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FE Evaluation of Hillside Excavation for a Construction Contract Dispute

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Abstract

This paper presents a forensic evaluation of an earthwork grading dispute between a grading contractor (plaintiff) and property owner (defendant) associated with construction of an approach driveway and hillside cut for a new residential property. The plaintiff's allegations were that "changed conditions" had been encountered through the presence of a landslide and/or geologic fault. These conditions resulted in schedule delays and increased costs. Finally, the plaintiff alleged breach of contract after being terminated. The allegations were investigated through both on-site field reconnaissance and desktop studies. The forensic analyses found no basis for the changed conditions claims. The case was tried in Napa County California Superior Courts via bench trial. The judge's decision mirrored the findings of the forensic analyses.

Keywords

Construction dispute, earthwork grading, hillside excavation, landslide, fault, forensic engineering

Project Overview

The project involved constructing a new residence and associated approach driveway, as shown in the project site plan (Figure 1). The first phase of construction was

earthwork grading to enable access to the building footprint. Second, the new residence structure and pool were constructed. Finally, the landscaping was installed. This case was focused on the first phase of the construction,

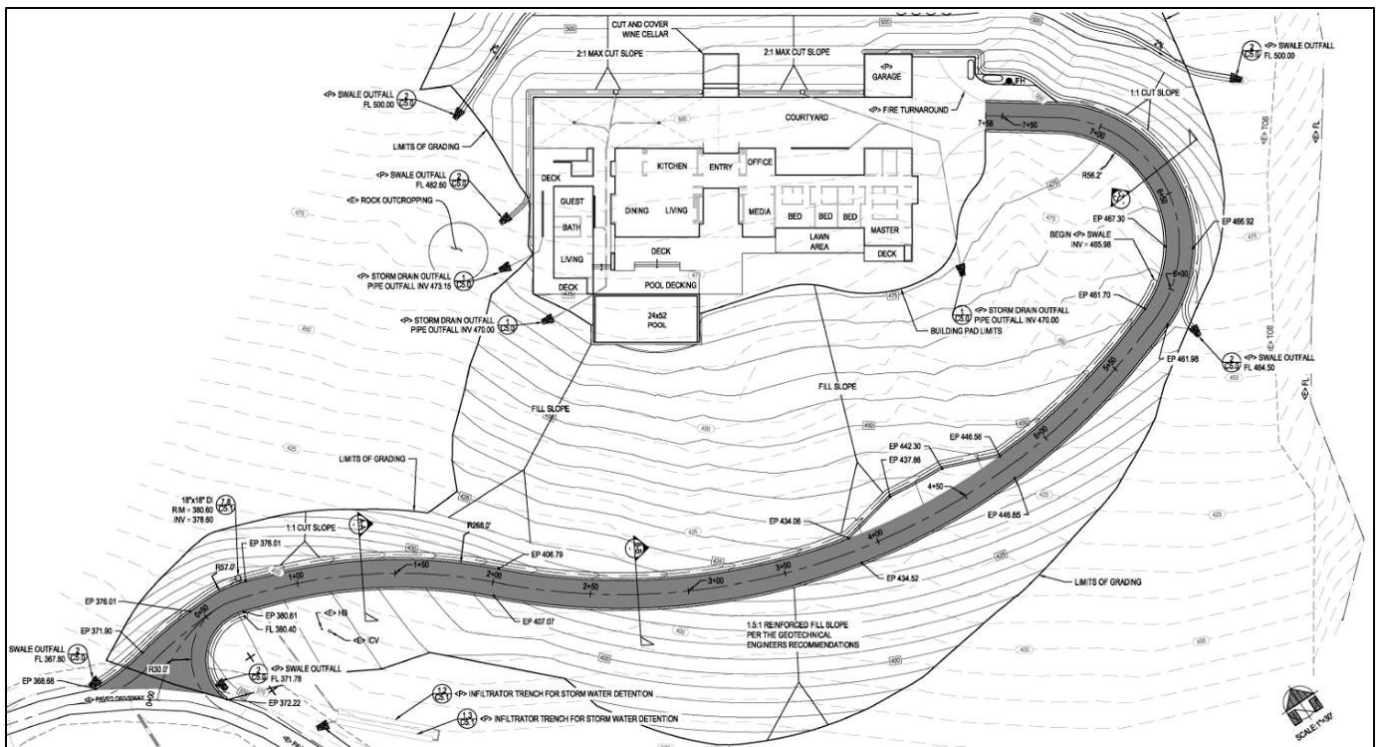


Figure 1
Overview of project features from the site plan (Source: Project civil engineer).

CONSTRUCTION TIMELINE																	
WORK PHASE	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct
Bid Submitted	X																
Contractor Selected		X															
Work Starts			X														
Grading Work			X	X	X												
Grading Permit Ends						X											
Contractor Terminated							X										
New Contractor Hired												X					
Grading													X	X	X	X	X
Grading Complete																	X

Figure 2
Project timeline at onset of project.

which entailed site grading operations.

Construction began in the late summer of 2012. A general contractor (GC) was retained by the property owners (owners/defendants) to generally oversee and manage day-to-day construction work. A grading contractor (plaintiff) was hired directly by the owners (defendants) based on submission of the low bid to complete the grading work. The plaintiff mobilized to the site in August. An overview of the project timeline is presented in **Figure 2**. The project plans required a cut volume (i.e., material removed from the hillside) of 30,000 cubic yards (CY). Site fills were considered part of the grading work delineated by the 30,000 CY cut volume presented in the plans.

Grading operations are regulated by both the county and the state because the grading activities have the potential to result in water quality turbidity pollution during rain events. The “grading season” in the county generally starts in April and continues through the end of October, which corresponds to the time of year with the lowest chance of rain. Grading activities can extend further into the rainy season (November through March), but sediment control practices must be employed to prevent runoff of soils from the work area to nearby streams, rivers, and storm drains. These sediment control practices are delineated in Stormwater Pollution Prevention Plans (SWPPP) and were noted in the project plans, as illustrated in **Figure 3**.

Construction Dispute

The plaintiff alleged that he was directed by the project geotechnical engineer to go beyond his scope of work in order to mitigate for an unforeseen landslide and/or geologic fault. This work included enlargement of the roadway embankment keyway, moisture conditioning of

excavated soils, multiple “moves,” and additional sub-drain installation. The alleged additional work caused a delay in his work progress, which, in turn, resulted in the plaintiff not having grading operations complete before the end of the grading season. The incomplete grading required stabilization for the winter so that no soil would be washed from the project area. The plaintiff alleged that the additional work and subsequent stabilization was out of scope and required a change order to cover the additional costs beyond the plaintiff’s accepted bid. The plaintiff was seeking compensation for his full bid price (\$725,000), as a result of a breach of contract, and additional work, as a result of changed conditions due to the landslide/fault in the amount of \$116,900.

As a result of this unanticipated schedule and cost impacts to the project, the defendants terminated the services of the plaintiff. This termination was alleged by the plaintiff to be a breach of contract, and he was owed the

1. GRADING ON THE SITE WILL BE LIMITED TO THE AREAS SHOWN ON THE PLAN.
2. ALL MOVEMENT OF EARTH SHALL COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE NAPA COUNTY GRADING ORDINANCE AND THE EROSION CONTROL PLAN.
3. CHANGES TO THIS EROSION AND SEDIMENT CONTROL PLAN TO MEET FIELD CONDITIONS WILL BE MADE ONLY WITH THE APPROVAL OF/ OR AT THE DIRECTION OF THE DIRECTOR OF PUBLIC WORKS.
4. BETWEEN OCTOBER 15 AND APRIL 1, EROSION CONTROL MEASURES WILL BE INSPECTED AND REPAIRED AT THE END OF EACH WORKING DAY AND/OR AT THE END OF A STORM EVENT. ALL PAVED AREAS WILL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE WILL BE MAINTAINED SO THAT A MINIMUM OF SEDIMENT-LADEN RUNOFF LEAVES THE SITE.
5. THE CONTRACTOR WILL INFORM ALL CONSTRUCTION SITE WORKERS ABOUT THE MAJOR PROVISIONS OF THE EROSION AND SEDIMENT CONTROL PLAN AND SEEK THEIR COOPERATION IN AVOIDING THE DISTURBANCE OF THESE CONTROL MEASURES.
VEGETATION REMOVAL CONSISTS OF CLEARING BRUSH, GRASSES, AND PLANTS FROM THE SITE. ALL ORGANIC MATERIAL SHALL BE MULCHED AND SPREAD ON-SITE.
SOILS WITHIN THE GRADING ENVELOPE HAVE BEEN CLASSIFIED IN THE USDA SOIL CONSERVATION SERVICE'S, NAPA COUNTY SOIL SURVEY, INCLUDING THE HAZARD OF EROSION AS FOLLOWS:
SCS# SOIL TYPE % SLOPE HAZARD OF EROSION
152 HAMBRIGHT ROCK OUTCROP COMPLEX 30-50% HIGH
TEMPORARY EROSION CONTROL MEASURES WILL CONSIST OF THE INSTALLATION OF FIBER ROLLS, DROP INLET PROTECTORS, ROCK CHECK DAMS, AND HYDROSEEDING AND MULCHING OF GRADED SLOPES. PERMANENT EROSION CONTROL MEASURES WILL CONSIST OF SEEDING OVER THE DISTURBED AREA AND CONSTRUCTION OF SWALES AND OUTFALLS AS SHOWN ON THIS PLAN.

Figure 3

Notes on the project plans highlighting grading restrictions (Source: Project plans).

remainder of his contract. The defendants provided cost share (on the order of \$30,000) for the SWPPP measures implemented as a result of incomplete grading activities as well as partial payments to the plaintiff. Contractual documentation indicated that in the event of termination, the contractor (plaintiff) would be compensated for services rendered. Thus, a question arose as to the value of the services completed at the time of separation.

The author was retained by the defendants to evaluate the merits of the plaintiff's allegations and provide testimony in court relative to findings.

Site Overview

The nature of this project (extensive hillside cuts) afforded numerous opportunities to inspect the exposures from the grading activities to evaluate the presence of landslide and/or faulting features. **Figure 4** through **Figure 8** (on pages 4 and 5) show views of the grading areas, starting at the bottom of the newly constructed driveway (**Figure 4**) to the hillside cut behind the newly constructed residence (**Figure 8**). Work by the plaintiff was limited to the areas shown in **Figure 4** and **Figure 5**.

Landslide Allegation Evaluation

To evaluate the allegation of the presence of a landslide

in the roadway grading area, a desktop review was performed, followed by a site-specific field reconnaissance. The desktop review included a review of available site-specific documents (i.e., geotechnical report, civil drawings, daily field reports), a review of aerial photos (Google Earth 2012-2013), available landslide surveys by the California Geological Survey (CGS), a review, and interpretation of aerial LiDAR surveys¹. A site-specific field reconnaissance mapping was conducted following completion of the desktop study.

No published accounts of landslide activity were identified at the site. The site-specific field reconnaissance of the site found no evidence of landslide activity. Based on this review, no evidence was found to support the allegation that a landslide existed within the grading limits — all the evidence refuted the presence of a landslide. A description of the desktop evaluation and site-specific field reconnaissance is presented below.

The geotechnical report for the project presented a discussion of slope stability and found that the site appeared “relatively stable.” The project's geotechnical engineer found no “obvious indications of active slope instability such as landslides, debris flows, or extensive soil creep.” The civil drawings also did not have any landslide notes



Figure 4

View at lower end of grading area, looking up the new driveway, which was within the plaintiff's work area (Source: R. Storesund).



Figure 5

View of hillside slope where plaintiff performed some grading operations.
This area was re-constructed by the second grading contractor (Source: R. Storesund).



Figure 6

View looking down the driveway. This is outside the grading limits of the plaintiff.
This work was completed by the second grading contractor (Source: R. Storesund).



Figure 7

View in the driveway looking up toward the hillside pad cut for the new residence. This work was completed by the second grading contractor (Source: R. Storesund).



Figure 8

View of the hillside cut behind the new residence. This work was completed by the second grading contractor (Source: R. Storesund).

or areas identified. The geotechnical daily field reports did not indicate any faults, landslides, or other unusual/unforeseen geologic conditions that should have affected the scope of work. The project geotechnical engineer testified at deposition (and at trial) that their direction to the plaintiff to move material was a result of overly wet in-situ materials — not because of the presence of a landslide or fault. The project’s geotechnical engineer at trial refuted the notion that a fault or landslide was present in the plaintiff work area. Additionally, the subsequent grading contractor (hired to finish the project after the plaintiff was terminated) testified that he never encountered any landslide material and believed that the plaintiff simply underbid the project and had insufficient equipment to excavate the hard rock.

The plaintiff also admitted both at deposition and in trial that he was not able to distinguish the difference between a landslide and/or fault and was not sure what the “changed” condition he encountered was.

A review of the available Aerial LiDAR1 (Light

Detection and Ranging) derived elevation models of the area revealed that the geologic fabric/structure showed no obvious discontinuities or bulging that would be indicative of landslide features. However, the presence of a number of drainage channels located in the eastern portion of the project area — and the potential of an older alluvial fan in the vicinity of the pre-existing residence — were visible in the eastern portion of the project area. These drainage swales were mapped and shown as part of the existing conditions presented on the “demolition plan” of the project plans, as shown in **Figure 9**.

There are apparent drainage channels on the eastern portion of the project site that are situated on a thin veneer of soil, which overlies the volcanic bedrock. The channels become less steep as one moves from the top of the mountain to the base of the mountain because sands and gravels collect at the base of the drainage channel. One would expect water flow to be visible in the upper portions where the water flows on top of the shallow bedrock and then “sink” into the collection of sands, gravels and trapped fine-grained soil (clays and silts) as you move toward the

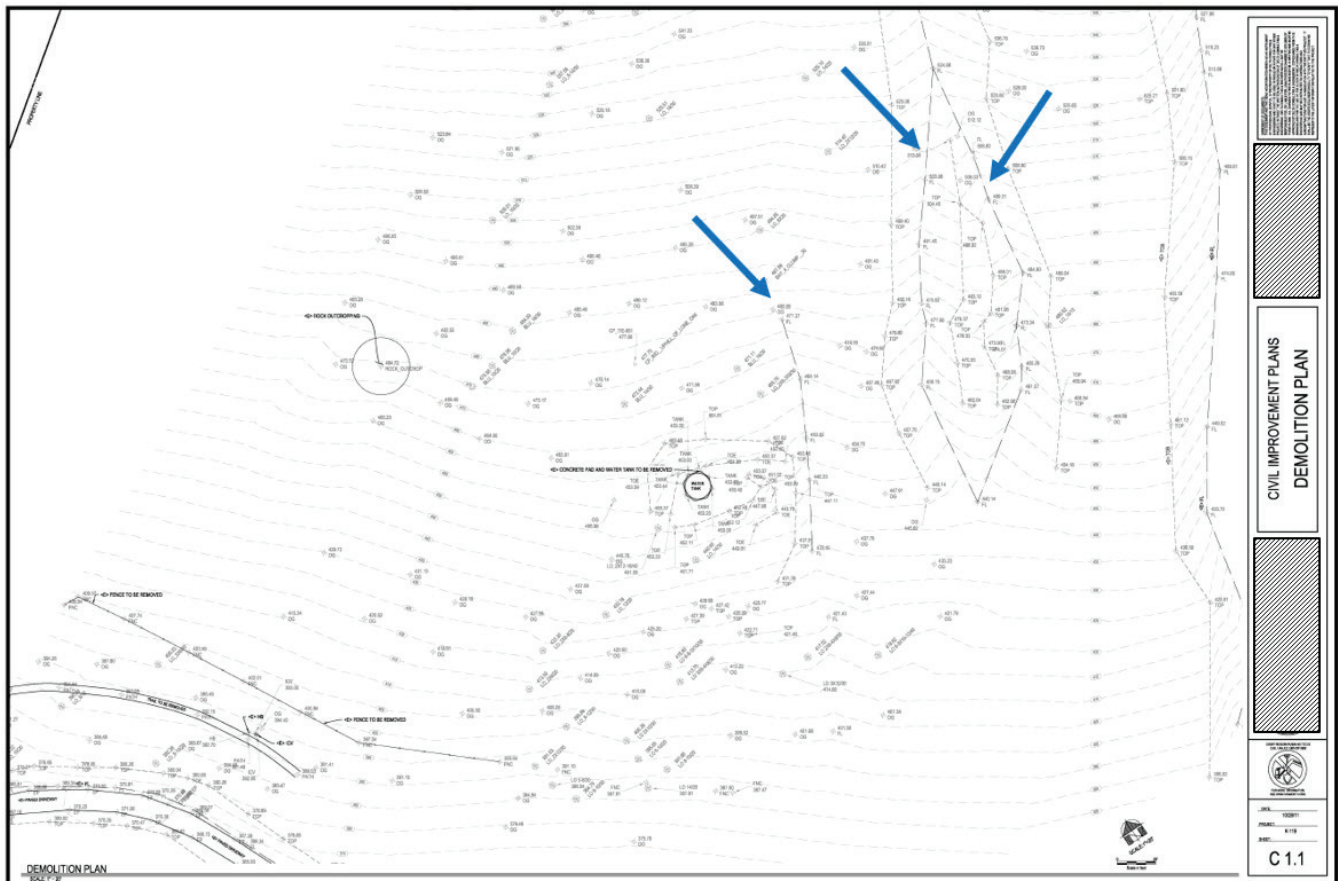


Figure 9

Demolition plan (Sheet C1.1) showing pre-project conditions, including presence of drainage channels, highlighted by blue arrows. (Source: Project plans)

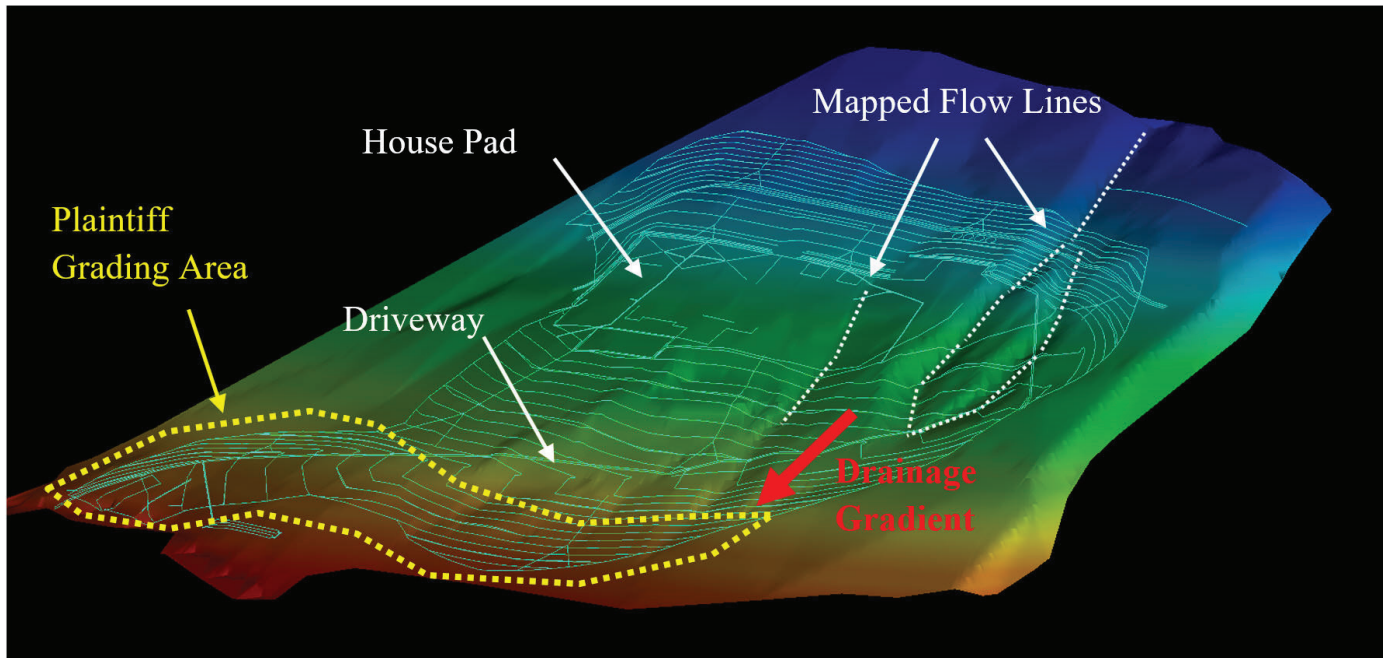


Figure 10

Flow lines of the streams identified on Sheet C1.1 (white dashed lines) relative to the proposed site grading.
Note: These drainages are concentrated on the east side of the property.

base of the hill. Deposits of caliche (white powdery calcium carbonate material with other precipitated minerals) are common as the water leaches out of the soils at this interface.

Figure 10 shows the proposed grading in relation to the flow lines mapped onto a 3D Digital Terrain Model (DTM). The general drainage gradient is toward the eastern portion of the planned keyway. **Figure 11** on page 18 is an exhibit from the plaintiff's deposition, where the plaintiff drew two green parallel lines to indicate the "wet" material he observed on the eastern side of the excavation (and corresponding to the area of "changed" conditions). This is consistent with the mapped drainage courses identified in the plan set (Sheet C1.1). This is also consistent with the photographs supplied during the plaintiff's construction activities where the surficial soils have caliche staining, as shown in **Figure 12** on page 18.

The California Geological Survey (CGS) maintains a state-wide inventory of known and potential landslides² that is publicly available. The project site is mapped outside any of the mapping quadrangles, which indicates the project site is not located in an area of active landslides. A review of the project area reveals the potential presence of a landslide feature to the east of the project area, as illustrated in **Figure 13** on page 19. One can infer from this mapping that the CGS has reviewed this general vicinity

and concluded that only one potential area might be a landslide, but further interpretation and site-specific evaluation would be required to confirm/refute this notion.

The findings from the desktop study were confirmed with a site-specific field reconnaissance mapping, which consisted of a one-day physical inspection of the site. Physical examinations were made of the terrain surrounding the plaintiff work limits to try and identify features such as bulging, shear, surface of rupture, and/or micro-relief typical of slope movements. No physical landslide morphological features were found. The site-specific field reconnaissance confirmed the findings of the desktop study.

Expert Opinion

Based on the available evidence, the allegation of a landslide being present in the grading limits is not supported. There is/was no landslide within the approach driveway embankment grading limits at the time of or following the plaintiff's work. There are no "changed" conditions and no basis for a contract modification.

Faulting Allegation Evaluation

To evaluate the allegation of the presence of geologic faulting that may have resulted in changed conditions within the plaintiff's work area, a desktop review was performed followed by a site-specific field reconnaissance. The desktop review included a review of available site-

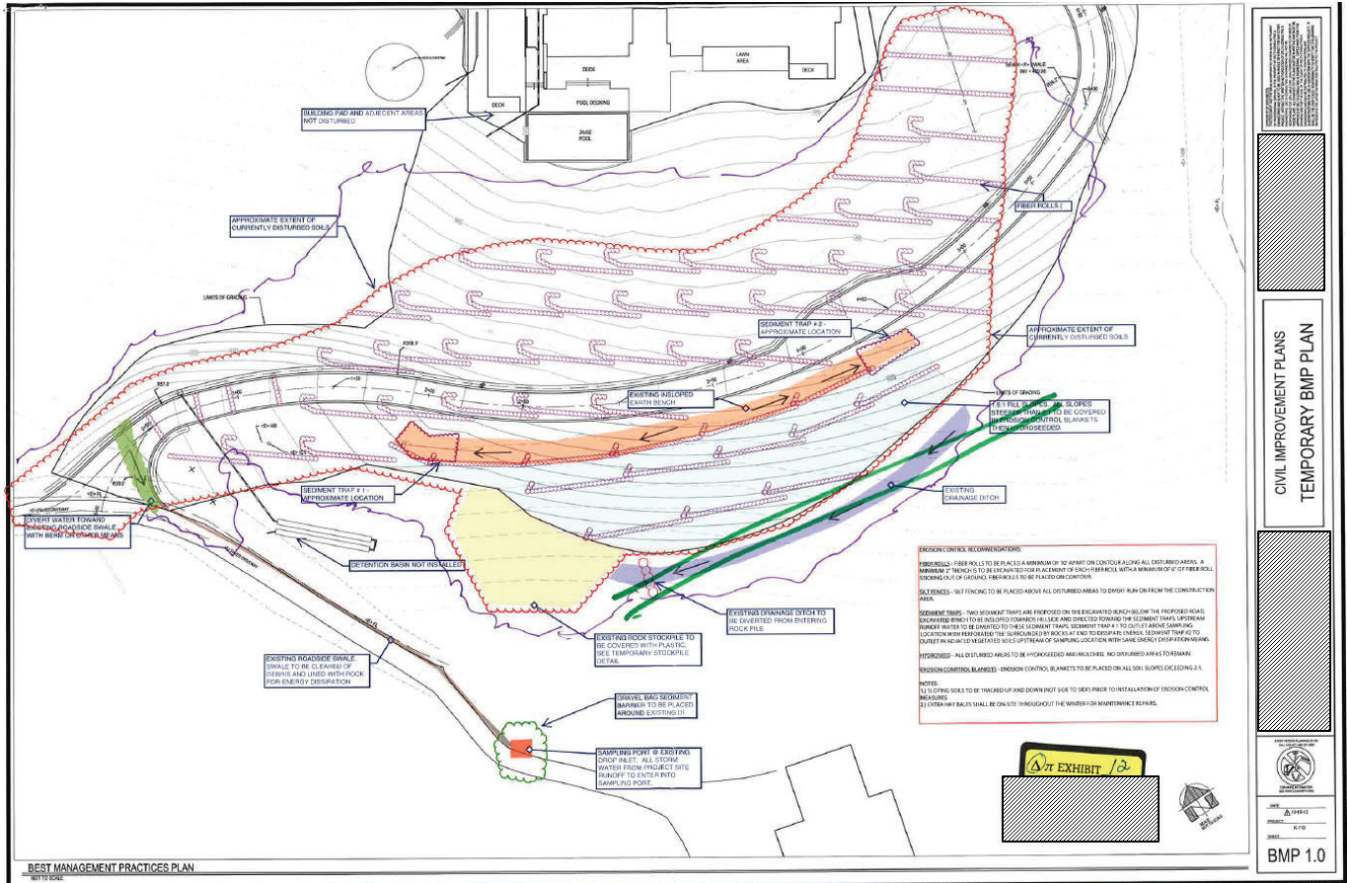


Figure 11

Parallel green lines delineating of zone of “unexpected” material (Exhibit from the plaintiff’s deposition). These green lines are coincident with the natural on-site drainage.

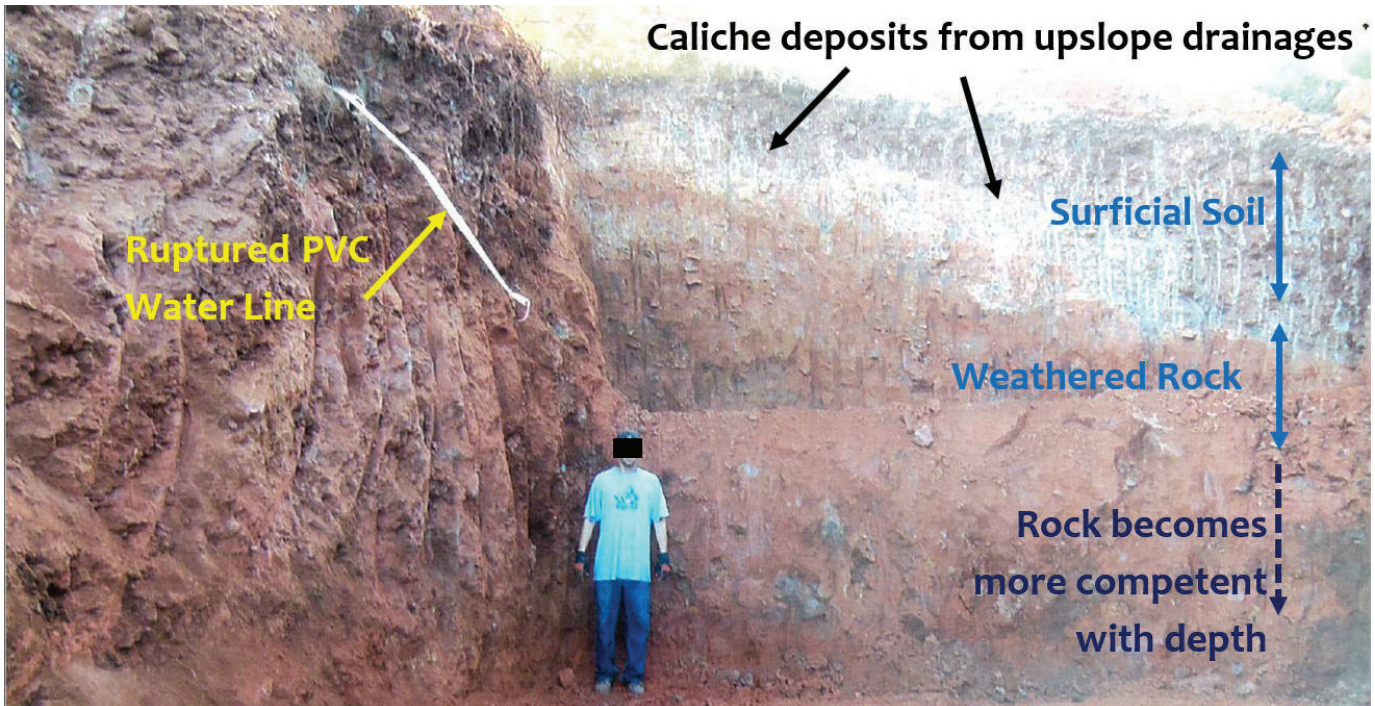


Figure 12

View (looking eastward) of the eastern end of the keyway (Source: plaintiff photo, annotations by author).

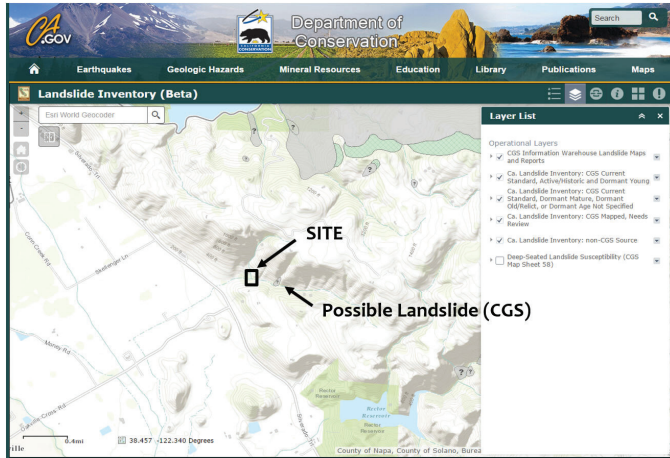


Figure 13

Possible landslide mapped by CGS2 to the east of the project area.

specific documents (i.e., geotechnical report, civil drawings, daily field reports), a review of aerial photos (Google Earth 2012-2013), available landslide surveys by the California Geological Survey (CGS), a review and interpretation of aerial LiDAR surveys¹. A site reconnaissance mapping was conducted following completion of the desktop study.

The available mapping inventory from the California Geological Survey³ indicates there are no active faults currently mapped in the project area.

The geotechnical report for the project presented a discussion of geologic faulting and found no indication of onsite active faults (where active faults have had movement within the past 10,000 years). The project geotechnical engineer identified that “no known active fault passes through the site. The site is not located in the

Alquist-Priolo Earthquake Fault Studies Zone. According to the CGS, an approximately located fault trace exists approximately 550 feet northeast of the project site.”

The geotechnical engineer’s daily field reports from site visits during the course of the plaintiff’s work did not indicate any faults or other unusual or unforeseen geologic conditions that should have affected the scope of work. The project geotechnical engineer testified at deposition (and in court) that their direction to the plaintiff to move material was a result of overly-wet in-situ materials and not because of the presence of a fault. The project geotechnical engineer refuted again at trial the notion that a fault was present in the plaintiff work area.

The grading contractor retained following termination of the plaintiff, testified at deposition (and at trial) that he encountered no faults, and believed the plaintiff underbid and under-resourced (equipment too small) to excavate the on-site hard rock.

The plaintiff admitted both at deposition (and in trial) that he was not able to distinguish the difference between a landslide and/or fault and was not sure what the nature of the encountered changed condition was.

A review of the photographs taken by the plaintiff during the course of his construction work provide visual exposures of the cut slopes in the grading area. All of these photographs are consistent with the mapped geology. No faulting is apparent in any of the plaintiff-supplied photographs, as demonstrated in **Figure 14** and **Figure 15**.

As part of the site reconnaissance, the geology of



Figure 14

Exposure of cut-slope (left hand side of photo) shows no faulting, and the exposed material is likely near optimum moisture content (Source: Plaintiff photo).



Figure 15

Another photo taken during construction where the exposed cut slope shows no signs of faulting (Source: Plaintiff photo).

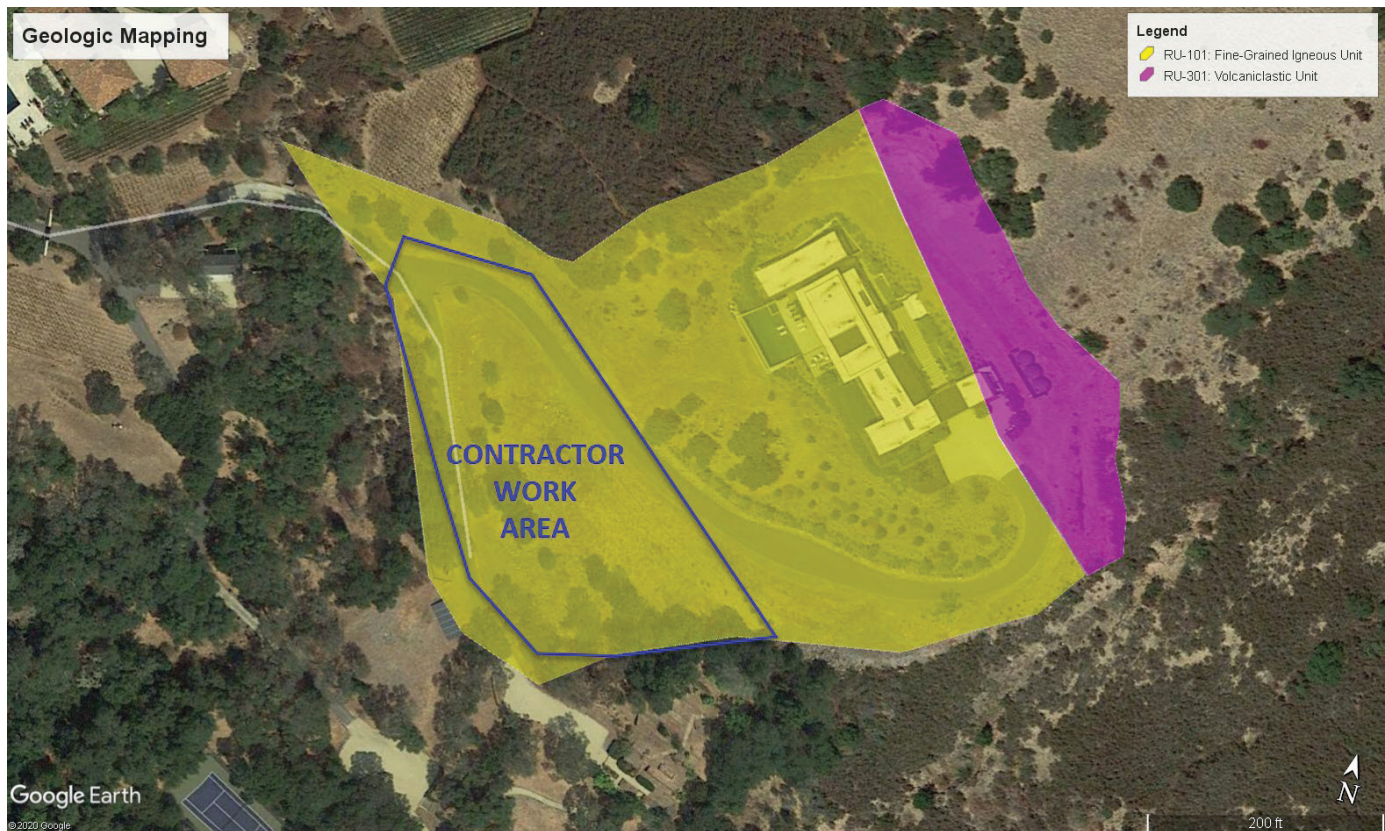


Figure 16

Geologic mapping based on site reconnaissance found no faulting in the contractor’s work area.

the site was mapped. A geologic contact was observed at the top of the driveway between two distinct onsite geologic units — a volcaniclastic unit and a fine-grained igneous unit (**Figure 16**). This contact was not situated within the work limits of the plaintiff and had no impact to the plaintiff work area. No evidence was observed that this fault was active (activity within the last 10,000 years).

There are no published accounts of faulting at the site. The site reconnaissance found no evidence or surface expressions of faulting in the excavation area. Based on this review, there is no evidence to support the allegation that faults existed within the grading limits — rather all the evidence refutes the presence of a fault.

Expert Opinion

Based on the available evidence, the allegation of a fault being present in the grading limits is fully unsupported. There is and was no fault within the approach driveway embankment grading limits. There are no “changed” conditions and no basis for a contract modification.



Figure 17

Deployment of straw wattles for erosion and sediment control (Source: Plaintiff photo).

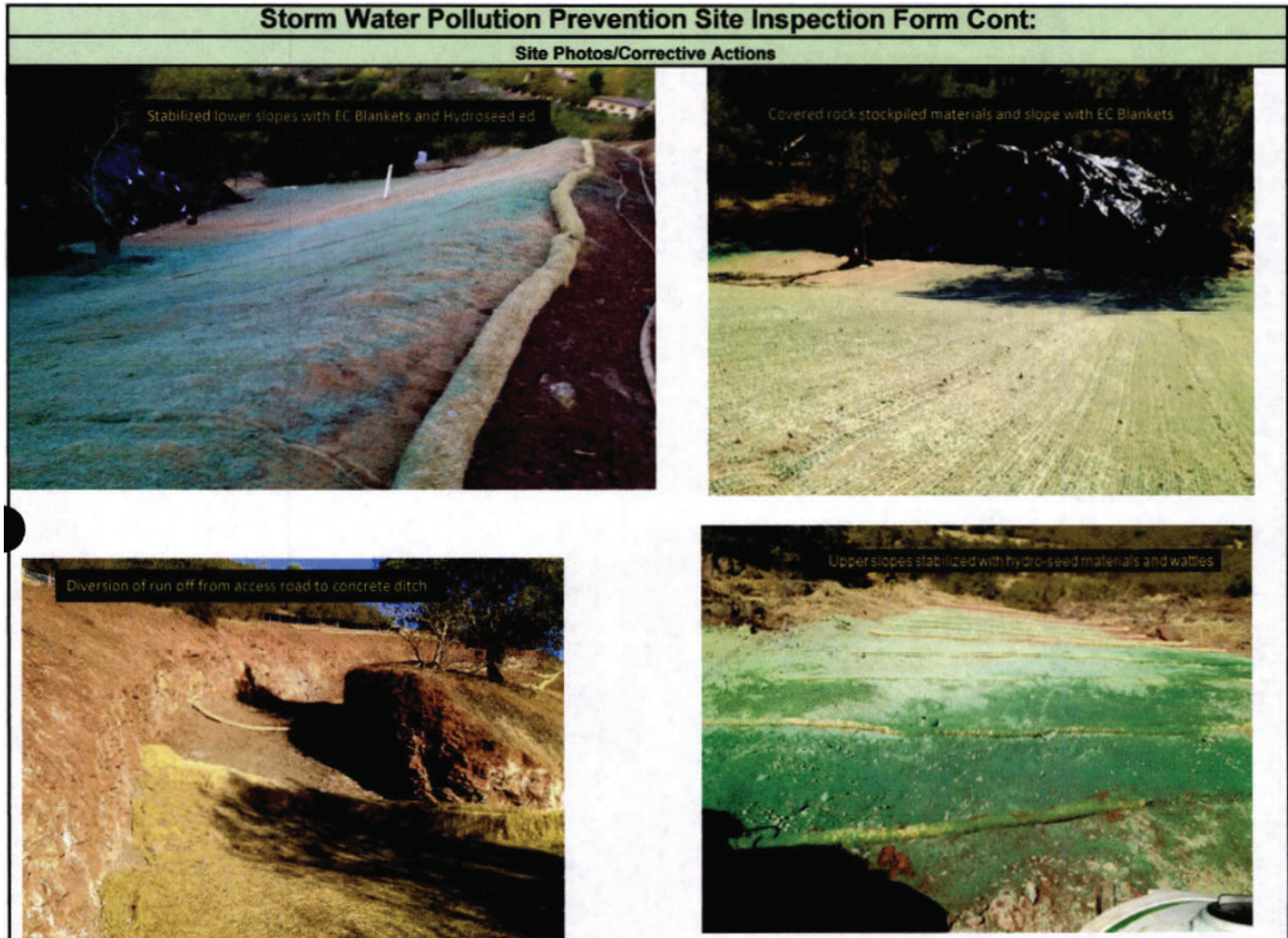


Figure 18

Photo documentation following installation of erosion and sediment control devices. All devices are consistent with the notes and details in the project plans (Source: Project SWPPP consultant).

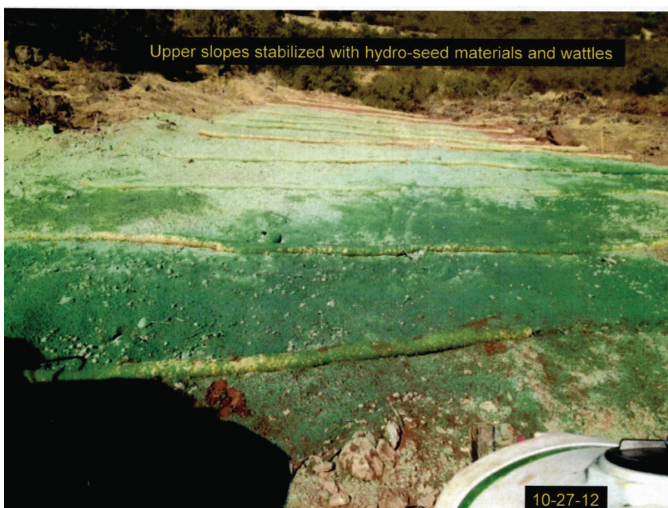


Figure 19

Photo documentation following installation of erosion and sediment control devices. All devices are consistent with the notes and details in the project plans (Source: Project SWPPP consultant).

Erosion and Sediment Control Activities

Erosion and sediment control were specifically identified as being part of the scope of work in the project plans. The grading notes state: "Contractor shall provide to the public works department an erosion and sediment control plan, and a schedule for implementation of such measures, if any lot or street grading is to be done between October 15 through April 1. Hydroseeding of all graded slopes shall be completed by November 1."

Examples of the identified erosion and sediment control can be seen via the site construction photos, such as **Figure 17** taken by the plaintiff and **Figure 18** and **Figure 19** taken by representatives documenting BMP implementation at the time of termination of the plaintiff. The installation of these erosion and sediment controls were part of the grading scope of work as delineated by the project plans.

performed pursuant to the terms and conditions of such agreement(s), Subcontractor shall perform such work in conformity with the terms and conditions of such agreement(s).

SECTION 10. **TERMINATION.** (i) Should Subcontractor fail to rectify any contractual deficiencies, including failure to pay its creditors, within three (3) working days from receipt of Contractor's written notice, Contractor shall have the right to take whatever steps he deems necessary to correct said deficiencies and charge the cost thereof to Subcontractor, who shall be liable for the full cost of Contractor's corrective action, including reasonable overhead, profit and attorney's fees. (ii) Contractor may at any time for any reason terminate Subcontractor's services hereunder at Contractor's convenience; in the event of termination for convenience; Subcontractor shall recover only the actual cost of work completed to the date of termination plus fifteen percent (15%) of the actual cost of the work for overhead and profit. Subcontractor shall not be entitled to any claim or lien against Contractor or Owner for any additional compensation or damages in the event of such termination.

SECTION 11. **INDEMNIFICATION.**

Figure 20

Termination terms in the project agreement between the plaintiff and defendant (Source: defendant).

Expert Opinion

The project plans clearly include erosion and sediment control as part of the work scope. As a result, any erosion and sediment control work performed at the site is not a changed condition — rather part of the scope of work outlined in project plans and specifications.

Work Valuation

Delineating the value of the work provided by the plaintiff as of the time of termination was accomplished by evaluating degree of completion of the task items delineated in the contractor's bid sheet. The plaintiff retained no documentation (i.e., time cards, expense receipts, rental agreements) to establish actual work effort expended. No topographic surveys were completed to document the extent of the plaintiff's completed work. As a result, the

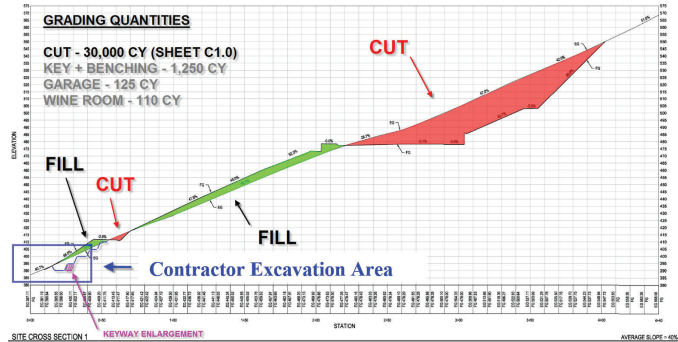


Figure 22

Contractor's work area in relation to overall project cut and fill. Note that the keyway and benching is not a significant (>20%) portion of the site work (Source: Cross-section from project plans).

degree of completion had to be estimated based primarily on available photographic evidence. The available agreement noted that the contract may be terminated at any time for any reason and that the subcontractor (plaintiff) would recover actual cost of work plus 15% overhead and profit. An excerpt of the agreement showing the termination clause is shown in Figure 20.

Note that for this agreement, the defendants (also the owners) enacted an agreement directly with the plaintiff who was the grading contractor.

An accepted scope of work was dated August 14, 2012 that outlined four primary work items: Excavation, Drainage, Drainage Bid Per C2.1, and Backfill, Waterproof, and

Work Item	Bid Amount	% Complete	Amount Due
EXCAVATION	\$ 287,400		\$ 35,638
<i>Mobilize Equipment</i>	\$ 2,500	100%	\$ 2,500
<i>Grub and clear new construction areas</i>	\$ 3,000	50%	\$ 1,500
<i>Remove tree stumps</i>	\$ 1,500	67%	\$ 1,000
<i>Cut and fill 30,000 CY earth, install perf drainage per typical soil report</i>	\$ 239,683	12%	\$ 27,963
<i>Chip trees & shrubs and spread onsite</i>	\$ 3,000	67%	\$ 2,000
<i>Provide all gravel & pipe for re-build</i>	\$ -	**Included in cut/fill	
<i>Compact to 90% per soil tech requirements</i>	\$ -	**Included in cut/fill	
<i>Provide all trucking & dump fees included</i>	\$ 4,500	15%	\$ 675
<i>Cut new roadway to 11" below final finish</i>	\$ 11,370	0%	\$ -
<i>Install 6" Class II base on roadway</i>	\$ 12,137	0%	\$ -
<i>Scarify & compact roadway</i>	\$ 9,710	0%	\$ -
DRAINAGE	\$ 34,740	0%	\$ -
DRAINAGE BID PER C2.1	\$ 26,650	0%	\$ -
BACKFILL, WATERPROOF & PERF PIPE	\$ 29,100	0%	\$ -
FOUNDATION	\$ 347,110	0%	\$ -
TOTAL	\$ 725,000		\$ 35,638

Figure 21

Breakdown of bid items and percent complete. Note: Items in gray italics are estimated as no detailed breakdown was provided by the plaintiff.

Estimated Grading Quantity (CY)	Variation (25%)	In-Scope Upper Limit Grading Quantity
30,000	7,500	37,500
31,500	7,875	37,875

Figure 23

Industry standard in-scope allowance.

Perf Pipe. This scope of work was consistent with a proposal submitted by the plaintiff to the defendants via email. The email proposal listed explicit dollar values for each work item and mirrored the August 2012 work categories. These amounts are summarized in **Figure 21** on page 12. Also summarized in **Figure 21** are the estimated completion for the bid items based on the available aerial photographs, site photographs, and site documentation. The plaintiff was insisting on full payment on the submitted bid (\$725,000) as well as additional amount of \$116,900 for “extra work” as a result of the alleged landslide/fault changed condition.

The grading quantities shown on the project drawings anticipated a project cut of 30,000 CY. The project cut volume accounted for excavation of material to create the building pad, the cut/fill associated with the entry driveway, and any off-haul of spoils if excess materials remained after grading activities were complete. **Figure 22** on page 12 shows the cut (red areas) and fill (green areas) that comprise the 30,000 CY volume. Examination of the plans by an experienced/seasoned contractor would have revealed that this grading quantity did not include grading of the keyway and benching, grading of the garage, grading of the wine room, or grading of the pool. These items were all aspects of the project called out on the drawings.

As a result, the actual total amount of cut for the grading operations was on the order of 31,500 CY. A typical allowance (per Caltrans standard specification and Public Works “Greenbook” see attachments) is 25% +/- variation on actual quantity. **Figure 23** shows a summary of additional quantities beyond the estimated bid amount that is considered “in-scope” based on industry standards/practices. For this project, that variation corresponds to plus or minus 7,000 to 8,000 CY of material.

To address the plaintiff’s allegation of additional work associated with enlargement of the keyway, an evaluation of additional quantities was performed. If one assumes the keyway is 250 ft long and has a minimum width of 8 ft and is 4 ft tall with two benches 15 ft wide and 3 ft tall, that amounts to approximately 1,130 CY. If the keyway was 15 ft wide, an increased quantity of approximately 260 CY is obtained. This is far short of the standard 25% allowance for the entire project. Only considering the keyway, the standard allowance would be 275 CY. The additional 260 CY is less than 275 CY, so the standard allowance is not exceeded.

To evaluate the work completed by the plaintiff, imagery from Google Earth was used as well as the project grading plans. **Figure 24** shows a close-up view of the



Figure 24

Close-up of where the plaintiff performed grading in fall of 2012. Note the top of the roadway embankment is at approximately El. +400 ft.

embankment in the spring of 2013. It is inferred that this condition is very similar to the condition at the end of site operations in October 2012. Note that the top of the berm is situated just under El. +400 ft.

A volumetric analysis was completed using the base surface as the “existing” (pre-project) contours shown on the “demolition sheet” drawing with the proposed grades

shown on the “grading plan.” The project cut quantity corresponding to the contract cut with proposed grades developed to El. +400 ft was approximately 3,800 CY. **Figure 25** through **Figure 27** show aerial oblique views of the volumetric analysis performed to compute the estimated cut volume completed by the plaintiff. No topographic data was collected during the course of the plaintiff’s work to corroborate the analytic results; however, the subsequent

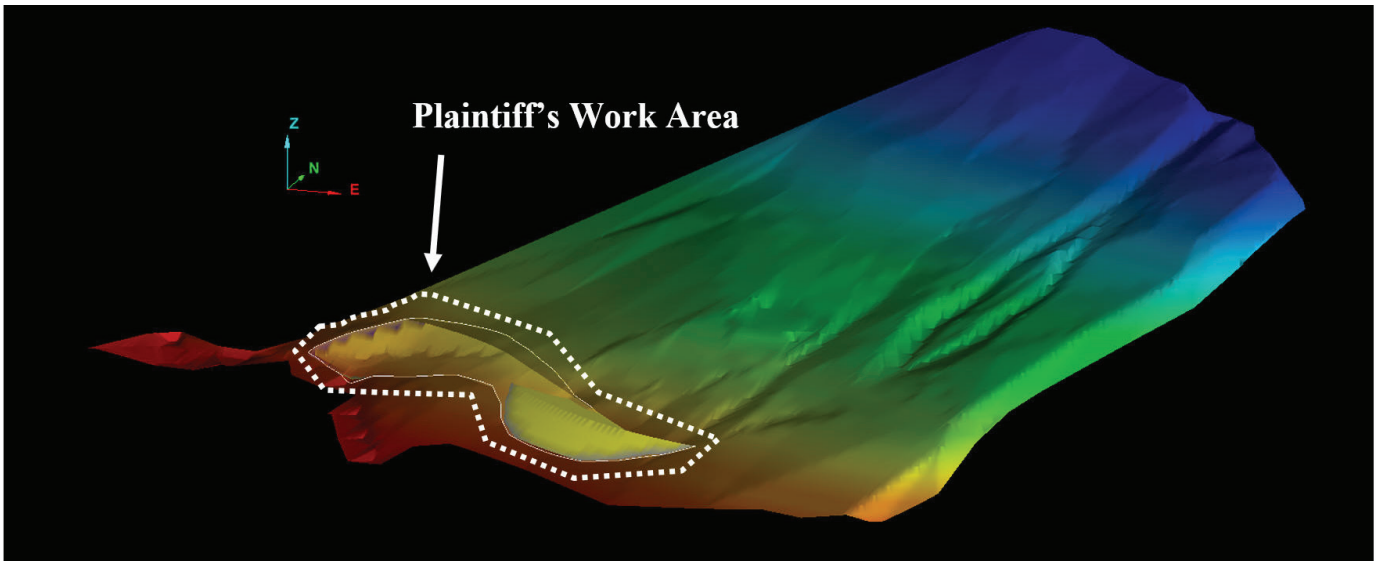


Figure 25

Aerial oblique view of volumetric analysis performed to compute cubic yards (CY) of excavation performed. White line delineates interpreted extents of plaintiff’s work.

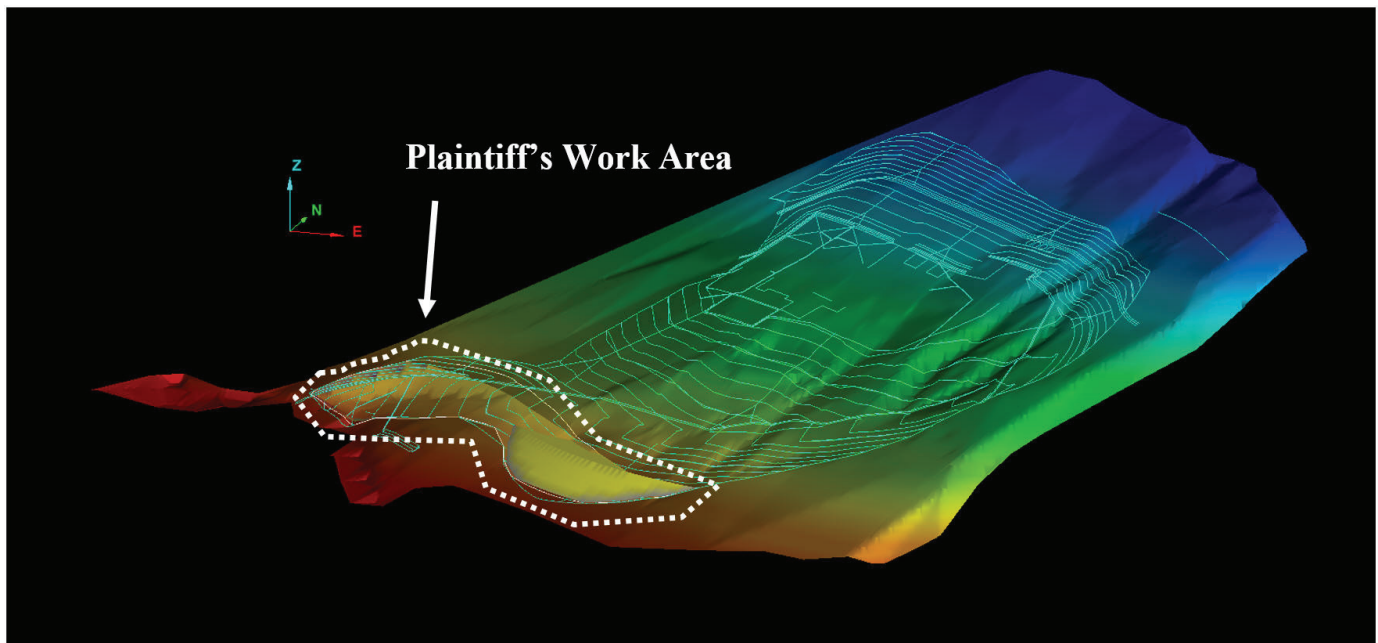


Figure 26

Aerial oblique view (Northwest) of volumetric analysis performed to compute cubic yards (CY) of excavation performed with overlay of project plans. White line delineates interpreted extents of plaintiff’s work.

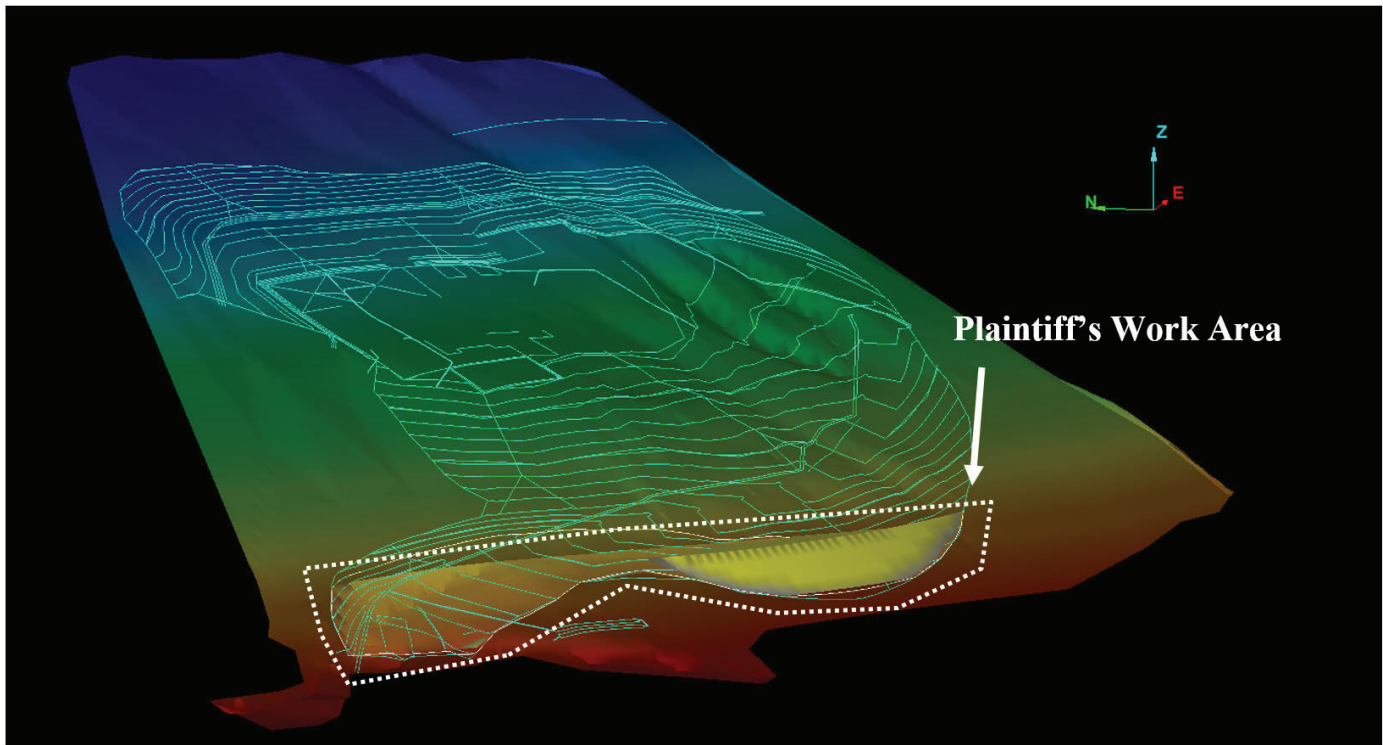


Figure 27

Aerial oblique view (northeast) of volumetric analysis performed to compute cubic yards (CY) of excavation performed with overlay of project plans. White line delineates interpreted extents of the plaintiff's work.

grading contractor (hired after termination of the plaintiff) confirmed the results of the analysis as being representative of the plaintiff's grading quantities.

Expert Opinion

Based on the author's review and analysis of the available evidence, the plaintiff completed about 3,800 CY of the estimated 30,000 CY of project cut (the basis for the plaintiff's scope of work and bid), which corresponds to approximately \$36,000. This amount is based on a proportion of the plaintiff's bid, which includes overhead and profit.

Conclusion

A number of allegations were brought forth by the plaintiff's relative to changed conditions and breach of contract. This review found no substantiation for any of the allegations. Rather, overwhelming evidence was uncovered that refuted the plaintiff's contentions. Specifically, the findings were:

- There is no and was no landslide within the approach driveway embankment grading limits. As a result, there are no "changed" conditions and no basis for a contract modification.

- There is and was no fault within the limits of the approach driveway embankment grading limits. As a result, there are no "changed" conditions and no basis for a contract modification.

- The project plans prepared by the project civil engineer clearly included erosion and sediment control as part of the work scope. As a result, any erosion and sediment control work performed at the site is not a changed condition — rather part of the scope of work outlined in project plans and specifications.

- Based on the author's review and analysis of the available evidence, the contractor completed about 3,800 CY of the estimated 30,000 CY of cut (which is what his scope of work is based on). This quantity corresponds to approximately \$36,000 of the original \$287,400 bid item for excavation. The author believes the reasonable value of the contractor's completed work is \$36,000, inclusive of the 15% overhead and profit.

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