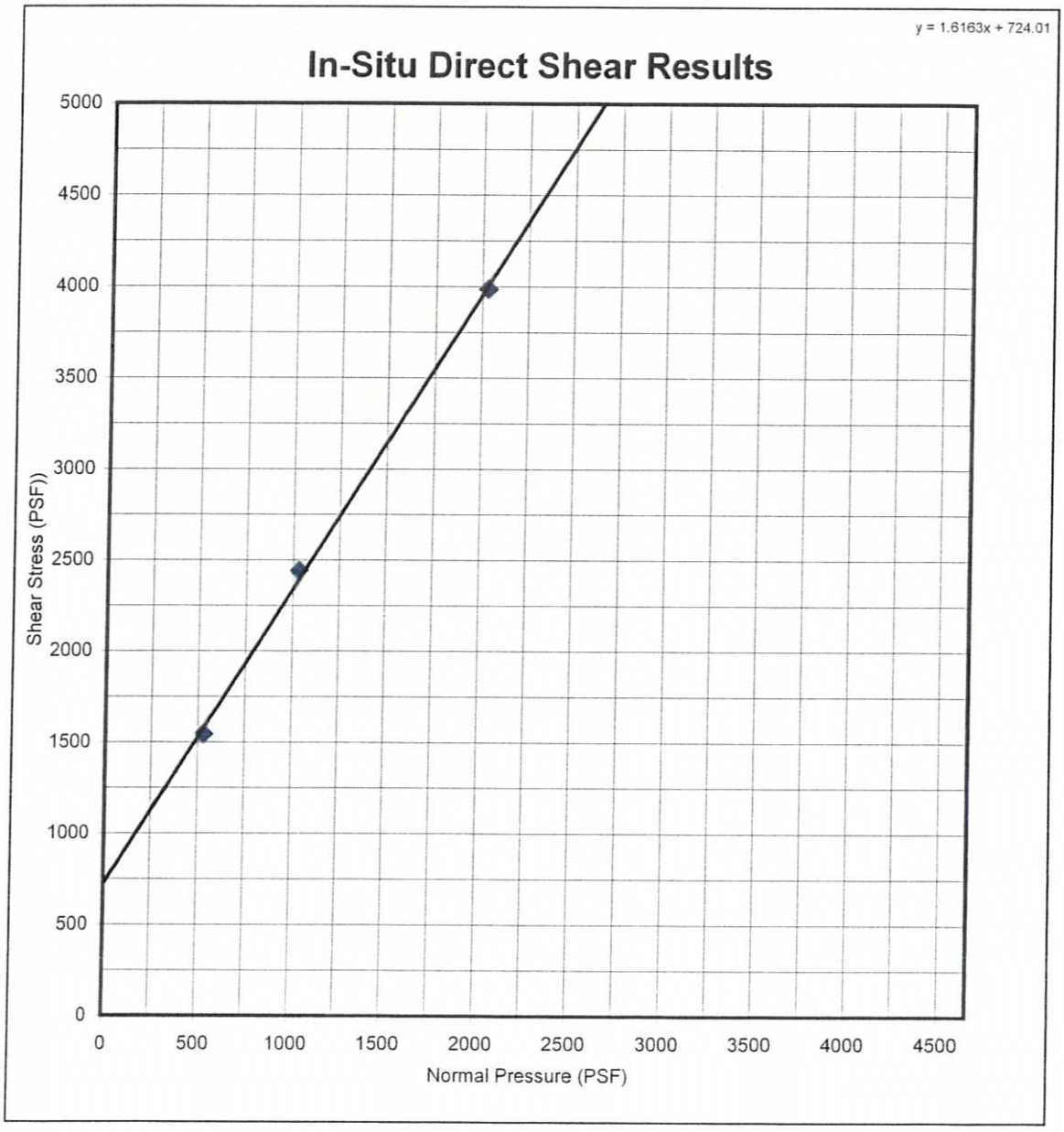

Figure No.

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Figure No.

Direct Shear

Project:	Driscoll
Sample #	B-2-1 (Site 16)
Description	Brown Clayey Sand w/ sandstone

Date	4/15/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	51.3	89.2	151.4	
Shear Stress (PSF)	1509.1	2622.2	4453.9	

Equation of Trendline	
Intercept	Slope
534.92	1.9444

C (PSF)	PHI
535	63

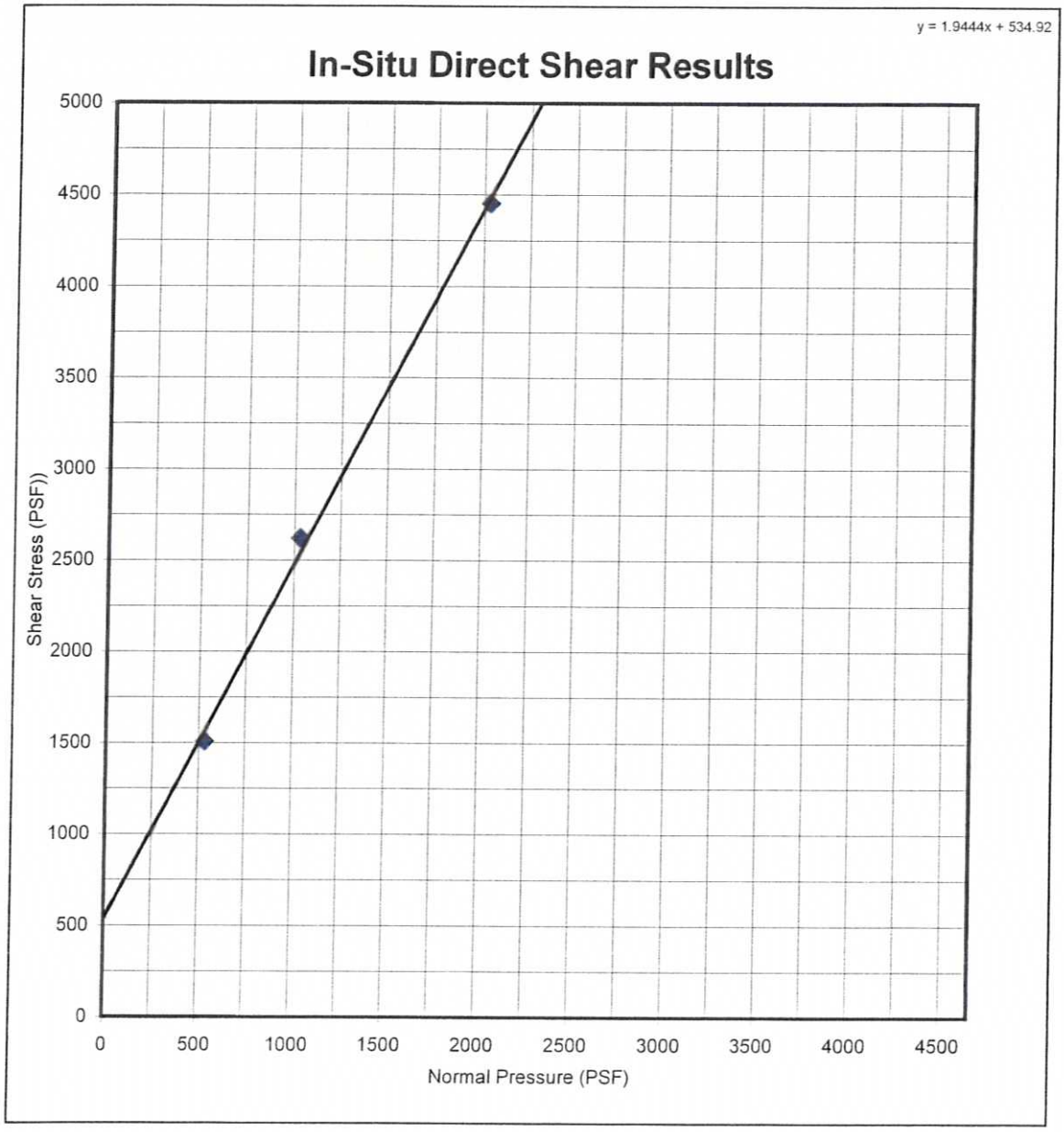

Figure No.

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Figure No.

Direct Shear

Project:	Driscoll
Sample #	B-3-1 (Site 36)
Description	Brown Clayey Sand w/ sandstone

Date	4/17/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	60.5	87.9	117.3	123.4
Shear Stress (PSF)	1778.4	2586.2	3448.8	
				3628.8

Equation of Trendline	
Intercept	Slope
1314.8	1.0777

C (PSF)	PHI
1315	47

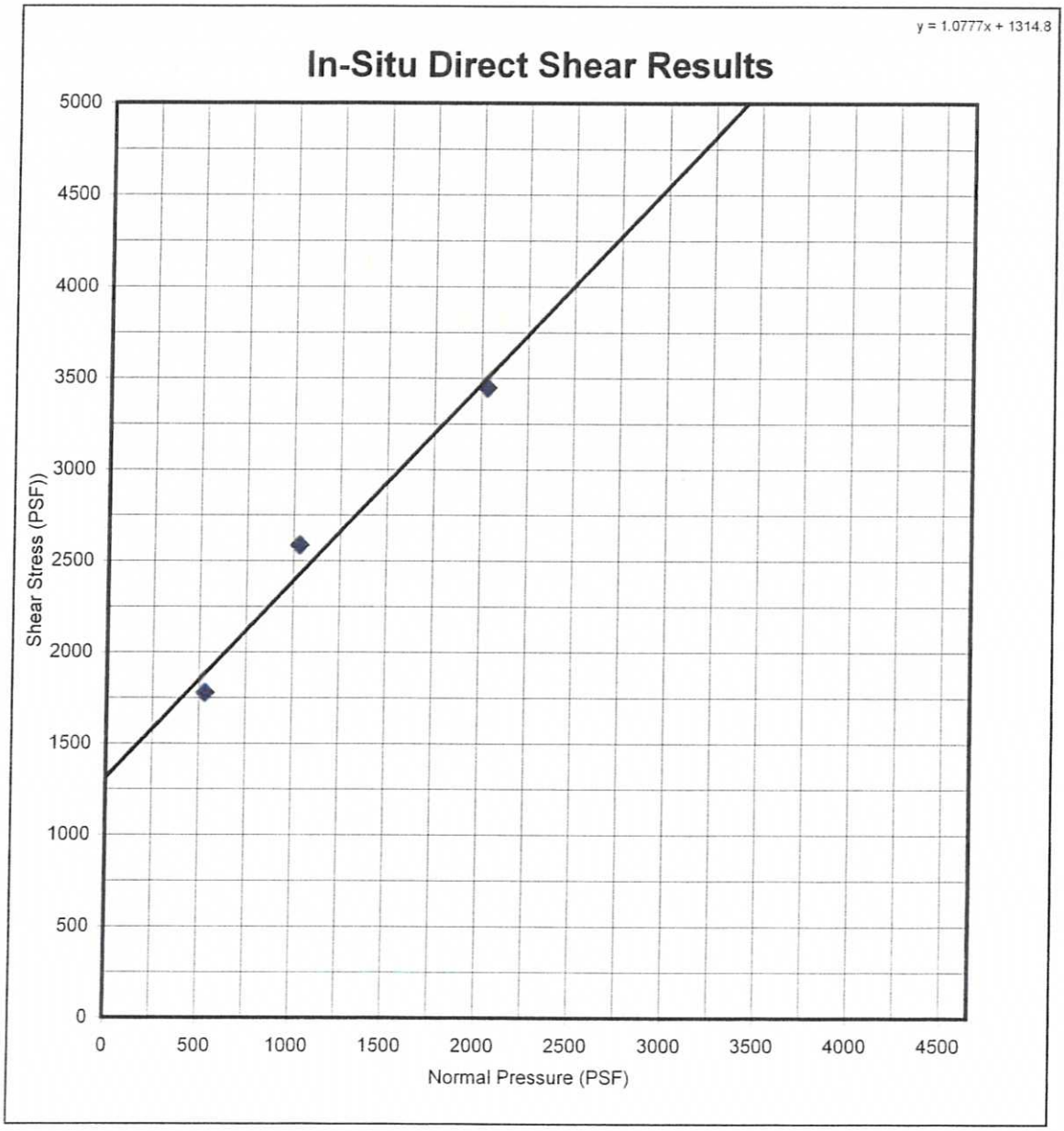

Figure No.

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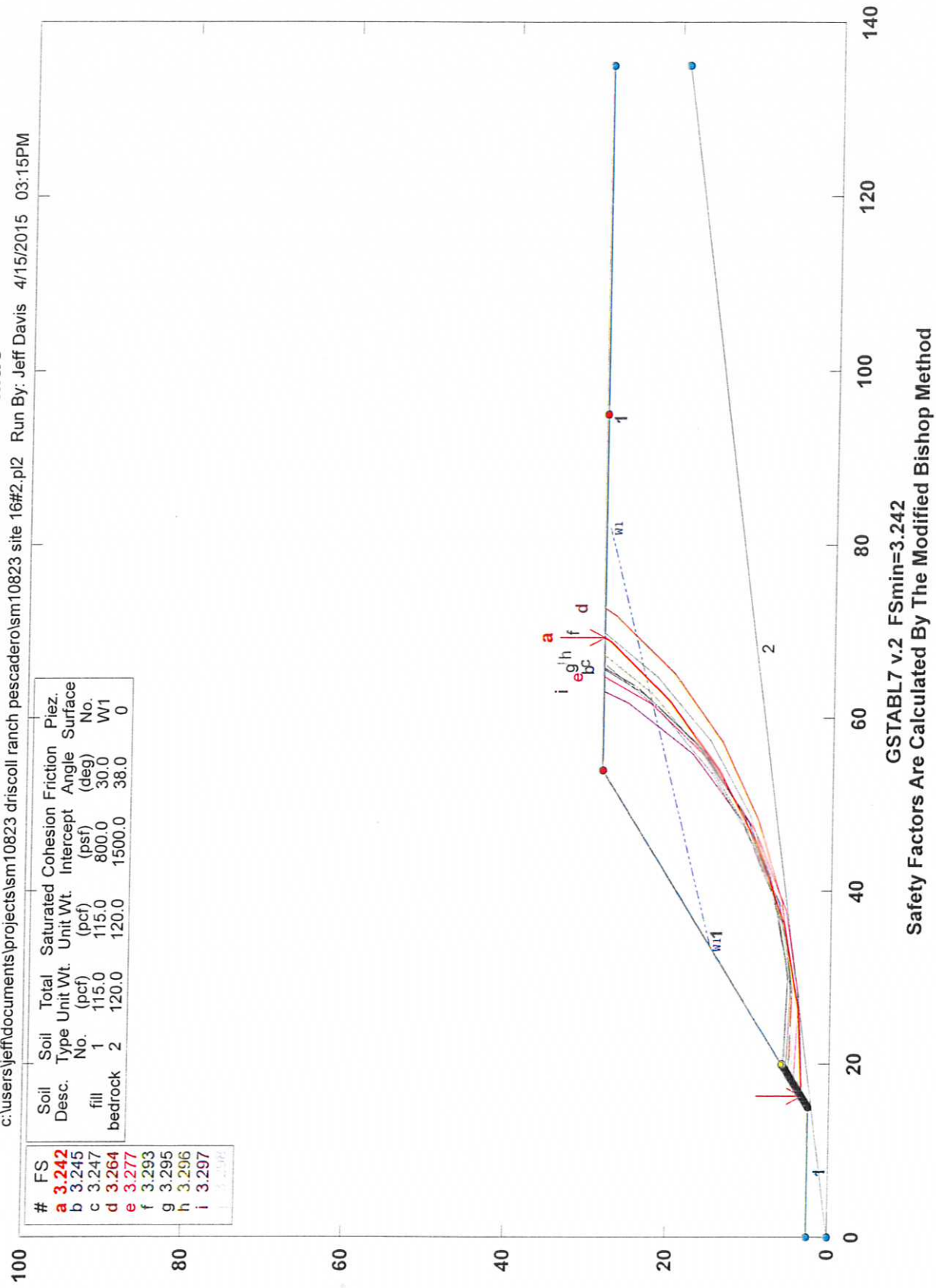
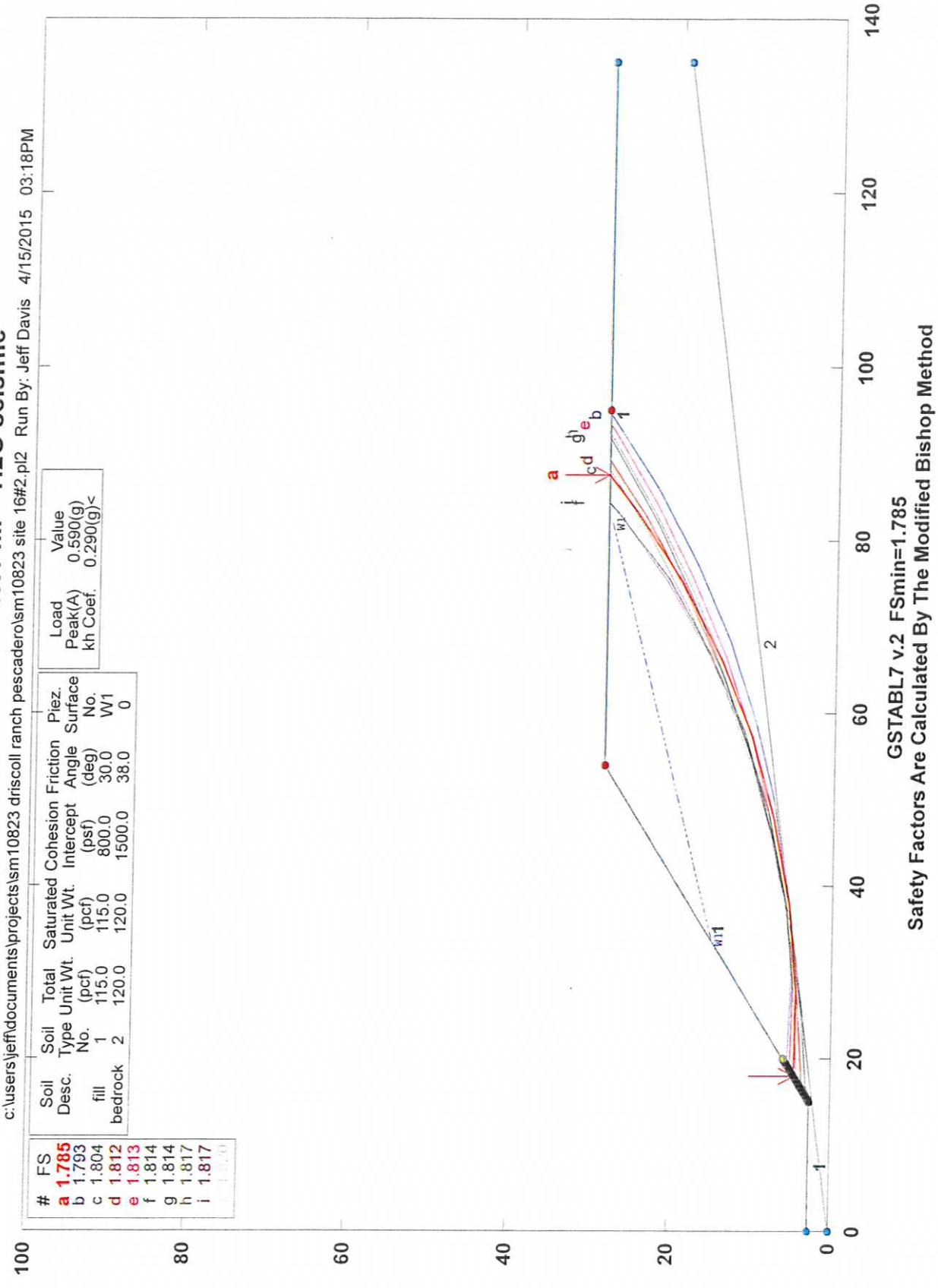
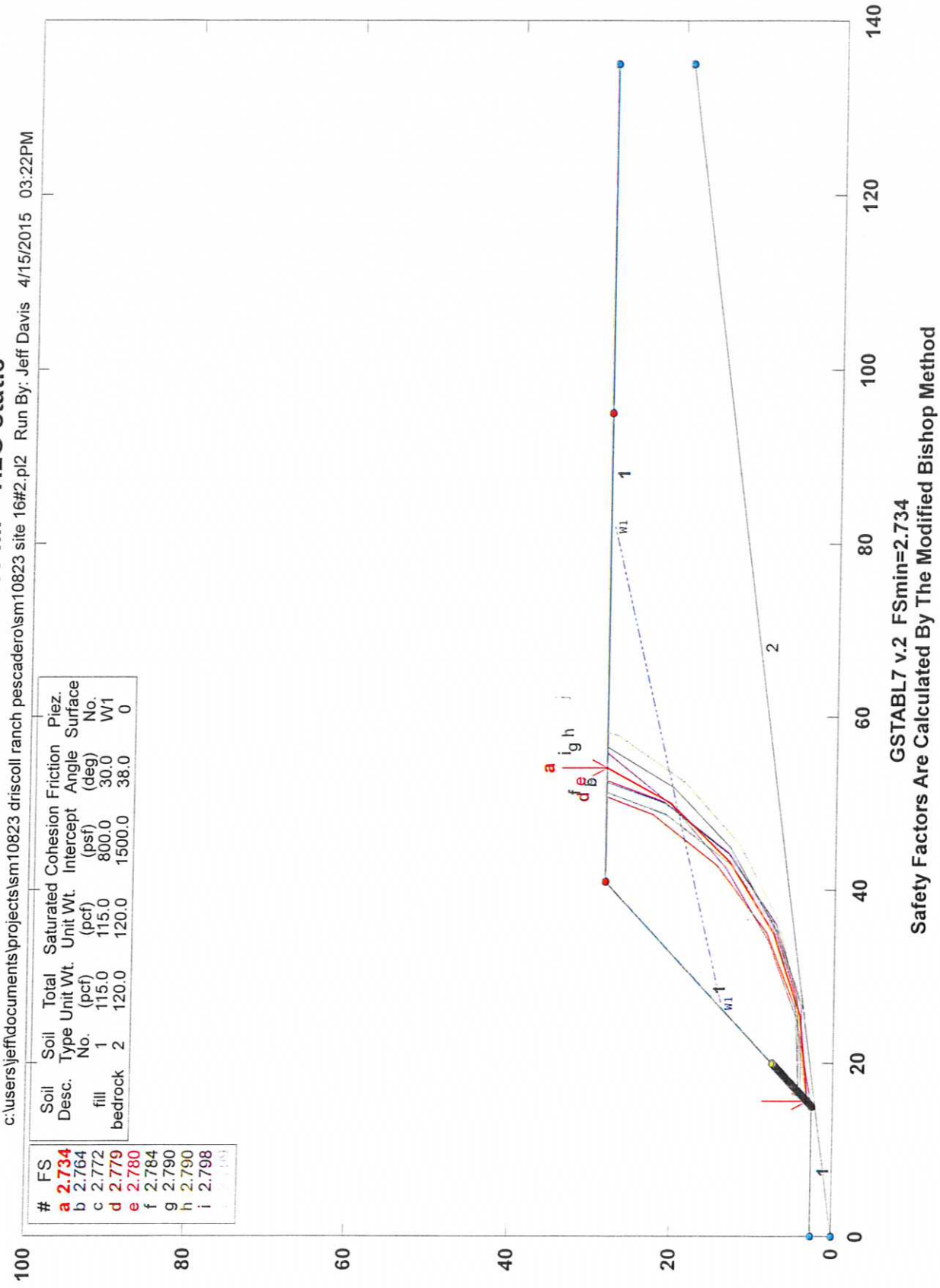
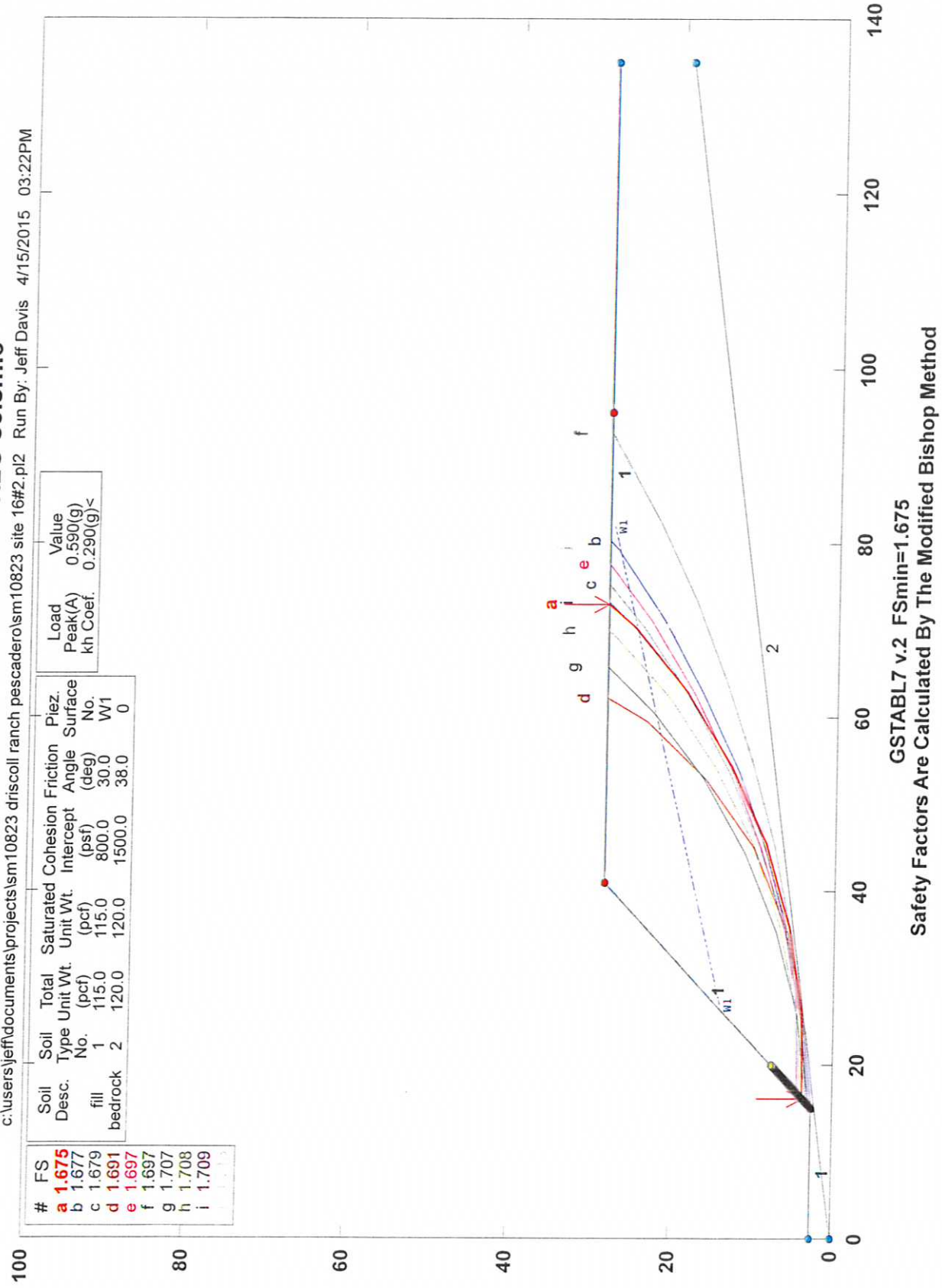
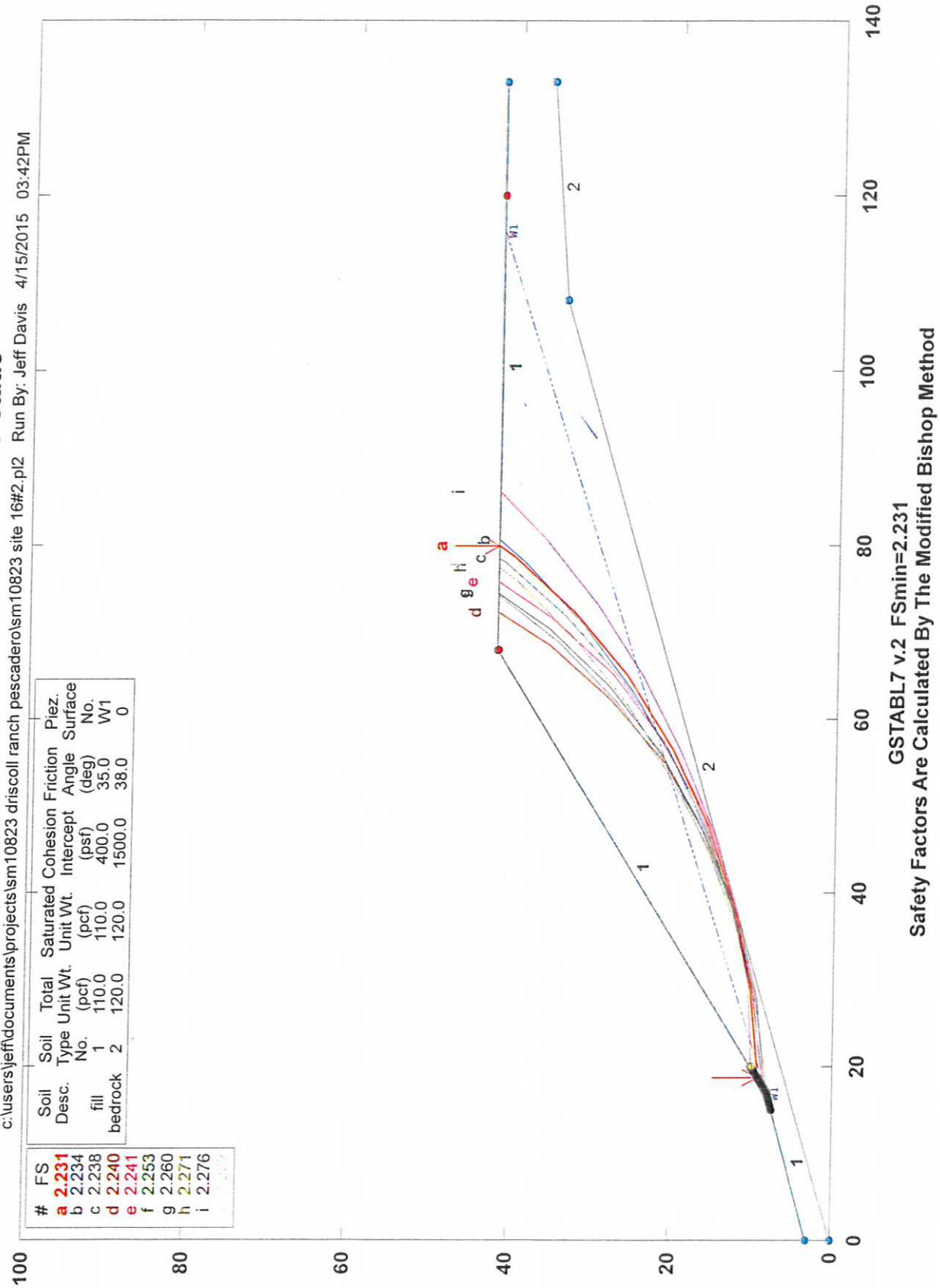
Figure No.

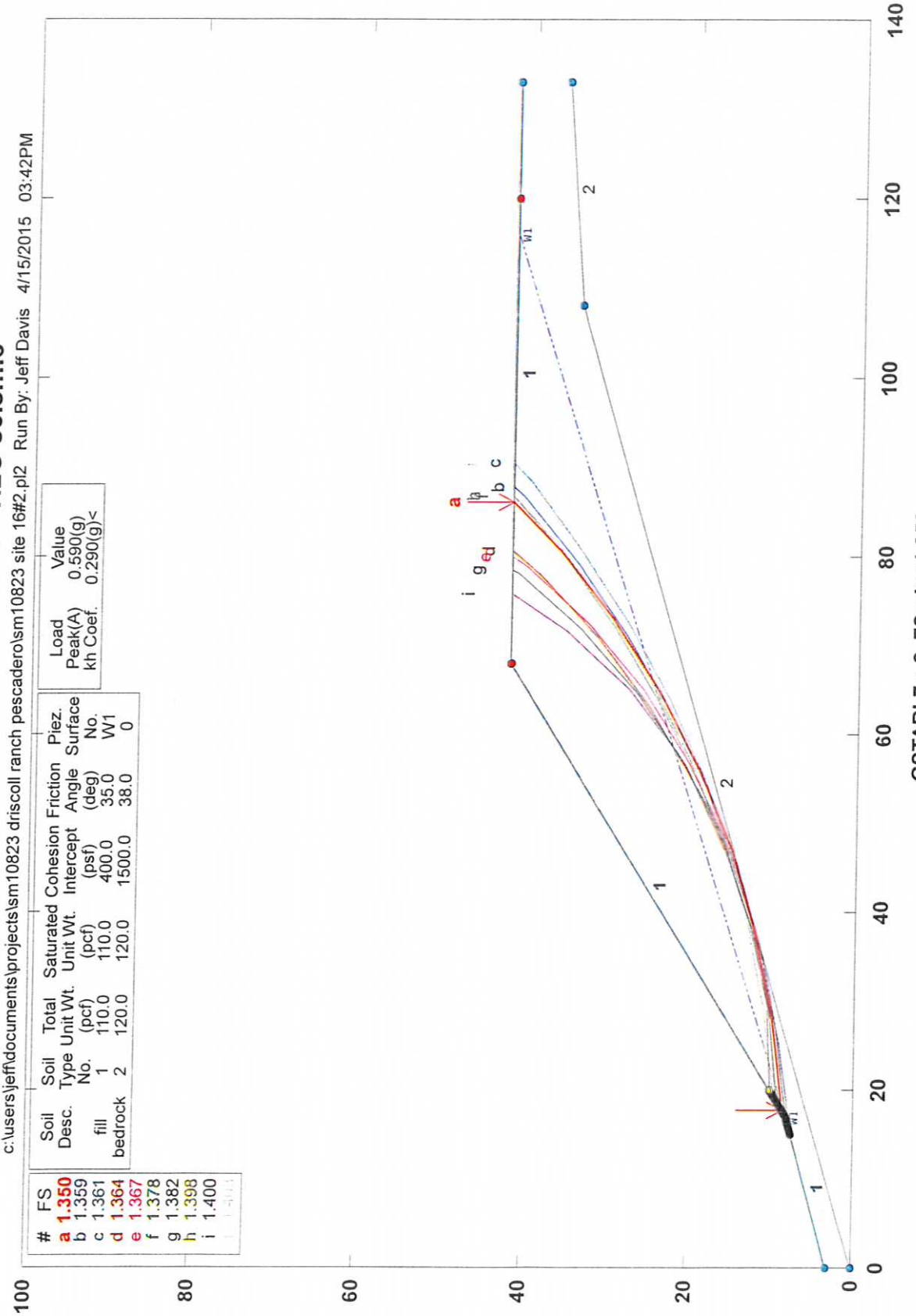

SM10823 Driscoll site 9 1.5:1 fill + H2O static
c:\users\jeff\documents\projects\sm10823 driscoll ranch pescadero\sm10823 site 16#2.pl2 Run By: Jeff Davis 4/15/2015 03:15PM
FS
a 3.242
b 3.245
c 3.247
d 3.264
e 3.277
f 3.293
g 3.295
h 3.296
i 3.297
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 115.0 | 115.0 | 800.0 | 30.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
GSTABL7 v.2 FSmin=3.242
Safety Factors Are Calculated By The Modified Bishop Method


SM10823 Driscoll site 9 1.5:1 fill + H2O seismic
c:\users\jeff\documents\projects\sm10823 driscoll ranch pescadero\sm10823 site 16#2.pl2 Run By: Jeff Davis 4/15/2015 03:18PM
FS
a 1.785
b 1.793
c 1.804
d 1.812
e 1.813
f 1.814
g 1.814
h 1.817
i 1.817
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 115.0 | 115.0 | 800.0 | 30.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
Load
Peak(A) Value
kh Coef. 0.590(g)
0.290(g)<
GSTABL7 v.2 FSmin=1.785
Safety Factors Are Calculated By The Modified Bishop Method
0
20
40
60
80
100
120
140
W1
1
2


SM10823 Driscoll site 9 1:1 fill + H2O static
c:\users\jeff\documents\projects\sm10823 driscoll ranch pescadero\sm10823 site 16#2.pl2 Run By: Jeff Davis 4/15/2015 03:22PM
FS
a 2.734
b 2.764
c 2.772
d 2.779
e 2.780
f 2.784
g 2.790
h 2.790
i 2.798
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 115.0 | 115.0 | 800.0 | 30.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
GSTABL7 v.2 FSmin=2.734
Safety Factors Are Calculated By The Modified Bishop Method


SM10823 Driscoll site 9 1:1 fill + H2O seismic
c:\users\jeff\documents\projects\sm10823 driscoll ranch pescadero\sm10823 site 16#2.pl2 Run By: Jeff Davis 4/15/2015 03:22PM
FS
a 1.675
b 1.677
c 1.679
d 1.691
e 1.697
f 1.697
g 1.707
h 1.708
i 1.709
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 115.0 | 115.0 | 800.0 | 30.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
Load
Peak(A) Value
kh Coef. 0.590(g)
0.290(g)<
GSTABL7 v.2 FSmin=1.675
Safety Factors Are Calculated By The Modified Bishop Method
0
20
40
60
80
100
120
140


SM10823 Driscoll site 16 1:5 fill + H2O static
c:\users\jeff\documents\projects\sm10823 driscoll ranch pescadero\sm10823 site 16#2.pl2 Run By: Jeff Davis 4/15/2015 03:42PM
FS
a 2.231
b 2.234
c 2.238
d 2.240
e 2.241
f 2.253
g 2.260
h 2.271
i 2.276
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 110.0 | 110.0 | 400.0 | 35.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
GSTABL7 v.2 FSmin=2.231
Safety Factors Are Calculated By The Modified Bishop Method


SM10823 Driscoll site 16 1:5 fill + H2O seismic
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FS
a 1.350
b 1.359
c 1.361
d 1.364
e 1.367
f 1.378
g 1.382
h 1.398
i 1.400
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 110.0 | 110.0 | 400.0 | 35.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
Load Peak(A) 0.590(g)
kh Coef. 0.290(g)<
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Safety Factors Are Calculated By The Modified Bishop Method
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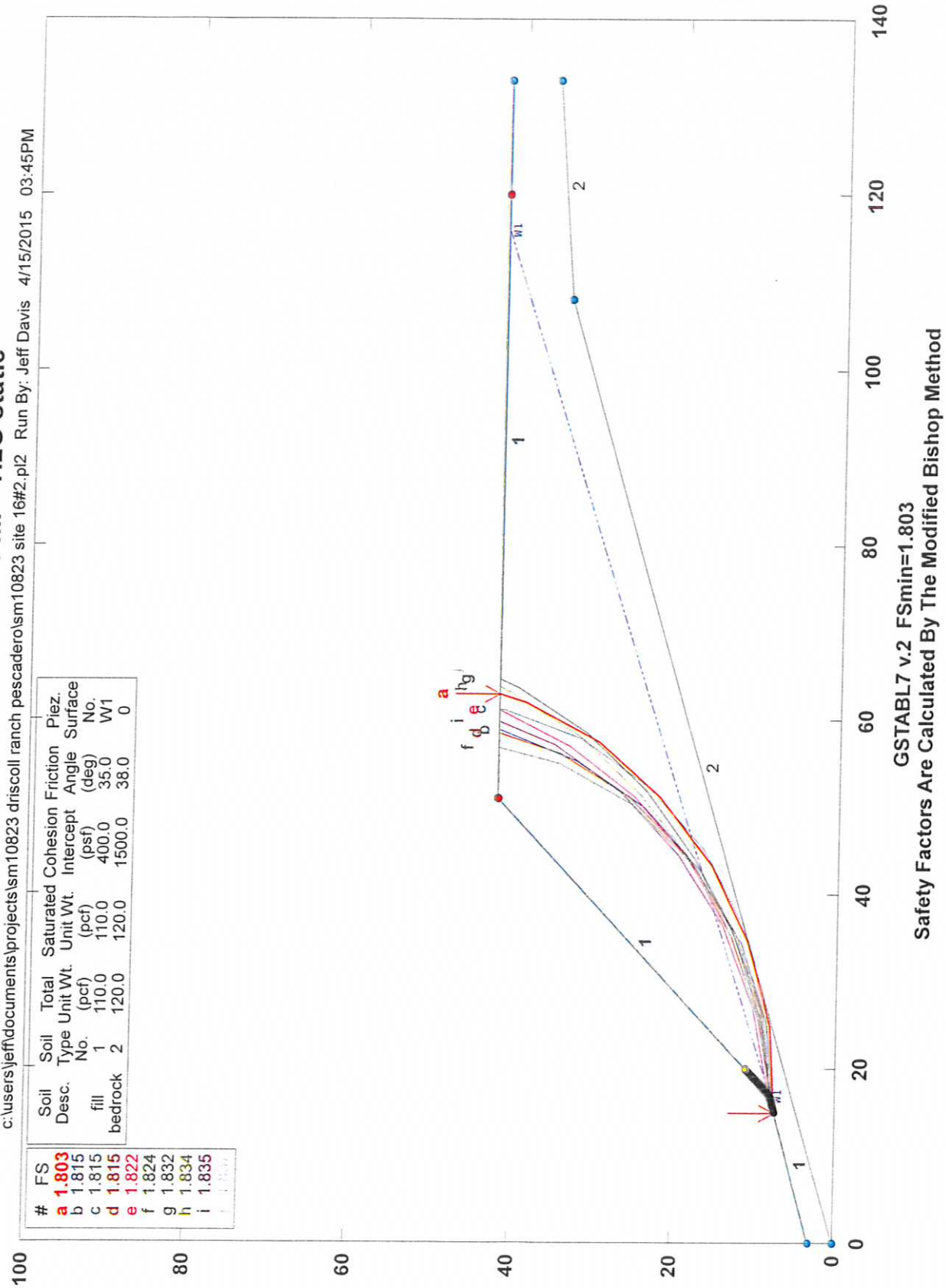
20
40
60
80
100
120
140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e 1.822
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h 1.834
i 1.835
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
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bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
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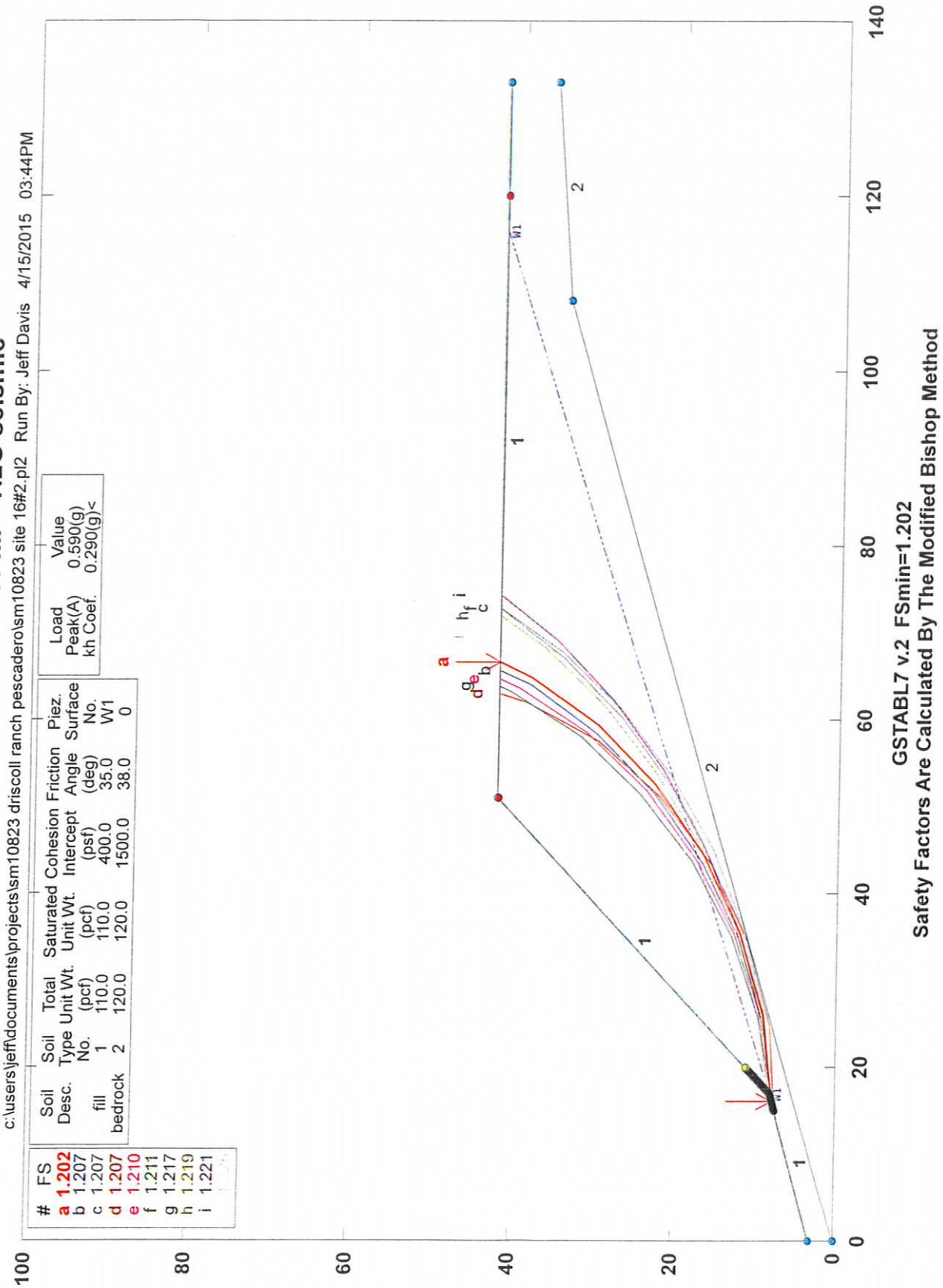
Safety Factors Are Calculated By The Modified Bishop Method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b 1.207
c 1.207
d 1.207
e 1.210
f 1.211
g 1.217
h 1.219
i 1.221
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
fill | 1 | 110.0 | 110.0 | 400.0 | 35.0 | W1
bedrock | 2 | 120.0 | 120.0 | 1500.0 | 38.0 | 0
Load Peak(A) kh Coef. | Value 0.590(g) 0.290(g)<
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Safety Factors Are Calculated By The Modified Bishop Method

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT, COUNTY OF SAN MATEO, CA

PROJECT DESCRIPTION/SCOPE

The purpose of this project is to complete environmental restoration at the La Honda Creek Open Space Preserve to reduce sediment from the deteriorating rural ranch road network from getting into downstream watercourses having known presence of protected fish species and to repair a failing stock pond. The scope of work shall include erosion and sediment control treatment on 4.68 miles of dirt road. Treatment includes road upgrades along 3.68 miles of road, abandonment of 1.0 mile of road, replacement of 4,400 linear feet of waterline, and restoration of 1 stock pond. Specific treatments and treatment sites are further detailed and described herein as the Contract Documents.

CONTACTS

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MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
330 DISTEL CIRCLE
LOS ALTOS, CA. 94022
650 691-1200
CONTACT: JULIE ANDERSEN, RESOURCE PLANNER

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1002 COLUMBIA STREET
SANTA CRUZ, CA 95060
831 425-5832

GEOTECHNICAL ENGINEER (Crossings 9, 16 and 35 only)
HARO, KASUNICH AND ASSOCIATES, INC
116 EAST LAKE AVE
WATSONVILLE, CA. 95076
831 722-4175 OR 831 247-5466
CONTACT: JOHN KASUNICH, PE, GE
MARK FOXX, CEG 831 234-7001

TASK #	DESCRIPTION OF WORK	QUANTITY UNIT	Road 30	Road 10	Road 50	Road 40	Road 23 A	Road 23 B Pond 10	Road 23 C
1	(N) Reverse grade dip	Each	20	20	15	5	2		
2	(N) Knick	Each		3	1				
3	(N) Waterbar	Each	8					13	3
4A	Remove (E) ditch relief culvert	Each	1						
4B	(N) Ditch relief culvert (18" x 30')	Each	3	3	4	9			
4B	(N) Ditch relief culvert (18" x 40')	Each			1				
4C	(RR) Ditch relief culvert (18"x30')	Each	1		1				
4D	(N) Clean inlet to ditch relief culvert	Each	7		5				
5A	(N) Clean inboard ditch (as required)	LF	285	676	190	775			
5B	(N) Rock inboard ditch	LF		330		300			
5B1	(N) Rock inboard ditch (4"x8" rock)	tons		44		45			
5B2	(N) Rock inboard ditch (12" rock)	tons		40		45			
6A	(N/RR) 24" Culvert	LF	30		70				
6A	(N/RR) 24" Culvert	Each	1		2				
6B	(N/RR) 30" Culvert	LF			80				
6B	(N/RR) 30" Culvert	Each			2				
6C	(N/RR) 36" Culvert	LF		60					
6C	(N/RR) 36" Culvert	Each		1					
6D	(N/RR) 42" Culvert	LF				240			
6D	(N/RR) 42" Culvert	Each				1			
6E	(N/RR) 48" Culvert	LF		160		80		40	
6E	(N/RR) 48" Culvert	Each		2		1		1	
7A	(N) 4" x 12" Rock placement at culverts	tons (min)	7	7.5	26.5	4.5			
7B	(N) 8" x 12" Rock placement at culverts	tons (min)		18		8			
7C	(N) 12" x 18" Rock placement at culverts	tons (min)	7		26	0			
7D	(N) 18" x 24" Rock placement at culverts	tons (min)		18		37			
7E	(N) 24" x 36" Rock placement at culverts	tons (min)		65				25	
8	(N) Drop Inlet	Each			1				
9	(N) Slope Drain: 18" x 60' w/ slope flared inlet, slope anchors, and T-outlet	Each				1			
10	(N) Abandon stream crossing and regrade	Each	1					2	1
11	(N) Remove perched fill	CY (est)	100	5	10	150			
12	(N) Regrade/reshape road to drain (est)	LF (min)	1250	6200	150	2825			
13	(N) Apply base rock aggregate to road	tons (min)	370	1837	44	837			
13	(N) Apply base rock aggregate to road	LF (min)	1250	6200	150	2825			
14	Apply erosion control as needed								
15	Other miscellaneous as specified on plans and as needed								
	(N): New (RR) Remove Replace								

SHEET INDEX

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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

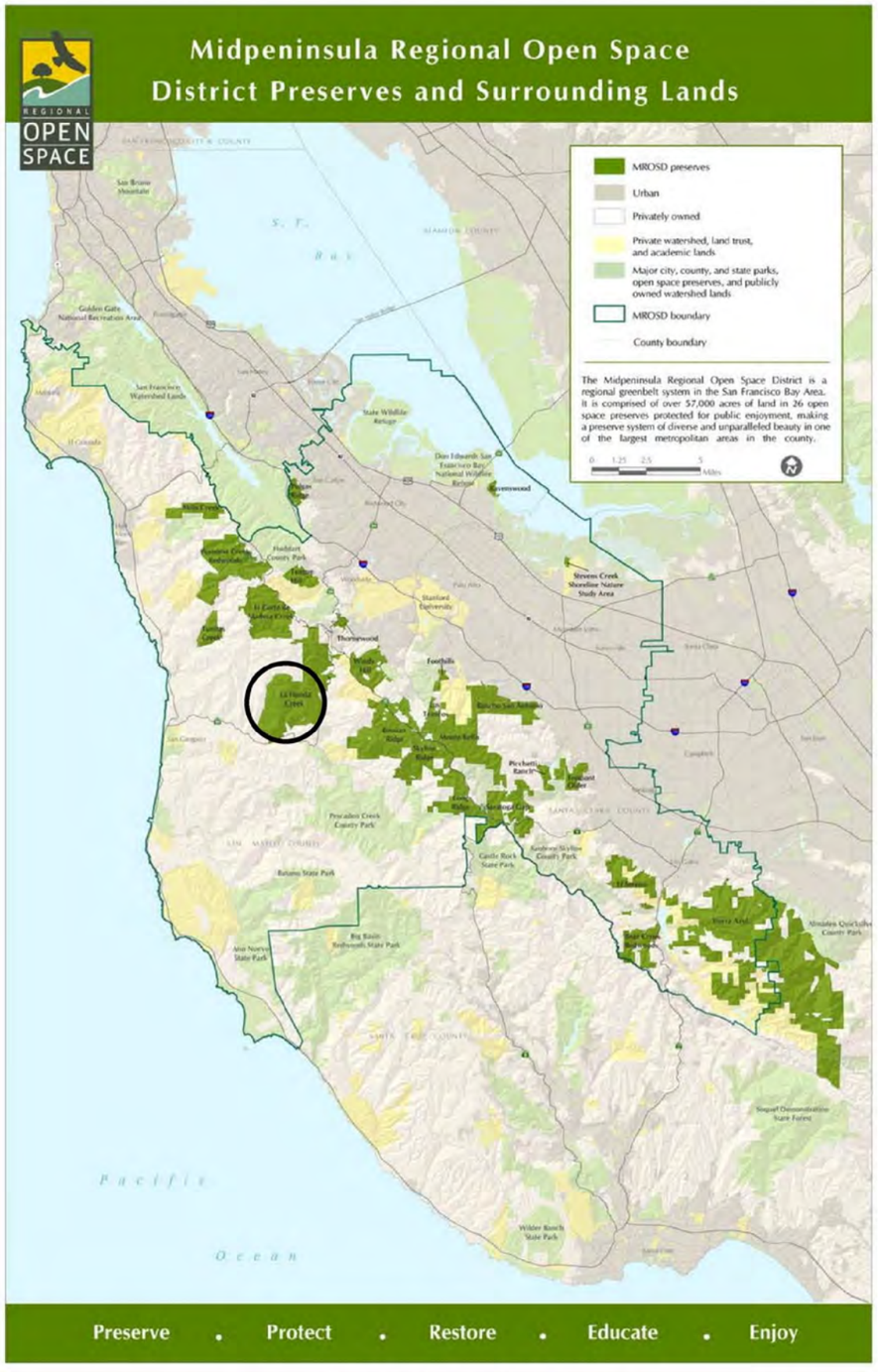
SHEET TITLE
TITLE SHEET

Date	Description
05/19/2015	
6/12/2015	REVISED

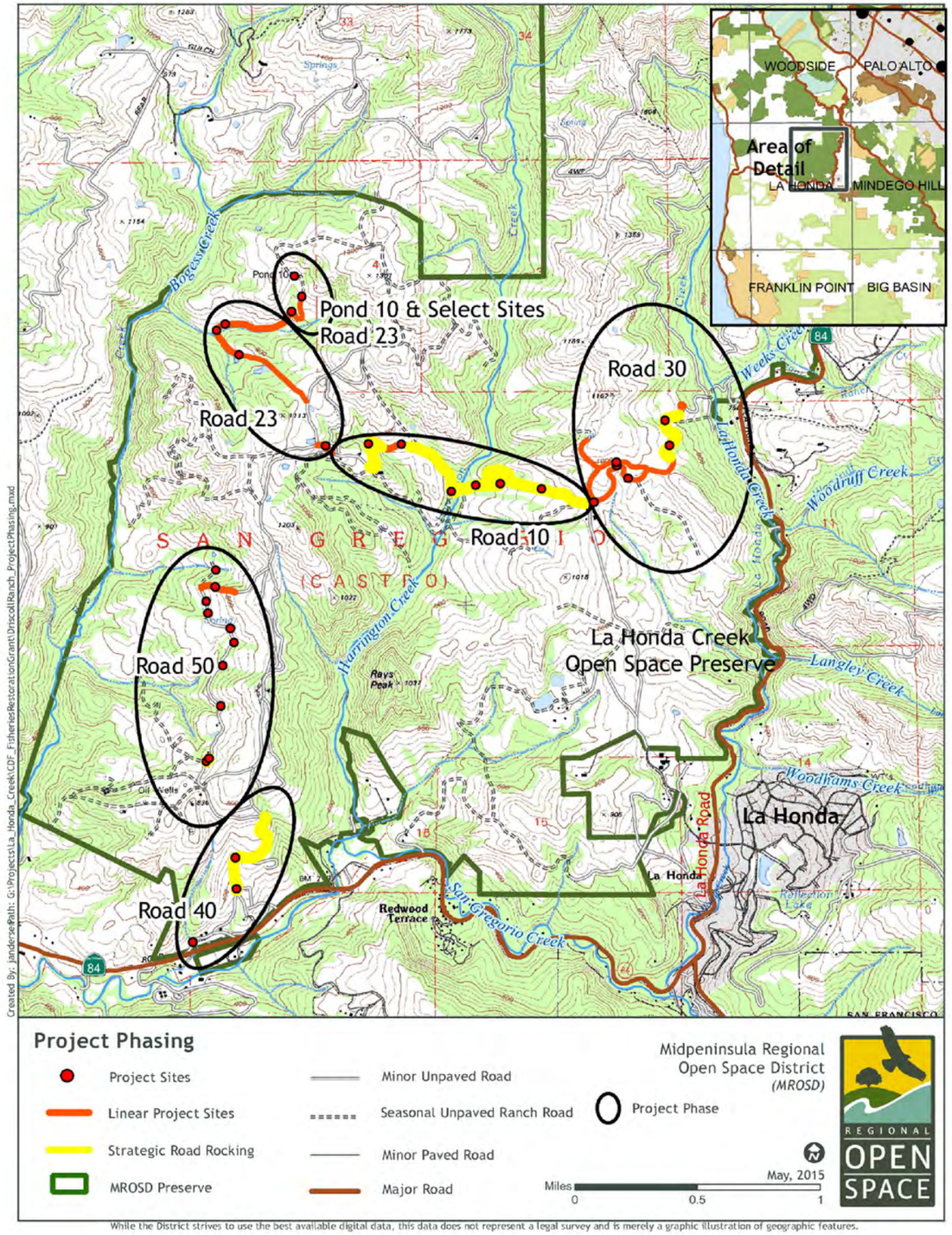
DRAWN
TCB

PROJECT
MPEN-DRISCOLL

SHEET NUMBER
C1



General Project Area
La Honda Creek Open Space Preserve



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DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
LOCATION AND SITE MAP

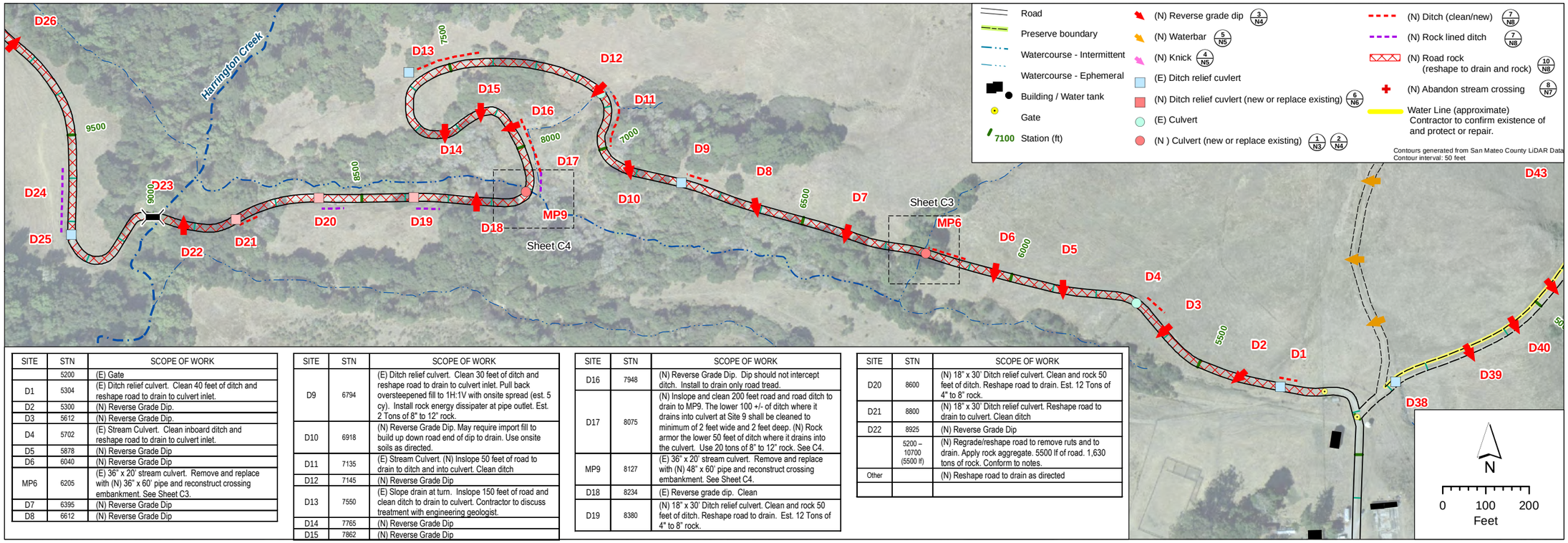
Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL

SHEET NUMBER
C1A

ATTACHMENT A

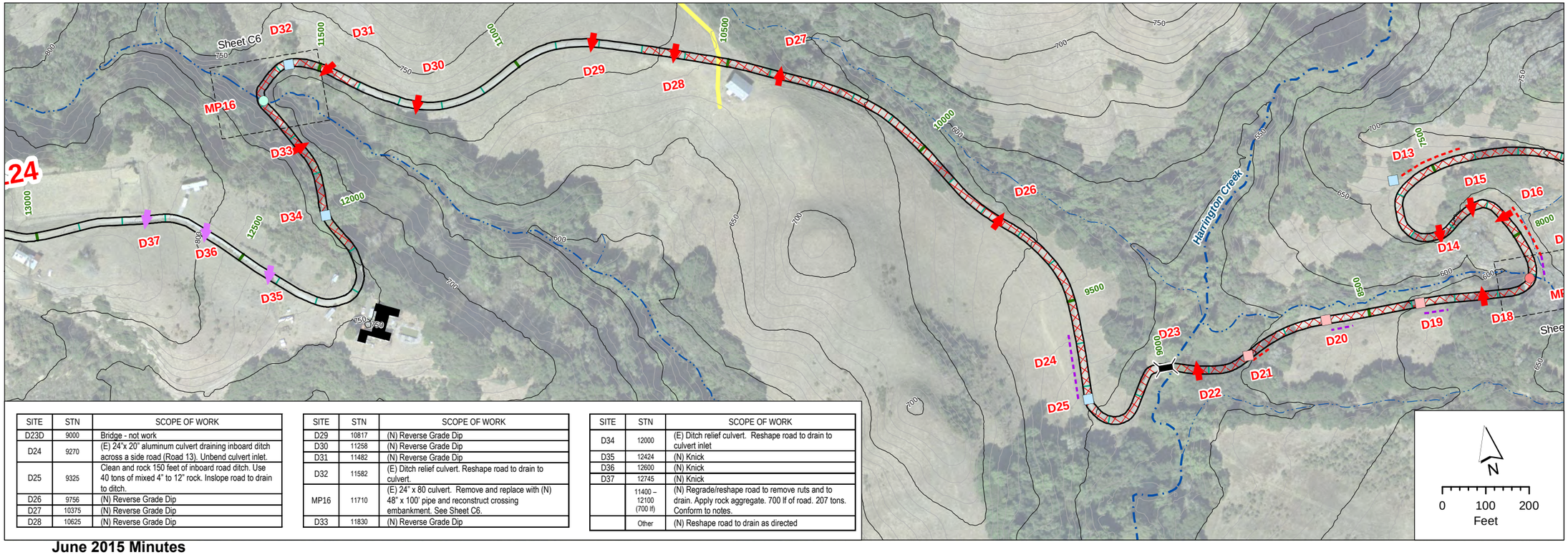


SITE	STN	SCOPE OF WORK
	5200	(E) Gate
D1	5304	(E) Ditch relief culvert. Clean 40 feet of ditch and reshape road to drain to culvert inlet.
D2	5300	(N) Reverse Grade Dip.
D3	5612	(N) Reverse Grade Dip.
D4	5702	(E) Stream Culvert. Clean inboard ditch and reshape road to drain to culvert inlet.
D5	5878	(N) Reverse Grade Dip
D6	6040	(N) Reverse Grade Dip
MP6	6205	(E) 36" x 20' stream culvert. Remove and replace with (N) 36" x 60' pipe and reconstruct crossing embankment. See Sheet C3.
D7	6395	(N) Reverse Grade Dip
D8	6612	(N) Reverse Grade Dip

SITE	STN	SCOPE OF WORK
D9	6794	(E) Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert inlet. Pull back oversteepened fill to 1H:1V with onsite spread (est. 5 cy). Install rock energy dissipater at pipe outlet. Est. 2 Tons of 8" to 12" rock.
D10	6918	(N) Reverse Grade Dip. May require import fill to build up down road end of dip to drain. Use onsite soils as directed.
D11	7135	(E) Stream Culvert. (N) Inslope 50 feet of road to drain to ditch and into culvert. Clean ditch
D12	7145	(N) Reverse Grade Dip
D13	7550	(E) Slope drain at turn. Inslope 150 feet of road and clean ditch to drain to culvert. Contractor to discuss treatment with engineering geologist.
D14	7765	(N) Reverse Grade Dip
D15	7862	(N) Reverse Grade Dip

SITE	STN	SCOPE OF WORK
D16	7948	(N) Reverse Grade Dip. Dip should not intercept ditch. Install to drain only road tread.
D17	8075	(N) Inslope and clean 200 feet road and road ditch to drain to MP9. The lower 100 +/- of ditch where it drains into culvert at Site 9 shall be cleaned to minimum of 2 feet wide and 2 feet deep. (N) Rock armor the lower 50 feet of ditch where it drains into the culvert. Use 20 tons of 8" to 12" rock. See C4.
MP9	8127	(E) 36" x 20' stream culvert. Remove and replace with (N) 48" x 60' pipe and reconstruct crossing embankment. See Sheet C4.
D18	8234	(E) Reverse grade dip. Clean
D19	8380	(N) 18" x 30' Ditch relief culvert. Clean and rock 50 feet of ditch. Reshape road to drain. Est. 12 Tons of 4" to 8" rock.

SITE	STN	SCOPE OF WORK
D20	8600	(N) 18" x 30' Ditch relief culvert. Clean and rock 50 feet of ditch. Reshape road to drain. Est. 12 Tons of 4" to 8" rock.
D21	8800	(N) 18" x 30' Ditch relief culvert. Reshape road to drain to culvert. Clean ditch
D22	8925	(N) Reverse Grade Dip
	5200 – 10700 (5500 lf)	(N) Regrade/reshape road to remove ruts and to drain. Apply rock aggregate. 5500 lf of road. 1,630 tons of rock. Conform to notes.
Other		(N) Reshape road to drain as directed



SITE	STN	SCOPE OF WORK
D23D	9000	Bridge - not work
D24	9270	(E) 24"x 20' aluminum culvert draining inboard ditch across a side road (Road 13). Unbend culvert inlet.
D25	9325	Clean and rock 150 feet of inboard road ditch. Use 40 tons of mixed 4" to 12" rock. Inslope road to drain to ditch.
D26	9756	(N) Reverse Grade Dip
D27	10375	(N) Reverse Grade Dip
D28	10625	(N) Reverse Grade Dip

SITE	STN	SCOPE OF WORK
D29	10817	(N) Reverse Grade Dip
D30	11258	(N) Reverse Grade Dip
D31	11482	(N) Reverse Grade Dip
D32	11582	(E) Ditch relief culvert. Reshape road to drain to culvert.
MP16	11710	(E) 24" x 80 culvert. Remove and replace with (N) 48" x 100' pipe and reconstruct crossing embankment. See Sheet C6.
D33	11830	(N) Reverse Grade Dip

SITE	STN	SCOPE OF WORK
D34	12000	(E) Ditch relief culvert. Reshape road to drain to culvert inlet
D35	12424	(N) Knick
D36	12600	(N) Knick
D37	12745	(N) Knick
	11400 – 12100 (700 lf)	(N) Regrade/reshape road to remove ruts and to drain. Apply rock aggregate. 700 lf of road. 207 tons. Conform to notes.
	Other	(N) Reshape road to drain as directed

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

ROAD 10 SITE MAP

Date	Description
5/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

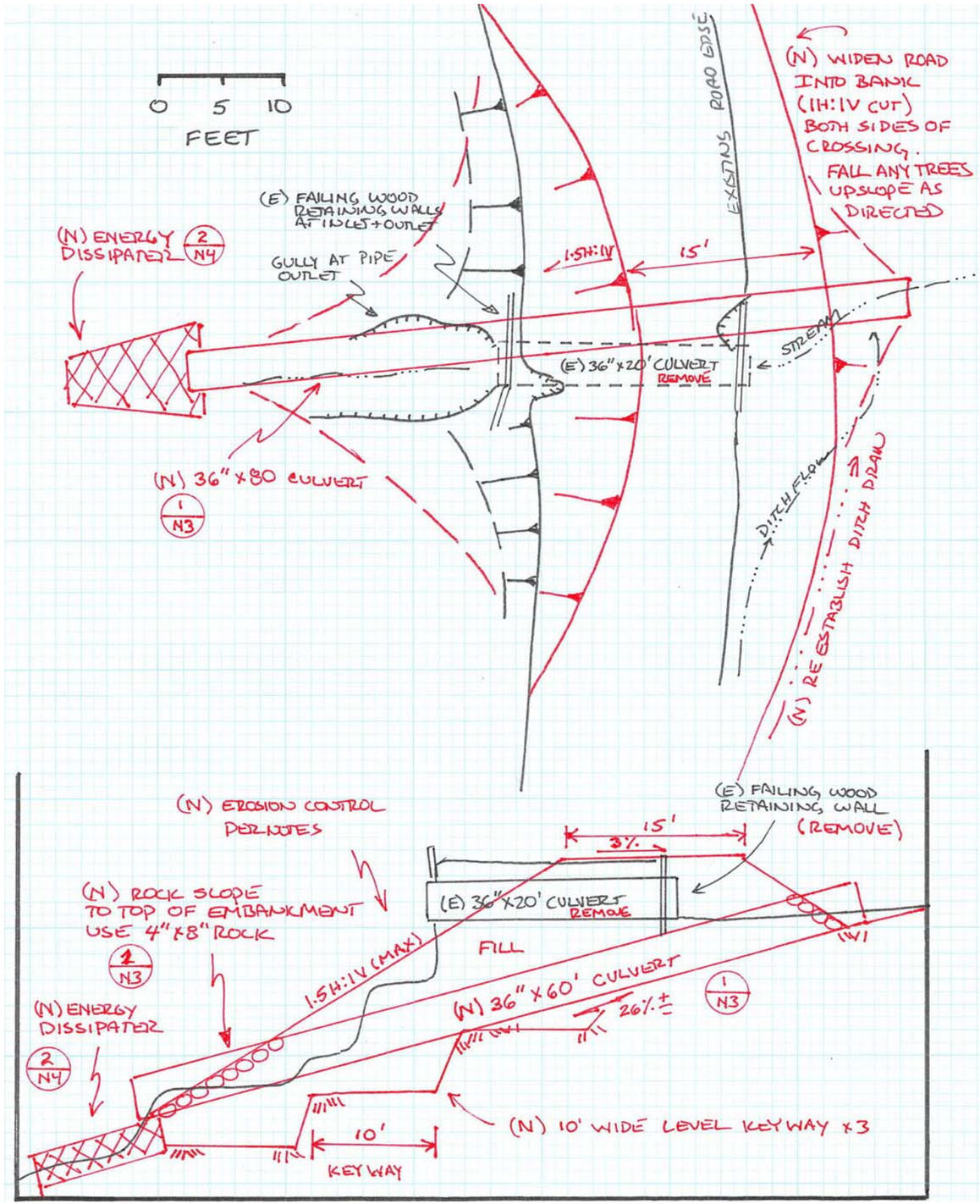
C2

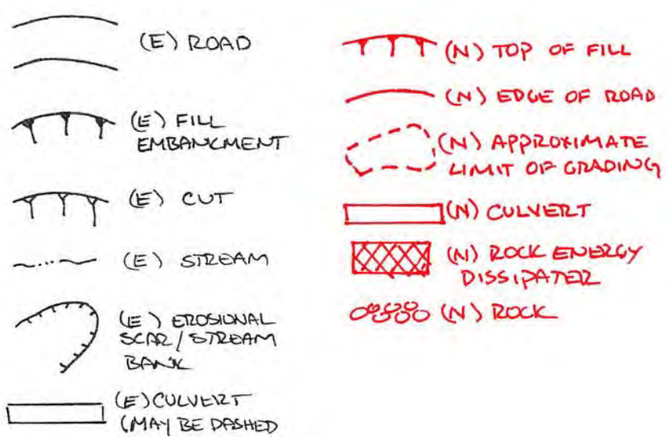
6: REMOVE AND REPLACE CULVERT

This is an existing 36 inch x 20 foot metal culvert at narrow and steep gradient ephemeral watercourse draining a 12.5 acre watershed. The project proposes to remove the existing culvert and replace it with a new 36 inch by 60 foot culvert and realign the road inboard (into the slope). The crossing is not expected to be flowing at time of construction.

SCOPE OF WORK

- Remove and replace culvert within new 36 inch by 60 foot culvert per standard specifications and as shown
  - Excavate crossing to native channel grade as shown.
    - Remove the old culvert, degraded low wood retaining wall and dispose offsite.
    - It is expected that the majority of crossing fill can be used as engineered fill. A small amount of deterious fill may need to be removed and spread onsite on gentle gradient ground nearby.
  - Realign the center line of road 8 feet inboard (into the slope) from existing as shown.
    - Cut into bank (5 feet max) to either side of crossing as shown and as directed
    - Incline (N) cut at maximum 1H:1V.
    - Fill generated from realigning the road can be used as engineered fill to reconstruct the crossing.
  - Install culvert along native channel grade at S=26%+/-
  - Reconstruct the crossing embankment with engineered fill
    - Fill shall be keyed into firm native soils and brought up to grade at 1.5H:1V slope. Keyway shall be a minimum of 10 feet wide and shall be level. Minimum 3 required.
    - Construct for a 15 foot wide road width.
  - Approximately 150+ cy of grading will be required to reconstruct the crossing embankment.
- Install rock energy dissipater at pipe outlet rock per standard specifications 2/N4
  - Use 18 tons of 18" to 24" rock
- Armor embankment face to top of culvert diam per standard specifications 1/N3
  - Use 6 tons of 4" to 8" rock
- Install critical dip
- Treat exposed soils outside roadway per notes and as directed
- Conform to CDFW 1600 agreement





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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 6
SITE MAP AND SECTION

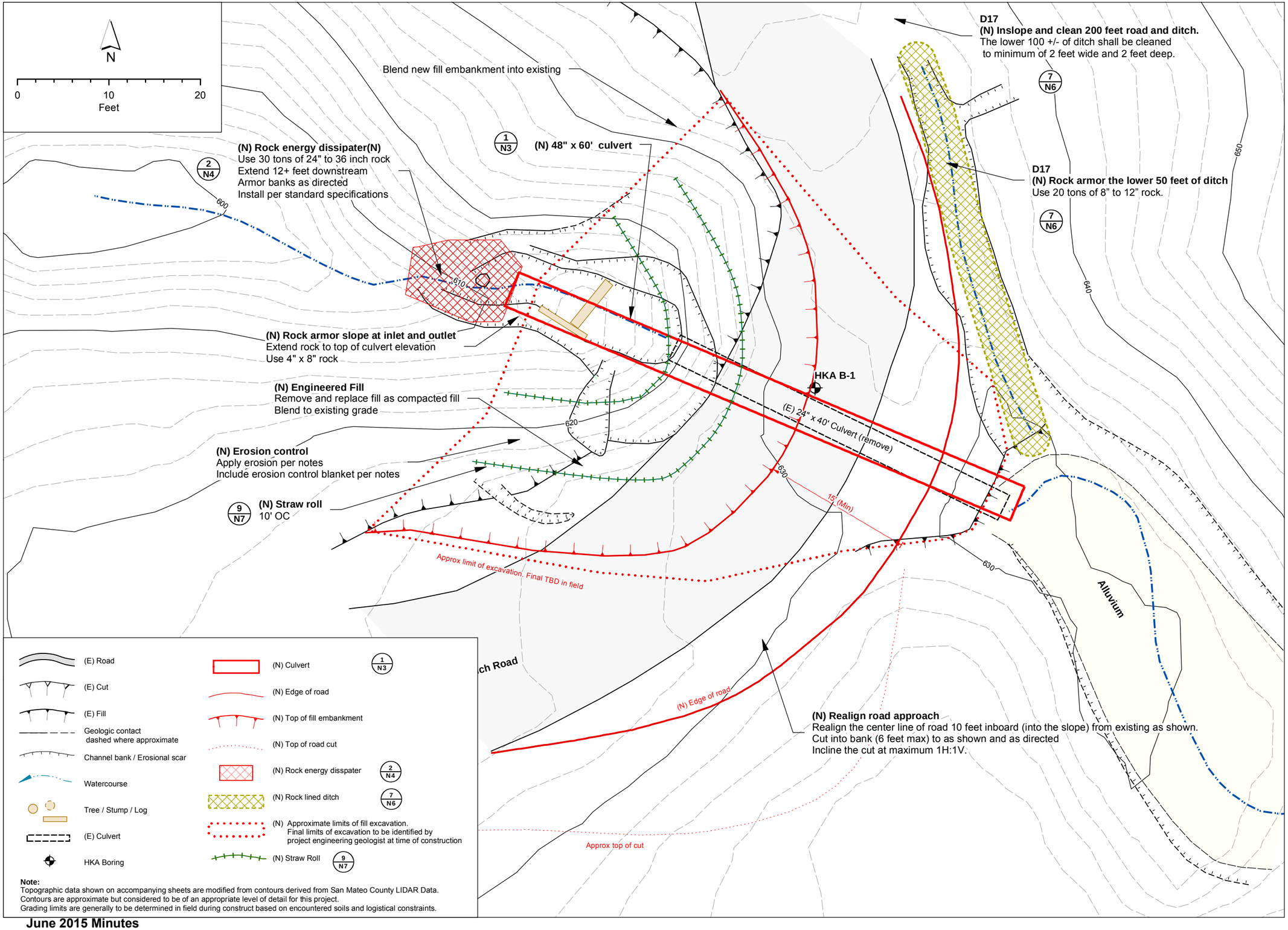
Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C3



Note:
Topographic data shown on accompanying sheets are modified from contours derived from San Mateo County LIDAR Data.
Contours are approximate but considered to be of an appropriate level of detail for this project.
Grading limits are generally to be determined in field during construct based on encountered soils and logistical constraints.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

MP 9 SITE MAP

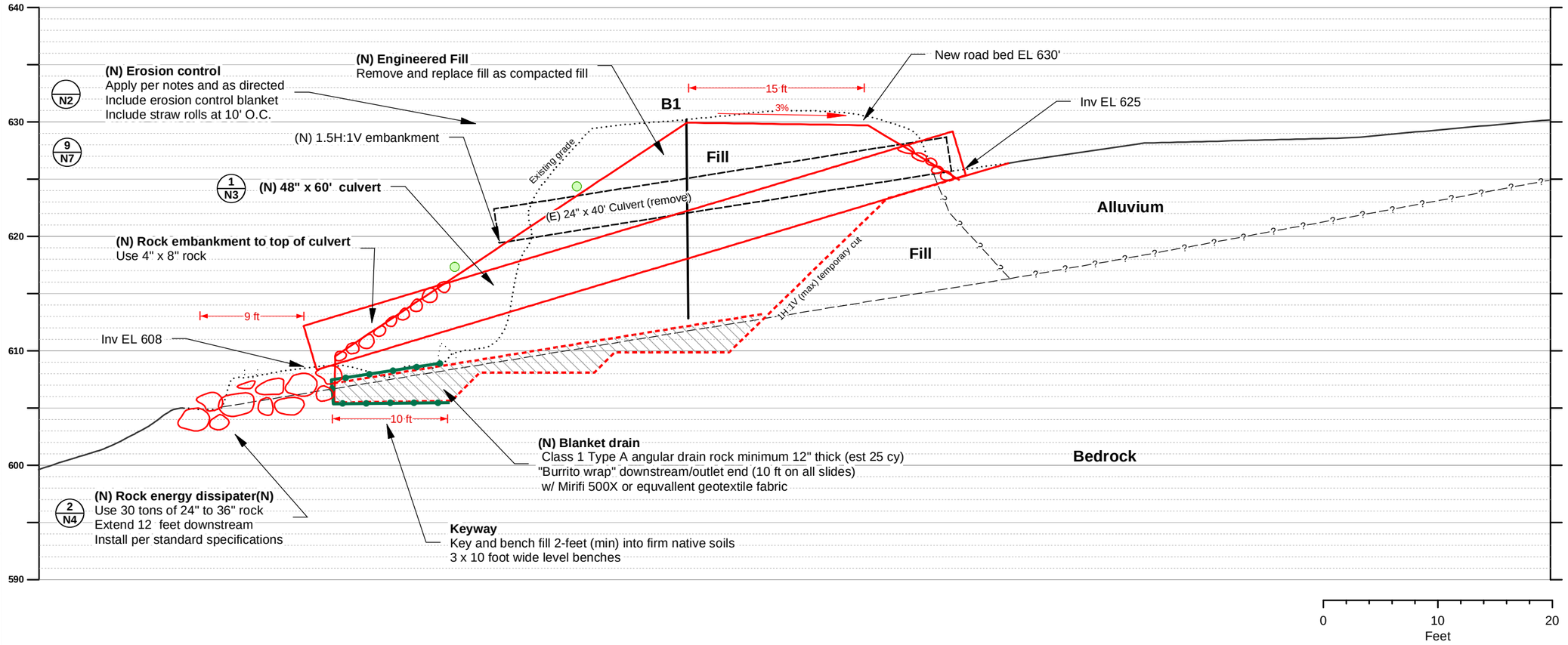
Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

C4



9: REMOVE AND REPLACE CULVERT

At this site there is an existing 36 inch x 20 foot metal culvert at an intermittent stream. The pipe also receives flow from a small ephemeral stream that is diverted a short distance down the inboard ditch to the culvert.

The culvert is short and placed at a shallow grade with the outlet shotgunned 12 feet above the native channel. This has resulted in active gully erosion at pipe outlet which in turn has partially undermined the road prism. It has also resulted in sediment to be backed up behind the culvert inlet. Crossing volume is estimated at over 400 cy with fill being a maximum of 18 feet deep. Crossing is not expected to be flowing at time of construction though groundwater may be encountered at depth.

The culvert also receives flow from a small ephemeral stream that drains the inboard road ditch and into the inlet of the 36 inch pipe. The upper portion of the inboard ditch is seasonally wet but is anticipated to be dry at the time of construction. The lower portion of the ditch is incised and proposed to be rock armored.

SCOPE OF WORK

- Remove the existing culvert and replace with new 48 inch by 60 foot culvert per standard specifications and as shown.
  - Dispose of the existing pipe offsite
  - Remove vegetation in work area and dispose onsite as directed
- Install new 48 inch by 60 foot culvert at native stream channel as shown on plans and as directed by project engineering geologist.
- Excavate crossing fill to native channel grade as shown and as verified by engineering geologist
  - All loose fill shall be removed and recompacted as engineered fill.
  - New fill shall be keyed and benched a minimum of 2 feet into firm native soils. Four 10 foot wide level benches are required on the downstream side of the crossing.
  - Estimate 400 cy of excavation and fill placement.
- Install gravel blanket drain on the three keyways.
  - Use approved Class 1 Type A angular drain rock minimum. Place minimum 12" thick (est. 30 cy).
  - Extend rock up to an elevation equal to middle of culvert on sides of keyway/bench.
  - "Burrito wrap" downstream/outlet end (10 ft on all slides) w/ Mirafi 500X or equivalent geotextile fabric.
- New fill shall be compacted to 85% relative compaction and brought up to grade at max 1.5H:1V slope.
- Install rock energy dissipater at pipe outlet per standard specifications
  - Use 30 tons of 24” to 36” rock
  - Rock to extend 12 feet downstream of pipe outlet.
- Armor embankment face to top of culvert
  - Use 8 tons of 12” rock
- Realign the downroad center line of road 10 feet inboard (into the slope) from existing as shown.
  - Widen road into bank (5 feet) crossing as shown and as directed
  - Incline (N) cut at maximum 1H:1V.
  - Fill generated from realigning the road can be used as engineered fill to reconstruct the crossing.
- D16: Road and inside ditch leading to crossing
  - Reshape road and clean and enlarge 200 feet of the inboard ditch leading into the crossing
  - Rock armor 50 feet of the ditch closest to the culvert inlet to prevent the ditch from downcutting. Use 20 tons of 4” to 8” rock. Install per standard specifications 7/N6
- Exposed soils shall be treated with appropriate erosion control measures per notes
- Excess excavated soils from grading shall be spread on adjacent landing as directed and unless otherwise directed.
- Modifications may be required per site conditions and as directed by engineer.

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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
MP 9 SECTION

Date	Description
05/19/2015	

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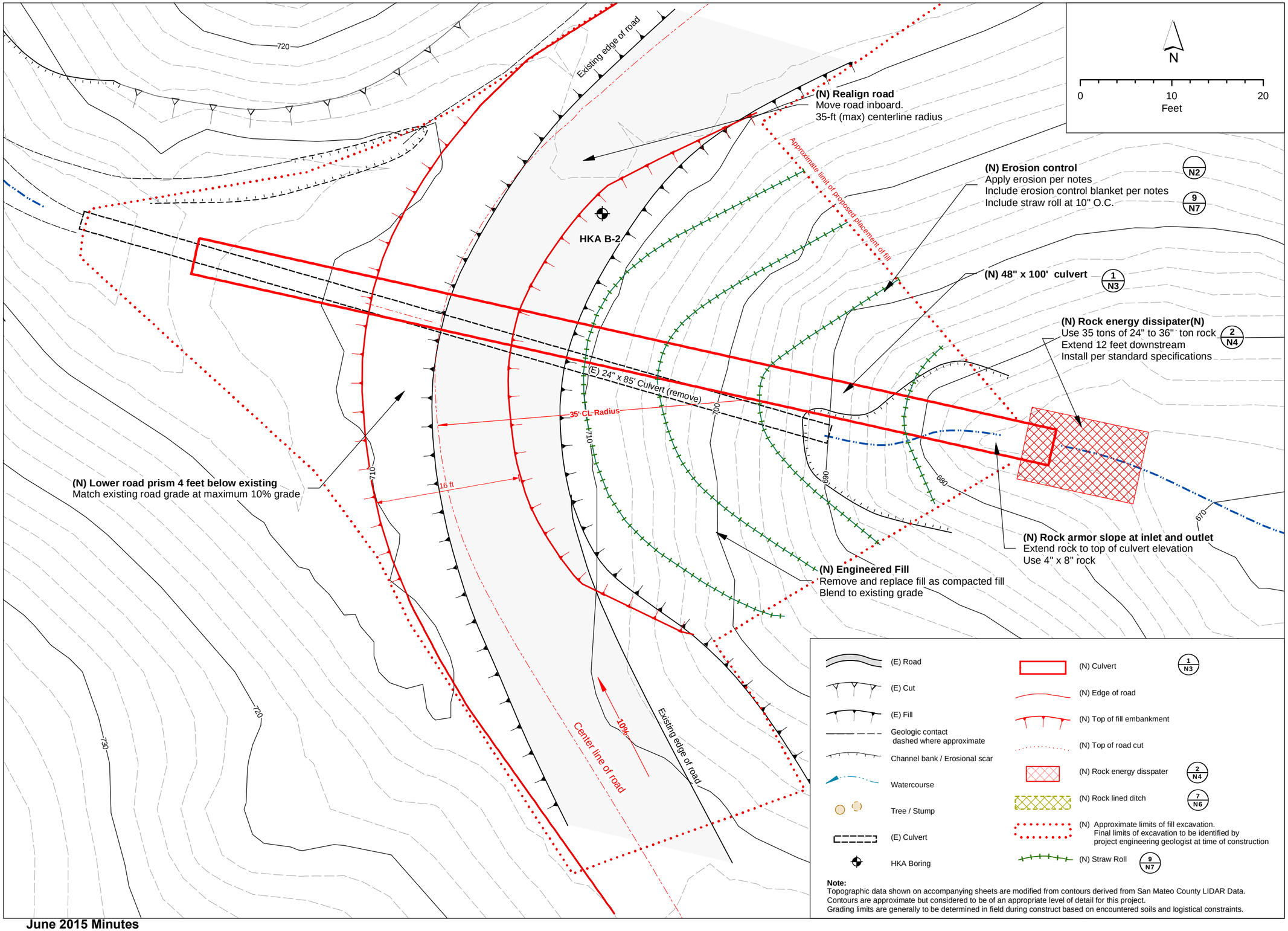
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C5



Note:
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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
MP 16 SITE MAP

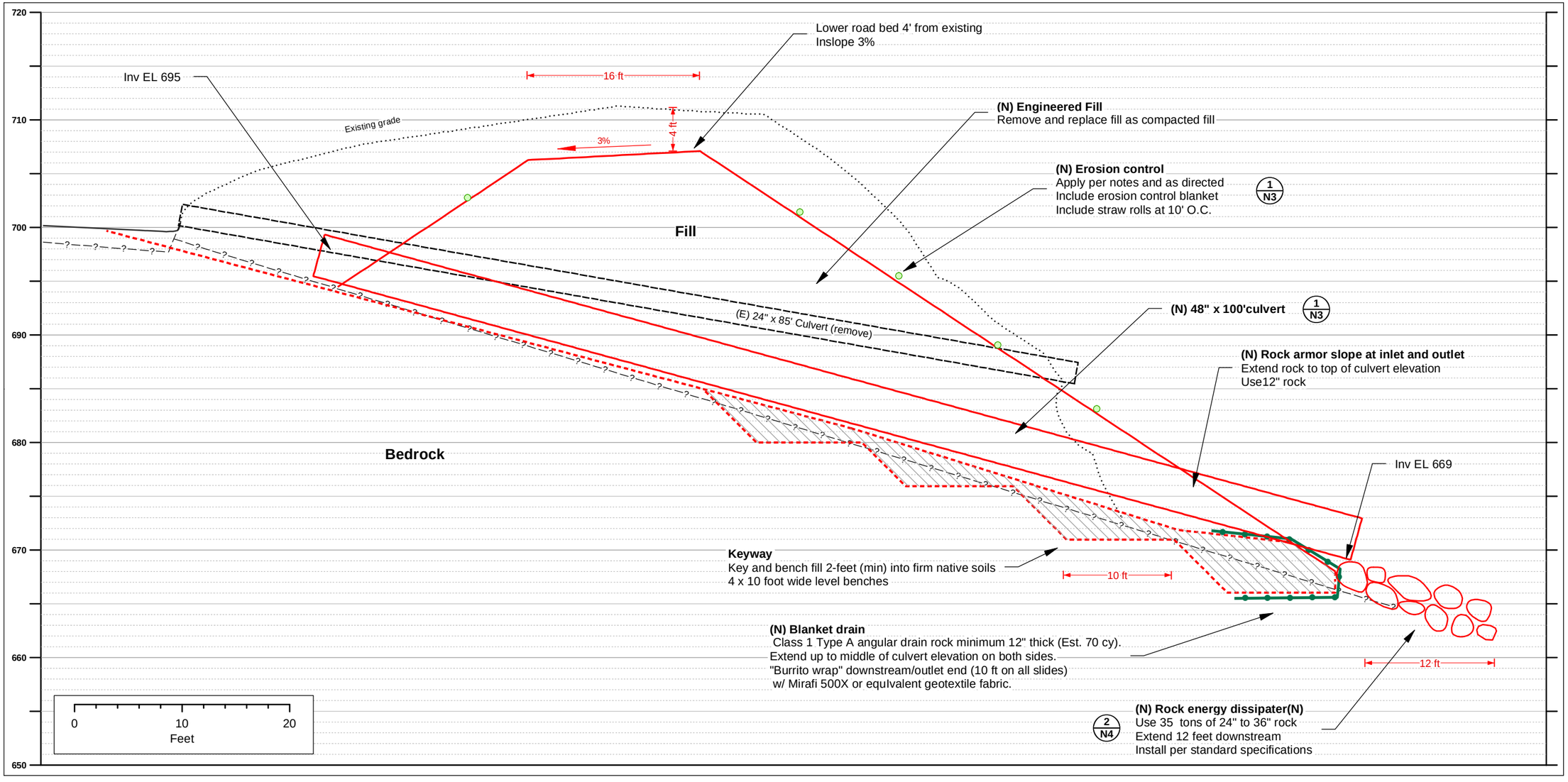
Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C6

ATTACHMENT A



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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

MP 16 SECTION

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

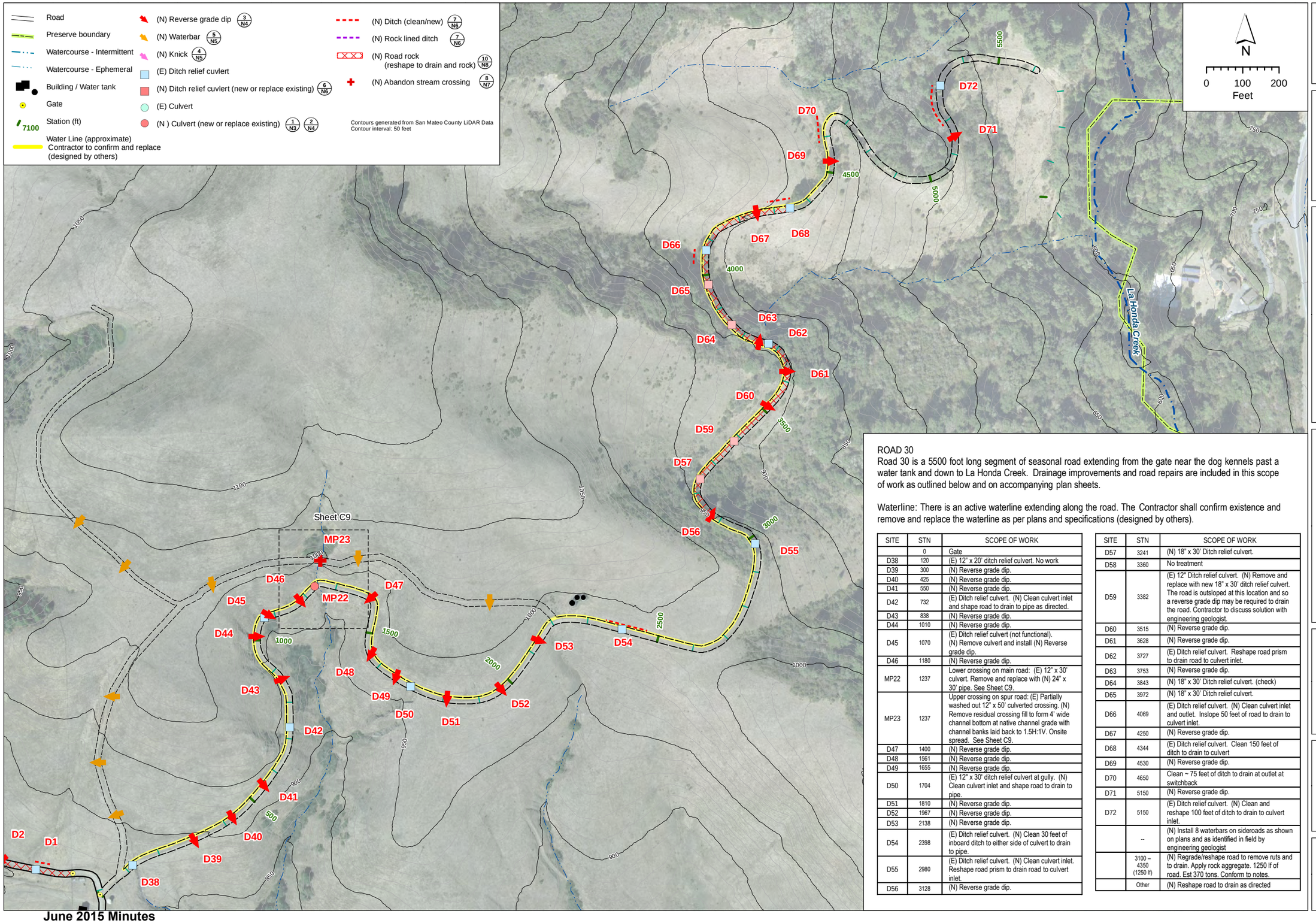
C7

16: REMOVE AND REPLACE CULVERT

At this site there is an existing 24 inch x 85 foot culvert with concrete sack headwall at narrow and entrenched intermittent stream draining a 60 acre basin. The crossing volume is estimated at 1,200 cy with fill 28 feet deep. Nonoperational buried phone lines extend through the middle of the road.

SCOPE OF WORK

- Remove the existing culvert and replace with new 48 inch by 100 foot culvert per standard specifications and as shown.
  - Dispose of the existing pipe offsite
  - Placement of culvert may require removing buried phone lines and other utilities that may extend down the middle of the road.
- Install new 48 inch by 100 foot culvert at native stream channel as shown on plans and as directed by project engineering geologist.
- Excavate crossing fill to native channel grade as shown and as verified by engineering geologist
- All loose fill shall be removed and recompacted as engineered fill. New fill shall be keyed and benched a minimum of 2 feet into firm native soils. Three 10 foot wide level benches are required on the downstream side of the crossing.
- Install gravel blanket drain on the three keyways.
  - Use approved Class 1 Type A angular drain rock minimum. Place minimum 12" thick (est. 70 cy).
  - Extend rock up to an elevation equal to middle of culvert on sides of keyway/bench.
  - "Burrito wrap" downstream/outlet end (10 ft on all slides) w/ Mirafi 500X or equivalent geotextile fabric.
- New fill shall be compacted to 85% relative compaction and brought up to grade at max 1.5H:1V slope. The road bed shall be lowered 4 vertical feet from existing.
- Estimate 1,200 cy of fill excavation with 900+ cy of engineer fill placement. Approve onsite fill may be used for engineered fill. Excess fill (est. 300 cy) shall be endhauled 700 feet up the road, past the old house and spread out on approved grassland slopes. Fill shall be spread less than 4 feet.
- The culvert shall discharge onto rock energy dissipater.
  - Use 35 tons of 24" to 36" rock
- Armor embankment face to top of culvert
  - Use 8 tons of 12" rock
- Exposed soils shall be treated with appropriate erosion control measures per notes
  - Install straw rolls across embankment face at 10' O.C.
- Contractor to repair any utilities damaged during construction



ROAD 30
Road 30 is a 5500 foot long segment of seasonal road extending from the gate near the dog kennels past a water tank and down to La Honda Creek. Drainage improvements and road repairs are included in this scope of work as outlined below and on accompanying plan sheets.

Waterline: There is an active waterline extending along the road. The Contractor shall confirm existence and remove and replace the waterline as per plans and specifications (designed by others).

SITE	STN	SCOPE OF WORK
	0	Gate
D38	120	(E) 12" x 20' ditch relief culvert. No work
D39	300	(N) Reverse grade dip.
D40	425	(N) Reverse grade dip.
D41	550	(N) Reverse grade dip.
D42	732	(E) Ditch relief culvert. (N) Clean culvert inlet and shape road to drain to pipe as directed.
D43	838	(N) Reverse grade dip.
D44	1010	(N) Reverse grade dip.
D45	1070	(E) Ditch relief culvert (not functional). (N) Remove culvert and install (N) Reverse grade dip.
D46	1180	(N) Reverse grade dip.
MP22	1237	Lower crossing on main road: (E) 12" x 30' culvert. Remove and replace with (N) 24" x 30' pipe. See Sheet C9.
MP23	1237	Upper crossing on spur road: (E) Partially washed out 12" x 50' culverted crossing. (N) Remove residual crossing fill to form 4' wide channel bottom at native channel grade with channel banks laid back to 1.5H:1V. Onsite spread. See Sheet C9.
D47	1400	(N) Reverse grade dip.
D48	1561	(N) Reverse grade dip.
D49	1655	(N) Reverse grade dip.
D50	1704	(E) 12" x 30' ditch relief culvert at gully. (N) Clean culvert inlet and shape road to drain to pipe.
D51	1810	(N) Reverse grade dip.
D52	1967	(N) Reverse grade dip.
D53	2138	(N) Reverse grade dip.
D54	2398	(E) Ditch relief culvert. (N) Clean 30 feet of inboard ditch to either side of culvert to drain to pipe.
D55	2980	(E) Ditch relief culvert. (N) Clean culvert inlet. Reshape road prism to drain road to culvert inlet.
D56	3128	(N) Reverse grade dip.

SITE	STN	SCOPE OF WORK
D57	3241	(N) 18" x 30' Ditch relief culvert.
D58	3360	No treatment
D59	3382	(E) 12" Ditch relief culvert. (N) Remove and replace with new 18" x 30' ditch relief culvert. The road is outsloped at this location and so a reverse grade dip may be required to drain the road. Contractor to discuss solution with engineering geologist.
D60	3515	(N) Reverse grade dip.
D61	3628	(N) Reverse grade dip.
D62	3727	(E) Ditch relief culvert. Reshape road prism to drain road to culvert inlet.
D63	3753	(N) Reverse grade dip.
D64	3843	(N) 18" x 30' Ditch relief culvert. (check)
D65	3972	(N) 18" x 30' Ditch relief culvert.
D66	4069	(E) Ditch relief culvert. (N) Clean culvert inlet and outlet. Inslope 50 feet of road to drain to culvert inlet.
D67	4250	(N) Reverse grade dip.
D68	4344	(E) Ditch relief culvert. Clean 150 feet of ditch to drain to culvert
D69	4530	(N) Reverse grade dip.
D70	4650	Clean ~ 75 feet of ditch to drain at outlet at switchback
D71	5150	(N) Reverse grade dip.
D72	5150	(E) Ditch relief culvert. (N) Clean and reshape 100 feet of ditch to drain to culvert inlet.
	--	(N) Install 8 waterbars on sideroads as shown on plans and as identified in field by engineering geologist
	3100 – 4350 (1250 lf)	(N) Regrade/reshape road to remove ruts and to drain. Apply rock aggregate. 1250 lf of road. Est 370 tons. Conform to notes.
	Other	(N) Reshape road to drain as directed

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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
ROAD 30 SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C8

MP 22 AND 23
DESCRIPTION

At this site there are two seasonal roads located one above the other that both cross a small ephemeral watercourse. The lower crossing is MP 22 and is located on the main road (Road 22). The upper crossing is MP 23 and located upstream on a short spur road which is to be abandoned after the fill has been removed from it. The small watercourse drains a 5 acre grassland watershed.

MP 22 (lower crossing) is a 12 inch x 50 foot metal pipe. The inlet is completely plugged with debris and a small alluvial fan has formed in the catch basin. Though the culvert is plugged the basin has not recently overtopped. The outlet of the pipe is shotgunned several feet above the active channel with an old gully at the outlet. There is a shallow underground waterline extending along road and which will need to be removed, replaced or protected.

MP 23 (upper crossing) is a partially washed out 12" x 50' culverted crossing. The residual fill is at risk for continued erosion.

SCOPE OF WORK

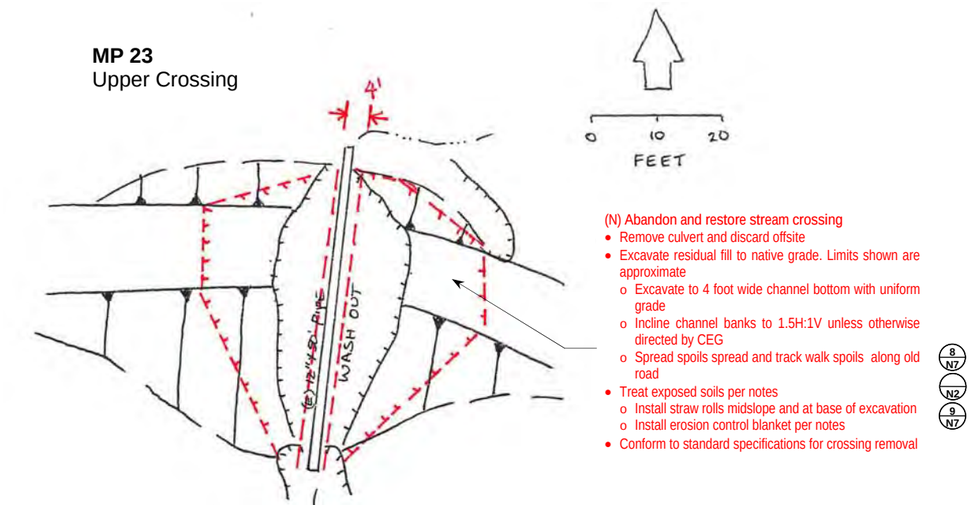
MP 22

- Remove and replace the existing culvert with a new 24 inch diameter x 30 foot long pipe culvert per standard specifications
  - Excavate crossing to native channel grade as shown.
  - Discard old pipe offsite at approved disposal site.
- Discharge culvert onto rock new rock dissipater per plans and Specifications 2/N4
  - Use 7 tons of 12" - 18" rock.
- Provide rock slope protection at inlet and outlet to top of culvert per 1/N3
  - Use 5 cy of 4" x 8" rock.
- Replace waterline (designed by others)
- Install critical dip

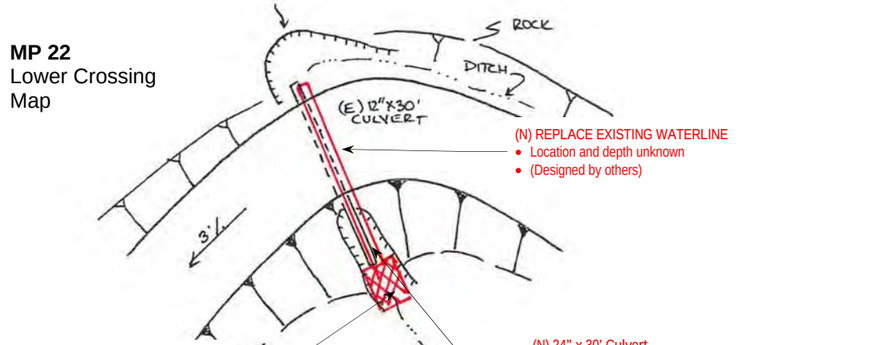
MP 23

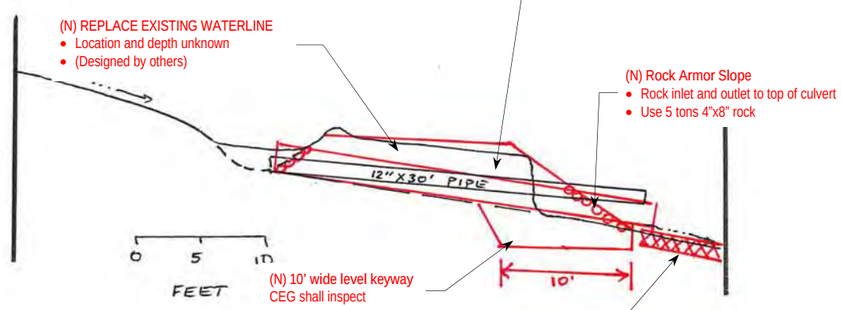
- Abandon the crossing per standard specifications and as directed by project engineering geologist.
  - Excavate the residual crossing fill down to the native channel grade
  - Remove and discard culvert offsite at approved disposal site.
  - Excavation shall result in 4 foot wide flat channel bottom with uniform channel grade
  - Lay channel banks back to 1.5H:1V slope.
  - Excavated spoils may be spread along inboard edge of road.
- Treat exposed soils outside roadway per notes and as directed
  - Install straw rolls at midslope along the excavation and along the bottom edge of channel
  - Install erosion control blanket per notes
- Conform to standard specifications for crossing abandonment 8/N7
- Drain adjacent segments of road by installing 8 waterbars per standard specifications as shown on plans
  - Engineering geologist shall flag all waterbar locations

MP 23
Upper Crossing



MP 22
Lower Crossing
Map





SITE 22
Lower Crossing
Section

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LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 22 & 23
SITE MAP AND SECTION

Date	Description
05/19/2015	

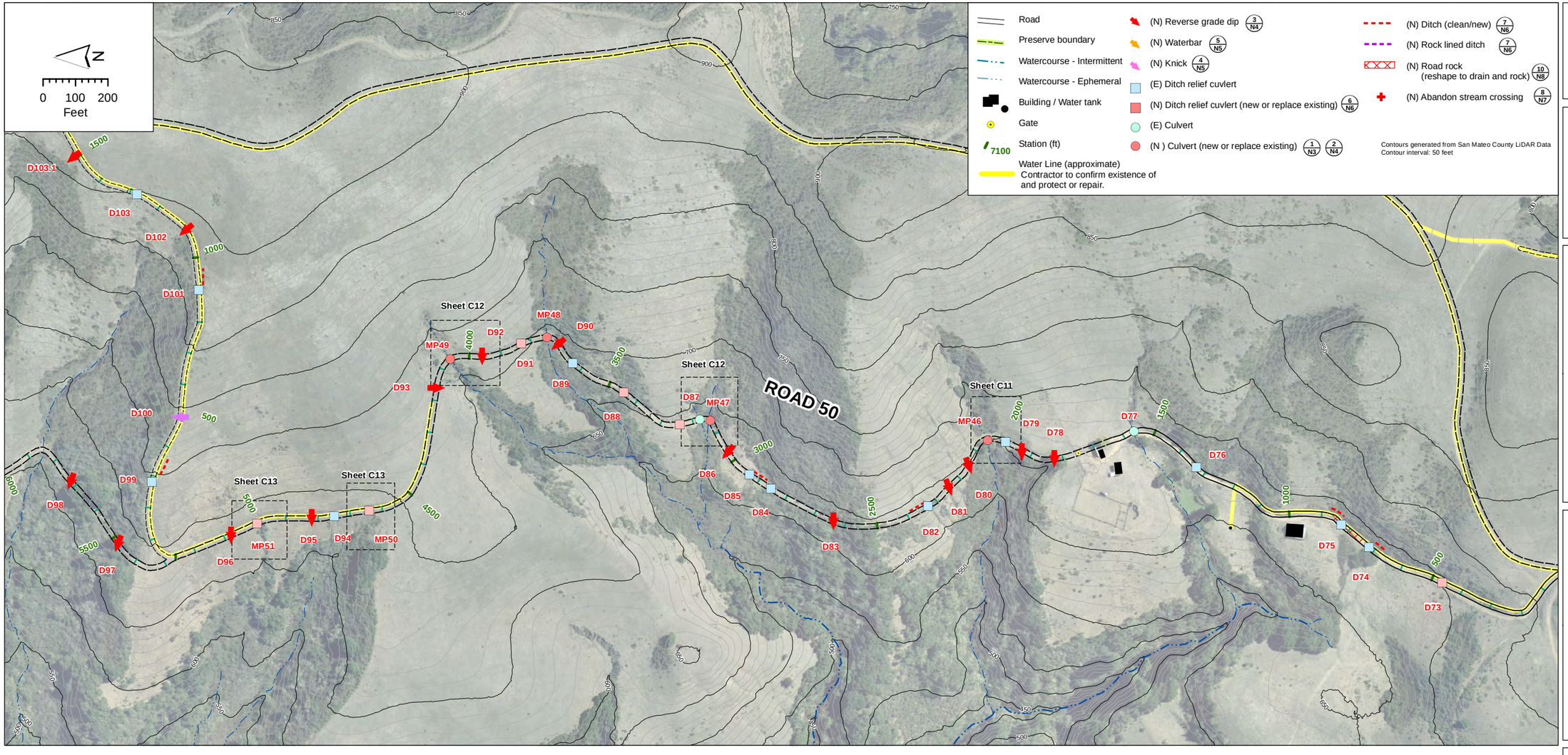
DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C9

ATTACHMENT A



SITE	STN	SCOPE OF WORK
D73	466	(N) 18"x30' Ditch relief culvert. Contractor to protect or repair exiting buried waterline.
D74	719	(E) Ditch relief culvert. Clean inlet and 30 feet of ditch to drain to culvert. Contractor to protect or repair exiting buried waterline.
D75	829	(E) Ditch relief culvert. Prior (south) of culvert, build up ~150 feet road prism up on 6"+ of engineered fill and rock per standard specifications. Use approved onsite earth materials for fill. To north, clean ~ 50 feet of ditch to drain. Contractor to protect or repair exiting buried waterline.
D76	1331	(E) Ditch relief culvert. Clean inlet and shape road to drain to culvert. Contractor to protect or repair exiting buried waterline.
D77	1594	(E) Stream Culvert. No work.
	1750	Gate
D78	1826	(N) Reverse grade dip
D79	1940	(N) Reverse grade dip. Pull back fill at dip outlet as directed.
MP46	1989	(E) 18" Ditch relief culvert. Install vertical riser at pipe inlet (Contractor design) and backfill to 1-foot depth. See Sheet C11.

SITE	STN	SCOPE OF WORK
MP46	2037	(E) 12" x 30' stream culvert. Remove and replace with (N) 24" x 40' culvert per plans. See Sheet C11.
D80	2152	(N) Reverse grade dip
D81	2243	(N) Reverse grade dip. Ok to drain into gully.
D82	2331	(E) Ditch relief culvert with crushed and plugged inlet. Clean inlet and 30 feet of inboard ditch to drain.
D83	2638	(N) Reverse grade dip
D84	2855	(E) Ditch relief culvert. Clean inlet and shape road to drain as required.
D85	2934	(E) Ditch relief culvert. Clean inlet and 30 feet of inboard ditch to drain.
D86	3032	(N) Reverse grade dip
MP47	3143	(N) 30" x 40' stream culvert. Plug ditch on down road side of culvert. Install per plans. See Sheet C12.
MP47	3177	(E) 12" X 30' stream culvert. Insufficient fill covering pipe. Place 10 cy of additional fill to cover pipe. Approved onsite soils are suitable for fill. See Sheet C12.
D87	3241	(N) 18" x 30+' Ditch relief culvert. Final culvert length be determined

SITE	STN	SCOPE OF WORK
D88	3448	(N) 18" x 30' Ditch relief culvert. Shape road and ditch to drain to pipe inlet.
D89	3632	(E) 12" Ditch relief culvert. Clean culvert inlet and dip/shape road to drain to culvert.
D90	3705	(N) Reverse grade dip
MP48	3750	(E) 12" x 30' stream culvert. Remove and replace with (N) 30" x 40' culvert per standard plans. Discharge onto rock energy dissipater (10 ton of 12" rock). Armor inlet and outlet to top of pipe with 8" rock (6 ton). Plug ditch on downroad side of culvert with compacted earth. Install per standard plans and as directed.
D91	3832	(N) 18" x 30' Ditch relief culvert. Shape road and ditch to drain to pipe inlet. (CHECK)
D92	3960	(N) Reverse grade dip
MP49	4060	(E) 12" x 35' culvert. Remove and replace with (N) 24" x 30' culvert per plans. See Sheet C12.
D93	4161	(N) Reverse grade dip. Contractor shall confirm existence of and protect and repair buried waterline.
MP50	4640	(N) 18" x 40' Ditch relief culvert. Discharge onto 3 tons 4"x8" rock. Contractor shall confirm existence of and protect and repair buried waterline. See Sheet C13.

SITE	STN	SCOPE OF WORK
D94	4750	(E) 12" x 20' Ditch relief culvert. (N) Install rock energy dissipater using 3 ton of 4"x12" rock at pipe outlet. Plug ditch on downroad side of culvert to prevent diversion down ditch. Contractor shall confirm existence of and protect and repair buried waterline. See Sheet C13.
D95	4820	(N) Reverse grade dip. Contractor shall confirm existence of and protect and repair buried waterline.
MP51	4990	(E) 12" x 20 ditch relief culvert. Remove and replace with (N) 18" x 30' ditch relief culvert. Reconstruct fill embankment per plans. Clean 50' of ditch to drain. Contractor shall confirm existence of and protect and repair buried waterline.
D96	5080	(N) Reverse grade dip. Contractor shall confirm existence of and protect and repair buried waterline.
D97	5478	(N) Reverse grade dip.
D98	5720	(N) Reverse grade dip.
D99		(E) Ditch relief culvert. Clean ditch leading to culvert to drain. Contractor shall confirm existence of and protect and repair buried waterline.
D100		(N) Knick. Contractor shall confirm existence of and protect and repair buried waterline.

SITE	STN	SCOPE OF WORK
D101		(E) Ditch relief culvert. Clean and reshape road to drain. Contractor shall confirm existence of and protect and repair buried waterline.
D102		(N) Reverse grade dip. Contractor shall confirm existence of and protect and repair buried waterline.
D103		(E) Ditch relief culvert. Clean and reshape road to drain. Contractor shall confirm existence of and protect and repair buried waterline.
D103.1		(N) Reverse grade dip. Contractor shall confirm existence of and protect and repair buried waterline.
		Minor reshaping of road to facilitate drainage as directed
		Additional rocking of road prism may be requested by District. These services will be considered "extra"

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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

ROAD 50 SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

C10

46: REMOVE AND REPLACE CULVERT & UPGRADE DITCH RELIEF CULVERT

This is an existing 12 inch x 30 foot metal culvert at an ephemeral watercourse crossing. The inlet to the culvert is plugged about 50%. The pipe is placed on top of a second pipe laid parallel to the road. This second pipe acts as a small crib to support the steep fill prism. The crossing volume is about 30 cy with fill being a maximum of 6 feet thick.

To the south of the crossing is an existing plastic 18 inch x 30 foot long plastic ditch relief culvert draining a 40 foot long, ~4 foot deep ditch. This pipe was placed at a shallow depth.

SCOPE OF WORK

- Replace the existing 12 inch metal culvert with new 24 inch x 40 foot pipe per standard specifications and as shown.
  - Remove crib pipe
  - Dispose of the culvert and crib pipe off site.
- Place a new 24 inch culvert at native stream gradient as directed by project engineering geologist
- The culvert shall discharge onto rock energy dissipater.
  - Use 8 tons of 12" to 24" rock
- Armor embankment face to top of culvert
  - Use 3 tons of 4"x 8" rock
- Install critical dip as directed

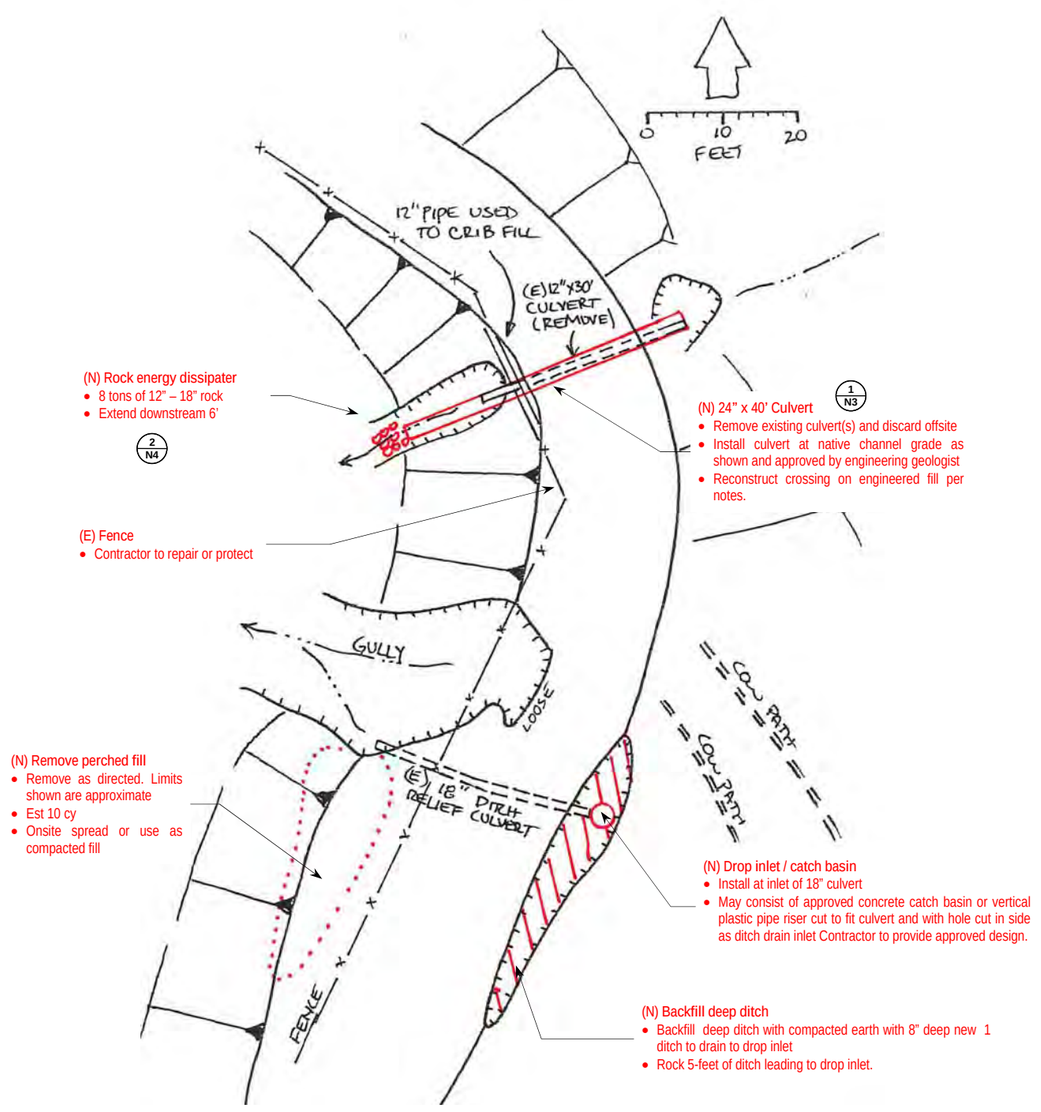
- Install a drop inlet / vertical riser to the ditch relief culvert.
  - May consist of approved concrete catch basin with side inlet or approved plastic vertical riser. The vertical riser shall be cut to fit and seal with culvert. A hole may be cut into the side of the riser to receive ditch flow. Cap the riser as necessary
  - Backfill the deep ditch to maintain 8" deep ditch per standard specifications.
  - Rock line 5 feet of ditch leading to the culvert inlet.

- Pull back perched fill along 30 feet of roadway to the south of the ditch relief culvert (estimate 10 cy). Limits of excavation to be marked by project engineering geologist prior to work. Excavated spoils may be spread along road prism to build up road or may be used as compacted fill to back fill the deep ditch.

- Work will require removing the existing cattle fence. Reinstall the fence per specifications (by others) following work to satisfaction of District representative.

- Exposed soils shall be treated with appropriate erosion control measures per notes

- Modifications may be required per site conditions and as directed by engineer.



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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 46
SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

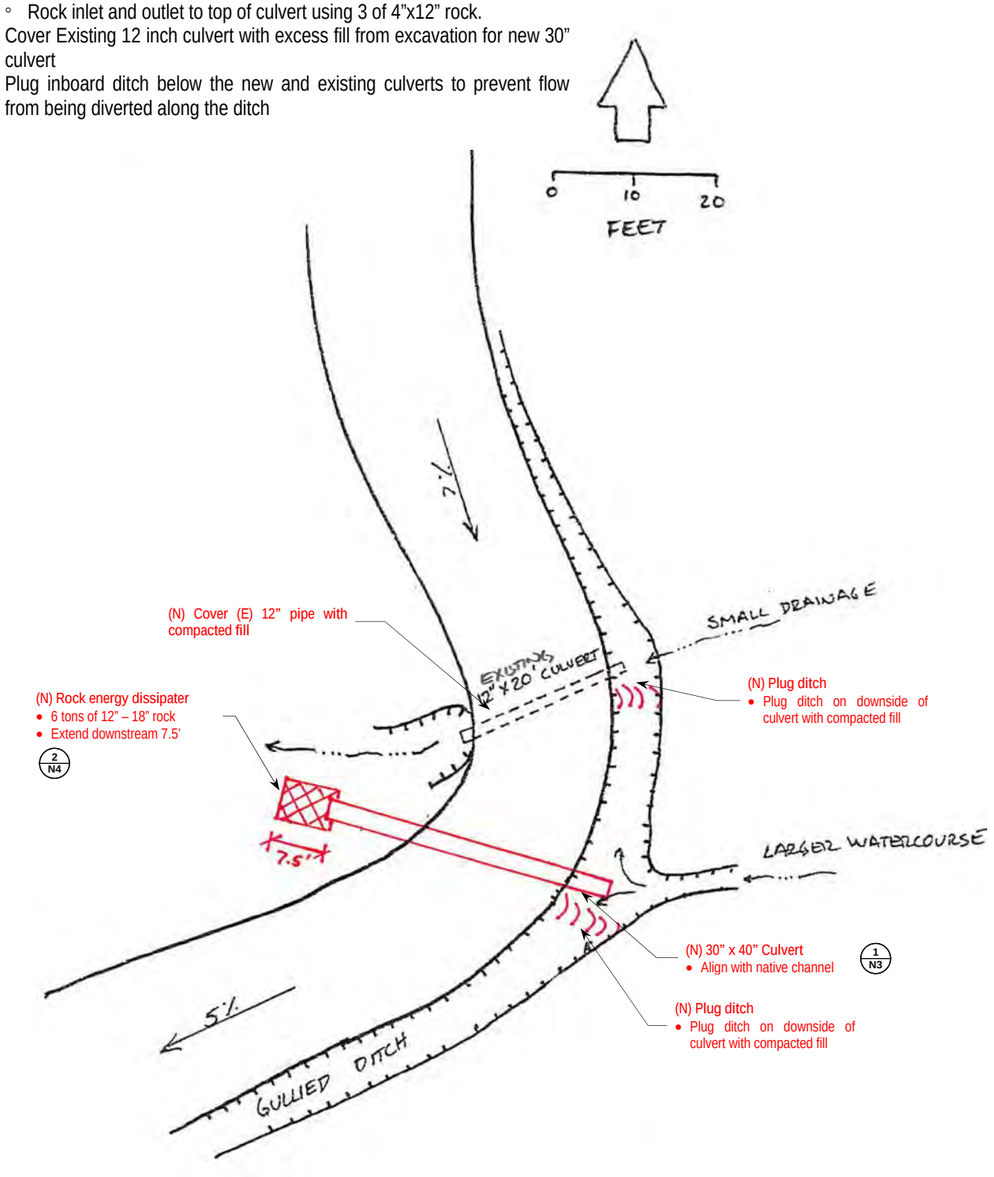
C11

MP 47

This is a 12 inch x 20 foot metal culvert that drains a 14 acre grassland watershed and over 300 feet of unsurfaced seasonal road. The pipe is offset about 20 feet north of the main ephemeral watercourse with stream flow diverted to the pipe via an inboard road ditch.

SCOPE OF WORK

- Install new 30 inch x 40 foot culvert at the stream crossing as shown.
  - Place pipe at natural stream grade.
  - Discharge culvert onto rock energy dissipater use 6 cy of 12" – 18" rock.
  - Rock inlet and outlet to top of culvert using 3 of 4"x12" rock.
- Cover Existing 12 inch culvert with excess fill from excavation for new 30" culvert
- Plug inboard ditch below the new and existing culverts to prevent flow from being diverted along the ditch

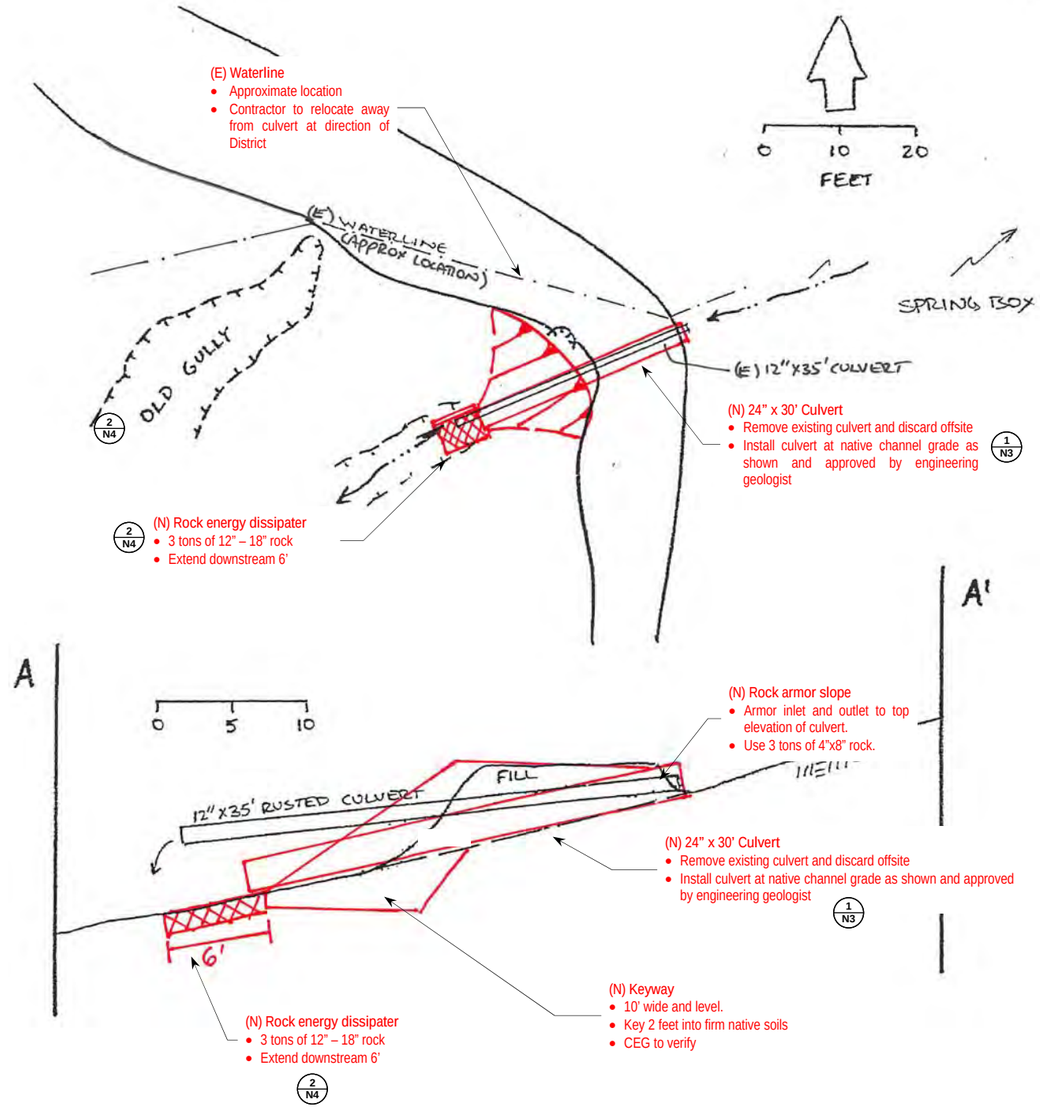


MP 49

This is a 12 inch x 35 foot rusted out and undersized metal culvert at an ephemeral stream draining a 9 acre basin. The culvert is shotgunned about 4 feet over the channel. A buried waterline exists (location unknown) to be removed and relocated away from culvert at direction of District

RECOMMENDATIONS

- Remove and replace existing pipe with 24 inch x 30 foot culvert.
  - Dispose of existing culvert offsite
- Install new culvert per standard specifications
  - Discharge culvert onto rock energy dissipater using 5 tons of 12" – 18" rock.
  - Rock inlet and outlet to top of culvert using 3 tons of 4 - 8 inch rock
  - Install a critical dip
- Contractor shall relocate waterline at Direction of District.



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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 47
MP 49
SITE MAPS AND SECTION

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

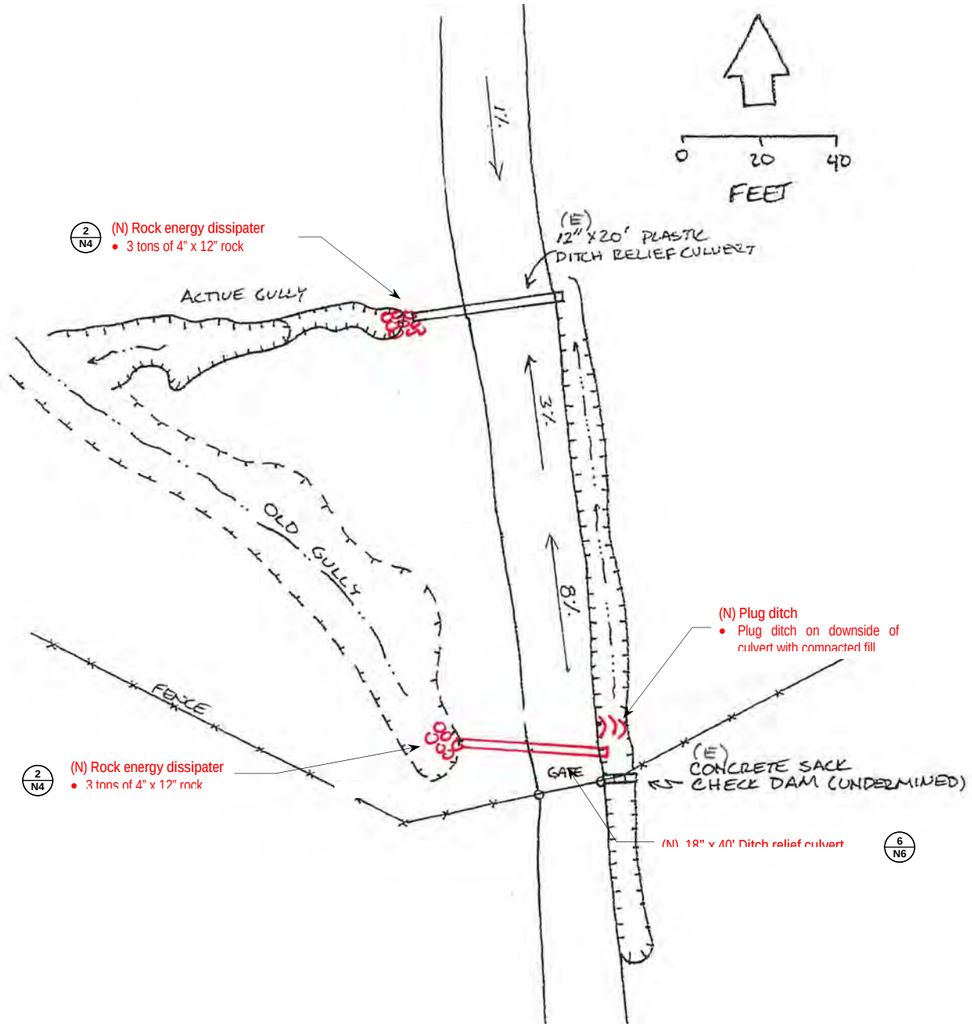
C12

MP 50

This is a 12 inch x 20 foot new plastic ditch relief culvert draining 160 feet of inboard ditch. The ditch has become deeply gullied up to 10 feet wide and 4 feet deep (50+ cy). At the outlet is an active 80 foot long gully 2 foot to 4 foot deep gully. A concrete sack check dam was in the ditch draining to culvert (at the gate 145 feet south of the culvert) but has become undermined and is now ineffective.

RECOMMENDATIONS

- Add new 18 inch x 40 foot ditch relief culvert 80 feet south of the existing culvert (just below the concrete sack check dam).
  - Add rock energy dissipater at the culvert using 3 tons of 4 - 8 inch rock
  - Plug the ditch below the proposed culvert to prevent flow from bypassing the inlet
- Add rock energy dissipater at the existing plastic ditch relief culvert using 3 tons of 4 - 8 inch rock

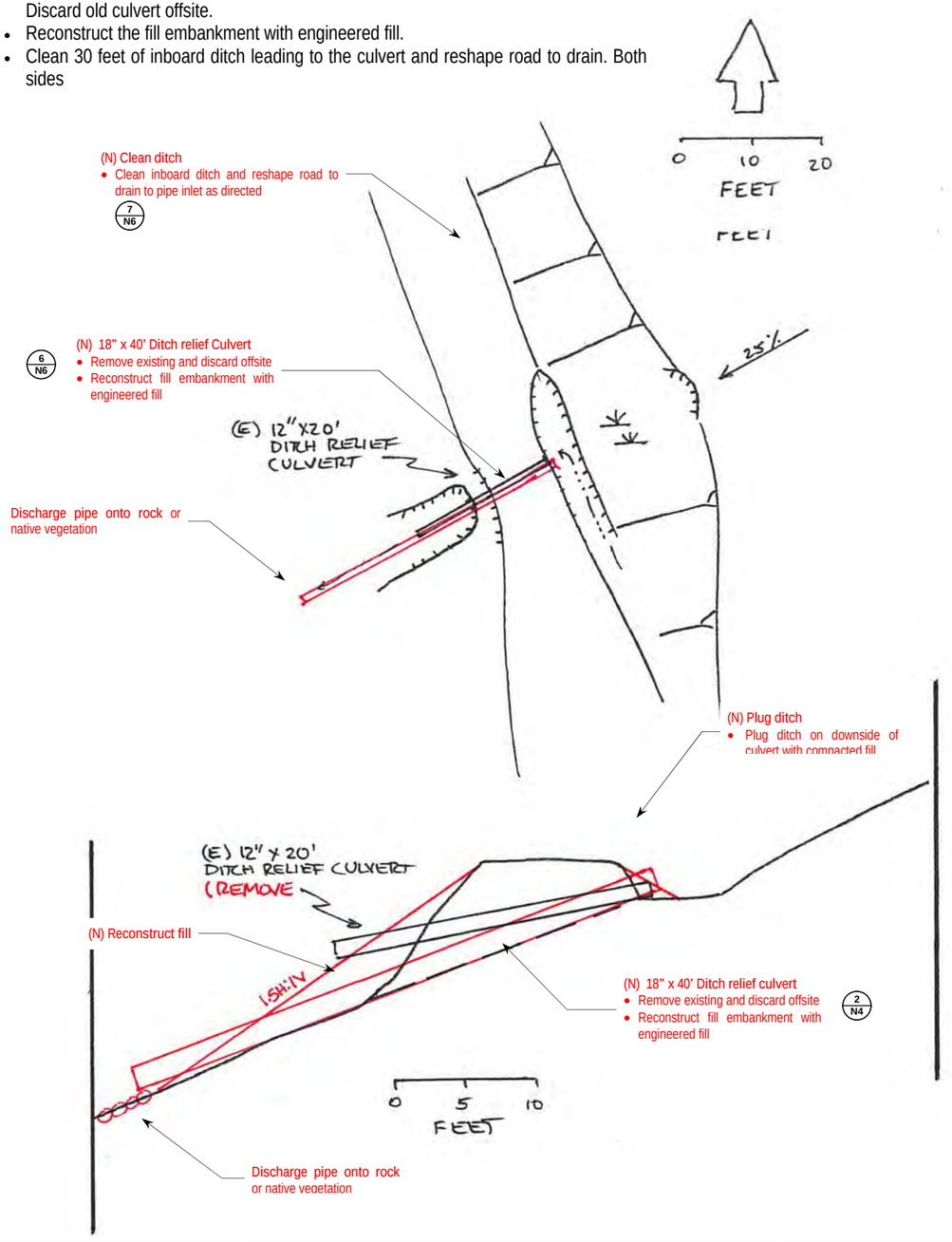


MP 51

This is a 12 inch x 20 foot ditch relief culvert. Outlet to the culvert is shotgunned by several feet resulting in a gully at the outlet that has narrowed the road. Road ditch draining the culvert has infilled and needs to be cleaned.

SCOPE OF WORK

- Remove and replace the existing culvert with new 18 inch x 40 foot ditch relief culvert. Discard old culvert offsite.
- Reconstruct the fill embankment with engineered fill.
- Clean 30 feet of inboard ditch leading to the culvert and reshape road to drain. Both sides



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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 50
MP 51
SITE MAPS AND SECTION

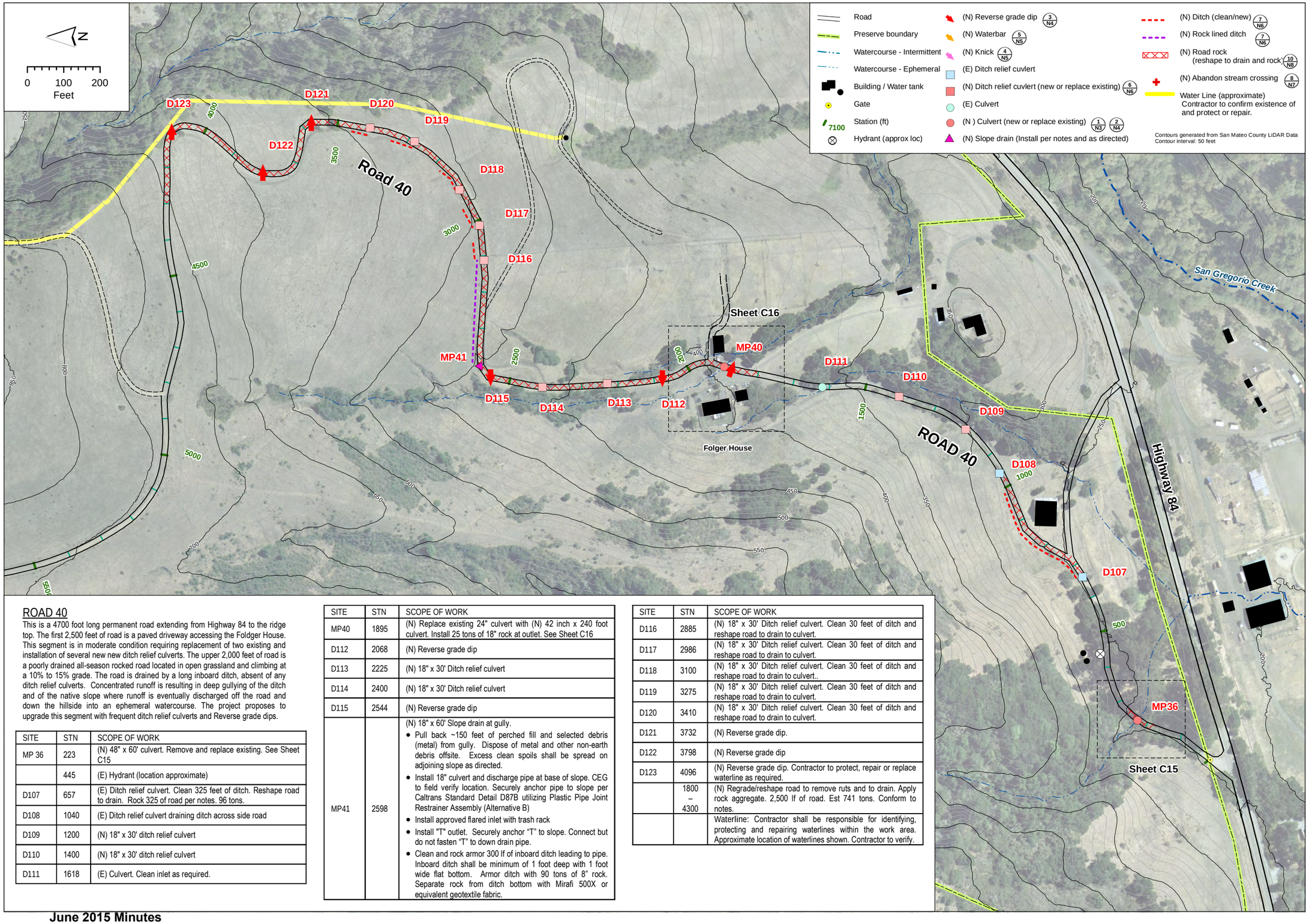
Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C13



ROAD 40

This is a 4700 foot long permanent road extending from Highway 84 to the ridge top. The first 2,500 feet of road is a paved driveway accessing the Foldger House. This segment is in moderate condition requiring replacement of two existing and installation of several new new ditch relief culverts. The upper 2,000 feet of road is a poorly drained all-season rocked road located in open grassland and climbing at a 10% to 15% grade. The road is drained by a long inboard ditch, absent of any ditch relief culverts. Concentrated runoff is resulting in deep gullying of the ditch and of the native slope where runoff is eventually discharged off the road and down the hillside into an ephemeral watercourse. The project proposes to upgrade this segment with frequent ditch relief culverts and Reverse grade dips.

SITE	STN	SCOPE OF WORK
MP 36	223	(N) 48" x 60' culvert. Remove and replace existing. See Sheet C15
	445	(E) Hydrant (location approximate)
D107	657	(E) Ditch relief culvert. Clean 325 feet of ditch. Reshape road to drain. Rock 325 of road per notes. 96 tons.
D108	1040	(E) Ditch relief culvert draining ditch across side road
D109	1200	(N) 18" x 30' ditch relief culvert
D110	1400	(N) 18" x 30' ditch relief culvert
D111	1618	(E) Culvert. Clean inlet as required.

SITE	STN	SCOPE OF WORK
MP40	1895	(N) Replace existing 24" culvert with (N) 42 inch x 240 foot culvert. Install 25 tons of 18" rock at outlet. See Sheet C16
D112	2068	(N) Reverse grade dip
D113	2225	(N) 18" x 30' Ditch relief culvert
D114	2400	(N) 18" x 30' Ditch relief culvert
D115	2544	(N) Reverse grade dip
MP41	2598	(N) 18" x 60' Slope drain at gully. • Pull back ~150 feet of perched fill and selected debris (metal) from gully. Dispose of metal and other non-earth debris offsite. Excess clean spoils shall be spread on adjoining slope as directed. • Install 18" culvert and discharge pipe at base of slope. CEG to field verify location. Securely anchor pipe to slope per Caltrans Standard Detail D87B utilizing Plastic Pipe Joint Restrainer Assembly (Alternative B) • Install approved flared inlet with trash rack • Install "T" outlet. Securely anchor "T" to slope. Connect but do not fasten "T" to down drain pipe. • Clean and rock armor 300 lf of inboard ditch leading to pipe. Inboard ditch shall be minimum of 1 foot deep with 1 foot wide flat bottom. Armor ditch with 90 tons of 8" rock. Separate rock from ditch bottom with Mirafi 500X or equivalent geotextile fabric.

SITE	STN	SCOPE OF WORK
D116	2885	(N) 18" x 30' Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert.
D117	2986	(N) 18" x 30' Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert.
D118	3100	(N) 18" x 30' Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert..
D119	3275	(N) 18" x 30' Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert.
D120	3410	(N) 18" x 30' Ditch relief culvert. Clean 30 feet of ditch and reshape road to drain to culvert.
D121	3732	(N) Reverse grade dip.
D122	3798	(N) Reverse grade dip
D123	4096	(N) Reverse grade dip. Contractor to protect, repair or replace waterline as required.
	1800 – 4300	(N) Regrade/reshape road to remove ruts and to drain. Apply rock aggregate. 2,500 lf of road. Est 741 tons. Conform to notes.
		Waterline: Contractor shall be responsible for identifying, protecting and repairing waterlines within the work area. Approximate location of waterlines shown. Contractor to verify.

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DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
ROAD 40 SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

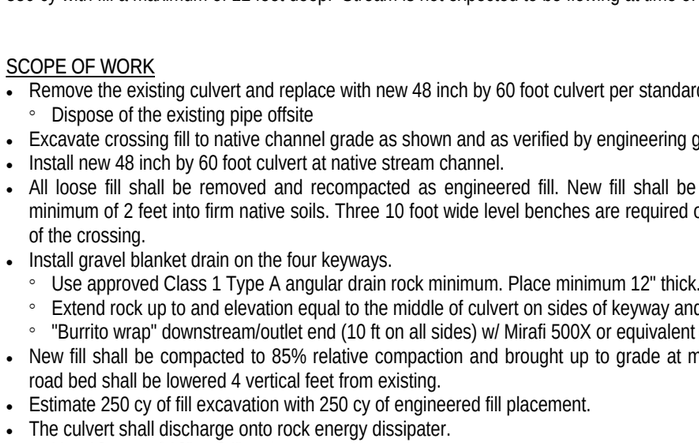
SHEET NUMBER
C14

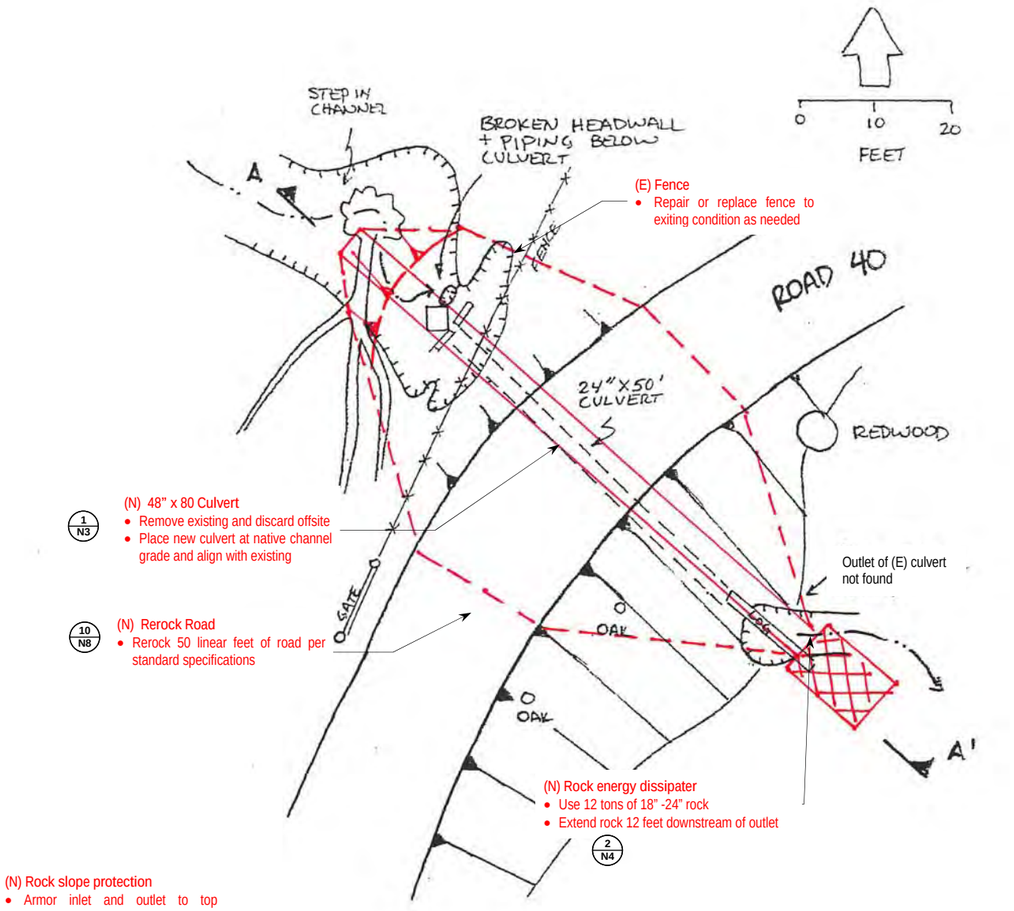
36: REMOVE AND REPLACE CULVERT & UPGRADE DITCH RELIEF CULVERT

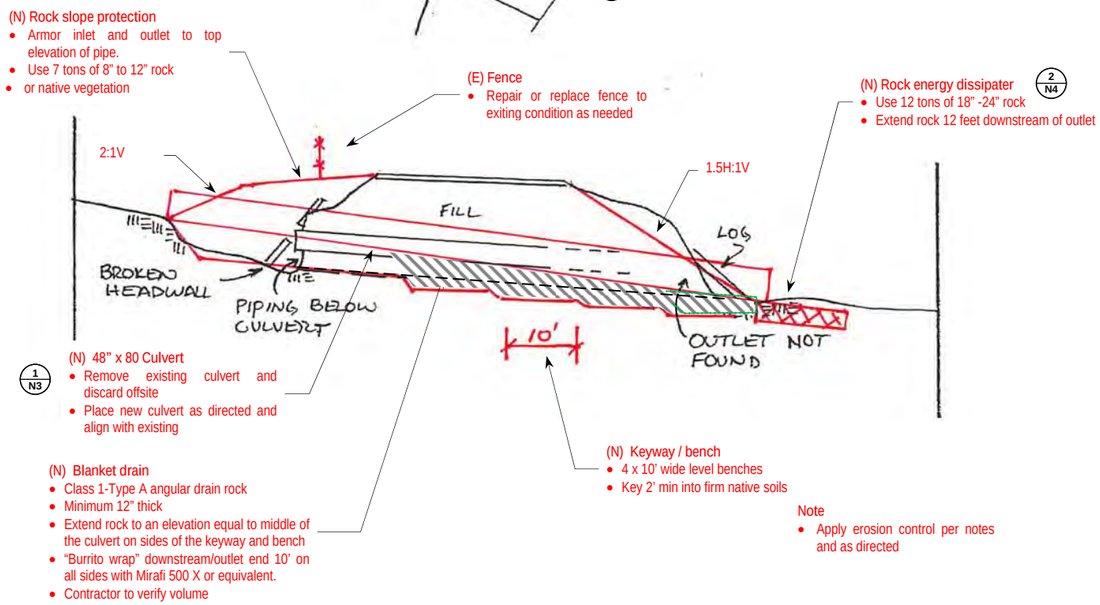
This is a 36 inch x 50 foot CMP located where a paved residential road crosses an intermittent stream. The pipe inlet is torn and plugged about 60% with debris; the culvert outlet was not found and assumed to be completely plugged. The culvert is rusted with most of the low summer flows piping through the fill. Crossing volume is about 350 cy with fill a maximum of 12 feet deep. Stream is not expected to be flowing at time of operations.

SCOPE OF WORK

- Remove the existing culvert and replace with new 48 inch by 60 foot culvert per standard specifications.
  - Dispose of the existing pipe offsite
- Excavate crossing fill to native channel grade as shown and as verified by engineering geologist
- Install new 48 inch by 60 foot culvert at native stream channel.
- All loose fill shall be removed and recompacted as engineered fill. New fill shall be keyed and benched a minimum of 2 feet into firm native soils. Three 10 foot wide level benches are required on the downstream side of the crossing.
- Install gravel blanket drain on the four keyways.
  - Use approved Class 1 Type A angular drain rock minimum. Place minimum 12" thick.
  - Extend rock up to and elevation equal to the middle of culvert on sides of keyway and bench.
  - "Burrito wrap" downstream/outlet end (10 ft on all sides) w/ Mirafi 500X or equivalent geotextile fabric.
- New fill shall be compacted to 85% relative compaction and brought up to grade at max 1.5H:1V slope. The road bed shall be lowered 4 vertical feet from existing.
- Estimate 250 cy of fill excavation with 250 cy of engineered fill placement.
- The culvert shall discharge onto rock energy dissipater.
  - Use 12 tons of 18" to 24" rock
- Armor embankment face to top of culvert
  - Use 7 tons of 8" to 12" rock
- Exposed soils shall be treated with appropriate erosion control measures per notes
  - Install straw rolls across embankment face at 10' O.C.
- Rerock 50 feet of road over crossing per standard specifications.







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PROJECT

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LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 36
SITE MAP AND SECTION

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C15

MP 36: REMOVE AND REPLACE CULVERT & UPGRADE DITCH RELIEF CULVERT

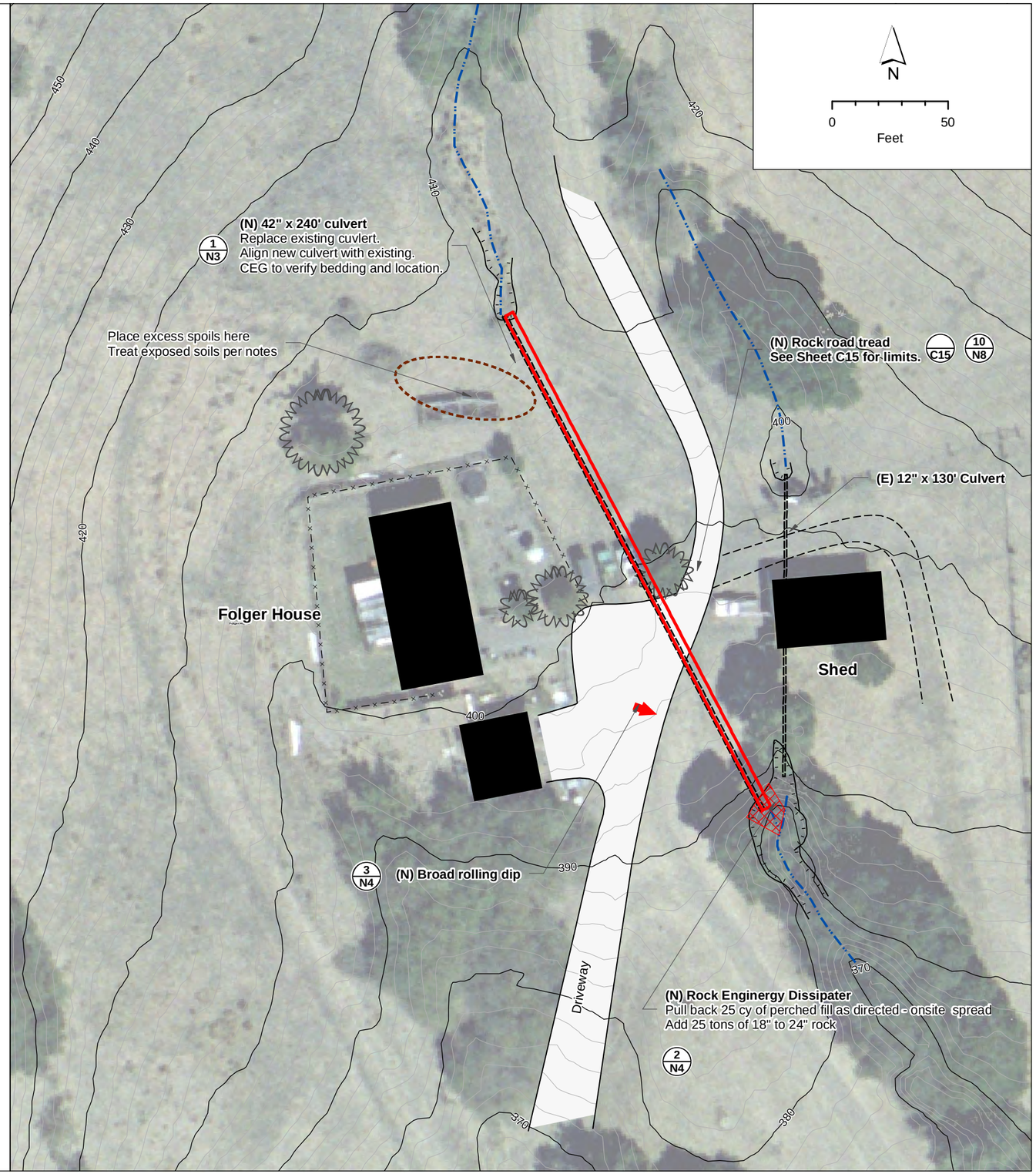
This is a 24 inch x 240 foot plastic culvert at an intermittent stream and adjacent to a residential home, shed and pasture. Though the culvert is aligned with the natural channel it is very long because it needs to cross the road, turnout and parking area at an oblique angle. The crossing volume is approximately 500 cy with fill up to 8 feet deep.

A second 12 inch x 130 foot old metal culvert is located nearby on an ephemeral watercourse that extends below a shed. No treatment of this pipe is required.

Both pipes discharge into a narrow incised channel that has probably been partially backfilled with fill. Chucks of concrete have been placed at the outfall in an attempt to curb erosion, though some erosion is ongoing.

SCOPE OF WORK

- Remove the existing culvert and replace with new 42 inch by 240 foot culvert per standard specifications.
  - Dispose of the existing pipe offsite
  - Place new culvert at existing alignment
- Upgrade the existing rock energy dissipater
  - Pull back some of the perched and unstable fill (~25 cy) and spread onsite. CEG to define limits.
  - Add 25 tons of additional 18" to 24" rock. Place at outfall as directed. Rock placement may require resetting the concrete chunks
- Armor inlet and outlet to pipe to top of culvert
  - Use 3 tons of 8" to 12" rock
- Install a broad critical dip at downstream side of crossing as directed by CEG
- Rock road as specified on Sheet C15



(E) Road
(E) Building
E) Culvert
Channel bank / Erosional scar
Watercourse
Tree

(N) Culvert (30" x 20') 1 N3
(N) Rock Energy Dissipater 2 N4
(N) Suitable spoil site
(N) Critical dip (reverse grade dip) 3 N4
(N) Aggregate base rock (See Sheet C16)

Note:
Topographic data shown on accompanying sheets are modified from contours derived from San Mateo County LIDAR Data.
Contours are approximate but considered to be of an appropriate level of detail for this project.
Grading limits are generally to be determined in field during construct based on encountered soils and logistical constraints.

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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

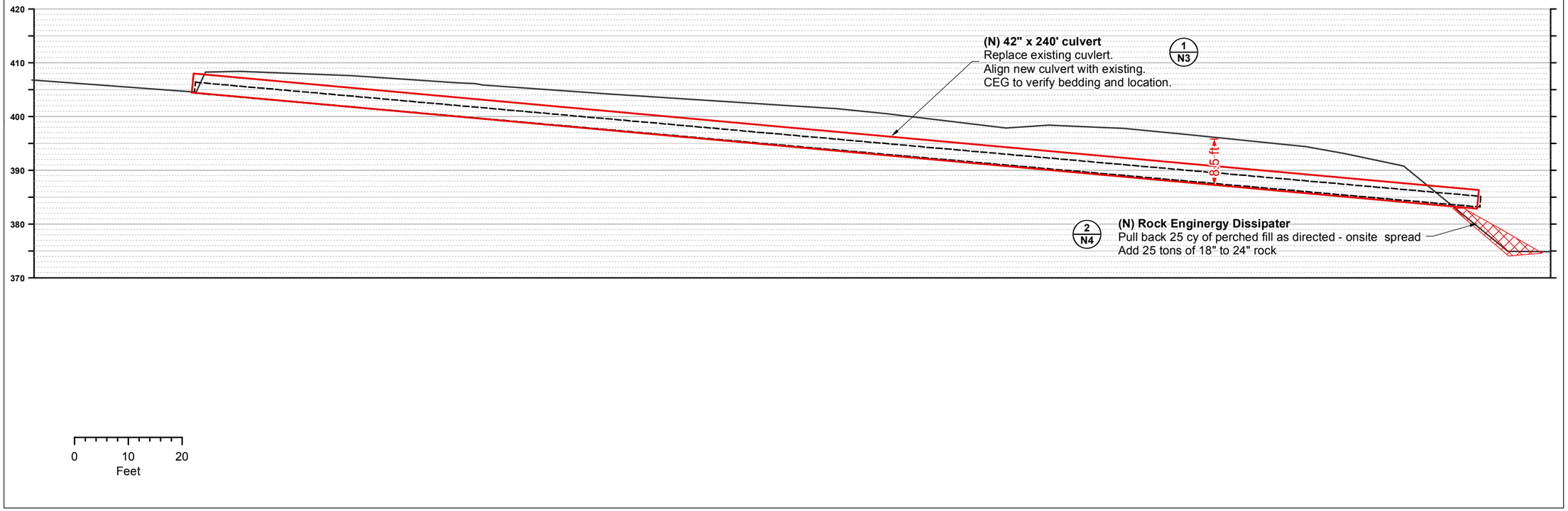
SHEET TITLE
MP 40 SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C16



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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

MP 40 SECTION

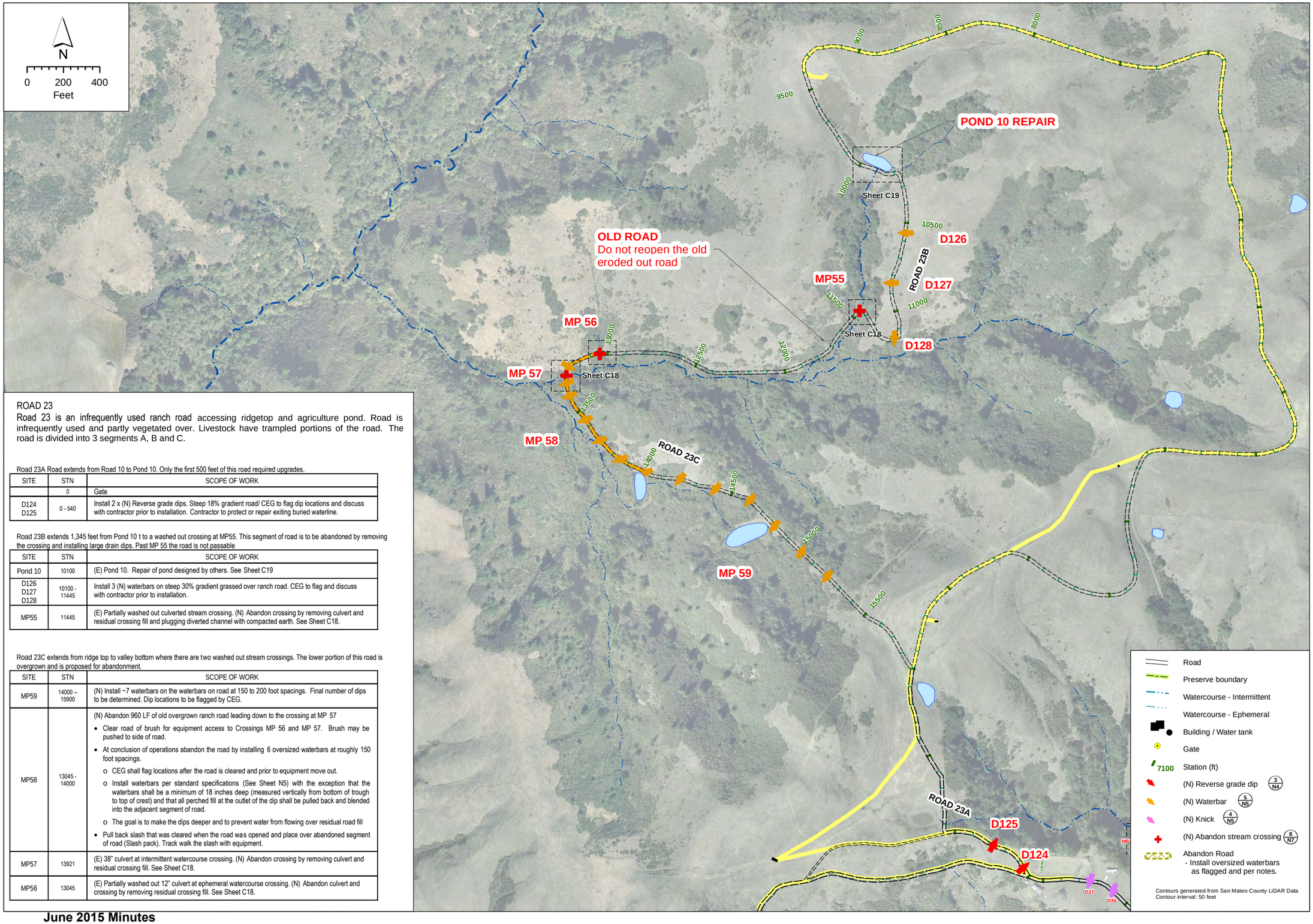
Date	Description
06/09/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

C16A



ROAD 23

Road 23 is an infrequently used ranch road accessing ridgetop and agriculture pond. Road is infrequently used and partly vegetated over. Livestock have trampled portions of the road. The road is divided into 3 segments A, B and C.

Road 23A Road extends from Road 10 to Pond 10. Only the first 500 feet of this road required upgrades.

SITE	STN	SCOPE OF WORK
	0	Gate
D124 D125	0 - 540	Install 2 x (N) Reverse grade dips. Steep 18% gradient road/ CEG to flag dip locations and discuss with contractor prior to installation. Contractor to protect or repair exiting buried waterline.

Road 23B extends 1,345 feet from Pond 10 t to a washed out crossing at MP55. This segment of road is to be abandoned by removing the crossing and installing large drain dips. Past MP 55 the road is not passable

SITE	STN	SCOPE OF WORK
Pond 10	10100	(E) Pond 10. Repair of pond designed by others. See Sheet C19
D126 D127 D128	10100 - 11445	Install 3 (N) waterbars on steep 30% gradient grassed over ranch road. CEG to flag and discuss with contractor prior to installation.
MP55	11445	(E) Partially washed out culverted stream crossing. (N) Abandon crossing by removing culvert and residual crossing fill and plugging diverted channel with compacted earth. See Sheet C18.

Road 23C extends from ridge top to valley bottom where there are two washed out stream crossings. The lower portion of this road is overgrown and is proposed for abandonment.

SITE	STN	SCOPE OF WORK
MP59	14000 – 15900	(N) Install ~7 waterbars on the waterbars on road at 150 to 200 foot spacings. Final number of dips to be determined. Dip locations to be flagged by CEG.
MP58	13045 - 14000	(N) Abandon 960 LF of old overgrown ranch road leading down to the crossing at MP 57 • Clear road of brush for equipment access to Crossings MP 56 and MP 57. Brush may be pushed to side of road. • At conclusion of operations abandon the road by installing 6 oversized waterbars at roughly 150 foot spacings. o CEG shall flag locations after the road is cleared and prior to equipment move out. o Install waterbars per standard specifications (See Sheet N5) with the exception that the waterbars shall be a minimum of 18 inches deep (measured vertically from bottom of trough to top of crest) and that all perched fill at the outlet of the dip shall be pulled back and blended into the adjacent segment of road. o The goal is to make the dips deeper and to prevent water from flowing over residual road fill • Pull back slash that was cleared when the road was opened and place over abandoned segment of road (Slash pack). Track walk the slash with equipment.
MP57	13921	(E) 38" culvert at intermittent watercourse crossing. (N) Abandon crossing by removing culvert and residual crossing fill. See Sheet C18.
MP56	13045	(E) Partially washed out 12" culvert at ephemeral watercourse crossing. (N) Abandon culvert and crossing by removing residual crossing fill. See Sheet C18.

Road
Preserve boundary
Watercourse - Intermittent
Watercourse - Ephemeral
Building / Water tank
Gate
7100 Station (ft)
(N) Reverse grade dip (3 N4)
(N) Waterbar (5 N5)
(N) Knick (4 N5)
(N) Abandon stream crossing (8 N7)
Abandon Road
- Install oversized waterbars as flagged and per notes.

Contours generated from San Mateo County LiDAR Data
Contour interval: 50 feet

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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
ROAD 23 SITE MAP

Date	Description
05/19/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C17

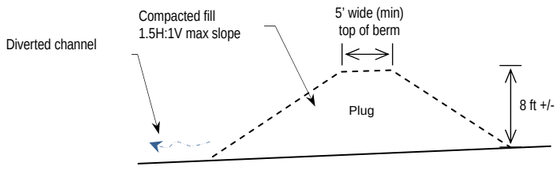
55: ABANDON CROSSING

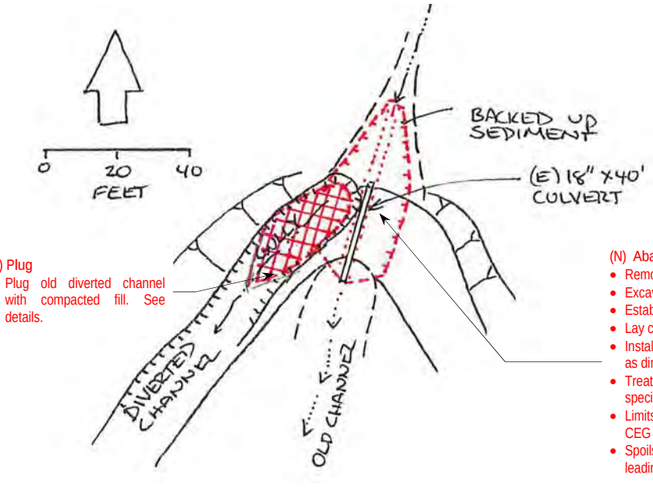
This is a plugged and non-functional 18 inch x 40 foot plastic pipe where an abandoned and overgrown ranch road crosses an intermittent stream. The watercourse is diverted out of the natural channel and down the road to the southwest where it has eroded a 280+ foot long 8 to 15 foot wide gully. The project proposes to redirect streamflow back into the natural channel by excavating the old road fill and placing a plug of compacted earth in the diverted channel. The stream is not expected to be flowing at time of operations. The site is accessed via a seasonal ranch road that extends past Pond 10.

RECOMMENDATIONS

- Abandon stream crossing and redirect streamflow into the native channel by excavating residual crossing fill and some of the sediment that has backed upstream of the crossing.
  - The excavated channel shall be minimum 5 feet wide channel bottom with banks laid back to a 1.5:1 slope. The excavation shall extend a minimum of 30 feet upstream of the crossing and have uniform channel grade of about 18%.
- Plug the diverted channel with compacted fill (est 100 cy).
  - Areas to receive fill shall be cleared of organic material
  - Place fill to form a berm approximately 8 feet deep. The top of the berm shall be about 5 feet wide with banks inclined at 1.5H:1V or gentler. Compact to minimum 85% relative compaction.
  - Clean fill used from crossing excavation shall be used to form the plug. Additional material may be obtained onsite by grading down the road segment leading to the crossing
- Treat exposed soils per notes. Install erosion control blanket and straw rolls at 10' OC along excavated channel bank. Alternatively the excavated area may be slash packed if directed by CEG
- Install wood grade checks on excavated channel if directed by CEG
- Conform to standard specifications for stream crossing removal.

Plug Detail





(N) Plug
- Plug old diverted channel with compacted fill. See details.

(N) Abandon and restore crossing
- Remove existing culvert and discard offsite
- Excavate old crossing fill to native grade
- Establish 5-foot wide minimum channel width
- Lay channel banks back to 1.5H:1V
- Install wood grade checks along channel bottom as as directed
- Treat exposed soils per notes and standard specifications
- Limits of excavation to be determined in filed by CEG at time of operations
- Spoils to be spread onsite along edge of road leading to crossing

SITES 56 AND 57

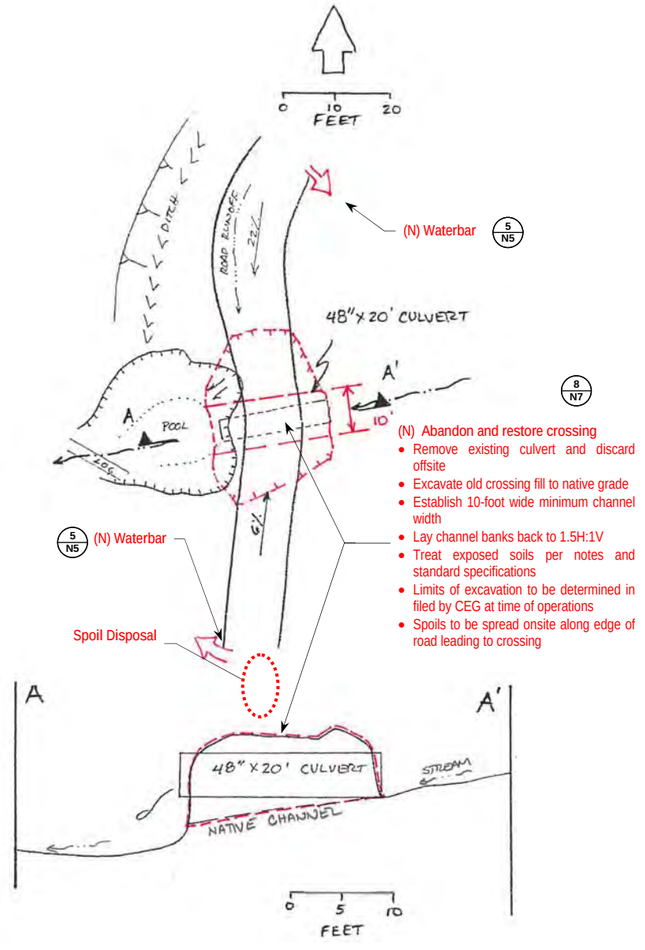
These two sites are accessed via an old ranch road that extends off the ridge top. The lower portion of this ranch road is heavily brushed over and is no longer passable by vehicles. The old road will need to be cleared of vegetation for equipment access. Following operations several waterbars will need to be installed and the cleared vegetation pulled back onto the roadway and track walked into the road surface.

57: ABANDON CROSSING

This is a 48 inch x 20 foot plastic culvert located where an abandoned ranch road crosses a large intermittent stream. About 75 cy of fill material reside at the crossing with maximum depth of fill of 9 feet. Stream may be flowing at time of operations

SCOPE OF WORK

- Reopen road to site by clearing minimum amount of vegetation from the road
- Abandon stream crossing
  - Remove exiting culvert and dispose offsite
  - Excavate crossing to native channel grade to form a 10 foot wide channel bottom with banks laid back to a 1.5:1 slope. About 100 cy of material will need to be excavated.
- Treat exposed soils per notes. Install erosion control blanket and straw rolls at 10' OC along excavated channel bank. Alternatively the excavated area may be slash packed if directed by CEG
- Conform to standard specifications for crossing removal
- Stream may be flowing at time of operations. Contractor to consult with District to determine if steam flow will need to be conveyed around the work area. This will be dependent upon how much streamflow there is at the time of operations and if the conveyance of streamflow around the crossing will be effective and necessary given the short time frame the work is required to take.



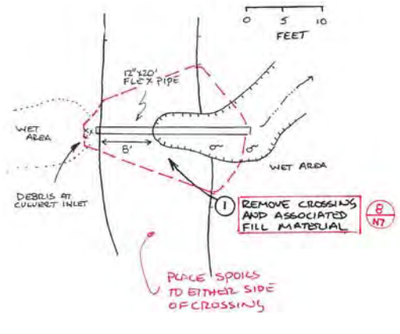
(N) Abandon and restore crossing
- Remove existing culvert and discard offsite
- Excavate old crossing fill to native grade
- Establish 10-foot wide minimum channel width
- Lay channel banks back to 1.5H:1V
- Treat exposed soils per notes and standard specifications
- Limits of excavation to be determined in filed by CEG at time of operations
- Spoils to be spread onsite along edge of road leading to crossing

56: ABANDON CROSSING

This is a partially washed out 12 inch X 20 foot flex pipe installed at small ephemeral stream. A small 12 foot wide, 15 foot long and 5 foot deep gully has formed at the outlet of the crossing narrowing the road to about 8 feet. Inlet to the pipe is about 60% plugged. Ground around the culvert inlet is seasonally wet and boggy.

SCOPE OF WORK

- Remove crossing by excavating all fill from the channel to create a 3 foot wide channel bottom with banks laid back to a 1.5:1 slope. Minimize area of ground disturbance. About 25 cy of material will need to be excavated. Excavated spoils can be spread onsite. Conform to standard specifications for crossing removal



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LA HONDA OPEN SPACE PRESERVE

Marin County Parks
San Mateo County, CA

SHEET TITLE

MP 55
56 & 57
SITE MAPS AND SECTION

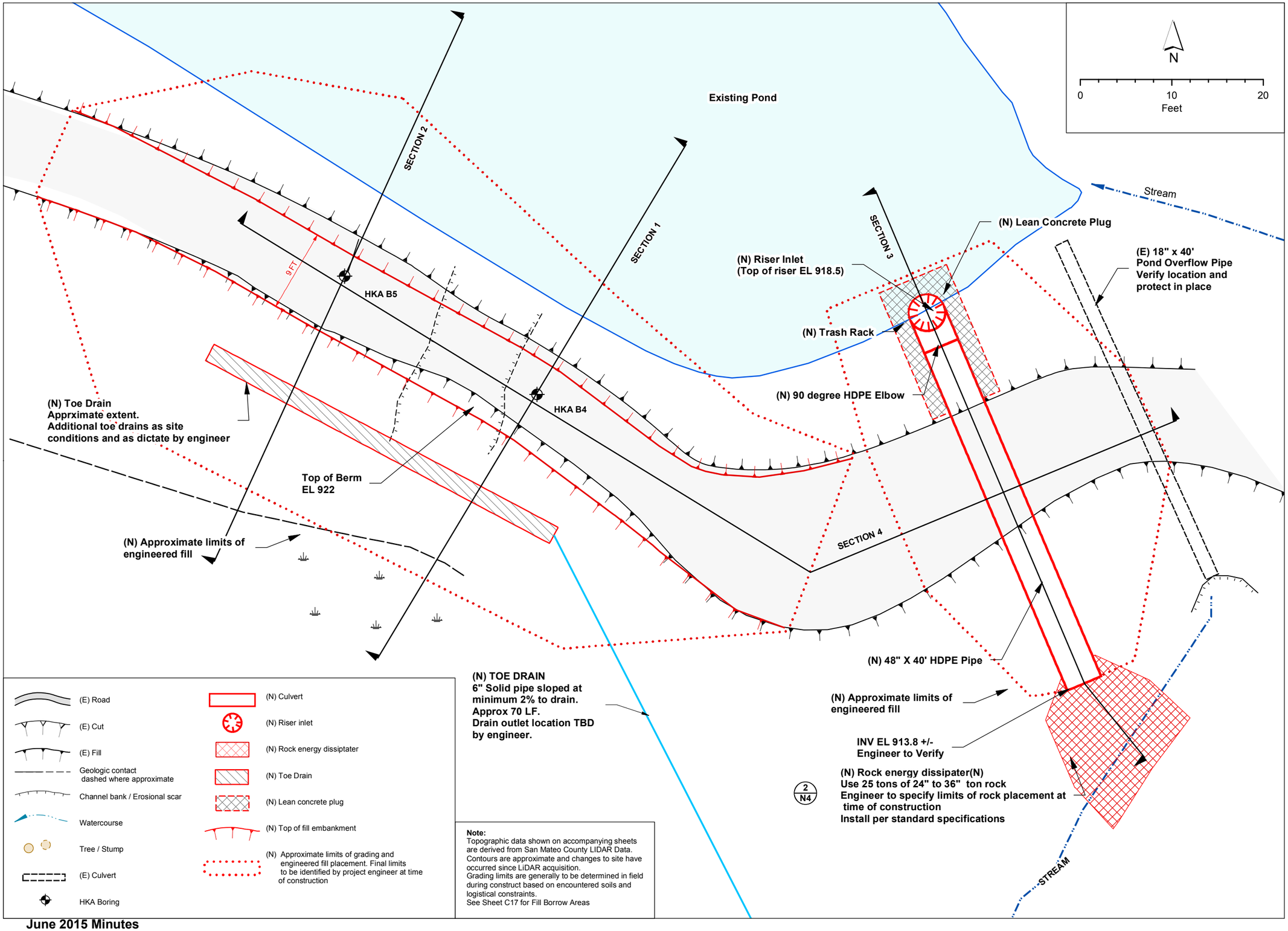
Date	Description
5/19/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C18



Note:
Topographic data shown on accompanying sheets are derived from San Mateo County LIDAR Data. Contours are approximate and changes to site have occurred since LiDAR acquisition.
Grading limits are generally to be determined in field during construct based on encountered soils and logistical constraints.
See Sheet C17 for Fill Borrow Areas

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DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
POND DR10 SITE MAP

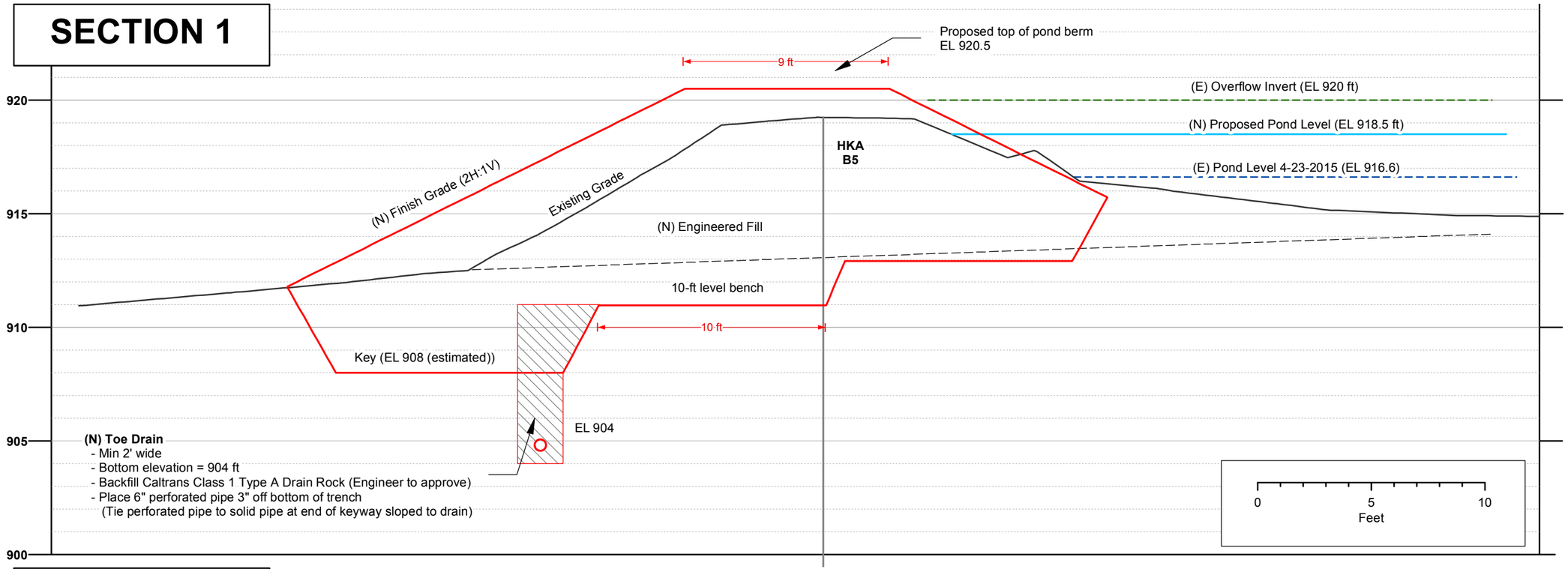
Date	Description
06/01/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

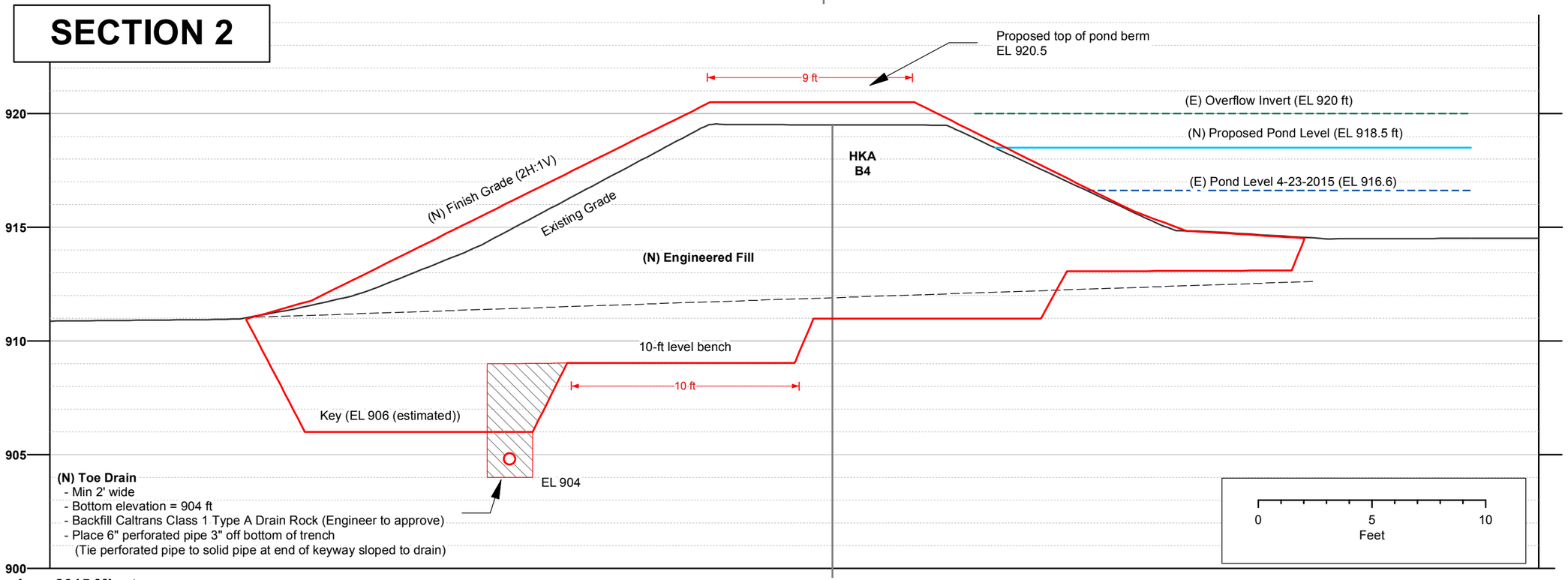
SHEET NUMBER
C19

SECTION 1



(N) Toe Drain
- Min 2' wide
- Bottom elevation = 904 ft
- Backfill Caltrans Class 1 Type A Drain Rock (Engineer to approve)
- Place 6" perforated pipe 3" off bottom of trench
  (Tie perforated pipe to solid pipe at end of keyway sloped to drain)

SECTION 2



(N) Toe Drain
- Min 2' wide
- Bottom elevation = 904 ft
- Backfill Caltrans Class 1 Type A Drain Rock (Engineer to approve)
- Place 6" perforated pipe 3" off bottom of trench
  (Tie perforated pipe to solid pipe at end of keyway sloped to drain)

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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
POND DR10 SECTIONS 1 AND 2

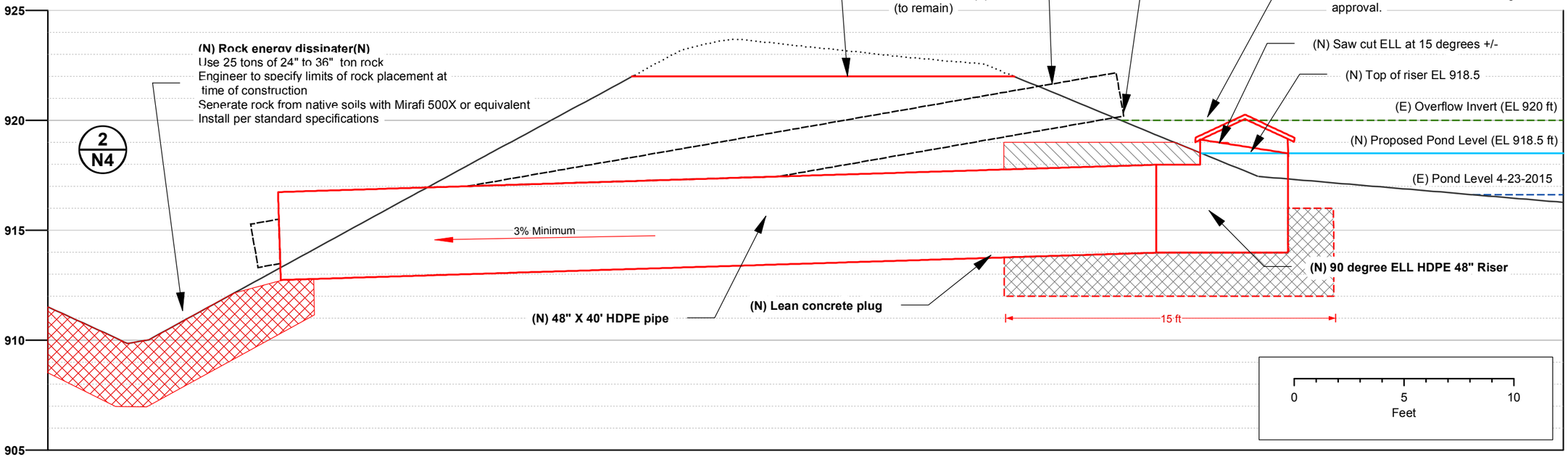
Date	Description
06/01/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C20

SECTION 3



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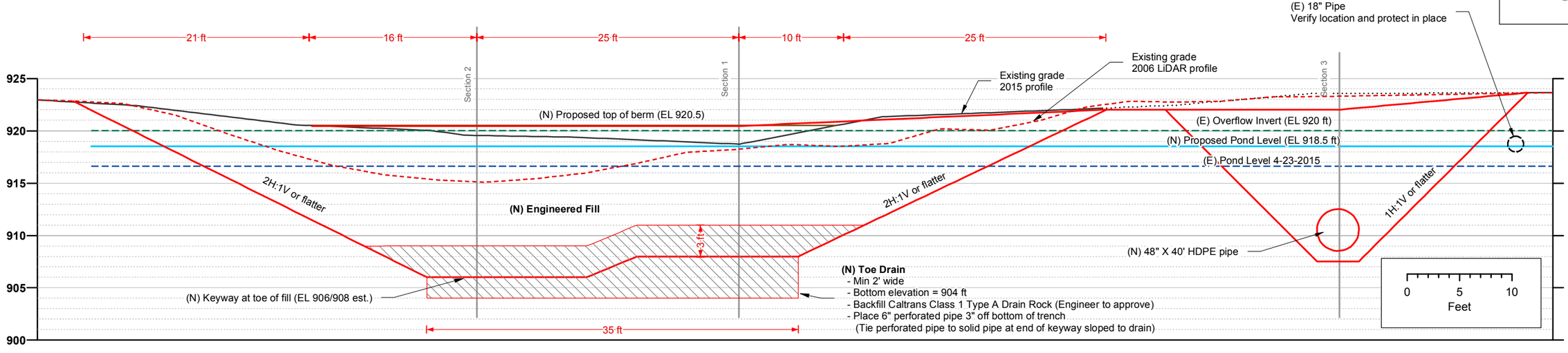

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PROJECT

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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE

POND DR10 SECTIONS 3 AND 4

Date	Description
06/01/2015	

DRAWN
TCB
PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER

C21

POND 10 EARTHWORK AND GRADING NOTES

EARTHWORK AND GRADING

1) POND SLOPE GRADING
   a) Plan Sheets C19 through C21, pond site plan and cross sections, depicts the current surface of the pond and its embankment, as well as the proposed reconstruction scheme.
   b) The proposed pond embankment shall be partially reconstructed and widened to a minimum width of 10 feet at the top. The side slopes of the pond embankment shall be graded to 2:1 (horizontal to vertical), as depicted on Plan Sheets C19 through C21

2) SITE PREPARATION
   a) The initial preparation of the site will consist of the removal of any abandoned underground utilities, all subsurface obstructions, and root balls, as necessary. Surface vegetation and organically contaminated topsoil should be stripped from the areas to be graded. The required depth of stripping will vary with the time of year and must be based upon visual observations of the geotechnical engineer. The extent of sediment, vegetation and debris removal will be designated by the Engineering Geologist or the Geotechnical Engineer in the field.
   b) All debris, grubbed material, sediment, and muck must be disposed of in an approved disposal area outside of the limits of the project site or below the pond and embankment.
   c) All voids, including those created by removal of subsurface obstructions, utilities or root balls must be backfilled with properly compacted approved soils that are free of organic and other deleterious materials or with approved import fill.
   d) No over-excavation of bedrock is permitted.

3) SUBGRADE PREPARATION
   a) Following the site preparation, the area should be excavated to the design grades. The exposed soils in the grading and construction areas should then be scarified, moisture conditioned, and compacted as an engineered fill.

4) COMPACTION AND MINIMUM DENSITY REQUIREMENTS
   a) Compaction should be performed in accordance with ASTM Test Procedure D1557. All overexcavated surfaces should be scarified (ripped) to depths of 6 to 8 inches, moisture conditioned by aeration if the soil is too wet, or by adding water if the soil is too dry, and properly compacted to at least 90 percent relative compaction. Within the construction areas, any fill or native soil not meeting compaction criteria should be over-excavated to its full depth, properly moisture conditioned, and placed back in thin lifts compacted to a minimum of 90 percent of the maximum dry density.
   b) Compaction of the predominately clayey fill and native soils should be performed while the soil is at a moisture content that is at least 2 percent over optimum. All fill and backfill should be placed in uniform lifts not exceeding 8 inches in loose thickness.
   c) Material used for earth berm construction shall be compacted to achieve minimum density requirements (by Sheepsfoot or other approved method) in layers that do not exceed 8 inches in thickness following compaction.

5) MINIMUM DENSITY REQUIREMENTS

Percent of Maximum Dry Density	Location
90%	Earth Embankment
85%	Miscellaneous Fill Material

   a) The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be in accordance with ASTM Test #D2922.

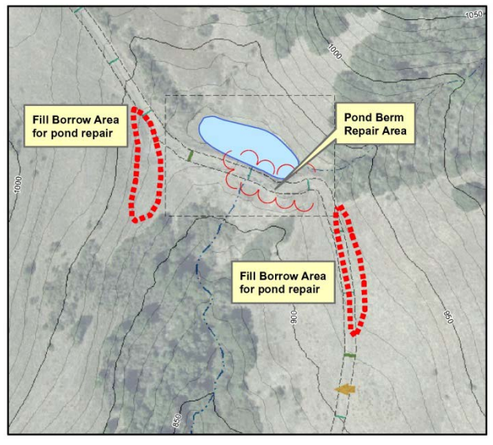
6) MOISTURE CONDITIONING
   a) Proper moisture conditioning of the soil used for construction of the earth berm is essential. The moisture conditioning procedure should result in a soil with a relatively uniform moisture content of between optimum and +3% percent over optimum at the time of compaction.
   b) Soils used for the construction of the earth berm that are not relatively uniform or that have a moisture content lower than 1% below optimum at the time of compaction will need to be removed and replaced with soil that is uniformly moisture conditioned with an adequate moisture content.
   c) The borrow site soil may require a diligent and active drying and/or mixing operation to reduce or raise the moisture content to the required specifications. The use of a commercial rototiller or disking may be needed to create an adequately compacted uniform soil.
   d) If the in-situ water content of the soil at the borrow site is below optimum, it should be increased in the borrow area as far ahead of construction as feasible. It may be necessary to sprinkle or pond the borrow area well in advance of excavation to obtain a uniform and acceptable moisture content.

7) ENGINEERED FILL MATERIAL
   a) Excavated soils that meet this specification shall be used as fill.
      i) If additional fill material is needed for the construction of the pond and earth berm, it shall be taken from approved borrow areas.
      ii) Acceptable borrow areas are shown on this sheet
   b) Engineered fill used for pond and earth berm construction shall conform to the following:
      i) Uniform soil classifications: CH (Clay with high plasticity), CL (Clay with low plasticity) or SC (Clayey Sand).
      ii) A minimum of 60% passing the #200 sieve.
      iii) Free of organics, deleterious material and stones larger than 4 inches.
      iv) Thoroughly and uniformly mixed and adequately moisture conditioned.
   c) Samples of all proposed import fill planned for use on this project should be submitted to the geotechnical engineer for appropriate testing and approval not less than 4 working days before the anticipated use and jobsite delivery.

8) CUT AND FILL SLOPE HEIGHT, GRADIENT AND CONSTRUCTION RECOMMENDATIONS
   a) Cut and fill slopes shall not exceed 2:1 (horizontal to vertical) gradient. All fill slopes should be constructed with engineered fill meeting the minimum density and moisture content requirements of this report. The above recommended gradients do not preclude periodic maintenance of the slopes, as minor sloughing and erosion may take place.
   b) New fill slopes shall be constructed by overbuilding and compacting 2 feet beyond the design face. The outer 2 feet should be removed following compaction.

9) FILL SLOPE KEYWAYS
   a) Fill slopes should be keyed into the native slopes with a 10 foot wide base keyway that is sloped negatively at least 2% into the bank. The depth of the keyways will vary, depending on the materials encountered. It is anticipated that the depth of the keyways may be 3 to 5 feet, but at all locations shall be at least 2 feet into firm material. Subsequent keys may be required as the fill section progress upslope. The Geotechnical Engineer will designate keys in the field.

10) SUBSURFACE DRAINAGE
   a) Our recommended cut and fill slope gradients assume that the soil moisture is a result of precipitation penetrating the slope face, and not a result of subsurface seeps or springs, which can destabilize slopes with hydrostatic pressure. All groundwater seeps encountered during construction should be drained as necessary to maintain stable slopes at the recommended gradients. Drainage facilities may include subdrains, gravel blankets, rock-filled surface trenches or horizontally drains. The geotechnical engineer will determine the drainage facilities required during the grading operations.
   b) As shown on the plans, a toe drain along the base of the pond berm repair area will be necessary. Rocks or cobbles larger than 3 inches in maximum dimension should not be allowed to remain in the soils forming the outlet pipe trench, unless they can be crushed in-place by the construction equipment.



FILL BORROW AREA (for Pond Repair)

0 50 100 200 Feet

HARO, KASUNICH AND ASSOC., INC.
Geotechnical and Coastal Engineers
115 East Lake Ave. Watsonville, CA 95076
(831) 722-4175

PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

POND DR 10 NOTES

Date	Description
06/01/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

C22

PROJECT SPECIFICATIONS

GENERAL

1) GENERAL NOTES
   a) The "District" shall be Midpeninsula Regional Open Space District , the “engineering geologist” (CEG) shall be Timothy C. Best, the “geotechnical engineer” shall be Haro, Kasunich and Associates, 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) 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 geotechnical consultants 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 geotechnical consultants.
   c) 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.
   d) The contractor shall notify the project engineering geologist a minimum of 7 days prior to commencement of work and a minimum of 4 days in advance of required inspections.
   e) Contractor shall be responsible for following any requirements of the District's general and supplemental conditions for the project.
   f) 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.
   g) The contractor shall provide the District, Engineering Geologist, and Geotechnical Engineer with the name and telephone number of the responsible person to contact, with regard to this project, 24 hours a day.
   h) All work shall be subject to observation, testing and approval by District, engineering geologist, and geotechnical engineer, in addition to inspections required by regulatory agencies.
   i) Contractor shall be responsible for site clean-up to the satisfaction of the District.

EXAMINATION OF JOB SITE, PLANS AND SPECIFICATIONS

2) The documents indicate general and typical details of construction.
3) 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.
4) The contractor shall recognize that the plans used for the drawings of the Work 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.
5) The Contractor must attend a pre-bid meeting with the CEG 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 scope of work, permit conditions and environmental constraints.
6) 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

7) 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.

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

9) 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.

10) 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.

SITE GRADING

11) EXCAVATION
   a) Excavate crossing fill to native grade or as directed in field by project CEG. The approximate limits of excavation are shown on plans.
   b) Areas to be graded should be cleared of all obstructions, including trees not designated to remain and other unsuitable material.
   c) In areas to receive engineered fill it will likely be necessary to over-excavate the subgrade soil an average of 2 feet below buried native grade to remove additional unsuitable earth materials. Limits of over-excavation to be determined in field by the CEG.
   d) In areas where stream channel is to be restored excavated stream channel shall be a minimum of 4 feet wide with banks shall be laid back to 1.5:1 or flatter unless otherwise directed.

12) SEPARATE EXCAVATED SOILS
   a) Separate clean excavated soils from deleterious soils and stumps and vegetation.
   b) Deleterious soils including topsoil, fat clay soils, organic rich soils, decayed woody debris rich soils, and other material, as identified by the CEG, shall be placed in an approved stable location as directed by the CEG or District representative and as specified in Item 10.
   c) Granular clayey soils may be used as engineered fill as approved by the CEG. This material may be temporarily stockpiled on site in approved areas.
   d) Soils suitable for engineered fill and not used at crossings may be used to form rolling dips.

13) ENGINEERED FILL PLACEMENT
   a) Reconstruct crossing with engineered fill
   b) The on-site granular and clayey soil generated from the site is generally suitable for use as engineered fill.
   c) Engineered fill shall be free of highly expansive clay, organic material, and contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches. Soil should also have a Plasticity Index (P.I.) less than 18.
   d) Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.
   e) Areas to receive engineered fill should be scarified 6 inches, moisture conditioned and compacted to 90 percent relative compaction. Engineered fill should be placed in thin lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted to a minimum of 85 percent relative compaction.
   f) The upper 6 inches of subgrade and aggregate roadbed sections shall be moisture conditioned and compacted to at least 85 percent relative compaction.
   g) If grading is performed in a wet condition, compaction may be difficult, pumping bringing water to the surface may occur. If such conditions are encountered soils shall not be used until reconditioned to conform to specifications outlined here and as approved by project geotechnical engineer.
   h) Engineered fill shall be inspected and tested by project geotechnical engineer or designee

14) FILL SLOPE CRITERIA
   a) Fill slopes should be inclined no steeper than 1.5:1 (horizontal to vertical) without approval of the project CEG or Geotechnical Engineer. Where shown on plans at the transitions to existing slopes that are steeper gradients fill slopes may be blended with natural grades.
      i) Fills situated on slopes greater than 20% in gradient shall be keyed and benched into firm native material, unless otherwise directed by project CEG
      ii) All keys and benches shall be adequately drained as directed by project CEG or geotechnical engineer.
   b) Cut and fill slopes should be protected from erosion by intercepting runoff and not allowing spill onto graded slopes unless otherwise directed by project CEG. V-ditches and/or berms may be considered to accomplish this.

15) DELETERIOUS SPOILS
   a) Spoils not used for engineered fill shall be placed in an approved location.
   b) Project geotechnical engineering geologist or designee shall approve all spoil sites prior to fill placement. In most cases spoils are expected to be spread and compacted along inboard road edges where road width permits; in some cases deleterious and excess soils may need to be endhauled to open slopes and spread where slope gradients are less than 30%.
   c) Areas to receive fill shall be cleared of vegetation and ripped to a depth of 6 inches.
   d) Spoils placed along inside edge of road shall be placed in thin lifts (not to exceed 8 inches in maximum thickness) and compacted in good workman like manner. Compacting may employ track walking with a dozer, bucket of the excavator, roller or hand tamper. Spoils spread on open slopes shall be placed loose to allow for revegetation and spread to have smooth uniform grade.
   e) Spoils shall be placed a maximum of 5 feet deep with an embankment face inclined no steeper than 3:1 (35%) unless otherwise directed or specified.
   f) The contractor shall be responsible for matching existing surrounding conditions with smooth transition in grading, and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.
   g) Apply erosion control per notes
   h) CEG shall approve all spoil sites prior to fill placement.

16) EXCESS ENGINEERED FILL
Spoils suitable for use as engineered fill may be used to form rolling dips.

17) OTHER CRITERIA
   a) 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 CEG upon discovery of any conflicts between plans and field conditions.
   b) Cut slopes in rock may be inclined at a 0.75:1 (H:V) slope for heights up to 12 feet. Natural slopes exposing soil may be temporarily cut no steeper than 1:1 or flatter for heights of 12 feet as directed by CEG. Steeper inclinations may be acceptable based on site review by CEG and/or geotechnical engineer.
   c) The contractor should be aware that slope height, inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state or federal safety regulations, i.e. OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 Subpart P, or successor regulations.
   d) Following grading, exposed bare slopes and soil should be planted or covered as soon as possible with erosion resistant vegetation or erosion control fabric installed in accordance with the manufactures specifications.
   e) After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the geotechnical engineer.
   f) Contractor shall be responsible for grade staking, and conformance of finish grades to those shown on the plans.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PROJECT SPECIFICATIONS 1

Date	Description
05/14/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

N1

PROJECT SPECIFICATIONS

CULVERT

13) SIZES, LENGTHS AND ALIGNMENTS
- a) Culverts shall be smooth bore, double wall soil tight plastic HDPE. ADS N-12 ST IB conforms to this recommendation.
- b) Culverts sizes and lengths are specified on plans
- c) General Specifications for culverts at stream crossings are specified on Sheet 1/N3. Ditch relief culvert general specifications are found on Sheet 6/N6

14) CULVERT ORIENTATION AT WATERCOURSE CROSSINGS
- a) Culverts shall be installed at the natural stream level, grade and orientation unless otherwise specified or directed.
- b) Position inverts as shown on plans. In general, culverts shall be installed at the natural stream level, grade and orientation.

15) CULVERT BED
- a) The width of trenches shall permit satisfactory joining and thorough tamping of the backfill material.
- b) The culvert bed shall be clean and free of large woody debris and large rocks. Unsuitable material shall be replaced with selected granular drainage material and compacted to obtain uniform bed.
- c) Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the culvert 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.
- d) Culvert trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The final project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.
- e) Trenches should be backfilled with granular-type material and uniformly compacted by mechanical means to not less than 85 percent. The relative compaction will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Test Designation D1557.
- f) Place approved impervious material (such as clayey soil) in the culvert trench near the upstream edge of the fill prism, in order to prevent stream water or storm runoff from following in the backfill along the edge of the culvert.

16) LAYING PIPE
- a) Culvert shall be laid in center of trench on uniform grade line. The entire length of pipe shall be in contact with the culvert bedding.
- b) Culverts distorted more than 10% of normal dimension, ruptured, or broken shall be replaced.
- c) Culvert shall be joined and anchored per manufacturer's guidelines.

17) OUTLET ENERGY DISSIPATER
- a) Watercourse crossings
  - i) Install rock energy dissipater at culvert outlet. Use approved sound durable rock sized as indicated on plans. Rock to extend a minimum of 3 times culvert diameter downstream of culvert. Refer to standard specifications for rock energy dissipater installation on Sheet 2/N4
- b) Ditch Relief culverts
  - i) Discharge pipe onto rock, slash or suitable vegetation as directed or specified.

18) CULVERT HEADWALL
- a) Watercourse crossings
  - i) Place rock at inlet and outlet to top of culvert as specified in plans or on Sheet 1/N3
- b) Ditch Relief culverts
  - i) Place rock at inlet and outlet to top of culvert if specified in plans or directed

19) ROCK
- a) All rock used for rock energy dissipaters shall conform to applicable Caltrans standards unless otherwise approved by CEG

DRAINAGE

20) 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.

21) 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.
- e)

22) ROAD ROCK
- a) Portions of road to be rocked are specified on plans
- b) The subgrade for the road shall be scarified to a depth of 6 inches, moisture conditioned and compacted to a minimum of 90 percent relative compaction. The subgrade shall be compacted to a minimum of 12 inches beyond (laterally) the edge of the base rocked surface.
- c) Aggregate baserock shall consist of approved Lime Treated Class II Aggregate Base and conforming to the latest Caltrans standards. Rock obtained from Stevens Creek Quarry conforms to this specification
- d) New aggregate baserock should be compacted to a minimum 4" thickness and to 95 percent relative compaction.
- e) Road tread shall be insloped/outsloped/crowned at 8%

EROSION CONTROL, WATER POLLUTION PREVENTION AND HOUSEKEEPING

23) EROSION CONTROL
- 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:
  - i) Minimize erosion and sedimentation during construction.
  - ii) Eliminate pollution of storm runoff by chemicals and materials used in the construction process.
  - iii) 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 if 30% or greater chance of rail. 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.
  - iv) The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm events.
- b) Exposed soils outside of the road 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 treated in order to reduce the potential for short-term sheet and rill erosion.
  - i) Seed: Native grass seed mix (provided by District). Spread seed mix after all grading has been completed, before spreading straw or mulch on the site. Finished grading shall leave tractor cleat marks, preferably perpendicular to slope. Seed mix should be spread at a rate of 40 lbs/acre. Lightly rake seed into soil and cover with 1 to 2 inches of straw. Seed may not be applied until late September or October to promote successful germination.
  - ii) Mulch: Native vegetation cleared at work sites shall be stockpiled and re-applied on the disturbed ground surface as directed by the CEG or District. Spread slash shall be lopped or tractor crushed to promote good contact with the soil surface. Slash, straw and seed may also be combined on finished ground surfaces
  - iii) Straw: Use only certified weed-free straw; often it is rice straw. Documentation of purchase must be provided prior to spreading on site. Spread straw so that it is one and one half to two inches thick, and coverage exceeds 90% of ground surface, or better.
  - iv) Erosion Control Blanket: Exposed slopes greater than 2H:1V with the exposed slope distance exceeding 20 lf in a downslope direction shall be covered with approved erosion control blanket (Tensar Rollmax C125BN or equivalent) in accordance with the manufacturer's recommendations and as directed by the engineering geologist or designee. This specification does not apply to exposed slopes that are shorter than 20 lf in a downslope direction
  - v) Straw Roll: Where the exposed slope exceeds 20 lf in downslope direction, install straw roll(s) at 10' O.C. per standard specifications
- c) Unnecessary grading and disturbance of soil shall be avoided.

24) 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

25) 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.

PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

26) INSPECTIONS
- a) The project geotechnical engineer and 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)

27) INSPECTION SCHEDULE
- a) As required to allow observations and testing of:
  - i) Road alignments
  - ii) Culvert positions
  - iii) Limits of excavation
  - iv) Spoil placement
  - v) Subgrade
  - vi) Keyway
  - vii) Fill placement
  - viii) Compaction testing
  - ix) Energy dissipater shape and position
  - x) Finish grades
  - xi) Road drainage
  - xii) Road shaping (dips, knicks, etc)
  - xiii) Erosion control

ROAD ACCESS

28) ROAD ACCESS

Through road access shall be maintained. If through access cannot be maintained, a schedule for closure must be approved by a District representative.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

PROJECT SPECIFICATIONS 2

Date	Description
05/14/2015	
06/12/2015	revised

DRAWN
TCB

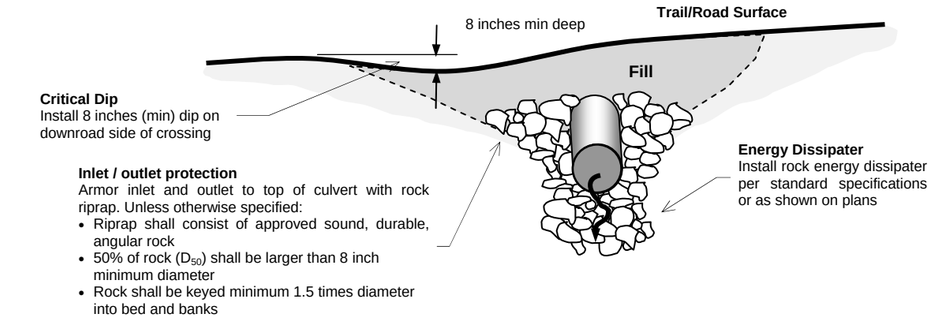
PROJECT
MIDPEN-DRISCOLL3-689

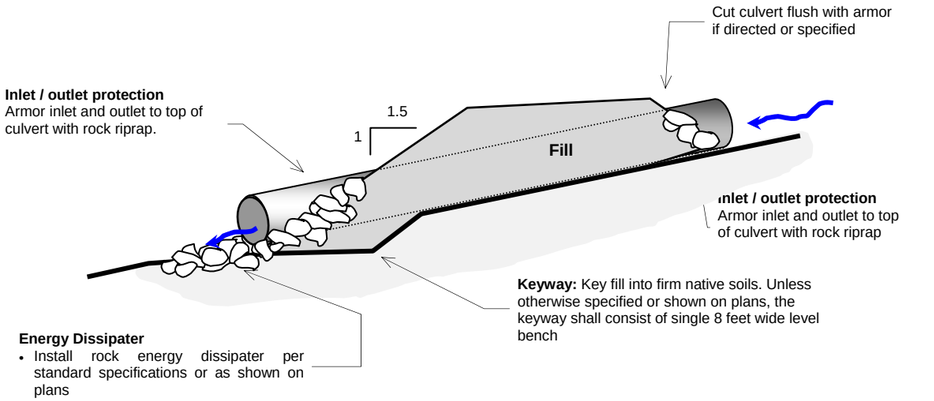
SHEET NUMBER

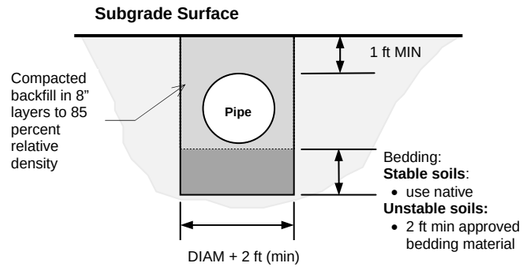
N2

1
N3

PERMANENT CULVERT- RURAL ROAD
NTS







NOTES

- **Culvert Orientation**
  - Culvert should be installed at the natural stream level, grade and orientation.

- **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.
  - The inlet to the culvert should be countersunk 10% of the pipe diameter below stream grade so that the water falls into the culvert inlet.

- **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.
  - Unless otherwise specified, the culvert shall have a minimum grade of 2%.
  - Culvert shall be joined and anchored per manufacturer's guidelines.

- **Backfill**
  - Areas to receive fill shall be stripped to remove vegetation, near-surface roots, brush, highly organic soils, and other unsuitable fill material.
  - Fill shall be keyed and benched into firm native soils. Keyway shall consist of single 8 feet wide level bench, unless otherwise specified on plans or directed in field by project engineering geologist.
  - Install blanket drain if specified in plans
  - 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**
  - Unless otherwise specified, culverts shall be smooth bore, double wall, soil tight plastic HDPE. ADS N-12 ST IB conforms to this recommendation.
  - Pond culvert shall be water tight HDPE. ADS N-12 WT conforms to this recommendation.
  - 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 apron per general specifications.

- **Critical dip**
  - Install a critical dip on road side of the crossing unless otherwise specified on plans or directed by engineering geologist.
  - Critical dip shall conform to reverse grade dip specifications per plans
  - Contractor shall consult with engineering geologist to confirm rolling dip and location

- **Erosion Control**
  - On running streams, water will be pumped or diverted past the crossing and into the downstream channel during the construction process.
  - 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 Game Code 1600 where applicable.

- **Culvert disposal**
  - Dispose of old culverts at approved dumpsites

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

CULVERT SPECIFICATIONS

Date	Description
05/19/2015	

DRAWN
TCB

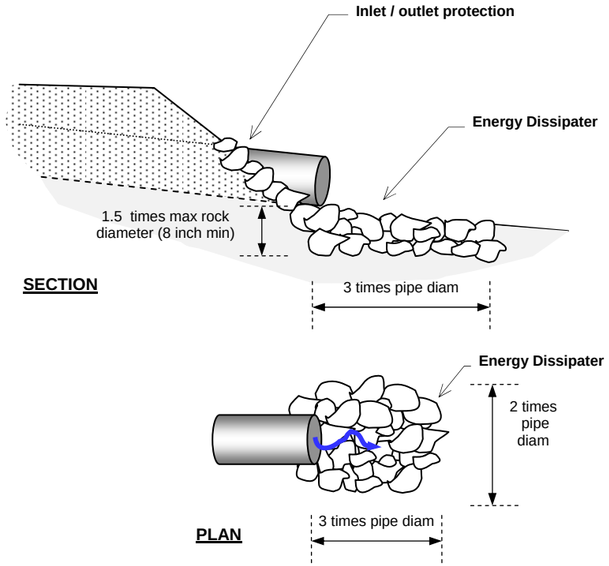
PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

N3

2 N4 ENERGY DISSIPATER (Typical)

NTS



NOTES

- **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 inches minimum diameter unless otherwise specified
  - Rock shall be keyed minimum 1.5 times diameter into bed and banks unless otherwise specified

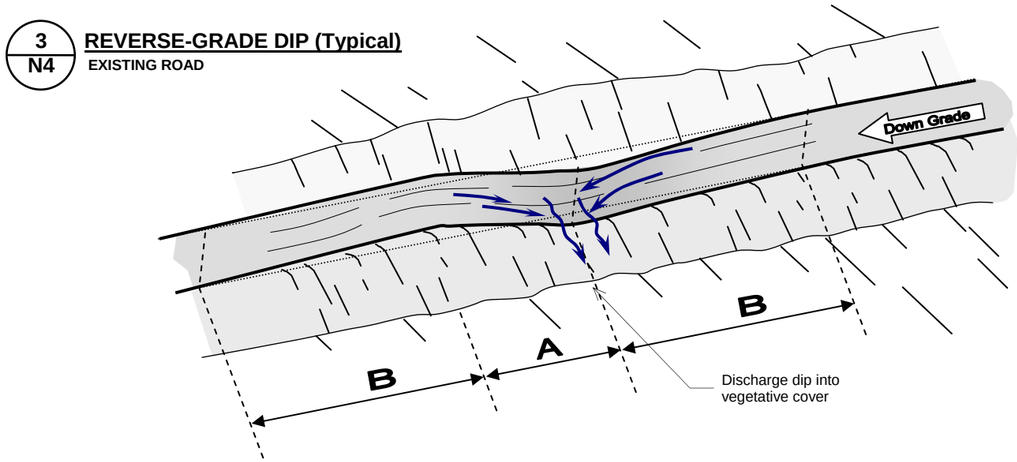
- **Energy dissipater**
  - Culvert shall discharge onto rock energy dissipater / apron aligned with native channel as shown on plans or as directed
  - Unless otherwise specified in plans or directed by geotechnical consultant, armor shall consist of approved sound, durable, angular rock adequately sized for design flow; preliminary rock size is specified in Table C
  - Rock apron shall extend a minimum of 3 times pipe diameter downstream of outlet and be a minimum of 2 times pipe diameter wide; apron may taper downstream on steeper gradient channels
  - Rock shall be embedded into channel a minimum of 1.5 times maximum rock diameter; 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
  - Separate rock from native soils with approved geotextile fabric if specified on plans or directed
  - Compact loose soils adjacent to rock riprap

TABLE C

Pipe Diameter	D_{50} Rock Size (50% of rock larger than specified)		
	Diameter	Weight	Quantity
< 18”	8”	Light	tbd
24”	12”	¼ T	tbd
36”	24”	½ T	tbd
48”	30”	½ - 1 T+	tbd

3 N4 REVERSE-GRADE DIP (Typical)

EXISTING ROAD



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)	Grade (%)
<5%	8 inches	15 feet at 5%	17	10%
10%			30	15%
15%			60	20%
>15%		7 feet at 10%	60	25%

NOTES

- A reverse-grade dip (or rolling dip) is a broad, long, permanent dip constructed into native soils. It is intended to drain the trail/road while not significantly impeding traffic.
- On existing trails/roads the dip is cut into the existing tread with the downroad dip built up on compacted fill.
- The dip shall be a minimum of 8 inches deep and incorporate a 2 foot long flat reach at the base of the trough (unless otherwise directed).
- The downroad reverse grade of the dip shall generally be sloped 5% for a minimum of 7 feet, to 10% for minimum of 15 feet, to form the minimum 8 inch deep dip. On roads/trails steeper than 15% a steeper reverse-grade dip may be required.
- The dip axis should be outsloped 3% greater than trail grade to maximum 15%. Dip axis may be skewed down road at 30 degree – this will make installation of dips on steeper grades easier.
- 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.
- Where natural slopes exceed 50%, fill shall not be pushed over the dip outlet. A backhoe or excavator may be required to pull back fill at outlet of existing dips.
- Dips shall be placed as specified in the plans. If not specified, then dips shall be placed at maximum 75 foot spacings.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

ENERGY DISSIPATER AND REVERSE GRADE DIP SPECIFICATIONS

Date	Description
05/19/2015	

DRAWN
TCB

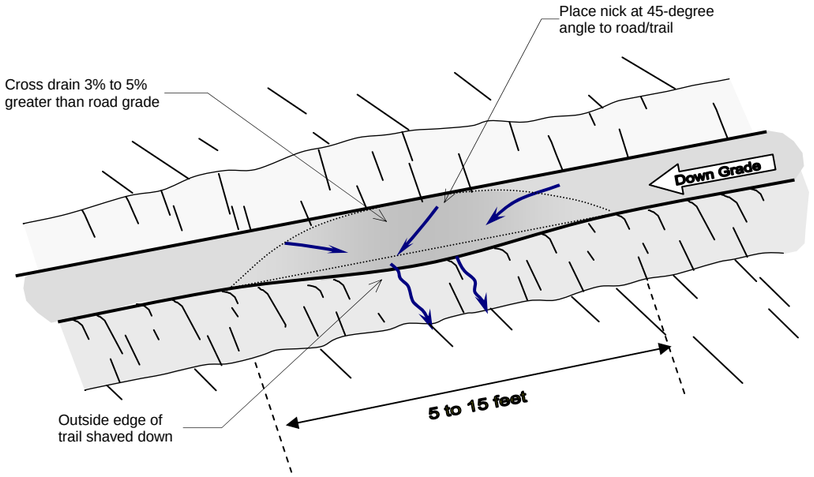
PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

N4

4 N5 KNICK (Typical)

NTS

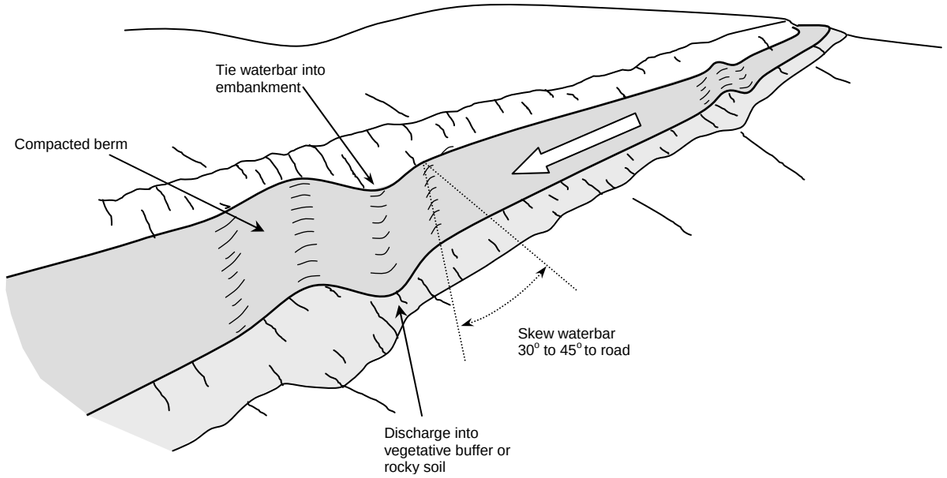


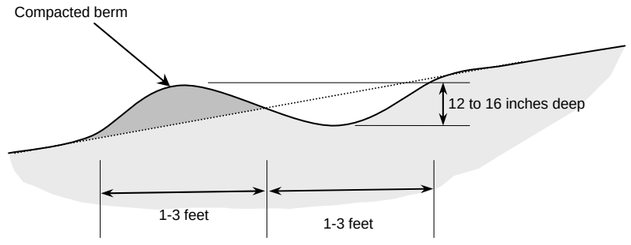
NOTES

- 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.

5 N5 WATERBAR (Typical)

NTS





NOTES

- Identify waterbar locations that take advantage of natural drainage features and minimize the amount of disturbance required for waterbar construction.
- All waterbars shall begin at the intersection of the roadbed surface and the cut slope and run the entire width of the road surface prism.
- Waterbar length shall not exceed 1.5 times the width of the road surface.
- Acceptable waterbars shall be skewed 30 to 45 degrees.
- All waterbars shall have free-flowing outlets with minimum 2% grade in the bottom of the channel that discharges onto vegetative surfaces or less erodible material where possible.
- Native materials used to construct downslope berm shall be compacted with equipment to minimize wear resulting from trespass and/or administrative use.
- Waterbar depth measured from the bottom of the waterbar channel to the top of the compacted berm must be between 12 and 16 inches high.

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PROJECT

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LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

KNICK AND WATERBAR SPECIFICATIONS

Date	Description
05/19/2015	

DRAWN
TCB

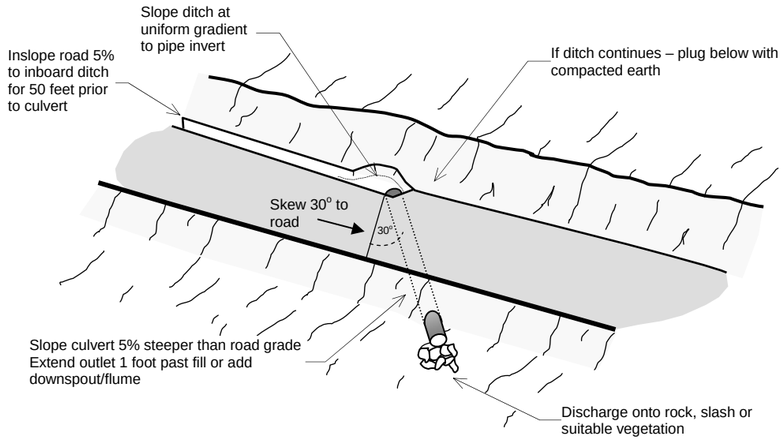
PROJECT
MIDPEN-DRISCOLL3-689

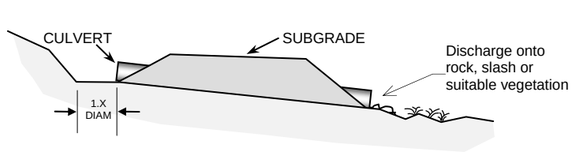
SHEET NUMBER

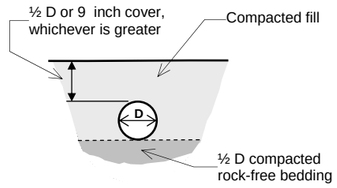
N5

6 N6 DITCH RELIEF CULVERT (Typical)

NTS







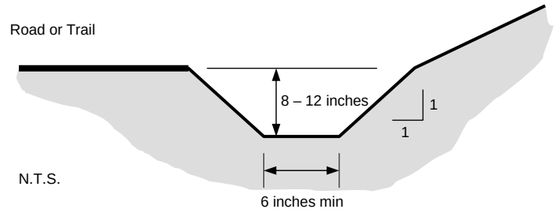
NOTES

- Ditch relief culverts shall be installed at flagged locations or as identified on plans. The maximum spacing of culverts shall be 150 feet unless otherwise specified or directed.
- Culverts shall be 18 inch diameter smooth bore, double wall HDPE (ASTM D3350 and AASHTO M294, Type S) unless otherwise specified.
- The culverts shall be placed at a 30 degree skew angle down grade (where allowable) with a gradient 5% steeper than that of the road. Culverts should extend a minimum of 1 foot beyond base of road fill.
- Where necessary, outlet ditch shall be constructed at a steeper gradient than the culvert, at least one pipe diameter in width, and with bank tapered back to a 1:1 slope.
- The culvert bed shall be ½ diameter of the culvert and be clean and free of large woody debris and large rocks. Trench shall be adequate width to facilitate compaction.
- Select approved mineral soil shall be used for culvert backfill. The backfill shall have no rocks greater than 3 inches in any dimension placed closer than 1 foot to the culvert. Backfill shall be adequately compacted throughout the entire process to 95 percent ASTM 1557 unless otherwise specified. During placement and compaction of fill, the moisture content of the materials being placed shall be maintained.
- Compacted fill coverage shall be minimum ½ pipe diameter or 9 inches, whichever is greater.
- Rock, slash or suitable vegetation should be used at discharge point as directed or specified.
- A ditch block shall be placed immediately downslope of the culvert intake to prevent ditch flow from bypassing the pipe inlet.
- Specifications are intended only as guidelines; modifications may be made in the field by engineering geologist or designee.

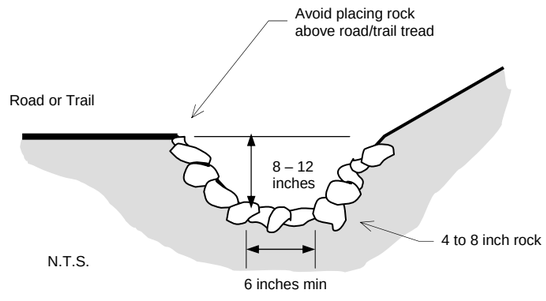
7 N6 INSIDE ROAD DITCH (Typical)

NTS

INSIDE DITCH (native)



INSIDE DITCH (Rock lined)



NOTES

- Slope ditch to drain 3% minimum.
- Armor ditch where specified.
- Drain ditch to ditch relief culvert inlet as specified with uniform grade.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

DITCH RELIEF CULVERT AND INSIDE ROAD DITCH SPECIFICATIONS

Date	Description
05/19/2015	

DRAWN
TCB

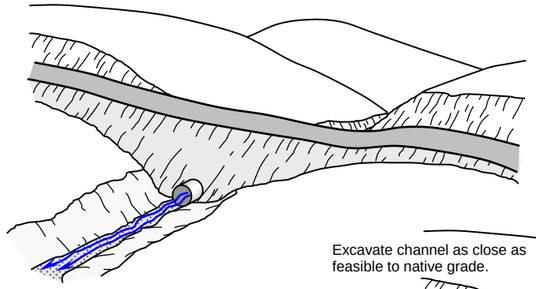
PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

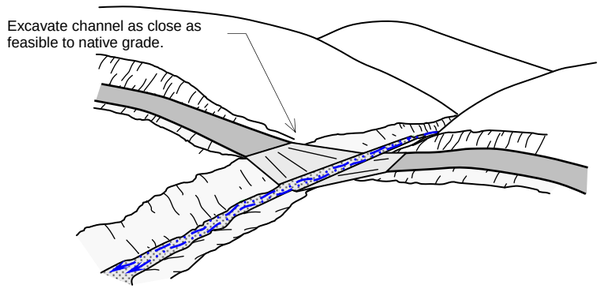
N6

8/N7 STREAM CROSSING REMOVAL
NTS

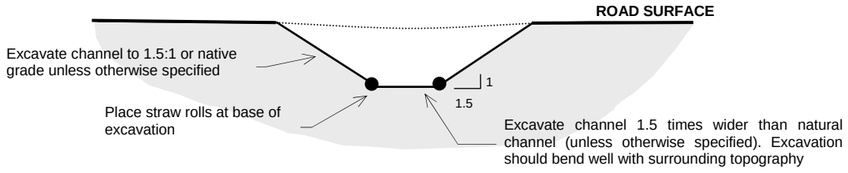
EXISTING CROSSING



REMOVED



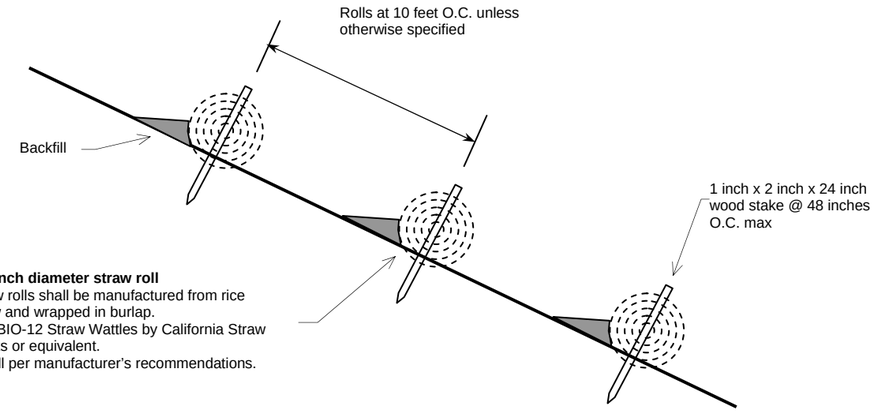
ROAD SURFACE



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.
- Erosion Control
  - Place straw rolls at base of excavation along stream channel and 10' O.C. per standard specifications on excavated channel bank
  - Treat exposed spoils per notes. Seed and mulch exposed soils. Install erosion control blanket on slopes 2H:1V or steeper
- 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.

9/N7 STRAW ROLL (Typical)
NTS



6 to 8 inch diameter straw roll

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

NOTE:

- 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.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

STREAM CROSSING REMOVAL AND STRAW ROLL SPECIFICATIONS

Date	Description
05/19/2015	

DRAWN
TCB

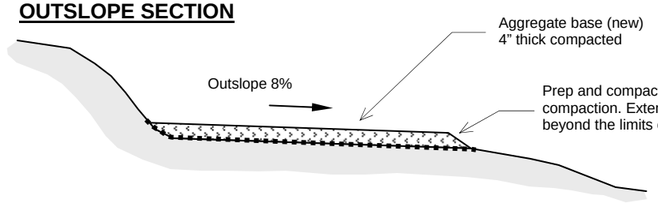
PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

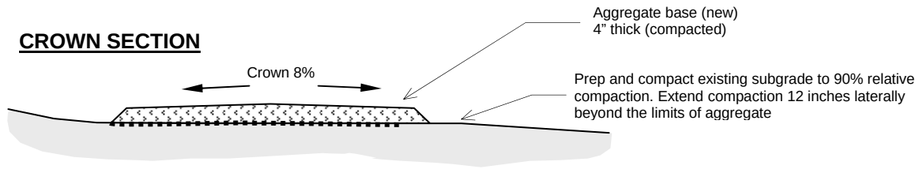
N7

10 N8 AGGREGATE SURFACING - ROAD
NTS

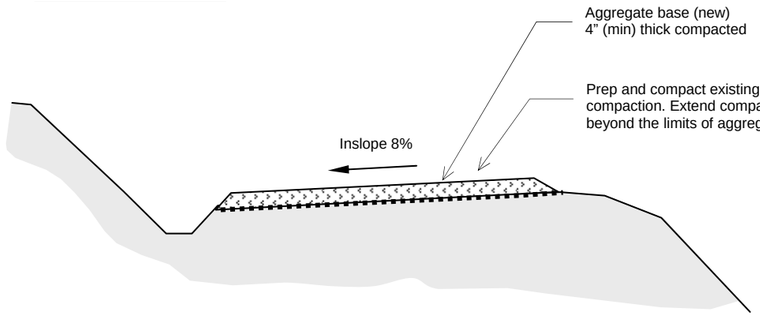
OUTSLOPE SECTION



CROWN SECTION



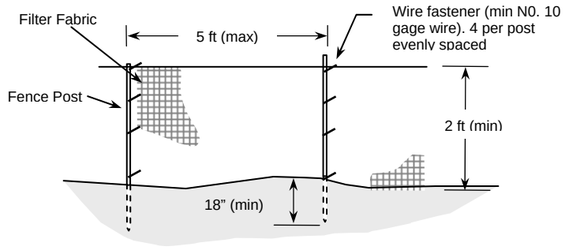
INSLOPE SECTION



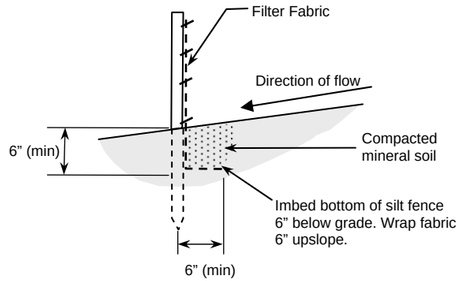
NOTES

- The subgrade for the road shall be scarified to a depth of 6 inches, moisture conditioned and compacted to a minimum of 90 percent relative compaction. The subgrade shall be compacted to a minimum of 12 inches beyond (laterally) the edge of the base rocked surface.
- Over-excavation may be required in limited areas to obtain the required compaction. In addition, the use of stabilization fabric (Mirafi 500X or equivalent) may be used to stabilize localized areas. The depth of over-excavation and placement of stabilization fabric should be reviewed by the geotechnical engineer during grading.
- Rock aggregate
  - o Aggregate baserock shall consist of approved Lime Treated Class II Aggregate Base. Rock obtained from Stevens Creek Quarry conforms to this recommendation
- New aggregate baserock shall be compacted to a minimum 4” thickness and to 95 percent relative compaction.
- Rock shall be placed at minimum 10’ width, typically 12’ and may be wider at turn outs and at turns.

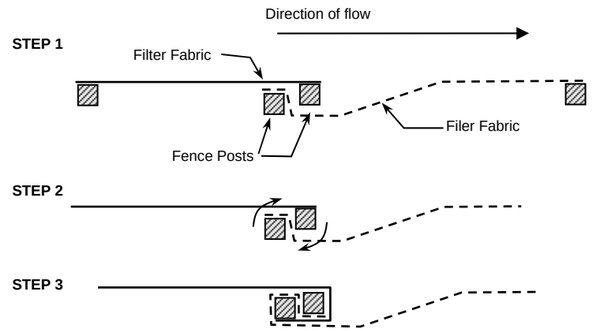
11 N8 SILT FENCE
NTS



ELEVATION VIEW



FABRIC ANCHOR DETAIL



ATTACHING TWO SILT FENCES SECTION TOGETHER

ATTACHMENT NOTES:

1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material overlap.
3. Drive both posts a minimum of 18” into the ground and bury the material flap a minimum of 6” deep.
4. Use approved filter fabric for silt fence.

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PROJECT

DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
San Mateo County, CA

SHEET TITLE

ROAD AGGREGATE SURFACING AND SILT FENCE SPECIFICATIONS

Date	Description
05/15/2015	

DRAWN
TCB

PROJECT
MIDPEN-DRISCOLL3-689

SHEET NUMBER

N8

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. SM10823
1 June 2015

JULIE ANDERSEN, PLANNER II
Natural Resources Dept.
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Subject: Geotechnical Investigation

Reference: Pond DR-10 Embankment Repair
Driscoll Ranch Road Erosion Prevention Project
La Honda Open Space Preserve
Midpeninsula Regional Open Space District
San Mateo County, California

Dear Ms. Andersen:

This report presents geotechnical design criteria for Pond DR-10 embankment repairs. Pond DR-10 is located at latitude 37.3529° and longitude -122.3051°. The pond is accessed by "jeep trails" off of Wool Ranch Road. Animal tracks caused depressions in the 10 foot wide pond embankment that eventually lead to the pond draining through the depressions instead of the spillway. When standing outside the pond, the existing embankment is approximately 8 feet tall. Inside the pond the embankment is approximately 4 feet tall. It is our understanding the proposed project will consist of rebuilding a 95 foot long section of the embankment and raising the height by one foot to allow more water holding capacity. New pond overflow components will replace the existing inadequate overflow system. The new 36 inch diameter overflow pipe will release water onto a rock lined energy dissipater.

Field Exploration

On 23 April 2015, we explored the embankment subsurface soil conditions with two (2) machine powered borings, both advanced to 26.5 feet below grade. The borings were advanced on the pond embankment top, on either side of the main embankment failure. The site plan (Sheet C19) in the Timothy C. Best and Associates plan set shows the specific boring locations. The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2488, Visual-Manual Proceeding).

The borings were advanced with 6-inch diameter continuous flight auger drilling equipment. Representative soil samples were obtained from the exploratory boring at selected depths, or at major strata changes. These samples were recovered using a 3.0

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inch O.D. Modified California Sampler (L), or by a Standard Terzaghi Sampler (T). Stratification lines shown on the log represent the approximate boundaries between soil types. The actual soil layer transitions may be gradual.

The penetration blow counts noted on the boring log was obtained by driving a sampler into the soil with a 140-pound hammer dropping through a 30-inch fall. The sampler was driven up to 18 inches into the soil and the number of blows counted for each 6-inch penetration interval. The numbers indicated on the log are the total number of blows that were recorded for the second and third 6-inch intervals, or the blows that were required to drive the penetration depth shown if high resistance was encountered. The soil boring logs are included in the Appendix of this report.

Laboratory Testing

Soil samples obtained from the boring at selected depths were taken to our laboratory for further examination and laboratory testing. The laboratory testing program was directed toward determining pertinent engineering properties of soil underlying the project site.

Moisture Content and Dry Unit Weight

Moisture content and dry unit weight tests were performed to evaluate soil overburden pressures and relative soil strength and compressibility. Moisture content was evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937.

Sieve Analysis

Sieve analysis was performed to evaluate the gradational characteristics of the material and to aid in soil classification. Tests were performed in general accordance with ASTM Test Method D 422 (Modified).

Direct Shear

Direct shear analysis was performed to determine the strength parameters of the underlying embankment fill materials. Samples from the embankment fill were compacted to 90 percent relative compaction and a saturated shear test was performed on the recompacted sample. Tests were performed in general accordance with ASTM Test Method D 3080.

Unconfined Compression Testing

Unconfined compression testing was performed to determine the unconfined compressive strength of the fine grained materials in the soil matrix under consolidated

and drained conditions. Tests were performed in general accordance with ASTM Test Method D 2116.

The results of the laboratory testing appear on the boring logs opposite the sample tested.

Subsurface Conditions

We encountered fill soil to depths of 6 to 11.5 feet respectively in Boring No.'s 4 and 5. The fill consisted of a loose to medium dense mixture of clay, sand and sandstone gravels. Groundwater was encountered in B-4 and equilibrated at 10.3 feet below grade after drilling. Groundwater was encountered in B-5 and equilibrated at 7.8 feet below grade after drilling. The fill appears to be mixed native material placed during embankment construction. Below the fill native sandy clay soil was encountered to a depths of 26 feet in B-4 and 24 feet in B-5. Below the native soil, very dense sandstone bedrock was encountered. It should be noted groundwater levels may fluctuate due to variations in pond level, rainfall or other factors not evident during our investigation. Contrasts in permeability between soil and bedrock strata could allow perched groundwater conditions to develop. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes to the conditions observed or inferred from our investigation.

Spoils from each of the borings were collected in separate buckets for bulk sample analysis. We compacted the spoils from B-4 to 90% relative compaction (per ASTM D1557) to determine optimum soil moisture and dry density at the designated percent compaction. Refer to compact test curve results in the attached appendix. Loose soil from each bulk sample was mixed with water to achieve the optimum water content and was then carefully compacted in direct shear mold ring until the weight of the ring and the soil matched the desired wet unit weight. The ring samples were then sheared per ASTM D3080. The B-4 bulk sample was classified as a black, brown sandy clay. This sample was saturated for 24 hours prior to shearing. Test results indicate the soil has cohesive strength of 222 psf and an internal friction angle of 19 degrees at 90% relative compaction under saturated conditions.

Unconfined compression test results ranged between 1,713 and 2,509 psf, indicating the soil has adequate strength to maintain the embankment shape over time if the fill is placed in accordance with the recommendations in this report.

Quantitative Slope Stability Analysis

Discussion and General Methodology

Slope failures or landslides can cause problems, including encroachment and undermining of engineered structures (pond embankments). Slope failures occur when stresses acting on the soil mass are greater than its internal strength (shear strength). A slope is considered stable when the strength of its soil mass is greater than the stress field acting within it. Some common variables influencing stress are gravity (steeper slopes), hydrostatic pressure (perched groundwater), bearing pressures (engineered structures), and seismic surcharge (earthquake shaking).

Various methods of analyzing stability of slopes yield a factor of safety (FS). A FS is determined by dividing the resisting forces within the slope soils by the driving forces within the slope (stress field). When a FS less than one is determined, a slope failure is likely. When a FS equal to one is determined, the slope is in a state of equilibrium. When a FS greater than one is determined, the slope is considered stable. Local jurisdictions require a seismic slope stability analysis to yield a FS equal to or greater than 1.2, and a static FS equal to or greater than 1.5.

The subsurface profile soil properties and strength parameters are generalized to develop the working model used in our analyses. Calculations are performed using the computer program GSTABL7 with STEDwin, developed by Garry H. Gregory, P.E. and Harald W. Van Aller, P.E. GSTABL7 is a computer program for analysis of slope stability problems by two dimensional limiting equilibrium methods. GSTABL7 program uses the Modified Bishop, Simplified Janbu or GLE Method of Slices to determine normal and resistive forces in each slice. The forces in each slice are then summed up to a total force acting on the mass.

A quantitative slope stability analysis was performed on Cross Section 1, prepared by Timothy C. Best and Associates (Sheet C20). The cross-section shows projected boundaries between geologic units found in the exploratory borings located in the field and proposed final gradients of the pond embankment. Strength of the fill soil was determined from the laboratory shear testing of fill soils compacted to 90 percent. A slope stability model was developed based on conservative parameters derived from the shear and unconfined compression testing described above.

Circular failure surfaces were evaluated using the Modified Bishop Method. At least hundreds of trial surfaces were evaluated between a wide range of possible toe and scarp locations along the section. The 10 slip surfaces yielding the lowest factors of

safety were evaluated for both seismic and static conditions and are presented in the Appendix to this report.

Soil Properties
In general the cross sections were modeled using two predominant soil types. Reduced strength values were assigned to the soil types on the basis of unconfined compression testing of in situ soil and direct shear testing of the recompacted fill sample using conservative engineering judgement in conjunction with the typical properties of compacted soils listed in Table 1 on page 39 of Navfac Design Manual 7.2. Saturated seepage zones were included in the model.

Seismic Coefficient
Horizontal forces generated by a design seismic event are typically modeled by applying a seismic coefficient value (K) to the analysis intended to represent earthquake induced ground motion. The following seismic accelerations were determined for the site:

PGA = 0.59g
K = 0.290

We used the same seismic accelerations presented in Bauldry Engineering's Jan. 2012 Geotechnical Investigation Report for the same property.

Groundwater
Soil moisture levels (pheratic surface) based on the pond water level alignment were incorporated into our analysis.

Slope Stability Results and Conclusions:
The results of our slope stability analysis with a 2:1 (H:V) reconstructed pond outboard embankment slope indicate seismic and static factors of safety equal to or greater than 1.4 and 2.5, respectively. Graphical presentations of our analysis are included in the Appendix of this report.

Based on the results of our analysis, the reconstructed outboard embankment gradients should be safe from landsliding as long as the recommendations of this report are adhered to in terms of relative compaction of redensified onsite material.

It must be cautioned that slope stability analysis is an inexact science. The mathematical models of the slopes, earth materials, pore pressures and seismic forces contain many simplifying assumptions, not the least of which are isotropy and

homogeneity. Slope stability analyses and the generated factors of safety should be used as indicating trendlines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

Deep Seated Landsliding

An analysis of deep seated landsliding was beyond our scope of work. As such, the hazard of deep seated landsliding is unknown. However, deep seated landsliding is known to occur within the region. Deep seated landsliding, if it does occur, has the potential to destabilize the proposed project. Our work was limited to analyzing the reconstructed embankment stability only.

Discussions, Conclusions and Recommendations

Based on the results of our investigation, the proposed pond embankment improvement project can be constructed, from a geotechnical standpoint, provided our recommendations are closely followed during the construction phases of the project.

The following recommendations should be used as guidelines for preparing project plans and specifications, and assume that **Haro, Kasunich & Associates** will be commissioned to review project grading and foundation plans before construction and to observe, test and advise during earthwork and foundation construction. This additional opportunity to examine the site will allow us to compare subsurface conditions exposed during construction with those inferred from this investigation. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

General

1) The geotechnical engineer should be notified at least four (4) working days prior to any site clearing or grading, so that the work in the field can be coordinated with the grading contractor and arrangements for testing and observation services can be made. The recommendations of this report are based on the assumption that the geotechnical engineer will perform the required testing and observation services during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2) Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.

3) Temporary cuts of 1:1 (H:V) are acceptable from a geotechnical standpoint as long as saturated soil conditions are not encountered. If saturated soils are exposed during any excavation the soil engineer or his representative should be notified immediately and scheduled for a site visit observation.

4) Final embankment slope gradients are not to be steeper the 2:1 (H:V).

5) Soil moistures to achieve 90% relative compaction in the onsite soil should range from approximately 13 to 20 percent. The results of the laboratory compaction tests are included in the Appendix of this report.

EARTHWORK AND GRADING

1. POND SLOPE GRADING

1. Plan Sheets C19 thru C21, pond site plan and cross sections, depicts the current surface of the pond and its embankment, as well as the proposed reconstruction scheme.

2. The proposed pond embankment shall be partially reconstructed and widened to a minimum width of 10 feet at the top. The side slopes of the pond embankment shall be graded to 2:1 (horizontal to vertical), as depicted on Plan Sheets C19 thru C21.

2. SITE PREPARATION

The initial preparation of the site will consist of the removal of any abandoned underground utilities, all subsurface obstructions, and root balls, as necessary. Surface vegetation and organically contaminated topsoil should be stripped from the areas to be graded. The required depth of stripping will vary with the time of year and must be based upon visual observations of the geotechnical engineer. The extent of sediment, vegetation and debris removal will be designated by the Engineering Geologist or the Geotechnical Engineer in the field.

All debris, grubbed material, sediment, and muck must be disposed of in an approved disposal area outside of the limits of the project site or below the pond and embankment.

All voids, including those created by removal of subsurface obstructions, utilities or root balls must be backfilled with properly compacted approved soils that are free of organic and other deleterious materials or with approved import fill.

No over-excavation of bedrock is permitted.

3. SUBGRADE PREPARATION

Following the site preparation, the area should be excavated to the design grades. The exposed soils in the grading and construction areas should then be scarified, moisture conditioned, and compacted as an engineered fill.

4. COMPACTION AND MINIMUM DENSITY REQUIREMENTS

Compaction should be performed in accordance with ASTM Test Procedure D1557. All overexcavated surfaces should be scarified (ripped) to depths of 6 to 8 inches, moisture conditioned by aeration if the soil is too wet, or by adding water if the soil is too dry, and properly compacted to at least 90 percent relative compaction. Within the construction areas, any fill or native soil not meeting compaction criteria should be over-excavated to its full depth, properly moisture conditioned, and placed back in thin lifts compacted to a minimum of 90 percent of the maximum dry density.

Compaction of the predominately clayey fill and native soils should be performed while the soil is at a moisture content that is close to 2 percent over optimum. All fill and backfill should be placed in uniform lifts not exceeding 8 inches in loose thickness.

Material used for earth berm construction shall be compacted to achieve minimum density requirements (by Sheepsfoot or other approved method) in layers that do not exceed 8 inches in thickness following compaction.

MINIMUM DENSITY REQUIREMENTS

Percent of Maximum Dry Density	Location
90%	Earth Embankment
85%	Miscellaneous Nonstructural Fill Material

The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be in accordance with ASTM Test #D2922.

5. MOISTURE CONDITIONING

Proper moisture conditioning of the soil used for construction of the earth berm is essential. The moisture conditioning procedure should result in a soil with a relatively uniform moisture content of between optimum and +3% percent over optimum at the time of compaction.

Soils used for the construction of the earth berm that are not relatively uniform or that have a moisture content lower than 1% below optimum at the time of compaction will need to be removed and replaced with soil that is uniformly moisture conditioned with an adequate moisture content.

The borrow site soil may require a diligent and active drying and/or mixing operation to reduce or raise the moisture content to the required specifications. The use of a commercial rototiller or disking may be needed to create an adequately compacted uniform soil.

If the in-situ water content of the soil at the borrow site is below optimum, it should be increased in the borrow area as far ahead of construction as feasible. It may be necessary to sprinkle or pond the borrow area well in advance of excavation to obtain a uniform and acceptable moisture content.

6. ENGINEERED FILL MATERIAL

All fill material used in the construction of the pond and earth berm shall be taken from approved borrow areas, designated borrow areas shall be determined by the Midpeninsula Regional Open Space District in conjunction with the project geotechnical engineer.

Engineered fill used for pond and earth berm construction shall conform to the following"

a. Uniform soil classifications: CH (Clay with high plasticity), CL (Clay with low plasticity) or SC (Clayey Sand).

b. A minimum of 60% passing the #200 sieve.

c. Free of organics, deleterious material and stones larger than 4 inches.

d. Thoroughly and uniformly mixed and adequately moisture conditioned.

Samples of all proposed import fill planned for use on this project should be submitted to the geotechnical engineer for appropriate testing and approval not less than 4 working days before the anticipated use and jobsite delivery.

7. CUT AND FILL SLOPE HEIGHT, GRADIENT AND CONSTRUCTION RECOMMENDATIONS

Permanent cut and fill slopes shall not exceed 2:1 (horizontal to vertical) gradient. All fill slopes should be constructed with engineered fill meeting the minimum density and

moisture content requirements of this report. The above recommended gradients do not preclude periodic maintenance of the slopes, as minor sloughing and erosion may take place.

New fill slopes shall be constructed by overbuilding and compacting 2 feet beyond the design face. The outer 2 feet should be removed following compaction.

8. FILL SLOPE KEYWAYS

Fill slopes should be keyed into the native slopes with a 10 foot wide base keyway that is sloped negatively at least 2% into the bank. The depth of the keyways will vary, depending on the materials encountered. It is anticipated that the depth of the keyways may be 3 to 5 feet, but at all locations shall be at least 2 feet into firm material. Subsequent keys may be required as the fill section progress upslope. The Geotechnical Engineer will designate keys in the field. See the keyway detail on the plans for general details.

9. SUBSURFACE DRAINAGE

Our recommended cut and fill slope gradients assume that the soil moisture is a result of precipitation penetrating the slope face, and not a result of subsurface seeps or springs, which can destabilize slopes with hydrostatic pressure. All groundwater seeps encountered during construction should be drained as necessary to maintain stable slopes at the recommended gradients. Drainage facilities may include subdrains, gravel blankets, rock-filled surface trenches or horizontally drains. The geotechnical engineer will determine the drainage facilities required during the grading operations.

As shown on the plans, a toe drain along the base of the pond berm repair area will be necessary. Rocks or cobbles larger than 3 inches in maximum dimension should not be allowed to remain in the soils forming the outlet pipe trench, unless they can be crushed in-place by the construction equipment.

Should you have any questions concerning this report, please call our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

John E. Kasunich
G.E. 455

JEK/sr
Attachments
Copies: 1 to Addressee, via email
1 to Tim Best CEG, via email
1 to File

Project No. SM10823
1 June 2015

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property 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 our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

Project No. SM10823
1 June 2015

APPENDIX A

Pond DR10 Site Map, Figure 1

Pond DR10 Sections 1 and 2, Figure 2

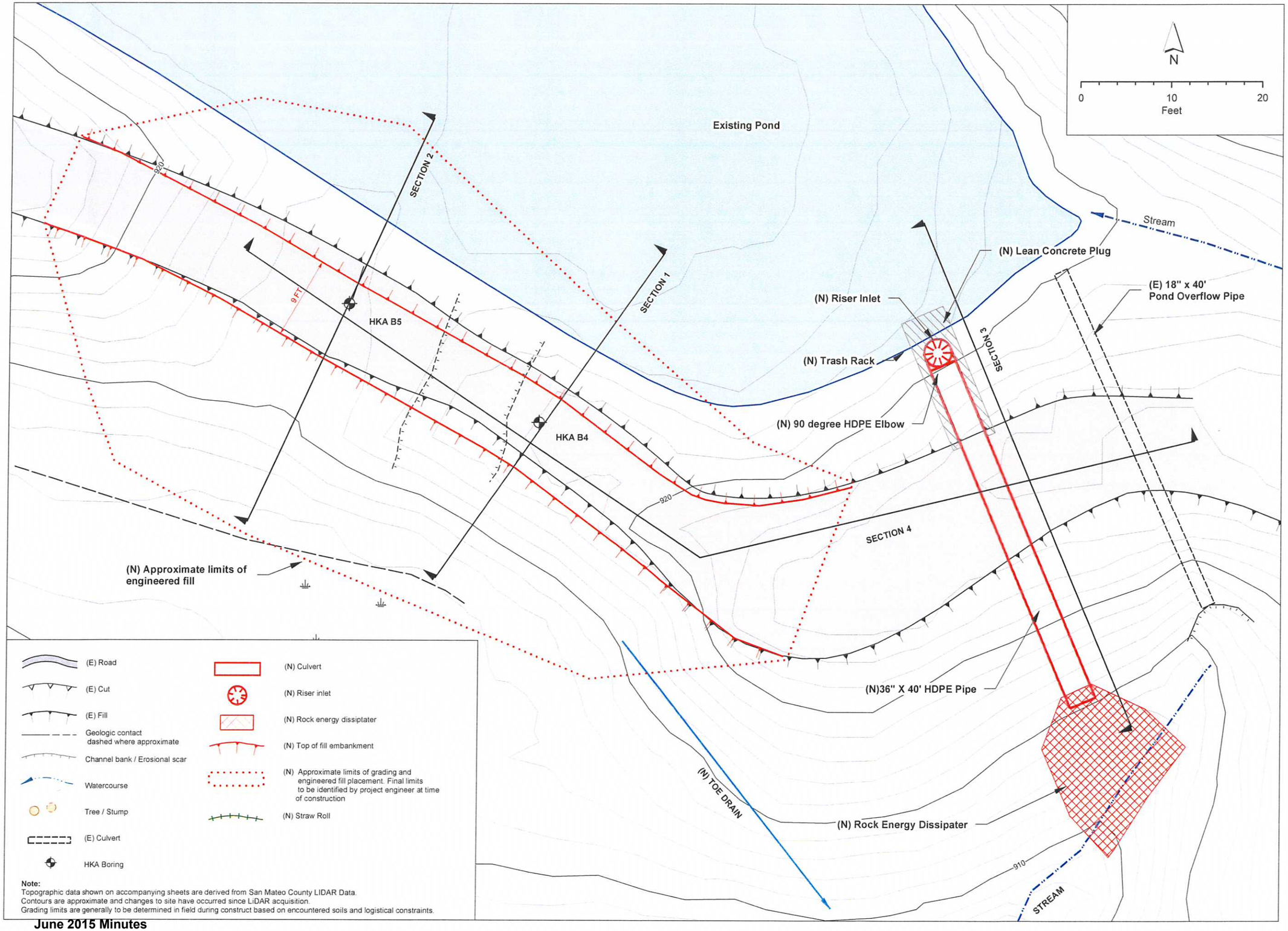
Pond DR10 Sections 3 and 4, Figure 3

Key to Logs, Figure 4

Logs of Test Borings, Figure 5 - 6

Laboratory Results, Figures 7 - 8

Slope Stability Results, Figures 9 - 12



Note:
Topographic data shown on accompanying sheets are derived from San Mateo County LIDAR Data.
Contours are approximate and changes to site have occurred since LiDAR acquisition.
Grading limits are generally to be determined in field during construct based on encountered soils and logistical constraints.

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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
POND DR10 SITE MAP

DRAFT
65% COMPLETE
NOT FOR CONSTRUCTION

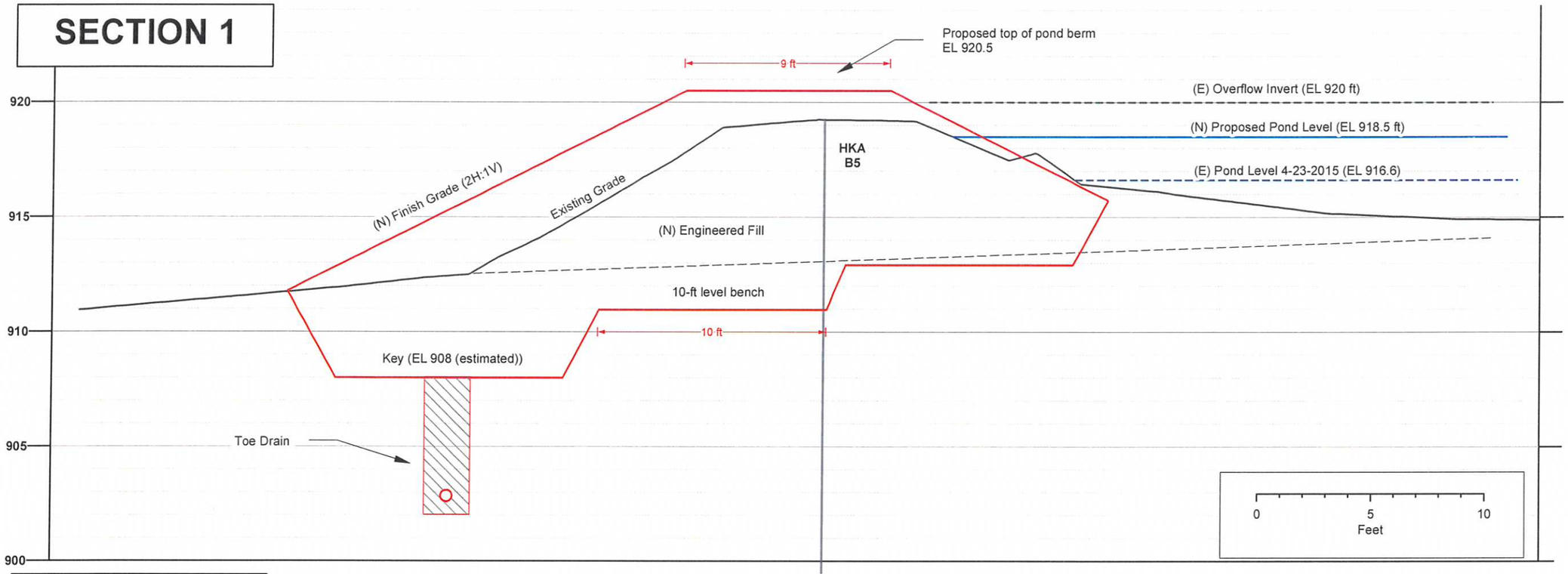
Date	Description
05/15/2015	

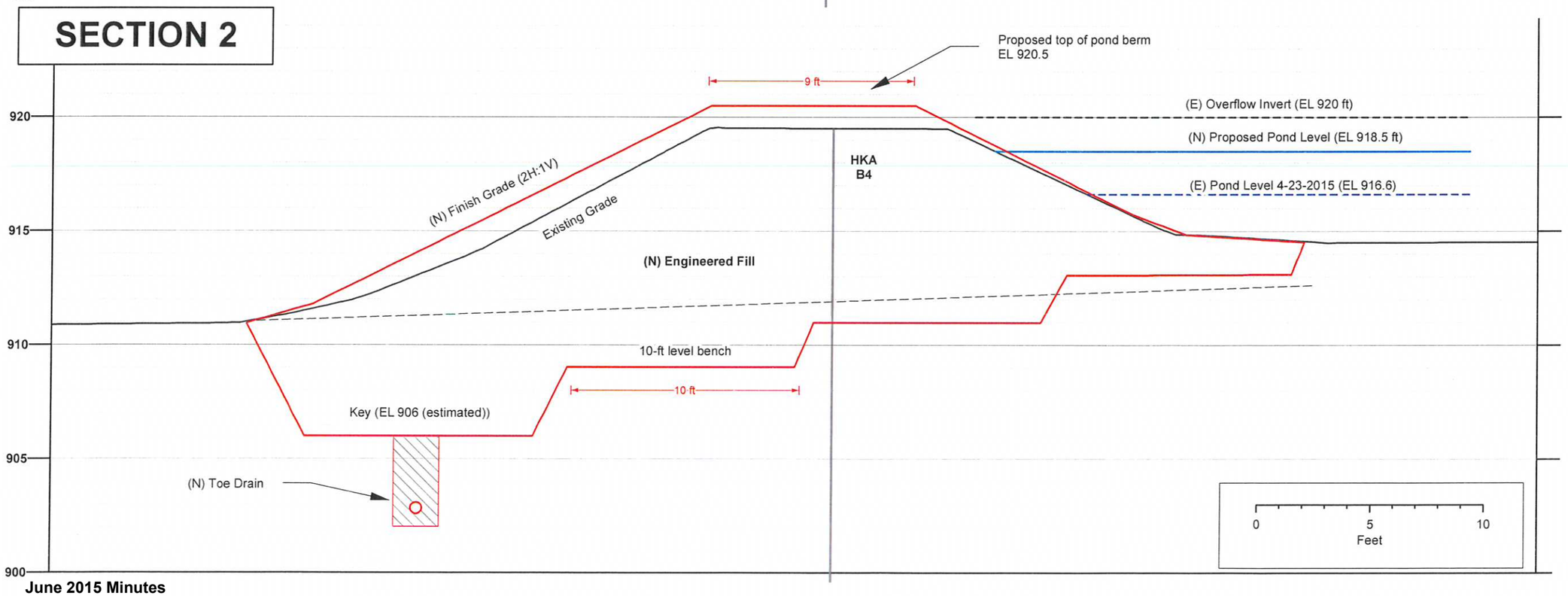
DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C19

Figure No. 1





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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
POND DR10 SECTIONS 1 AND 2

DRAFT
65% COMPLETE
NOT FOR CONSTRUCTION

Date	Description
05/15/2015	

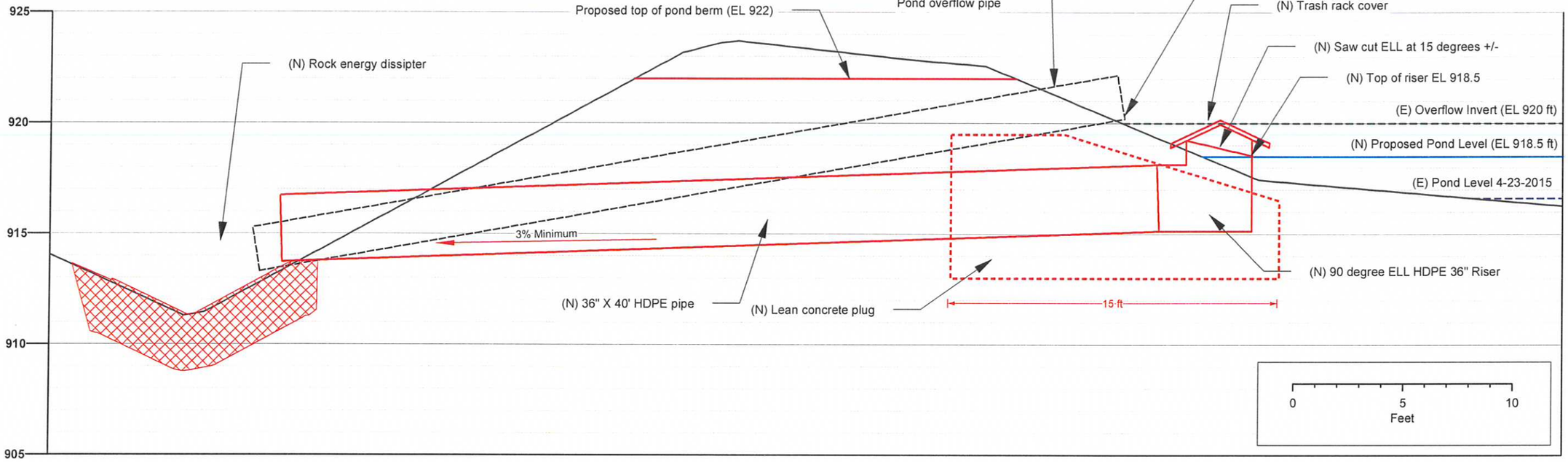
DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

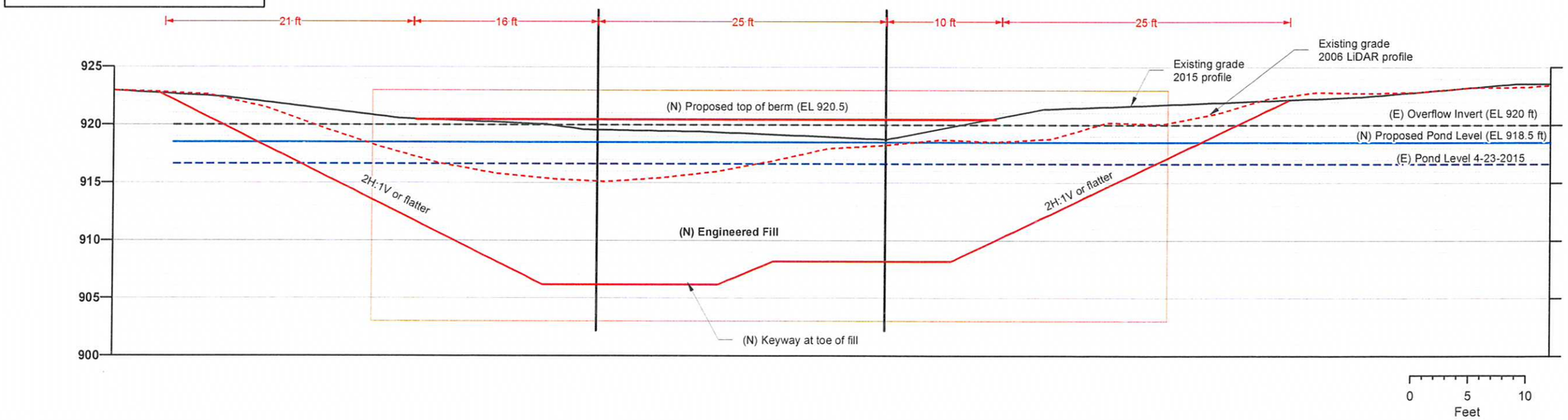
SHEET NUMBER
C20

Figure No. 2

SECTION 3



SECTION 4



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PROJECT
DRISCOLL RANCH ROAD EROSION PREVENTION PROJECT

LA HONDA OPEN SPACE PRESERVE

Midpeninsula Regional Open Space District
County of San Mateo, CA

SHEET TITLE
POND DR10 SECTIONS 3 AND 4

DRAFT
65% COMPLETE
NOT FOR CONSTRUCTION

Date	Description
05/15/2015	

DRAWN
TCB

PROJECT
MPEN-DRISCOLL3-689

SHEET NUMBER
C21

Figure No. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE: 200 | 40 | 10 | 4 — CLEAR SQUARE SIEVE OPENINGS: 3/4" | 3" | 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY		CONSISTENCY		
SANDS AND GRAVELS	BLOWS PER FOOT*	SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*
VERY LOOSE	0 - 4	VERY SOFT	0 - ¼	0 - 2
LOOSE	4 - 10	SOFT	¼ - ½	2 - 4
MEDIUM DENSE	10 - 30	FIRM	½ - 1	4 - 8
DENSE	30 - 50	STIFF	1 - 2	8 - 16
VERY DENSE	OVER 50	VERY STIFF	2 - 4	16 - 32
		HARD	OVER 4	OVER 32

SAMPLING METHOD		
STANDARD PENETRATION TEST	T	
MODIFIED CALIFORNIA	L or M	
PITCHER BARREL	P	
SHELBY TUBE	S	
BULK	B	

H_2O	
Final	▽
Initial	▼
Water level designation	

*Number of blows of 140 lb hammer falling 30 inches to drive a 2" O.D. (1⅜" I.D.) split spoon sampler (ASTM D-1586).

**Unconfined compressive strength in tons/ft² as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

KEY TO BORING LOGS

SCALE:	
DRAWN BY:	JD
DATE:	June 2015
REVISED:	
JOB NO.	SM10823

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FIGURE NO. 4

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

Driscoll Ranch Pond 10

PROJECT NO. SM10823

LOGGED BY MF | DATE DRILLED April 23, 2015 | BORING DIAMETER 6" | BORING NO. B-4

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Damp dark brown Silty CLAY with some Sand	CL					
	4-1 (L)				7		92.9	26.7	% Passing #200 Sieve = 64.1%
5	4-2 (L)				8		87.5		Unconfined Compression = 1,713 psf
			Fill	CL					
			Darker Native						
10			Water rose to 10.3 feet depth after drilling		9				
	4-3 (L)		Mottled damp dark brown, grey, orange Silty CLAY	CL					
15	4-4 (L)		Medium brown CLAY		9		88.3	34.1	
	4-5 (L)		Olive grey blue Clayey SAND	SC	8		77.9	42.0	
20			Water @ 19 - Seep						
	4-6 (T)		Baggie, blue, grey, fine Sandy CLAY		8			36.2	
25	4-7 (L)				43		84.6	40.6	
			Bedrock	SC					
			Boring terminated at 26.5 feet						
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SM10823 Driscoll Ranch Pond.log Date: 6/1/2015

HARO, KASUNICH AND ASSOCIATES, INC.

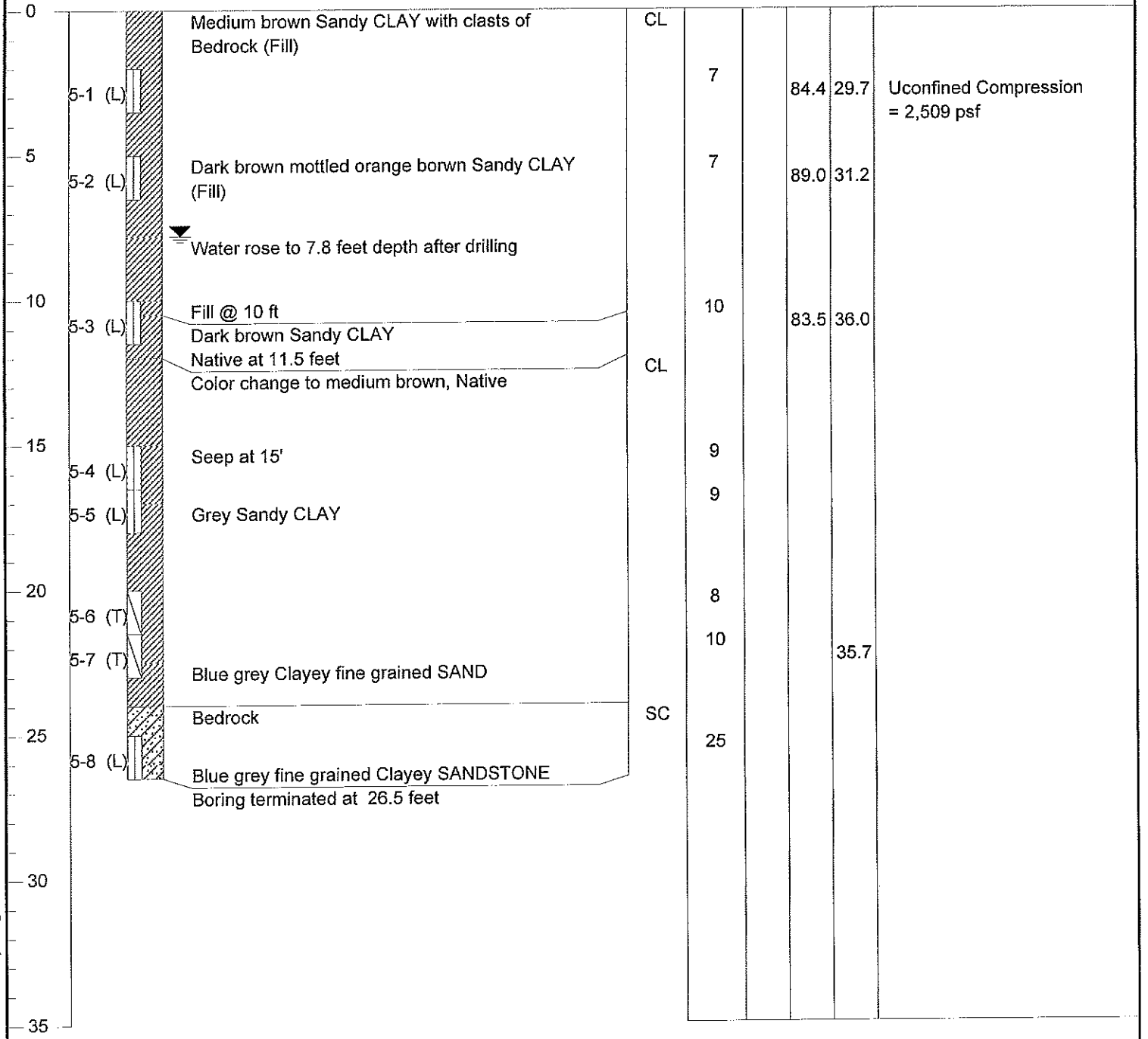
BY: dk | FIGURE NO. 5

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

Driscoll Ranch Pond 10

PROJECT NO. SM10823

LOGGED BY MF | DATE DRILLED April 23, 2015 | BORING DIAMETER 6" | BORING NO. B-5



HARO, KASUNICH AND ASSOCIATES, INC.

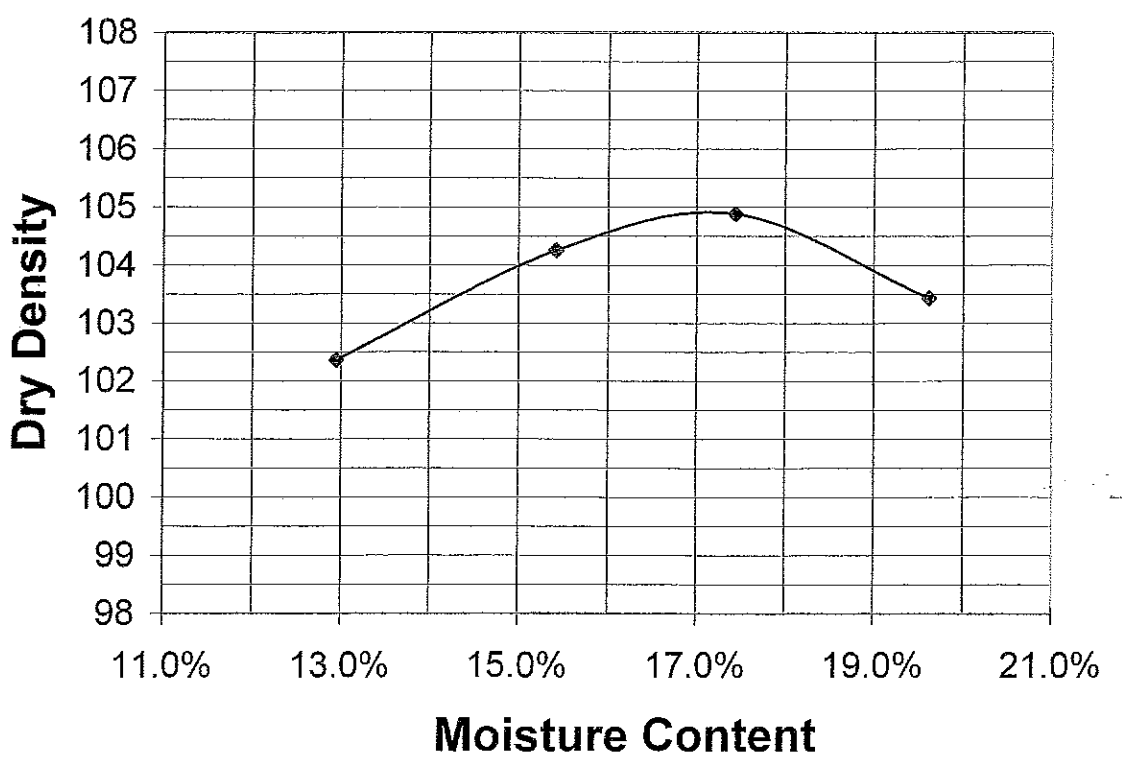
BY: dk | FIGURE NO. 6

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SM10823 Driscoll Ranch Pond.log Date: 6/1/2015

Compaction Test

Project:	Driscoll	**Project #**	SM 10823
Descriptn:	Black Brown Sandy Clay	**Date:**	May 14, 2015
B-4, Pond, Top 10' mixed		**Tested By:**	MA
Type:	4" mold **Curve:** 4	**Sample Wt.**	2200 gr.

Moisture		+6	+8	+10	+12		
Wt. Mold+Comp. Soil		3857.8	3929.2	3972.2	3980.6		
Wt. of Mold	2106.0	2106.0	2106.0	2106.0	2106.0		
Vol. Factor:	0.066	0.066	0.066	0.066	0.066		
Tare No.:		176	5	105	11		
Wet Wt.+Tare:		1008.2	1182.7	985.2	1137.8		
Dry Wt.+Tare:		900.8	1039.4	850.4	969.3		
Wt. Comp. Soil		1751.8	1823.2	1866.2	1874.6		
Tare Wt.		71.4	110.1	77.3	110.4		
Net Dry Wt.		829.4	929.3	773.1	858.9		
Wt. of Water		107.4	143.3	134.8	168.5		
Wet Density		115.6	120.3	123.2	123.7		
Water Content		0.129	0.154	0.174	0.196		
Water Content %		12.9%	15.4%	17.4%	19.6%		
Dry Density		102.4	104.3	104.9	103.4		



Laboratory
Max D.D.
104.9
Opt Moist.
17.4%

Corrected
Max D.D.
105.0
Opt Moist.
17.0%

Engineer
JK

Tech

Figure No. 9

Direct Shear

Project:	Driscoll Pond
Sample #	B-4
Description	Black Brown Sandy Clay

Date	5/18/2015
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	12.2	22	30.6	
Shear Stress (PSF)	358.6	646.6	898.6	

Equation of Trendline	
Intercept	Slope
222.26	0.3446

C (PSF)	PHI
222	19

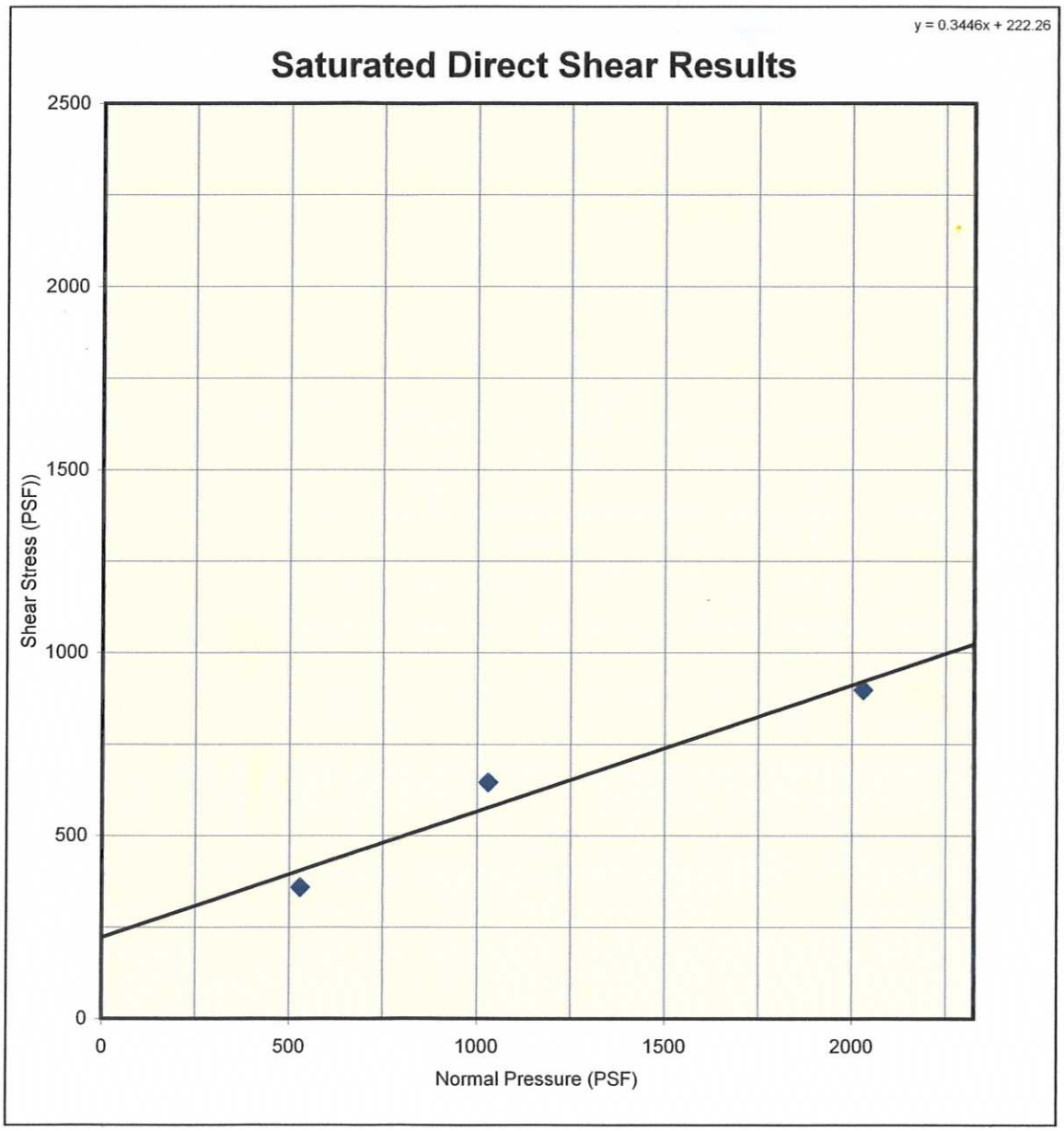


Figure No. 8

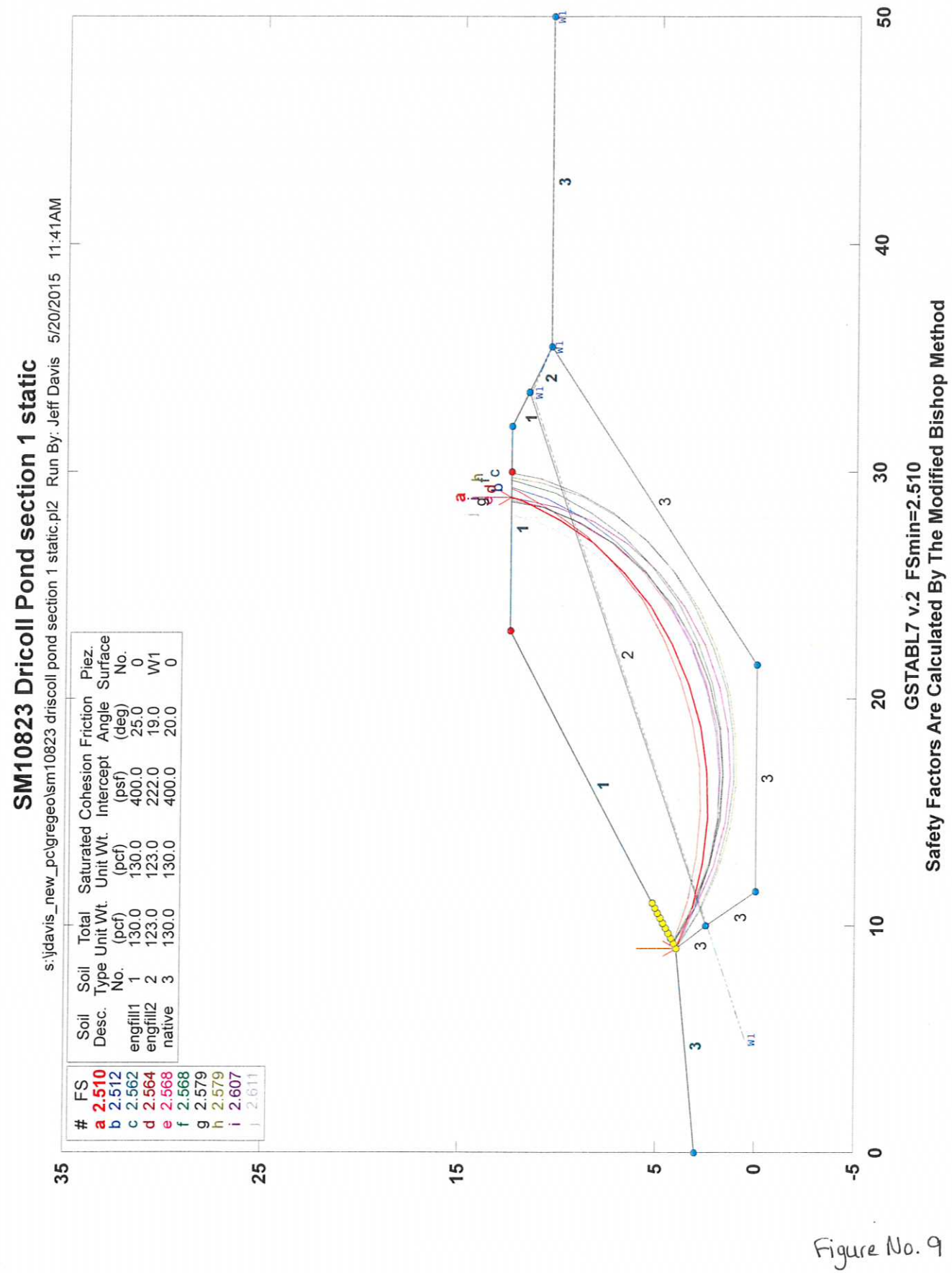

SM10823 Dricoll Pond section 1 static
s:\jdavis_new_pc\gregeo\sm10823 driscoll pond section 1 static.pl2 Run By: Jeff Davis 5/20/2015 11:41AM
FS
a 2.510
b 2.512
c 2.562
d 2.564
e 2.568
f 2.568
g 2.579
h 2.579
i 2.607
j 2.611
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
engfill1 | 1 | 130.0 | 130.0 | 400.0 | 25.0 | 0
engfill2 | 2 | 123.0 | 123.0 | 222.0 | 19.0 | W1
native | 3 | 130.0 | 130.0 | 400.0 | 20.0 | 0
GSTABL7 v.2 FSmin=2.510
Safety Factors Are Calculated By The Modified Bishop Method

Figure No. 9

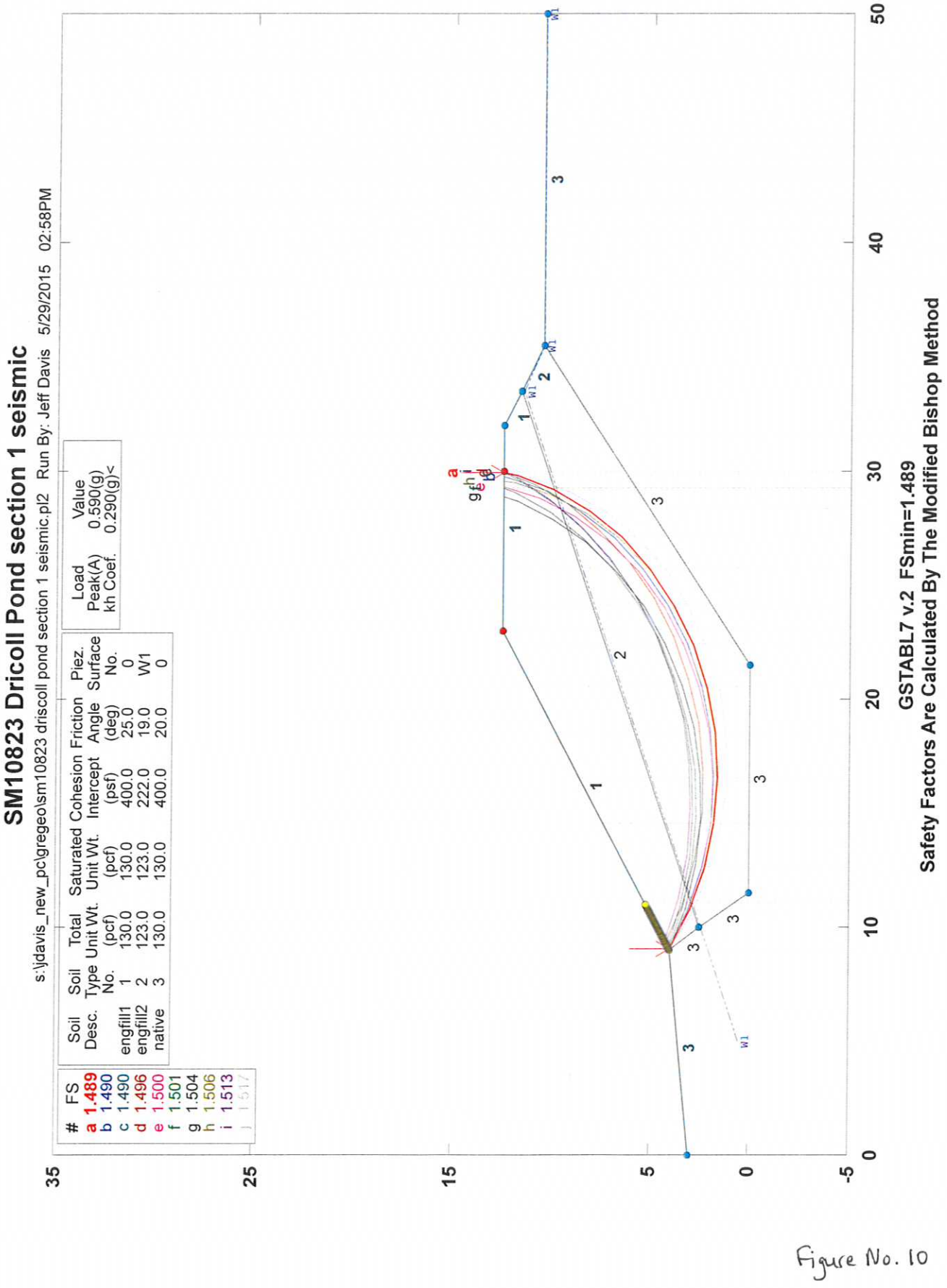

SM10823 Dricoll Pond section 1 seismic
s:\jdavis_new_pc\gregeo\sm10823 driscoll pond section 1 seismic.pl2 Run By: Jeff Davis 5/29/2015 02:58PM
FS
a 1.489
b 1.490
c 1.490
d 1.496
e 1.500
f 1.501
g 1.504
h 1.506
i 1.513
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
engfill1 | 1 | 130.0 | 130.0 | 400.0 | 25.0 | 0
engfill2 | 2 | 123.0 | 123.0 | 222.0 | 19.0 | W1
native | 3 | 130.0 | 130.0 | 400.0 | 20.0 | 0
Load
Peak(A) Value 0.590(g)
kh Coef. 0.290(g)<
GSTABL7 v.2 FSmin=1.489
Safety Factors Are Calculated By The Modified Bishop Method

Figure No. 10

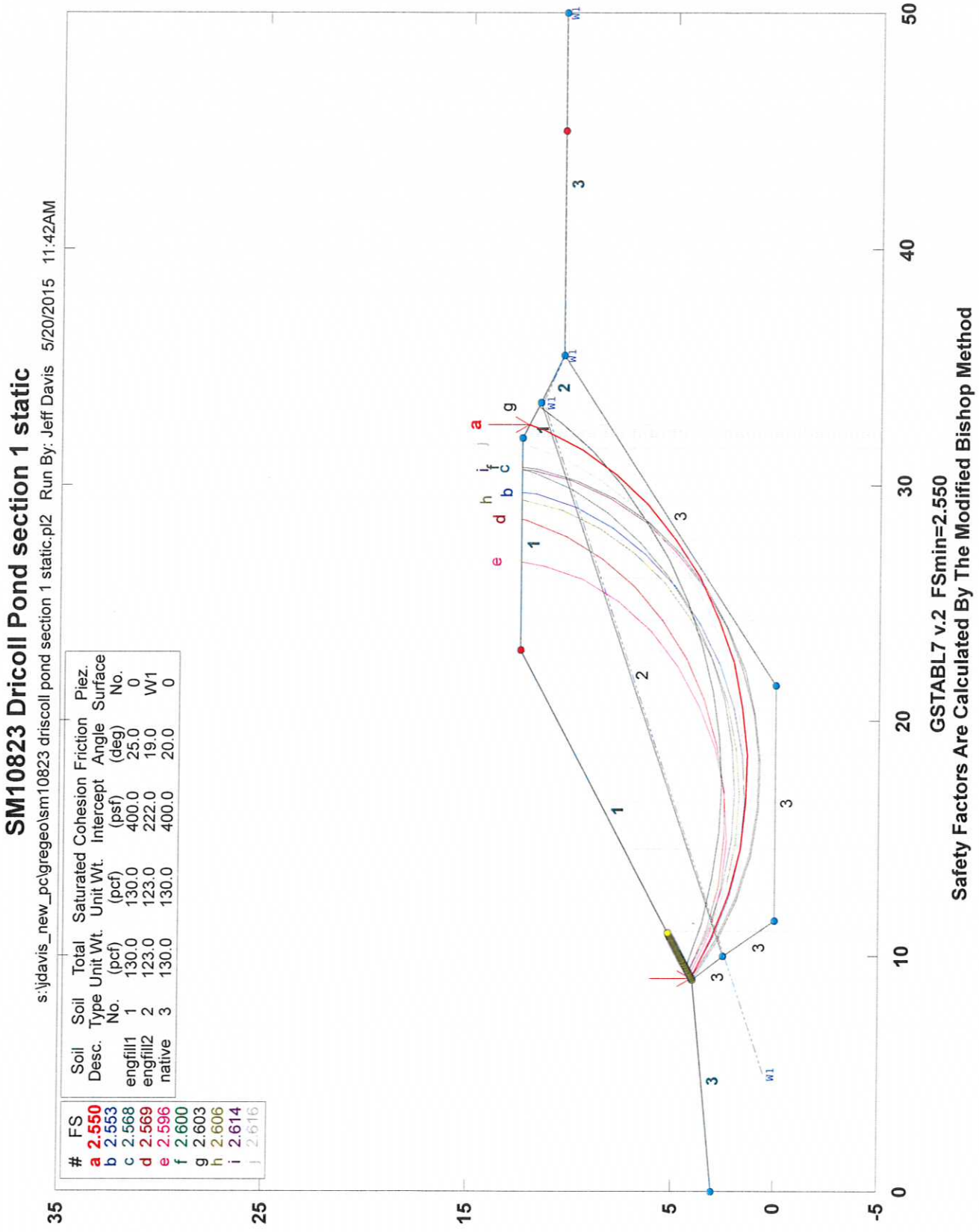

SM10823 Dricoll Pond section 1 static
s:\jdavis_new_pc\gregeo\sm10823 driscoll pond section 1 static.pl2 Run By: Jeff Davis 5/20/2015 11:42AM
FS
a 2.550
b 2.553
c 2.568
d 2.569
e 2.596
f 2.600
g 2.603
h 2.606
i 2.614
j 2.616
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
engfill1 | 1 | 130.0 | 130.0 | 400.0 | 25.0 | 0
engfill2 | 2 | 123.0 | 123.0 | 222.0 | 19.0 | W1
native | 3 | 130.0 | 130.0 | 400.0 | 20.0 | 0
GSTABL7 v.2 FSmin=2.550
Safety Factors Are Calculated By The Modified Bishop Method

Figure No. 11

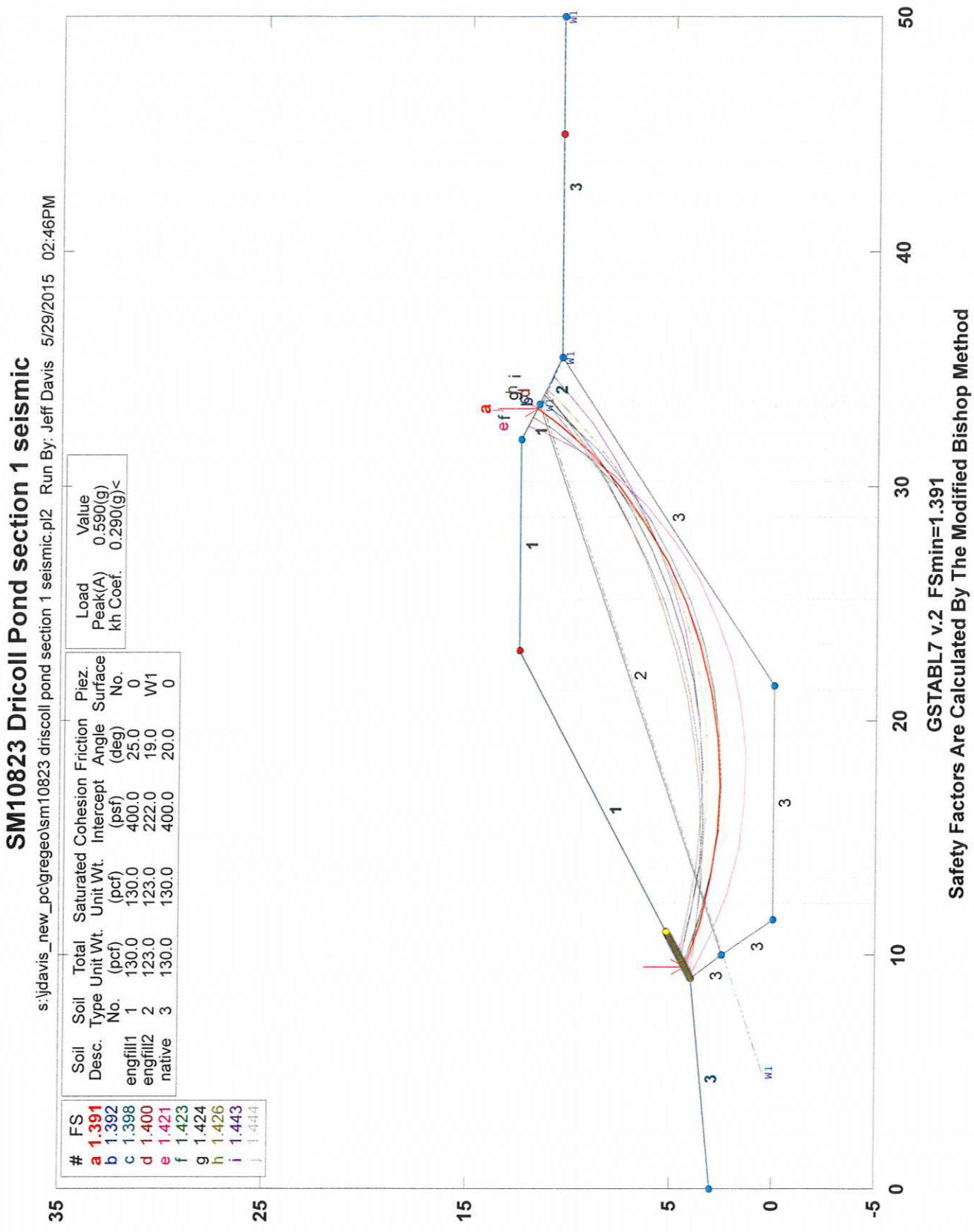

SM10823 Dricoll Pond section 1 seismic
s:\jdavis_new_pc\grege\sm10823 driscoll pond section 1 seismic.pl2 Run By: Jeff Davis 5/29/2015 02:46PM
FS
a 1.391
b 1.392
c 1.398
d 1.400
e 1.421
f 1.423
g 1.424
h 1.426
i 1.443
j 1.444
Soil Desc. | Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Piez. Surface No.
engfill1 | 1 | 130.0 | 130.0 | 400.0 | 25.0 | 0
engfill2 | 2 | 123.0 | 123.0 | 222.0 | 19.0 | W1
native | 3 | 130.0 | 130.0 | 400.0 | 20.0 | 0
Load
Peak(A) 0.590(g)
kh Coef. 0.290(g)<
GSTABL7 v.2 FSmin=1.391
Safety Factors Are Calculated By The Modified Bishop Method

Figure No. 12

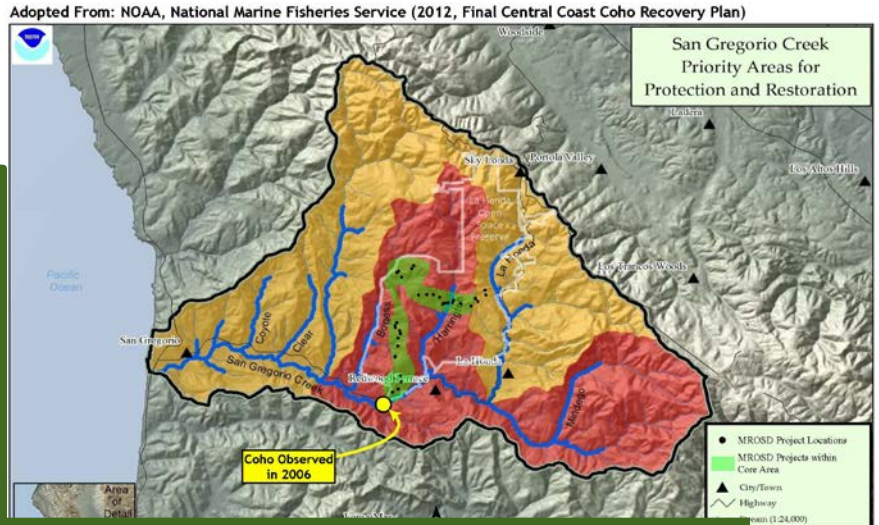
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

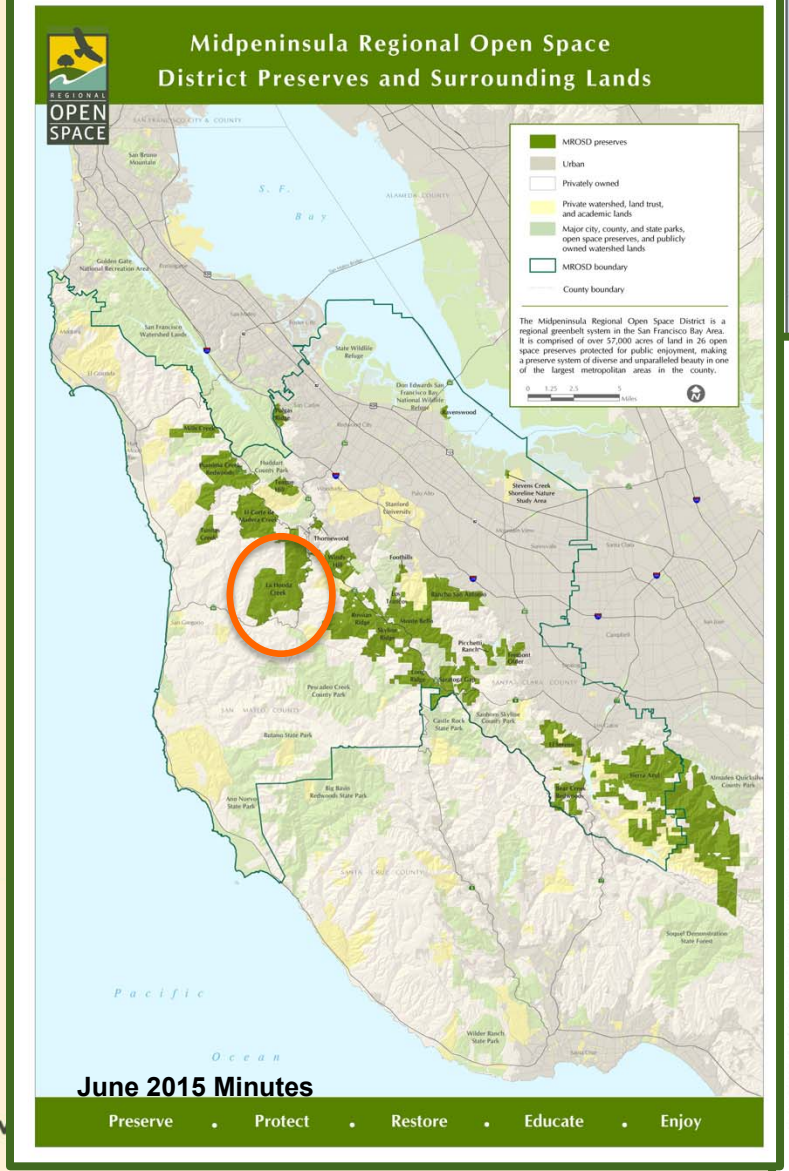
The Project: Driscoll Ranch Roads Sediment Reduction and Pond Restoration Project

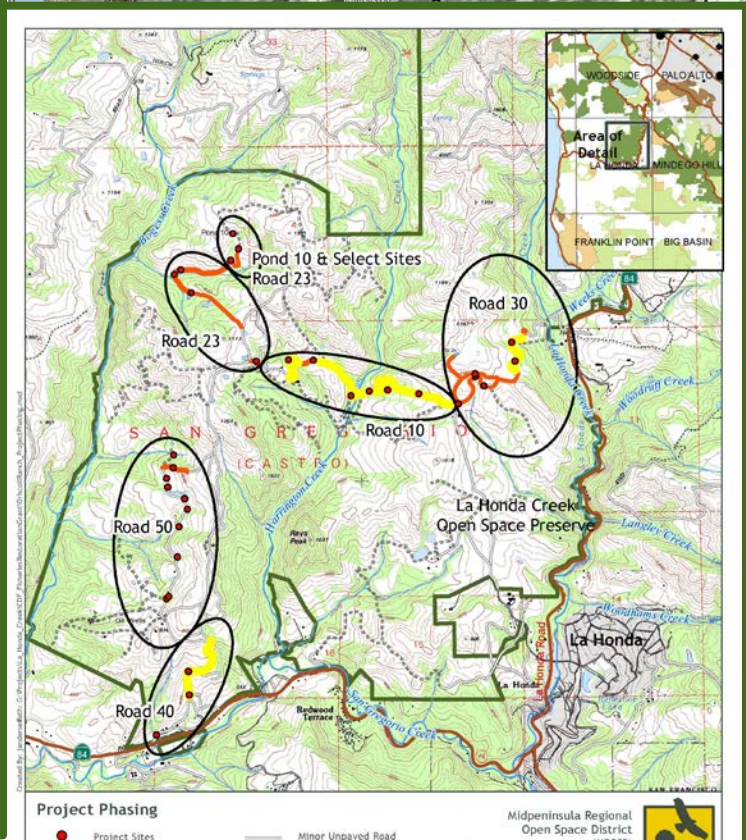
- In 2013, the Midpeninsula Regional Open Space District, partnered with the San Mateo County RCD and applied for and was granted $230,970 in funding to complete this project through the California Department of Fish and Wildlife, Fisheries Restoration Grant Program.

Project Location

ATTACHMENT A







Project Goals

- Partner with the RCD under the Rural Roads Program
- Prevent 3,435 cubic yards of sediment flowing downstream
- Benefit fish species:
  - Coho
  - Steelhead
- Habitat enhancement for California red-legged frog
- Improve infrastructure for grazing and other tenants
- Improve deteriorating ranch roads to all weather access
- Reduce potential for sediment and pathogens in San Gregorio Creek

Project Components

- Culverted stream crossing removals and 1 mile of road abandonment
- Upgrade of existing culverts and add new ditch relief culverts, reverse grade dips, and reshaping of 3.68 miles of road to facilitate drainage
- Rocking 10,000 linear of road for all weather access
- Replace deteriorating waterline embedded in the roadway
- Restore one pond and berm that provide access to some of the grant funded sites
- Will be implemented from July to October 2015

Previous Experience and Success

- In 2011, the District completed a similar road abandonment project using CDFW FRGP monies in the Skyline Ridge Open Space Preserve.

- The District routinely maintains roads and trails using similar standards which have proven effective over time.

Previous Experience and Success

- From 2009 to 2014 the District has completed four similar pond and berm repair projects within the La Honda Creek Open Space Preserve.

Questions?


San Mateo County
Resource
Conservation
District


MIDPENINSULA
REGIONAL
OPEN
SPACE


CALIFORNIA
DEPARTMENT OF
FISH &
WILDLIFE

Peninsula Open Space Trust

June 16, 2015

San Mateo County Resource Conservation District
Attn. Irina Kogan
625 Miramontes Street, Suite 103
Half Moon Bay, CA 94019

Subject: Grading Permit Exemption Application for Driscoll Apple Orchard Site 3 Culvert Replacement, La Honda, CA.

Dear Ms. Kogan,

Peninsula Open Space Trust ("POST") is pleased to submit this proposal packet in request for a grading permit exemption for an emergency culvert replacement on a ranch road on POST's Driscoll Apple Orchard property ("Property").

The Property is currently owned by POST and subject to a License and Management Agreement with the Midpeninsula Regional Open Space District ("MROSD").

Project partners POST, MROSD, and the San Mateo County Resource Conservation District ("RCD") commissioned a roads assessment for the Property in order to inform management decisions around shared priorities.

Project Description

The highest-priority project recommended through the roads assessment was the replacement of a highly degraded culvert.

The existing 24" x 60+' culvert is rusted out and failing corrugated metal pipe with thick unstable fill located at an ephemeral watercourse crossing. A 3 foot high concrete headwall is found at the inlet. The pipe appears very old with the bottom of the culvert completely rusted out.

The outer fill embankment to the crossing has failed resulting in a 25+ foot high near vertical and actively eroding escarpment. The residual crossing volume is calculated at over 1,200 cy with fill greater than 25 feet deep. Continued erosion with collapse of the remaining portion of the crossing is expected. Under existing conditions the roadway is unstable and may be at risk for failure under the weight of a vehicle.

222 High Street
Palo Alto, California 94301
www.openspacetrust.org
Tel: (650) 854-7696
Fax: (650) 854-7703

The culvert drains an 18 acre forest and grassland watershed. The stream is well incised with steep channel banks. The active channel is about 3 feet wide, sand bedded with a 10% average channel grade.

The failing culvert will be replaced by a 36" x 80' pipe, sized for 100 year flow by a Certified Engineering Geologist (CEG). New culvert will be properly installed at native stream grade, with a rock armored headwall and rocked energy dissipater at the outlet, as shown on the grading plan. The road crossing embankment will be reconstructed with engineered fill. All culvert and earthwork will be completed under the direction of the project Certified Engineering Geologist (CEG) and geotechnical engineer.

Construction work for the project will be accomplished using a medium-sized excavator and bulldozer.

Conservation Benefits

This project will implement the highest-priority recommendation for the property, which will reduce sediment input into the San Gregorio Creek Watershed and maintain necessary access to historic/current grazing land.

Project Location

The project is located on San Mateo County Assessor's Parcel 083-361-100. The approximate street address is 1003 Sears Ranch Rd, La Honda. Please refer to the attached maps of the property location and project site.

To access the project site from California State Route 35/Skyline Blvd, take California State Route 84/La Honda Rd west approximately 6.2 miles until reaching Sears Ranch Rd. Turn north/right on Sears Ranch Road and continue approximately 0.3 miles until reaching the property entrance gate, which is located on the west/left side of the road.

Project Implementation Schedule

The project implementation process will consist of geotechnical assessment, which is currently scheduled for June/July 2015, and implementation, which is currently scheduled for August 2015.

If you have any questions, please feel free to contact me at (650) 854-7696 ext. 320 or nsharma@openspacetrust.org.

Sincerely,

Neal Sharma, Assistant Project Manager

Enclosures

GRADING EXEMPTION CERTIFICATE APPLICATION and FEE SCHEDULE

Yards of Dirt to be moved:	Fee
1 UP TO 100 CUBIC YARDS	$ 500.00
101 UP TO 1,000 CUBIC YARDS	$ 750.00
1,001 UP TO 5,000 CUBIC YARDS	$1000.00
5001 UP TO 10,000 CUBIC YARDS	$1250.00
10,001 CUBIC YARDS & ABOVE	$1500.00

(RCD/NRCS assistance for programs over 10,000 CY will be determined on a case by case basis).

RCD Grading Exemption Certificate Application Information

Date: June 10, 2015

Cubic Yards of Dirt to be Moved: 1,200 cubic yards

Name: Peninsula Open Space Trust

A.P.N.: 083-361-100

Mailing Address:

222 High St., Palo Alto, CA 94301

Attn. Neal Sharma

Site Location/Address:

La Honda, CA 94020

Conservation Purpose: Reduction of sediment input into San Gregorio Creek Watershed, maintains access to historic/current grazing land

RCD Approval: _____ **Date:** _____

Fees Paid in Full: _____ **Check #:** _____ **$** _____

Date Certificate Submitted to San Mateo County: _____ **County GRX#** _____

Additional Information Submitted: _____

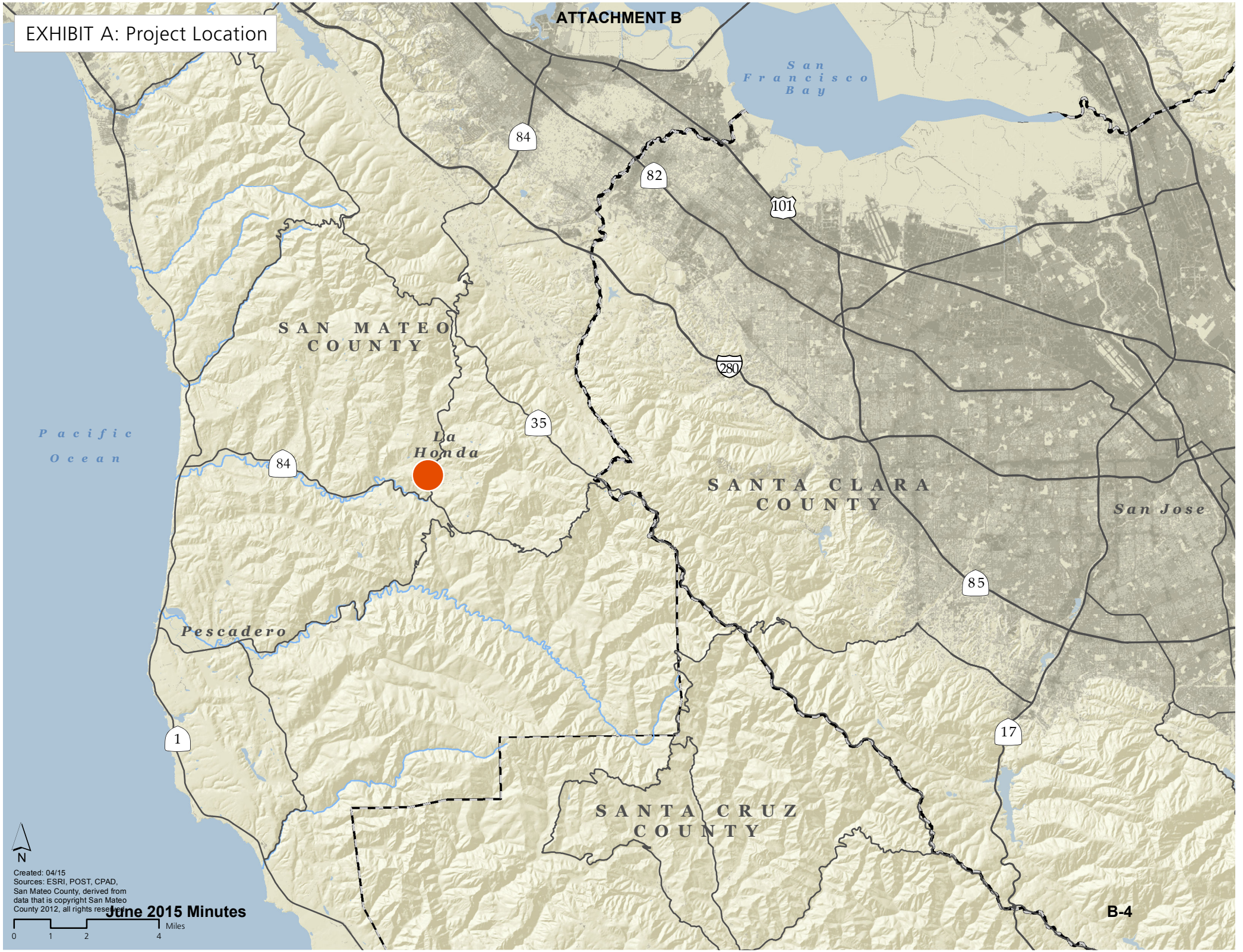
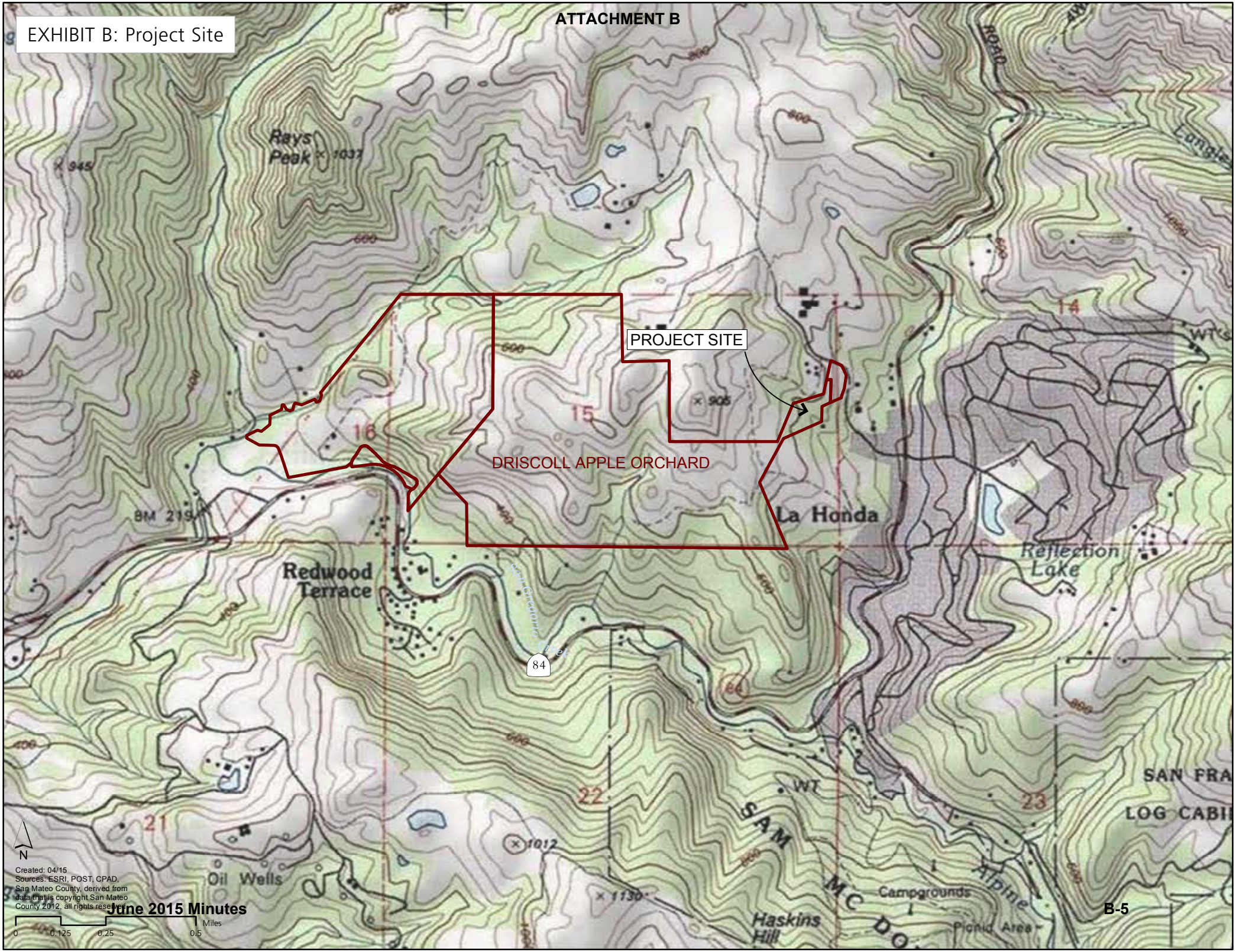


EXHIBIT A: Project Location
San Francisco Bay
84
82
101
SAN MATEO COUNTY
280
Pacific Ocean
35
La Honda
84
SANTA CLARA COUNTY
San Jose
85
Pescadero
1
17
SANTA CRUZ COUNTY
N
Created: 04/15
Sources: ESRI, POST, CPAD, San Mateo County, derived from data that is copyright San Mateo County 2012, all rights reserved
0 1 2 4
Miles

EXHIBIT B: Project Site



SITE	3
ROAD	1000
STATION	700
FEATURE	24" culvert
Sediment Delivery	1,200 cy
Condition	P
Treatment Priority	H
Cost	$31,000+

DESCRIPTION

24" x 60+' rusted out and failing CMP with thick unstable fill located at an ephemeral watercourse crossing. A 3 foot high concrete headwall is found at the inlet. The pipe appears very old with the bottom of the culvert completely rusted out.

The outer fill embankment to the crossing has failed resulting in a 25+ foot high near vertical and actively eroding escarpment. The residual crossing volume is calculated at over 1,200 cy with fill greater than 25 feet deep. Continued erosion with collapse of the remaining portion of the crossing is expected. Under existing conditions the roadway is unstable and may be at risk for failure under the weight of a vehicle.

The culvert drains an 18 acre forest and grassland watershed. The stream is well incised with steep channel banks. The active channel is about 3 feet wide, sand bedded with a 10% average channel grade.

The native soils consist of loose to medium dense silty sand derived from the underlying bedrock of the Tahana Member of the Purisma Formation. Mudstone and shale bedrock are exposed in the eroded channel bank on the downstream side of the crossing.

The right bank approach to the stream crossing is steep and poorly drained. Concentrated road runoff has resulted in a 70 foot long 4 foot deep gully where flow drains into the crossing along an old abandoned tractor trail.

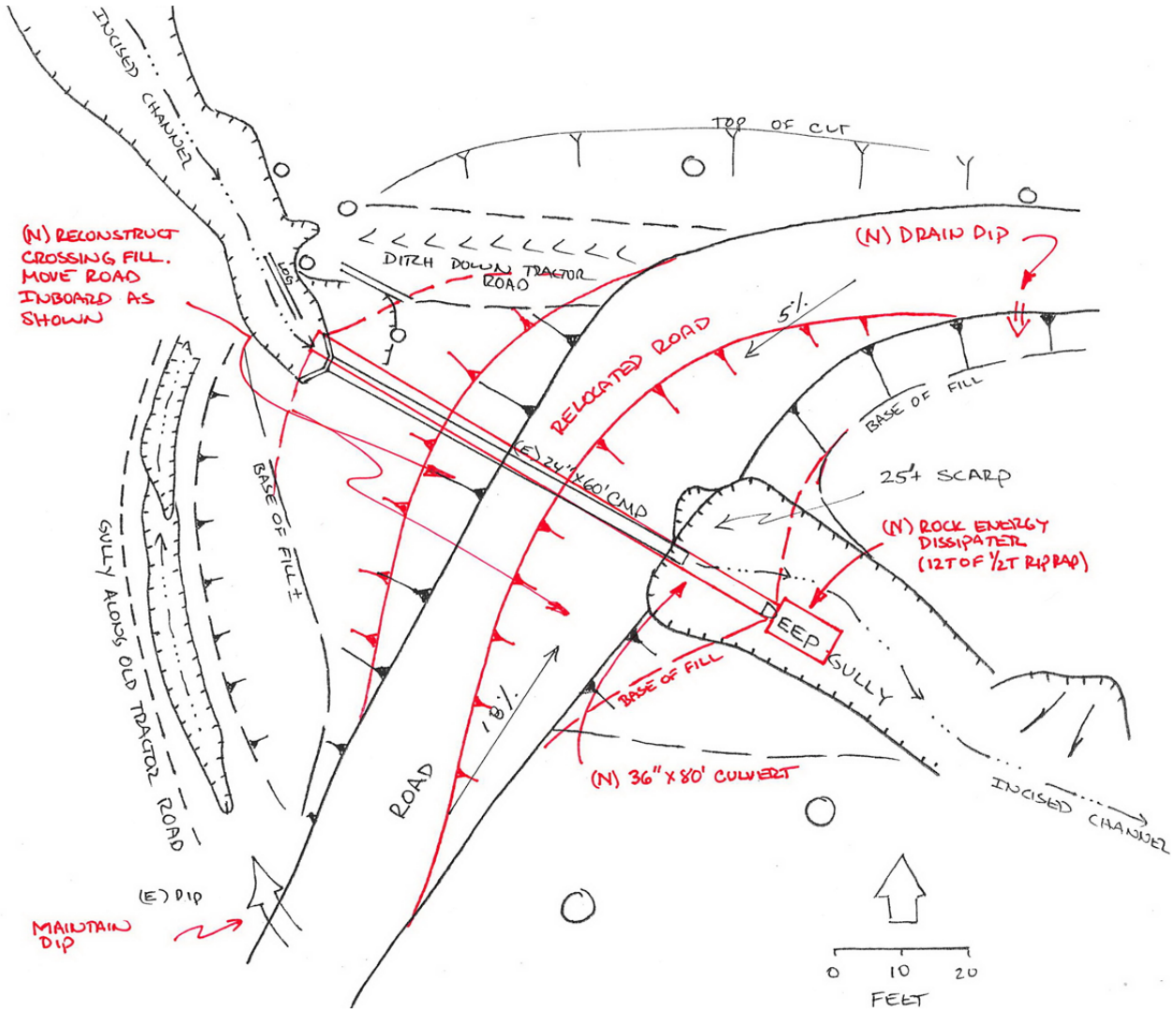
Site 3: Culvert inlet

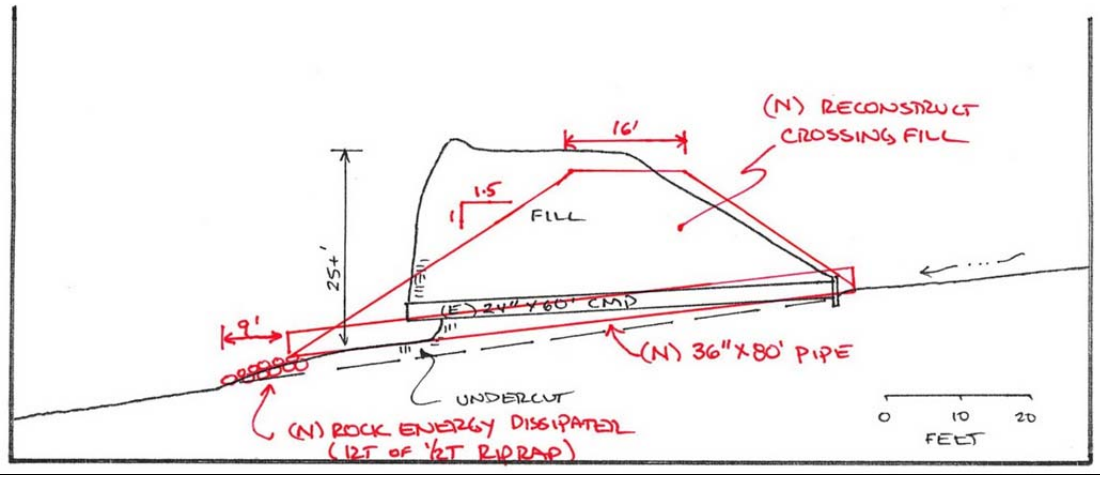
Site 3: Upstream stream channel

RECOMMENDATIONS

- Remove and replace existing culvert with new 36" x 80' pipe as shown on drawing
  - Install pipe at native stream grade
  - Reconstruct the crossing embankment on engineered fill.
  - The road will need to be moved about 8 feet upstream and constructed at a 15 foot width to minimize the amount of crossing fill. Estimated 1100 cy of excavation and fill placement is required.
  - A geotechnical engineer shall be consulted to provide specifications for fill placement.
- Install rock energy dissipater at culvert outlet per standard specifications.
- Maintain reverse grade dip approximately 50 feet to the south of the crossing.
- Upgrade road drainage elsewhere along the right bank approach as prescribed elsewhere in this report.

SITE 3


INCISED CHANNEL
TOP OF CUT
(N) RECONSTRUCT CROSSING FILL. MOVE ROAD INBOARD AS SHOWN
DITCH DOWN TRACTOR ROAD
(N) DRAIN DIP
5%
RELOCATED ROAD
BASE OF FILL
(E) 24" X 60' CMP
25+ SCARP
(N) ROCK ENERGY DISSIPATER (12T OF 1/2T RIPRAP)
GULLY ALONG OLD TRACTOR ROAD
BASE OF FILL +
DEEP GULLY
BASE OF FILL
ROAD
18%
(N) 36" X 80' CULVERT
INCISED CHANNEL
(E) DIP
MAINTAIN DIP
0 10 20
FEET


(N) RECONSTRUCT CROSSING FILL
16'
1.5
1
FILL
25+'
(E) 24" X 60' CMP
9'
(N) 36" X 80' PIPE
UNDERCUT
(N) ROCK ENERGY DISSIPATER (12T OF 1/2T RIPRAP)
0 10 20
FEET

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5832 ● Fax: (831) 425-5830 ● e-mail: timbest@coastgeo.com

June 16, 2015

Neal Sharma
Assistant Project Manager
Peninsula Open Space Trust (POST)
222 High Street
Palo Alto, CA 94301

RE: DESIGN STANDARDS
APPLE ORCHARD CROSSING 3 UPGRADE PROJECT

Dear Ms. Sharma:

The proposed road improvements at Crossing 3 on the Apple Orchard property described in my Road Erosion Assessment: Apple Orchard dated February 2015. The improvements generally conform to California Department and Fish and Wildlife (CDFW) applicable design standards outlined in Part X of the California Salmonid Stream Habitat Restoration Manual (CDFG, 2006) and Handbook for Forest, Ranch and Rural Roads (Weaver et al., 2014). Where necessary, engineered approved modifications may be made to address onsite conditions.

Please feel free to contact me if you have any questions.

Sincerely,

Timothy C. Best, CEG

Cc: Matt Baldzikowski (Midpeninsula Regional Open Space District)

REFERENCES

CDFG, 2006, California Salmonid Stream Habitat Restoration Manual: Part X Upslope Erosion Inventory and Sediment Control Guidance, California Department of Fish and Game, http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp, p. 207.

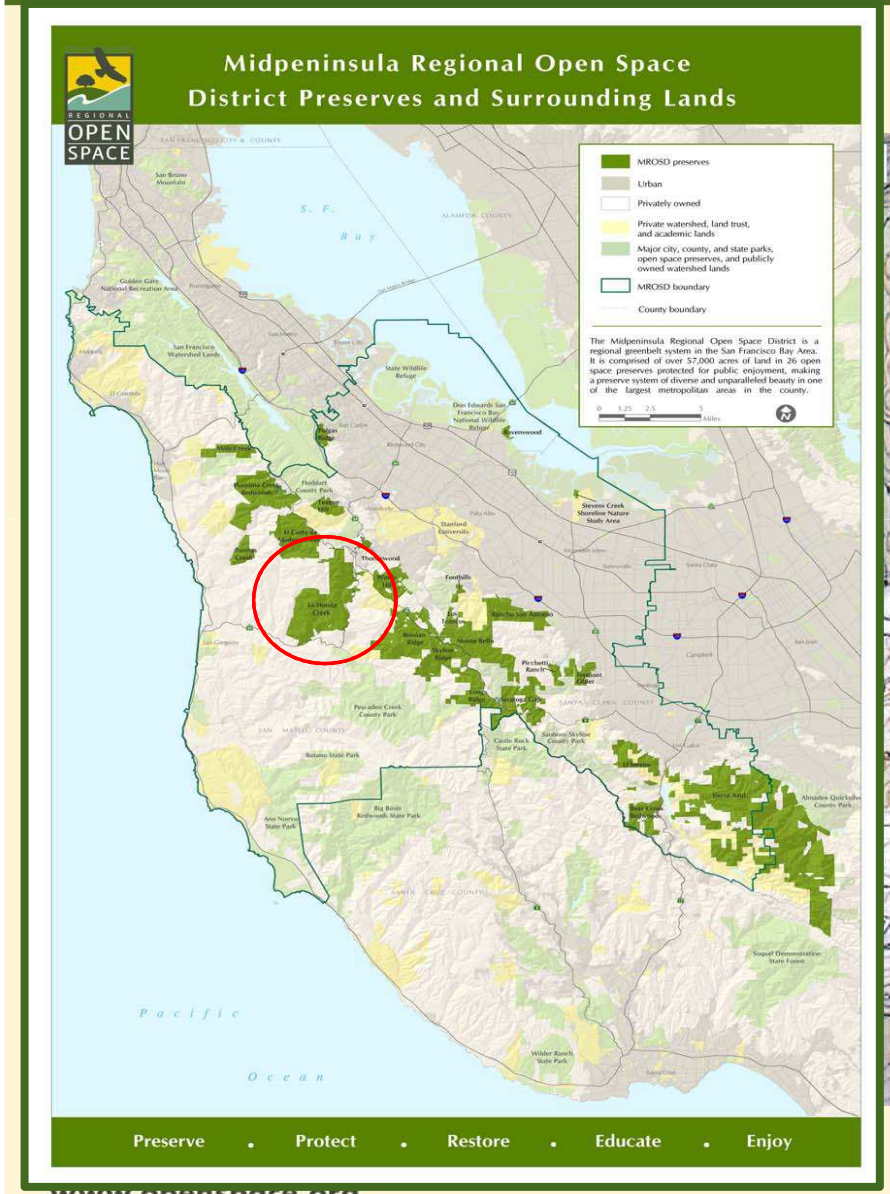
Weaver, W. E., Weppner, E., and Hagans, D. K., 2014, Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads, Mendocino County Resource Conservation District, Ukiah, California, 416 p.:

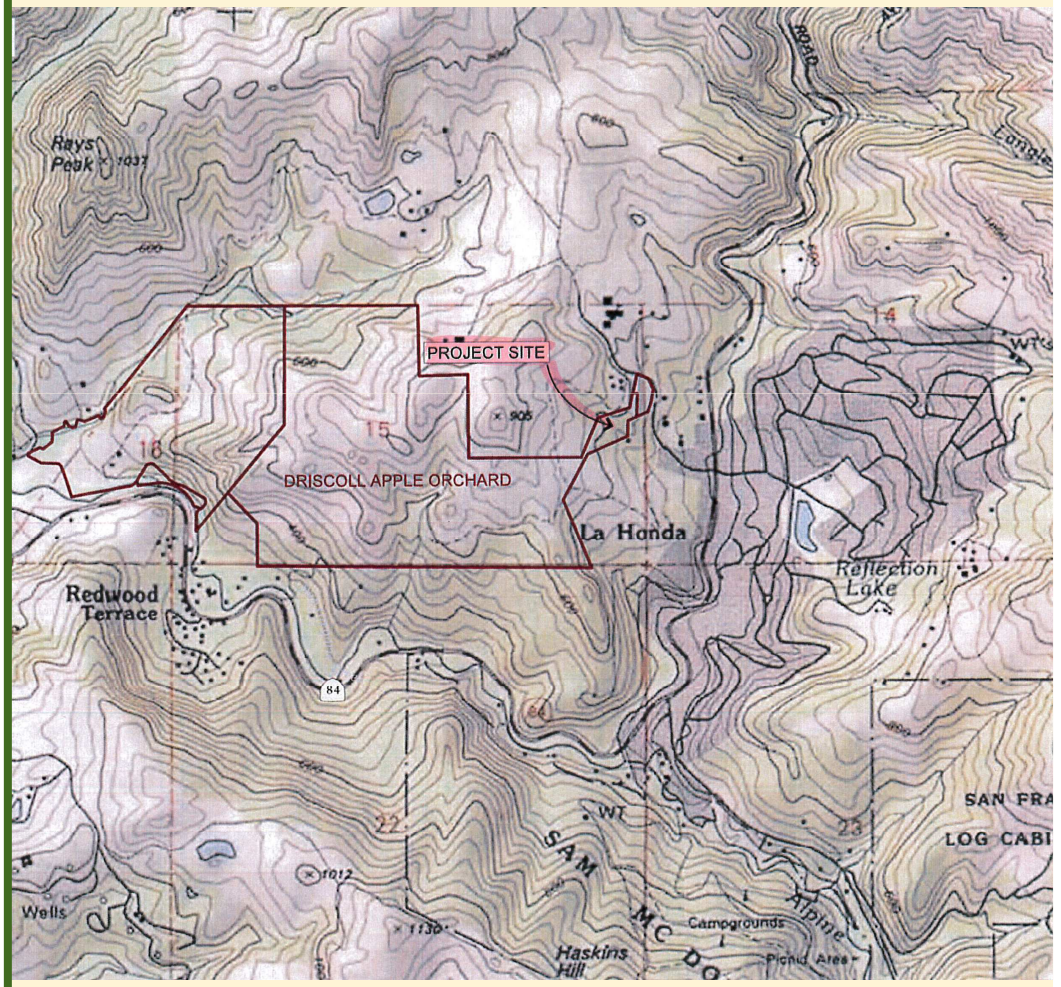
PENINSULA OPEN SPACE TRUST and MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

Driscoll Ranch Apple Orchard Road Repair

- In 2014, the Peninsula Open Space Trust and Midpeninsula Regional Open Space District, partnered with the San Mateo County RCD to complete this road assessment for a newly purchased property within the San Gregorio Creek Watershed.

Project Location





PRESERVE • PROTECT • RESTORE • EDUCATE • ENJOY 3

Project Goals

- Partner with the RCD under the Rural Roads Program
- Prevent sediment impacts downstream (benefits water quality and fisheries habitat)
- Improve infrastructure for grazing management and patrol access

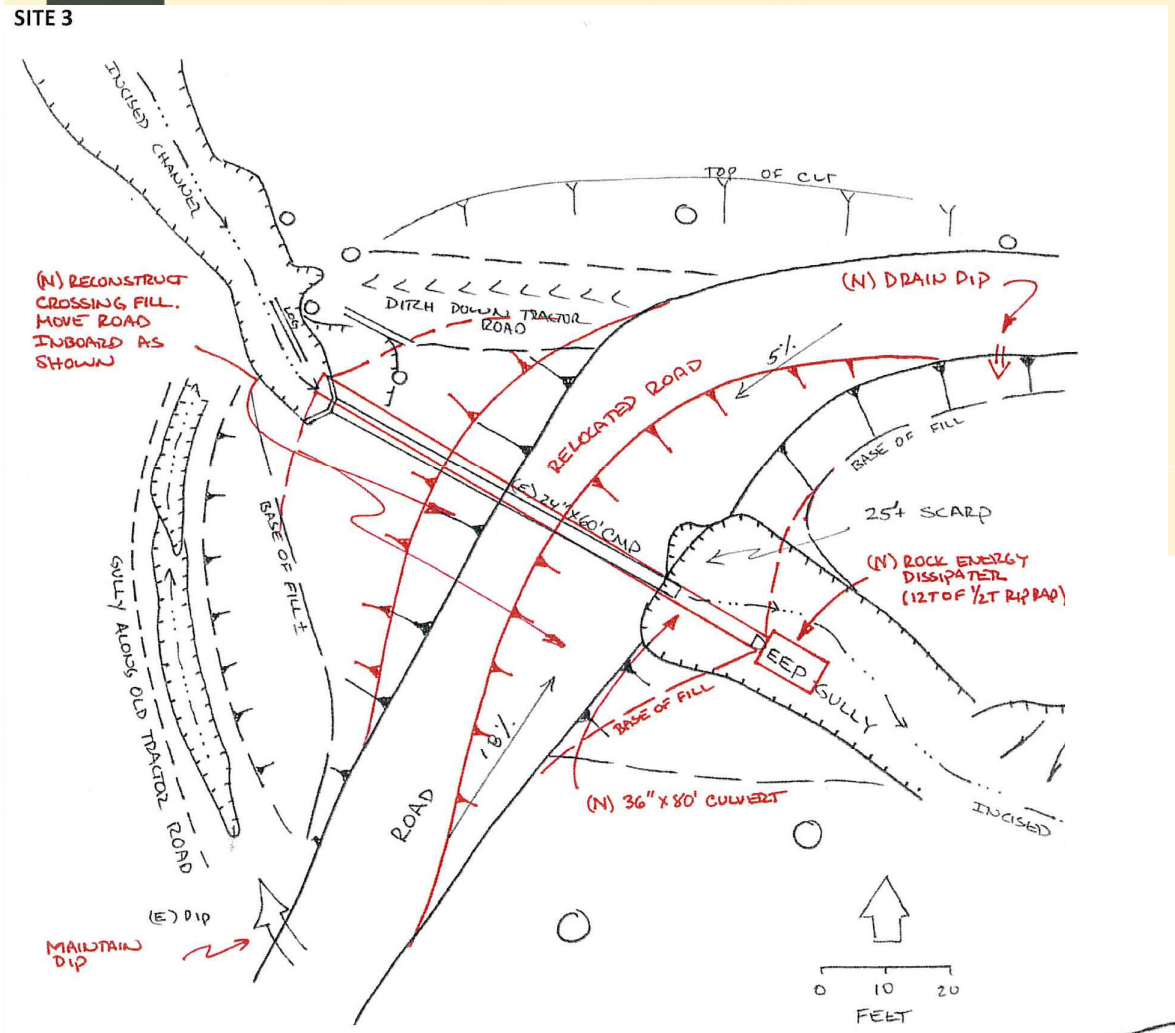
Existing Conditions

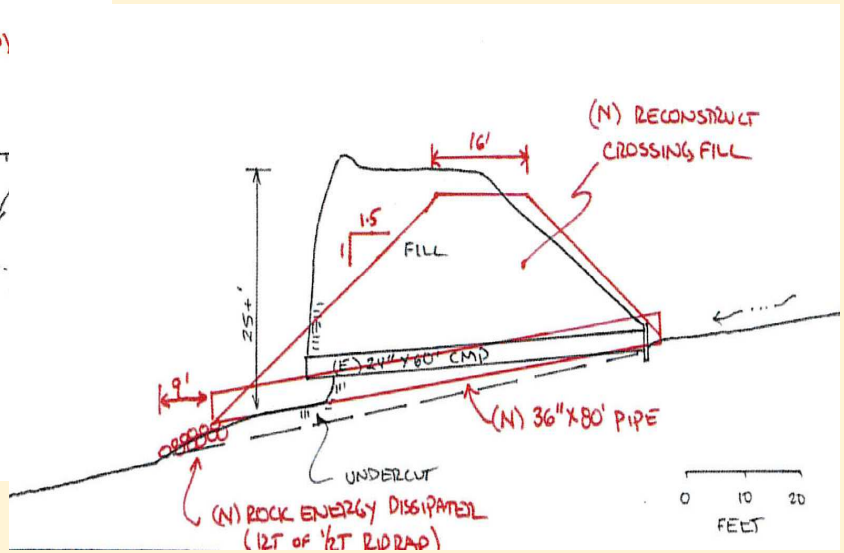
Project Components

- Remove old failing 24" culvert and failing road fill.
- Replace with new 36" culvert and rebuild road fill with approximately 1200 cubic yards of engineered fill.
- Install erosion control BMP's at finished work site.
- Construction oversight by Engineering Geologist and Geotechnical Engineer required.
- Project implementation anticipated in August-September 2015.

Project Design

SITE 3





Questions?


San Mateo County
Resource
Conservation
District


POST


MIDPENINSULA
REGIONAL
OPEN
SPACE

San Mateo County Resource Conservation District
FY 2016 Financial Budget

BUDGET (FY 2016)

	FY16 Budget	FY15 Budget	FY15 Estimated Projected Actual	FY 15 Projected Variance (FY 15 actual minus budgeted)
REVENUE				
Project Revenue				
Ag Ombudsman	$ 50,000.00	$ 37,739.00	$ 40,000.00	$ 2,261.00
Ano Nuevo Habitat Enhancement	$ 8,650.00	$ 13,415.00	$ 4,765.00	$ (8,650.00)
Biochar Field Trials	$ 19,000.00	$ 21,400.00	$ 11,181.00	$ (10,219.00)
Bonde Weir	$ 4,000.00	$ 2,437.00	$ 3,116.00	$ 679.00
Butano Farms Floodplain Restoration	$ 164,167.00	$ -	$ 31,412.00	$ 31,412.00
Climate Mitigation and Adaptation Program	$ 81,853.00	$ -	$ -	$ -
Cloverdale Ponds Enhancement Project	$ -	$ 200,000.00	$ 175,030.00	$ (24,970.00)
Coastal Fish Passage	$ 29,037.00	$ 20,170.00	$ 5,200.00	$ (14,970.00)
County Services - Ag Workshop and County Contribution	$ -	$ 1,000.00	$ 1,000.00	$ -
Creek Habitat Enhancement	$ 55,713.00	$ -	$ -	$ -
Fitzgerald Pollution Reduction	$ 441,010.00	$ 83,850.00	$ 70,273.00	$ (13,577.00)
Gully Erosion Control	$ 10,000.00	$ 15,718.00	$ 4,000.00	$ (11,718.00)
Integrated Watershed Restoration Program	$ 158,243.00	$ 120,000.00	$ 100,000.00	$ (20,000.00)
Johnston Ranch Riparian Habitat Enhancement	$ -	$ 33,378.00	$ -	$ (33,378.00)
Livestock and Land Program	$ -	$ 2,269.00	$ 2,269.00	$ -
Memorial Park Fish Passage	$ 427,676.00	$ 50,117.00	$ 27,075.00	$ (23,042.00)
NRCS Contribution Agreement	$ 25,000.00	$ -	$ -	$ -
Pescadero Integrated Flood Reduction Habitat Enhancement Project	$ 104,900.00	$ 179,080.00	$ 102,000.00	$ (77,080.00)
Pilarcitos Integrated Watershed Management Plan	$ 14,950.00	$ 14,250.00	$ 4,669.00	$ (9,581.00)
Ponds Project	$ -	$ 20,000.00		$ (20,000.00)
` Rural Roads and Gully Erosion Control Program	$ 528,238.00	$ 147,344.00	$ 80,000.00	$ (67,344.00)
San Gregorio Watershed Enhancement Program	$ -	$ 113,501.00	$ 108,309.00	$ (5,192.00)
San Gregorio Stream Gage	$ 20,000.00	$ 13,550.00	$ 11,850.00	$ (1,700.00)
South Coast San Mateo County Drought Relief	$ 1,055,320.00	$ 650,000.00	$ -	$ (650,000.00)
Vegetation Management	$ 140,878.00	$ -	$ -	$ -
Water Quality Monitoring and Technical Assistance	$ 81,246.00	$ 90,149.00	$ 65,000.00	$ (25,149.00)
Weed Abatement	$ -	$ 99,703.00	$ 72,560.00	$ (27,143.00)
Western Sare	$ -	$ 1,242.00		$ (1,242.00)
Subtotal Project Revenue	**$ 3,419,881.00**	**$ 1,930,312.00**	**$ 919,709.00**	**$ (1,010,603.00)**
Other Revenue				
Individual Contributions	$ 5,000.00	$ 1,500.00	$ 9,200.00	$ 7,700.00
Interest Income	$ 500.00	$ 500.00	$ 300.00	$ (200.00)
Property Tax	$ 57,000.00	$ 55,000.00	$ 57,534.00	$ 2,534.00
Service Fees	$ 1,000.00	$ 5,500.00	$ (450.00)	$ (5,950.00)
County Contributions	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ -
Subtotal Other Revenue	$ 163,500.00	$ 162,500.00	$ 166,584.00	$ (3,616.00)
Total Revenue	**$ 3,583,381.00**	**$ 2,092,812.00**	**$ 1,086,293.00**	**$ (1,014,219.00)**

EXPENSES Personnel					
Salaries	$ 579,601.00	$ 459,706.00	$ 398,443.00	$ (61,263.00)	
Benefits	$ 89,909.00	$ 67,691.00	$ 50.38	$ (67,640.62)	
Personnel Subtotal	**$ 669,510.00**	**$ 527,397.00**	**$ 398,493.38**	**$ (128,903.62)**	
Operating Expenses					
Accounting	$ 8,500.00	$ 12,000.00	$ 9,000.00	$ (3,000.00)	
Bank Fees	$ 1,000.00	$ 1,000.00	$ 750.00	$ (250.00)	
Communications	$ 6,500.00	$ 14,000.00	$ 10,200.00	$ (3,800.00)	
Computer Services	$ 8,000.00	$ 6,300.00	$ 6,500.00	$ 200.00	
Consultant Services	$ 14,000.00	$ 6,000.00	$ 6,000.00	$ -	
Discretionary	$ 4,000.00	$ 4,200.00	$ 2,250.00	$ (1,950.00)	
Donations	$ 500.00		$ 250.00	$ 250.00	
Equipment	$ 4,500.00	$ 2,500.00	$ 2,200.00	$ (300.00)	
Insurance - Liability	$ 3,600.00	$ 3,000.00	$ 3,241.00	$ 241.00	
Legal	$ 2,000.00	$ 2,500.00	$ -	$ (2,500.00)	
Membership, Dues and Subscriptions	$ 3,500.00	$ 3,500.00	$ 1,700.00	$ (1,800.00)	
Mileage	$ 2,500.00	$ 2,000.00	$ 2,500.00	$ 500.00	
Personnel Service Fees	$ 4,500.00		$ 3,700.00		
Postage and Delivery	$ 400.00	$ 500.00	$ 100.00	$ (400.00)	
Printing and Copying	$ 1,000.00	$ 1,000.00	$ 1,000.00	$ -	
Professional Development	$ 5,500.00	$ 5,000.00	$ 2,100.00	$ (2,900.00)	
Project Software	$ 5,600.00	$ 3,400.00	$ 4,800.00	$ 1,400.00	
Public Relations	$ 750.00	$ 500.00	$ 6,650.00	$ 6,150.00	
Rent	$ 19,800.00	$ 22,800.00	$ 15,600.00	$ (7,200.00)	
Supplies	$ 2,000.00	$ 500.00	$ 1,100.00	$ 600.00	
Travel and Accomodations	$ 2,500.00	$ 2,500.00	$ 2,400.00	$ (100.00)	
Subtotal Operating Expenses	**$ 100,650.00**	**$ 93,200.00**	**$ 82,041.00**	**$ (14,859.00)**	
Program Expenses					
Ag Ombudsman	$ 500.00	$ 5,000.00	$ 35.00	$ (4,965.00)	
Ano Nuevo Habitat Enhancement	$ 4,000.00	$ 4,980.00	$ -	$ (4,980.00)	
Biochar Field Trials	$ 4,010.00	$ 13,160.00	$ 4,895.00	$ (8,265.00)	
Bonde Weir	$ 2,000.00	$ -	$ 2,451.00	$ 2,451.00	
Butano Farms Floodplain Restoration	$ 130,404.00	$ -	$ 13,425.00	$ 13,425.00	
Climate Mitigation and Adaptation Program	$ 10,739.00	$ -	$ -	$ -	
Cloverdale Ponds Enhancement Project	$ -	$ 191,725.00	$ 165,899.00	$ (25,826.00)	
Coastal Fish Passage	$ 15,180.00	$ 10,120.00	$ 12.00	$ (10,108.00)	
Creek Habitat Enhancement	$ 38,441.00	$ -	$ -	$ -	
Fitzgerald Pollution Reduction	$ 356,498.00	$ 36,000.00	$ 35,333.00	$ (667.00)	
Integrated Watershed Restoration Program	$ 107,672.00	$ 64,663.00	$ 40,000.00	$ (24,663.00)	
Johnston Ranch Riparian Habitat Enhancement	$ -	$ 15,178.00	$ -	$ (15,178.00)	
Livestock and Land Program	$ -	$ 1,446.00	$ 4,214.00	$ 2,768.00	
Memorial Park Fish Passage	$ 384,285.00	$ 21,047.00	$ 7,286.00	$ (13,761.00)	
Pescadero Integrated Flood Reduction Habitat Enhancement Project	$ 93,610.00	$ 152,945.00	$ 84,462.00	$ (68,483.00)	
Pescadero Streamflow Improvement Plan	$ -	$ -	$ 6,480.00	$ 6,480.00	
Pilarcitos Integrated Watershed Management Plan	$ 14,950.00	$ 14,250.00	$ 1,282.00	$ (12,968.00)	
Ponds Project	$ -	$ 15,000.00	$ -	$ (15,000.00)	
Rural Roads and Gully Erosion Control Program	$ 441,617.00	$ 89,056.00	$ 30,000.00	$ (59,056.00)	
San Gregorio Watershed Enhancement Program	$ -	$ 78,551.00	$ 77,843.00	$ (708.00)	
San Gregorio Gage	$ 20,000.00	$ 13,550.00	$ 13,550.00	$ -	
South Coast San Mateo County Drought Relief	$ 967,065.00	$ 575,000.00	$ 2,946.00	$ (572,054.00)	
Vegetation Management Program	$ 65,348.00	$ -	$ -	$ -	
Water Quality Monitoring and Technical Assistance	$ 18,291.00	$ 30,964.00	$ 18,106.00	$ (12,858.00)	
Weed Abatement	$ -	$ 34,195.00	$ 30,216.00	$ (3,979.00)	
Subtotal Program Expenses	**$ 2,674,610.00**	**$ 1,366,830.00**	**$ 538,435.00**	**$ (828,395.00)**	
Total Expenses	**$ 3,444,770.00**	**$ 1,987,427.00**	**$ 1,018,969.38**	**$ (972,157.62)**	
NET	**$ 138,611.00**	**$ 105,385.00**	**$ 67,323.62**	**$ (42,061.38)**	

San Mateo County Resource Conservation District

MEMORANDUM

Date: June 18, 2015

To: Board of Directors

From: Kellyx Nelson

Re: Recommendation to Contract with Bay Circle Construction, Inc. for Memorial Park Fish Passage Project

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RCD staff recommends Bay Circle Construction, Inc. to improve conditions for endangered Coho salmon and threatened steelhead at two sites on Pescadero Creek located within Memorial County Park.

The project will improve access to approximately 62.3 miles of salmonid habitat in the Pescadero watershed. At the Sequoia Flats crossing site, contractors will replace a concrete ford crossing with dual concrete box culverts. At the upstream dam that used to form a swim hole, the project will modify the flash board dam to create a low flow channel in the dam apron.

A request for proposals was distributed to 17 construction firms on May 12, 2015. 7 contractors participated in a mandatory pre-bid site inspection on May 27th.

Bay Circle Construction, Inc. was the only company to submit a bid. The package was complete and submitted before the deadline for submission. The amount bid ($179,055 for the Sequoia Flats crossing and $77,312 for the dam modification) is within the grant-funded budget for the project. Staff checked references and verified the qualifications of the bidder and recommends Bay Circle Construction, Inc. as a firm qualified to do the required work.