

Camille Leung

From: Jack Chamberlain <jtuttlec@aol.com>
Sent: Friday, August 10, 2018 10:19 AM
To: Camille Leung
Subject: Re: Lot 11, The Highlands

Camille,

We have decided to move forward with Lot 11 because it has no grading issues. We believe that we will have satisfied all of the other County Departments and need to know if there are any other issues relating to the subject house that would preclude Plannings approval.

Cordially,

Jack Chamberlain

Camille Leung

From: Jack Chamberlain <jtuttlec@aol.com>
Sent: Monday, August 13, 2018 11:15 AM
To: Camille Leung
Subject: Re: Lot 11, The Highlands

Camille,

At the moment, we are focusing on lot 11. Sherry is out until next Monday. We intend to have the revisions to the drainage systems, required by her, to sign off at the at the County before she returns. That leaves you.

The current site design for lot 11 is:

EIR: Cut 1200 cu. yds. Fill 1000 cu. yds. Export 200 cu. yds.

Now: Cut 470 cu. yds. Fill 70 cu. yds. Export 400 cu. yds.

This is well below, in total, then what was envisioned by the civil and geotechnical engineers at the time the project was approved.

Jack

In a message dated 8/10/2018 1:30:31 PM Pacific Standard Time, cleung@smcgov.org writes:

Hi Jack,

Thank you for the update. The following is a list of the status/comments for the outstanding Agency reviews for Lot 11:

Please address email of 7/18/18:

I spoke with Sherry today regarding the outfall design which is located on a fill slope on Lots 9-11. As the drainage will daylight uphill of the property line, County wants to encourage you to comply with the requirements of the Recorded Conservation Easement, in maintaining the overall nature state of the easement area. While the area of the conservation easement is off-site, stormwater will be directed to it from the project, and erosion to and instability of the area should be prevented in any design. Stormwater flow should mimic existing conditions.

Please address email of 6/18/18:

1. The earthwork volumes listed in BKF report for Lots 5-11 deviate from the 2015 Cornerstone report, as they do not include the amount of earthwork for landslide repair. For Lots 9-11, the grading volumes in Table 2 are the same as those shown on the Building plans as "excluding earthwork from

site strippings and soil stabilization factors". For Lots 5-8, the grading volumes in Table 2 are the same as those shown on the Building plans as "excluding earthwork from geotechnical slope remediation activities".

Please update the grading volumes included in Table 2, as well as the narrative of the memo, to include the volume of grading required to implement the recommendations contained in the Cornerstone report, and a description of how implementation of these recommendations relates to the grading activities described by the May 14th memo.

2. Grading plans submitted to the Building Inspection Section for all lots do not show grading necessary for slope repair work. A separate building permit for slope repair for Lots 9-11 and Lots 5-8 will need to be submitted prior to issuance of Building permits for houses on these lots.

3. Please provide a separate analysis of grading and truck trips for Lots 9-11 and Lots 5-8, as there is a potential for rough grading on Lots 9-11 to be completed far in advance of grading on Lots 5-8. Please describe the estimated truck trips under a concurrent grading scenario for Lots 5-11 and under a separate grading phases (Lots 9-11 then Lots 5-8) scenario.

4. For Lots 9-11, please correct the net volume of material from 800 cu. yds. import to 800 cu. yds. export. Additional comments on the Drainage Plan and Grading Plan for Lots 9-11 will be provided to you by the County's Geotechnical Section in a separate letter.

GEO: 6/19/2018 XL: comments from in house and CSA sent to the geotechnical consultant. email saved in DOC of BLD2016-00158

SEWER: Fees payment required BV ; Final Submittal (see Docs) 3/19/18 BV (Please pay fee)

PLANNING: 8/10/18 CML - For issuance of Grading Permit Hard Card:

1. Steve M approval of Grading Moratorium Exception (not needed if dry season: 5/1 – 9/30)

2. WDID# and SWPPP – Please confirm that the submitted NOI applies to Cowpens site (project address is listed as Ticonderoga)

3. Biological Reports (see Mitigation Measures for timing)

a. Woodrat survey

b. Bird Survey

c. Bat Survey

d. CA Red legged Frog – Lot 11

e. Willow scrub – Lot 11

f. Need biological review of erosion control plan for Lot 11 – Make any adjustments to Plan and resubmit

4. Once all review agencies sign off: Camille to mail Construction Notices to neighbors within 200-feet of lots, per Condition 4t

Thanks

Camille Leung, Senior Planner

Planning & Building Department

455 County Center, 2nd Floor

Redwood City, CA 94063

650-363-1826

cleung@smcgov.org

From: Jack Chamberlain [<mailto:jtuttlec@aol.com>]

Sent: Friday, August 10, 2018 10:19 AM

To: Camille Leung <cleung@smcgov.org>

Subject: Re: Lot 11, The Highlands

Camille,

We have decided to move forward with Lot 11 because it has no grading issues. We believe that we will have satisfied all of the other County Departments and need to know if there are any other issues relating to the subject house that would preclude Plannings approval.

Cordially,

Jack Chamberlain

Camille Leung

From: Scott Fitinghoff <sfitinghoff@cornerstoneearth.com>
Sent: Friday, August 10, 2018 2:02 PM
To: Camille Leung; Jack Chamberlain
Cc: Sherry Liu; Pete Bentley; Steve Monowitz; 'Roland Haga'; 'Jonathan Tang'
Subject: RE: Lot 11, The Highlands

Camille,

Thank you for the summary. I am working with Jack and Roland/Jonathan to address Sherry's comments for all Lots, but we are tackling Lot 11 first. I have provided recommendations/plan markups to BKF to address the Sherry's 7-18-18 email and concern about discharging onto the existing slope and a written response addressing CSA's and Sherry's comments. These will be submitted. Have a nice weekend.

Scott

Sincerely,

Scott E. Fitinghoff, P.E., G.E.
Principal Engineer
408-747-7503 (cell)



1259 Oakmead Parkway
Sunnyvale | California 94085
T 408-245-4600 Ext. 103 | F 408-245-4620

From: Camille Leung <cleung@smcgov.org>
Sent: Friday, August 10, 2018 1:30 PM
To: Jack Chamberlain <jtuttlec@aol.com>
Cc: Sherry Liu <xliu@smcgov.org>; Pete Bentley <pbentley@smcgov.org>; Steve Monowitz <smonowitz@smcgov.org>; Scott Fitinghoff <sfitinghoff@cornerstoneearth.com>; 'Roland Haga' <RHAGA@BKF.com>; 'Jonathan Tang' <jtang@BKF.com>
Subject: RE: Lot 11, The Highlands

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Please address email of 7/18/18:

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the project, and erosion to and instability of the area should be prevented in any design. Stormwater flow should mimic existing conditions.

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 - f. Need biological review of erosion control plan for Lot 11 – Make any adjustments to Plan and resubmit
4. Once all review agencies sign off: Camille to mail Construction Notices to neighbors within 200-feet of lots, per Condition 4t

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Camille Leung, Senior Planner
Planning & Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063
650-363-1826
cleung@smcgov.org

From: Jack Chamberlain [<mailto:jtuttlec@aol.com>]
Sent: Friday, August 10, 2018 10:19 AM
To: Camille Leung <cleung@smcgov.org>
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Cordially,

Jack Chamberlain

Camille Leung

From: Camille Leung
Sent: Monday, August 27, 2018 12:16 PM
To: 'Deke & Corrin Brown'
Subject: RE: Highlands
Attachments: Lots 5-11Reports received 082118.pdf

Hi Deke and Corrin,

Had a great summer! Hope you guys had a good one too!

Please see attached for the reports that were submitted from the Chamberlain team last week. I have requested a PDF of the revised civil plans (Lots 9-11) from the project engineer and should be getting that soon. Will pass them along once I get it.

Thanks!

From: Deke & Corrin Brown [mailto:d.cbrown@comcast.net]
Sent: Saturday, August 25, 2018 7:01 AM
To: Camille Leung <cleung@smcgov.org>
Subject: Highlands

Hi Camille,

How was your summer?

Deke and I are still up to our eyelashes taking care of our Moms (both are 96).

Some neighbors noticed some new activity on the county's website dated this past Tuesday 8/21 on Cobblehill and Cowpens. It reads:

[8/21/2018 Response to GEO comments, added soils information to new additional Civil pages](#)

Can you please send this to us ASAP, and any other new info, including grading or soil info?

Also, can we please receive new docs as they come in, moving forward?

Thanks very much,

Deke & Corrin

Camille Leung

From: Camille Leung
Sent: Monday, August 27, 2018 9:42 AM
To: 'Jonathan Tang'
Cc: 'Jack Chamberlain'
Subject: Civil Plans dated 8/21/18

Hi Jonathan,

Can you send me digital files of Civil Drawings dated 8/21/18?

Thank you!

Camille Leung, Senior Planner
Planning & Building Department
San Mateo County
455 County Center, 2nd Floor
Redwood City, CA 94063
Phone - 650-363-1826
Fax – 650-363-4849

TECHNICAL MEMORANDUM
Date: August 7, 2018

BKF Job Number: 19950158-20

Deliver To: Mr. Steve Monowitz,
 Director of Building and Planning
 San Mateo County
 Planning & Building Department
 455 County Center, 2nd Floor
 Redwood City, CA 94063

cc: Jack Chamberlain
 Pete Bentley, SMCo. Bldg.
 Camille Leung, SMCo. Planning
 Scott Fitinghoff, CEG
 Jonathan Tang, BKF

From: Roland Haga, PE, PLS, Leed®AP
 Vice President, BKF Engineers

Subject: Highland Estates Lots 5-11 Grading Earthwork

 RESUBMITTAL
 AUG 21 2018
 San Mateo County
 Building Inspection

The purpose of this memorandum is to document and describe the grading earthwork quantities associated with Highland Estates Subdivision in respect to the Improvement Plans for Lots 5-8, including earthwork associated with the required Geotechnical Slope Mitigation for lots 5 through 8 only. Please note the grading earthwork quantities associated with the geotechnical requirements on Lots 9-11 are negligible and have not changed on the site permit set of improvement plans for lots 9, 10 and 11.

The project approved Vesting Tentative Map (VTM) prepared by BKF, dated February 2, 2010 shows grading earthwork quantities using aerial topographic information with contours at 5 foot intervals. The grading earthwork quantities calculated for Lots 5-8 shown in the VTM are presented in Table 1.

Table 1 – Lot 5 through 8 Grading Earthwork Quantities (Vesting Tentative Map)

	Lot 5	Lot 6	Lot 7	Lot 8	5-8 Total
Cut (CY)	1,100	1,400	1,400	800	4,700
Fill (CY)	0	0	200	300	500
Net (CY)	1,100 Export	1,400 Export	1,200 Export	500 Export	4,200 Export

Earthwork quantities shown above are based on the approved Vesting Tentative Map dated February 2, 2010.

Upon approval of the VTM, and during the final design process and preparation of the Improvement Plans for Lots 5-8, grading earthwork quantities were calculated using updated design-level topographic survey, with structural retaining wall design, house foundations and other design information not yet developed at the VTM level. The project Improvement Plans for Lots 5-8 prepared by BKF, dated February 25, 2016 shows updated grading earthwork quantities and are presented in Table 2, below.

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82100
02100

Table 2 – Lot 5 through 8 Grading Earthwork Quantities (Improvement Plans)

	Lot 5	Lot 6	Lot 7	Lot 8	5-8 Total
Cut (CY)	1,740	2,030	2,170	2,080	8,020
Fill (CY)	0	0	40	90	130
Net (CY)	1,740 Export	2,030 Export	2,130 Export	1,990 Export	7,890 Export

Earthwork quantities shown above are based on the Improvement Plans dated February 25, 2016.

Analysis from Cornerstone Earth Group, associated with the slope mitigation and reconstruction/repair as required by project Condition of Approval Item No. 4.M, the grading earthwork quantities for Lots 5-8 were further refined and calculated based on geotechnical analysis and recommendations for site stripping, earthwork shrinkage and swelling factors, and estimated unsuitable material off-haul as part of the geotechnical slope mitigation for lots 5 through 8. The grading earthwork quantities associated with slope mitigation per Geotechnical information and recommendations are reflected in Table 3.

Table 3 – Lot 5 through 8 Slope Mitigation Cut Earthwork Quantities

	Lot 5	Lot 6	Lot 7	Lot 8	5-8 Total
Slope Mitigation Cut (CY) from Site Stripping, Shrinkage and Swelling Factors	520 Export	580 Export	660 Export	1,220 Export	2,980 Export

Cut earthwork quantities shown above are based on site stripping, shrinkage and swelling factors associated with the slope mitigation analysis per attached Summary of Estimated Soil/Bedrock Earthwork Quantities related to Geotechnical Mitigation, Highland Estates (Lots 5 to 8), prepared by Cornerstone Earth Group dated July 8, 2017¹.

The grading earthwork quantities shown on the Improvement Plans dated February 25, 2016, and updated with cut earthwork quantities based on Geotechnical information are presented in Table 4.

Table 4 – Lot 5 through 8 Grading Earthwork Quantities with Slope Mitigation

	Lot 5	Lot 6	Lot 7	Lot 8	5-8 Total
Cut (CY)	1,740	2,030	2,170	2,080	8,020
Slope Mitigation Export Credit (CY)	-520	-580	-660	-1,220	-2,980
Fill (CY)	0	0	-40	-90	-130
Net (CY)	1,220 Export	1,450 Export	1,470 Export	770 Export	4,910 Export

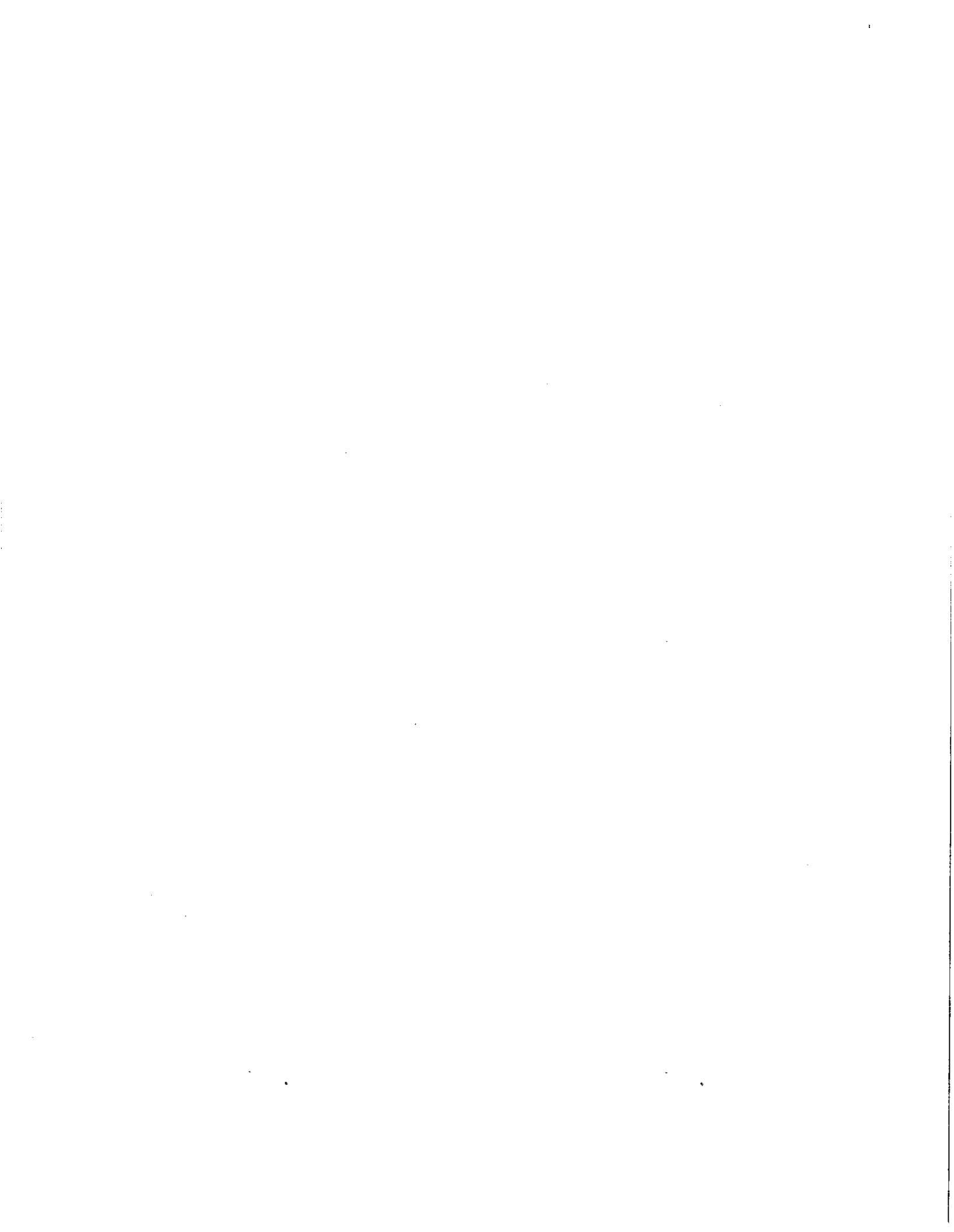
Earthwork quantities shown above are based on the approved Improvement Plans dated May 10, 2018.

The total earthwork export from Lots 5-8 is 4,910 cubic yards. The total earthwork export from Lots 9-11 is 800 cubic yards (per approved Improvement Plans dated May 10, 2018). This results in a net earthwork export of 5,710 cubic yards for Lots 5-11.

The 4,910 cubic yards from Lots 5-10 is equivalent to approximately 409 truck trips and the 800 cubic yards from Lots 9-11 is equivalent to approximately 67 truck trips. Accumulatively for Lots 5-11, the 5,710 cubic yards of export is equivalent to approximately 476 truck trips. The off-hauling associated with this export will take 4-5 weeks, at approximately 20 trucks per day. The off-hauling associated with the approximately 20 trucks per day is less than the traffic volumes of 68 (prorated for seven lots, Lots 5-11) daily project operations trips per day² and is significantly less than the project traffic volumes from the daily project operations over a 4-5 week period. This is consistent with what was analyzed as part of the Recirculated Draft EIR² Section 2.3 Environmental Analysis, Transportation.

Attachments: ¹Summary of Estimated Soil/Bedrock Earthwork Quantities Related to Geotechnical Mitigation, Highland Estates (Lots 5 to 8), July 8, 2017.

²Transportation Impact Assessment for Highland Estates, prepared by Fehr & Peers, dated September 2008. Equivalent 108 daily project operations trips per day for a total of 11 Lots.



Date: July 8, 2017
Project No.: 230-1-9
Prepared For: Mr. Jack Chamberlain
TICONDEROGA PARTNERS, LLC
655 Skyway, Suite 230
San Carlos, California 94070
Re: Summary of Estimated Soil/Bedrock Earthwork
Quantities Related to Geotechnical Mitigation
Highland Estates (Lots 5 to 8)
Ticonderoga Drive
San Mateo, California

Dear Mr. Chamberlain:

As requested, this letter presents our summary of estimated soil/bedrock earthwork quantities related to geotechnical mitigation for Lots 5 to 8 of the Highland Estates project in the County of San Mateo, California. Our services were performed in accordance with our proposal and agreement, dated July 1, 2017. As you know, our firm prepared a report for this project, titled "Updated Geotechnical Investigation, Highland Estates Lots 5 through 11, Ticonderoga Drive/Cobblehill Place/Cowpens Way, San Mateo, California" dated October 30, 2015. Prior to our 2015 report, over the decades there have been several geotechnical and geologic related investigations and analysis of the soil and bedrock conditions and recommendations made to mitigate the shallow landsliding occurring at Lots 5 to 8 and these documents are summarized in the above report and incorporated into the letter by reference. The project Civil Engineer has prepared design level grading plans for Lots 5 to 8 and these are presented on Sheets C5.3, C6.3, C7.3, and C8.3 of the plan sets for each lot.

Discussion of Earthwork and Estimated Quantities Related to Geotechnical Mitigation

As identified in the previous geotechnical and geologic reports and project EIR, shallow landsliding has been identified as a geologic/geotechnical condition that needs to be addressed during the site development. Cornerstone and other geotechnical engineers and engineering geologists have concluded that development of these lots is feasible and have provided geotechnical recommendations to mitigate the shallow landsliding.

Grading will be performed at Lots 5 to 8 to establish the building pads, retaining walls, driveways, street improvements along Ticonderoga Drive including construction of the retaining wall required by the public works department, and mitigation of shallow landsliding. Grading will be performed at the same time for Lots 5 to 8. In general, the mitigation work will consist of performing earthwork (grading) to excavate or remove the landslide materials down to undisturbed bedrock materials to establish keyways and benches, installation of subsurface

drains to control ground water, and replacement with suitable excavated soils as compacted fills.

The earthwork related to this geotechnical mitigation is estimated to include up to 25,000 cubic yards for excavation below the design grades shown on the project grading plans to excavate the landslide materials and establish keyways and benches in the undisturbed ground. Some of this excavated material will not be suitable for reuse because it will have too much organics or will not meet the target shear strength properties for reuse at the project site. The unsuitable material will be identified during grading by our staff and will be stockpiled for off-haul. Based on our observations at the site and experience on similar projects, we estimate the upper 1 to 2 feet of the graded surface area of the site below the site proposed site grades will be unsuitable for re-use because of high organic content. Based on discussions with BKF, we understand this corresponds to about 1,000 to 2,000 cubic yards. During excavation below the surficial unsuitable material, we anticipate that small pockets of additional unsuitable material will be encountered the either has too much organics and/or does not meet the target soil shear strength properties; the volume of material for this portion of the excavated material is estimated to be on the order of 500 yards corresponding to about 1/2 of a percent of the 25,000 cubic yards of excavation of the landslide materials. When the suitable excavated material is reused and compacted to backfill the excavation resulting from removal of the landside material, it will "shrink" which means that at least 10 percent or more material will have to be used to restore the grades back to the original ground surface or structural excavation grades for the residences. The earthwork quantity for "shrinkage" is estimated to be on the order of 2,500 yards for this project. In summary, we estimate that 4,000 to 5,000 yards of suitable material will be needed to balance the above items related to geotechnical earthwork mitigation for Lots 5 to 8.

Closure

We hope this provides the information you need at this time. Recommendations presented in this letter have been prepared for the sole use of Ticonderoga Partners, LLC specifically for the Highland Estates Lots 5 to 8 project in San Mateo County, California. Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at this time and location. No warranties are either expressed or implied. The estimated volumes described above are based on our experience with similar projects with similar geologic conditions but the actual quantities will be determined in the field during grading and we recommend that you carry a contingency in the project budget to cover any variations. The limitations described in our report are incorporated into the letter by reference.

If you have any questions or need any additional information from us, please call and we will be glad to discuss them with you.

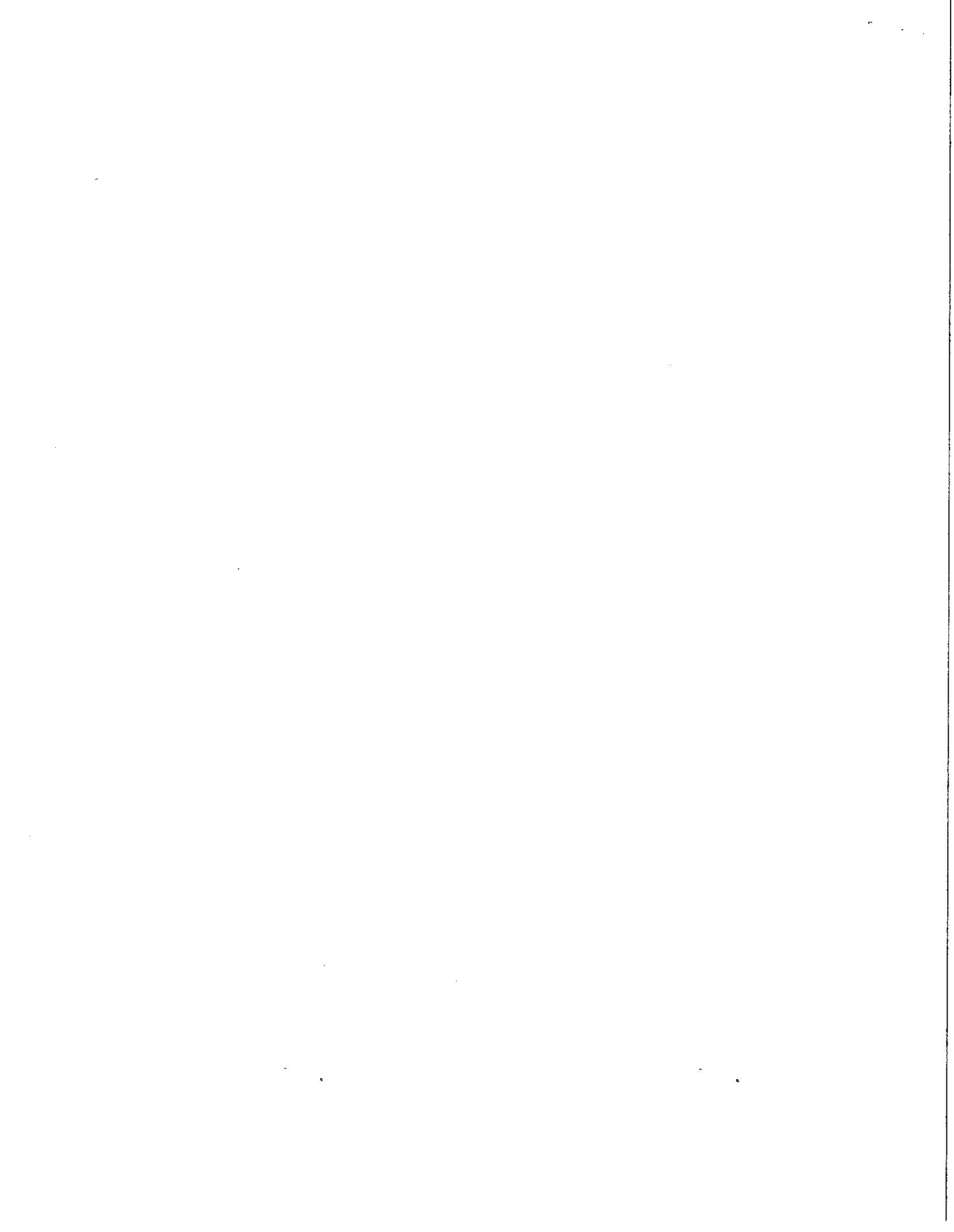
Sincerely,

Cornerstone Earth Group, Inc.

Scott E. Fitinghoff, P.E., G.E.
Senior Principal Engineer

SEF:sef

Addressee (1 by email)



EXECUTIVE SUMMARY

This report presents the findings, conclusions, and recommendations of the transportation impact study conducted by Fehr & Peers for the Highland Estates project, an eleven-unit single family residential development proposed in unincorporated San Mateo County, California. The proposed project would subdivide an approximately 99-acre parcel into eleven lots, with the remaining 92.46-acre parcel to be designated as common open space. The residential units would range in size from 2,800 to 3,600 square feet.

STUDY APPROACH

This study analyzed traffic conditions at three existing intersections, as shown on Figure 3. The intersections, as well as the transit, bicycle, and pedestrian networks were analyzed under four scenarios:

1. Existing Conditions
2. Existing With Project Conditions
3. Cumulative (Year 2030) No Project Conditions
4. Cumulative (Year 2030) with Project Conditions

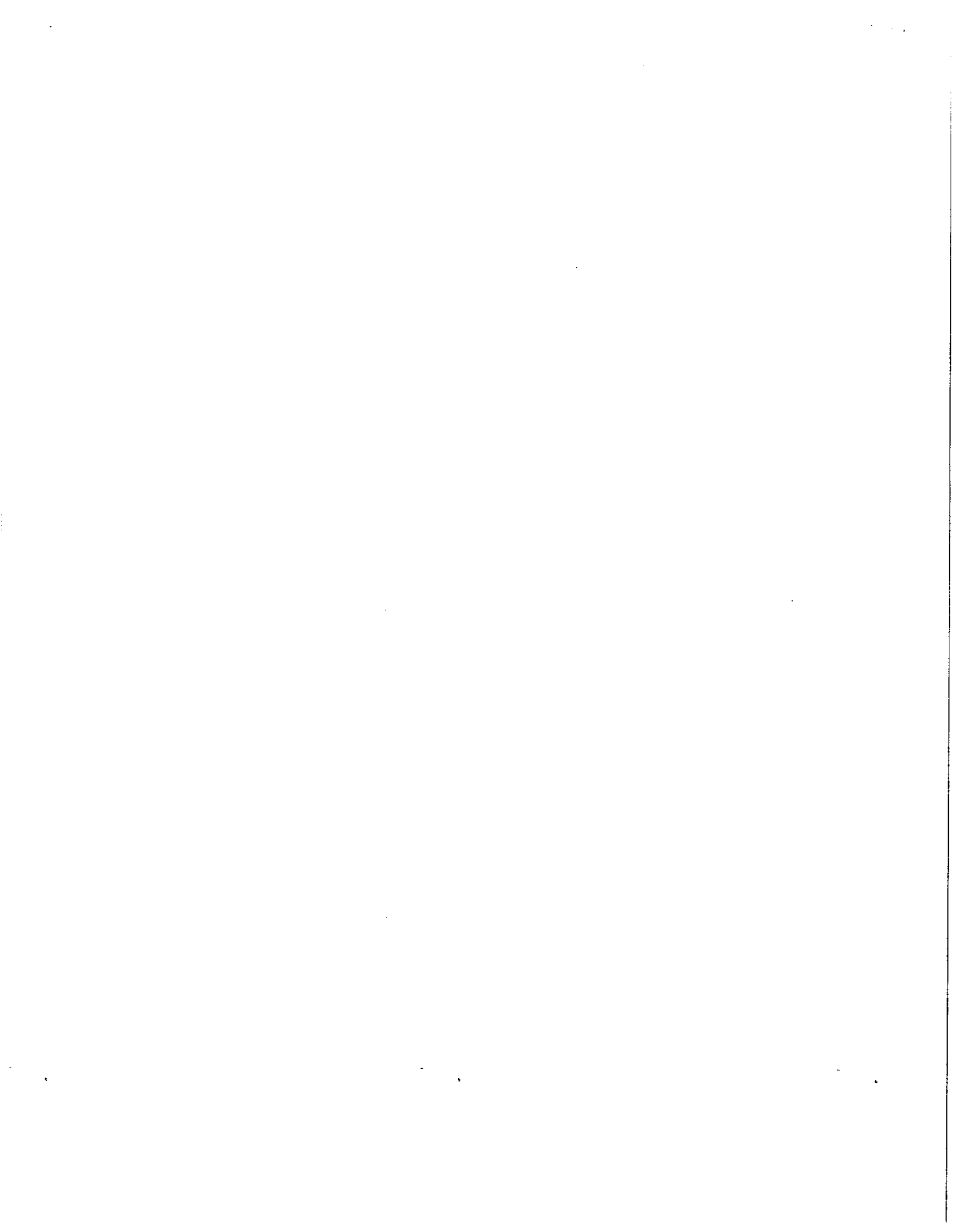
These scenarios were compared against each other using the significance criteria identified by governing documents to determine project impacts. Near-term conditions were qualitatively discussed to address the influence of the three San Francisco Public Utilities Commission (SFPUC) construction projects in the vicinity of the study area.

SUMMARY OF FINDINGS

The proposed project would generate 108 daily, 13 AM peak hour, and 15 PM peak hour total vehicle trips. This equates to approximately 0.5% of all vehicle trips on local streets in the study area, while it would represent about half of that under Cumulative (Year 2030) conditions.

The project's contribution to projected traffic growth at each study intersection between Existing and Cumulative conditions would be low, representing an average contribution of less than 1% of overall cumulative growth.

According to the significance criteria, the proposed project would have a **less-than-significant** impact on the study intersections and surrounding transportation network under Existing and Cumulative conditions.



BLD 2016 · 00158
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00160



Date: August 10, 2018
Project No.: 230-1-6
Prepared For: Mr. Jack Chamberlain
TICONDEROGA PARTNERS, LLC
655 Skyway, Suite 230
San Carlos, California 94070
Re: Geotechnical Consultation and
Response to County of San Mateo
Geotechnical Comments
San Mateo Highlands (Lot 11)
2184 and 2185 Cobblehill Place and 88 Cowpens Way
San Mateo, California
County of San Mateo Geotechnical File Number
BLD2016-00158--00164

RESUBMITTAL
AUG 21 2018
San Mateo County
Building Inspection

Dear Mr. Chamberlain:

As requested, this letter presents our geotechnical consultation and response to the recent County of San Mateo geotechnical comments for Lot 11 for the above referenced project, received via email on June 19, 2018. Our services were performed in accordance with our proposal and agreement, dated April 20, 2016. As you know, our firm prepared a report for this project, titled "Updated Geotechnical Investigation, Highland Estates Lots 5 through 11, Ticonderoga Drive/Cobblehill Place/Cowpens Way, San Mateo, California" dated October 30, 2015. Our Geotechnical Review of Foundation and Civil Plans for Lots 9 to 11 were presented in three letters (one for each lot) dated December 2, 2016. We also prepared a document titled "Recommended Standard Operating Procedure (SOP) for NOA Intrusive Work, Lots 9 to 11, Highland Estates" dated March 17, 2017. Additionally, we have previously prepared a letter titled "Response to County of San Mateo Planning Comments – Conditions 37 and 38, San Mateo Highlands (Lots 9 to 11)" dated September 25, 2017.

Timeline of Geotechnical Reviews for Lots 9 through 11

We understand that the building plans for Lots 9 through 11 have been under review by the County of San Mateo for nearly two years. Our firm has reviewed the previous sets of plans and responded to previous comments from the County of San Mateo Geotechnical Section. On January 4, 2017, we received an email from Ms. Jean Demouthe (who has since retired) stating that the Geotechnical Section has signed off on these three lots. More recently, we understand that sets of plans for Lots 9 through 11 were submitted on June 18, 2018 and this has triggered additional comments from Ms. Sherry Liu of the Geotechnical Section. In addition, we understand an outside geotechnical consultant has reviewed the recent plan set submittals and

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provided comments that were incorporated into Ms. Liu's comments dated June 18, 2018. Our response to the new comments are presented below.

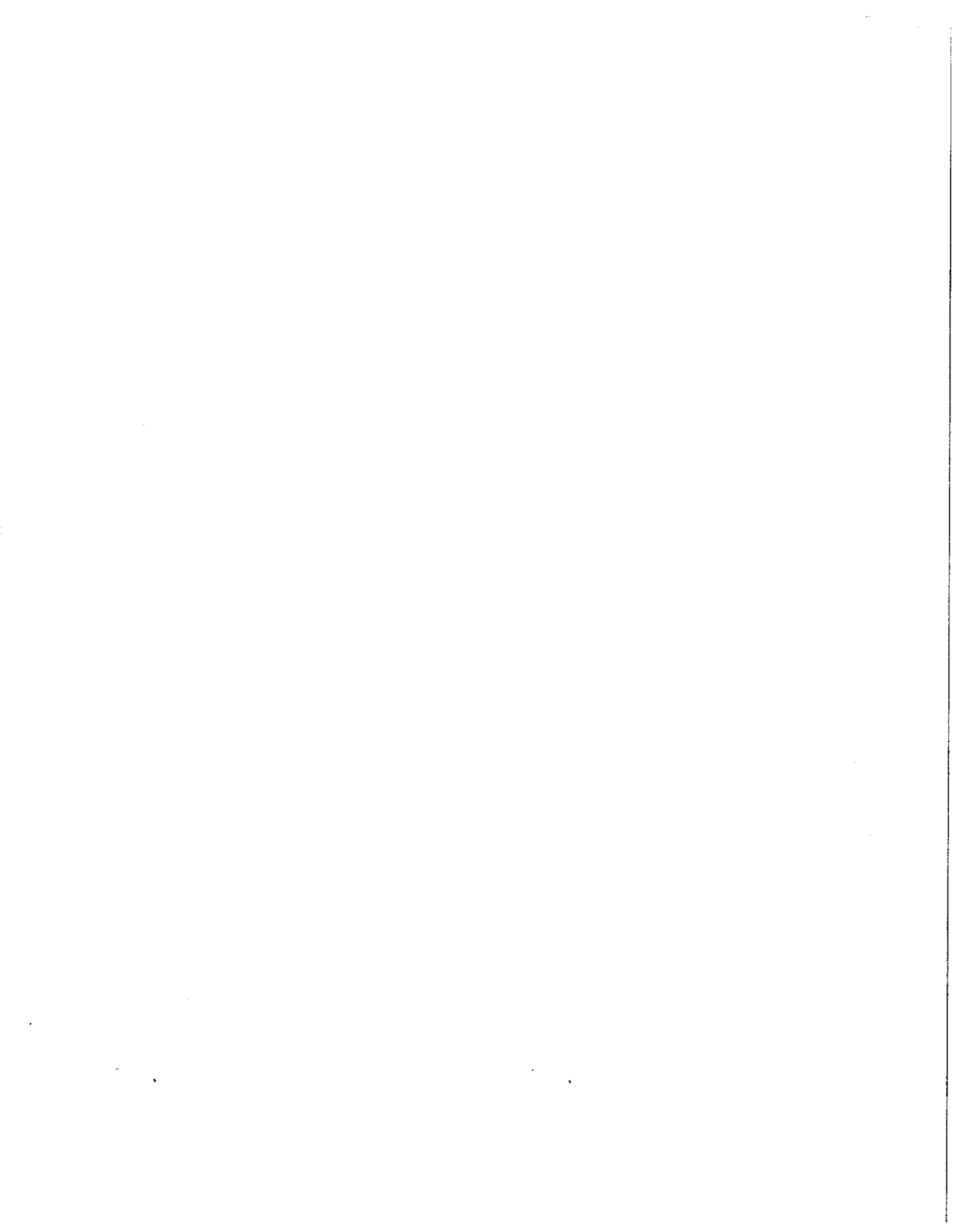
Response to Comments June 18, 2018 for Lot 11 Only

Comment #1: *The proposed slope repair listed in the geotechnical report is not included in the current grading plans, for any of the listed lot. Please Check.*

CEG Response:

The proposed slope repair recommendations in our geotechnical report are incorporated in the current grading plans by reference. Specifically, Note 2 on Sheets C9.2, C10.2 and C11.2 (for Lots 9, 10, and 11, respectively) states: "Perform work in conformance with the recommendation of the project geotechnical engineering report titled "Updated Geotechnical Investigation, Highland Estates Lots 5 through 11, Ticonderoga Drive/Cobblehill Place/Cowpens Way, San Mateo County, California" prepared by Cornerstone Earth Group, dated October 30, 2015. Grading work will be subject to approval of geotechnical engineer." Remedial grading is not anticipated for Lot 11 because only minor cuts and fills are proposed for the driveway and the proposed residence will be "cut" into the hillside and supported on drilled piers founded into bedrock. Representatives of Cornerstone (including Engineering Geologists, Geotechnical Engineers, and Engineering Technicians) will be present during the site grading to observe the conditions encountered, make recommendations, and perform compaction testing to document the earthwork is being performed in accordance with our geotechnical/geological recommendations.

Comment #2: *From CSA (Outside Geotechnical Consultant): The proposed drainage discharge on the face of the fill slope (even with the depicted rip rap) is not within the prevailing standards of geotechnical practice and is not something our office could approve (near the common property line between Lots 9 and 10) {Comment 2A}. It is also concerned that the 25 feet high 2:1 fill slope is not consistent with Cornerstone's recommendations (we felt their recommendations were generally appropriate and prudent in the 2017 Update Report) {Comment 2B}. CSA is concerned about the extent of fill placement proposed on Lot 9. {Comment 2C}. It should be appreciated that this fill will place new loads on underlying Franciscan sheared bedrock materials that do not have entirely predictable strength properties. {Comment 2D}. Our concerns with Lot 11 primarily relate to the storm drain pipe depicted downslope of the residence. This buried storm drainage pipe crossed near the top of slope r features that indicate either past significant erosion or landslides. The concern is that this pipe could be subjected to significant lateral displacement from soil creep or slope instability. If a joint of this pipe is pulled apart than concentrated discharge could occur undetected until a more significant slope failure is triggered. Ideally, a buried pipe would not be routed parallel to slope contours below the residence unless the pipe is extended to a depth where it is embedded in bedrock. {Comment 2E}. Cornerstone shall critically evaluate all planned location for discharge of street drainage and concentrated roof drainage. Inappropriate discharge locations could result in significant erosion and slope instability problems considering local earth materials and slopes. {Comment 2F}.*



CEG Response: For the purposes of our response to this comment, we will provide our response for Lot 11 since it is located at separate a location. Additionally, we have subdivided Comment 2 into six parts; Comments 2A through 2F as designated above. We also visited the site on June 29, 2018 and July 8, 2018 to review the current conditions in preparation of our responses to these comments. Additionally, we reviewed BKF's Technical Memorandum titled "Highland Estates Lots 9-11 Stormwater Outfall Rock Riprap" dated August 7, 2018.

Response to Comments on Lot 11 (Comments 2E and 2F)

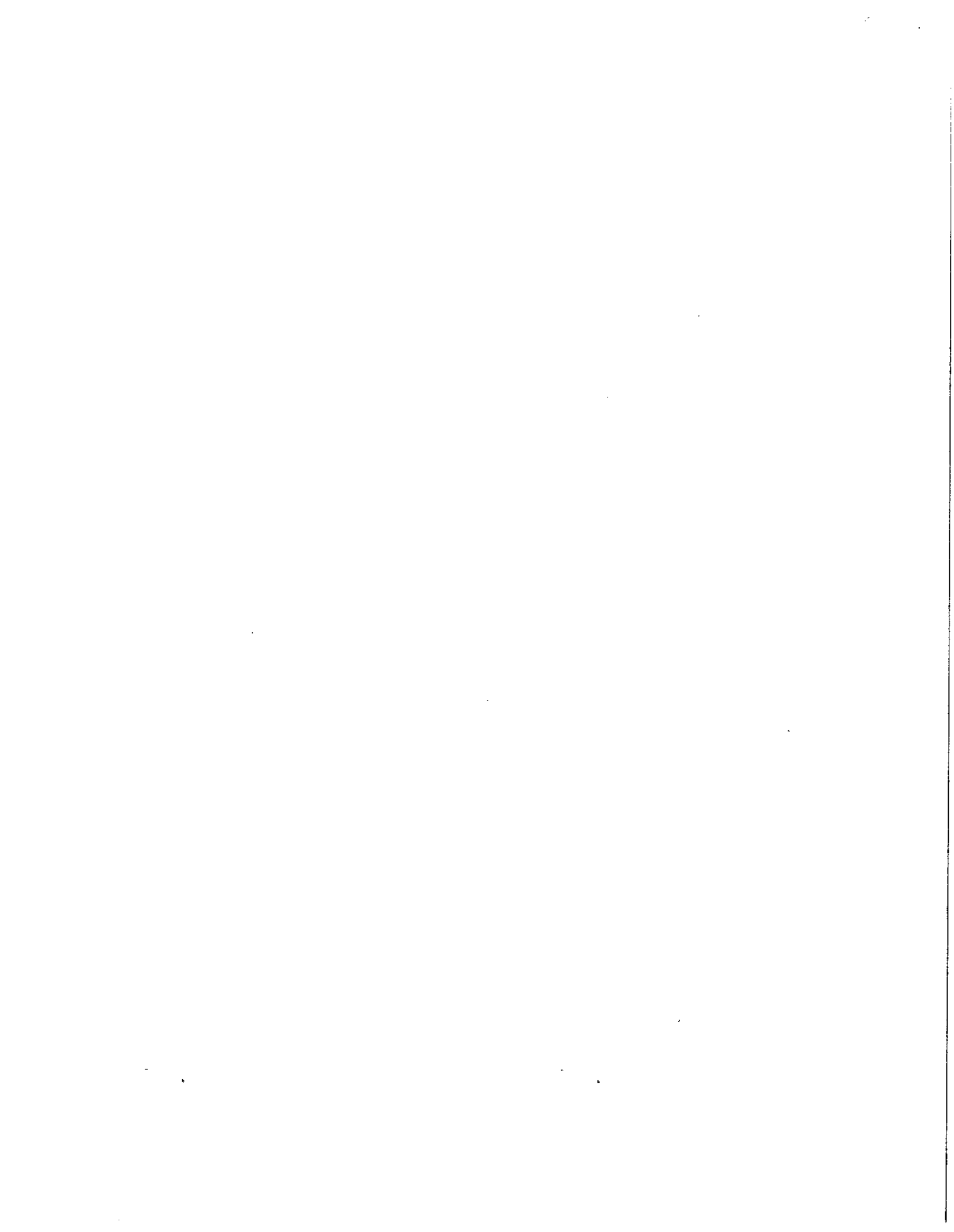
Summary of Site Reconnaissance by Cornerstone on June 29, 2018 and July 8, 2018.

We visited Lot 11 on June 29, 2018 and July 8, 2018 to observe the surface conditions. The surface conditions are consistent with those described in our 2015 report except that the thick growth of shrubs and brush has been cut down to expose the ground surface on most of the site area. The exposed earth materials are consistent with those previously reported in our 2015 report and the limits of undocumented fill are more apparent with the brush cleared and are consistent the limits shown on our Site Plan and Geologic Map, Figure 2C presented in our report. We noted that the drainage from street and residences along Cowpens Way (west of Lot 11) is characterized as uncontrolled sheet flow and is directed in the existing gutters onto the subject Lot 11. Once the water reaches the lot appears to sheet flow out onto Lot 11. Along the eastern property boundary within the private storm drain easement there is the terminus of a seasonal creek. Bedrock outcroppings consisting of unweathered sandstone were noted at the edge of the seasonal creek and along the northern property boundary indicating that shallow bedrock is likely to exist in these areas. Based on discussions with BKF, we understand that the drainage design for these lots must consider both the runoff from the existing subdivision plus the drainage from the new lots. The drainage from the existing subdivision does not implement any engineering controls reduce the impacts of the concentrated discharge at the end of Cowpens Way. No other signs of soil/bedrock movement were observed during our site visit.

Response to Comment 2E - Our concerns with Lot 11 primarily relate to the storm drain pipe depicted downslope of the residence. This buried storm drainage pipe crossed near the top of slope features that indicate either past significant erosion or landslides. The concern is that this pipe could be subjected to significant lateral displacement from soil creep or slope instability. If a joint of this pipe is pulled apart than concentrated discharge could occur undetected until a more significant slope failure is triggered. Ideally, a buried pipe would not be routed parallel to slope contours below the residence unless the pipe is extended to a depth where it is embedded in bedrock. {Comment 2E}.

Cornerstone visited the site to observe the surface conditions in this area. The area on the downslope side is nearly level and there is exposed sandstone outcroppings in the area. Additionally, there is an exposed Sandstone Outcropping located adjacent to the downslope property line in the future open space area that is topographically higher than the ground surface downslope of the residence. No signs of landsliding or erosion was observed in this area. The pipe will likely be trenched into bedrock. In our judgment, the concerns outlined in this comment are unlikely. In our opinion, the current storm drain routing is acceptable from a geotechnical viewpoint.

Response to Comment 2F - "Cornerstone shall critically evaluate all planned location for discharge of street drainage and concentrated roof drainage. Inappropriate discharge locations



could result in significant erosion and slope instability problems considering local earth materials and slopes. {Comment 2F}."

Cornerstone has visited the site to observe the recent conditions, re-evaluated the proposed drainage discharge outfall areas, and has reviewed the engineering controls presented in the plans as discussed above. For the residence, the rainfall water will be collected from the roofs and piped to a line flow through planter where the water will be filtered. Then the water will be conveyed through a solid pipe to an outlet structure with rip rap keyed into undisturbed bedrock to dissipate the energy in the water and reduce the water velocity. The project civil engineer estimates that the velocity of the water discharged from the residences will be about 1 to 2 feet/sec (very low). The water discharged from the storm drain pipes that intercept the water from the streets for the adjacent subdivision are anticipated to be higher (6 feet per second per BKF's memo dated August 7, 2018) but will be reduced by flowing through the rip rap to within permissible flow velocities for earthen/bedrock swales (i.e. natural creek drainage) by the time the water filters through the rip rap. For the soil types at the site, a maximum permissible velocity of 2 to 4 feet/sec is considered by the Corps of Engineers as a velocity that will not cause significant erosion. The bedrock observed in the bottom of the natural creek in the area of the proposed discharge will have higher permissible flow velocities. Therefore, the anticipated water velocity is not expected to cause erosion of the soils/bedrock below the rip rap. The water will be discharged within existing natural swales and seasonal creeks with 3:1 to 4:1 (h:v) slopes in areas that are not impacted by slope stability issues.

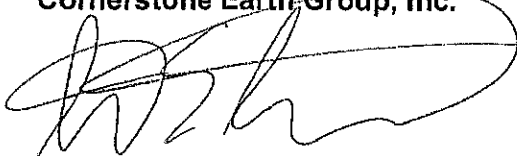
Closure

We hope this provides the information you need at this time. Recommendations presented in this letter have been prepared for the sole use of Ticonderoga Partners, LLC specifically for the property at 88 Cowpens Way (Lot 11) in San Mateo, California. Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at this time and location. No warranties are either expressed or implied.

If you have any questions or need any additional information from us, please call and we will be glad to discuss them with you.

Sincerely,

Cornerstone Earth Group, Inc.



Scott E. Fitinghoff, P.E., G.E.
Senior Principal Engineer

SEF:sef

Addressee (1 by email)



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TECHNICAL MEMORANDUM

Date: August 7, 2018 **BKF Job Number:** 19950158-20

Deliver To: Ms. Sherry Liu **cc:** Jack Chamberlain
San Mateo County Scott Fitinghoff, CEG
Geotechnical Engineer Pete Bentley, SMCo. Bldg.
455 County Center, 2nd Floor Jonathan Tang, BKF
Redwood City, CA 94063

From: Roland Haga, PE, PLS, Leed®AP
Vice President, BKF Engineers

Subject: Highland Estates Lots 9-11 Stormwater Outfall Rock Riprap

RESUBMITTAL
AUG 21 2018
San Mateo County
Building Inspection

BKF's design of the stormwater outfall rock riprap for lots 9, 10 and 11 of the Highland Estates Subdivision in San Mateo County shown on the Improvement Plans that have already been reviewed and approved by County Public Works Department in May of 2018. This technical memorandum is provided to describe BKF's analysis, design and sizing of the outfall rock riprap for lots 9, 10 and 11 to address your concerns. Please note sizing of rock riprap and is based on a 100-year design storm event.

Lots 9 and 10

The combined drainage areas for lots 9, 10 and the contributing off-site drainage area generates a peak flow rate of 14.3 cubic feet per second during a 100-year storm rainfall event. Based on this flow rate, and using the California Stormwater Quality Association (CASQA) California Stormwater BMP Handbook, dated January 2011, Velocity Dissipation Devices EC-10¹, the required outfall rock riprap sizing shall be 16 feet long, 5 feet wide, with 6-inch diameter rock. BKF design on the improvement plans show rock riprap 40 feet long, 12 feet wide, with 8-inch diameter rock. The proposed rock riprap length and width was increased over minimum requirements due to the 2:1 slope, and will be keyed into the slope in three separate locations. Additionally, the rock diameter was increased to 8-inch diameter to provide suitable gradation of rock for the anticipated flow. Increasing the rock size further would negatively impact the ability to dissipate the flow energy as the gradation becomes too large for the anticipated flow.

In addition to the outfall rock riprap design and sizing as described above, a stormwater inlet structure with a 3-foot drop between the inlet and outlet pipes and a tee structure with lateral pipe discharge are provided prior to the outfall to the rock riprap. The drop within the structure provides flow dissipation and reduces the flow velocity from approximately 24 feet per second to approximately 12 feet per second. The additional tee structure with lateral pipe discharge further reduces the flow velocity to

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approximately 6 feet per second prior to discharge onto the rock riprap. Please refer to revised Lot 9 and 10 Improvement Plans. The velocity of the storm drainage should be further reduced through the rock-rip length of 40-feet.

Lot 11

The combined drainage areas for lot 12 and the contributing off-site drainage area generates a peak flow rate of 2.5 cubic feet per second during a 100-year storm rainfall event. Based on this flow rate, and using the California Stormwater Quality Association (CASQA) California Stormwater BMP Handbook, dated January 2011, Velocity Dissipation Devices EC-10¹, the required outfall rock riprap shall be 16 feet long, 5 feet wide, with 6-inch diameter rock. BKF design on the improvement plans show rock riprap 25 feet long, 10 feet wide, with 8-inch diameter rock. The proposed rock riprap length and width was increased over minimum requirements and located further down the to the existing outfall natural creek headwaters where the slope is less than 3:1 (horizontal:vertical), and will be keyed into the slope in three separate locations. Additionally, the rock diameter was increased to 8-inch diameter to provide suitable gradation of rock for the anticipated flow. Increasing the rock size further would negatively impact the ability to dissipate the flow energy as the gradation becomes too large for the anticipated flow.

In addition to the outfall rock riprap design and sizing as described above, a stormwater inlet structure with a 5-foot drop between the inlet and outlet pipes is provided prior to the outfall to the rock riprap. The drop within the structure provides flow dissipation and reduces the flow velocity from approximately 14 feet per second to approximately 6 feet per second prior to discharge onto the rock riprap. The velocity of the storm drainage should be further reduced through the rock-rip length of 25-feet.

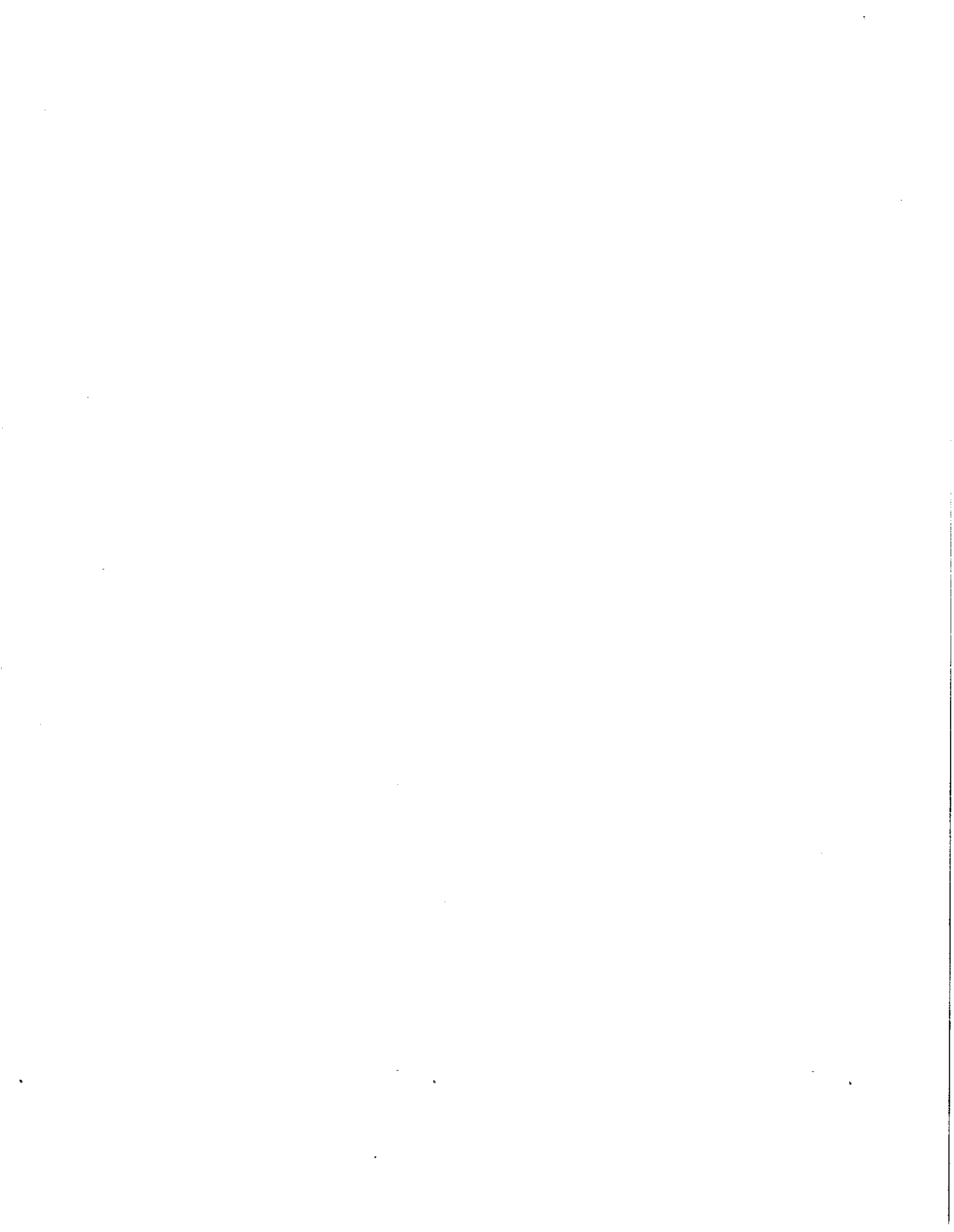
Summary

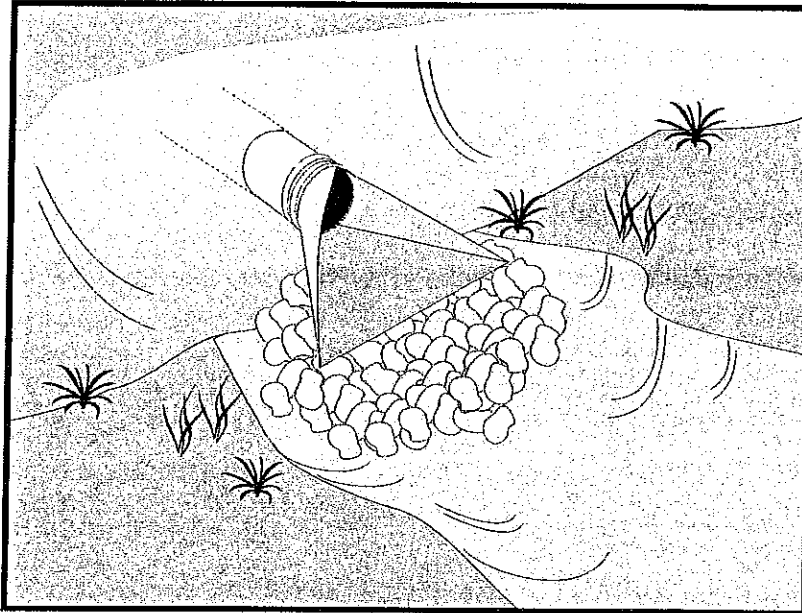
It is BKF's opinion that the outfall rock riprap design and sizing is consistent with, and in conformance with the minimum requirements outlined within the California Stormwater Quality Association (CASQA) California Stormwater BMP Handbook, dated January 2011, Velocity Dissipation Devices EC-10 and the Association of Bay Area Governments (ABAG) Appendix G for Design of Outlet Protection². Please refer to attached Table 10 of the approved Storm Drainage Report³ for stormwater calculations.

Attachments: ¹ California Stormwater Quality Association (CASQA) California Stormwater BMP Handbook, dated January 2011, Velocity Dissipation Devices EC-10.

² Association of Bay Area Governments (ABAG), Appendix G for Design of Outlet Protection.

³ Highland Estates Storm Drain Report FOR Lots 5-8 Ticonderoga Drive, Lots 9-10 Cobblehill Place, Lot 11, Cowpens Way, dated May 10, 2018, Table 10 – Highland Estates Lots 9 through 11 – Storm Drain Pipe Capacity and Rock Riprap Sizing.





Description and Purpose

Outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble, which is placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated, high velocity flows.

Suitable Applications

Whenever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This includes temporary diversion structures to divert runoff during construction.

- These devices may be used at the following locations:
 - Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits, or channels.
 - Outlets located at the bottom of mild to steep slopes.
 - Discharge outlets that carry continuous flows of water.
 - Outlets subject to short, intense flows of water, such as flash floods.
 - Points where lined conveyances discharge to unlined conveyances

Limitations

- Large storms or high flows can wash away the rock outlet protection and leave the area susceptible to erosion.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input type="checkbox"/>
TC	Tracking Control	<input type="checkbox"/>
WE	Wind Erosion Control	<input type="checkbox"/>
NS	Non-Stormwater Management Control	<input type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input type="checkbox"/>

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input type="checkbox"/>
Trash	<input type="checkbox"/>
Metals	<input type="checkbox"/>
Bacteria	<input type="checkbox"/>
Oil and Grease	<input type="checkbox"/>
Organics	<input type="checkbox"/>

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.



- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.
- Sediment accumulation, scour depressions, and/or persistent non-stormwater discharges can result in areas of standing water suitable for mosquito production in velocity dissipation devices.

Implementation

General

Outlet protection is needed where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the immediate downstream reach. This practice protects the outlet from developing small eroded pools (plunge pools), and protects against gully erosion resulting from scouring at a culvert mouth.

Design and Layout

As with most channel design projects, depth of flow, roughness, gradient, side slopes, discharge rate, and velocity should be considered in the outlet design. Compliance to local and state regulations should also be considered while working in environmentally sensitive streambeds. General recommendations for rock size and length of outlet protection mat are shown in the rock outlet protection figure in this BMP and should be considered minimums. The apron length and rock size gradation are determined using a combination of the discharge pipe diameter and estimate discharge rate: Select the longest apron length and largest rock size suggested by the pipe size and discharge rate. Where flows are conveyed in open channels such as ditches and swales, use the estimated discharge rate for selecting the apron length and rock size. Flows should be same as the culvert or channel design flow but never the less than the peak 5 year flow for temporary structures planned for one rainy season, or the 10 year peak flow for temporary structures planned for two or three rainy seasons.

- There are many types of energy dissipaters, with rock being the one that is represented in the attached figure.
- Best results are obtained when sound, durable, and angular rock is used.
- Install riprap, grouted riprap, or concrete apron at selected outlet. Riprap aprons are best suited for temporary use during construction. Grouted or wired tied rock riprap can minimize maintenance requirements.
- Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipaters. It also serves to trap sediment and reduce flow velocities.
- Carefully place riprap to avoid damaging the filter fabric.

- Stone 4 in. to 6 in. may be carefully dumped onto filter fabric from a height not to exceed 12 in.
 - Stone 8 in. to 12 in. must be hand placed onto filter fabric, or the filter fabric may be covered with 4 in. of gravel and the 8 in. to 12 in. rock may be dumped from a height not to exceed 16 in.
 - Stone greater than 12 in. shall only be dumped onto filter fabric protected with a layer of gravel with a thickness equal to one half the D_{50} rock size, and the dump height limited to twice the depth of the gravel protection layer thickness.
- For proper operation of apron: Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.
 - Outlets on slopes steeper than 10 percent should have additional protection.

Costs

Costs are low if material is readily available. If material is imported, costs will be higher. Average installed cost is \$150 per device.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subjected to non-stormwater discharges daily while non-stormwater discharges occur. Minimize areas of standing water by removing sediment blockages and filling scour depressions.
- Inspect apron for displacement of the riprap and damage to the underlying fabric. Repair fabric and replace riprap that has washed away. If riprap continues to wash away, consider using larger material.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.
- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

References

County of Sacramento Improvement Standards, Sacramento County, May 1989.

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursztynsky, P.E., McGraw Hill Book Company, 1986.

Handbook of Steel Drainage & Highway Construction, American Iron and Steel Institute, 1983.

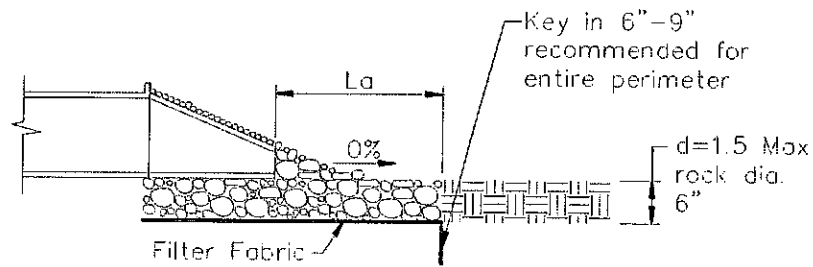
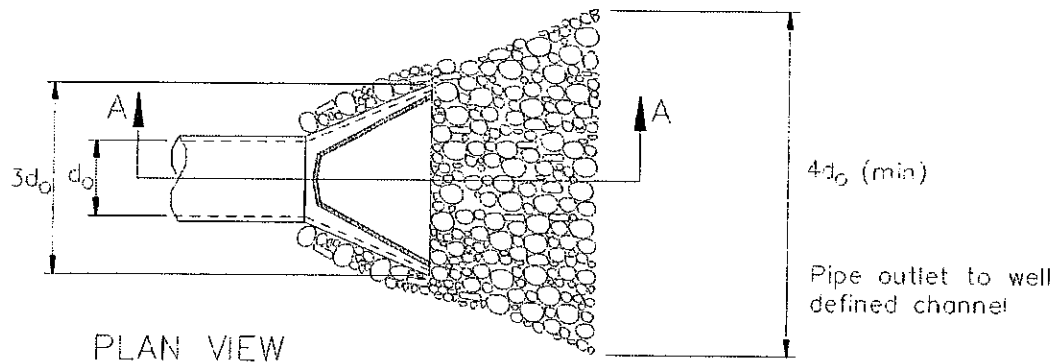
Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Metzger, M.E. 2004. Managing mosquitoes in stormwater treatment devices. University of California Division of Agriculture and Natural Resources, Publication 8125. On-line: <http://anrcatalog.ucdavis.edu/pdf/8125.pdf>

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, state of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



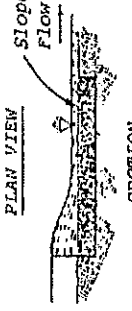
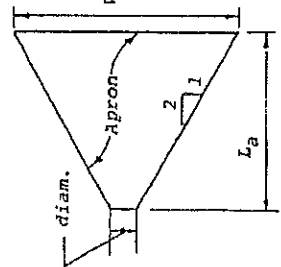
Pipe Diameter inches	Discharge ft ³ /s	Apron Length, L _a ft	Rip Rap D ₅₀ Diameter Min inches
12	5	10	4
	10	13	6
18	10	10	6
	20	16	8
	30	23	12
24	40	26	16
	30	16	8
	40	26	8
	50	26	12
	60	30	16

For larger or higher flows consult a Registered Civil Engineer
 Source: USDA - SCS



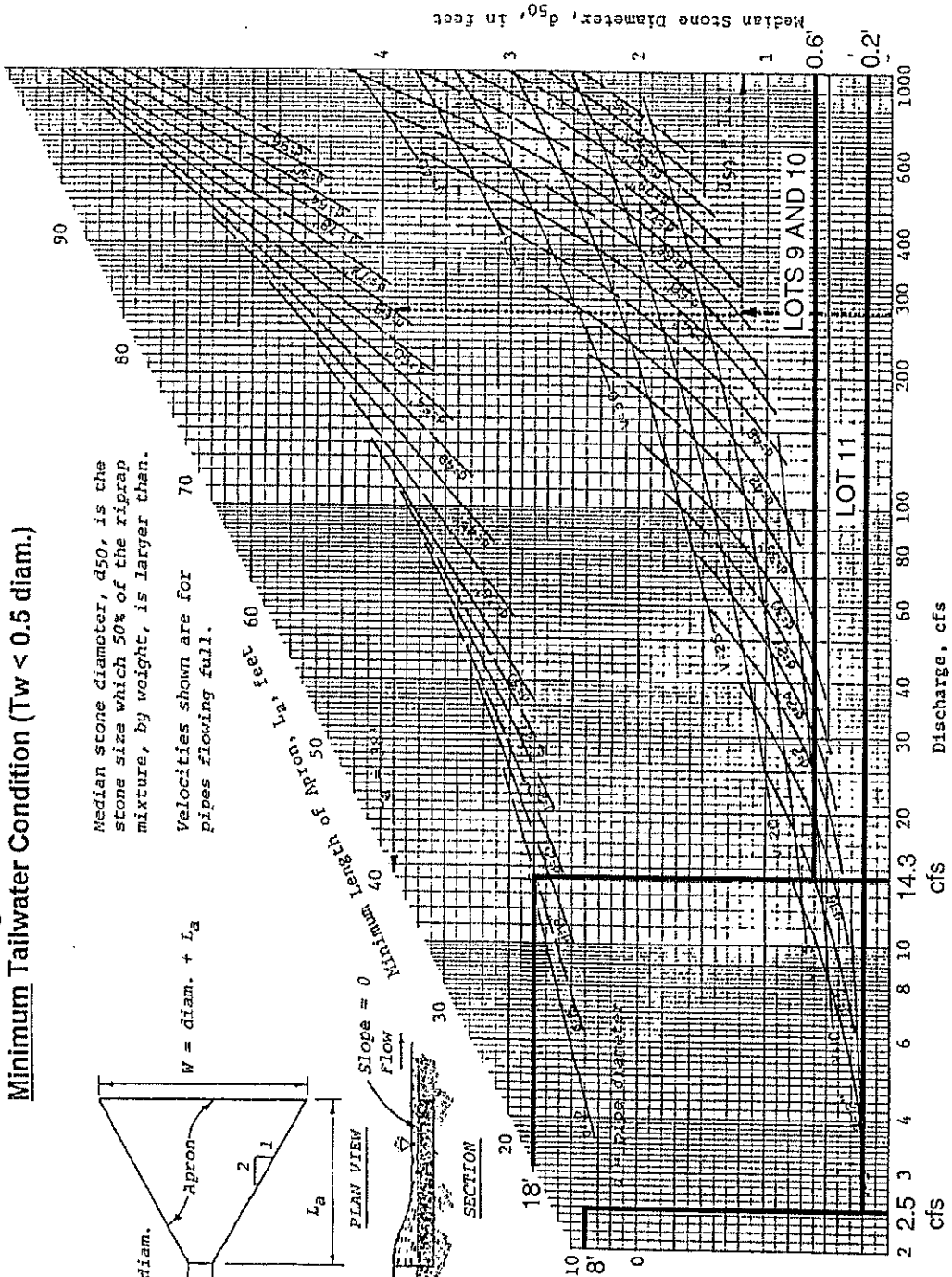
APPENDIX G
SAMPLE DESIGN OF OUTLET PROTECTION

Design of Outlet Protection
Minimum Tailwater Condition (Tw < 0.5 diam.)



Median stone diameter, d_{50} , is the stone size which 50% of the riprap mixture, by weight, is larger than.

Velocities shown are for pipes flowing full.



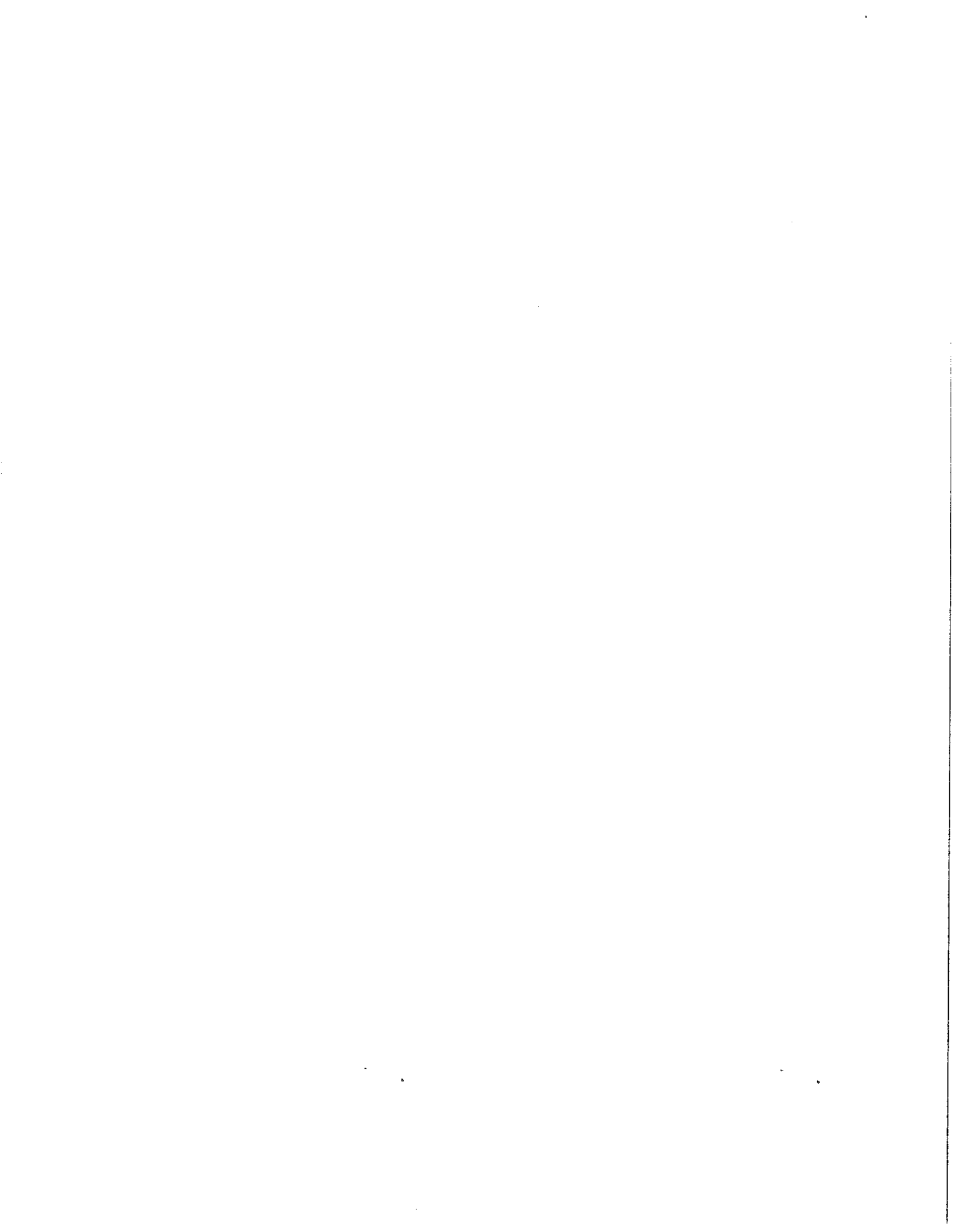


Table 10
Highland Estates Lots 9 through 11 - Storm Drain Pipe Capacity and Rock Riprap Sizing

Intensity 10-year, 10-minute, I = 3.42 in/hr
 Intensity 100-year, 10-minute, I = 4.61 in/hr
 Impervious Runoff Coefficient, C = 0.90
 Pervious Runoff Coefficient, C = 0.30
 Off-Site Contributing Runoff Coefficient, C = 0.50

Proposed Peak Flow

Lot	On-Site Lot Area (acres)	Lot Area Impervious (acres)	Lot Area Pervious (acres)	Off-Site Contributing Area (acres) *	Total Area (acres)	Weighted Runoff Coefficient	Flow, 10-Year (cfs)	Flow, 100-Year (cfs)
Lot 9	0.41	0.14	0.27	2.92	3.33	0.50	5.71	7.69
Lot 10	0.41	0.13	0.28	2.46	2.87	0.50	4.90	6.60
Lot 11	0.66	0.14	0.84	0.32	0.98	0.55	1.83	2.47
Total	1.48	0.41	1.39	5.70	7.18	0.51	12.44	16.77

Storm Drain Pipe Capacity

Lot	Flow, 10-Year (cfs)	Pipe Size (Inches)	Pipe Area (sf)	Pipe Perimeter (sf)	Pipe Slope (feet/foot)	Pipe Roughness Coefficient	Pipe Capacity (cfs)
Lots 9 and 10	10.61	15	1.23	3.93	0.020	0.010	11.88
Lot 11	1.83	15	1.23	3.93	0.015	0.010	10.29

Rock Riprap Sizing ⁽¹⁾

(1) Rock riprap sizing is based on Velocity Dissipation Devices EC-10 of the California Stormwater Quality Association (CASQA) BMP Handbook, January 2011.

Lot	Flow, 100-Year (cfs)	Pipe Diameter (Inches)	Rock Riprap Apron Length Required (ft)	Rock Riprap Width Required (ft)	Rock Diameter Required (Inches)	Rock Riprap Apron Length Provided (ft)	Rock Riprap Width Provided (ft)	Rock Diameter Provided (Inches)
Lots 9 and 10	14.30	15	16	5	6	40	12	8
Lot 11	2.47	15	10	5	6	25	10	8

