July 12, 2017

Mr. Tim Morgan c/o
Vista Tassajara HOA
563 Leisure Street
Livermore, CA 94551

Re: Supplemental Report for Hillview Drive Slope Repair
Vista Tassajara, Danville, California
SFB Project No.: 768-1

Mr. Morgan:

In accordance with the request of the Vista Tassajara Homeowners Association, Stevens, Ferrone & Bailey Engineering Company, Inc. (SFB) has prepared this supplemental report in order to respond to review comments prepared by Cal Engineering & Geology (CEG) in their letter addressed to the Town of Danville, dated June 29, 2017. Previously, SFB prepared a geotechnical engineering report dated June 5, 2017 and also prepared hillside repair plans dated June 2017. Our responses to the CEG comments are listed below in accordance with the numbering system used by CEG in their letter. The information, opinions, conclusions, and recommendations presented below are meant to supplement our previous report dated June 5, 2017; all previous recommendations, conditions, and limitations apply.

CEG Comment 1 Response:

Groundwater Assumed at the Base of Rebuilt Fill: It should be emphasized that our slope stability analyses of this case (assumed groundwater at the base of rebuilt fill) is for the purpose of identifying any possible scenarios of the future slope failure event (if it ever occurs) and at the same time to provide reasons for our recommendations for long term slope and drainage maintenance. As with all natural and man-made slopes, properly functioning surface and subsurface drainage is critical to slope stability. Our hillside repair plans will specifically aid in improving the surface and subsurface drainage at the repair area.

It was never our intent nor was it in our scope of work to evaluate of stability and appropriateness of the 1988 grading at the repair area. According to Berlogar Geotechnical Consultants (BGC)'s November 8, 1988 mass grading report (provided by the Town of Danville and attached in Appendix B for reference), most of Slide 23 (which includes the repair area) was removed during mass grading except for specific upslope portions that extended beyond the subdivision boundary that were left in place but buttressed with engineered fill. As reported on Page 12 of BGC's February 8, 1988 geotechnical investigation report, the entire removal of Slide 23 and rebuilding of the hillslope with compacted, engineered fill yields a static factor of safety of over 4.0 and a static plus dynamic (earthquake condition based on a BGC calculated site ground acceleration of 0.38g) factor of safety of 1.5 against slope failures. Our hillside repair plans do not alter the inherent global stability of the entire existing fill slope below or beyond the slope repair area that resulted from the 1988 grading.

Groundwater Assumed Not to Be Present: We do not agree that our calculated factor of safety against sliding of 0.96 under a pseudo-static condition (k = 0.25) should be considered as unconservative for the sole reason of the factor of safety being less than 1.0. As stated clearly on Page 79 of the Southern California Earthquake Center (SCEC) publication, *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California*, the Newmark-type analysis displacements (as the basis of the screening criteria we used in our seismic slope stability analyses) provide only an "**Index of Slope Performance"**. The 15 centimeters (6 inches) value we used in the analyses distinguishes conditions in which small to moderate displacements are likely from conditions in which large displacements are likely. The proper development of an appropriate slope stability analysis model and the interpretations of the results are a very complex engineering reasoning process which also depends on a wide range of assumptions and judgements. Our analyses were carefully performed to include any reasonable and critical conditions while using quite conservative engineering parameters and approaches. It is not clear to us why 1.0 is considered as conservative, but 0.96 (which is scientifically rounded up to 1.0) is unconservative when the whole purpose of the analysis method is to provide an "**Index of Slope Performance**". Our results clearly indicate that small to moderate displacements are more likely to occur on the repair area during or immediately after a major earthquake event than large displacements are, which in our opinion is appropriate for an open space area especially when small to moderate displacements of the repair area will have no impact on the life and safety of the surrounding homeowners. In addition, as described above, our hillside repair plans will not alter the inherent global stability of the entire existing fill slope below or beyond the slope repair area that resulted from the 1988 grading.

It also must be understood that water was encountered only at the fill/bedrock interface in Boring SFB-1. The bedrock acts as a relatively impermeable surface/boundary for the water, resulting in perched water that is directed toward the existing subdrain system. Therefore, this water does not increase the pore water pressures within the bedrock unit but simply flows across the surface of the bedrock toward the existing subdrain system.

In order to directly respond to the last sentence of CEG Comment 1, we performed additional slope stability analyses assuming groundwater is located at the existing fill/bedrock interface (which assumes the 1988 subdrains are present and functional). We do not have any information to suggest that the 1988 subdrains are not present or not functional. By placing the groundwater surface at this interface, this condition results in the bedrock being affected by groundwater induced pore water pressures. The results of this slope stability condition analysis are attached in Appendix A. The static factor of safety in this case is 1.87 and the seismic factor of safety in this case is 0.96 which represents the slope performance index when the slope is subjected to a major earthquake (as explained above).

Seed Procedure

For comparison purposes, we performed additional slope stability analyses using the generally accepted Seed procedure (by apply a seismic coefficient k = 0.15). The table below summarizes the most critical results of our slope stability analyses of the proposed slope repair grading along Section a - a' under both static and pseudo-static conditions. The results of the additional slope stability analyses (as requested by CEG) are included in the table for comparison. The result of this analysis is presented in the attached **Appendix A**.

Cross-Section a-a'	Factor of Safety against Sliding		
	Static	Pseudo-Static (Earthquake Loading k = 0.25)	**Seed Procedure Pseudo-Static (Earthquake Loading k = 0.15)**
Proposed Slope Repair (Groundwater at Fill/Bedrock Interface)	1.87	0.96	**1.20**

The results of our supplemental analyses using the Seed procedure indicates that the factor of safety against sliding for the case where groundwater is located at the fill/bedrock interface is greater than the generally acceptable value of 1.15 when applying a Seed seismic coefficient of 0.15.

CEG Comment 2 Response: We will add the task of checking the existing surface drainage and subdrain system in the area of the Hillview Drive Landside site for functionality to the project plans which will require the selected contractor to perform the task as part of the project. However, due to the lack of exact location and elevation information of the existing subdrain pipes, outlets and cleanouts (besides the approximate plan view of the subdrains as shown on the 1988 as-built plan), and previous subdrain maintenance records, it will be quite difficult to determine actual functionality of any existing 1988 subdrain systems within the Vista Tassajara subdivision. We will perform a thorough field search in the area of the Hillview Drive Landslide site during the project over-excavation to identify any existing subdrain features. If any of the 1988 subdrains are encountered during over-excavation, a more detailed functionality check (video inspection/testing) will be performed on the encountered subdrains.

CEG Comment 3 Response: The 1988 subdrains are shown on the attached Figure 1 (Site Plan) and the attached Figures 2 and 3 (Cross-Sections). The 1988 as-built subdrain plan only shows the approximate plan view of the subdrains and does not show at what elevations the subdrains are located. Based on our understanding of the Berlogar Geotechnical Consultants (BGC) report for the 1988 grading project, the subdrains were to be placed at the bottom of over- excavations and keyways. In the area of the Hillview Drive landslide repair project, the 1988 subdrains therefore should be located at the interface between bedrock and the 1988 fill materials. Our interpreted depths (based on BGC reports) of over-excavation performed in 1988 are shown on our cross-sections in our previous report and on Sheet 5 of the plans. We don't anticipate encountering any of the 1988 subdrains since the current landslide has occurred within the existing fill materials as shown on our cross-sections. If any of the 1988 subdrains are encountered, the encountered 1988 subdrains will be properly connected to a drainage system so that they can continue to function. This task will be added to the project plans as a remedial slope grading note on Sheet 1. As shown on Sheet 6 of the plans, the lowermost subdrain is planned to discharge at the existing concrete v-ditch located in the open space area to the west of the landslide repair site (see plan sheet 2 for a view of the v-ditch). The elevation of the lowermost subdrain discharge location is at approximately 730 feet, significantly lower than the planned lowermost keyway/subdrain elevation of 750 feet at the repair site.

For reference, CEG was emailed on July 6, 2017, the entire 1988 grading file we received from the Town of Danville. The grading file includes all BGC reports, grading plans, and as-built subdrain plans that were prepared for the 1988 grading that took place at the Vista Tassajara subdivision. A copy of the Town of Danville grading file is included in **Appendix B**.

CEG Comment 4 Response: The basal shape of the landslides was determined by the results of our field surface mapping, borings, and back-calculation techniques. The locations of the headscarp and toe of each landslide and areas of deposition were located and mapped. Sheet 4 of the plans and Figure 1 of the report shows the results of this mapping. No evidence of ground movement was observed above the headscarp or beyond the toe of the landslides. The highly plastic characteristics of the relatively homogenous clayey fill materials also show that the basal shape is relatively circular in the more critical deeper landslides. Three possible and conservative landslide planes (as shown on Sheet 5 of the plans and on Figures 2 and 3 of the report) were determined by projecting the headscarp shape through the zone of the potentially deepest section of the landslide bottom and downward toward the toe of the landslides, resulting in a relatively circular shape. As described in our previous June 5, 2017 report in Section 4.0, we also performed slope stability back calculations along these three possible landslide planes to estimate the friction angle of the existing hillslope fill materials. In addition, it is our opinion that none of the shear planes intercept the bottom of the over-excavations performed in 1988 (based on our interpretation of the 1988 grading), therefore, the landsliding has occurred wholly within the previously placed fill materials and the underlying bedrock is not a factor in the recent slope instability. **During the construction phase of this project, the existing landslide shear planes will be completely over-excavated to whatever depth is needed to complete remove the shear planes.**

CEG Comment 5 Response: It is unclear to us as to exactly why blowcounts are higher in Boring SFB-3 than the other two borings. Based on our review of the grading data contained in the Town of Danville grading file, Boring SFB-3 should have encountered compacted fill materials throughout the entire depth of the boring. Samples retrieved from Boring SFB-3 exhibit fill material characteristics. One theory is that during the previous grading activities, the area surrounding SFB-3 was used as access for grading equipment including compaction equipment. As a result, the fill materials in the area of SFB-3 ended up receiving much more compaction energy (thereby increasing the density of the fill materials and increasing the blowcounts measured in Boring SFB-3) than was necessary simply due to the grading equipment travelling over the area numerous times. Another theory is that the fill materials in the area of Boring SFB-3 have not been subjected to the long-term influence of surface water infiltration and subsurface water seepage compared to the fill materials encountered in the other two borings. In any case, the area surrounding Borings SFB-3 will be included in the hillslope remediation project.

CEG Comment 6 Response: The landsliding that occurred on the hillside was the result of a combination of (1) lack of proper surface water collection on the hillside and (2) the upper 5 feet of the hillside being severely disturbed due to bioturbation (primarily by digging rodents) and desiccation cracking within the fill soils.

As shown on Sheet 10 of the 1988 Vista Tassajara grading plans (part of the Town of Danville grading file), no ditches were planned or constructed on the entire impacted hillslope at the time of subdivision development, even though the top of the hillside is located at an approximate elevation of 960 feet and the toe of the hillside is located at an approximate elevation of 760 feet and the hillside was planned in 1988 to be completely over-excavated and re-constructed. Building code requires surface benches and surface water collection facilities be constructed for every 30 feet of elevation gain on a graded hillslope yet this was not done during subdivision development. On Sheet 4 of our slope repair plans, we show where surface water collection ditches were located at the time of the slope failures. As you can see on Sheet 4, the headscarps of the primary landslides exist at the locations where concrete surface water collection ditches should have been constructed. In fact, the lateral extent of the easternmost landslide complex terminates where an existing concrete surface water collection ditch begins.

We also observed during our field work that the approximately upper 5 feet of fill soils is highly disturbed by bioturbation and desiccation cracking (the five-year drought has exacerbated this effect). Due to this disturbance, the fill soils have lost their cohesive integrity which has resulted in allowing surface water to infiltrate the surficial fill soils.

The landsliding primarily occurred in January 2017 during a month of very heavy rainfall. In January alone, over 13 inches of rainfall occurred at the site and by the end of January, the site had already received its yearly average total of rainfall (according to Danville Library rainfall collection totals). This rainfall infiltrated the hillside because of lack of surface drainage and the upper five feet of fill soil being highly disturbed. This water reduced the shear strength of the surficial fill soils and increased with weight of the fill soils resulting in the landslides that are mapped on Sheet 4 of the repair plans. Therefore, the landsliding that occurred at the hillside was due to surficial processes rather than deep-seated processes. Our analyses have taken into account these surficial processes.

During our field work, abundant water was observed within the upper 5 to 6 feet of the landslide mass (including the landslide debris/deposit area). The water content of fill soils sampled within the upper 5 to 6 feet were very high (39 and 40 percent) whereas below these depths, the water content of the fill soils was fairly consistent (25 to 30 percent) except for the fill soils in Boring SFB-3 that appear to have been less impacted by water.

No water seepage was encountered or observed deep within the landslide masses except for the seepage that was encountered at the fill/bedrock interface in Boring SFB-1. The intent of the existing subsurface drainage system installed in 1988 is to collect the seepage at the fill/bedrock interface and discharge it to an appropriate location.

Based on the information presented above, we concluded that the landsliding occurred as a result of surface water infiltration. Since no surface drainage was installed on the hillside during the 1988 subdivision development, we also conclude that the hillside was not properly drained. The only drainage that was provided the hillside in 1988 was deep subsurface drainage utilizing subdrains (which are incapable of providing surficial drainage). **It is very clear that the proposed repair does not use the exact same concept as was completed during the original site development**. The primary design differences between the 1988 hillside development and the current repair plans are summarized in the table below.

Hillside Repair Feature	Provided for in 1988?	Provided for in Current Repair Plans?
Surface Water Collection Ditches	NO	YES. Approximately 1,040 lineal feet of ditch.
Surface Benches	NO	YES. Approximately 750 lineal feet of hillside surface benches.
Subdrains Below Water Collection Ditches	NO	YES. Approximately 1,040 lineal feet of 3-foot-deep subdrains below ditches for a total subdrain depth of 4 feet.
Continuous Vertical Subdrain Coverage at Back-Cut of Over-Excavation	NO	YES. All subdrains will extend from bottom of excavation to top of subgrade bench providing continuous vertical elevation coverage. Uppermost subdrain will extend from bottom of excavation to ground surface.

CEG Comment 7 Response: SFB's borings were appropriately logged in the field by a licensed Geotechnical Engineer and Certified Engineering Geologist. To provide clarification, the lower two borings encountered water seepage at a depth of about 6 feet. No free water was encountered below a depth of 6 feet. The water encountered in the lower borings was a result of surficial water infiltration as described above.

As described above, it is our opinion that that landslide occurred as a result of surface water infiltration rather than deep fill saturation. The water content results on the boring logs show that the upper 5 to 6 feet of the fill soils are saturated.

CEG Comment 8 Response: We agree that Google Earth imagery shows three areas of bare soil in photos dated May and June 2003. We are unaware of any past landsliding (based on our review of available information and documents provided) on the subject hillside.

CEG Comment 9 Response: If the Vista Tassajara HOA wants to monitor future slope movements, groundwater levels/behavior, and/or pore water pressures, we can have these devices installed as part of the hillside repair project. It is unclear from the comment where and how many of these monitoring devices are suggested and whether the devices are to monitor the repair site or to monitor slopes beyond the limits of the repair site (including the other slopes built during the 1988 grading).

CEG Comment 10 Response: It is unclear why this comment was made. General Note 17 on Sheet 1 stated that contact with USA must be made at least 48 hours in advance and no "day" specification is made.

CEG Comment 11 Response: The primary purpose for this requirement of the Contractor is for us to review how the Contractor is sequencing the excavation, moving dirt, and compacting. We still request the Contractor to provide us this information prior to commencing work. We will make the suggested title changes to the plans.

CEG Comment 12 Response: We will change the largest dimension size to 6 inches maximum for concrete debris.

CEG Comment 13 Response: Meridian Associates (the project's surveyors) have recently prepared a separate plan titled "Control Map". This plan provides numerous construction control points and their elevation, northing, and easting coordinates. As of July 7, 2017, all construction control points have been set at the site and have been accepted by the grading contractor. As-builts will be prepared based on these control points. A copy of the "Control Map" is attached as **Appendix C**.

CEG Comment 14 Response: Sheet 6 will be modified to include the orange lines and cut slope symbols within the Key and to also highlight the location of the keyway.

CEG Comment 15 Response: An additional subdrain will be added on the sheet to the west side of the repair. We recommend subdrains be located along the eastern and western limits at the base of the over-excavation slopes in those areas.

CEG Comment 16 Response: The plan will be modified to include this note. The features will be located in the field using the survey control points and field fit techniques.

CEG Comment 17 Response: The plan will be modified to state that continuous coverage is specified at all back-cuts.

CEG Comment 18 Response: The plan will be modified to state that a minimum slope of 0.5% is required for all subdrain pipes.

CEG Comment 19 Response: The plan will be modified to include coverage of existing slide debris stockpiles and debris removal at toe of slope.

CEG Comment 20 Response: The plan will be modified to include a reference to CASQA BMP (Best Management Practices) standard specifications/plans.

If you have any questions or need additional information, please call our office.

Sincerely,

Stevens, Ferrone & Bailey Engineering Company, Inc.

Taiming Chen, PE, GE
Civil/Geotechnical Engineer

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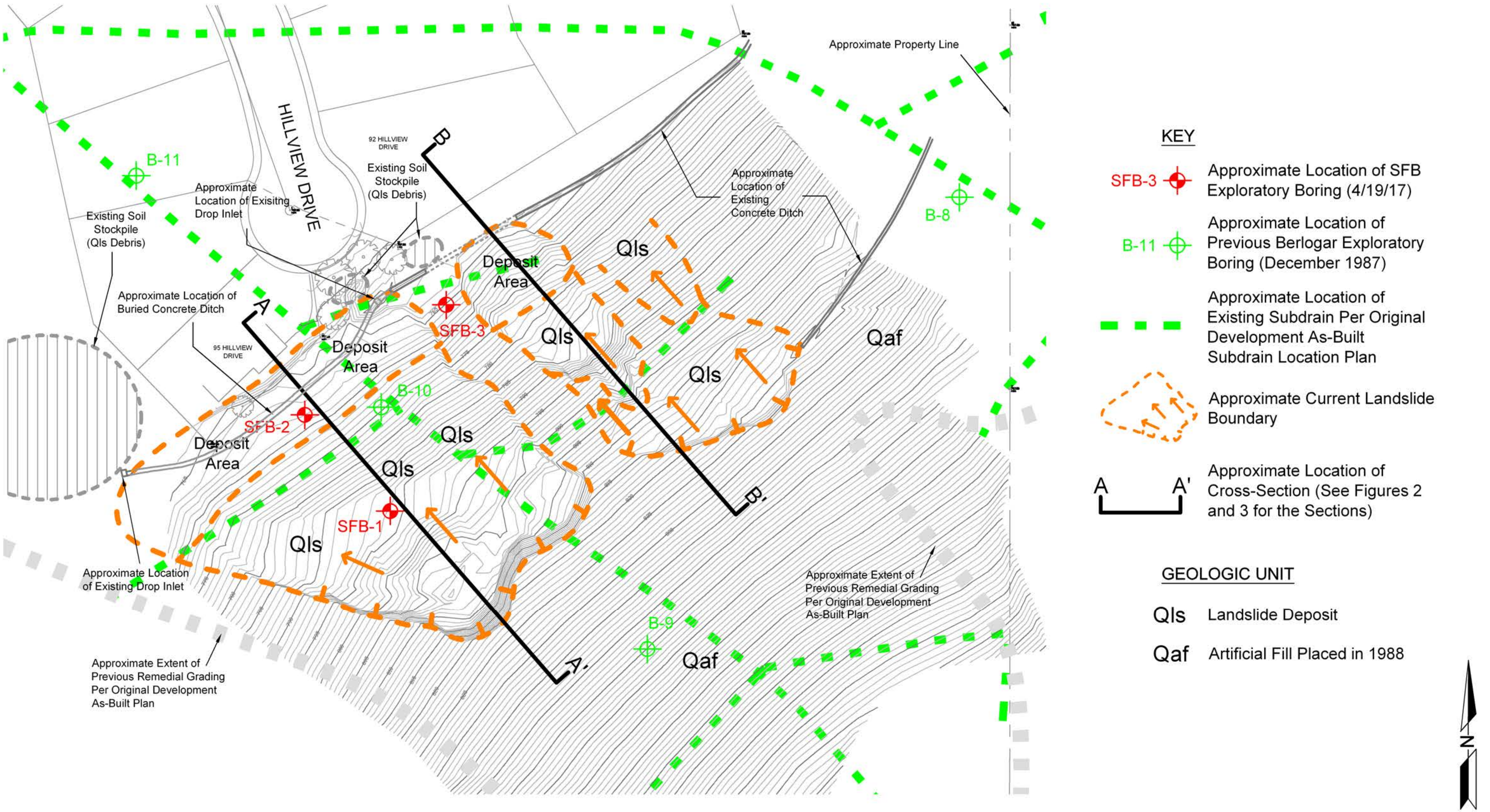
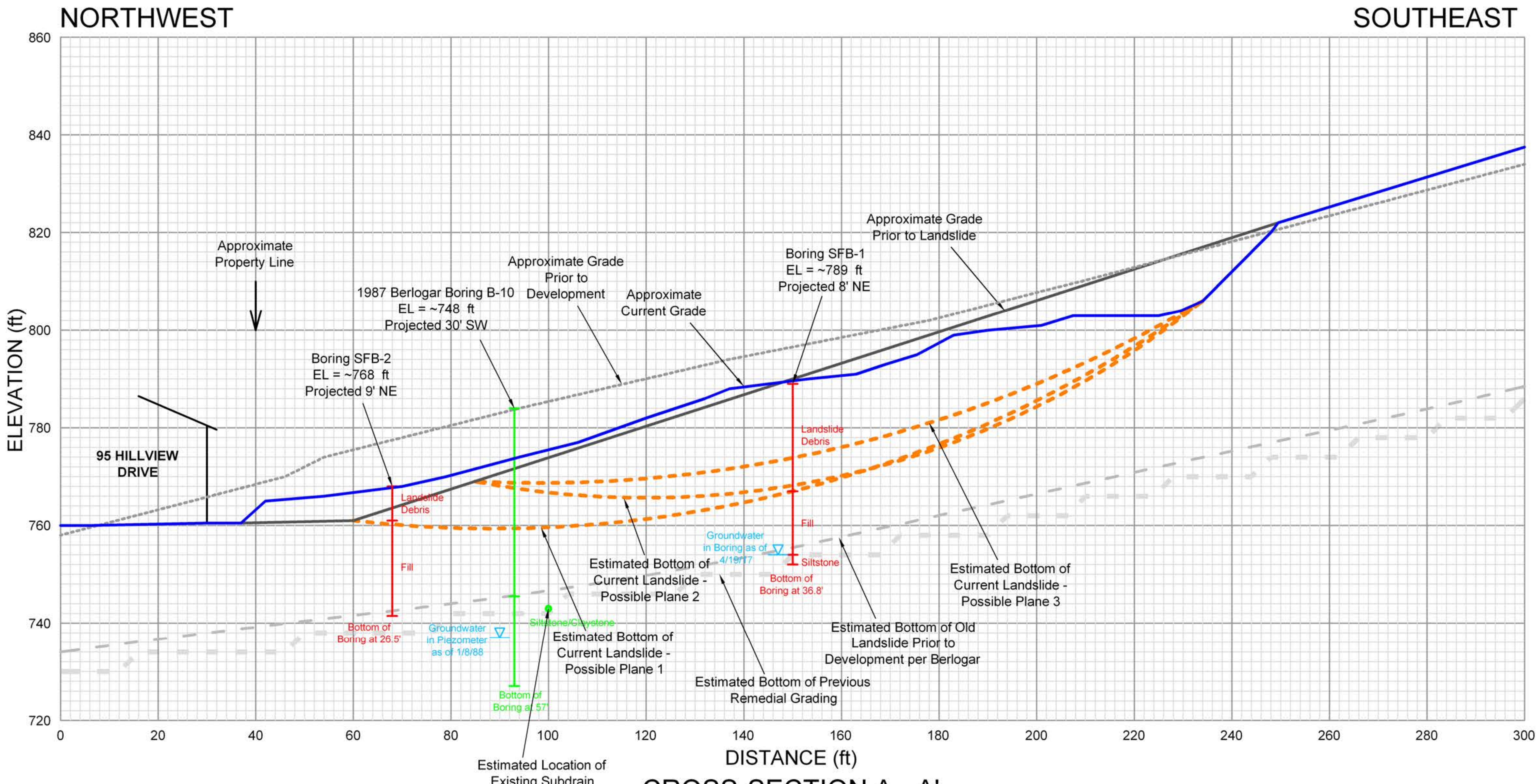
TC/KCF
Copies: Addressee (1 by email)
Attachments: Figures 1 through 3
Appendices A, B &, C



NOTE: Topographic survey by Meridian Associates, Inc. and dated April 2017.

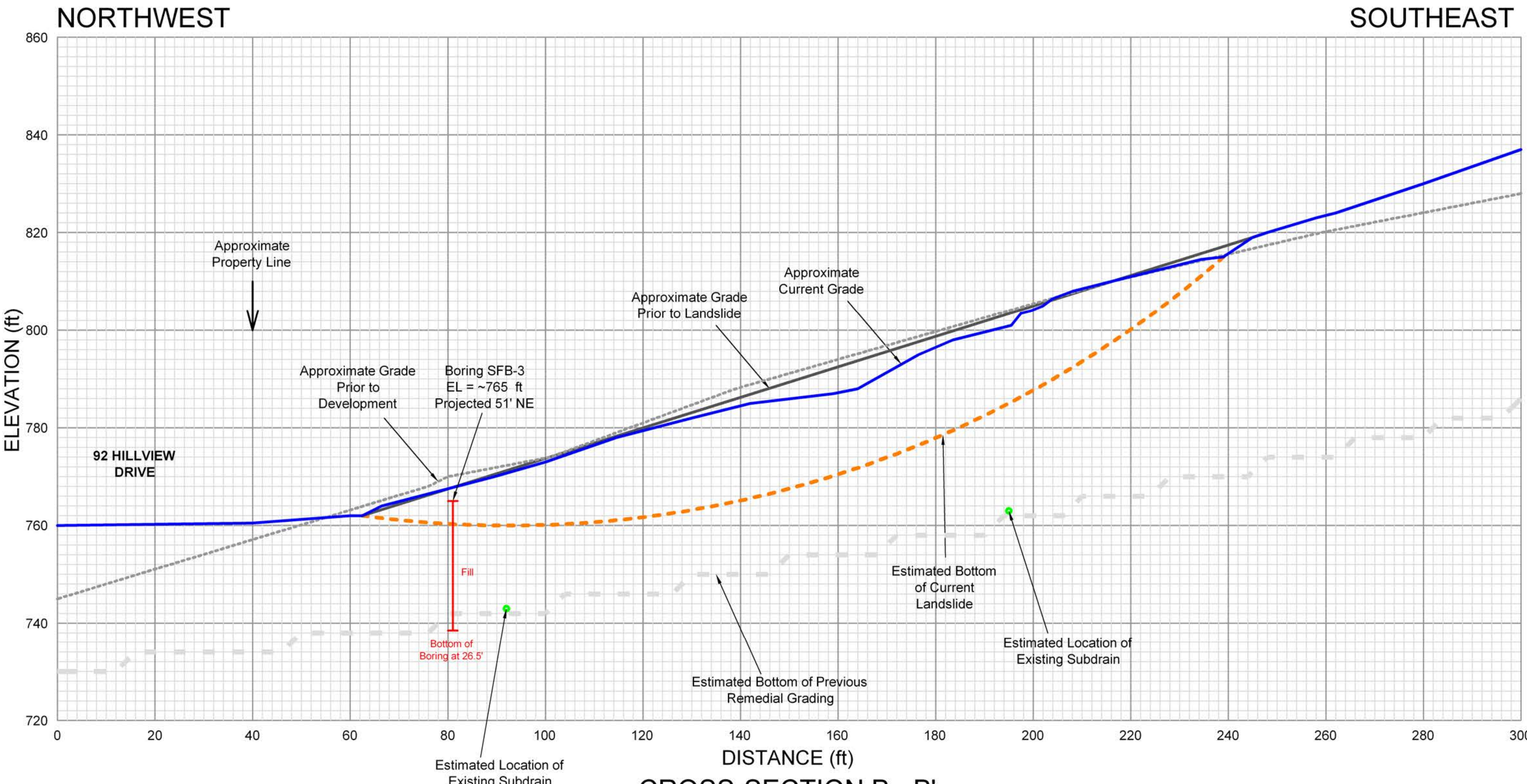
APPROXIMATE SCALE: 1" = 60' 0 60' 120'	DATE July 2017 PROJECT NO. 768-1	Stevens Ferrone & Bailey Engineering Company, Inc 1600 Willow Pass Court Concord, CA 94520 Tel 925.688.1001 Fax 925.688.1005 www.SFandB.com	SITE PLAN AND ENGINEERING GEOLOGY MAP HILLVIEW DRIVE SLOPE REPAIR Danville, California	FIGURE 1



CROSS-SECTION A - A'

NOTE:
1. See Figure 1 for location of section.
2. Improvements, elevations, and locations of explorations are approximate.
3. Refer to exploration logs for more details. Boring logs projected onto cross-section.
4. See report for additional conditions and limitations.

HORIZONTAL & VERTICAL SCALE: 1" = 20' (0, 20', 40')	DATE: July 2017 / PROJECT NO.: 768-1	Stevens Ferrone & Bailey Engineering Company, Inc	1600 Willow Pass Court, Concord, CA 94520, Tel 925.688.1001, Fax 925.688.1005, www.SFandB.com	CROSS-SECTION A - A' / HILLVIEW DRIVE SLOPE REPAIR / Danville, California	FIGURE 2



CROSS-SECTION B - B'

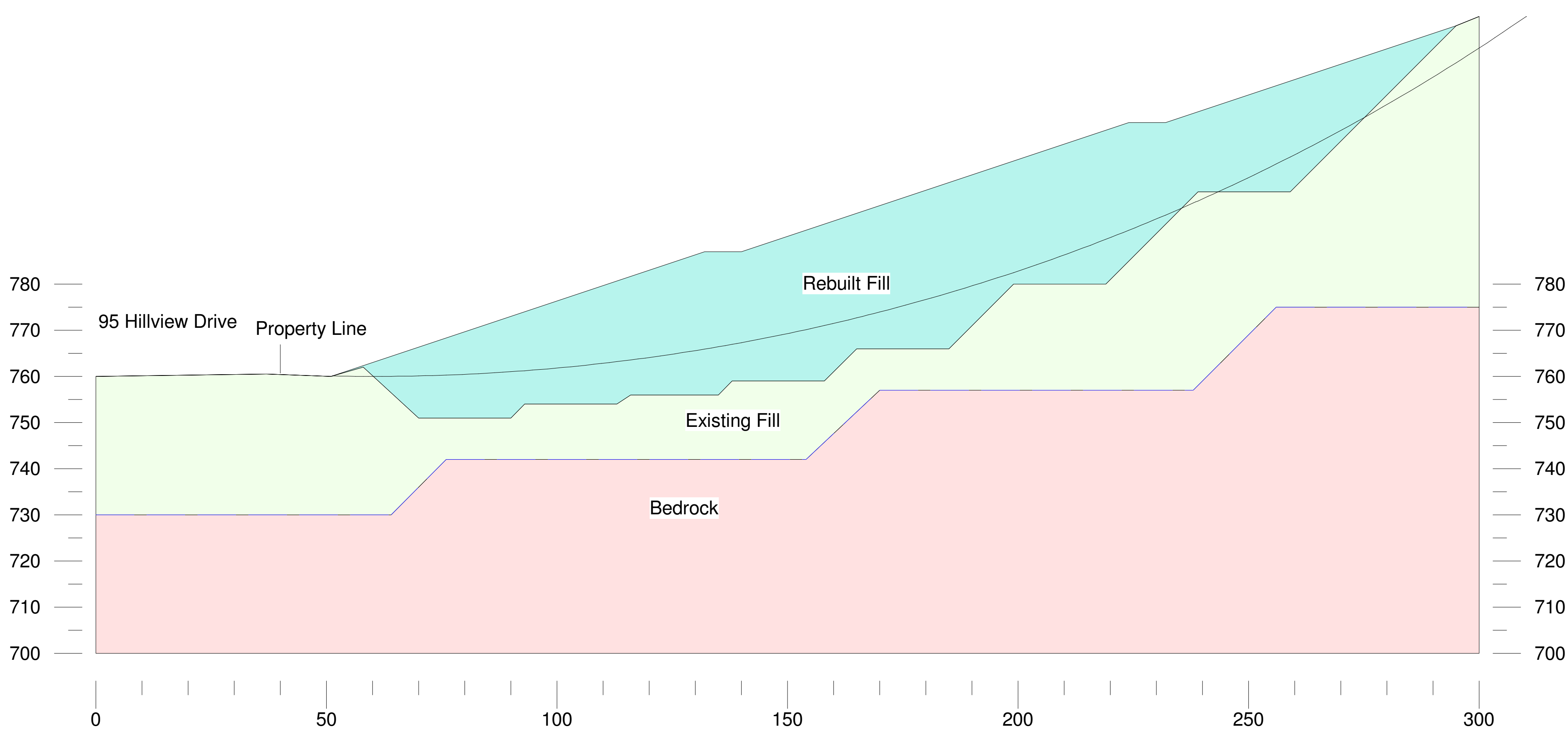
NOTE:
1. See Figure 1 for location of section.
2. Improvements, elevations, and locations of explorations are approximate.
3. Refer to exploration logs for more details. Boring logs projected onto cross-section.
4. See report for additional conditions and limitations.

HORIZONTAL & VERTICAL SCALE: 1" = 20' (0, 20', 40')	DATE: July 2017 / PROJECT NO.: 768-1	Stevens Ferrone & Bailey Engineering Company, Inc	1600 Willow Pass Court, Concord, CA 94520, Tel 925.688.1001, Fax 925.688.1005, www.SFandB.com	CROSS-SECTION B - B' — HILLVIEW DRIVE SLOPE REPAIR, Danville, California	FIGURE 3

APPENDIX A
SUPPLEMENTAL SLOPE STABILITY RESULTS

	Gamma pcf	C psf	Phi deg	Piezo Surf.	Ru
Rebuilt Fill	120	100	26	0	0
Existing Fill	120	100	26	0	0
Bedrock	125	100	30	1	0

Stevens Ferrone & Bailey Engineering Co. Inc.
SFB 768-1
Hillview Drive Landslide, Danville, CA
Section A
Slope Repair with Groundwater in Bedrock
Static

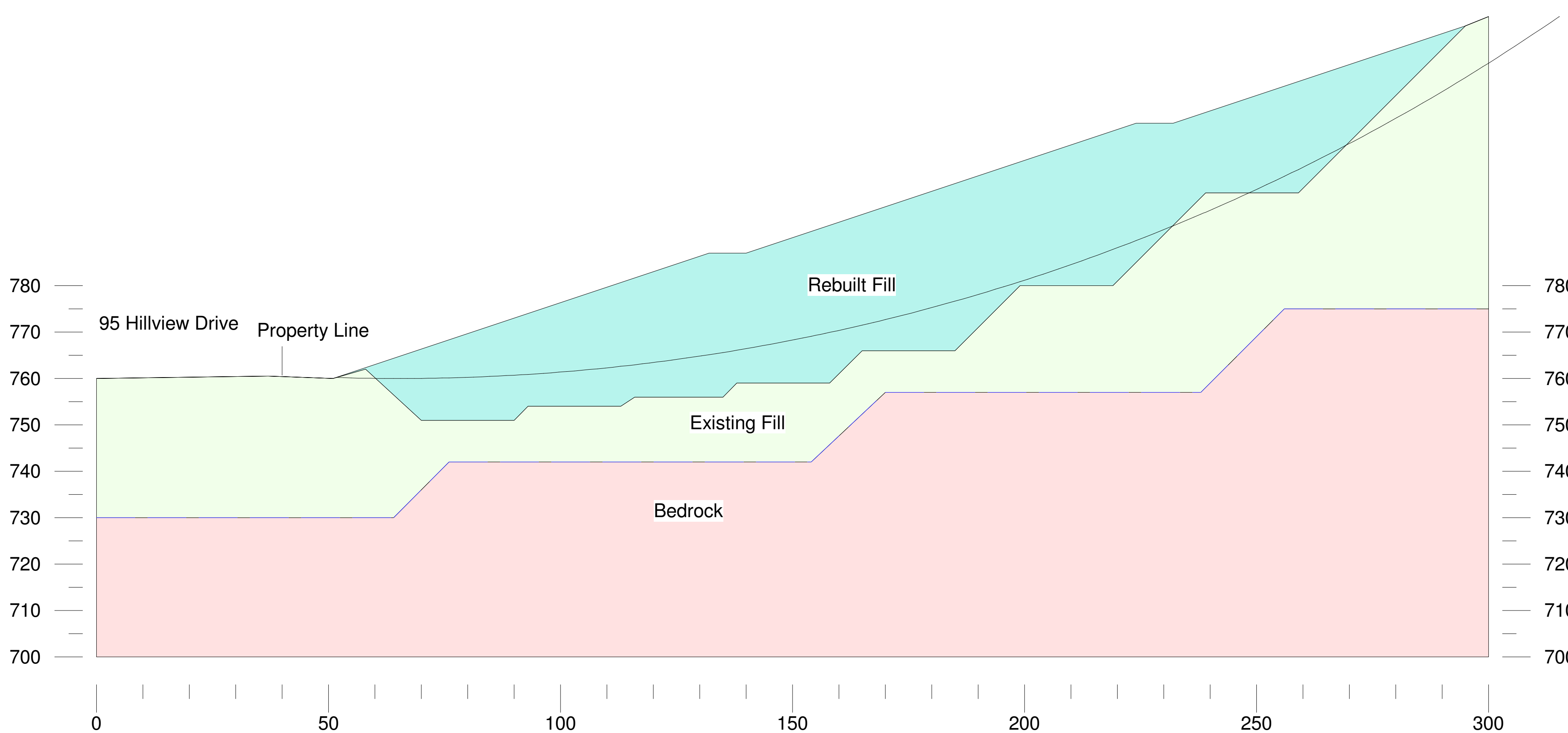


7/13/2017 9:26:51 AM F:\PPBI7E~E\768-1\7MHV7A~O\SECVXG~R\A_RWR.GSL Stevens Ferrone & Bailey Engineering Co. Inc. F = 1.865

	Gamma pcf	C psf	Phi deg	Piezo Surf.	Ru
Rebuilt Fill	120	100	26	0	0
Existing Fill	120	100	26	0	0
Bedrock	125	100	30	1	0

Seismic coefficient = 0.25

Stevens Ferrone & Bailey Engineering Co. Inc.
SFB 768-1
Hillview Drive Landslide, Danville, CA
Section A
Slope Repair with Groundwater in Bedrock
Pesudo-Static

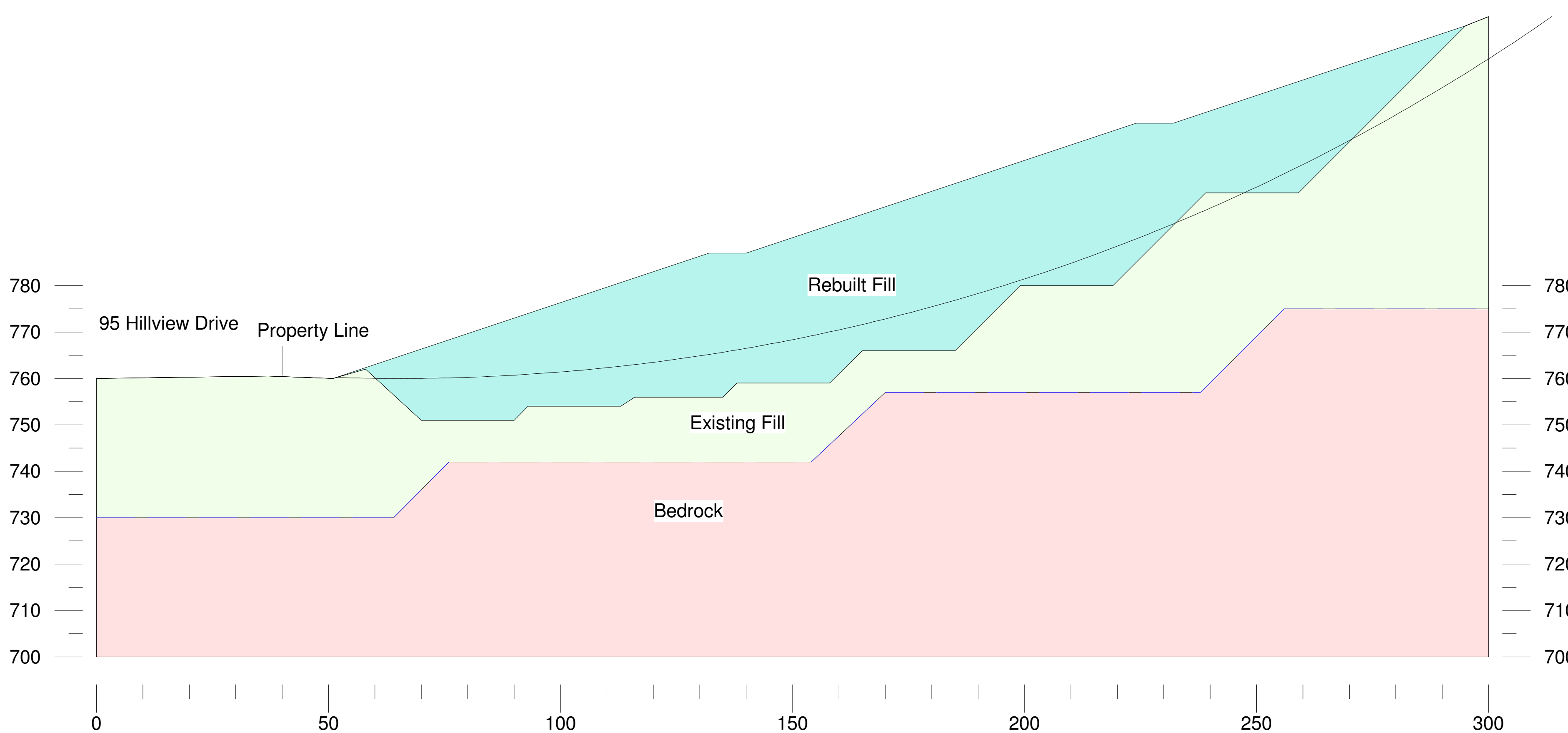


7/13/2017 9:28:26 AM F:\PPBI7E~E\768-1\7MHV7A~O\SECVXG~R\AS_RWR.GSL Stevens Ferrone & Bailey Engineering Co. Inc. F = 0.959

	Gamma pcf	C psf	Phi deg	Piezo Surf.	Ru
Rebuilt Fill	120	100	26	0	0
Existing Fill	120	100	26	0	0
Bedrock	125	100	30	1	0

Seismic coefficient = 0.15

Stevens Ferrone & Bailey Engineering Co. Inc.
SFB 768-1
Hillview Drive Landslide, Danville, CA
Section A
Slope Repair with Groundwater in Bedrock
Pesudo-Static, Seed Procedure



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APPENDIX B
TOWN OF DANVILLE'S 1988 GRADING FILE

TOWN OF DANVILLE

510 La Gonda Way, Danville, California 94526

For Inspections call 24-hr. recorder at 820-1846. For Building Inspection Office call 820-9323

This permit becomes void if work not commenced within 180 days from date issuance, OR, if work has been suspended or abandoned for a period of 180 days.

ISSUE DATE: 06/22/88 PERMIT #:1592 - GRS/NEW

WORK ADDRESS: CAMINO TASSAJARA LOT: BLOCK:

OWNER: STANDARD PACIFIC-NORTHERN CAL PARCEL: 206-020-046

PROJ. DESC: VISTA TASSAJARA, SD 6736, 918,000 CY 34,300 CY STRIPPING

VALUATION: $1,227,700 AREA(sq.ft.): 0 ZONING:

PLAN REFERENCE#: SETBACKS: RIGHT: REAR:

CONTRACTOR: STANDARD PACIFIC-NORTHERN CAL LICENSE NUMBER/CLASS: 507666/

ADDRESS: PHONE NUMBER: 415/ -

DANVILLE, CA 94526

ARCH/ENGR: LICENSE NUMBER:

ADDRESS: PHONE NUMBER:

INSPECTOR:

FEES: GRADING SUPERV $ 24,564.00

PLAN REVIEW $ 6,148.50

CCCSD FEES $ NA

SRVFD FEES $

TIP FEES $

PARK FEES $

ISSUED BY: [signature]

TOTAL FEES $ 30,712.50

☑ LICENSED CONTRACTOR'S DECLARATION: I hereby affirm that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

OWNER-BUILDER DECLARATION: I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law [Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code] or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars [$500].):

☐ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale.)

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License Law.)

☐ I am exempt under Sec. __________, B. & P.C. (Attach Certificate).

Owner [signature] Date ________

WORKERS' COMPENSATION DECLARATION: I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Workers' Compensation Insurance, or a certified copy thereof (Sec. 3800, Lab. C.).

☐ Certified copy is hereby furnished.

☑ Certified copy is filed with the Building Inspection Department or ________

CERTIFICATE OF EXEMPTION FROM WORKERS' COMPENSATION INSURANCE: This section need not be completed if the permit is for one hundred ($100) or less. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Workers' Compensation Laws of California.

Applicant [signature] Date ________

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Workers' Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked.

CONTRUCTION LENDING AGENCY: I hereby affirm that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).

Lender's Name ________

Lender's Address ________

The approval of this permit or any plans or specifications shall not be held to permit or to be an approval of the provisions of any ordinance of law. Occupancy of any structure not permitted until after final approvals.

Applicant's Signature [signature]

... DEPT.

PLAN CHECK # 115 **DATE:** 2/24/88

Check the appropriate ( )
(contact person)

CONTRACTOR ( ) **OWNER** (XX) **ARCHITECT** ( ) **SOILS ENG.** ( ) **CIVIL ENG.** (XX)

PERMIT TYPE: BLI ~~PRECISE GRADING~~
CLASS OF WORK: NEW
USE CODE: R3

SQ.FT.:
DEPT.COMM:
VALUATION: 1,193,400.–
#OF STORIES:

PROJECT DESC: NEW GRADING VISTA TASSAJARA, SUB. 6736
APPROVED TENTATIVE MAP FOR 210 S.F. D.U.'s

JOB LOCATION

APN: 206-020-046

ADDRESS: TASSAJARA RD.

SUB DIV.: 6736

CONTRACTOR INFORMATION

LICENSE#: 273747
NAME: N/A NOT SELECTED YET FOSTER
ADDRESS:
CITY,ST.ZIP:
PHONE:

OWNER INFORMATION

NAME: STANDARD PACIFIC-NORTHERN CA.
ADDRESS: 3825 HOPYARD RD., SUITE 195
CITY,ST.ZIP: PLEASANTON, CA. 94566
PHONE: 415 847-8400
DOUG LEDERER

ARCHITECT/ENGINEER INFORMATION

NAME: PARSONS ROURKE & WALKER/ASSOC., INC.
ADDRESS: 400 TAYLOR BLVD., STE. 325
CITY,ST.ZIP: PLEASANT HILL, CA. 94523
PHONE: 415 686-6300

PLANNING: **ENGINEERING:** **COUNTER:**

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SOILS
BERLOGAR
GEOTECHNICAL
CONSULTANTS.

STANDARD MONUMENTS
VISTA TASSAJARA, SUBDIVISION 6736
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC OF
NORTHERN CALIFORNIA

September 8, 1988

Job No. 1358.300

SEP 1988

BERLOGAR GEOTECHNICAL CONSULTANTS

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BERLOGAR GEOTECHNICAL CONSULTANTS

September 8, 1988
Job No. 1358.300

Standard Pacific of Northern California
3825 Hopyard Road, Suite 195
Pleasanton, California 94566

Attention: Mr. Hal Stauff

Subject: Settlement Monuments
Vista Tassajara, Subdivision 6736
Tassajara Road
Danville, California

Gentlemen:

This letter contains our geotechnical recommendations pertaining to the installation of settlement monuments at Vista Tassajara.

Settlement monuments should be installed, as recommended in our geotechnical investigation report of February 8, 1988. The settlement monuments should be installed immediately after the conclusion of fill placement, and should be monitored at periodic intervals to measure actual post-construction fill settlements and settlement rates. Recommended locations for the settlement monuments are shown on the attached Settlement Monument Location Plan, Plate 1.

In areas where the fill will be deeper than about 30 feet, we recommend delaying building construction if observed settlement rates warrant, or until the remaining total and differential settlements are determined to be tolerable.

Settlement monuments should be constructed of either No. 6 rebar or 3/4-inch diameter, heavy-wall pipe at least 5 feet long. The pipe or rebar should be driven almost to full length, or to refusal. The initial elevations of the settlement monuments should be recorded immediately after installation. Subsequent elevation readings should be recorded on a semimonthly basis for the first six months and monthly thereafter for one year. The results of the settlement monument readings should be provided to us for review.

The conclusions and recommendations presented herein have been derived in accordance with current standards of soil engineering practice; no other warranty is expressed or implied.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS

Philip Tse
Senior Engineer

Paul C. Weidig
Principal Geotechnical Engineer
GE 886 Exp. 12/31/89

REGISTERED PROFESSIONAL ENGINEER
PAUL C. WEIDIG
No. GE886
Exp. 12/31/89
GEOTECHNICAL
STATE OF CALIFORNIA

PT/PCW:cgm/sk/24\2400

Attachments: Plate 1 - Settlement Monument Location Plan

Copies: Addressee (3)

Standard Pacific of Northern California (1)
Attn: Mr. Gary McGee

Parsons Rourke & Walker (1)
Attention: Mr. Robert M Rourke

Town of Danville (1)
Attn: Mr. Peter Neumann

SOIL ENGINEERING SERVICES
DURING MASS GRADING
VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC OF
NORTHERN CALIFORNIA

November 8, 1988

Job No. 1358.300

BERLOGAR GEOTECHNICAL CONSULTANTS

November 8, 1988
Job No. 1358.300

Standard Pacific Of Northern California
3825 Hopyard Road, Suite 195
Pleasanton, California 94566

Attention: Mr. Hal Stauff

Subject: Soil Engineering Services
During Mass Grading
Vista Tassajara
Tassajara Road
Danville, California

Gentlemen:

INTRODUCTION

This report contains the results of our soil engineering services during mass grading of the subject project from June 27, 1988, through September 28, 1988. The site is located on the south side of Tassajara Road, approximately ½ mile east of Crow Canyon Road. Site grading was performed by Joe Foster Excavating, Inc. and consisted of clearing and stripping, excavation of loose fill, cuts to 70 feet in depth, and fill placement and compaction up to 35 feet in thickness. Plans dated February 17, 1988, by Parsons Rourke & Walker, and the recommendations presented in our geotechnical investigation report, of February 8, 1988, provided guidelines for the work. Supplemental recommendations regarding ash beds encountered on cut pads and in cut slope faces were presented in our letters of August 16, 1988, and September 7, 1988. In addition, we described our geologic observations during grading in a report dated October 4, 1988.

CONCLUSIONS

On the basis of our observation and testing, it is our opinion that the following work was completed in substantial compliance with our recommendations:

1. Unsuitable materials including trash and vegetation exposed during grading were removed from the site.

2. Topsoil was stripped, moisture conditioned and blended into fill placed between 10 and 30 feet below planned rough pad grade, at a ratio not exceeding 1 part topsoil to 10 parts fill material.

3. Preexisting fills were removed to the east of Lots 39 through 43; to the west and northwest of Lot 208; to the west of Lots 154 through 156; and to the west of Lots 158 and 159.

4. Colluvial areas designated to receive engineered fill were excavated to a depth of not less than 2½ feet below preexisting grades.

5. Unstable and soft deposits in gullies and swales were excavated during grading operations.

6. Subdrains were installed in areas of major canyon fills, fill slope keyways, and landslide repairs. These subdrains were installed in substantial accordance with our recommendations, and were field-located by Parsons Rourke & Walker. The approximate locations of the subdrains are shown on the attached Subdrain Location Plan, Plate 1. All subdrains should be permanently maintained and protected at their discharge points. The locations and depths of shallower subdrains should be reviewed before any excavations are made in these areas.

7. Keyways were excavated at the toes of fill slopes. Keyways were excavated to a depth of at least 4 feet into bedrock, as approved by our engineering geologist. The width of each keyway was not less than 15 feet. The approximate locations of the keyways are summarized as follow: subjacent to Lots 1 through 4; subjacent to Lots 27 through 30; subjacent to Lakefield Court; above Lots 137 through 139; subjacent to Lots 153 through 150; and above the drainage outlet to the extreme south of the development.

8. A bench key not less than 100 feet wide was excavated at the toe of the slope subjacent to Lots 63 through 72. The base of the keyway was inclined at a gradient of approximately 5 percent into the slope.

9. Landslides 1, 2, 3 and 24, located outside of the area of development were left untreated.

   Landslides 4 through 15, 17, 18, 20 and 21 were completely removed and those portions outside design cut areas were replaced with engineered fill.

   Those portions of Landslide 16 within the design cut and fill were completely removed. The lower portion of Landslide 16, which extends outside the grading limits, was left in place.

   Most of Landslides 19, 22 and 23 were removed, although specific upslope portions that extend off the site were left in place but were buttressed with engineered fill.

10. Soil subgrades upon which engineered fill was placed were scarified to a depth of approximately 8 inches where greater than 30 feet below finished grade, and to a depth of about 6 inches where less than 30 feet below finished grade.

    Scarified subgrades that were more than 10 feet below finished grade were brought to at least the optimum moisture content and compacted to not less than 90 percent relative compaction. Scarified subgrades that were less than 10 feet below finished grade were brought to at least 4 percent over the optimum moisture content and compacted to between 85 and 90 percent relative compaction.

11. Fills placed on natural slopes with a gradient steeper than 7 horizontal to 1 vertical were benched through the soil mantle and into material approved by our soil engineer.

12. Fill consisting of suitable on-site soil and bedrock material was placed in lifts, typically not exceeding 8 inches thick. Fill that was placed within 10 feet of finished grade was brought to at least 4 percent over the optimum moisture content and compacted to between 85 and 90 percent relative compaction. Fill placed deeper than 10 feet from finished grade was brought to at least the optimum moisture content and compacted to not less than 90 percent relative compaction.

13. The cut portions of transition lots on which both rock and fill (more than 1 foot thick) were exposed at rough pad grade, were overexcavated to a depth of at least 3 feet, followed by scarification to a depth of 12 inches, compaction of the roughened subgrade and restoration to final pad elevation with engineered fill. Lots 1, 3, 21, 28, 29, 30, 37, 38, 39, 41, 54, 55, 58, 59, 122, 123, 124, 130, 135, 136, 147, 148, 149, 150, 153, 154, 155, 156, 157, 158, 159, 162, 164, 188, 195 and 208 were treated in this manner.

14. Ash beds transecting the cut portions of lots on which they were exposed were overexcavated to a depth of at least 5 feet and grade was then restored with engineered fill. Lots 14, 174, 176, 178, 179 and 194 were treated in this manner.

15. An ash bed that was exposed in the cut slope behind Lot 18 was removed and replaced by an engineered buttress fill. The buttress fill was composed of on-site soil to at least 4 percent over the optimum moisture content and compacted to between 85 and 90 percent relative compaction. The buttress fill included a keyway at least 15 feet wide and extending at least 3 feet

below the lower pad grade. A subdrain was installed at the back of the keyway, and finger drains were extended from the subdrain up to and beyond the ash bed.

OBSERVATION AND TESTING

Our services consisted of full-time observation of the contractor's procedures and soil conditions exposed during the above grading. At times, the contractor's operations were spread to more than one area of the job site. During these periods, our representatives divided their time among the different work areas. We also performed field and laboratory testing to evaluate the compaction of soils and materials used. Field density test locations were selected to confirm field observations as variations in construction procedures and soil conditions were noted. Test locations and elevations were determined by pacing and hand level measurements from on-site survey stakes. These locations and elevations should be considered accurate only to the degree implied by the methods used.

Areas determined to be unsatisfactory were reworked until the specified minimum relative compaction was obtained. Field density testing was performed in accordance with ASTM Test Designation D 2922-81 ("Density of Soil and Soil Aggregate by Nuclear Methods"); the field compaction test results appear in attached Table A. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil, as determined by ASTM Designation D 1557-78 laboratory compaction test procedures. The laboratory compaction test results are presented in Table B. Additional laboratory test results for Class 2 "Permeable Material" utilized in the subdrains are presented in Tables C and D. The laboratory test results show that some of the "Permeable Material" was slightly out of specification. The deviations are considered insignificant and should not adversely affect proper functioning of the subdrains.

SUMMARY OF SERVICES

This report covers mass grading operations only. We have not completed observation and testing of: 1) underground utility trench backfill; 2) roadway subgrade compaction; 3) aggregate base placement; and 4) foundation excavations.

LIMITATIONS

We believe that the level of earthwork observations and testing services provided is reasonable in reducing the geotechnical risks to the project. It should be recognized that there are variations in the accuracy and statistical repeatability of the tests and methods used to monitor the earthwork construction and materials. Our services were performed in accordance with generally accepted standards of geotechnical engineering practice; no other warranty is expressed or implied.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS

P. J. Tse
Philip Tse
Senior Engineer

David L. Borchert
Manager, Construction Division

Paul C. Weidig
Paul C. Weidig
GE 886 Exp. 12/31/89

PT/DLB/PCW:cgm/2550\2521

Attachments:
- Plate 1 - Subdrain Location Plan
- Table A - Field Compaction Test Results Mass Grading
- Table B - Laboratory Compaction Test Results
- Tables C and D - Laboratory Test Results - Imported Material

Copies: Addressee (6)

Parsons Rourke & Walker (1)
Attention: Mr. Robert M. Rourke

Standard Pacific Of Northern California (1)
Attention: Mr. Gary McGee

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Lot						
1	6/28	91	718	108.0	98.0	19.1	91	
2	6/28	90	720	108.0	97.8	18.7	91	
3	6/28	96	722	108.0	97.3	22.3	90	
4	6/28	105	718	108.0	99.4	18.2	92	
5	6/28	106	724	108.0	96.9	21.4	90	
6	6/28	97	718	108.0	97.9	19.6	91	
7	6/29	98	720	108.0	96.8	21.7	90	
8	6/29	99	722	108.0	99.5	18.9	92	
9	6/29	100	724	108.0	97.0	21.9	90	
10	6/28	101	726	108.0	96.9	22.3	90	
11	6/30	95	724	108.0	93.1	23.3	86	
12	6/30	105	720	108.0	98.2	19.4	91	
13	6/30	97	722	108.0	97.3	21.2	90	
14	6/30	99	724	108.0	99.3	18.8	92	
15	6/30	101	728	108.0	97.6	20.0	90	
16	7/1	68	720	108.5	98.1	19.9	90	
17	7/1	70	710	108.5	99.6	17.8	92	
18	7/1	69	712	108.5	97.9	20.1	90	
19	7/1	72	714	108.5	94.0	23.7	86	20
20	7/1	72	714	108.5	97.8	20.4	90	
21	7/5	68	721	108.5	97.7	21.3	90	
22	7/5	71	714	108.5	98.5	19.0	91	
23	7/5	72	716	108.5	98.7	19.1	91	
24	7/5	49	716	108.5	97.9	20.8	90	
25	7/5	50	718	108.5	98.0	22.3	90	

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
26	7/5	51	726	108.0	99.4	18.4	92
27	7/5	70	718	108.0	98.3	19.0	91
28	7/5	69	716	108.0	97.7	21.6	90
29	7/6	105	724	108.0	98.1	19.3	91
30	7/6	95	722	108.0	93.0	23.2	86
31	7/6	104	726	108.0	97.4	20.1	90
32	7/6	98	724	108.0	96.9	19.9	90
33	7/6	88	726	108.0	99.2	24.1	92
34	7/6	91	724	108.0	94.1	18.4	97
35	7/7	104	712	108.5	98.0	19.3	90
36	7/7	103	716	108.5	99.6	16.9	92
37	7/7	74	714	108.5	97.8	18.8	90
38	7/7	75	715	108.5	99.4	16.3	92
39	7/7	73	710	108.5	98.5	17.9	91
40	7/7	72	712	108.5	97.7	20.0	90
41	7/7	115	726	114.0	105.1	14.0	92
42	7/7	113	720	114.0	103.9	13.9	91
43	7/7	111	718	114.0	102.4	15.1	90
44	7/8	109	718	108.5	99.5	16.9	92
45	7/8	110	720	108.5	97.9	20.6	90
46	7/8	112	722	108.5	98.0	20.9	90
47	7/8	114	724	114.0	103.8	14.2	91
48	7/8	113	723	114.0	102.5	16.3	90
49	7/8	115	726	114.0	104.9	13.8	92
50	7/8	112	725	114.0	102.6	17.1	90

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Park Site					
51	7/9	N474020/E593500	716	114.0	104.1	14.5	91
52	7/9	N474120/E593450	718	114.0	103.3	14.8	91
53	7/9	N474210/E593410	720	114.0	105.2	13.8	92
54	7/9	N474200/E593390	724	114.0	102.9	15.9	90
55	7/9	N474000/E593525	716	110.0	99.2	20.9	90
56	7/9	N473915/E593380	721	110.0	101.3	18.4	92
57	7/9	N473875/E593550	723	110.0	100.1	19.6	91
58	7/9	N473990/E593440	725	110.0	99.3	21.0	90
		Lot					
59	7/11	110	725	114.0	98.1	18.9	86
60	7/11	113	727	114.0	99.3	20.0	87
		Parkland Drive					
61	7/11	18+00	722	110.0	94.1	26.2	85
62	7/11	20+10	724	110.0	95.8	27.3	87
63	7/11	22+20	734	110.0	98.8	20.1	90
		Parkview Court					
64	7/11	0+30	726	110.0	94.1	25.1	85
65	7/11	1+40	728	110.0	96.3	23.9	88
66	7/11	3+90	730	110.0	95.5	24.3	87
		Lot					
67	7/12	111	728	118.3	102.1	20.2	86
68	7/12	114	729	118.3	104.4	19.3	88

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Parkland					
69	7/12	2+20	725	108.5	99.8	17.2	92
70	7/12	3+10	728	108.5	97.9	21.2	90
		Lot					
71	7/12	74	716	108.5	98.0	19.1	90
72	7/12	75	718	108.5	98.9	18.0	91
73	7/12	72	720	108.0	99.0	16.9	92
74	7/12	73	718	108.0	98.3	17.8	91
75	7/12	71	720	108.0	97.7	21.7	90
76	7/13	69 Keyway	708	112.2	102.1	15.6	91
77	7/13	71 Keyway	711	112.2	101.4	16.9	90
78	7/13	68 Keyway	706	112.2	103.0	14.0	92
79	7/13	70 Keyway	713	112.2	103.2	13.7	92
80	7/13	72 Keyway	715	112.2	101.3	15.8	90
81	7/13	68 Slope	716	112.2	104.1	13.9	93
82	7/13	70 Slope	718	112.2	103.0	14.2	92
83	7/13	71 Slope	721	112.2	101.4	15.8	90
84	7/13	69 Slope	720	112.2	100.9	16.1	90
85	7/14	68 Slope	723	112.2	101.4	15.9	90
86	7/14	70 Slope	725	112.2	103.3	13.5	92
87	7/14	71 Slope	727	112.2	101.5	14.2	91
88	7/14	69 Slope	729	112.2	103.2	13.9	92
89	7/14	68 Slope	732	112.2	100.8	16.1	90
		Park Site					
90	7/14	N473990/E593450	728	114.0	100.3	19.9	88
91	7/14	N474205/E593400	729	114.0	99.1	21.2	87

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Park Site						
92	7/14	N474110/E593375	734	114.0	101.2	18.0	89	
93	7/14	N473870/E593450	736	114.0	97.1	21.2	85	
94	7/14	N473850/E593340	738	114.0	97.6	22.0	86	
		Lot						
95	7/15	49	720	112.2	102.1	20.6	91	
96	7/15	48	723	112.2	101.7	20.8	91	
97	7/15	50	725	112.2	101.3	22.3	90	
98	7/15	51	727	118.3	106.1	14.2	90	
99	71/5	69	730	118.3	107.3	15.1	91	
100	7/15	71	732	118.3	105.9	14.7	90	
		Hillview Drive						
101	7/15	1+10	718	110.0	100.2	21.4	91	
102	7/15	2+15	720	110.0	99.8	22.6	91	
103	7/15	3+20	724	110.0	96.2	19.9	87	104
104	7/15	3+20	724	110.0	101.3	20.3	92	
		Lot						
105	7/16	67	733	112.2	102.1	14.8	91	
106	7/16	68	734	112.2	101.0	15.1	90	
107	7/16	73	735	112.2	104.3	13.3	93	
108	7/16	70	737	112.2	103.6	14.0	92	
109	7/16	49	728	112.2	103.3	13.9	92	
110	7/16	51	732	111.2	99.9	16.2	90	
111	7/16	48	734	111.2	100.2	15.3	90	
112	7/16	71	736	111.2	103.3	14.0	93	

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Hillview Drive					
113	7/16	4+00	727	111.2	101.7	15.1	91
114	7/16	2+80	730	111.2	101.9	14.6	92
115	7/16	1+20	734	111.2	102.0	14.5	92
116	7/16	0+80	736	111.2	104.4	13.8	94
		Lot					
117	7/18	92	720	108.5	93.2	21.9	86
118	7/198	95	726	108.5	95.3	22.0	88
119	7/18	97	728	108.5	97.2	20.7	90
120	7/18	96	730	108.5	96.5	21.2	89
121	7/18	94	724	108.5	94.1	22.8	87
122	7/18	120	722	116.0	102.1	17.0	88
123	7/18	118	728	116.0	100.3	19.3	86
124	7/18	116	730	116.0	101.0	18.8	87
125	7/18	69	738	112.0	101.2	15.6	90
126	7/18	72	740	112.0	102.4	14.9	91
127	7/18	50	732	112.0	103.4	14.5	92
		Parkview Court					
128	7/19	0+40	722	118.3	103.2	18.5	87
129	7/19	1+10	723	118.3	101.6	20.1	86
130	7/19	2+20	726	118.3	102.0	19.9	86
131	7/19	3+30	727	118.3	104.1	18.7	88
132	7/19	4+20	733	118.3	105.0	16.4	89
		Lot					
133	7/19	104	729	110.0	99.9	20.2	91
134	7/19	75	733	110.0	101.3	19.3	92

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Danville, California

TABLE A
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Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
135	7/19	76	725	110.0	100.8	19.0	92
136	7/19	73	735	110.0	100.4	21.0	91
137	7/19	48	736	110.0	102.6	18.9	93
138	7/19	47	738	110.0	100.0	22.2	91
139	7/19	46	740	110.0	98.8	21.6	90
140	7/19	45	736	110.0	100.5	21.7	91
141	7/20	97	734	118.3	104.5	19.5	88
142	7/20	100	732	114.0	102.4	18.2	90
143	7/20	74	738	108.5	95.7	20.7	88
144	7/20	40	740	114.0	102.1	21.6	90
145	7/20	50	734	108.5	101.4	20.7	93
146	7/20	79	736	110.0	99.8	20.3	91
147	7/20	81	734	110.0	102.3	18.9	93
		View Point Drive					
148	7/20	10+10	733	111.2	101.1	14.1	91
149	7/20	11+20	738	111.2	102.9	15.0	93
150	7/20	13+00	742	111.2	98.1	18.9	88
		Lot					
151	7/21	78	744	112.2	99.6	21.4	89
152	7/21	76	743	108.5	93.2	24.4	86
153	7/21	98	737	110.0	99.0	23.7	90
154	7/21	93	728	110.0	99.1	22.7	90
155	7/21	19	736	114.0	98.7	21.1	87
156	7/21	37	740	110.0	95.6	22.8	87

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Vista Point Drive					
157	7/21	15+50	742	118.3	101.9	18.3	86
158	7/21	16+10	744	118.3	104.0	18.0	88
159	7/21	17+00	739	108.0	96.8	22.3	90
160	l7/21	18+20	745	108.0	94.0	24.2	87
		Lot					
161	7/22	75	746	108.5	94.2	21.5	86
162	7/22	79	747	108.5	93.7	22.8	88
163	7/22	103	743	114.0	101.1	21.8	88
164	7/22	74	743	114.0	99.1	18.1	87
165	7/22	76	745	114.0	98.3	21.0	86
166	7/22	78	747	114.0	98.0	20.9	86
167	7/22	80	740	112.2	103.5	14.1	92
168	7/22	82	742	112.2	98.0	17.4	87
		View Point Drive					
169	7/22	9+50	740	112.2	97.5	18.4	87
170	7/22	8+15	742	112.2	996.3	19.8	86
		Lot					
171	7/23	48	740	116.0	106.1	13.5	91
172	7/23	50	736	116.0	105.8	13.2	91
173	7/23	72	741	116.0	100.2	18.9	86
174	7/23	70	742	116.0	99.4	19.0	86
175	7/23	68	743	116.0	104.5	15.3	90
176	7/23	109	722	111.2	95.6	19.9	86
177	7/23	111	730	111.2	96.1	18.0	87
178	7/23	113	728	111.2	94.9	21.6	85
179	7/23	114	732	111.2	97.1	20.6	87

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
180	7/23	110	731	111.2	98.4	20.1	88
181	7/25	48	746	114.0	96.6	19.7	85
182	7/25	45	742	114.0	96.9	18.5	85
183	7/25	105	734	108.5	93.3	23.5	86
184	7/25	35	740	108.0	98.8	19.6	91
185	7/25	51	731	112.2	101.8	21.8	91
186	7/25	34	746	108.5	97.6	22.4	90
187	7/25	120	730	108.5	95.8	22.9	88
188	7/25	90	733	108.5	95.0	24.7	88
189	7/25	88	738	108.5	94.7	22.2	87
190	7/25	33	760	116.0	104.2	18.2	90
		Parkland Drive					
191	7/26	27+00	761	118.3	104.0	21.2	88
		Lot					
192	7/26	114	738	118.3	105.4	17.6	89
193	7/26	75	747	118.3	102.5	19.4	86
194	7/26	126	740	110.0	96.4	24.4	88
195	7/26	76	748	118.3	101.9	21.0	86
196	7/26	125	742	116.0	99.8	19.8	86
197	7/26	83	749	118.3	102.5	20.0	87
198	7/26	47	744	108.0	94.3	23.4	87
		View Point Drive					
199	7/26	3+10	735	108.0	93.8	21.9	87
200	7/26	1+60	738	108.0	95.1	22.6	88

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Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Lot						
201	7/27	127	746	112.2	100.9	17.6	90	
202	7/27	147	744	118.3	104.4	18.6	88	
203	7/27	37	747	111.2	100.1	21.2	90	
204	7/27	121	736	118.3	104.5	18.8	88	
205	7/27	145	748	114.0	102.2	20.7	90	
206	7/27	41	750	114.0	102.5	21.1	90	
207	7/27	129	753	111.2	99.9	20.9	90	
208	7/27	68	729	111.2	102.0	21.1	92	
209	7/27	70	743	111.2	100.0	18.8	90	
210	7/27	69	734	111.2	101.4	15.3	91	
211	7/28	73 Slope	727	110.0	94.0	15.9	85	212
212	7/28	73 Slope	727	110.0	99.9	13.9	91	
213	7/28	52	740	108.5	98.8	20.8	91	
214	7/28	73 Slope	732	112.2	100.7	20.8	90	
215	7/28	69 Slope	734	108.5	97.9	21.4	90	
216	7/28	73 Slope	735	112.2	100.7	23.5	90	
217	7/28	64 Slope	706	108.5	97.2	22.9	90	
218	7/28	65 Slope	706	110.0	100.1	21.8	91	
219	7/28	66 Slope	708	110.0	100.9	19.9	92	
220	7/28	67 Slope	714	110.0	99.8	20.8	91	
221	7/29	65 Slope	710	111.2	101.8	22.8	92	
222	7/29	66 Slope	712	116.0	104.8	18.5	90	
223	7/29	66 Slope	713	108.5	99.7	23.3	92	
224	7/29	144	754	108.5	92.3	25.4	85	
225	7/29	142	761	108.5	93.1	22.4	86	

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Lot						
226	7/29	67 Slope	714	111.2	100.8	19.8	91	
227	7/29	65 Slope	715	111.2	102.1	20.0	92	
228	7/29	66 Slope	716	111.2	100.9	18.9	91	
229	7/29	Slide #16 Keyway	634	111.2	103.0	15.9	93	
230	7/29	Slide #16 Keyway	637	111.2	103.3	14.8	93	
		Lot						
231	7/30	66 Slope	717	108.5	97.4	18.7	90	
232	7/30	64 Slope	718	108.5	99.9	17.8	92	
233	7/30	65 Slope	720	111.2	101.4	22.7	91	
234	7/30	63 Slope	719	111.2	102.9	18.3	93	
235	7/30	68 Slope	723	108.5	98.9	21.7	91	
236	7/30	64 Slope	721	108.5	99.4	22.0	92	
237	7/30	Slide #16 Keyway	639	114.6	105.1	14.8	92	
238	7/30	Slide #16 Keyway	641	114.6	103.9	13.8	91	
239	7/30	Slide #16 Keyway	644	114.6	104.6	14.0	91	
240	7/30	Slide #16 Keyway	647	114.6	103.8	14.2	91	
		Lot						
241	8/1	67	720	111.2	100.5	17.2	90	
242	8/1	64	723	111.2	97.0	18.4	87	243
243	8/1	64	723	111.2	99.9	21.0	90	
244	8/1	65	725	108.5	97.9	22.4	90	
245	8/1	68	726	108.5	98.3	20.9	91	
246	8/1	66	724	114.6	104.3	14.2	91	
247	8/1	Slide #16 Keyway	649	111.8	101.1	18.9	90	
248	8/1	Slide #16 Keyway	652	111.8	102.3	17.0	92	
249	8/1	Slide #16 Keyway	655	111.8	102.6	16.8	92	
250	8/1	Slide #16 Keyway	657	111.8	103.8	16.9	93	

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Hillview Drive					
251	8/2	5+00	726	114.6	104.2	14.3	91
252	8/2	6+10	727	114.6	105.3	14.0	92
253	8/2	3+90	729	114.6	103.9	15.2	91
254	8/2	2+10	732	114.6	103.3	16.1	90
		Lot					
255	8/2	64	728	111.8	101.1	18.4	90
256	8/2	66	730	111.8	103.6	16.9	93
257	8/2	68	732	111.8	102.4	17.3	92
258	8/2	Slide #16 Slope	659	114.6	103.4	14.8	90
259	8/2	Slide #16 Slope	662	114.6	105.4	13.9	92
260	8/2	Slide #16 Slope	664	114.6	104.1	15.2	91
		Hillview Court					
261	8/3	0+20	742	111.2	100.2	19.6	90
		Lot					
262	8/3	60	744	111.2	100.7	20.3	90
263	8/3	61	748	111.2	101.9	17.4	92
264	8/4	62	746	110.0	101.0	21.3	92
265	8/3	63	750	110.0	99.1	21.5	90
266	8/3	64	753	110.0	95.6	23.6	86
267	8/3	66	750	110.0	94.2	24.9	86
268	8/3	Slide #16 Slope	667	118.5	108.0	18.0	91
269	8/3	Slide #16 Slope	669	118.5	107.1	17.7	90
270	8/3	Slide #16 Slope	670	118.5	106.9	17.5	90
		Lot					
271	8/4	69	750	114.6	101.1	17.0	88
272	8/4	67	753	114.6	102.3	16.9	89

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Lot						
273	8/4	65	755	114.6	99.5	18.3	87	
274	8/4	63	754	114.6	97.9	20.4	85	
275	8/4	57	750	116.0	102.9	16.9	87	277
276	8/4	58	753	116.0	104.6	14.7	90	
277	8/4	57	750	116.0	105.8	13.9	94	
278	8/4	Slide #18 Keyway	655	118.5	107.0	16.2	90	
279	8/4	Slide #18 Keyway	658	118.5	108.5	14.0	92	
280	8/4	Slide #18 Keyway	661	118.5	106.9	15.9	90	
281	8/5	Slide #18 Keyway	663	112.2	102.1	14.8	91	
282	8/5	Slide #18 Keyway	666	112.2	103.4	13.4	92	
283	8/5	Slide #18 Keyway	669	112.2	101.9	14.3	91	
284	8/5	Slide #18 Keyway	672	112.2	100.9	16.7	90	
		Lot						
285	8/5	144	752	118.5	109.1	14.9	92	
286	8/5	142	754	118.5	107.8	15.1	91	
287	8/5	138	760	118.5	106.6	16.0	90	
288	8/5	135	763	118.5	105.9	18.0	89	
289	8/5	139	766	118.5	104.3	18.5	88	
290	8/5	141	769	118.5	102.8	18.9	87	
291	8/5	Slide #23 Slope	758	118.5	106.7	17.1	90	
292	8/6	Slide #23 Slope	762	118.5	107.9	16.8	91	
293	8/6	Slide #23 Slope	764	118.5	109.0	15.3	92	
294	8/6	Slide #23 Slope	767	118.5	106.5	17.2	90	
295	8/6	Slide #23 Slope	770	118.5	108.1	14.8	91	
		Lot						
296	8/6	3	675	114.6	105.0	14.2	92	
297	8/6	4	678	114.6	103.8	15.0	91	

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Mountain View Court					
298	8/6	1+20	681	114.6	103.3	16.9	90
299	8/6	Slide #13 Slope	674	108.5	98.1	19.9	90
300	8/6	Slide #13 Slope	677	108.5	99.6	17.2	92
301	8/8	Slide #23 Slope	770	110.0	99.0	21.2	90
302	8/8	Slide #23 Slope	772	111.2	104.7	19.5	94
303	8/8	Slide #23 Slope	774	111.2	102.2	15.9	92
304	8/8	Slide #23 Slope	777	111.2	101.9	16.0	92
305	8/8	Slide #23 Slope	779	114.6	103.1	13.9	90
306	8/8	Slide #23 Slope	781	114.6	104.4	13.5	91
		Lot					
307	8/8	14	724	114.0	102.1	18.9	89
308	8/8	208	680	114.0	100.6	19.3	88
309	8/8	3	683	114.0	99.5	19.9	87
310	8/8	4	687	114.0	97.9	21.3	86
311	8/9	Slide #22 Slope	753	110.0	100.0	19.6	91
312	8/9	Slide #22 Slope	756	110.0	99.4	20.9	90
313	8/9	Slide #22 Slope	759	110.0	101.3	18.8	92
314	8/9	Slide #22 Slope	761	110.0	100.3	20.4	91
315	8/9	Slide #22 Slope	763	108.0	98.1	16.9	91
316	8/9	Slide #22 Slope	765	108.0	97.9	19.4	91
317	8/9	Slide #14 Slope	684	116.0	105.2	13.8	91
318	8/9	Slide #14 Slope	689	116.0	106.9	13.0	92
319	8/9	Slide #14 Slope	695	116.0	104.4	14.9	90
320	8/9	Slide #14 Slope	701	116.0	103.9	15.4	90
321	8/10	Slide #10 Keyway	690	111.2	104.0	14.2	94

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Lot						
322	8/10	Slide #10 Keyway	692	111.2	103.2	13.7	93	
323	8/10	Slide #10 Keyway	693	111.2	101.4	16.0	91	
324	8/10	Slide #10 Keyway	696	111.2	101.6	15.9	91	
325	8/10	Slide #22	768	118.3	106.9	15.4	90	
326	8/10	Slide #22	771	118.3	108.4	12.4	92	
327	8/10	Slide #22	774	118.3	106.6	14.9	90	
328	8/10	Slide #23	784	118.3	107.3	13.8	91	
329	8/10	Slide #23	787	118.5	108.8	13.7	92	
330	8/10	Slide #23	791	118.5	107.3	15.4	91	
331	8/11	Slide #22 Slope	776	114.0	104.9	13.9	92	
332	8/11	Slide #22 Slope	779	114.0	102.7	15.5	90	
333	8/11	Slide #22 Slope	781	114.0	102.6	1534	90	
334	8/11	Slide #22 Slope	783	114.0	103.1	14.5	90	
335	8/11	Slide #22 Slope	785	114.0	98.2	11.9	86	336
336	8/11	Slide #22 Slope	785	114.0	104.3	14.2	91	
337	8/11	Slide #10	698	118.5	106.3	15.9	90	
338	8/11	Slide #10	703	118.5	107.4	13.9	91	
339	8/11	Slide #11	705	118.5	107.9	14.2	91	
340	8/11	Slide #11	701	118.5	106.8	15.5	90	
341	8/12	Slide #22	787	112.2	104.0	13.2	93	
342	8/12	Slide #22	791	112.2	102.1	14.3	91	
343	8/12	Slide #22	792	112.2	100.9	15.9	90	
344	8/12	Slide #22	795	112.2	101.1	16.0	90	
345	8/12	Slide #23	790	114.6	103.2	16.1	90	
346	8/12	Slide #23	793	114.6	104.9	12.9	92	

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
347	8/12	Slide #23	795	114.6	103.5	15.8	90
348	8/12	Slide #23	797	114.6	103.8	15.4	91
349	8/12	Slide #10	707	118.3	106.1	12.4	90
350	8/12	Slide #11	710	118.3	107.2	11.8	91
351	8/15	Slide #10	712	118.5	106.2	16.9	90
352	8/15	Slide #10	714	118.5	107.4	15.0	91
353	8/15	Slide #11	716	118.5	107.7	14.9	91
354	8/15	Slide #11	719	118.5	108.5	13.7	92
355	8/15	Slide #11	721	118.5	106.3	16.8	90
356	8/15	Slide #11	723	118.5	107.5	15.6	91
357	8/15	Slide #22	798	112.2	104.0	13.1	93
358	8/15	Slide #22	798	112.2	104.0	13.1	93
359	8/15	Slide #22	800	112.2	100.5	16.3	90
360	8/15	Slide #22	802	112.2	101.6	15.0	91
361	8/16	Slide #20 @ Lot 42	732	110.0	100.2	19.6	91
362	8/16	Slide #20 @ Lot 42	735	110.0	99.4	21.2	90
363	8/16	Slide #20 @ Lot 43	737	110.0	101.6	18.5	92
364	8/16	Slide #20 @ Lot 73	739	110.0	100.5	20.1	91
365	8/16	Slide #20 @ Lot 42	741	110.0	103.7	18.2	94
366	8/16	Slide #23	800	112.2	101.1	14.1	91
367	8/16	Slide #23	803	112.2	103.4	13.9	92
368	8/16	Slide #12	705	111.8	102.2	17.8	91
369	8/16	Slide #12	708	111.8	103.9	16.9	93
370	8/16	Slide #12	711	111.8	101.4	18.8	91
371	8/17	Slide #19 Slope	677	118.5	107.1	17.7	90

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
372	8/17	Slide #19 Slope	680	118.5	106.9	18.4	90
373	8/17	Slide #19 Slope	686	118.5	108.2	16.9	91
374	8/17	Slide #19 Slope	692	118.5	106.8	18.2	90
375	8/17	Slide #19 Slope	698	118.5	109.1	15.3	92
376	8/17	Slide #19 Slope	704	118.5	110.5	13.9	93
377	8/17	Slide #19 Slope	711	118.5	108.8	14.3	92
378	8/17	Slide #20 @ Lot 42	744	116.0	104.1	19.4	90
379	8/17	Slide #20 @ Lot 73	747	116.0	100.6	21.2	87
380	8/17	Slide #20 @ Lot 42	750	116.0	99.8	21.6	86
381	8/18	Slide #19 Slope	715	111.2	101.7	15.2	91
382	8/18	Slide #19 Slope	719	111.2	104.1	13.9	94
383	8/18	Slide #19 Slope	722	111.2	103.3	14.1	93
384	8/18	Slide #19 Slope	726	111.2	101.5	15.3	91
385	8/18	Slide #19 Slope	729	111.2	102.9	15.0	93
386	8/18	Slide #19 Slope	723	111.2	101.4	15.9	91
		Lot					
387	8/18	43	752	114.0	98.3	19.7	86
388	8/18	42 Slope	754	114.0	102.7	14.8	90
389	8/18	41 Slope	757	114.0	102.5	13.9	90
390	8/18	42 Slope	760	114.0	104.9	14.0	92
391	8/19	Slide #19 Slope	736	116.0	106.1	12.9	91
392	8/19	Slide #19 Slope	742	116.0	107.2	12.5	92
393	8/19	Slide #19 Slope	749	116.0	105.5	13.9	91
394	8/19	Slide #18	739	116.0	104.8	15.4	90
395	8/19	Slide #18	746	116.0	106.3	14.0	92
396	8/19	Slide #18	753	116.0	105.9	15.6	91

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Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
397	8/19	Slide #20 Slope	763	116.8	106.0	14.7	91	
398	8/19	Slide #20 Slope	767	116.8	108.1	13.0	93	
399	8/19	Slide #20 Slope	772	116.8	105.7	16.3	90	
400	8/19	Slide #20 Slope	775	116.8	104.9	16.6	90	
		Lot						
401	8/22	27 Slope	755	110.0	99.9	19.9	91	
402	8/22	28 Slope	728	110.0	100.6	20.3	91	
403	8/22	30	761	110.0	100.9	18.4	92	
404	8/22	29	764	111.8	101.0	16.9	90	
405	8/22	28	767	111.8	103.4	16.5	92	
406	8/22	30	770	111.8	100.9	19.0	90	
407	8/22	Slide #20	778	116.8	105.1	14.3	90	
408	8/22	Slide #20	781	116.8	107.3	12.9	92	
409	8/22	Slide #20	783	116.8	106.6	13.5	91	
410	8/22	Slide #20	785	116.8	105.9	14.2	91	
411	8/23	Slide #20 Slope	787	114.0	104.1	15.7	91	
412	8/23	Slide #20 Slope	789	114.0	106.4	13.9	93	
413	8/23	Slide #20 Slope	792	114.0	105.2	14.1	92	
414	8/23	Slide #20 Slope	794	114.0	103.0	16.2	90	
		Lot						
415	8/23	27	770	118.3	105.2	16.4	89	
416	8/23	30	772	118.3	103.2	17.2	87	
417	8/23	28	774	118.3	102.6	18.0	87	
418	8/23	29	776	118.3	100.2	20.3	85	
419	8/23	27	775	118.3	101.5	19.8	86	
420	8/23	30	778	118.3	102.9	18.9	87	

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
421	8/24	Slide #22 Slope	806	118.5	108.0	14.0	91
422	8/24	Slide #22 Slope	809	118.5	109.2	13.8	92
423	8/24	Slide #22 Slope	812	118.5	106.5	15.8	90
424	8/24	Slide #22 Slope	816	118.5	107.3	16.0	91
425	8/24	Slide #23 Slope	807	118.5	108.8	13.7	92
426	8/24	Slide #23 Slope	811	116.8	106.0	14.2	91
427	8/24	Slide #23 Slope	815	116.8	105.4	15.2	90
428	8/24	Slide #23 Slope	818	116.8	106.9	12.5	92
429	8/24	Slide #23 Slope	820	116.8	107.1	14.3	92
430	8/24	Slide #23 Slope	824	116.8	108.5	13.5	93
431	8/25	Slide #22 Slope	820	111.2	100.1	14.9	90
432	8/25	Slide #22 Slope	824	111.2	102.3	14.3	92
433	8/25	Slide #22 Slope	829	111.2	102.5	14.0	92
434	8/25	Slide #23 Slope	826	112.2	102.0	14.4	91
435	8/25	Slide #23 Slope	828	112.2	101.5	14.9	90
436	8/25	Slide #23 Slope	833	112.2	103.3	13.1	92
437	8/25	Slide #23 Slope	837	112.2	101.2	15.1	90
438	8/25	Slide #23 Slope	842	114.0	104.1	15.0	91
439	8/25	Slide #23 Slope	846	114.0	103.6	14.8	91
440	8/25	Slide #23 Slope	851	114.0	104.9	13.9	92
441	8/26	Slide #23 Slope	855	116.0	1005.1	13.9	91
442	8/26	Slide #23 Slope	858	116.0	107.9	12.8	93
443	8/26	Slide #23 Slope	861	116.0	104.8	14.2	90
444	8/26	Slide #23 Slope	863	116.0	104.4	14.7	90
445	8/26	Slide #23 Slope	866	114.6	103.1	14.8	90

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
446	8/26	Slide #23 Slope	869	114.6	105.4	12.9	92	
447	8/26	Slide #23 Slope	872	114.6	103.9	13.4	91	
448	8/26	Slide #10 Slope	714	111.8	102.0	16.8	91	
449	8/26	Slide #11 Slope	717	111.8	102.7	17.5	92	
450	8/26	Slide #11 Slope	720	111.8	104.4	16.7	93	
451	8/29	Slide #11 Slope	723	116.8	105.1	12.4	90	
452	8/29	Slide #12 Slope	726	116.8	106.6	12.2	91	
453	8/29	Slide #10 Slope	729	116.8	107.9	13.0	92	
454	8/29	Slide #12 Slope	732	116.8	104.9	15.9	90	
455	8/29	Slide #23 Slope	874	112.2	104.1	12.9	93	
456	8/29	Slide #23 Slope	876	112.2	102.2	13.1	91	
457	8/29	Slide #23 Slope	879	112.2	99.0	11.8	88	458
458	8/29	Slide #23 Slope	879	112.2	103.4	13.9	92	
459	8/29	Slide #23 Slope	881	112.2	103.9	13.3	93	
460	8/29	Slide #23 Slope	883	112.2	101.4	15.2	90	
461	8/30	Slide #23 Slope	883	114.0	104.9	13.9	92	
462	8/30	Slide #23 Slope	884	114.0	103.3	14.2	91	
463	8/30	Slide #23 Slope	886	114.0	103.6	14.3	91	
464	8/30	Slide #23 Slope	887	114.0	102.8	15.2	90	
465	8/30	Slide #22 Slope	831	110.0	100.1	19.1	91	
466	8/30	Slide #22 Slope	834	110.0	99.8	20.2	91	
467	8/30	Slide #22 Slope	837	110.0	98.9	22.3	90	
468	8/30	Slide #22 Slope	840	110.0	99.7	21.9	91	
469	8/30	Slide #22 Slope	843	111.2	100.1	13.7	90	
470	8/30	Slide #22 Slope	846	111.2	101.5	14.2	91	

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
471	8/31	Slide #23 Slope	890	112.2	103.0	13.6	92
472	8/31	Slide #23 Slope	894	112.2	102.8	13.3	92
473	8/31	Slide #23 Slope	901	112.2	101.4	14.9	90
474	8/31	Slide #23 Slope	906	112.2	101.2	15.0	90
475	8/31	Slide #23 Slope	910	112.2	102.5	14.4	91
		Lot					
476	8/31	19	740	111.8	100.1	20.9	90
477	8/31	20	744	111.8	97.9	22.3	88
478	8/31	21	748	111.8	96.5	21.5	86
479	8/31	33	756	111.8	97.9	20.3	90
480	8/31	34	752	111.8	97.0	20.7	87
		Slide					
481	9/1	23	913	112.2	100.8	12.9	90
482	9/1	23	916	112.2	101.2	13.2	90
483	9/1	23	919	112.2	103.0	13.4	92
484	9/1	23	924	112.2	102.1	14.9	91
		Lot					
485	9/1	28	778	116.0	103.0	18.4	89
486	9/1	29	778	116.0	102.3	19.2	88
487	9/1	30	780	116.0	104.4	17.1	90
488	9/1	29	780	116.0	101.1	20.2	87
489	9/1	33	761	116.0	99.1	21.2	85
490	9/1	34	758	116.0	99.7	18.8	86
		Slide					
491	9/2	22	848	110.0	99.9	17.4	91

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)	Retest No.
		Slide						
492	9/2	22	850	110.0	100.6	17.9	91	
493	9/2	22	852	110.0	97.0	18.0	88	494
494	9/2	22	852	110.0	100.9	18.2	92	
		Lot						
495	9/2	154	726	111.8	99.0	21.2	89	
496	9/2	156	730	111.8	97.9	21.0	88	
497	9/2	158	734	111.8	96.7	20.8	86	
498	9/2	155	733	111.8	95.9	22.3	86	
499	9/2	157	737	111.8	96.2	20.9	86	
500	9/2	153	728	111.8	98.0	21.2	88	
		Parkview Court						
501	9/3	0+70	723	116.8	105.1	16.4	90	
502	9/3	1+60	722	116.8	103.3	16.9	88	
503	9/3	2+40	729	116.8	102.1	16.5	87	
504	9/3	3+80	733	116.8	100.0	17.9	86	
505	9/3	4+20	736	116.8	99.3	19.4	85	
		Lot						
506	9/6	126	742	118.5	105.0	17.6	89	
507	9/6	127	744	118.5	103.3	19.5	87	
508	9/6	128	753	118.5	101.5	20.1	86	
509	9/6	127	755	118.5	102.1	19.4	86	
510	9/6	129	758	118.5	103.5	18.8	87	
511	9/7	37 Slope	752	114.0	104.0	14.4	91	
512	9/7	38 Slope	754	114.0	103.6	14.6	91	
513	9/7	39 Slope	757	114.0	102.9	15.9	90	

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
514	9/7	38 Slope	759	114.0	105.4	13.9	92
515	9/7	39 Slope	761	114.0	103.0	16.2	90
		Excess Fill					
516	9/7	N473000/E593400	712	108.5	100.1	16.4	92
517	9/7	N473200/E593375	715	108.5	98.4	17.0	91
518	9/7	N473250/E593390	719	108.5	98.6	16.8	91
519	9/7	N472900/E593405	722	108.5	97.4	19.4	90
520	9/7	N473100/E593360	725	108.5	97.9	20.1	90
		Lot					
521	9/8	38 Slope	762	118.5	108.1	13.9	91
522	9/8	39 Slope	763	118.5	107.6	14.0	91
523	9/8	63	759	111.8	95.3	23.0	85
524	9/8	65	758	111.8	97.9	20.8	88
525	9/8	69	752	111.8	97.6	20.9	87
526	9/8	66	756	111.8	97.0	21.2	87
527	9/8	71	749	111.2	94.8	20.5	85
528	9/8	73	745	111.2	97.4	17.4	88
529	9/8	127	756	111.2	98.9	18.5	89
530	9/8	128	760	111.2	99.3	19.6	89
531	9/9	128	762	116.0	104.3	16.9	90
532	9/9	129	764	116.0	100.2	17.8	86
533	9/9	145	755	116.0	99.9	18.5	86
534	9/9	143	760	116.0	101.4	17.3	87
535	9/9	140	772	116.0	102.4	17.0	88
536	9/9	138	770	116.0	101.9	19.4	88

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Parkland Drive					
537	9/9	27+10	765	116.8	101.5	16.4	87
538	9/9	26+00	761	116.8	100.7	19.4	86
539	9/9	25+20	756	116.8	100.5	18.8	86
540	9/9	24+50	753	116.8	101.8	17.0	87
		Lot					
541	9/12	62	753	112.2	101.1	17.4	90
542	9/12	61	756	112.2	100.6	17.1	90
543	9/12	57	764	112.2	100.2	18.5	89
544	9/12	52	752	112.2	97.7	19.9	87
545	9/12	53	760	112.2	96.5	20.1	86
		Hill View Court					
546	9/12	0+60	749	114.6	99.5	16.8	87
547	9/12	1+20	754	114.6	101.4	16.9	88
		Lot					
548	9/12	139	773	114.6	97.2	19.8	85
549	9/12	142	766	114.6	102.3	17.0	89
550	9/12	144	759	114.6	100.5	17.2	88
551	9/13	137	772	110.0	94.0	18.2	85
552	9/13	138	771	110.0	96.8	19.0	88
553	9/13	138	773	110.0	97.2	19.4	88
554	9/13	Slide #7 Slope	776	111.8	100.4	16.9	90
555	9/13	Slide #7 Slope	779	111.8	101.1	17.0	90
556	9/13	Slide #7 Slope	782	111.8	103.4	16.9	92
557	9/13	Slide #7 Slope	785	111.8	104.5	16.5	93

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
558	9/13	Slide #7 Slope	788	118.3	108.1	12.5	91
559	9/13	Slide #7 Slope	791	118.3	107.9	12.9	91
560	9/13	Slide #7 Slope	794	118.3	106.2	13.9	90
		Lot					
561	9/14	54	762	116.8	100.2	17.9	86
562	9/14	55	764	116.8	101.5	16.8	87
563	9/14	58	766	116.8	103.0	16.5	88
564	9/14	59	765	116.8	99.9	19.4	86
565	9/14	Slide #4 Keyway	716	116.0	106.2	13.0	91
566	9/14	Slide #4 Keyway	719	116.0	107.5	12.7	92
567	9/14	Slide #4 Keyway	722	116.0	104.9	14.2	90
568	9/14	Slide #4	724	111.2	101.3	16.3	91
569	9/15	Slide #4	726	111.2	102.9	13.8	93
570	9/15	Slide #4	729	111.2	103.2	14.0	93
571	9/15	Slide #4	731	111.2	100.8	15.7	91
572	9/15	Slide #4	733	111.2	99.9	17.1	90
573	9/15	Slide #4	736	111.2	100.1	17.4	90
574	9/16	Slide #4	738	108.0	100.1	16.4	93
575	9/16	Slide #4	740	108.0	97.8	16.8	91
576	9/16	Slide #4	742	108.0	97.2	19.4	90
577	9/16	Slide #4	744	114.6	104.0	13.9	91
		Lot					
578	9/16	155	734	118.5	105.1	18.8	89
579	9/16	157	738	118.5	106.2	17.7	90
580	9/16	159	741	118.5	102.5	19.3	86
581	9/17	Slide #5	725	110.0	100.2	20.1	91
582	9/17	Slide #5	729	110.0	99.8	19.5	91

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
583	9/17	Slide #4	746	110.0	101.5	18.5	92
584	9/17	Slide #4	748	110.0	98.5	20.9	90
585	9/17	Slide #4	750	110.0	98.7	20.6	90
586	9/198	Slide #4	753	116.0	106.3	14.1	91
587	9/19	Slide #4	755	116.0	107.6	13.0	92
588	9/19	Slide #4	757	116.0	108.6	12.6	93
589	9/19	Slide #4	759	116.0	104.8	15.2	90
590	9/19	Slide #4	760	116.0	105.0	15.1	90
591	9/20	Slide #4	762	114.6	103.0	15.9	90
592	9/20	Slide #4	764	114.6	103.7	16.2	90
593	9/20	Slide #4	767	114.6	105.8	13.0	92
594	9/20	Slide #4	770	114.6	103.9	14.7	91
595	9/20	Slide #4	772	114.6	106.2	12.9	93
		Lot					
596	9/20	154	731	111.8	100.2	20.7	90
597	9/20	156	739	111.8	97.1	20.8	87
598	9/20	158	742	111.8	98.0	21.3	88
		Crestview Drive					
599	9/20	3+50	722	111.8	96.6	21.7	86
600	9/20	4+10	710	111.8	96.3	22.0	86
601	9/21	Slide #4	774	117.0	105.1	17.4	90
602	9/21	Slide #4	776	117.0	106.3	15.6	91
603	9/21	Slide #4	779	117.0	106.4	15.2	91
604	9/21	Slide #4	780	114.5	103.3	14.5	90
605	9/21	Slide #4	782	114.5	104.9	14.3	92
606	9/22	Slide #4	784	110.0	99.1	19.7	90
607	9/22	Slide #4	786	110.0	101.3	18.5	92
608	9/22	Slide #4	788	110.0	103.2	18.2	94

TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
609	9/22	148	742	114.5	103.0	18.6	90
610	9/22	149	740	114.5	100.4	18.4	88
611	9/22	150	736	114.5	101.7	18.6	89
612	9/22	130 Slope	762	114.5	98.9	20.1	86
613	9/22	130 Slope	766	114.5	98.4	19.7	86
614	9/23	Slide #4 Slope	758	117.0	106.2	16.7	91
615	9/23	Slide #4 Slope	761	117.0	105.1	15.9	90
616	9/23	Slide #4 Slope	763	117.0	107.3	14.7	92
617	9/23	Slide #4 Slope	765	117.0	105.4	15.6	90
618	9/23	188	729	111.8	100.0	20.9	89
619	9/23	194	724	111.8	97.6	21.2	87
620	9/23	194	726	111.8	97.4	21.6	87
621	9/24	130	772	114.0	102.9	18.3	90
622	9/24	153	727	114.0	100.7	18.7	88
623	9/24	Slide #4 Slope	767	111.2	99.8	13.7	90
624	9/24	Slide #4 Slope	769	111.2	102.6	13.9	92
625	9/24	Slide #4 Slope	770	111.2	101.5	14.0	91
626	9/24	Slide #4 Slope	771	111.2	100.8	15.5	91
627	9/26	150	737	111.2	96.7	19.9	87
628	9/26	147	750	114.5	98.2	20.8	86
629	9/26	149	742	111.2	95.7	20.0	86
630	9/26	148	746	111.2	97.3	18.7	88
631	9/26	122	743	111.2	96.9	19.1	87
632	9/26	123	743	111.2	94.8	20.3	85
633	9/26	124	744	111.8	98.4	21.3	88
634	9/26	Slide #4 Slope	773	111.8	100.2	19.7	91

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TABLE A
FIELD COMPACTION TEST RESULTS
Mass Grading

Test No.	Date of Test (1988)	Test Location	Elevation (ft.)	Max. Dry Density (pcf)	Test Dry Density (pcf)	Moisture Content (%)	Relative Compaction (%)
		Lot					
635	9/27	157	741	118.3	101.0	17.5	85
636	9/28	N473280/E593325	708	111.2	98.1	18.0	88
637	9/28	N473200/E59300	707	111.2	99.8	18.2	90

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TABLE B
LABORATORY COMPACTION TEST RESULTS

Descriptions of materials and corresponding laboratory compaction data, per ASTM Designation D 1557-78, are listed below:

Sample Description	Optimum Moisture Content (%)	Maximum Dry Density (pcf)
Black Silty Clay	16.5	108.0
Gray-Brown Sandy Clay	16.3	108.5
Tan silty Clay and Sandstone Mix	12.2	118.3
Gray-Brown Silty Clay	13.8	114.0
Brown Silty Clay and Claystone Mix	18.3	110.0
Tan silty Clay and Sandstone Mix	13.0	112.2
Tan Silty Claystone	12.8	116.0
Brown Silty Clay	13.6	111.2
Gray-Brown Sandy Clay	12.7	114.6
Gray Sand and Gravel (Imported Class 2 AB)	5.4	141.2
Blue-Gray Claystone	16.7	111.8
Gray-Brown Silty Clay	13.6	118.5
Gray Silty Clay	12.3	116.8
Gray Claystone	16.7	111.8
Gray Silty Clay and Siltstone Mix	15.0	110.0
Gray Claystone	14.6	117.0
Light Brown Sand and Sandstone Mix	14.3	114.5

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TABLE C
LABORATORY TEST RESULTS
Import Material

Material: Class 2 "Permeable Material"

Location: Mission - Sunol

Sieve Analysis

	Percent Passing					
Sieve Size	Sample A	Sample B	Sample C	Sample D	Sample E	Specification Requirements
Date	6/28/88	7/5/88	7/14/88	7/24/88	8/5/88	
1-inch	100	100	100	100	100	100
3/4-inch	96.6	96.3	96.6	96.9	98.9	90 -100
3/8-inch	49.2	52.2	53.6	47.9	55.5	40 - 100
#4	34.3	40.7*	39.6	32.8	41.4*	25 - 40
#8	23.1	27.6	28.4	23.8	29.2	18 - 33
#30	9.5	10.8	11.6	9.9	11.4	5 - 15
#50	5.2	5.5	5.5	5.3	5.4	0 - 7
#200	1.8	1.7	1.9	1.9	2.5	0 - 3
Sand Equivalent = (California Method 217)	75	73*	73*	74*	75	75 Min
Durability Index = (California Method 229)	79	75	73	76	80	35 Min

*Slightly out of specification

Job No. 1358.300
Vista Tassajara
Danville, California

TABLE D
LABORATORY TEST RESULTS
Import Material

Material: Class 2 Permeable

Location: Mission - Sunol

Sieve Analysis

Sieve Size	Percent Passing Sample F	Sample G	Specification Requirements
Date	8/12/88	9/13/88	
1-inch	100	100	100
3/4-inch	96.8	97.7	90 -100
3/8-inch	73.3	55.2	40 - 100
#4	38.5	40.6*	25 - 40
#8	31.2	31.0	18 - 33
#30	13.5	14.4	5 - 15
#50	6.3	7.1*	0 - 7
#200	2.2	2.4	0 - 3

Sand Equivalent = (California Method 217)	75	75	75 Min
Durability Index = (California Method 229)	78	75	35 Min

*Slightly out of specification

REPORT
GEOTECHNICAL INVESTIGATION
VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA

This set of plans and specifications MUST be kept on the job at all times and it is unlawful to make any changes or alterations on same without written permission from Building Inspection, Town of Danville.

APPROVED

APR 5 1989

By ______ Permit No. ______

The stamping of this plan and specifications SHALL NOT be held to permit or to be an approval of the violation of any provisions of any Ordinance or Law. Occupancy of structure not permitted until after final approval.

February 8, -1988 Job No. 1358.102

BERLOGAR GEOTECHNICAL CONSULTANTS

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REPORT
GEOTECHNICAL INVESTIGATION
VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC
OF NORTHERN CALIFORNIA

INTRODUCTION

Purpose

A design-level geotechnical investigation has been completed for Vista Tassajara, near the Town of Danville. This study has been undertaken to gather information on the nature, distribution and characteristics of the earth materials and ground water conditions throughout the site, and to prepare specific recommendations for grading, subdrainage, foundations and infrastructural improvements.

Scope

This investigation has included a geologic evaluation of the property by members of our professional staff, examination of stereopaired aerial photographs covering the site and immediate vicinity, the excavation of 91 backhoe exploration pits to a maximum depth of 12 feet below existing grade, the drilling of 13 test borings to a maximum depth of 55½ feet below existing grade, laboratory testing conducted on selected samples of the earth materials recovered from the exploration pits and test borings, geologic interpretation, a review of pertinent geologic and geotechnical literature, engineering analyses, and the preparation of this report.

Reference is made to our report entitled "Remedial Grading Investigation", issued June 22, 1987 for the project. Subsurface data obtained during that study have been incorporated as a part of this investigation. We have also reviewed a report entitled "Soil and Geologic Study, Big Lone Oak Project Site", prepared by Hallenbeck & Associates on December 6, 1985, for the property.

Our findings regarding site, soil, geologic and ground water conditions are presented herein, together with our conclusions pertaining to expansive soils, seismic risks, flood hazards, slope stability, settlement, borrow materials, excavation conditions, and foundation alternatives; and recommendations for grading, subdrainage, foundations, slabs-on-grade, utility trenches, pavements and related aspects of the proposed development.

The location of the project in relationship to surrounding cultural features and landmarks is depicted on the Vicinity Map, Plate 1. The geologic setting of the property is shown on the Regional Geologic Map, Plate 2, and the position of the site with respect to known faults and earthquake epicenters is shown on the Regional Fault and Seismicity Map, Plate 3. Site topography and geologic features as well as the locations of the exploration pits and test borings are displayed on the Geologic Map, Plate 4. Sectional views of areas where special remedial grading is recommended are illustrated on the Geologic Cross Sections, Plate 5.

The Test Pit Logs are tabulated on Plates 6 through 32. The Boring Logs are displayed on Plates No. 33 through 63. An explanation of the symbols, classification system and other data posted on the logs appears on Plate 64. Ground water levels measured in the borings are listed on Plate 65. Results of the laboratory testing program are presented on Plates 66 through 77.

References consulted during the course of this investigation follow the text.

Proposed Development

As presently planned, the property will be subdivided into approximately 210 lots for single-family, detached one- and two-story wood frame dwellings. Lot sizes will range from 0.09 to 0.69 acre, and pad elevations will vary from +682.2 feet to +781.2 feet (County datum) according to the final development plan prepared by Parsons, Rourke and Walker, civil engineering consultants for the project. Low retaining walls will be constructed along some common lot lines to effect grade transitions. Additional improvements will include major collector streets, secondary arterials and penetrator streets ending in cul-de-sacs; adjustments to a stream course which passes through the center of the property; and a 6.1-acre recreation area at the south end of the development area.

Mass grading is expected to require cuts up to 70 feet high and fills up to 35 feet deep relative to existing ground surface. Surface runoff is expected to be routed toward the stream course.

On-site construction will be phased. Future off-site improvements will include a realignment and widening of Tassajara Road on a tangent north of its present centerline; however, the scope of this investigation excludes those improvements.

FINDINGS

Site Description

Vista Tassajara is located on the south side of Tassajara Road, between Crow Canyon and Lawrence Roads, near Danville. The site encompasses approximately 132.8 acres of rolling foothill terrain roughly bisected by a southerly-trending drainageway. Natural site grades vary from approximate elevation +958 feet, at a point near the southwest property corner, to about elevation +630 feet, in the thread of the West Branch of Alamo Creek, which intercepts the northwest property corner. Ground surface within the area to be developed generally slopes downward at an average inclination of about 8 horizontal to 1 vertical (8:1), from the east and west property lines toward the central drainage channel, although locally, slopes are inclined as steeply as 3:1. The gradient of the central drainage channel is less than 2 percent.

Indigenous vegetation consists of isolated live and blue oak trees near the east property lines; dense brush in the West Branch of Alamo Creek; marsh grasses at several points on the creek flood plain and near the west property boundary; and a cover of dry, seasonal grasses and weeds elsewhere. Past land use appears to have been restricted to open range for grazing livestock.

High-tension electrical transmission lines borne on steel towers extend along the west property boundary. Residential properties adjoin the east site boundary and include the Cameron parcel at 1050 Leema Road; the Osterman residence at 1100 Leema Road; the Howland residence at 1250 Casolyn Ranch Road; and the Rowlett residence at 50 Hayes Ranch Road. Water line and water access easements, within which domestic water storage and buried water lines are located, also adjoin the east project boundary. In addition, each of the residences is served by subsurface septic tanks/leach field systems, and there are several power poles near the limits of the proposed grading areas.

Other than as indicated above, we discovered no evidence of significant subsurface structures on or near the property, although the possible presence of such features cannot be precluded.

Geologic Character

Regional Setting - The project is situated in the central part of the Coast Ranges geomorphic province, which is characterized by a series of parallel, northwesterly-trending, folded and faulted mountain chains. In this part of the province, the lower-lying foothills are composed of nonmarine sedimentary rocks deposited during the post-Miocene epochs of geologic time, within the past 5 million years, whereas the higher ridges are underlain by older marine sedimentary, metamorphic and volcanic rocks that have been intruded by igneous rocks.

Local Setting - The property is indicated to be underlain by siltstone, sandstone and claystone with subordinate beds of pebble conglomerate and tuff, all locally recognized as a part of the Orinda Formation, deposited during the Late Pliocene and Early Pleistocene epochs, about 1.5 to 3 million years ago. Structurally, the property lies on the northerly limb of the Tassajara Anticline, a large convex fold, so most of the rock beds dip to the north on almost due east-west strike lines. Locally, however, individual beds are crushed to contorted, resulting in anomalous to chaotic bedding attitudes.

Faults that may influence the earthquake susceptibility of the site include the Antioch Fault, 14 miles northeast; the Hayward Fault, 12 miles southwest; the Livermore, Pleasanton and Verona Faults, less than 10 miles to the south; the Concord Fault, about 5 miles north; and the Calaveras Fault, 3 miles southwest. All of these faults are active or potentially active, and the nearby active Calaveras Fault is exceptionally seismic.

Earth Materials

Fill - Artificial fills were discovered in five of the test pits excavated as a part of our off-site exploration at the east property line, and in two others excavated as part of our earlier investigation near the west property line. They are indicated by the symbol "Qaf" on the Geologic Map.

The fill materials on the east side generally were found to consist of soft, dark gray silty clay (Unified Soil Classification: CL/CH) with roots extending to a depth of 4 feet downslope of the Osterman property; soft, light brown silty clay (CL/CH) and stiff, black clay (CH) with roots, plastic and wood fragments to a maximum depth of 7 feet near the Howland property; and soft to hard, light gray to black clay (CH) with paper, plastic and wood fragments to a maximum depth of 5 feet at the Rowlett property. These fills appear to have been built to extend the rear yard areas to accommodate outbuildings, driveways, plantings and other additions. All have been constructed, apparently without benefit of controlled compaction, across the upper reaches of ravines tributary to the central drainageway that divides the property.

The fill materials on the west side were found to consist of soils similar to those described above, but no inclusions of trash or other debris were discovered. These fills appear to be stockpiled soils placed within the power line corridor during grading by Pacific Gas & Electric Company and appear to be less than 3 feet deep.

Residual Soils - Residual natural soils, derived by in-place weathering of the underlying parent bedrock, were encountered in test pits excavated on higher, undisturbed terrain. These soils were found to consist almost entirely of stiff to hard, dark gray to black clay (CH) or silty clay (CL/CH), frequently riddled with desiccation cracks up to 1 inch wide and 3 feet deep. The average thickness of the residual soil cover revealed by these test pits is about 3 feet, but at individual locations, soil depths were found to vary from 1 to 6 feet below existing ground surface.

Colluvial Deposits - Colluvial soils, generated by the downslope creeping of residual soils and/or their transportation by erosion, were revealed in the test borings drilled over the valley floor as well as in the ravines leading to the central stream channel. Where more than about 3 feet deep, these deposits are delineated by the symbol "Qc" on the Geologic Map.

In general, the profile of colluvial soils appears to be zoned and was found to consist of soft to stiff, dark gray to black clay (CH), locally containing calcareous deposits to depths ranging from about 2 to 5 feet; stiff to very stiff, dark gray to gray-brown silty clay (CL/CH) to depths of about 20½ to 27½ feet; very stiff, yellow-gray to gray-brown, "lean" silty clay (CL) to depths of about 17½ to 24½ feet; and very stiff, yellow-gray to yellow-brown and blue-gray mottled clayey silt (CL/ML) to depths of about 21½ to 36 feet below existing ground surface.

In general, the in-place unit weight of the colluvial soils tends to decrease slightly and the moisture content tends to increase slightly with depth. Shrinkage cracks up to 3 inches wide and 3 feet deep were commonly observed in areas overlain by colluvial deposits.

Alluvial Deposits - Alluvial stream deposits were noted in the West Branch of Alamo Creek, and are marked by the symbol "Qal" on the Geologic Map. These soils principally consist of silty to clayey sand, gravel and small cobbles (SM,GM) confined to the drainage channel and are visually estimated to be less than 5 feet thick.

Landslides - A total of 26 landslides or landslide complexes were identified on the property. All but two will be affected by the proposed grading scheme. They are identified by sequential numbers and arrows signifying both type and sense of movement on the Geologic Map.

The landslides can be classified as recently active and older features. Recently active landslides are distinguished by sharp, conspicuous and essentially uneroded head and/or lateral scarps as well as prominent bulges at the downslope extremities. Springs or wet areas are often associated with recently active landslides and may encourage the growth of phreatophytes (water-loving plants). All of the recently active landslides discovered on the property involve only residual soils generally less than 5 feet deep. In addition, all are intimately associated with, and some have been developed above, the older landslide masses. Active landslides that show signs of continuing displacement can be expected to move with relatively low-level changes in soil moisture content, and are sensitive to disturbance.

Older landslides are characterized by subtle topographic irregularities that have been modified by erosion and vegetative overgrowth. They may be either surficial, involving only the soil cover or, they may be deep-seated, involving both surface soils and the underlying bedrock. Older landslides frequently are dormant and are capable of renewed movement under the influence of elevated ground water conditions, topographic modification, earthquakes, or other external forces. We found a total of 24 older landslide complexes within or adjoining the proposed development area. Six of these seem to be deep-seated and coalesce with nearby surficial landslides. All but one of the deep-seated landslide complexes will affect the proposed grading scheme.

The surficial landslide deposits, both recently active and older materials, apparently form a gradational profile, with the number of zones probably reflecting the relative age of each landslide mass. The exploration pits and test borings revealed that this profile consists chiefly of soft to very stiff, dark gray clay (CH) to depths ranging from about 2 to 6 feet; very stiff, orange-brown silty clay (CL), typically containing calcareous deposits to depths of about 7½ to 16 feet; and very stiff, blue-green to yellow-brown clayey silt (CL/ML) to depths of about 8 to 16 feet below existing ground surface.

The deep-seated landslides have displaced both surface soils and siltstone or claystone, which we found is typically deeply weathered to an orange-brown or tan cast and is characterized by a sheared, crushed texture with randomly-oriented soft clay partings. Maximum depths to the bases of the deep-seated landslide surfaces were found to range from about 11 feet at Landslide 19 up to 49 feet at Landslide 23. In all cases, the transition from displaced to intact bedrock was marked by an interval of slickensided clay or claystone.

<u>Bedrock</u> - Most of the exploration pits and test borings encountered intact bedrock immediately below the mantle of residual and colluvial soils, or below the landslide deposits. Where bedrock is overlain by less than about 5 feet of colluvial soil, it is shown by the symbol "Tps" on the Geologic Map.

In general, the bedrock was found to consist of a hard, gray-brown to olive-green, crushed claystone, usually highly weathered near the upper surface but becoming less weathered with depth. Minor associations of hard (but friable) tan silty sandstone or sandy siltstone, gray rhyolitic ash or gray-brown, pebbly to cobbly conglomerate were found at several points on the property.

The claystone beds at least locally appear to be gypsum-bearing, with individual crystals sometimes approaching 1 or 2 inches in diameter. All of the bedrock materials are recognized as a part of the Orinda Formation and were penetrated to a maximum depth of 55½ feet.

Rock bedding attitudes were found to vary from 35° to 50° N on strike lines approximating S 60° W to N 30° W. Important exceptions to this overall trend were discovered near the deep-seated landslide complexes, a condition that may have contributed to slope instability at those locations.

Ground Water

No ground water was observed in any of the exploration pits. In addition, there were no indications of ground water movement or intrusion while drilling any of the test borings; however, all were drilled using rotary wash bits and heavy drill mud, a technique that ordinarily precludes immediate detection of a stabilized ground water level.

To facilitate future ground water measurements, all of the borings were thoroughly flushed with clear water to displace the drilling fluid and 3/4-inch diameter, slotted piezometer pipes were installed to full depth. Subsequent ground water level readings are presented on Plate 65.

CONCLUSIONS

Expansive Soils

Laboratory test data indicate that both the native soils (residual soils and colluvium) and claystone bedrock are highly plastic and highly expansive. The shrinkage cracks observed over the surface throughout most of the project area are a manifestation of high soil plasticity. The surface and near-surface soils can shrink and swell significantly with variations in moisture content, a process that can cause distress to foundations, floor slabs, and exterior flatwork, unless specific precautions are undertaken.

Ground Water

Perched ground water levels are expected to develop within the colluvial soils; at or near the interface between residual soils and the immediately underlying bedrock; and within the more permeable zones of landslide debris. Under present site conditions, perched water occurrences are expected to depend upon seasonal recharge due to rainfall and when the project is developed, upon individual irrigation practices.

Seismic Risks

Faults - No faults have been mapped on or near the vicinity of the site, nor did we discover any indications of faulting during our field reconnaissance. In addition, the site does not lie in a Special Studies Zone as defined by the State Geologist.

In our opinion, there is a very low potential for faulting at the site.

Ground Shaking - We have conducted a computer-assisted earthquake risk evaluation of the project area, using return periods for earthquakes arising on active and potentially active faults within 100 miles of the site. Because the analysis is probabilistic, ground shaking risks are dependent upon the life span of the development.

For design purposes, we have used the criteria recommended by the Applied Technology Council (1978), which state that for structures such as residential buildings, a 10 percent risk or probability of exceedance in 50 years is appropriate. On this basis, the computer model yields a design peak horizontal acceleration of 0.38 g (1 g = 32.2 feet per second per second). This value confirms the lateral force level for which structures should be designed per Uniform Building Code Zone 4, including the project area.

Liquefaction - Liquefaction is the temporary transformation of a saturated, cohesionless soil into a viscous liquid during strong ground shaking from a major earthquake. There is no evidence of historic ground failure due to liquefaction on the site.

The only area which may be remotely prone to liquefaction occurs in the West Branch of Alamo Creek, where saturated gravelly sands exist. Elsewhere, we encountered no earth materials which might be susceptible to liquefaction.

Lurching - Lurching is the sudden swaying, spreading or rolling of the ground during a strong earthquake. Lurching usually is accompanied by the development of fissures on slopes overlain by weak soils.

The proposed grading plan will eliminate the possibility for slope lurching within the proposed construction areas, but lurching could occur along the banks of the West Branch of Alamo Creek, and along the lower reaches of the central stream course, south of the project area.

Ground Subsidence - Ground subsidence can occur as a result of "shakedown" when dry, cohesionless soils are subjected to earthquake vibrations of high amplitude; as a result of extensive subsurface mining activities; or due to ground water overdrafting.

None of these conditions exists on the site; therefore ground subsidence is not considered a geologic hazard on the property.

Earthquake-Induced Landsliding - Strong ground shaking during a major earthquake is likely to cause sympathetic reactivation of landslides in many parts of the Danville area. The stability of all slopes is lower during earthquake disturbances than at other times.

The proposed grading scheme will greatly mitigate most of the seismically-triggered landslide risk on the property. Remaining vulnerable areas probably are restricted to preexisting landslides outside the development perimeter.

Flood Hazard

The property appears to lie outside any flood-prone areas and is not susceptible to seismically-induced inundation, due to its elevation with respect to nearby reservoirs.

Slope Stability

General - We conducted a series of computer-assisted slope stability analyses to assess the integrity of the existing natural and proposed cut slopes as well as the condition of the four deep-seated landslide complexes that will be affected by the proposed grading plan. Strength parameters were derived from laboratory test results, including triaxial compression series on remolded and undisturbed specimens of soil and rock; and slow, ("simple") direct shear tests conducted on selected samples of the interface materials below the deep-seated landslides. These and other index data used in the slope stability analyses are shown below.

TABLE 1

SLOPE STABILITY INDEX PARAMETERS

Earth Material	In-Place Unit Weights Unsaturated (pcf)	Buoyant (pcf)	Angle of Friction	Effective Cohesion (psf)
Residual soils	120	58	10	250
Engineered fill	125	62	38	1980
Bedrock				
Intact	124	62	9	2000
Sheared	119	56	18	590

For the combined static and dynamic analyses, we incorporated a peak horizontal ground acceleration of 0.38 g, derived as explained previously. Bishop's Ordinary Method of Slices, modified to account for failure surface geometry and interslice forces, was used for all but the surficial analyses which were based on a translational mode of failure. Where appropriate, the models also incorporated phreatic (free groundwater) surfaces to simulate the effects of perched water.

Each analysis yields a safety factor which is defined as the ratio of resisting forces to driving forces. Thus, a safety factor of unity corresponds to exact equilibrium, any value less than unity implies potential failure, and values greater than unity represent the degree to which the slope under analysis should remain stable beyond threshold equilibrium.

<u>Natural Slopes</u> - Surficial failures can occur if the soils overlying the bedrock surface approach saturation, are exposed to concentrated surface flow, lack satisfactory vegetative cover and/or repose on oversteepened slopes. Our stability analyses indicate that surficial failures can occur where natural slopes exceed an inclination of about 7:1, where vegetation has afforded at least nominal mechanical slope reinforcement, and where the soil cover is at least 3 feet thick. If vegetative cover is minimal or if the depth of soil is less than about 3 feet, slopes as shallow as 10:1 maybe susceptible to surficial slope stability.

Our analyses indicate that minimum safety factors against deep-seated failures of natural slopes outside of existing landslide areas exceed 4.0 under static conditions and approach 3.7 under static plus dynamic conditions.

<u>Graded Slopes</u> - Cut slopes graded in accordance with recommendations of this report can be expected to remain stable under minimum safety factors of 2.9 for static conditions and 1.3 for static plus dynamic conditions. Minimum safety factors for the proposed embankment are expected to approach 3.5 under static conditions and 2.5 under static plus dynamic conditions.

<u>Landslides</u> - We have concluded that all of the recently active and older surficial landslides within the confines of the area to be developed should be removed and grades restored with engineered fill, as recommended at a later point in this report. In most cases, these landslides will be removed during the ordinary course of grading; however Landslides 19, 20, 21-22 and 23, all situated along the east property line, do not entirely

lie within the proposed mass grading limits. Our slope stability analysis indicate that these landslides are unstable to marginally stable in their present state under static conditions and are likely unstable under static plus dynamic conditions. If Landslides 20, 21-22 and 23 are entirely removed and replaced (the "rebuilt" case), as recommended in this report, the associated minimum safety factors exceed 4.0 under static conditions and approach 3.1 under static plus dynamic conditions. If Landslides 19, 20, and 21-22 are partially rebuilt (the "reinforced" case), in accordance with our alternative recommendations, then the minimum computed safety factors diminish only slightly. The results of the stability analysis for all of the cases are tabulated below.

TABLE 2

RESULTS OF LANDSLIDE STABILITY ANALYSES

Landslide(s) No.	Condition	Minimum Factor of Safety Static	Minimum Factor of Safety Static + Dynamic
19	Existing	0.8	0.3
	Reinforced	Over 4.0	1.9
20	Existing	1.1	0.3
	Reinforced	Over 4.0	2.4
	Rebuilt	Over 4.0	2.9
21-22	Existing	1.1	0.2
	Reinforced	Over 4.0	2.5
	Rebuilt	Over 4.0	3.1
23	Existing	1.0	0.3
	Rebuilt	Over 4.0	1.5

Settlement

We have completed a series of settlement analyses, based upon the results of consolidation tests conducted on undisturbed samples of colluvial soils as well as remolded samples of claystone, expected to be typical of most of the proposed fill materials. The parameters used in our settlement analyses are listed below.

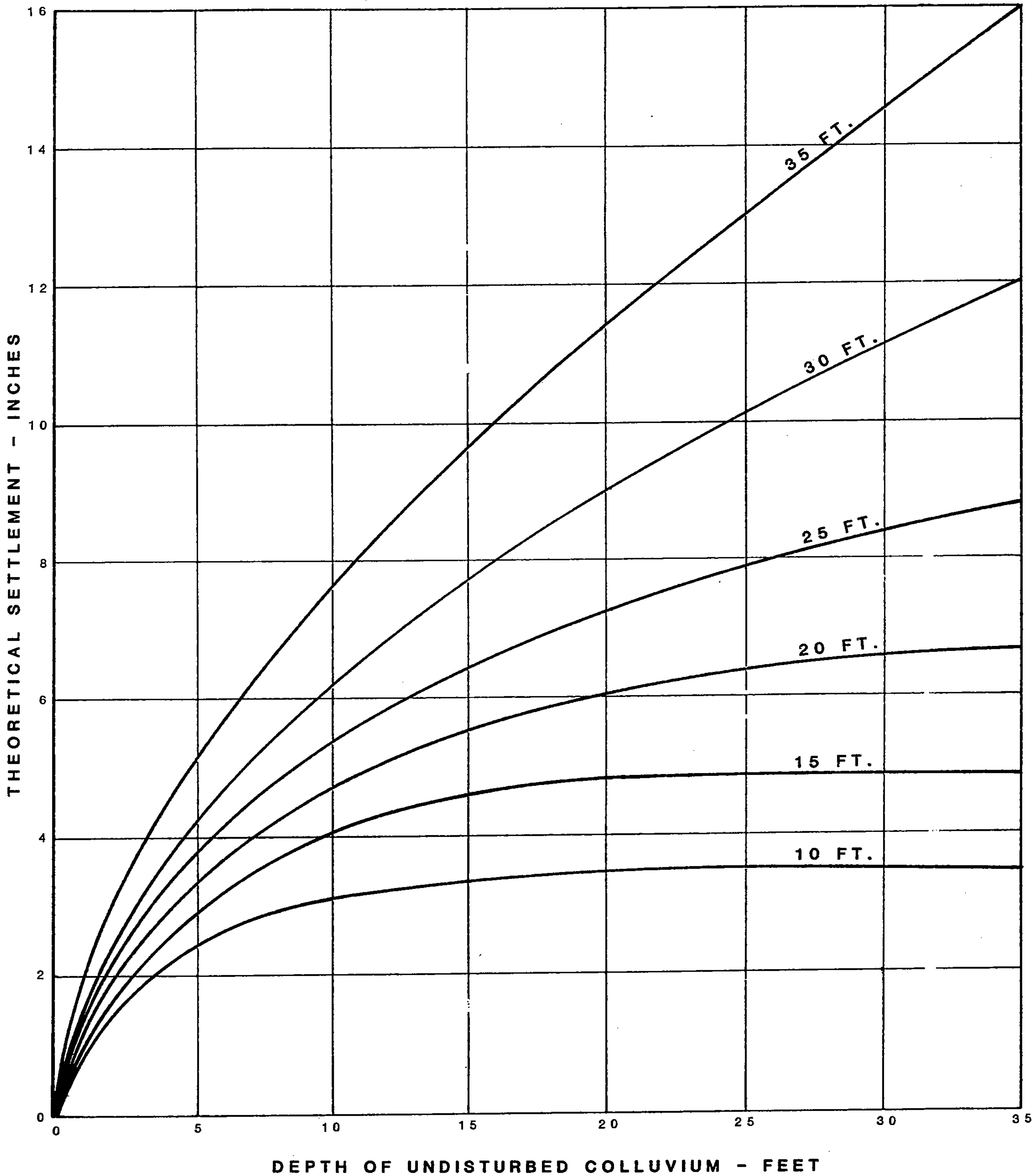
TABLE 3

SETTLEMENT ANALYSIS PARAMETERS

Earth Material	In-Place Unit Weights Unsaturated (pcf)	Saturated (pcf)	Coefficients of Consolidation Compression	Rebound
Engineered fill	124	127	0.12	0.06
Colluvium				
0-5 ft.	119	125	0.18	0.03
5-15 ft.	119	124	0.15	0.04
15-35 ft.	119	123	0.13	0.05

Computations were completed for various depths of fill and thicknesses of undisturbed colluvial deposits; the results are illustrated graphically on Figure 1. A maximum theoretical settlement of about 16 inches could be expected for the case where 35 feet of engineered fill overlies 35 feet of colluvium, but less than about 3 inches of settlement would be expected where the proposed fills adjoin natural slopes or overlie bedrock. The greatest settlements would be expected over and near the proposed playfield/recreation area, where the depths of proposed fill and colluvium are greatest, whereas the smallest settlements would be expected near cut-to-fill transitions where the depth of colluvium is limited. Because of the magnitude of the implied differential settlements, we have concluded that settlement monuments should be installed upon completion of mass grading and then monitored on a bimonthly basis. From our experience on other projects with similar geologic conditions and grading concepts, we anticipate that 90 percent of primary consolidation is likely to occur within 6 months to 1 year after final embankment grades have been reached. Roadway and associated utility line construction may proceed during this period, provided that invert adjustments to accommodate the anticipated settlements are recognized and accounted for.

JOB NUMBER: 1358.102.1 DATE: 1-13-88 BY: PW/CR



THEORETICAL SETTLEMENT CHART

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FIGURE 1

Borrow Materials

Suitability - The results of our investigation indicate that the on-site soils, including residual soils and colluvium, as well as excavated bedrock are considered acceptable for use in engineered fill construction provided that these materials are processed to remove rubble, rubbish, vegetation and other undesirable substances, and are properly moisture conditioned. In addition, all proposed fill materials should be free of rock fragments greater than 6 inches in largest dimension and should be approved by our office prior to use. Existing fill materials containing excessive refuse and vegetation are considered unsuitable for reuse as engineered fill.

During and shortly following the wet season, infiltrating surface runoff water trapped at or near the interface between the soils and underlying bedrock can create a saturated surface condition which can seriously impair grading progress and may also require extensive aeration or other processing of the surface soils to produce a manageable moisture content for compaction. These possibilities should be taken into consideration when scheduling grading operations.

Grading Factors

We have calculated approximate grading factors for the native soils and excavated bedrock. This analysis is based upon a comparison of laboratory data and must be considered theoretical. In addition the analysis does not (and cannot) account for subsidence beneath haulageways, overcompaction, rejection of unsuitable materials, and losses during transportation.

Given the limitations described above, we have calculated an overall shrinkage factor of 15 percent for the soils and an overall swell factor of 5 percent for the bedrock materials. Therefore, 1.00 cubic yard of excavated soil theoretically can be expected to produce approximately 0.85 cubic yard of engineered fill and 1.00 cubic yard of excavated bedrock theoretically can be expected to produce 1.05 cubic yards of engineered fill.

Excavation Conditions

Field exploration data suggest that all of the soils and bedrock can be excavated using conventional equipment ordinarily available to contractors. The results of this study indicate that the soil mantle can be removed without significant difficulty using such equipment. Our investigation also indicates that open excavation and trenching of the bedrock to the anticipated depths can be accomplished with heavy-duty equipment. Most of the bedrock materials are expected to break down without difficulty into fragments 6 inches in diameter or smaller.

Foundation Alternatives

The use of conventional spread foundations, whether or not heavily reinforced and/or deepened, is considered impractical at this site, owing to the highly expansive nature of the soils and bedrock. Viable foundation alternatives that can be designed to cope effectively with these expansion problems include pier and grade beam foundations, where raised floor construction would be appropriate; and post-tensioned slabs-on-grade elsewhere.

RECOMMENDATIONS

Grading

Clearing - Grubbing - General clearing within the proposed construction areas should include the removal of all vegetation, debris, preexisting fills, and all loose or saturated soils including those which remain in our test pits. Ponded water should be drained away form areas to be graded. Strippings may be reserved for blending with clean fill, as described below.

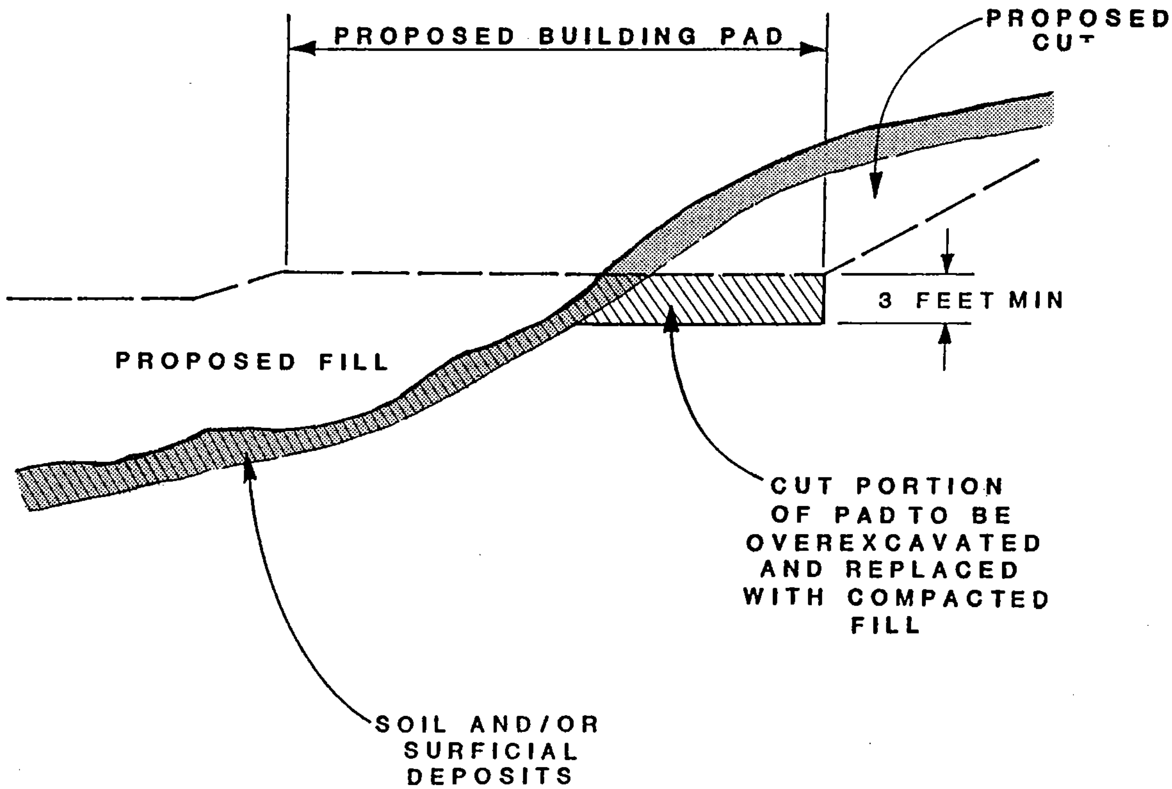
Overexcavation - Colluvial areas designated to receive engineered fill should be overexcavated to a depth of 2½ feet below existing grade. To reduce the possibility for differential settlement, the cut portions of transition lots where daylight lines would otherwise occur between cut and fill should be overexcavated to a depth of at least 3 feet below rough pad grade as shown on Figure 2. (This condition exists on Lots 3, 4, 20, 21, 23, 30, 31, 33, 34, 38, 39, 41, 42, 54, 55, 57, 58, 59, 124-130, 136-139, 147, 152, 154-160, 163, 164, 186 and 187.)

Surficial soils beneath proposed fill embankments should be removed to expose the underlying bedrock surface.

Except for the proposed playfield area and open space, all recently active and older surficial landslide deposits should be removed from the proposed development area.

The estimated average thickness of each landslide appears in the following tabulation.

JOB NUMBER: 1358.102.1 DATE: 1-14-88 BY: CR



TYPICAL TRANSITION LOT OVEREXCAVATION DETAILS

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FIGURE 2

TABLE 4

ESTIMATED LANDSLIDE THICKNESSES

Landslide No.	Estimated Average Thickness (feet)
4	8
6	8
7	12
8	6
9	12
10	6
11	6
12	8
13	10
14	8
15	6
16	19
17	16
18	10
19	15
20	18
21	5
22	15
23	25

Care should be taken in using these figures for estimated remedial grading quantities.

Those parts of Landslide 4, downslope of Lot 134; Landslide 9, upslope of Lot 139; Landslide 10, adjoining Lot 154; Landslide 12, adjoining Lots 160 and 161; Landslide 13, adjoining Lot 210; and Landslide 15, between Lots 165 and 210 should also be removed entirely and restored to grade as recommended below.

More than one remedial grading approach might be feasible to stabilize Landslides 19, 20 and 21-22. These include complete removal; or, the removal of the lower parts of the landslides and buttressing the remaining parts that extend upslope and beyond the east property boundary. The first approach is considered preferable from the standpoint of long-term security; however, as discussed above, the differences between safety factors for either scheme are slight. Both overexcavation schemes are depicted schematically on the Geologic Cross Sections. Whichever approach is selected will depend largely upon the cooperation of the affected landholders onto whose property the slides extend, protection of lots and infrastructural improvements within the confines of the project itself, and other legal aspects beyond our purview.

Subgrade Preparation - Soil subgrades upon which engineered fill is to be placed should be scarified to a depth of 8 inches where greater than 30 feet below finished grade, and to a depth of 6 inches elsewhere. Bedrock subgrades created by excavation should be cleared of all loose rock fragments exceeding 6 inches in maximum dimension but should otherwise be left undisturbed.

Scarified subgrades that are more than 10 feet below planned finished grade should be brought to at least optimum moisture content and compacted to not less than 90 percent relative compaction, as stipulated by ASTM Specification D 1557-78. Other scarified subgrades should be brought to at least 4 percent over the optimum moisture content and compacted to at least 85 percent but not more than 90 percent relative compaction, in accordance with the above standard.

If unanticipated pumping and or yielding occurs during scarification or recompaction, it will be necessary to stabilize the exposed subgrades. The stabilization procedure chosen should be approved by our office.

Engineered Fill - Strippings may be placed between depths of 10 and 30 feet from finished grade, provided that they are blended with clean soils and/or excavated bedrock such that the resulting mixture contains no more than 10 percent strippings and is free of clumps or pockets of, vegetation including grass and roots.

All engineered fill should be placed in level lifts not exceeding 8 inches in loose thickness. Fill to be placed within 10 feet of finished grade should be brought to at least 4 percent over the optimum moisture content and compacted to not less than 85 percent nor more than 90 percent relative compaction, per ASTM Specification D 1557-78. Elsewhere, fill should be brought to at least the optimum moisture content and compacted to not less than 90 percent relative compaction, in accordance with the above standard.

Benching - Keying - Keyways should be constructed beneath all fill slopes, as shown on Figure 3. Each keyway should extend at least 4 feet into underlying bedrock as determined by our field engineer. Keyways should be at least 15 feet wide or ½ the height of the fill slope, whichever is greater, and should have side slopes not exceeding 1:1; the actual depth and extent of the keyways should be determined by our field engineer.

All engineered fills should be benched into firm soil or bedrock. Each bench should consist of a level terrace at least 8 feet wide, sloped into the hill side at an effective inclination of 20:1.

Graded Slopes

Except as noted below, permanent cut and fill slopes should be designed no steeper than 3:1. To avoid encroaching upon the water tank above Landslide 23, it may be possible to steepen the cut slope to an effective configuration of 2:1, contingent upon a review of the exposed bedrock in the field.

Except as noted below, permanent cut and fill slopes greater than about 40 feet high should be provided with intermediate benches at least 8 feet wide and spaced vertically about every 30 feet, as shown on Figure 3. A concrete "V" ditch should be constructed along each drainage terrace and should be led to outlet toward a storm drain, the central creek channel, or other appropriate discharge area.

Slope terracing may be waived for the cut slope proposed between "L" Court and "D" Drive, west of "A" Drive, provided that the section of cut slope above a height of 30 feet is flattened to an inclination not exceeding 4:1. Only one drainage terrace, positioned 30 feet above the toe line, is considered necessary for the cut slope proposed between "A" and "B" drives. It may be possible to reduce the number of drainage terraces to two or three at Landslides 22 and 23. The drainage terrace along the cut slope proposed between the east property line and "A" Drive should be positioned along the midpoint of the slope.

Where appropriate, "V" ditches, as previously described, should be constructed along the crown lines of slopes to prevent overslope sheet runoff.

The crest of the buttress fill at Landslide 19 should be at least half the width of the keyway and should be sloped outboard at an effective inclination of 10:1.

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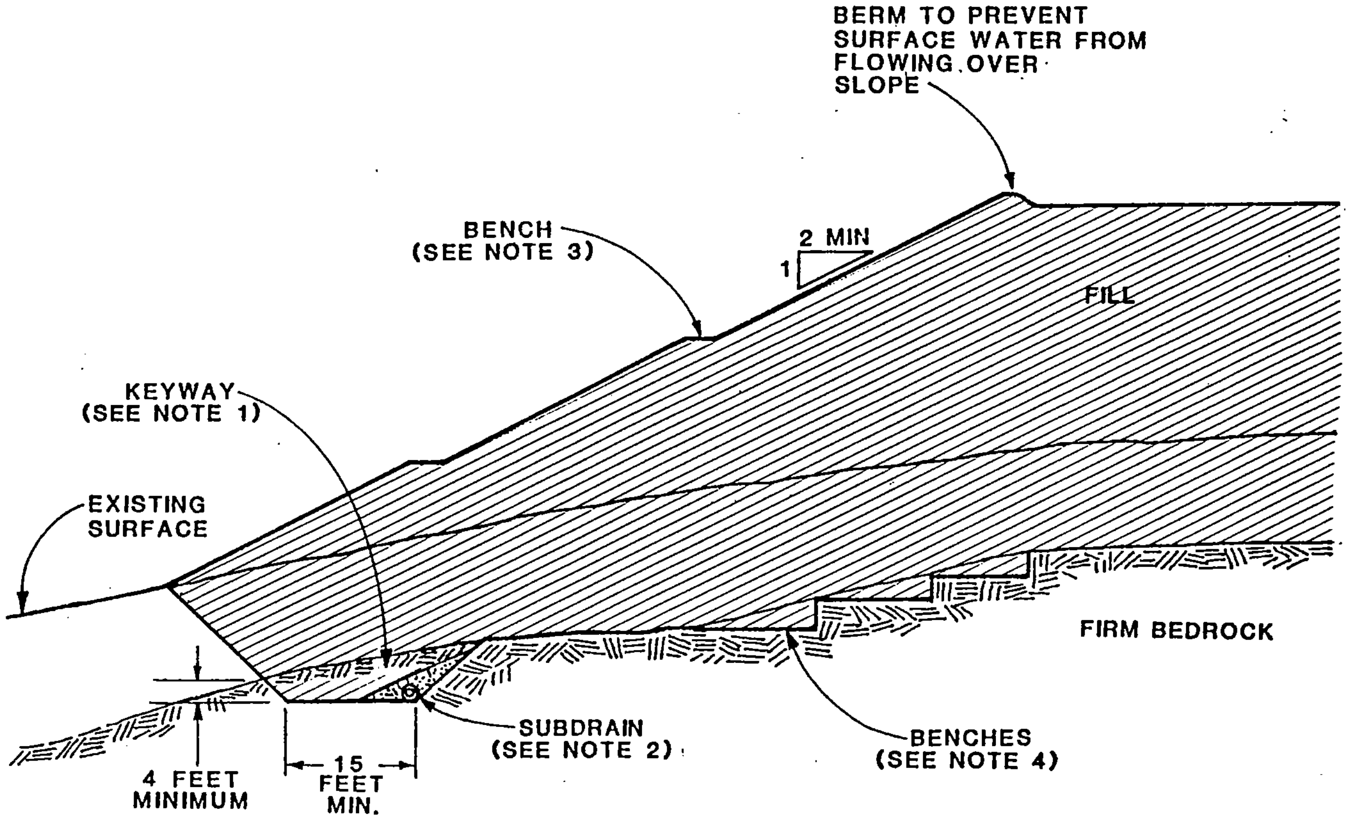


NOTES:

1. THE KEYWAY SHOULD HAVE A MINIMUM WIDTH OF 15 FEET OR 1/2 THE HEIGHT OF THE FILL SLOPE, WHICHEVER IS GREATER, AND EXTEND AT LEAST 4 FEET INTO FIRM BEDROCK. THE ACTUAL DEPTH AND EXTENT OF THE KEYWAY SHOULD BE DETERMINED IN THE FIELD BY THE SOIL ENGINEER.

2. SUBDRAIN SHOULD OUTLET TO STORM DRAIN OR NATURAL DRAINAGE VIA GRAVITY DRAINING NON-PERFORATED PIPE.

3. FILL SLOPES GREATER THAN 40 FEET HIGH SHOULD BE PROVIDED WITH INTERMEDIATE BENCHES AT LEAST 8 FEET WIDE SPACED EVERY 30 VERTICAL FEET CONTAINING A LINED DRAINAGE DITCH OUTLET TO A STORM DRAIN OR NATURAL DRAINAGE.

4. BENCHING INTO FIRM MATERIAL WILL BE REQUIRED.

TYPICAL KEYWAY

Adverse bedding may be exposed in some cut slopes, a condition which may require remedial action. Our field representative should evaluate all cut slopes over 10 feet high to determine whether such adverse bedding conditions exist.

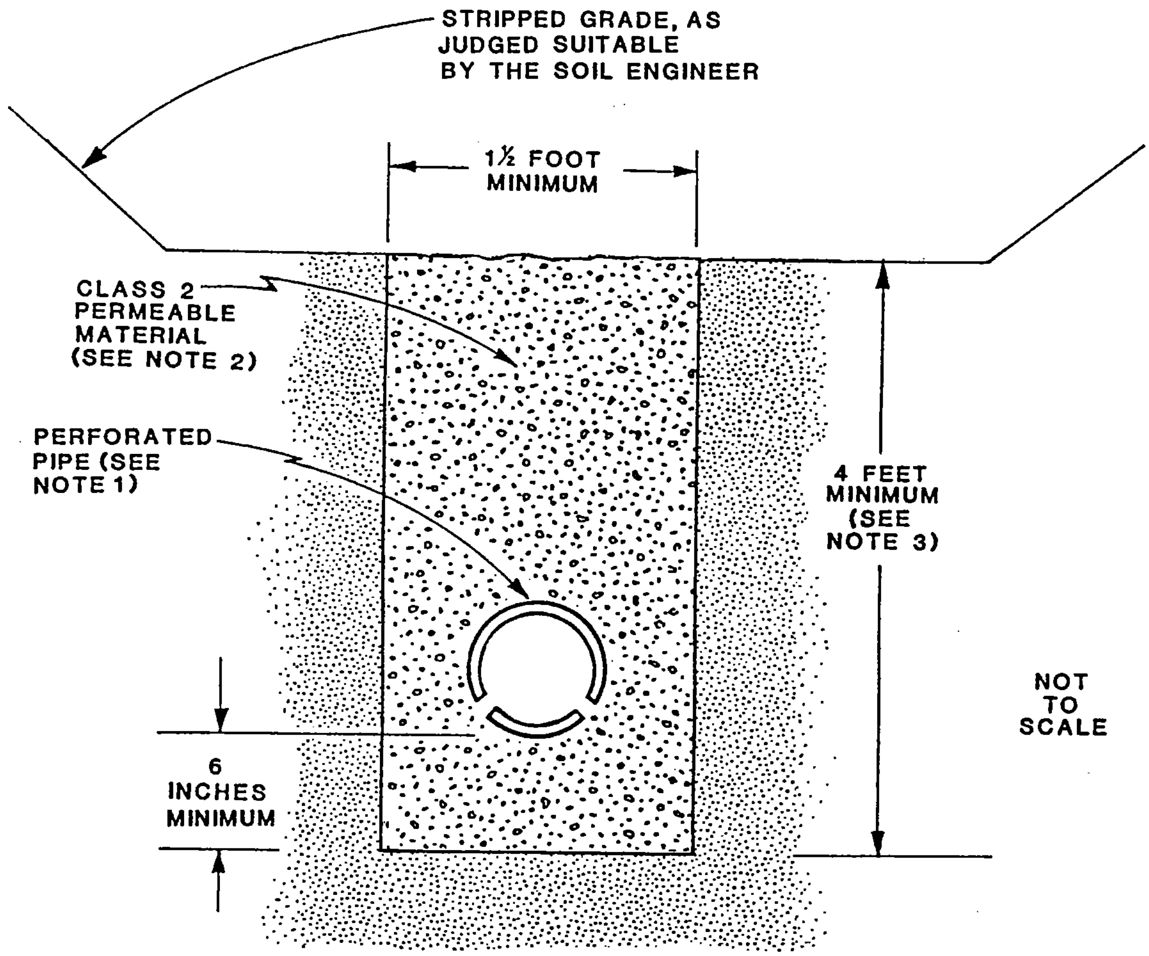
Subdrainage - Subdrains should be provided at seepage areas, swales and gullies to receive engineered fill as well as at other points determined in the field by our representative. Subdrains should consist of ABS perforated pipe conforming to ASTM Specification D 2751, Type SDR 35, and perforations should be placed down, as shown on Figure 4. Subsidiary subdrains should be at least 4 inches in diameter and central drains should be at least 6 inches in diameter. All subdrains should be surrounded by and underlain by at least 6 inches of Class 2 "Permeable Material", as delineated in section 68-1.025 of the Caltrans "Standard Specifications" (1984). Subdrain trenches should be at least 18 inches wide and should be at least 4 feet deep. Final trench configurations should be approved by our field engineer. Subdrain trenches should be capped with engineered fill or topsoil, depending upon the subdrain location. Keyway subdrains should be positioned along the upslope sides of all keyway excavations.

Subdrainage systems should be interconnected and lead to discharge into the central creek channel. "Y" split outlet arrangements are recommended, and clean outs should be provided at maximum 300-foot intervals on main lines.

Final Compaction - All engineered fill surfaces should be compacted to create a smooth, unyielding surfaces. This may be accomplished by final track walking; or, by slope overbuilding and cutting back to the compacted core.

Erosion Protection - Upon completion of grading, engineered fill slopes should be planted with deep-rooted, rapidly-growing, environmentally compatible vegetation that will develop root networks which will knit the surface soils together to resist slope erosion.

Testing Observation - Our field representatives should be present during all site clearing and grading operations to test and observe earthwork construction, to evaluate the condition of cut slopes, to recommend final keyway configurations and to approve final subdrain locations. The recommendations of this report are contingent upon these provisions. Our office should be notified at least 48 hours prior to commencement of any grading operations to allow for discussion and planning with the earthwork contractor.



NOTES:

1. PERFORATED PIPE WHERE SPECIFIED (PLACE PERFORATIONS DOWN). ABS PIPE WITH MINIMUM DIAMETER OF FOUR (4) INCHES CONFORMING TO ASTM D-2751 SDR35 (ARMCO) WHERE FILL IS LESS THAN FORTY (40) FEET DEEP. MAIN SUBDRAINS AND INTERCEPTOR SUBDRAINS REQUIRE SIX (6) INCH PIPE UNLESS OTHERWISE NOTED.
2. CLASS 2 PERMEABLE MATERIAL AS GIVEN IN SECTION 68-1.025, STATE OF CALIFORNIA STANDARD SPECIFICATIONS, JULY 1984 EDITION.
3. DEPTH SHOULD TYPICALLY BE FOUR (4) FEET.

TYPICAL SUBDRAIN DETAIL

Following completion of grading, chemical testing for soluble sulfates should be undertaken to determine whether special concrete mixtures would be advisable to protect foundations, floor slabs and other flatwork from progressive deterioration. The results should be submitted to our office and, as appropriate, we will prepare special recommendations for concrete mixtures designed to counteract the effects of gypsum- bearing soils.

Settlement Monitoring

We recommend installing settlement monuments in a radial pattern centered near the point of greatest fill depth, and in linear segments following the centerlines of major draws to be filled. Monuments should be spaced no farther apart than 200 feet. The number and locations of these monuments should be estimated upon our review of the final grading plan and should be established in the field, after haulageways and other earthwork staging areas have been determined.

Level readings should be taken bimonthly during the first month of fill placement in the survey area, and at least weekly thereafter. Measurements should be tied to at least two independent benchmarks founded well beyond the influence of grading operations. Our office should be furnished with a copy of all readings as soon as they are recorded, in order to expedite interpretation and the preparation of any supplementary recommendations, as necessary.

Foundations

Drilled Piers - The proposed homes may be supported upon drilled, cylindrical, cast-in-place concrete pier foundations at least 8 inches in diameter and designed to acquire support by side friction. All piers should extend to a minimum depth of 8 feet below finished pad grade and should be drilled plumb. On transition zone lots, piers should extend at least 4 feet into bedrock.

Piers so established may be designed for an average 450 pounds per square foot side shearing resistance or adhesion, except for the uppermost 3 feet of soil, which should be neglected due to the possibility of soil shrinkage to that depth. The weight of foundation concrete extending below grade may be disregarded in sizing computations.

Pier shafts should be thoroughly clean and dry prior to placement of structural steel and concrete. Structural concrete should be placed by means of an "elephant trunk" or similarly device to avoid dislodging soil from the pier shaft walls.

Connecting grade beams should be rigid and designed to be self-supporting. A gap of at least 2 inches should be provided between the bottom face of any grade beam and the subjacent soils as a precaution against uplift due to soil expansion.

Homes constructed on lots where subdrains may be less than 10 feet deep should be supported upon specially-designed pier and grade beam foundations, or on post-tensioned slabs-on-grade, as described below.

Resistance to horizontal foundation displacement maybe calculated using an equivalent fluid pressure of 250 pounds per cubic foot combined with a uniform pressure of 380 pounds pr square foot, to form a trapezoidal distribution of pressure below a depth of 3 feet. A shape factor of 1.6 may be used, if desired.

Post-construction settlements of properly installed pier and grade beam foundation systems are expected to be less than 1 inch, total, and less than ½ inch differential.

Post-Tensioned Slabs

Post-tensioned concrete slab-on-grade foundation systems may be designed using an effective Thornthwaite index of -12; edge moisture variation distances of 2.8 feet, for edge lift, and 5.9 feet, for center lift; a soil activity ratio of 0.75; a cation exchange capacity index of 1.36; and a soil suction coefficient of 3.6 pF. For design purposes, a maximum differential edge lift may be assumed at 0.23 inch, and maximum differential center lift may be assumed at 0.15 inch.

Net bearing may be calculated using maximum allowable soil pressures of 1,800 pounds per square foot for "real" (dead plus permanently applied live) load, or 2,400 pounds per square foot for total load, including the effect of either seismic or wind forces.

Lateral resistance to slab displacement may be calculated using an allowable friction factor of 0.24 acting between the undersurfaces of the post-tensioned slab systems and the supporting subgrade soils.

Setback

Structures situated near the crown of either a cut or fill slope more than 5 feet high should be set back from the edge slope a distance equal to half the slope height or 10 feet, whichever is less.

Slabs-on-Grade

Where moisture penetration of concrete slab-on-grade living area floor slabs would be objectionable, a capillary moisture break and vapor barrier should be considered by the designer of the slab and floor coverings. The designer of the slab should determine the dimensions and materials used for the capillary moisture break and vapor barrier system.

For homes constructed with pier and grade beam foundation systems, garage floors should remain detached from adjacent walls and porches should be dowelled on one side only.

Exterior Flatwork

The risk of driveway, patio, sidewalk and curb cracking due to subgrade heaving can be reduced by reinforcement, incorporating construction joints (both internally and between adjoining structural members), use of thickened edge details, presaturation of the subgrade soils prior to placement of concrete, or a combination of those measures.

Landscaping

Certain species of trees and shrubs are known to draw substantial amounts of moisture from surface and near-surface soils, especially during the dry months. Invasive root systems penetrating beneath concrete flatwork or slab-on-grade floors can induce significant structural distress by desiccation of the supporting soils. Therefore, it is advisable to provide landscape irrigation systems adjacent to exterior flatwork wherever possible, and to avoid planting moisture-demanding trees or shrubs near driveways and other slab edges.

Retaining Walls

A wall retaining horizontal backfill and capable of deflection such that the top of wall can rotate at least 0.1 percent of its height could be subject to active lateral earth pressures equivalent to those exerted by a fluid weighing approximately 40 pounds per cubic foot, assuming that the wall is fully drained. Wooden retaining walls less than 3 feet high are anticipated for this project and should be adequately drained.

Pier foundations for retaining walls along common lot lines may be designed using the same values described for drilled, cast-in-place concrete pier foundations.

Utility Trenches

Trench Walls - The responsibility for the safety of open trenches should be borne by the contractor. Construction equipment and stockpiled earth materials should not be positioned within 10 feet of open trenches for more than brief periods. Traffic and vibration adjacent to trench walls should be minimized and cyclic wetting and drying of excavation side slopes should be avoided.

Trench Backfill - Trench backfill materials for main line utilities beneath streets may consist of native soils and crushed or broken bedrock processed to remove vegetation, rock fragments exceeding 1 inch in diameter and other undesirable substances. All such trench backfill below a depth of 3 feet from finished pavement grade should be compacted to at least 85 percent relative compaction at or above the optimum moisture content, and all backfill above this level should be compacted to at least 90 percent relative compaction at or above the optimum moisture content, per ASTM Specification D 1557-78.

Compaction Procedure - Compaction of trench backfill materials by mechanical means only is recommended. Jetting or densification by other hydraulic methods is specifically discouraged because of the difficulty in obtaining minimum compaction standards, the likelihood of inconsistent results, and inevitable subsidence that can extend over an unpredictable length of time.

Pavements

The following recommendations for asphalt concrete pavement sections are intended as a conceptual guide for planning only. Our pavement analyses are based upon the results of resistance ("R") value tests conducted upon selected samples of the native soils and bedrock which we expect to be representative of final pavement subgrade materials, the Caltrans "Design Method for Flexible Pavements", and traffic indices ("T.I."s) which are indications of where load frequency and intensity. Typical expansive soil subgrade "R" values near 6 are expected for this project. For preliminary planning purposes, we recommend the following pavement sections:

TABLE 5

PRELIMINARY PAVEMENT SECTIONS

Design "T.I."	Recommended Pavement Thickness - Inches: Asphalt Concrete (Type B)	Aggregate Base (Class 2)	Aggregate Subbase (Class 2)
4.0	3	7	--
5.0	3	10	--
	3	5	6
6.0	3	13	--
	3	6	8
	3-1/2	12	--
	3-1/2	5	8
7.0	3-1/2	16	--
	3-1/2	7	10
	4	15	--
	4	7	9

Additional "R" value samples should be collected for testing after mass grading has been completed to rough street grades and underground utilities have been installed. Final pavement sections should be determined at that time.

All utility trench backfill should be properly placed and compacted as previously described, prior to subgrade preparation in pavement areas. Subgrade soils should be brought to or maintained at 3 percent or more over the optimum moisture content, at relative compaction value between 90 and 95 percent, per ASTM Specification D 1557-78, until overlain by pavement.

Materials quality and compaction characteristics within the structural sections should conform to Caltrans "Standard Specifications" (1984), except that the base course materials should be compacted to at least 95 percent relative compaction, at or above the optimum moisture content, per ASTM Specification D 1557-78.

Pavement cracks may develop within 6 feet of adjoining pavement edges, due to expansive soils volume changes. These cracks are most likely to appear outside areas where pavement edges adjoin landscaped medians, buildings, exterior slabs or sidewalks. Periodic maintenance will be required to control crack propagation. We can provide specific recommendations for cracking mitigation prior to construction, if desired.

Where drop inlets or other surface drainage devices are to be installed, we strongly recommend that slots or weep holes be provided to allow free drainage of the contiguous base course materials.

Stream Hydraulics

Since the proposed development will increase the volume and intensity of runoff, consideration should be given to constructing energy dissipation devices within the central stream channel, at points south of the project area. Such devices could include riffle boards, rock revetments, stone gabions, concrete wiers, stilling basins, or baffle gates.

LIMITATIONS

The conclusions and recommendations of this report are based upon the information provided to us regarding the proposed improvements, subsurface encountered at the exploration pit and test boring locations, our geologic reconnaissance, and professional judgement. This study has been conducted in accordance with current professional geotechnical engineering and geologic standards; no other warranty is expressed or implied.

The locations of the exploration pits and test borings were determined by pacing from established cultural features and other points of reference indicated on drawings supplied by Parsons, Rourke and Walker, and are to be considered approximate only. The elevations of the test borings and other elevations discussed in the text of this report were determined by interpolation between nearest adjacent ground surface contours shown on topographic maps supplied by Parsons, Rourke and Walker, and are also to be considered approximate only. Site conditions described in the text are those existing at the time of our last field exploration and reconnaissance, December 3 through December 23, 1987, and are not necessarily representative of such conditions at other locations and times.

The logs of the exploration pits and test borings show subsurface conditions at the locations and on the dates indicated. It is not warranted that they are representative of such conditions elsewhere or at other times.

If it is found during construction that subsurface conditions differ from those described on the test pit and boring logs then the conclusions and recommendations in this report shall be considered invalid, unless the changes are reviewed and the conclusions and recommendations modified or approved in writing.

Our firm must be accorded the opportunity to review the final plans and specifications to determine if the recommendations of this report have been implemented in those documents. The review would be acknowledged in writing. Field observation and testing services are essential and integral parts of this geotechnical investigation. It is imperative that our firm be retained to monitor the earthwork and other relevant construction operations; the recommendations of this report are contingent upon this stipulation.

We emphasis that this report is applicable only to Vista Tassajara, as presently planned, and should not be utilized for design and/or construction on any other project.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS

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PCW/RPS/FB:nlc/14/1406

Attachments:

Plate	1	- Vicinity Map
Plate	2	- Regional Geologic Map
Plate	3	- Regional Fault and Seismicity Map
Plate	4	- Geologic Map
Plate	5	- Geologic Cross Sections
Plates	6 through 32	- Test Pit Logs
Plates	33 through 63	- Boring Logs
Plate	64	- Boring Legend/Unified Soil Classification
Plate	65	- Ground Water Levels
Plate	66	- Atterberg Limits Test Data
Plate	67	- Summary of Dry Unit Weight and Moisture Content Determination
Plate	68	- Shrink-Swell Test Data
Plate	69	- Summary of Unconfined Compressive Strength Data
Plate	70	- Summary of "Simple" Direct Shear Tests
Plate	71	- Summary of Triaxial Compression Test
Plates	72 through 73	- Consolidation Test Data
Plates	74 through 75	- Compaction Test Data
Plates	76 through 77	- Resistance (R)-Value Test Data

Copies: Addressee (5)

Parsons, Rourke and Walker (1)

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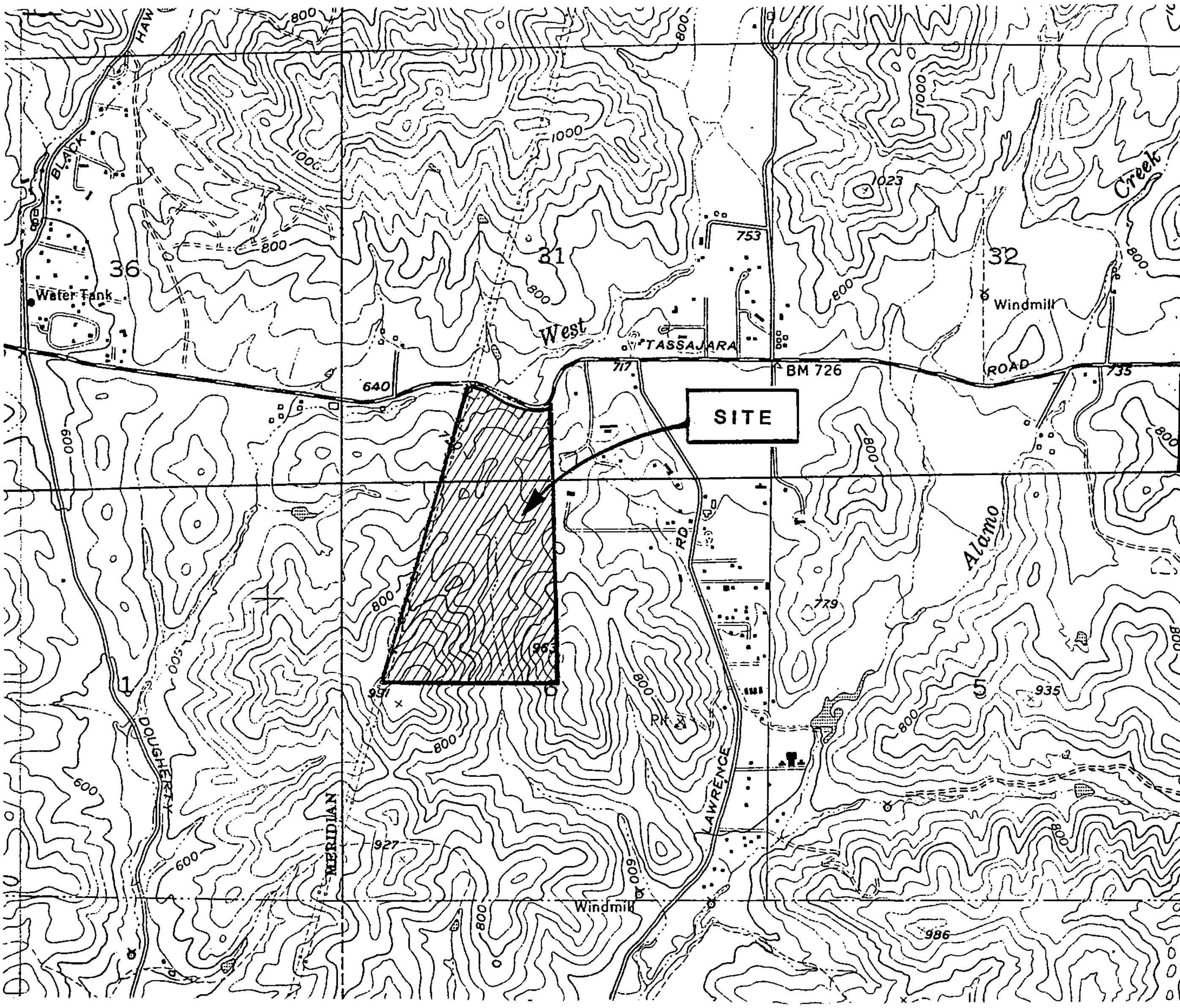
<u>Aerial Photographs</u>

Pacific Aerial Surveys, date of photography: 09-21-73; scale: 1:20,000; Flight Line 1, Panels 97-99.

United States Geological Survey, date of photography: 09-11-84; scale: 1:12,000; Flight Line AV2523-07, Panels 1-3.

JOB NUMBER: 1358.102.1 DATE: 1-5-87 BY: CR



SCALE: 1''=2000'

VICINITY MAP

VISTA TASSAJARA

TASSAJARA ROAD

DANVILLE, CALIFORNIA

FOR

STANDARD PACIFIC OF NORTHERN CALIFORNIA

REFERENCE:
PORTION OF U.S.G.S. 7½ MINUTE TOPOGRAPHIC QUADRANGLE, DIABLO, CALIFORNIA, DATED 1953, PHOTOREVISED 1980, AT A SCALE OF 1:24,000

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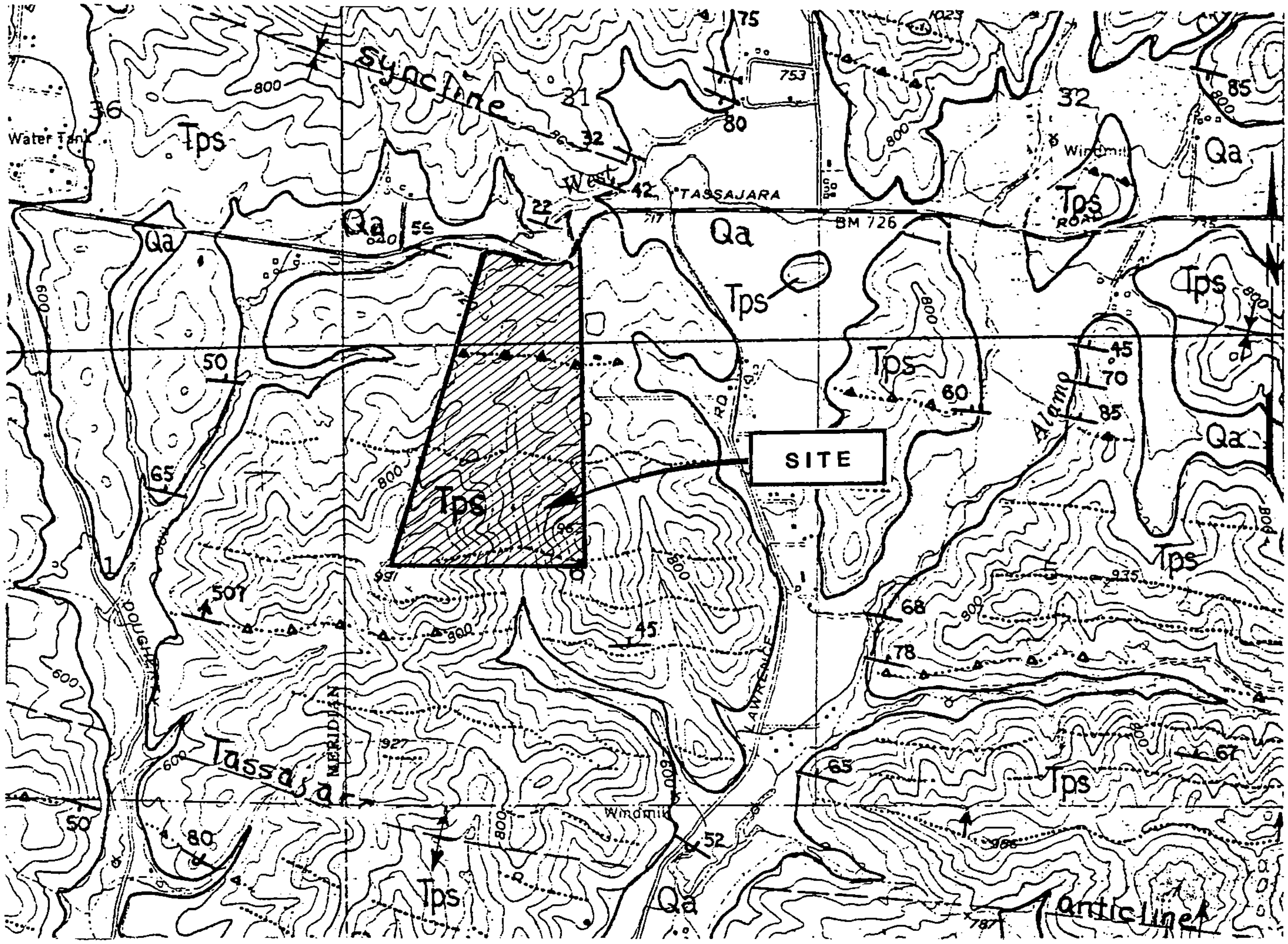
PLATE 1

JOB NUMBER: 1358.102.1 DATE: 1-12-87 BY: RPS/CR



SCALE: 1"=2000'

EXPLANATION

(solid line)	GEOLOGIC CONTACT	Qa	ALLUVIUM
(dotted line)	SANDSTONE BED	Tps	NONMARINE SEDIMENTARY ROCKS
(dotted line with triangles)	TUFF BED		

AREA GEOLOGIC MAP

VISTA TASSAJARA

TASSAJARA ROAD

DANVILLE, CALIFORNIA

FOR

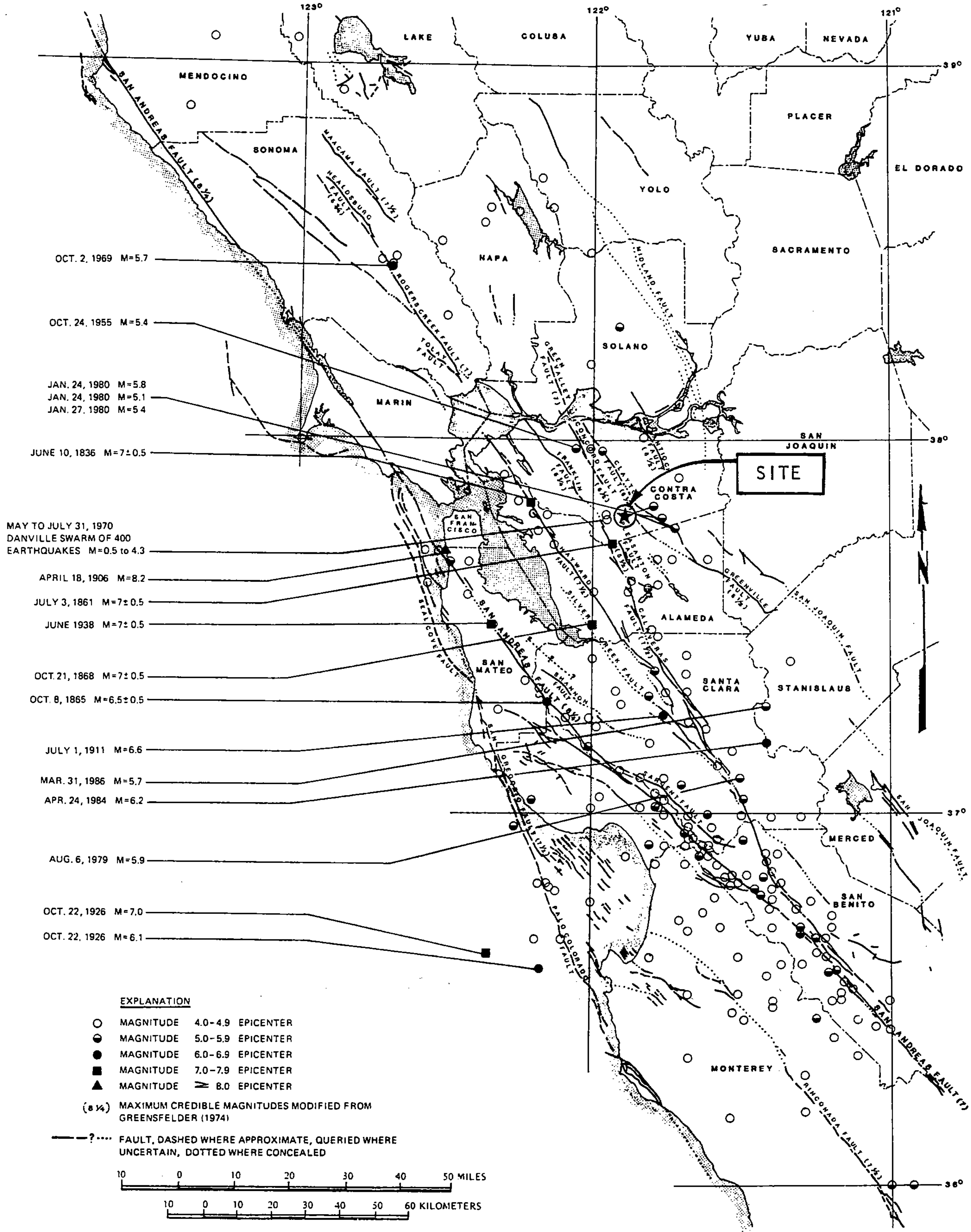
STANDARD PACIFIC OF NORTHERN CALIFORNIA

BASE:
PORTION OF PRELIMINARY GEOLOGIC MAP OF THE DIABLO QUADRANGLE, BY THOMAS W. DIBBLEE, DATED 1980, AT A SCALE OF 1:24,000

BERLOGAR GEOTECHNICAL CONSULTANTS

PLATE 2

JOB NUMBER: 1358.102.1   DATE: 1-5-87   BY: CR



FAULT LOCATIONS MODIFIED FROM JENNINGS (1975), HERD AND HELLEY (1977) AND PAMPEYAN (1979), SELECTED EPICENTERS OF EARTHQUAKES 1900 THROUGH 1974 FROM REAL AND OTHERS (1978), FROM 1975 THROUGH 1979 FROM TOPPOZADA AND OTHERS (1979), FROM 1979 THROUGH 1982 FROM SHERBOURNE AND OTHERS (1985), FROM 1982 THROUGH 1986 VERBAL COMMUNICATION FROM U.C. BERKELEY SEISMOLOGICAL STATION. MAXIMUM CREDIBLE MAGNITUDES MODIFIED FROM GREENSFELDER (1974), WESSON AND OTHERS (1975), AND ASSOCIATIONS OF BAY AREA GOVERNMENTS (1980).

REGIONAL FAULT AND SEISMICITY MAP

BERLOGAR GEOTECHNICAL CONSULTANTS

PLATE 3

Job No. 1358.102.1
Vista Tassajara

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-1	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5	SILTY CLAY AND ROCK FRAGMENTS, mottled light and dark brown, moist, stiff, abundant shrink-swell slickensides
	5 - 7	SILTSTONE, gray, weak, highly fractured, thickly bedded
	7 - 9	SILTSTONE, light brown, weak, highly fractured, thickly bedded, N45W, 10SW
		Total Depth 9 feet No free water encountered
TP 2-2	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5	SILTY CLAY AND ROCK FRAGMENTS, light gray, moist stiff
	5 - 9	CLAYSTONE, light gray-brown, friable to weak, crushed, thinly bedded, N30W 15E, some shrink-swell slickensides
		Total depth 9 feet No free water encountered
TP 2-3	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 8	SILTY CLAY AND ROCK FRAGMENTS, mottled gray and red-brown, wet, stiff, high plasticity, abundant slickensides
	8	CLAY GOUGE, ½ inch thick, slickensides, EW 10 N
	8 - 11	CLAYSTONE, gray, weak, thinly fractured, thickly bedded
		Total depth 11 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-4	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 14	SILTY CLAY, brown, moist to wet, moderate plasticity, slickensides 9½ to 10 feet, horizontal
		Total depth 14 feet No free water encountered
TP-5	0 - 6	FILL: SILTY CLAY AND ROCK FRAGMENTS, light gray, moist, medium stiff
	6	MATTED GRASS LAYER, ½ inch thick
	6 - 8	SILTY CLAY, dark brown, moist, very stiff, high plasticity
		Total depth 8 feet No free water encountered
TP-6	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3	SLICKENSIDED SURFACE, intermittent layer of sandstone rock fragments
	3 - 9	CLAYSTONE, gray, friable, crushed, moderate sheared, appears highly expansive, abundant slickensides
		Total depth 8 feet No free water encountered
TP-7	0 - 4½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4½ - 8	CLAYSTONE, gray, weak, crushed, thickly bedded
		Total depth 8 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-8	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5	SILTY CLAY, light gray, moist, stiff, high plasticity
	5 - 9	CLAYSTONE, gray, weak, highly fractured, appears expansive
		Total depth 9 feet No free water encountered
TP 2-9	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 7	CLAYSTONE, gray, weak, crushed, thickly bedded N40E 60W
		Total depth 7 feet No free water encountered
TP 2-10	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5	SILTY CLAY AND ROCK FRAGMENTS, light gray, moist, stiff, sharp contact at 5 feet
	5 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-11	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 5	SILTY CLAY AND ROCK FRAGMENTS, light gray, moist, stiff
	5 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded N50E 50 N
		Total depth 8 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-12	0 -4½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4½ - 5½	SILTY CLAY, light gray, wet, medium stiff
	5½	SLICKENSIDED SURFACE - slide plane
	5½ - 8½	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8½ feet No free water encountered
TP 2-13	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4	SLIDE PLANE
	4 - 6	SILTY CLAY AND ROCK FRAGMENTS, gray, moist, stiff
	6 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-14	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5	SLICKENSIDED SURFACE - slide plane
	5 - 9	CLAYSTONE, gray, weak highly fractured, thickly bedded, abundant shrink-swell slickensides
		Total depth 9 feet No free water encountered

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TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-15	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	6	SLICKENSIDED SURFACE - slide plane
	6 - 9	SANDY CLAY AND ROCK FRAGMENTS, light brown, moist, stiff
	9 - 11	INTERBEDDED SANDSTONE AND CLAYSTONE, light gray, weak, highly fractured, thinly bedded, horizontal
		Total depth 11 feet No free water encountered
TP 2-16	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 8	SANDSTONE, light gray, friable to weak, crushed, open fractures
	8 - 10	CLAYSTONE, gray, weak, crushed, bedding horizontal
		Total depth 10 feet No free water encountered
TP 2-17	0 - 4	SILTY CLAY, dark brown, moist, very stiff, hi plasticity
	4 - 7	SILTY CLAY AND ROCK FRAGMENTS, light gray and brown, moist, stiff
	7	SLICKENSIDED SURFACE, N60 8N
	7 - 10	SILTSTONE, light gray, friable to weak, crushe sheared
	10	SLICKENSIDED SURFACE, horizontal 1/4 inch thick clay gouge
	10 - 12	SILTSTONE, brown friable, highly fractured thic bedded
		Total depth 12 feet No free water encountered

PLATE 1

BERLOGAR GEOTECHNICAL CONSULTANTS

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-18	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	6 - 8	SILTY CLAY AND ROCK FRAGMENTS, light gray and brown, moist, stiff, highly sheared
	8 - 10	CLAYSTONE, gray, weak, crushed, thinly bedded
		Total depth 10 feet No free water encountered
TP 2-19	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-20	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 5½	CLAYSTONE, gray, weak, crushed, thinly bedded
	5½ - 8	INTERBEDDED SILTSTONE AND SANDSTONE, light brown, weak, highly fractured, thinly bedded EW 35S
		Total depth 8 feet No free water encountered
TP 2-21	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 7½	CLAYSTONE, gray, weak, crushed, thickly bedded
		Total depth 7½ feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-22	0 - 4½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4½ - 7	SILTY CLAY, some rock fragments, mottled light gray and brown, moist, stiff, light gray clay gouge, gouge at 5 feet, 1 inch thick, several slickensided surfaces
	7 - 10	CLAYSTONE, gray, friable to weak, crushed, thickly bedded N80W 50S
		Total depth 10 feet No free water encountered
TP 2-23	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 7	INTERBEDDED CLAYSTONE AND SILTSTONE, light brown, friable, crushed, thickly bedded
	7 - 7	SANDSTONE, light gray-brown, friable, thickly bedded N20E 30W
		Total depth 7 feet No free water encountered
TP 2-24	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity, sharp contact at 5 feet
	5 - 9	INTERBEDDED CLAYSTONE AND SANDSTONE, light gray ad brown, friable crushed thinly bedded, N65W vertical
		Total depth 9 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-25	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8	SILTY CLAY AND ROCK FRAGMENTS, mottled light gray and brown, moist, stiff, highly sheared, slickensided surface EW 20N
	8 - 10	SILTSTONE, light brown, friable, crushed, thickly bedded
		Total depth 10 feet No free water encountered
TP 2-26	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2½ - 5	SILTY CLAY, brown, moist, stiff, moderate plasticity
	5 - 8	CLAYSTONE, gray, friable to weak, crushed, thickly bedded, ash bed at 7 feet, 2 to 4 inches thick, greenish gray, waxy, very high plasticity N15W 35W
		Total depth 8 feet No free water encountered
TP 2-27	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 7	SILTY CLAY, light gray, moist to wet, stiff, moderate plasticity
	7 - 9	INTERBEDDED SILTSTONE AND CLAYSTONE, light brown, friable, crushed, thinly bedded N70E 60N
		Total depth 9 feet No free water encountered

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TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-28	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 8	SANDSTONE, light brown, friable, highly fractured, thickly bedded N40W 50E
		Total depth 8 feet No free water encountered
TP 2-29	0 - 7	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	7 - 8	SILTY CLAY, brown, wet, medium stiff, slickensided surface at 7 feet
	8 - 10	SANDSTONE, light gray-brown, friable, highly fractured, thickly bedded N75W 75S
		Total depth 10 feet No free water encountered
TP 2-30	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 8	CLAYSTONE, gray, weak, crushed, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-31	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 10	SILTY CLAY, some rock fragments, mottled gray and brown, moist, stiff, highly sheared
	10 - 12½	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 12½ feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-32	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 8	SANDSTONE, light brown, friable to weak, highly fractured, thickly bedded N65W 75S
		Total depth 8 feet No free water encountered
TP 2-33	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 7	INTERBEDDED CLAYSTONE AND SILTSTONE, gray, weak, highly fractured, thickly bedded N80E 60N
		Total depth 7 feet No free water encountered
TP 2-34	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 6½	SILTSTONE, gray-brown, friable, crushed, highly sheared
	6½ - 11	CLAYSTONE, gray, friable to weak, crushed, thickly bedded
		Total depth 11 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-35	0 - 2½	FILL: SILTY CLAY, mottled brown and dark brown, moist, very stiff
	2½	SLICKENSIDED SURFACE, Very prominent downslope striations, intermittent matted grass layer, grass fragments parallel to striations on slickensided surface
	2½ - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity (buried topsoil)
	5 - 15	SILTY CLAY, mottled brown and dark brown, moist, very stiff, abundant shrink-swell slickensides
		Total depth 15 feet No free water encountered
TP 2-36	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 8½	SILTY CLAY, brown, moist to wet, stiff, high plasticity, slickensided surface at 8 feet N60E 20N
	8½ - 10½	SILTSTONE, light gray, friable to weak, highly fractured, thinly bedded N50W 35S
		Total depth 10½ feet No free water encountered
TP 2-37	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 7	SILTY CLAY, brown, moist to wet, stiff, moderate plasticity
	7 - 10	SILTY CLAY AND ROCK FRAGMENTS, mottled brown nd gray, moist, stiff, numerous slickensided surfaces
	10 - 13	CLAYSTONE, gray, friable to weak, highly fractured, thickly bedded
		Total depth 13 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-38	0 - 1	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	1 - 6	INTERBEDDED SANDSTONE AND SILTSTONE, light gray, weak, highly fractured, thinly bedded EW 65N
		Total depth 6 feet No free water encountered
TP 2-39	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	6 - 9	SILTY CLAY, some rock fragment, brown, moist, stiff
	9	SLICKENSIDED SURFACE, N50E 20N, striations trend N45W
	9 - 11	CLAYSTONE, gray-brown, weak, highly fractured, thickly bedded
		Total depth 11 feet No free water encountered
TP 2-40	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2 - 6	SANDSTONE, light gray, friable to weak, moderately fractured, thickly bedded
		Total depth 6 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-41	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
	8 - 9½	SANDSTONE, light gray, friable, highly fractured, thickly bedded N80W 80S
		Total depth 9½ feet No free water encountered
TP 2-42	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 8½	SILTY CLAY, brown, moist, stiff , sharp contact at 8½ feet
	8½ - 11½	SANDSTONE, light gray, weak, highly fractured, thickly bedded
		Total depth 11½ feet No free water encountered
TP 2-43	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8	CLAYSTONE, light gray-brown, weak, highly fractured, thickly bedded N80W 75S?
		Total depth 8 feet No free water encountered
TP 2-44	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	6 - 14	SILTY CLAY, brown, moist to wet stiff, moderate plasticity
		Total depth 14 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-45	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 7	INTERBEDDED SANDSTONE AND CLAYSTONE, light gray, weak, highly fractured, thickly bedded N70W vertical
		Total depth 7 feet No free water encountered
TP 2-46	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity, slickensided plane at 4 feet N35W 30W downslope striations
	5 - 8	CLAYSTONE, gray, friable, crushed, highly sheared contact at 8 feet N50W 45N, possible slide plane
	8 - 10	SILTSTONE, light gray, weak, highly fractured, thickly bedded
		Total depth 10 feet No free water encountered
TP 2-47	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 10	INTERBEDDED SANDSTONE AND SILTSTONE, light gray, weak, highly fractured, thickly bedded
		Total depth 10 feet No free water encountered
TP 2-48	0 - 7	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	7 - 13	SILT CLAY, brown, moist to wet, stiff, moderate plasticity
		Total depth 13 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-49	0 - 7	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	7 - 10	SILTY CLAY, brown, moist to wet, stiff
	10 - 12	CLAYSTONE, brown, friable, crushed, highly sheared
	12 - 13	CLAYSTONE, gray, weak, crushed
		Total depth 13 feet No free water encountered
TP 2-50	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded, sandstone interbed N50W 65S
		Total depth 8 feet No free water encountered
TP 2-51	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2½ - 7	SANDSTONE, light gray, friable to weak, moderately fractured, thickly bedded
		Total depth 7 feet No free water encountered
TP 2-52	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2 - 7	INTERBEDDED SANDSTONE AND SILTSTONE, light gray, friable to weak, thinly bedded EW60N
		Total depth 7 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-54	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 10	SILTY CLAY AND ROCK FRAGMENTS, brown, friable, crushed, highly sheared
	10 - 12	CLAYSTONE, gray, friable to weak, highly fractured
		Total depth 12 feet No free water encountered
TP 2-55	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	8 - 9	CLAYSTONE, light gray, friable, crushed, highly sheared, slickensided surface at 8 feet N60W 40S
	9 - 11	CLAYSTONE, gray, weak, crushed, thickly bedded
		Total depth 11 feet No free water encountered
TP 2-56	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2 - 5	SILTY CLAY, gray-brown, moist to wet, stiff, high plasticity
	5 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-57	0 - 4½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4½ - 6½	SILTY CLAY AND ROCK FRAGMENTS, light gray, moist, stiff, slickensided surface at 6 feet, undulating N-S 15W, possible slide plane
	6½ - 10	CLAYSTONE, light gray, friable to weak, highly fractured, thickly bedded
		Total depth 10 feet No free water encountered
TP 2-58	0 - 5	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	5 - 9	SILTY CLAY, brown, moist, stiff, moderate plasticity
	9 - 9½	SILTY CLAY, some rock fragments, light gray, moist, medium stiff
	9½ - 15	SILTY CLAY AND ROCK FRAGMENTS, light brown, moist, medium stiff, slickensides and gray clay gouge at 15 feet, possible slide plane
	15 - 17	INTERBEDDED SILTSTONE AND CLAYSTONE, light gray-brown, weak, highly fractured
		Total depth 17 feet No free water encountered
TP 2-59	0 - 3½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3½ - 7½	CLAYSTONE, gray weak, crushed, thickly bedded, appears highly expansive
		Total depth 7½ feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-60	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 7	SILTY CLAY, brown, moist, stiff, moderate plasticity
	7 - 12	SILTY CLAY AND ROCK FRAGMENTS, mottled gray and red-brown, moist to wet, medium stiff, highly sheared, slickensides and clay gouge at 11 to 12 feet
	12 - 14	CLAYSTONE, light gray, friable to weak, crushed
		Total depth 14 feet No free water encountered
TP 2-61	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 5	SILTY CLAY AND ROCK FRAGMENTS, mottled light gray and brown, moist, stiff, gradational contracts
	5 - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-62	0 - 4	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4 - 8½	SILTY CLAY AND ROCK FRAGMENTS, mottled light gray and brown, moist, stiff, slickensided surface at 8½ feet N35W 15W
	8½ - 11	CLAYSTONE, gray, friable to weak, crushed, thickly bedded
	11 - 12	SILTSTONE, brown, weak, highly fractured, thickly bedded N60E 10N
		Total depth 12 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-63	0 - 4½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	4½ - 8	CLAYSTONE, gray, weak, highly fractured, thickly bedded
		Total depth 8 feet No free water encountered
TP 2-64	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 4	SILTY CLAY, mottled brown and red-brown, moist, stiff, grass and dark brown clay filling in old fractures, sharp contact at 4 feet
	4 - 10	CLAYSTONE, mottled gray and red-brown, friable to weak crushed, highly sheared, abundant clay and slickensided in multiple directions, traces of free water in fractures at 6 feet
	10 - 14	CLAYSTONE, gray, weak, highly fractured
		Total depth 14 feet No free water encountered
TP 2-65	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2½ - 6	CLAYSTONE, light gray, weak, crushed thickly bedded N60W 40S
		Total depth 6 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-66	0 - 6	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	6 - 9	SILTY CLAY, brown, moist, stiff, moderate plasticity
	9 - 10	SILTY CLAY AND ROCK, light gray, moist, stiff, slickensided surface at 10 feet
	10 - 12	SILTSTONE, light gray, weak, highly fractured
		Total depth 12 feet No free water encountered
TP 2-67	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2 - 5	SANDSTONE, light brown, weak to moderately strong, moderately fractured, thinly bedded N40W 40W
		Total depth 5 feet No free water encountered
TP 2-68	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5	SILTY CLAY, brown, moist to wet, medium stiff
	5½	CLAY GOUGE AND SLICKENSIDES N40W 20E
	5½ - 9	SILTSTONE, light gray, friable, highly fractured, thickly bedded N75W 30S
		Total depth 9 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-69	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2½ - 4	SILTY CLAY, gray-brown, moist, stiff, moderate plasticity
	4 - 7½	CLAYSTONE, gray, friable to weak, crushed, thickly bedded
		Total depth 7½ feet No free water encountered
TP 2-70	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	1½ - 6	SILTSTONE, light gray, weak, highly fractured, thickly bedded
		Total depth 6 feet No free water encountered
TP 2-71	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2 - 4	SILTY CLAY, light gray, moist, stiff, gradational contact at 2 feet, slickensides at 4 feet N25E 20W
	4 - 6½	SILTY CLAY, dark brown, moist, very stiff, high plasticity (buried paleosol)
	6½ - 12	SILTY CLAY, gray-brown, moist to wet, stiff moderate plasticity, abundant clay gouge and slickensides at 12 feet
	12 - 14	INTERBEDDED CLAYSTONE AND SILTSTONE, light gray, friable to weak, highly fractured, thickly bedded
		Total depth 14 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-72	0 - 3	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	3 - 5½	SILTY CLAY, gray-brown, moist, stiff, moderate plasticity
	5½ - 11	SILTY CLAY AND ROCK FRAGMENT, gray, moist, stiff, abundant slickensides
	11 -13	CLAYSTONE, gray, weak, highly fractured
		Total depth 13 feet No free water encountered
TP 2-73	0 - 2½	SILTY CLAY, dark brown, moist, very stiff, high plasticity
	2½ - 7	SILTSTONE, light gray, weak, highly fractured, thickly bedded N65W 30S
		Total depth 7 feet No free water encountered
TP 2-74	0 - 2	SILTY CLAY, dark brown, moist, very stiff, high plasticity, sharp contact at 2 feet
	2 - 5	SILTY CLAY AND ROCK FRAGMENTS, gray and red-brown, moist to wet, medium stiff
	5 - 12½	CLAYSTONE, gray and red-brown, friable to weak, crushed, highly sheared, abundant clay seams and slickensided
	12½ - 14	CLAY GOUGE AND SEVERAL SLICKENSIDED SURFACES, light gray, wet soft, very high plasticity, possible slide plane near elevation of adjacent streambed, slide plane horizontal, trench caved in at 14 feet
		Total depth 14 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-75	0 - 2	CLAY, black, dry, hard, desiccation cracks 1 inch x 2 feet, fill
	2 - 2½	CLAY, dark gray-brown, moist, very stiff
	2½ - 5	SANDSTONE, tan crushed, silty very fine, with thin bands of gray claystone
		Total depth 5 feet No free water encountered
TP 2-76	0 - 5	CLAY, light gray, dark soft to stiff, high plasticity, desiccation cracks 3/4 inch x 2 inches, with paper, plastic and wood fragments, fill
	5 - 6	CLAY, black, moist, very stiff, high plasticity
	6 - 10	CLAYSTONE, gray, sheared, slickensided, broken with limonite stains, slide plans at 10 feet
	10 - 12	CLAYSTONE, dark gray, crushed, weak, moderately weathered
		Total depth 12 feet No free water encountered
TP 2-77	0 - 2	CLAY, dark gray, dry to moist, stiff, high plasticity
	2 - 4½	CLAYSTONE, gray, crushed, weak, moderately weathered
		Total depth 4½ feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-78	0 - 3	CLAY, black, dry to moist, soft to stiff, high plasticity
	3 - 6½	CLAYSTONE, gray, sheared, crushed, slickensided, slide plane at 6½, feet striations EW
	6½ - 8	CLAYSTONE, dark gray, weak, crushed, moderately weathered
		Total depth 8 feet No free water encountered
TP 2-79	0 - 1½	CLAY, dark gray, moist, soft, high plasticity
	1½ - 2½	CLAYSTONE, gray, sheared, slickensided slide plane at 2½ feet 10 W N80 W
	2½ - 6	CLAYSTONE, dark gray, thickly bedded 65 W N20 E
		Total depth 6 feet No free water encountered
TP 2-80	0 - 3½	CLAY, black, moist, soft, high plasticity with caliche deposits
	3½ - 6½	CLAYSTONE, dark gray, weak, moderately weathered,hard thickly bedded 70 W N35 E
		Total depth 6½ feet No free water encountered
TP 2-81	0 - 2½	CLAY, Dark gray, moist, stiff, high plasticity
	2½ - 4½	CLAYSTONE, light gray to brown, sheared, slickensided highly weathered, slide plane at 4½ feet
	4½ - 7	CLAYSTONE, gray, weak, crushed, moderately weathered
		Total depth 7 feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-82	0 - 3	CLAY, black, moist, stiff, high plasticity with roots, fill
	3 - 5	CLAY, gray-brown, moist, very stiff, high plasticity
	5 - 9	CLAYSTONE, orange-brown, and gray mottled, sheared highly weathered, slide plane at 9 feet
	9 - 10½	CLAYSTONE, light gray, weak, thickly bedded, moderately weathered, with few limonite stains
		Total depth 10½ feet No free water encountered
TP 2-83	0 - 0½	SILTY CLAY, gray-brown, moist, soft, moderate plasticity
	0 ½ - 3	CLAYSTONE, light gray, weak, crushed, moderately weathered
		Total depth 3 feet No free water encountered
TP 2-84	0 - 7	SILTY CLAY, light brown, soft, dry, moderate plasticity, with roots, plastic and wood fragments, fill
	7 - 9½	CLAYSTONE, orange-brown, and gray mottled, sheared, highly weathered, slide plane at 9½ feet
	9½ - 10½	CLAYSTONE, dark gray, weak, crushed, moderately weathered
		Total depth 10½ feet No free water encountered

TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-85	0 - 4	SILTY CLAY, dark gray, dry, soft, moderately plastic, with roots, fill
	4 - 6	CLAY, black, moist, stiff, high plasticity
	6 - 7	SANDSTONE, light brown, friable, thickly bedded, moderately weathered
		Total depth 7 feet No free water encountered
TP 2-86	0 - 3	CLAY, black, moist, soft, high plasticity
	3 - 9½	CLAYSTONE, orange-brown, yellow-gray and dark gray mottled, soft, sheared with random clay partings, gypsiferous, slide plane at 9½ feet
	9½ - 11	CLAYSTONE, dark gray, crushed, weak, moderately weathered
		Total depth 11 feet No free water encountered
TP 2-87	0 - 4	CLAY, black, moist, soft, dry and hard below 3 feet, high plasticity
	4 - 11	CLAYSTONE, orange-brown and light gray mottled, weak, highly weathered, calcite seams slide debris
		Total depth 11 feet No free water encountered
TP 2-88	0 - 2½	CLAY, dark gray, moist, soft, high plasticity
	2½ - 6½	CLAYSTONE, light gray, hard crushed
		Total depth 6½ No free water encountered

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TEST PIT LOGS

Test Pit Number	Depth (feet)	Description
TP 2-89	0 - 3	CLAY, black, moist, soft, high plasticity
	3 - 4½	CLAYSTONE, orange-brown and light gray mottled, sheared, crushed highly weathered, slide plane at 4½ feet
	4½ - 6½	CLAYSTONE, light gray, weak, crushed, moderately weathered
		Total depth 6½ feet No free water encountered
TP 2-90	0 - 2	CLAY, black, moist, soft, high plasticity
	2 - 4	CLAYSTONE, orange-brown, and light gray mottled, soft, sheared, crushed, highly weathered, slickensided slide surface at 4 feet
	4 - 6	CLAYSTONE, light gray, weak, thickly bedded, moderately weathered
		Total depth 6 feet No free water encountered
TP 2-91	0 - 2	CLAY, dark gray-brown, moist, soft, high plasticity
	2 - 6	CLAYSTONE, olive-gray to gray-green, weak to firm, thickly bedded
		Total depth 6 feet No free water encountered

BORING LOG B-1

JOB NUMBER: 1358.102

DATE DRILLED: 12/11/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +667 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE: 2.5" I.D. Split Barrel

DRIVE WEIGHT – LB: 140

HEIGHT OF FALL – IN: 30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, dark gray, moist, soft
1	--	--			
					dry below 1½ feet
				CL/CH	SILTY CLAY, dark gray-brown, moist, very stiff
			5		
5	22.2	99			
9	--	--	10		calcareous streaks
				CL	SILTY CLAY, gray-brown, moist, very stiff, with calcareous nodules
14	--	--	15		
				CL/ML	CLAYEY SILT, yellow-gray, moist, very stiff very stiff
19	--	--	20		

BERLOGAR GEOTECHNICAL CONSULTANTS

BORING LOG B-1

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 30′ TO 31′ 6"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL/ ML	CLAYEY SILT, continued
					CLAYSTONE, olive-gray, hard, crushed, highly weathered
24	--	--	25		
			30		
30	--	--			
					Terminal depth of boring: 31 feet 6 inches Piezometer installed to 30 feet

BORING LOG B-2

JOB NUMBER: 1358.102
DATE DRILLED: 12/11/87
JOB NAME: Vista Tassajara
SURFACE ELEVATION: +712 Feet
DRILL RIG: Method: Rotary Wash
DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
				CH	CLAY, dark gray, moist, very stiff
30	--	--			dry below 1½ feet
				CL/ CH	SILTY CLAY, dark gray, moist, stiff
			5		
22	--	--			
			10		calcareous deposits
18	--	--			
			15		
23	--	--			
				CL	SILTY CLAY, yellow-gray, moist, very stiff, with calcareous deposits
			20		
25	34.2	89			

BORING LOG B-2

JOB NUMBER: 1358.102 SHEET: 2 OF: 3

JOB NAME: Vista Tassajara DEPTH: 20' TO 41'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL	SILTY CLAY, continued
				CL/ ML	CLAYEY SILT, yellow-gray, moist, very stiff
			25		
41	23.4	90			
					CLAYSTONE, blue-green and yellow-brown, mottled, hard, crushed, highly weathered
			30		
50/ 5"	--	--			
			35		
50/ 5"	--	--			olive-gray, moderately weathered
50/ 3"	--	--	40		gray-green

BORING LOG B-2

JOB NUMBER: 1358.102 SHEET: 3 OF: 3

JOB NAME: Vista Tassajara DEPTH: 40' TO 45' 3"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
50/ 3"	--	--			CLAYSTONE, continued
50/ 3"	--	--	45		dark gray-green
					Terminal depth of boring: 45 feet 3 inches Piezometer installed to 45 feet

BORING LOG B-3

JOB NUMBER: 1358.102

DATE DRILLED: 12/11/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +723 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE: 2.5" I.D. Split Barrel

DRIVE WEIGHT – LB: 140

HEIGHT OF FALL – IN: 30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, dark gray, moist, very stiff, with calcareous deposits
75	--	--			
			5	CL/ CH	SILTY CLAY, gray-brown, moist, very stiff, with calcareous deposits
43	--	--			
			10		
25	31.8	91		CL	SILTY CLAY, yellow-gray, moist, stiff
			15		
24	--	--			
			20	CL/ ML	CLAYEY SILT, yellow-gray, moist, very stiff

BORING LOG B-3

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 20' TO 33'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL/ ML	CLAYEY SILT, continued
24	--	--			blue-gray and orange-brown mottled
					CLAYSTONE, orange-brown, hard, crushed, highly weathered
			25		
80	--	--			
			30		
80/ 6"	--	--			gray-brown, moderately weathered
					Terminal depth of boring: 33 feet Piezometer installed to 32 feet

BORING LOG B-4

JOB NUMBER: 1358.102

DATE DRILLED: 12/17/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +705 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL	CLAY, black, moist to wet, soft
				CL/ CH	SILTY CLAY, gray-brown, moist, soft to stiff, with calcareous deposits
18	36.3	105	5		
25	--	--	10		gray-brown and orange-brown mottled
				CL	SILTY CLAY, tan to orange-brown, moist, very stiff
52	--	--	15		
45	--	--	20		

BORING LOG B-4

JOB NUMBER: 1358.102 SHEET: 2 OF: 3

JOB NAME: Vista Tassajara DEPTH: 20' TO 41'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL	SILTY CLAY, continued
				CL/ CH	SILTY CLAY, gray, moist, very stiff
50	--	--	25		
33	--	--	30		gray-brown and blue-green mottled
52	--	--	35		
					CLAYSTONE, gray-brown, hard, crushed, highly weathered
90	--	--	40		

BORING LOG B-4

JOB NUMBER: 1358.102 SHEET: 3 OF: 3

JOB NAME: Vista Tassajara DEPTH: 40' TO 44' 6"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
90	--	--			dark gray, moderately weathered
90/ 6"	--	--			
			45		Terminal depth of boring: 44 feet 6 inches Piezometer installed to 44 feet

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PLATE 42

BORING LOG B-5

JOB NUMBER: 1358.102

DATE DRILLED: 12/14/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +721 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE: 2.5" I.D. Split Barrel

DRIVE WEIGHT – LB: 140

HEIGHT OF FALL – IN: 30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, black, moist, soft
25	--	--			
				CL/ CH	SILTY CLAY, gray-brown, moist, very stiff, with calcareous deposits
16	--	--	5		
24	--	--	10		
				CL	SILTY CLAY, yellow-gray to yellow-brown, moist, very stiff
28	--	--	15		
					CLAYEY SILT, yellow-brown and blue-gray mottled, moist, very stiff
19	33.2	89.6	20	CL/ ML	

BORING LOG B-5

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 20' TO 30'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL/ ML	CLAYEY SILT, continued
			25		
					SILTSTONE, olive-gray, hard, crushed, highly weathered, argillic
84/ 9"	--	--			
			30		Terminal depth of boring: 30 feet Piezometer installed to 28 feet 6 inches

BERLOGAR GEOTECHNICAL CONSULTANTS

BORING LOG B-6

JOB NUMBER: 1358.102

DATE DRILLED: 12/18/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +705 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE: 2.5" I.D. Split Barrel

DRIVE WEIGHT – LB: 140

HEIGHT OF FALL – IN: 30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
				CH	CLAY, dark gray-brown, moist, very stiff to hard, with calcareous deposits
61	--	--			
			5	CL/CH	SILTY CLAY, gray-brown, moist, very stiff
36	25.6	97			
			10		
				CL	SILTY CLAY, gray-brown, moist, very stiff
33	--	--	15		
			20		
35	--	--			

BORING LOG B-6

JOB NUMBER: 1358.102

SHEET: 2 OF: 2

JOB NAME: Vista Tassajara

DEPTH: 20' TO 21'6"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
35	--	--			SILTY CLAY, continued
			25		Terminal depth of boring: 21 feet 6 inches Piezometer installed to 20 feet.

BERLOGAR GEOTECHNICAL CONSULTANTS

BORING LOG B-7

JOB NUMBER: 1358.102 | DATE DRILLED: 12/16/87

JOB NAME: Vista Tassajara | SURFACE ELEVATION: +750 Feet

DRILL RIG: Method: Rotary Wash | DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, dark gray, moist, very stiff, dry and hard below 3 feet
40	22.2	89			
			5	CL/ CH	SILTY CLAY, orange-brown, moist, very stiff, with calcareous deposits
23	--	--			
			10		
31	--	--			
			15		
					CLAYSTONE, tan to orange-brown, sheared, crushed, highly weathered, with soft clay partings
67	29.6	94			Slide surface at 19 feet
			20		CLAYSTONE, gray-brown, hard, crushed, highly weathered

BORING LOG B-7

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 20' TO 29'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
					CLAYSTONE, continued
	32.6	89			
			25		
50/6"	--	--			dark gray, moderately weathered
					Terminal depth of boring: 29 feet Piezometer installed to 28 feet 6 inches

BERLOGAR GEOTECHNICAL CONSULTANTS

BORING LOG B-8

JOB NUMBER: 1358.102

DATE DRILLED: 12/15/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +814 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, dark gray, moist, soft
				CL/CH	SILTY CLAY, dark orange-brown, moist, very stiff, with calcareous deposits
44	22.5	93	5		
35	--	--	10		yellow-brown
				CL/ML	CLAYEY SILT, blue-green and orange-brown mottled, moist, very stiff
64	26.8	97	15		
					CLAYSTONE, orange-brown, sheared, crushed, highly weathered, with randomly-oriented soft clay partings - landslide debris
45	--	--	20		

BORING LOG B-8

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 30' TO 33' 9"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
					Slide surface at 22 feet
					CLAYSTONE, gray-brown, hard, crushed, highly weathered
50/ 3"	33.7	88			
			25		
					dark gray, moderately weathered
30/ 6"	20.7	107			
			30		
					blue-gray
					Terminal depth of boring: 33 feet 9 inches Piezometer installed to 33 feet

CORE LOG

PROJECT: Vista Tassajara
DRILLING COMPANY: Pitcher Drilling
DRILLING METHODS: Rotary Wash
ELEVATION (FEET): 832 ±

BORING NO.: B-9
JOB NO.: 1358.102.1
DATE BEGUN: 12/14/87
DATE COMPLETED: 12/14/87
DEPTH OF HOLE: 55½ feet
NUMBER OF CORE BOXES: -0-
LOGGED BY: R. Skinner

RUN NO.	DRILL RATE (Min./Ft.)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
								CH	SILTY CLAY, dark brown, moist to wet, stiff, high plasticity Augered from 0 to 4 feet Set 5" diameter casting to 4 feet
							2		
							4	CL	2.5" I.D. drive sample at 4 feet, 16 blows/ft.
					0%				
	½								SILTY CLAY, brown, moist, stiff, low plasticity - landslide debris
	½								
							6		Began rotary wash drilling at 4 feet with 4 7/8" diameter drill bit
	½								
	½								
							8		
	½								
									2½" diameter drive sample at 9 feet, 45 blows/ft.
	½								
							10		
	1								
	1								
							12		
	2								Grading very stiff
									SILTSTONE, light brown, friable to weak, highly fractured, highly weathered (Qls)
							14		
	1								2.5" diameter drive sample at 14 feet, 50 blows/3"
	1								
							16		

BERLOGAR GEOTECHNICAL CONSULTANTS

CORE LOG

BORING NO. B-9 JOB NO. 1358.102.1

RUN NO.	DRILL RATE (Min./Ft.)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
	1½				0%				SILTSTONE, light brown, friable to weak, highly fractured, highly weathered - landslide debris
	1½								
	1½						18		
	1								Clay seam in sample 2.5" diameter drive sample at 19 feet, 50 blows/6"
	1						20		
	1½								
	1½						22		
	1½								
	1½						24	CH	SILTY CLAY, brown, wet, stiff, high plasticity, possible slide plane
	1½								2.5" diameter drive sample at 24 feet, blows 50/4"
	1½						26		SANDSTONE, light brown, friable, highly fractured, highly weathered - landslide debris
	1½								
	1½						28		CLAYSTONE, brown, friable, highly fractured, some clay seams, highly weathered - landslide debris
1	2½	2.5	1.5	60	0%	0			Began pitcher barrel sampling at 29 feet
							30		
	2½								
2	4	2.5	2.4	96	0%	0			
							32		

CORE LOG

BORING NO. B-9 JOB NO. 1358.102

RUN NO.	DRILL RATE (Min./Ft)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
					0%				CLAYSTONE, mottled light gray and brown, friable, crushed, highly sheared, highly weathered, abundant clay seams - landslide debris
	4								
	4								
							34		
3	4	2.5	1.7	68	0%	0			
	4								
	4						36		
4	6	2.5	2.4	96	0%	0			Bedding dip 20"
	9								SILTSTONE, brown, weak, moderately fractured, moderately weathered, sandy
							38		Slickensided surface, dip 17°
	10								Interpreted slide plane at 38½ feet
5	6	2.5	2.3	92	0%	0			
							40		
	4								
	4								Rotary wash drilling 41½ to 46 feet
							42		
	1				0%				
	1								
	1								SILTSTONE, gray, weak, moderately fractured, unweathered, sandy
							44		
	1								
	1½								
							46		
6	3	2.5	2.4	96	0	0			
	3								
							48		

CORE LOG

BORING NO. B-9 JOB NO. 1358.102

RUN NO.	DRILL RATE (Min./Ft)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
	1				0%				SILTSTONE, gray, weak, moderately fractured, unweathered, sandy
					0%				
	1								Rotary wash drilling from 48½ to 53 feet
							50		
	1								
									CLAYSTONE, dark gray, friable to weak crushed, moderately sheared, unweathered
	1						52		
	1								
7	3	2.5	100	0%	0	0			
							54		
	3								
	3								
									Total depth 55½ feet Installed piezometer to 53 feet

PLATE 53

BERLOGAR GEOTECHNICAL CONSULTANTS

BORING LOG B-10

JOB NUMBER: 1358.102

DATE DRILLED: 12/14/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +786 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CL/ ML	CLAYEY SILT, yellow-brown, soft to stiff, moist
22	24.7	97	5		
					SILTSTONE, orange-brown, argillaceous, crushed sheared, highly weathered - landslide debris
60/ 6"	--	--	10		
					CLAYSTONE, dark yellow-brown, crushed, sheared, highly weathered with randomly oriented thin bands of gray claystone - landslide debris
95/ 10"	24.5	94	15		
60/ 6"	--	--	20		

BORING LOG B-10

JOB NUMBER: 1358.102 SHEET: 2 OF: 3

JOB NAME: Vista Tassajara DEPTH: 20′ TO 41′

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
					SILTSTONE, continued
100/9"	24.5	97	25		brown to dark yellow-brown
78/6"	--	--			randomly-oriented soft clay partings
			30		
90/6"	--	--	35		
					Slide surface at 38½ feet
90/6"	21.8	104	40		SILTSTONE, dark gray, hard, crushed, moderately weathered, argillic

BORING LOG B-10

JOB NUMBER: 1358.102 SHEET: 3 OF: 3

JOB NAME: Vista Tassajara DEPTH: 40' TO 57'

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
96/ 6"	--	--			RHYOLITIC TUFF BED, 3/4 inch thick at 44½ feet
			45		
					CLAYSTONE, light yellow-gray, hard, crushed moderately weathered, tuffaceous
50/ 4"	--	--	50		
					SILTSTONE, light gray, very hard, moderately weathered, tuffaceous
			55		
100/ 1"	--	--			
					Terminal depth of boring: 57 feet Piezometer installed to 57 feet

BORING LOG B-11

JOB NUMBER: 1358.102

DATE DRILLED: 12/16/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION: +728 Feet

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE: 2.5" I.D. Split Barrel

DRIVE WEIGHT – LB: 140

HEIGHT OF FALL – IN: 30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
				CH	CLAY, dark gray-brown, moist, very stiff
38	19.5	96			
			5		
				CL/ CH	SILTY CLAY, brown, moist, stiff
55	--	--			CLAYSTONE, tan, sheared, crushed, highly weathered, with randomly-oriented soft clay partings - landslide debris
			10		
					Slide surface at 11½ feet
82	24.1	100			SILTSTONE, gray-brown, hard, crushed, highly weathered, argillic
			15		
90	--	--			
					CLAYSTONE, brown, hard, crushed, highly weathered
			20		

BORING LOG B-11

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 20' TO 27' 6"

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
					CLAYSTONE, continued
50/ 6"	21.3	105			
			25		
68/ 6"	--	--			
					Terminal depth of boring: 27 feet 6 inches Piezometer installed to 27 feet

CORE LOG

BORING NO. B-12 JOB NO. 1358.102
DATE BEGUN 12/10/87
DATE COMPLETED 12/10/87
DEPTH OF HOLE 40½
NUMBER OF CORE BOXES -0-, 6 - 3" tubes
LOGGED BY R. Skinner

PROJECT Vista Tassajara
DRILLING COMPANY Pitcher Drilling
DRILLING METHODS Rotary Wash
ELEVATION (FEET) 680 ±

RUN NO.	DRILL RATE (Min./Ft.)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
								CH	SILTY CLAY, dark gray-brown, wet, soft, high plasticity Augered from 0 to 3½ feet
							2	CH	SILTY CLAY, dark gray-brown, moist, very stiff, high plasticity - landslide debris
							4		2.5" diameter drive sample at 3½ feet, 66 blows/ft. Set 5" diameter casing to 4 feet, began rotary wash drilling with 4 7/8" diameter drag bit
	½				0%				
	½								
							6		
	½								
	½								
							8		
	½							CH	SILTY CLAY, light gray, moist to wet stiff, high plasticity (Qls) 2.5" diameter drive sample at 9 feet, 19 blows/ft.
	½								
							10		CLAYSTONE, light gray, friable, crushed, highly sheared - landslide debris
	½								
	½								
							12		
	½								
	½								
							14		
	½								
									2.5" diameter drive sample at 15 feet, 33 blows.ft.
	½								
							16		

CORE LOG

BORING NO. B-12 JOB NO. 1358.102

RUN NO.	DRILL RATE (Min./Ft.)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
					0%				CLAYSTONE, light gray, friable, crushed, highly sheared - landslide debris
	½								2.5" diameter drive sample at 16½ feet, 47 blows/ft.
	½								Slickensided surface in sample shoe at 17½ feet, dip 10
							18		2.5" diameter drive sample at 18 feet, 61 blows/ft.
	½								
	½								2.5" diameter drive sample at 19½ feet, 61 blows/ft.
							20		
	½								Mottled gray and brown
									Begin pitcher barrel sampling at 21 feet
1		2.5	1.9	76	0%	0			
	3								
							22		Highly sheared claystone, abundant clay seams, highly weathered
	3								
2	3	2.5	2.0	80	0%	0			
							24		
	3								
									Soft zone 25 to 25½ feet
	1								Began losing circulation at 25½ feet
					50%				
							26		Orange clay at 26 feet
3	3	2.5	1.2	60	20%	0			
									Orange clay in cuttings, interpreted slide plane at approximately 27 feet
	3								
									Contact, dip 15
							28		
	3								
4	5	2.5	2.3	92	10%	0			CLAYSTONE, dark gray, friable, crushed, unweathered
	4								
							30		
	5								
5	4	2.5	2.5	100	20%	0			
							32		

BERLOGAR GEOTECHNICAL CONSULTANTS

CORE LOG

BORING NO. B-12 JOB NO. 1358.102

RUN NO.	DRILL RATE (Min./Ft.)	CUT	RECOVERED	% REC.	DRILLING FLUID LOSS	RQD (%)	DEPTH	LOG	DESCRIPTION
	4				20%				CLAYSTONE, dark gray, friable, crushed, unweathered
	4								
	½				20%		34		Rotary wash drilling from 33½ to 38 feet with 4 7/8" diameter drag bit
	½								
	½								
							36		
	½								
	½								
							38		Pitcher barrel sample at 38 feet
6	4	2.5	1.6	64	20%	0			
	4								
	4								
							40		
									Total depth 40½ feet Installed piezometer to 39 feet

BORING LOG B-13

JOB NUMBER: 1358.102

DATE DRILLED: 12/10/87

JOB NAME: Vista Tassajara

SURFACE ELEVATION:

DRILL RIG: Method: Rotary Wash

DATUM: Contra Costa County

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" I.D. Split Barrel	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
				CL/ CH	SILTY CLAY, some rock fragments, light brown, wet, medium stiff, low plasticity
					SILTSTONE, light brown, friable, crushed, highly weathered - landslide debris
37	--	--	5		
					Began rotary was drilling at 4 feet with 4-7/8 inch diameter drill bit
					CLAYSTONE, light brown, friable, crushed, highly sheared, abundant clay seams - landslide debris
27	29.5	94	10		
64	--	--	15		mottled light brown and gray, highly sheared clay seam, high plasticity
					Slide surface at 18 feet
				CL	CLAYSTONE, blue-gray, friable, crushed, slightly sheared unweathered
63	--	--	20		

BORING LOG B-13

JOB NUMBER: 1358.102 SHEET: 2 OF: 2

JOB NAME: Vista Tassajara DEPTH: 20 TO 32½

NOTES:

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSI-FICATION	DESCRIPTION
					CLAYSTONE, blue-gray, friable, crushed, slightly sheared, unweathered
81	--	--			
			25		
84/9"	--	--			
			30		
					Total depth 30½ feet Installed piezometer to 28 feet

JOB NUMBER: 1358.102.1 DATE: 1-12-87 BY: CR

MAJOR DIVISIONS			CLASSIFICATION	TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN # 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL – SAND MIXTURES
			GP	POORLY GRADED GRAVELS; GRAVEL – SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL – SAND – SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL – SAND – CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND – SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND – CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN # 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 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 CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS 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 SILTS

UNIFIED SOIL CLASSIFICATION SYSTEM

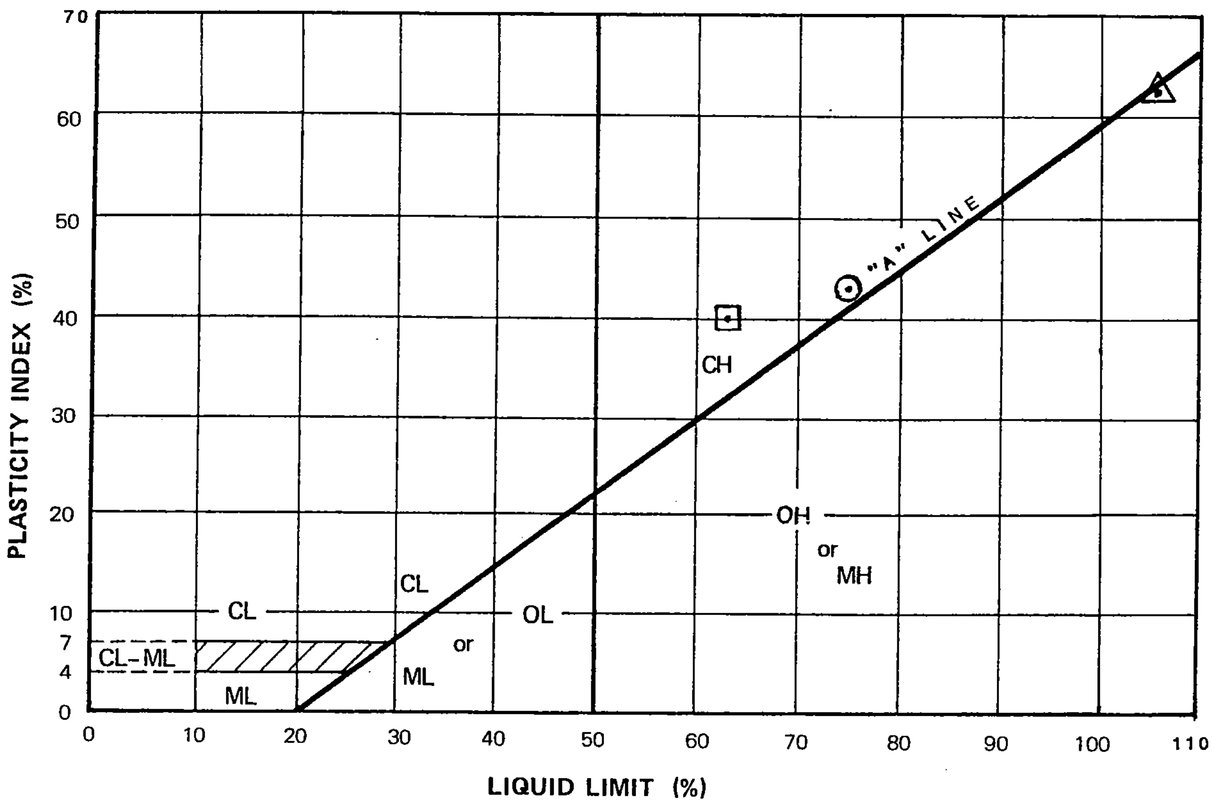
Blows per ft.	Moisture Content %	Dry Unit Weight (PCF)	Depth in feet	USCS Classification	DESCRIPTION
					Bulk sample
					2.5" I.D. Split Barrel Sample
					2.8" I.D. Shelby Tube Sample
					No sample recovered
					Standard Penetration Test interval.
					Well defined stratum change.
					Gradual stratum change
					Interpreted stratum change
					Apparent ground water level at date noted. Seasonal weather conditions, site topography, etc., may cause changes in water level indicated on logs

NOTE: Soils described as dry, moist, and wet are estimated to be dry of optimum, near optimum, and wet of optimum moisture content, respectively. Saturated soils are estimated to be within areas of free ground-water.

KEY TO BORING LOG SYMBOLS

GROUND WATER LEVELS

Boring No.	Date Drilled	Depth of Piezometer (ft)	Depth to Ground Water on 01/08/88 (ft)
1	12/09/87	31.5	18.5
2	12/11/87	45.3	7.0
3	12/11/87	33.0	7.2
4	12/17/87	44.5	3.3
5	12/16/87	30.0	7.9
6	12/15/87	21.5	17.1
7	12/16/87	29.0	16.0
8	12/15/87	33.8	12.3
9	12/14/87	53.0	21.5
10	12/14/87	57.0	47.0
11	12/16/87	27.5	20.4
12	12/10/87	39.0	10.9
12	12/10/87	28.0	10.9



SYMBOL	TEST PIT	DEPTH, FT.	LIQUID LIMIT, %	PLASTICITY INDEX, %	USCS SYMBOL
⊙	TP2-13	1	73	45	CH
△	TP2-26	7	105	62	MH/CH
⊡	TP2-44	10	63	40	CH

JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR

ATTERBERG LIMITS TEST DATA

SUMMARY OF DRY UNIT WEIGHT AND MOISTURE CONTENT DETERMINATIONS

Boring Number	Sample Depth (ft)	Moisture Content (%)	Dry Unit Weight (pcf)
B-1	5.0	22.2	99
B-2	19.0	34.2	89
B-3	3.0	23.4	90
	11.0	31.8	91
B-4	4.0	34.7	88
B-5	19.0	33.2	90
B-6	9.0	25.6	97
B-7	3.0	22.2	89
	18.0	29.6	94
	23.0	32.6	89
B-8	3.0	22.5	93
	13.0	26.8	97
	23.0	33.7	88
	28.0	20.7	107
B-9	4.0	26.1	87
	14.0	18.1	110
	24.0	18.4	112
	36.0	31.1	89
B-10	4.0	24.7	97
	14.0	24.5	94
	24.0	24.5	97
	39.0	21.8	104
B-11	2.0	19.5	96
	12.0	24.1	100
	22.0	21.3	105
B-12	9.0	27.1	95
	18.0	12.0	112
	26.0	32.1	89
B-13	9.0	29.5	94
	19.0	23.2	104

JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR

SAMPLE DESCRIPTION AND LOCATION	TEST SURCHARGE PSF	MOISTURE CONTENT PERCENT		DRY DENSITY PCF	SWELL % (+) SHRINK (–)
TP2-13 @ 1' SILTY CLAY, GRAY	144	INITIAL	18.3	93.8	
		SATURATION	29.5	87.8	+6.83
		AIR DRY	8.4	107.9	-19.87
		OVEN DRY	0	114.4	-24.79
TP2-26 @ 7' CLAY, LIGHT GRAY (BENTONITE)	144	INITIAL	41.8	76.0	
		SATURATION	49.4	72.5	+4.95
		AIR DRY	8.8	104.4	-32.07
		OVEN DRY	0	110.5	-36.08
		INITIAL			
		SATURATION			
		AIR DRY			
		OVEN DRY			
		INITIAL			
		SATURATION			
		AIR DRY			
		OVEN DRY			

DESCRIPTION OF SWELL-SHRINK TEST PROCEDURES

A. SAMPLE PREPARATION:

[ ] 1. UNDISTURBED SAMPLE: A 1-INCH-HIGH UNDISTURBED SAMPLE OF SOIL, CONFINED IN A 2.40 INCH I.D. RING.

[X] 2. REMOLDED SAMPLE: A REMOLDED 1-INCH-HIGH SOIL SAMPLE PREPARED AT APPROXIMATELY OPTIMUM MOISTURE CONTENT AND COMPACTED TO THE INDICATED DRY DENSITY BASED ON ASTM DESIGNATION: D1557-70, CONFINED IN A 2.40 INCH I.D. RING.

B. TEST PROCEDURES:

IMMERSE THE SOIL SAMPLE IN WATER WHILE UNDER A SURCHARGE PRESSURE. MEASUREMENTS OF SWELL OR SHRINK ARE TAKEN UNTIL MOVEMENT CEASES. THE SURCHARGE IS REMOVED AND THE SAMPLE AIR DRIED, THEN OVEN DRIED. BY MEASURING THE DIMENSIONS OF THE SAMPLE UNDER THESE VARIOUS CONDITIONS, IT IS POSSIBLE TO DETERMINE THE SOIL VOLUME UNDER THE FOLLOWING CONDITIONS:

1). AT FIELD MOISTURE CONTENT,
2) WHEN COMPLETELY SATURATED UNDER THE GIVEN SURCHARGE,
3) WHEN AIR DRY, AND
4) WHEN OVEN DRY.

THE DRY DENSITY IS COMPUTED FROM THE DRY WEIGHT OF THE SPECIMEN AND ITS VOLUME IS COMPARED UNDER THE VARIOUS MOISTURE CONDITIONS.

C. EXPLANATION OF RESULTS:

1. THE PERCENT OF SHRINK OR SWELL AT SATURATION MOISTURE CONTENT IS THAT WHICH OCCURRED STARTING AT INITIAL MOISTURE CONTENT
2. THE PERCENT OF SHRINK OR SWELL AT AIR DRY OR OVEN DRY MOISTURE CONTENT IS THAT WHICH OCCURRED STARTING AT SATURATION MOISTURE CONTENT.

SHRINK-SWELL TEST DATA

SUMMARY OF UNCONFINED COMPRESSIVE STRENGTH DATA

Boring No.	Sample Depth (ft)	Moisture Content (%)	Dry Unit Weight (pcf)	Unconfined Compressive Strength (tsf)	Strain at Failure (%)
B-1	5.0	22.2	99	2.3	21
B-3	11.5	31.8	91	1.3	4.1
B-6	9.0	25.6	97	1.7	5.6

Notes:

1. Sample dimensions: 2.430 inches x 5.700 inches
2. Strain rate: 0.02 inch/minute

SUMMARY OF "SIMPLE" DIRECT SHEAR TESTS

Boring No.	Sample Depth (ft)	Dry Unit Weight (pcf)	Moisture Content (%)	Normal Stress (psf)	Peak Values	
					Shear Stress (psf)	Displacement (in)
B-12	26.0	33.8	89	1000	1072	0.13
B-12	26.0	32.1	89	2500	1710	0.14
B-9	36.0	31.1	89	4000	2420	0.25

Notes:

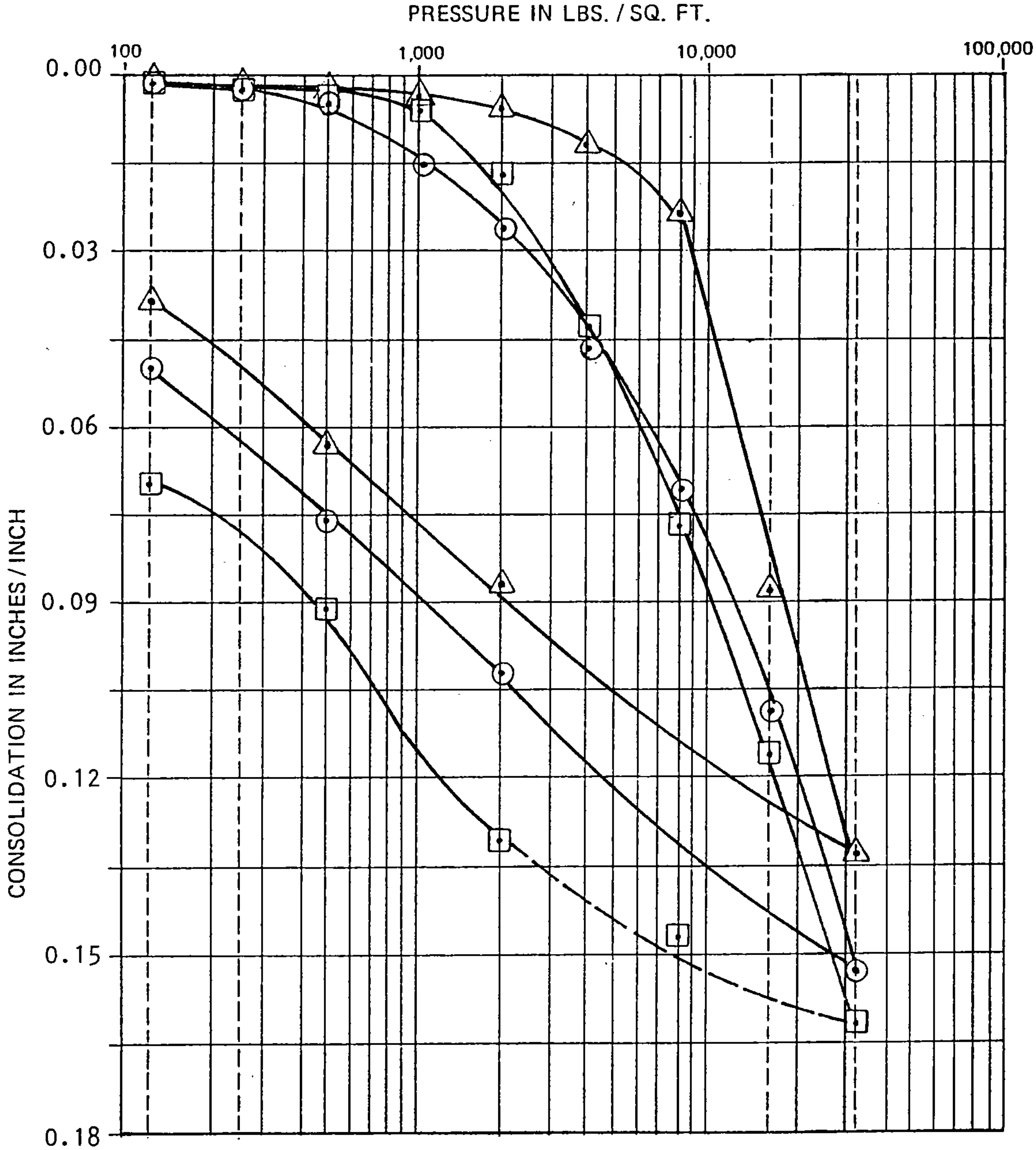
1. Sample dimensions: 2.430 inches x 1.000 inch
2. Samples sheared submerged
3. Test procedures: Shear box advanced in 0.01-inch increments, at 0.007 inch/minute strain rate, and shear dial allowed to stabilize for 5 minutes prior to next incremental advance.

SUMMARY OF TRIAXIAL COMPRESSION TESTS

Location	Sample Depths (ft)	Moisture Content (%)	Dry Unit Weight (pcf)	Lateral Pressure (psi)	Peak Values Shear Stress (psi)	Peak Values Strain (%)
B-13	19.0	23.2	104	20	27.2	34
B-8	23.0	33.7	88	40	13.5	12.2
B-10	39.0	21.8	104	60	28.0	6.1
TP-2-13*	6.0	18.4	105	3	67.6	1.6
TP-2-13*	6.0	18.2	105	6	84.9	1.8
TP-2-13*	6.0	18.0	105	9	91.0	2.3

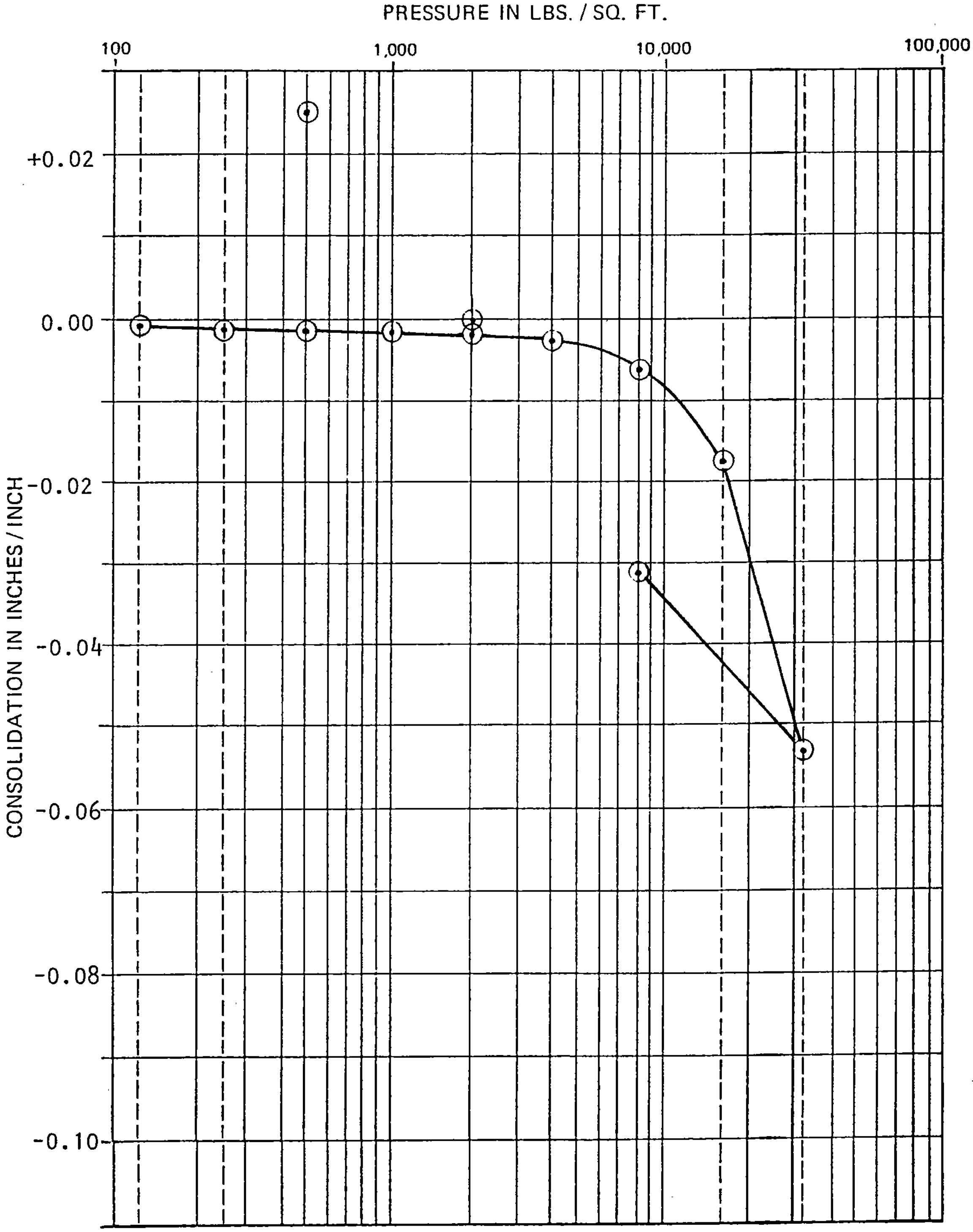
Notes:

1. Sample dimension: 2.430 inches x 5.950 inches
2. Strain rate: 0.02 inch/minute
3. Samples designated thus: * remolded to approximately 90% relative compaction near optimum moisture content.



SYMBOL	BORING	DEPTH FT.	DESCRIPTION	INITIAL MOISTURE CONTENT (%)	INIT. DRY DENSITY (PCF)
⊙	B-2	19	SILTY CLAY, MOTTLED GRAY & BROWN	34.2	89.0
⊡	B-4	4	SILTY CLAY, BROWN, GRAY MOTTLED	34.7	88.3
△	B-5	19	SILTY CLAY, MOTTLED GRAY, BROWN	33.2	89.6

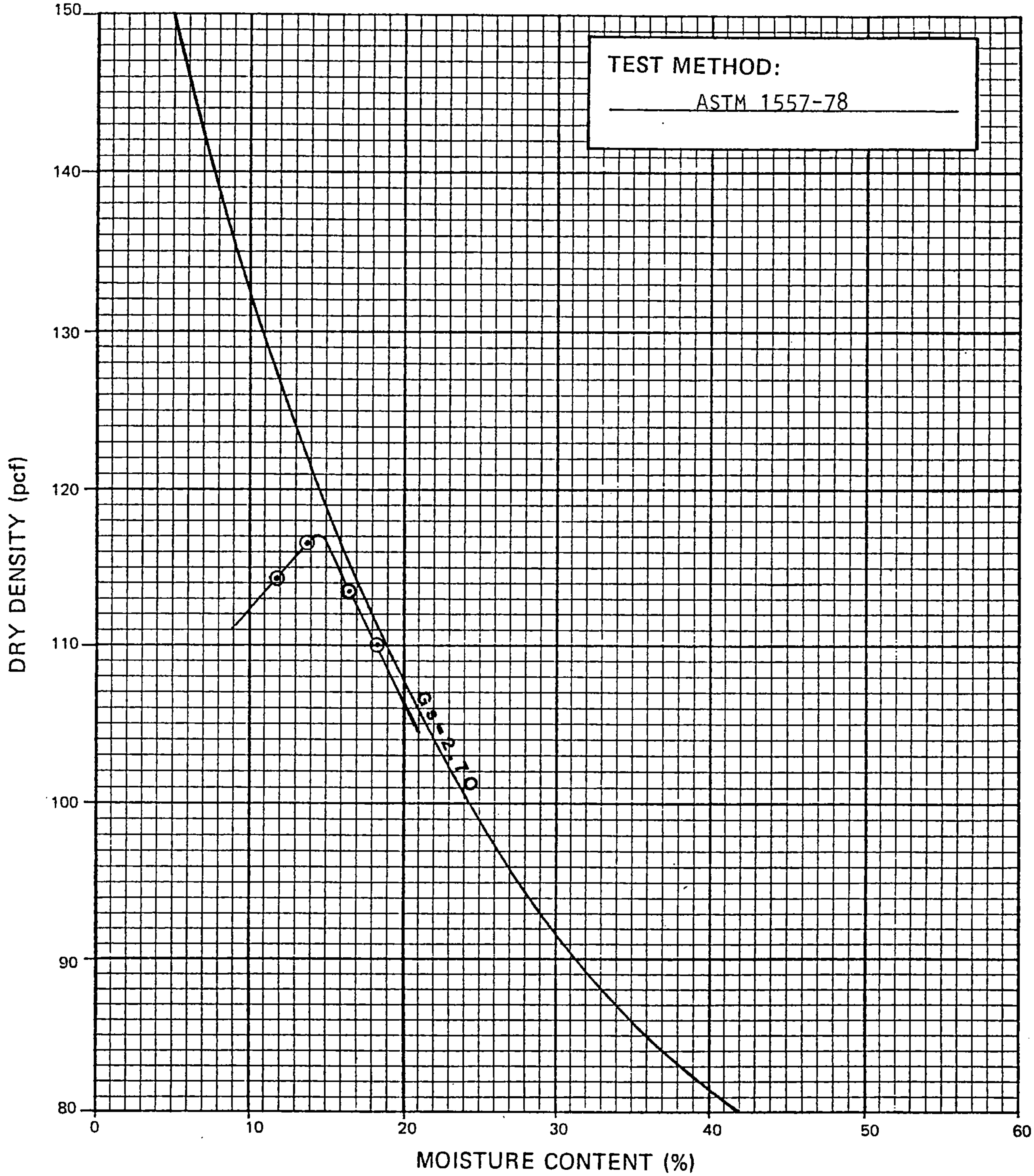
CONSOLIDATION TEST DATA



SYMBOL	BORING	DEPTH FT.	DESCRIPTION	INITIAL MOISTURE CONTENT (%)	INIT. DRY DENSITY (PCF)
⊙	TP2-13	6	SILTY CLAY, GRAY (REMOLDED)	17.8	105.2

CONSOLIDATION TEST DATA

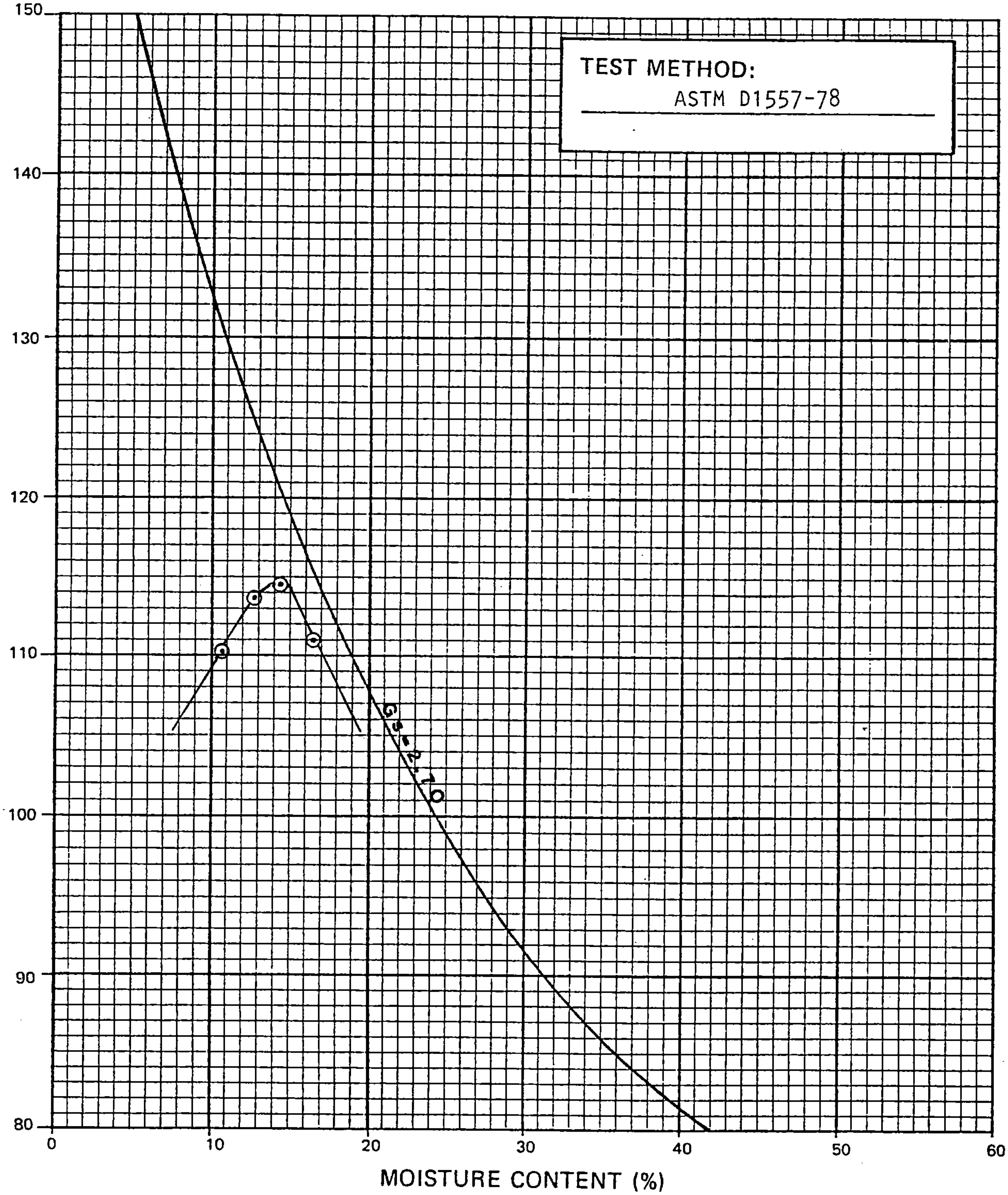
JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR



SYMBOL	LOCATION	DEPTH (FT)	DESCRIPTION	OPTIMUM MOISTURE CONTENT (%)	MAX. DRY DENSITY (pcf)
⊙	TP2-56	6	GRAY CLAYSTONE	14.6	117.0

COMPACTION TEST DATA

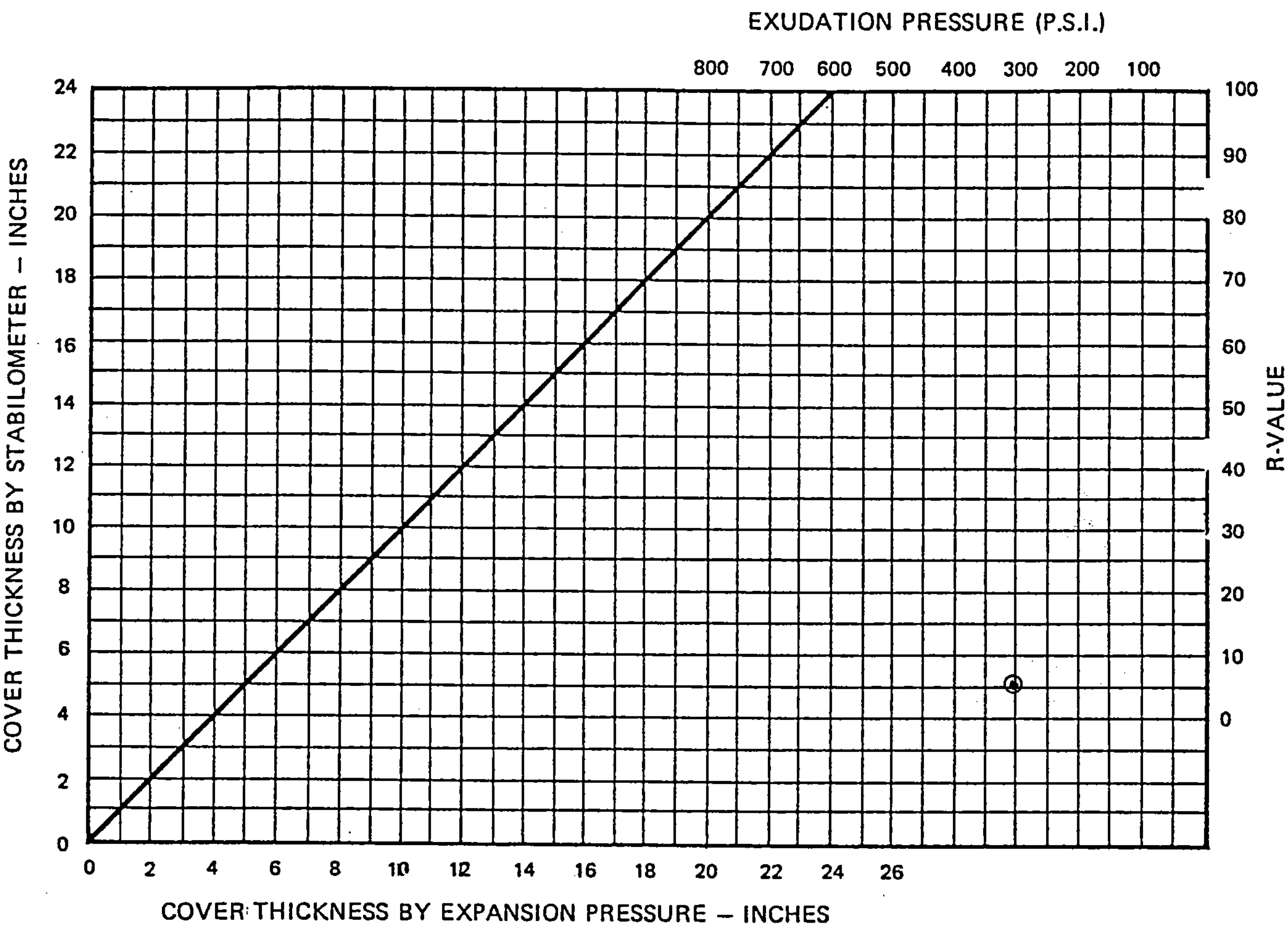
JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR



SYMBOL	LOCATION	DEPTH (FT)	DESCRIPTION	OPTIMUM MOISTURE CONTENT (%)	MAX. DRY DENSITY (pcf)
⊙	TP2-20	6	LIGHT BROWN SAND, SANDSTONE	14.3	114.5

COMPACTION TEST DATA

JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR



SAMPLE: TP2-13 @ 1'

DESCRIPTION: DARK GRAY SILTY CLAY

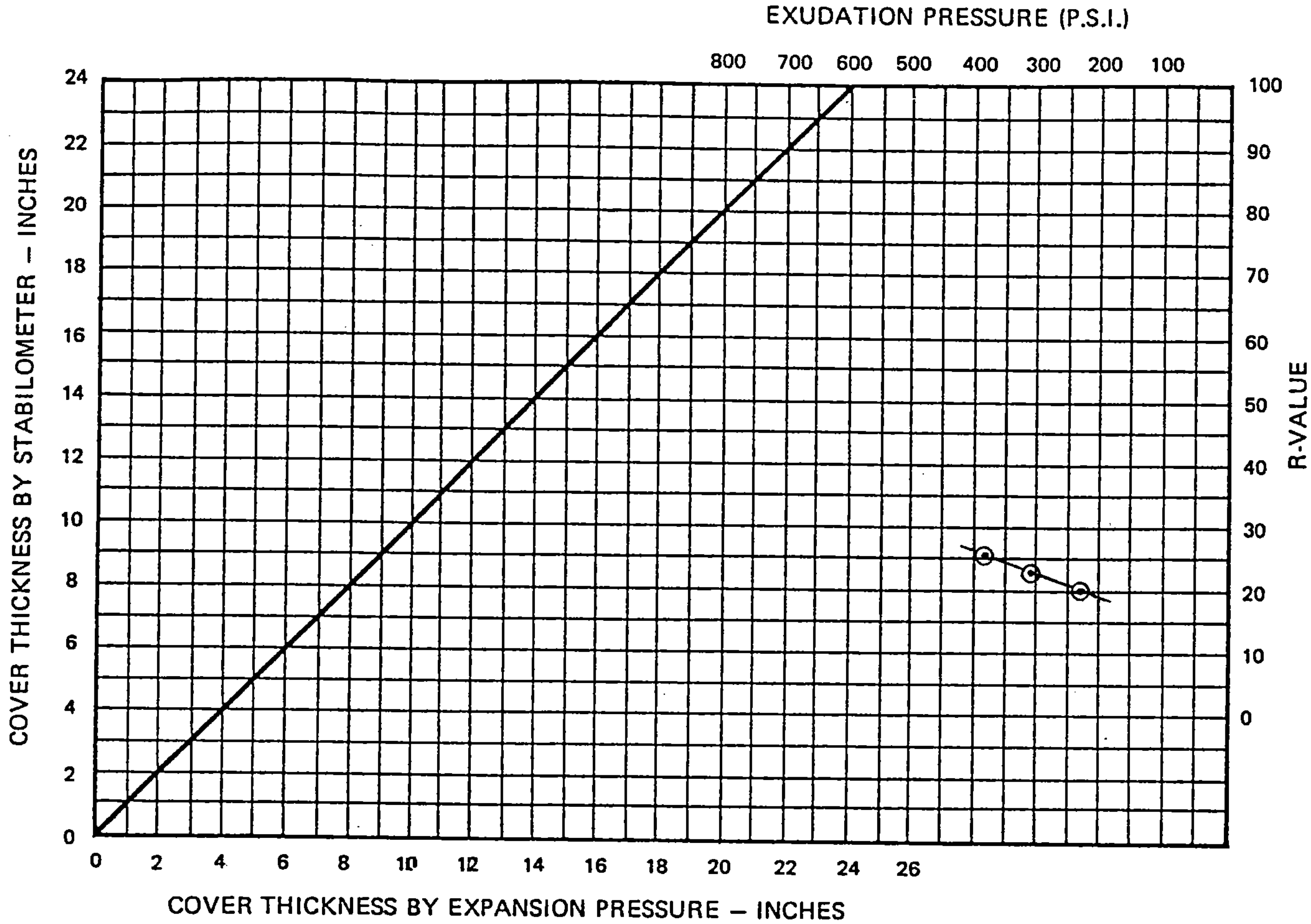
SPECIMEN	A	B	C
EXUDATION PRESSURE (P.S.I.)		302	
EXPANSION DIAL (.0001")		35	
EXPANSION PRESSURE (P.S.F.)		155	
RESISTANCE VALUE, "R"		6*	
% MOISTURE AT TEST		26.6	
DRY DENSITY AT TEST (P.C.F.)		89.3	
EXPANSION PRESSURE 300 psi		155 psf	
"R" VALUE AT 300 P.S.I. EXUDATION PRESSURE	=(6)		

*LIGHT/MUD

RESISTANCE (R)-VALUE TEST DATA

STATE OF CALIFORNIA TEST METHOD Nº CALIFORNIA 301-F

JOB NUMBER: 1358.102.1 DATE: 12-17-87 BY: CR



SAMPLE: TP2-33 @ 5' TWO WET/DRY CYCLES

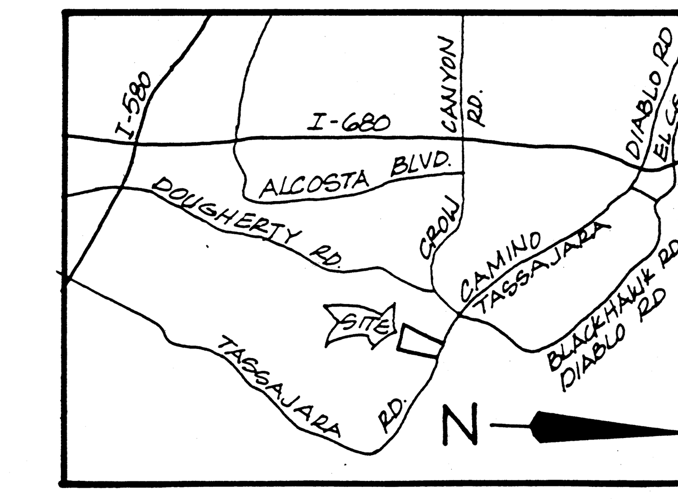
DESCRIPTION: LIGHT BROWN CLAYEY SILT, SILTSTONE

SPECIMEN	A	B	C
EXUDATION PRESSURE (P.S.I.)	231	302	390
EXPANSION DIAL (.0001")	76	83	105
EXPANSION PRESSURE (P.S.F.)	336	367	465
RESISTANCE VALUE, "R"	20	23	26
% MOISTURE AT TEST	22.4	21.5	20.6
DRY DENSITY AT TEST (P.C.F.)	99.8	101.0	103.0
EXPANSION PRESSURE 300 psi		367 psf	
"R" VALUE AT 300 P.S.I. EXUDATION PRESSURE	= (23)		

RESISTANCE (R)-VALUE TEST DATA

STATE OF CALIFORNIA TEST METHOD Nº CALIFORNIA 301-F

VISTA TASSAJARA
SUBDIVISION 6736
GRADING PLANS



VICINITY MAP
NTS

OWNER/DEVELOPER
STANDARD PACIFIC-NORTHERN CA
3825 HOPYARD RD, STE 195
PLEASANTON, CA 94566
(415) 847-8700

SOILS ENGINEER
BERLOGAR GEOTECHNICAL
4456 BLACK AVE
PLEASANTON, CA 94566
(415) 484-0220

CIVIL ENGINEER
PRW and ASSOCIATES
400 TAYLOR BLVD. STE. 325
PLEASANT HILL, CA. 94523
(415) 686-6300

GENERAL GRADING NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH THE STANDARDS OF THE TOWN OF DANVILLE AND THE CONTRA COSTA COUNTY FLOOD CONTROL DISTRICT.
2. ALL CONSTRUCTION SHALL COMPLY WITH THE TOWN OF DANVILLE MUNICIPAL CODE AND GRADING ORDINANCE.
3. THE CONTRACTOR SHALL COMPLY WITH ALL STATE, COUNTY, AND CITY LAWS AND ORDINANCES, AND REGULATIONS OF THE DEPARTMENT OF INDUSTRIAL RELATIONS, O.S.H.A., AND INDUSTRIAL ACCIDENT COMMISSION RELATING TO THE SAFETY AND CHARACTER OF WORK, EQUIPMENT, AND LABOR PERSONNEL.
4. IT SHALL BE UNDERSTOOD THAT THE TERM CITY ENGINEER AS USED HEREIN IS THE CITY ENGINEER FOR THE TOWN OF DANVILLE OR ITS AUTHORIZED REPRESENTATIVE.
5. IT SHALL BE UNDERSTOOD THE TERM ENGINEER IS THE ENGINEER OF RECORD AND AS USED HEREIN SHALL MEAN PRW AND ASSOCIATES OR ITS AUTHORIZED REPRESENTATIVE.
6. SPECIFICATIONS, SPECIFIC NOTES AND DETAIL DRAWINGS HEREON AND IN THE SOILS REPORT TAKE PRECEDENCE OVER GENERAL DRAWINGS AND PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ANY DEVIATION FROM THE APPROVED PLANS DURING CONSTRUCTION WILL REQUIRE 48 HOURS PRIOR NOTICE TO THE ENGINEER AND APPROVAL OF THE CITY ENGINEER. AT LEAST ONE SET OF PLANS SHALL BE ON THE SITE AT ALL TIMES FOR INSPECTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM AN INDEPENDENT QUANTITY TAKE OFF FOR BIDDING PURPOSES AND TO VERIFY THE ENGINEER'S ESTIMATE OF GRADING QUANTITIES.
8. THE ESTIMATED EARTHWORK QUANTITIES SHOWN HEREON ARE DETERMINED BY STANDARD ENGINEERING METHODS UTILIZING THE BEST INFORMATION AVAILABLE. HOWEVER, SOILS ENGINEERING IS AN IMPRECISE SCIENCE. THEREFORE, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY UNANTICIPATED CONDITIONS WHICH MAY OCCUR DURING THE GRADING OPERATION. THE CONTRACTOR SHALL KEEP THE ENGINEER INFORMED AS TO THE PROGRESS OF THE GRADING AND NOTIFY HIM AT THE EARLIEST POSSIBLE OPPORTUNITY OF ANY POTENTIAL SHORT FALL OR OVERAGE SO THAT THE GRADING PLANS MAY BE ADJUSTED IF REQUIRED.
9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT THE GRADING OPERATION IN SUCH A MANNER AS TO RESULT IN A FINAL ON SITE BALANCE. SHOULD THIS APPEAR IMPOSSIBLE DUE TO UNANTICIPATED SHRINK OR SWELL, EXCESSIVE OVEREXCAVATION, KEYWAY, OR SLIDE REPAIR OPERATIONS, OR OTHER SITE FACTORS NOT FORESEEABLE AT THE TIME OF GRADING PLAN PREPARATION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE ENGINEER SHALL THEN ADVISE THE CONTRACTOR AS TO POTENTIAL MODIFICATIONS TO THE GRADING WHICH THE CONTRACTOR MAY EMPLOY TO ATTEMPT TO OBTAIN AN ON SITE BALANCE.
10. ALL GRADING, SITE PREPARATION, AND PLACING AND COMPACTION OF FILL SHALL BE DONE UNDER THE OBSERVATION OF THE SOILS ENGINEER AND THE CITY ENGINEER. SUBSEQUENT TO COMPLETION OF THE WORK, THE SOILS ENGINEER SHALL SUBMIT TO THE TOWN OF DANVILLE A REPORT STATING THAT ALL WORK HAS BEEN DONE TO HIS SATISFACTION. RECOMMENDATIONS OF THE SOILS REPORT SHALL BE STRICTLY ADHERED TO.
11. THE SOILS REPORT TITLED,"GEOTECHNICAL REPORT, VISTA TASSAJARA, TASSAJARA ROAD, DANVILLE, CALIFORNIA" JOB NO. 1358.102, PREPARED BY BERLOGAR GEOTECHNICAL CONSULTANTS DATED FEBRUARY 8, 1988 SHALL BE CONSIDERED A PART OF THESE PLANS.
12. ALL CUT SLOPES SHALL BE INVESTIGATED BOTH DURING AND AFTER GRADING BY THE SOILS ENGINEER TO DETERMINE IF ANY SLOPE STABILITY PROBLEM EXISTS. SHOULD EXCAVATION DISCLOSE ANY GEOLOGICAL HAZARDS, THE SOILS ENGINEER SHALL RECOMMEND TREATMENT TO THE ENGINEER AND THE TOWN OF DANVILLE PUBLIC WORKS DEPARTMENT FOR APPROVAL.
13. ALL SLIDE REPAIR WORK, SUB-DRAIN INSTALLATION AND LINED DITCH WORK SHALL BE INSPECTED BY THE TOWN OF DANVILLE. REPORTS FROM THE SOILS ENGINEER SHALL BE SUBMITTED TO THE TOWN OF DANVILLE REGARDING THE SLIDE REPAIR AND/OR SUBDRAIN INSTALLATION.
14. AS-BUILT SUBDRAIN DRAWINGS SHOWING ALL LOCATIONS AND CONNECTIONS SHALL BE PREPARED BY THE SOILS ENGINEER AND SUBMITTED TO THE ENGINEER, AND THE TOWN OF DANVILLE.
15. NO WORK WHATSOEVER SHALL BE COMMENCED WITHOUT FIRST NOTIFYING THE CITY ENGINEER, ENGINEER, SOILS ENGINEER AND APPROPRIATE PUBLIC AGENCIES.
16. A PRECONSTRUCTION MEETING AT THE SITE IS REQUIRED 48 HOURS PRIOR TO THE START OF GRADING WITH THE FOLLOWING PEOPLE PRESENT: OWNER, GRADING CONTRACTOR, ENGINEER, SOILS ENGINEER/GEOLOGIST, TOWN INSPECTOR, OR THEIR REPRESENTATIVES.
17. PRIOR TO COMMENCING ANY GRADING ON THE SITE, THE EXTERIOR BOUNDARIES SHALL BE MARKED. BOUNDARY MARKERS SHALL BE MAINTAINED THROUGHOUT THE GRADING OPERATION.
18. THE PROPOSED CONSTRUCTION OPERATION WILL TAKE PLACE AT OR NEAR FENCE LINES, PROPERTY LINES, AND PROPERTY IMPROVEMENTS THAT SHALL BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION OPERATION. IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY THESE AREAS WITH THE ENGINEER AND OWNER PRIOR TO BEGINNING CONSTRUCTION.
19. PROTECTIVE FENCING AND/OR BARRIERS SHALL BE PROVIDED WHEN NECESSARY TO PROTECT ADJACENT PROPERTIES DURING THE GRADING OPERATION.
20. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN POINTS OF ACCESS THAT ARE AGREEABLE TO THE ADJACENT LAND USES AND TENANTS. SAID POINTS OF ACCESS SHALL BE MAINTAINED AT ALL TIMES.
21. IF ARCHAEOLOGIC MATERIALS ARE UNCOVERED DURING GRADING, TRENCHING OR OTHER EXCAVATION, EARTHWORK WITHIN 100 FEET OF THESE MATERIALS SHALL BE STOPPED UNTIL A PROFESSIONAL ARCHAEOLOGIST WHO IS CERTIFIED BY THE SOCIETY OF CALIFORNIA ARCHAEOLOGY (SCA) AND/OR THE SOCIETY OF PROFESSIONAL ARCHAEOLOGY (SOPA) HAS HAD AN OPPORTUNITY TO EVALUATE THE SIGNIFICANCE OF THE FIND AND SUGGEST APPROPRIATE MITIGATION MEASURES, IF THEY ARE DEEMED NECESSARY.
22. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN CONTROL OF THE ENTIRE CONSTRUCTION OPERATION AND TO THIS END KEEP THE ENTIRE SITE FREE FROM EROSION.
23. EROSION CONTROL MEASURES SHALL BE EMPLOYED DURING THE RAINY SEASON AS REQUIRED BY THE CITY ENGINEER.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REQUIRED INSPECTIONS AND SHALL MAKE PROPER (48 HOURS PRIOR) NOTIFICATION TO THE TOWN, ENGINEER, SOILS ENGINEER, OR OTHER REQUIRED INDIVIDUALS OR PUBLIC AGENCIES.
25. THE CONTRACTOR ASSUMES SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS AND SHALL HOLD THE OWNER AND ENGINEER HARMLESS FOR ANY ALLEGED LIABILITIES EXCEPT THOSE ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER. (ENGINEER REFERS TO CIVIL AND SOILS ENGINEER.)
26. HAULING OF ANY EARTH, SAND, GRAVEL, STONE, DEBRIS, PAPER OR ANY OTHER SUBSTANCE EXCAVATED FROM THIS SITE IS RESTRICTED OVER ANY PUBLIC STREET, ALLEY OR ANY OTHER PUBLIC PLACE WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER AND THE APPROVAL OF AN ACCEPTABLE HAUL ROUTE.
27. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPELINES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS AND IN SOME CASES BY FIELD SURVEY. APPROVAL OF THESE PLANS BY THE DESIGN ENGINEER OR REVIEW BY THE CITY ENGINEER DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OR COMPLETENESS OF THE LOCATION OR EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITIES OR STRUCTURES WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEANS TO PROTECT THE UTILITIES AND STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
28. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE CONSTRUCTION WITH THE UTILITY AGENCIES.
29. ALL ABANDONED UNDERGROUND PIPELINES EXPOSED DURING GRADING SHALL BE REMOVED OR ADEQUATELY PLUGGED PER THE DIRECTION OF THE SOIL ENGINEER.
30. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE NEED FOR SURVEY STAKING.
31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF ALL CONSTRUCTION STAKING SET BY THE ENGINEER'S SURVEYORS AND IS HEREBY NOTIFIED THAT HE WILL BE BACKCHARGED FOR ANY RESTAKING THAT IS REQUIRED.
32. HOURS OF CONSTRUCTION SHALL BE FROM 7:30 A.M. TO 5:30 P.M. MONDAY THROUGH FRIDAY OR AS MODIFIED BY THE TOWN OF DANVILLE.
33. THE CONTRACTOR SHALL BE RESPONSIBLE TO KEEP ALL PUBLIC RIGHTS-OF-WAY AND OFF-SITE AREAS CLEAN FROM ALL DIRT, MUD, DUST, AND DEBRIS AT ALL TIMES.
34. DUST CONTROL AND NOISE CONTROL:
AT ALL TIMES DURING CONSTRUCTION AND UNTIL FINAL COMPLETION, THE CONTRACTOR, WHEN HE OR HIS SUBCONTRACTOR ARE OPERATING EQUIPMENT ON THE SITE, SHALL PREVENT THE FORMATION OF ANY AIRBORNE NUISANCE BY WATERING AND/OR TREATING THE SITE OF THE WORK IN SUCH A MANNER THAT WILL CONFINE DUST PARTICLES TO THE IMMEDIATE SURFACE OF THE WORK. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY DUST FROM HIS OWN ACTIVITIES OR HIS SUBCONTRACTOR'S ACTIVITIES IN PERFORMING THE WORK UNDER THIS CONTRACT, AND SHALL BE RESPONSIBLE FOR ANY CITATIONS, FINES OR CHARGES RESULTING FROM DUST NUISANCE. IN ADDITION, THE NOISE LEVEL OF THE CONTRACTOR'S OPERATION SHALL BE KEPT TO A MINIMUM AS PER TOWN OF DANVILLE SPECIFICATIONS.
35. SANITARY FACILITIES SHALL BE MAINTAINED ON THE SITE.
36. FIELD DENSITY TESTS SHALL BE MADE BY THE SOILS ENGINEER TO VERIFY RELATIVE COMPACTION AS RECOMMENDED IN THE SOILS REPORT.

ASTM D 1557-78 CRITERION	DEPTH OF FILL: MASS FILL $\geq$ 10 FEET	MASS FILL $<$ 10 FEET	TRENCH BACKFILL $>$ 3 FEET	TRENCH BACKFILL $\leq$ 3 FEET
RELATIVE COMPACTION	$\geq$ 90%	85 - 90%	$\geq$ 85%	$\geq$ 90%
MOISTURE CONTROL	$\geq$ OPTIMUM	$\geq$ 4% OVER OPTIMUM	$\geq$ OPTIMUM	$\geq$ OPTIMUM

37. CARE SHALL BE TAKEN BY THE CONTRACTOR DURING FINAL GRADING TO PRESERVE ANY BERM, DRAINAGE TERRACE, INTERCEPTOR SWALE, OR OTHER DEVICE OF A PERMANENT NATURE ON OR ADJACENT TO THE PROPERTY.
38. ALL CUT AND FILL SLOPES SHALL BE 3:1, UNLESS SHOWN OTHERWISE. SLOPE BANKS BETWEEN ADJACENT PADS SHALL BE 2:1 WHEREVER PAD DIFFERENTIAL IS LESS THAN 5'.
39. WHEREVER SLOPE RATIOS ARE CALLED OUT, IT IS TO BE UNDERSTOOD THAT THE FIRST NUMBER REFERS TO HORIZONTAL DISTANCE AND THE SECOND NUMBER REFERS TO VERTICAL DISTANCE; I.E., 2:1 IS 2 HORIZONTAL TO 1 VERTICAL.
40. CUT SLOPES SHALL BE ROUNDED TO BLEND WITH THE NATURAL GROUND CONTOUR.
41. ALL HAUL ROADS SHALL BE RETURNED TO ORIGINAL CONDITIONS AND RESEEDED WHEN GRADING IS COMPLETE.
42. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREPARE THE GROUND SURFACE TO RECEIVE THE FILLS TO THE SATISFACTION OF THE SOILS ENGINEER AND TO PLACE, SPREAD, MIX, WATER, AND COMPACT THE FILL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS ENGINEER. THE CONTRACTOR SHALL ALSO REMOVE ALL MATERIAL CONSIDERED UNSATISFACTORY BY THE SOILS ENGINEER.
43. ALL CLEARING, SITE PREPARATION, AND EARTHWORK PERFORMED ON THE PROJECT SHALL BE CONDUCTED BY THE CONTRACTOR UNDER THE OBSERVATION OF THE SOILS ENGINEER.
44. MATERIAL THAT IS SPONGY, SUBJECT TO DECAY, OR OTHERWISE CONSIDERED UNSUITABLE SHALL NOT BE PERMITTED IN COMPACTED FILLS, AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE, SHALL BE REMOVED AND REPLACED WITH FILL JUDGED SUITABLE BY THE SOILS ENGINEER.
45. ANY UNDERGROUND STRUCTURES SUCH AS CESSPOOLS, CISTERNS, MINING SHAFTS, TUNNELS, SEPTIC TANKS, WELLS, AND PIPE LINES NOT LOCATED PRIOR TO CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DETERMINATION OF APPROPRIATE ACTION SUCH AS REMOVAL OR TREATMENT IN A MANNER JUDGED SUITABLE BY THE SOILS ENGINEER AND THE CITY ENGINEER.
46. THE CONTRACTOR SHALL HOLD THE TOWN AND ALL DULY AUTHORIZED TOWN REPRESENTATIVES HARMLESS FROM ANY REAL OR ALLEGED LIABILITIES ARISING FORM THIS WORK.
47. SUBDRAIN PIPE SHALL MEET THE REQUIREMENTS OF SDR 35 AND SHALL BE LAID AT A MINIMUM LONGITUDINAL GRADE OF 1%.
48. THE STORM DRAIN LAYOUT SHOWN ON THESE GRADING PLANS IS FOR INFORMATIONAL PURPOSES ONLY. SEE IMPROVEMENT PLANS PREPARED BY THE ENGINEER FOR DETAILED STORM DRAIN DESIGN.
49. SLOPE PLANTING SHALL BE SPECIFIED BY THE LANDSCAPE ARCHITECT, AND IS NOT A PART OF THE GRADING PROJECT.
50. ELEVATIONS ARE BASED ON THE TOWN OF DANVILLE DATUM.
51. ALL LOTS SHALL DRAIN TO THE PUBLIC STREETS UNLESS OTHERWISE APPROVED, AND SHALL BE AT A MINIMUM GRADIENT OF ONE PERCENT IN THE FINISH GRADED CONDITION.
52. UPON COMPLETION OF THE GRADING AND EXCAVATION A LETTER SHALL BE SUBMITTED TO THE TOWN OF DANVILLE BUILDING DEPARTMENT FROM THE SOILS ENGINEER VERIFYING THE ADEQUACY OF THE FOUNDATION EXCAVATIONS ALONG WITH A DESCRIPTION OF THE WORK THAT TOOK PLACE AND THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS AND SOILS REPORT RECOMMENDATIONS.
53. PRIOR TO ISSUANCE OF BUILDING PERMITS, THE ENGINEER SHALL SUBMIT TO THE TOWN OF DANVILLE BUILDING DEPARTMENT VERIFICATION THAT FINAL PAD GRADES HAVE BEEN COMPLETED PER THE GRADING DESIGN WITHIN TOLERANCE LEVELS ACCEPTABLE TO THE TOWN.
54. UPON COMPLETION OF THE WORK, A REPRODUCIBLE "RECORD" COPY OF THE GRADING PLANS, SHOWING THE LOCATIONS OF ALL SUBSURFACE DRAIN PIPES, SIGNED BY BOTH THE CIVIL ENGINEER AND SOILS ENGINEER SHALL BE SUBMITTED TO THE TOWN.
55. FINISH GRADING OF LOTS--TOP SOIL PLACED ON LOTS DURING FINISH GRADING SHALL BE THOROUGHLY COMPACTED. PONDING OF WATER ON THE LOTS RESULTING FROM SETTLEMENT OF TOP SOIL FILL SHALL BE CORRECTED AS DIRECTED BY THE TOWN. BERMS BETWEEN LOTS AND AT THE BACK OF LOTS SHALL BE NO MORE THAN 6" HIGH, ROUNDED AT THE TOP AND COMPACTED. FINISH GRADED LOTS SHALL BE FREE OF ALL DIRT CLODS, ROCKS, DEBRIS AND PILES OF LOOSE MATERIAL. DEFINED DRAINAGE SWALES SHALL BE MADE FOR PROPER LOT DRAINAGE. BERMS SHALL NOT BE USED FOR THE PURPOSE OF DIRECTING THE FLOW OF RUNOFF WATER, BUT RATHER DRAINAGE SWALES SHALL BE PROVIDED FOR THIS PURPOSE AS CALLED FOR IN THE SPECIAL AND TYPICAL LOT GRADING DETAILS SHOWN ON THE GRADING PLANS.
56. ALL GRADED SURFACES SHALL BE HYDROSEEDED.
57. ALL TREES WITHIN GRADING DAYLIGHT LINES ARE TO BE REMOVED EXCEPT AS NOTED.
58. THE ROOT SYSTEM OF ALL TREES TO BE REMOVED SHALL BE EITHER REMOVED OR GROUND AND BURIED PER THE DIRECTION OF THE SOILS ENGINEER.
59. UNDERGROUND UTILITY TRENCH BACKFILL TO BE TESTED, AND WRITTEN REPORT SUBMITTED TO THE TOWN OF DANVILLE, BY THE SOILS ENGINEER.
60. COMPACTED FILL PLACED WITHIN 5 FEET OF THE PERIMETER FOUNDATION GRADE BEAM TO BE TESTED FOR COMPACTION BY SOILS ENGINEER AND REPORTED TO THE TOWN OF DANVILLE BEFORE FINAL INSPECTION IS REQUESTED.
61. FIRE APPARATUS ROADWAYS MUST BE INSTALLED AND FIRE HYDRANTS IN SERVICE PRIOR TO COMMENCEMENT OF FRAMING. CONTACT THE SAN RAMON VALLEY FIRE PROTECTION DISTRICT TO SCHEDULE AN INSPECTION OF ROADWAYS AND FIRE HYDRANTS PRIOR TO FRAMING (UFC, 1985 SEC. 10.30LD).

SITE ADDRESS

APN# 206-020-046

ESTIMATED CONSTRUCTION SCHEDULE

START DATE - JUNE 1, 1988
COMPLETION - SEPTEMBER 1, 1988

GRADING QUANTITIES

CUT 929,400 C.Y.
FILL 929,400 C.Y.

THESE PLANS HAVE BEEN PREPARED UNDER THE DIRECTION OF AND APPROVED BY:

6/16/88
ROBERT M. ROURKE DATE
R.C.E. 29650 EXPIRES 3/31/91

REGISTERED PROFESSIONAL ENGINEER
ROBERT M. ROURKE
No. 29650
Exp. 3-31-91
CIVIL
STATE OF CALIFORNIA

OWNER'S GRADING OPERATION AUTHORIZATION

A CIVIL ENGINEER, SOIL ENGINEER AND/OR ENGINEERING GEOLOGIST WILL BE EMPLOYED TO GIVE TECHNICAL SUPERVISION, MAKE INSPECTIONS OF THE WORK, AND PROVIDE COMPLETE REPORTS TO THE EXTENT REQUIRED BY THE TOWN OF DANVILLE.

MICHAEL C. CORTNEY DATE
STANDARD PACIFIC-NORTHERN CALIFORNIA

#1592

THE PORTIONS OF THESE PLANS CONCERNING THE GEOTECHNICAL ASPECTS OF THE PROJECT HAVE BEEN REVIEWED AND APPEAR TO BE IN SUBSTANTIAL CONFORMANCE WITH THE INTENT OF OUR RECOMMENDATIONS.

FRANK BERLOGAR DATE
R.C.E. 20383 EXPIRES 9/30/89

THE GRADING PLANS HAVE BEEN REVIEWED FOR THE TOWN OF DANVILLE BY:

6-21-88
R. JOHN CA FIELD, P.E. DATE
R.C.E. 418 EXPIRES 3/31/92
ROGERS/PAC IC PROFESSIONAL ENGINEERING CONSULTANTS

PRINTED
AUG 30 1988

REV	DATE	DESCRIPTION	BY

DATE: 2/17/88
SCALE: 1"=40'-0"
DESIGN: RMR
DRAWN:
FIELDBOOK:

VISTA TASSAJARA
SUBDIVISION 6736
GRADING PLANS
TOWN OF DANVILLE, CALIFORNIA

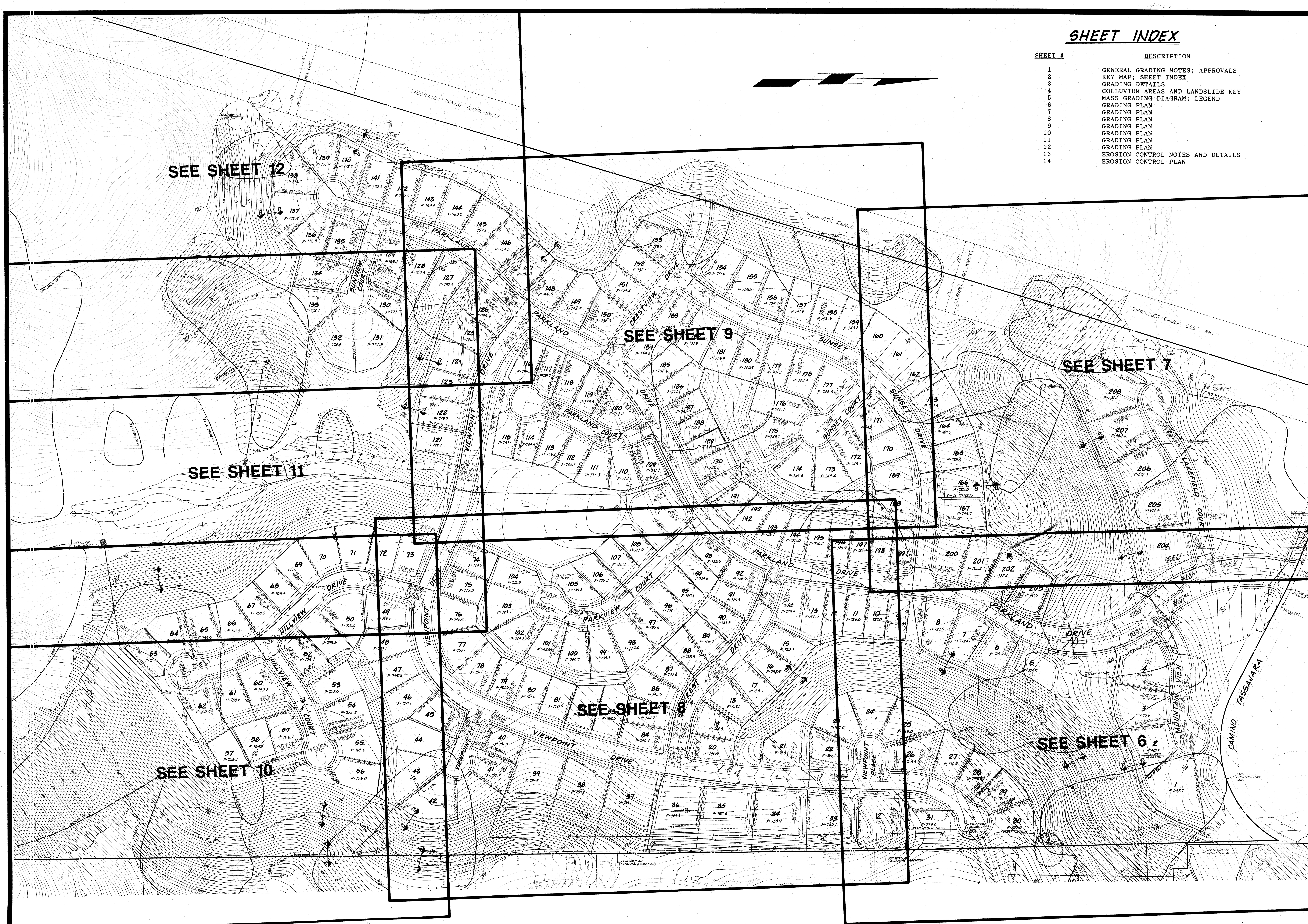
PRW and Associates
Planners • Engineers • Landscape Architects
400 Taylor Blvd. Suite 325
Pleasant Hill, California 94523
(415) 686-6300

SHEET
1
OF 14 SHEETS

PROJECT NO.
86001-20-0134

SHEET INDEX

SHEET #	DESCRIPTION
1	GENERAL GRADING NOTES; APPROVALS
2	KEY MAP; SHEET INDEX
3	GRADING DETAILS
4	COLLUVIUM AREAS AND LANDSLIDE KEY
5	MASS GRADING DIAGRAM; LEGEND
6	GRADING PLAN
7	GRADING PLAN
8	GRADING PLAN
9	GRADING PLAN
10	GRADING PLAN
11	GRADING PLAN
12	GRADING PLAN
13	EROSION CONTROL NOTES AND DETAILS
14	EROSION CONTROL PLAN



KEY MAP

SCALE 1"=100'

PRINTED AUG 30 1988

REV	DATE	DESCRIPTION	BY

DATE:
SCALE:
DESIGN:
DRAWN:
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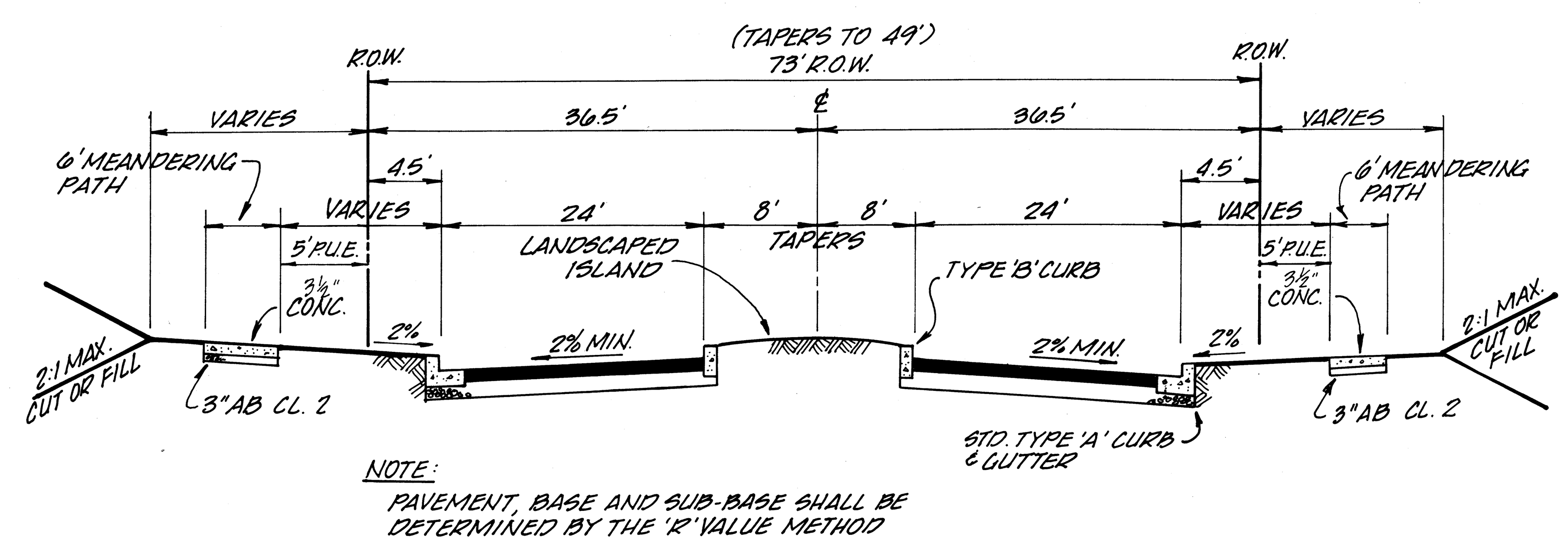
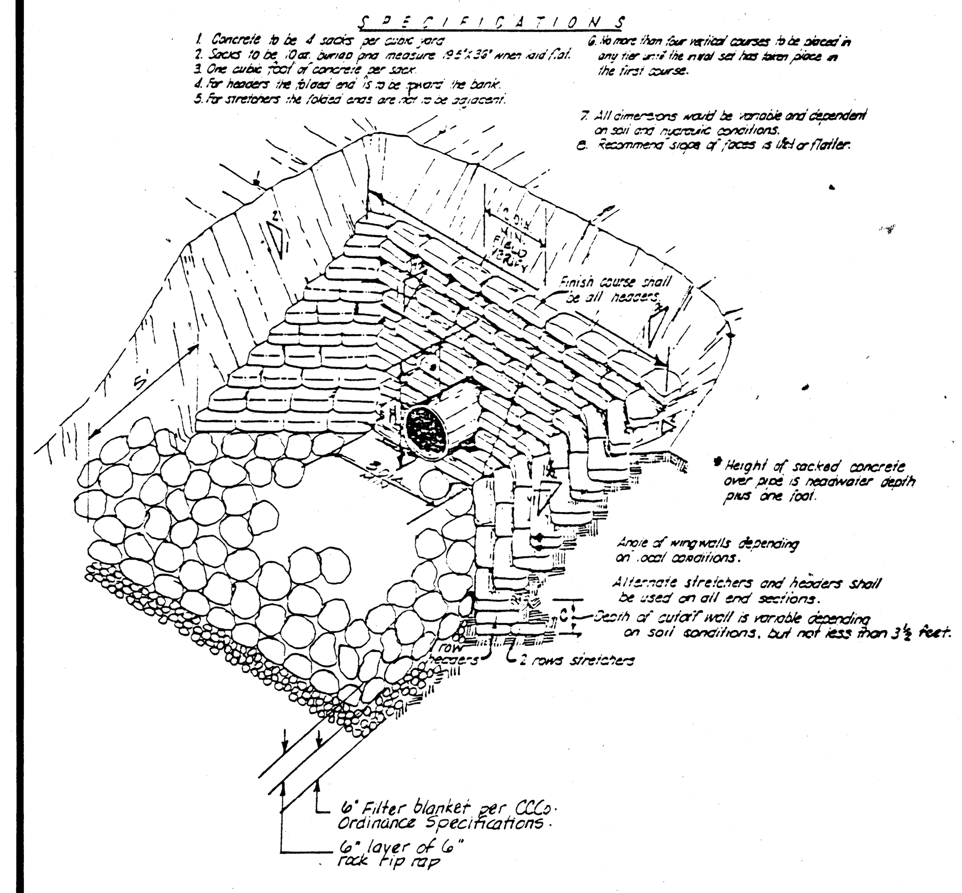
SHEET 2 OF 14 SHEETS

PROJECT NO. 86001-20-0134

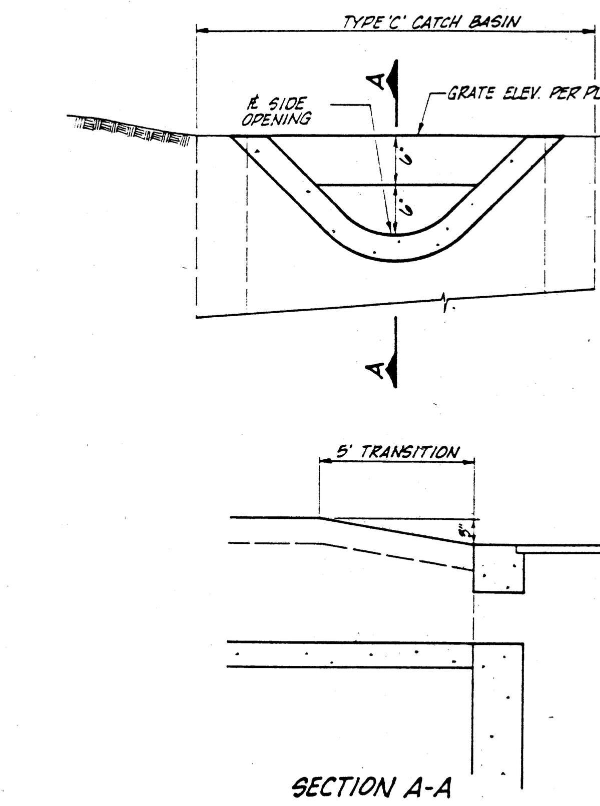


NOTE:
PAVEMENT, BASE AND SUB-BASE SHALL BE DETERMINED BY THE 'R' VALUE METHOD

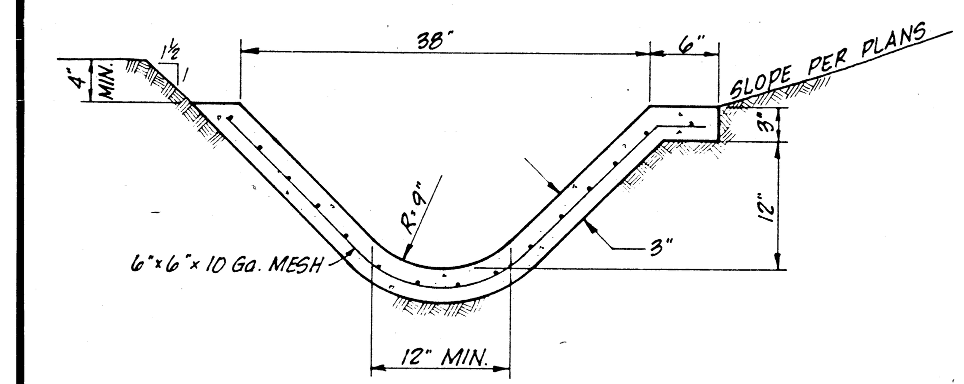
TYPICAL SECTION AT PARKLAND DRIVE ENTRY
NTS



CONCRETE SACK HEADWALL / ENDWALL DETAIL
NTS



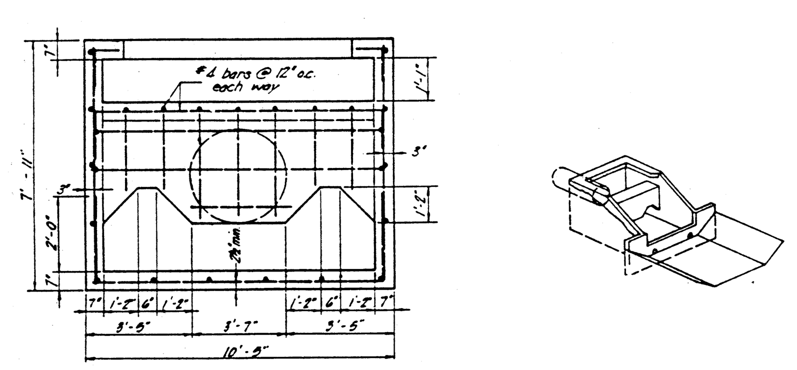
WARP TRANSITION AT FIELD INLET
NTS

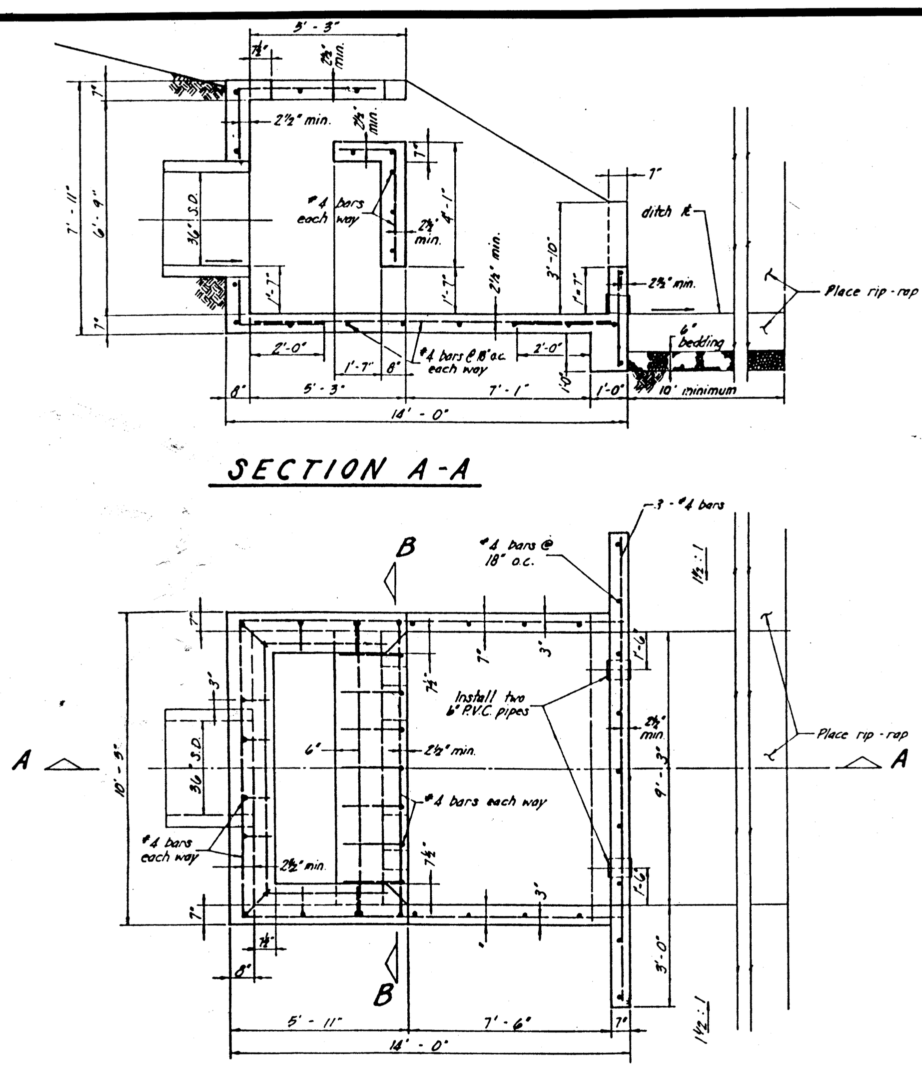


INTERCEPTOR DITCH
NTS

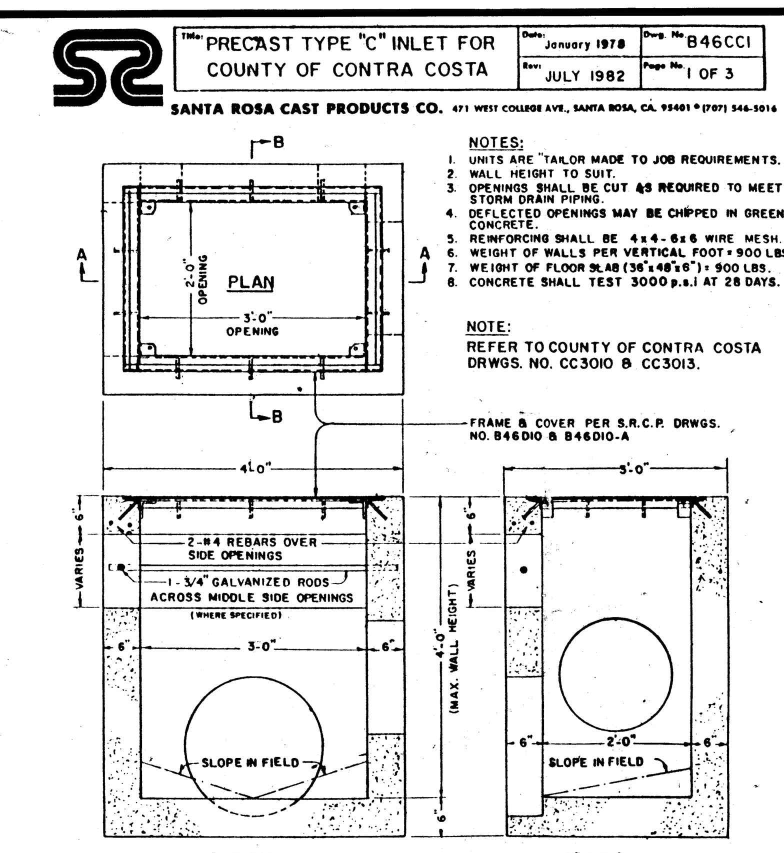
NOTE: SLOPE OF DITCH PER PLAN. MINIMUM SLOPE 1%. PLACE DEEP JOINTS @ 12 FEET O.C.

NOTES
1. All concrete to have a minimum compressive strength of 2500 #/in² @ 28 days
2. All reinforcing steel shall be deformed bars conforming to A615 - Grade 40.
3. Overlap continuous horizontal reinforcement 2' @ corners.



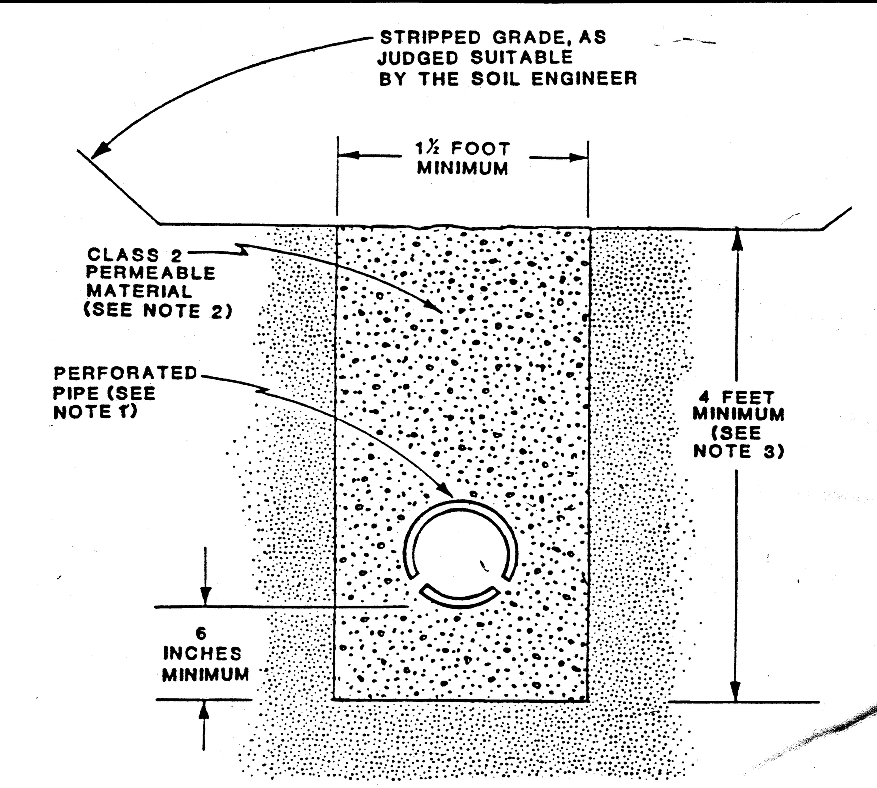


ENERGY DISSIPATOR DETAIL
NTS



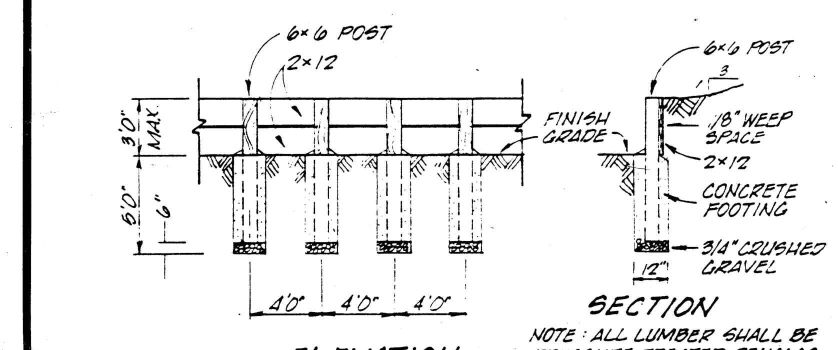
INTERCEPTOR DITCH INLET
NTS

FOR INLETS 4' DEEP OR LESS, USE SANTA ROSA PRECAST TYPE 'C' INLET W/ GRATE. FOR INLETS OVER 4' DEEP USE TOWN OF DANVILLE TYPE 'C' INLET W/ TYPE I MANHOLE BASE.



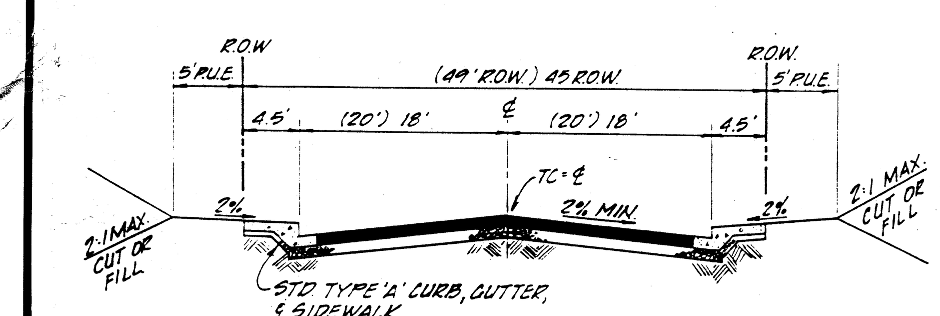
1. PERFORATED PIPE WHERE SPECIFIED (PLACE PERFORATIONS DOWN). ABS PIPE WITH MINIMUM DIAMETER OF FOUR (4) INCHES CONFORMING TO ASTM D-2751 SDR35 (ARMCO) WHERE FILL IS LESS THAN FORTY (40) FEET DEEP. MAIN SUBDRAINS AND INTERCEPTOR SUBDRAINS REQUIRE SIX (6) INCH PIPE UNLESS OTHERWISE NOTED.
2. CLASS 2 PERMEABLE MATERIAL AS GIVEN IN SECTION 68-1.025, STATE OF CALIFORNIA STANDARD SPECIFICATIONS, JULY 1984 EDITION.
3. DEPTH SHOULD TYPICALLY BE FOUR (4) FEET.

TYPICAL SUBDRAIN DETAIL
NTS



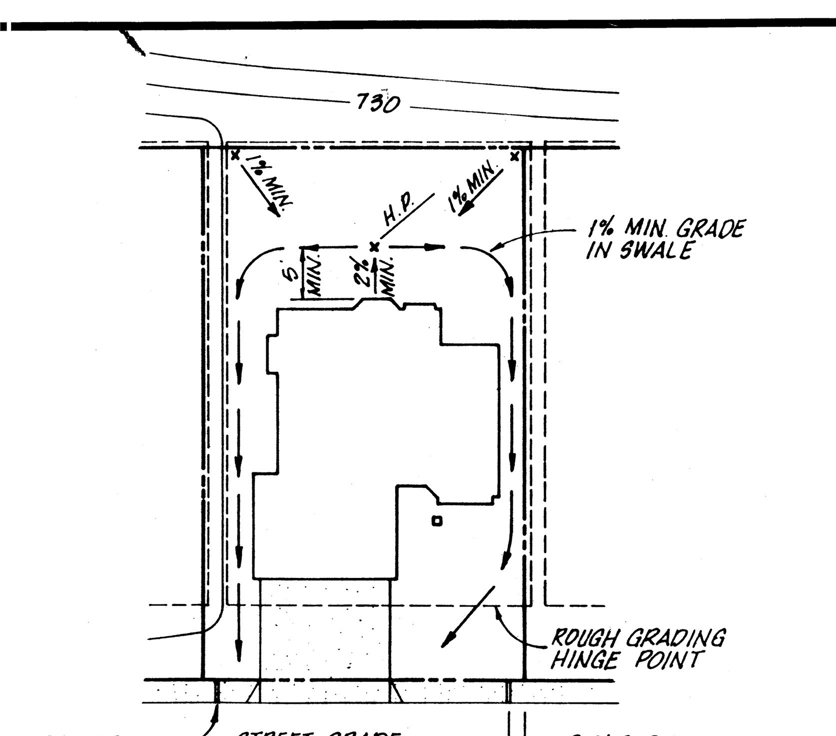
NOTE: ALL LUMBER SHALL BE PRESSURE TREATED DOUGLAS FIR. ALL CONCRETE TO HAVE MIN. 2000 #/SQ.IN. ULTIMATE COMPRESSIVE STRENGTH @ 28 DAYS.

WOOD RETAINING WALL
NTS



NOTE:
PAVEMENT, BASE AND SUB-BASE TO BE DETERMINED BY THE 'R' VALUE METHOD

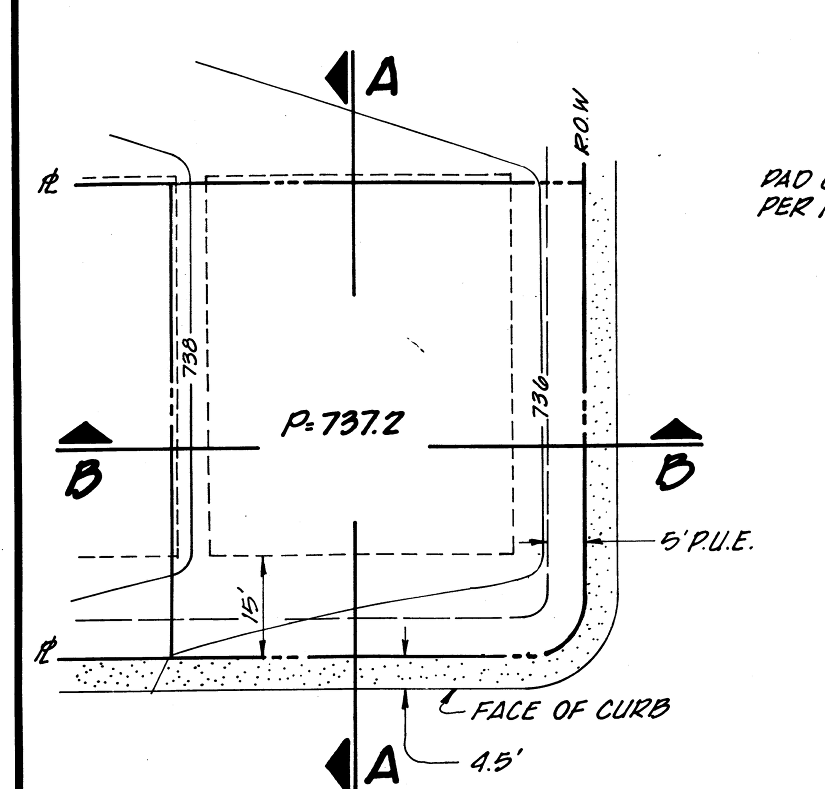
TYPICAL STANDARD STREET SECTION
NTS



NOTE:
THRU THE CURB DRAINS TO BE INSTALLED ON LOW SIDE OF LOT IN EVERY LOT AND ON HIGH SIDE OF LOT ONLY WHEN STREET GRADE IS 2% OR LESS.

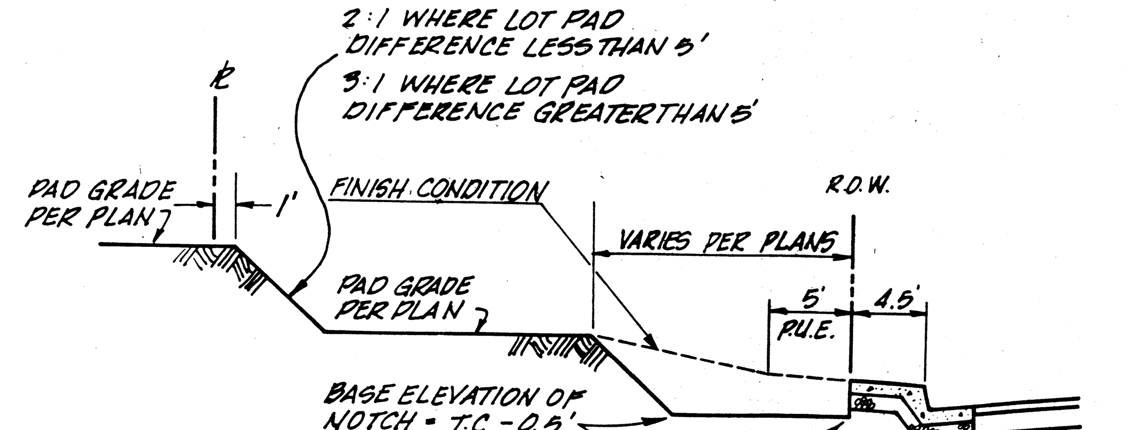
DRAINAGE FROM ROOF, PATIO, ETC. (IMPERVIOUS AREAS) IS TO BE COLLECTED AND CONVEYED IN A CLOSED PIPE TO THE STREET GUTTER.

TYPICAL PAD FINISH GRADING
NTS

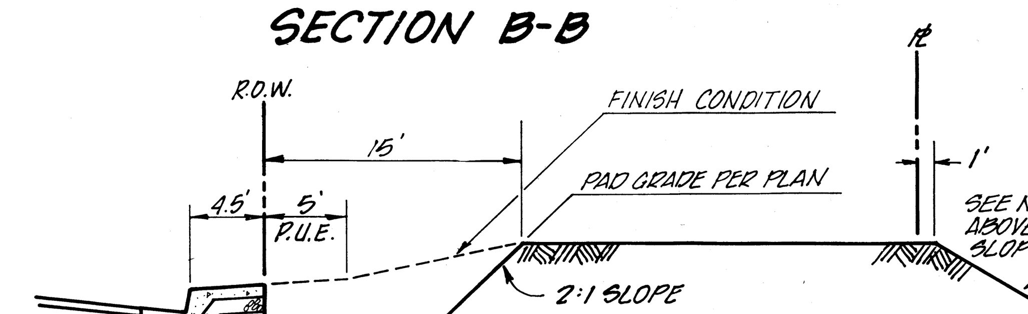


PLAN VIEW

NOTE:
2:1 WHERE LOT PAD DIFFERENCE LESS THAN 5'
3:1 WHERE LOT PAD DIFFERENCE GREATER THAN 5'

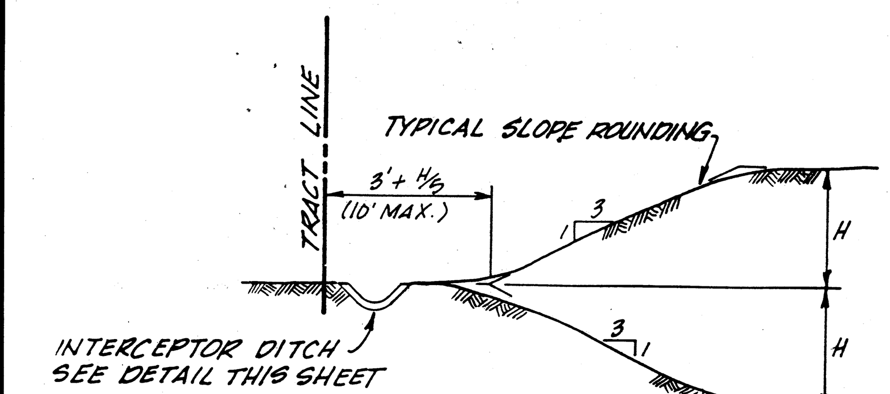


SECTION B-B

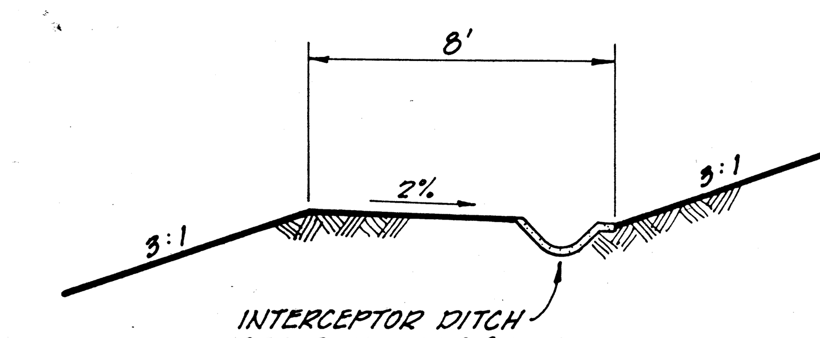


SECTION A-A

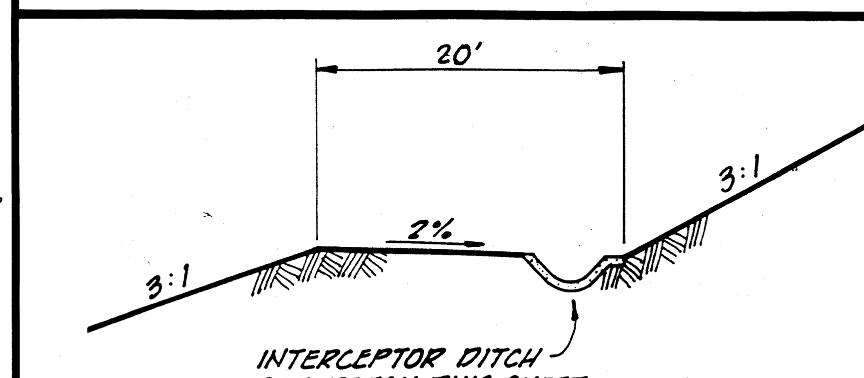
TYPICAL PAD ROUGH GRADING
NTS



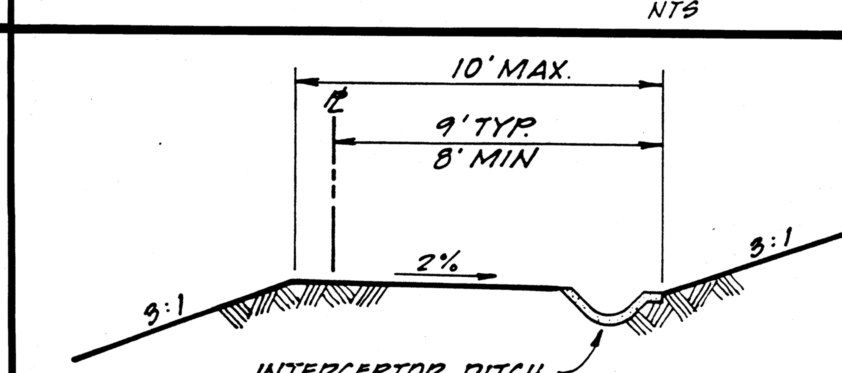
GRADING DETAIL
NTS



8' BENCH SECTION A-A
NTS



20' BENCH SECTION C-C
NTS



10' BENCH SECTION B-B
NTS

PRINTED AUG 30 1988

REV	DATE	DESCRIPTION	BY
1	8/29/88	REVISED SECTION TO 20' WIDE BENCH	GW

DATE: 2/17/88
SCALE: NOTED
DESIGN:
DRAWN:
FIELDBOOK:

VISTA TASSAJARA
SUBDIVISION 6736
GRADING PLANS
TOWN OF DANVILLE, CALIFORNIA

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SHEET 3 OF 14 SHEETS

PROJECT NO. 86001-20-0134

NOTE

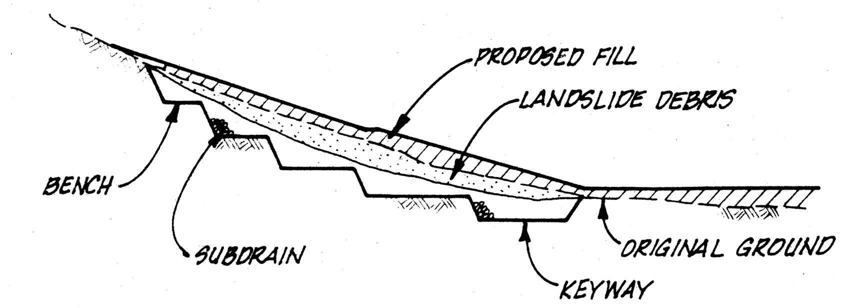
THE BOUNDARIES OF THE COLLUVIUM AREAS AS SHOWN ARE APPROXIMATE ONLY. EXACT BOUNDARIES TO BE DETERMINED BY THE SOIL ENGINEER IN THE FIELD.

LEGEND

COLLUVIUM AREA

LIMIT OF LANDSLIDE

(12) LANDSLIDE DESIGNATION NO.



TYPICAL LANDSLIDE OVEREXCAVATION

NTS

ESTIMATED LANDSLIDE THICKNESSES

LANDSLIDE NO.	ESTIMATED AVERAGE THICKNESS (FEET)
4	8
6	8
7	12
8	6
9	12
10	6
11	6
12	8
13	10
14	8
15	6
16	19
17	16
18	10
19	15
20	18
21	5
22	15
23	25

NOTES

1. LANDSLIDE TO BE ENTIRELY REMOVED, AS DETERMINED IN THE FIELD BY THE PROJECT GEOLOGIST.

2. KEYWAYS, SUBDRAINS, BENCHES AND FILL SLOPES SHOULD BE CONSTRUCTED AS DESCRIBED IN THE GEOTECHNICAL REPORT.

COLLUVIUM AREAS & LANDSLIDE KEY

SCALE 1"=100'

PRINTED AUG 30 1988

REV	DATE	DESCRIPTION	BY

DATE:
SCALE:
DESIGN:
DRAWN:
FIELDBOOK:

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SHEET 4 OF 14 SHEETS

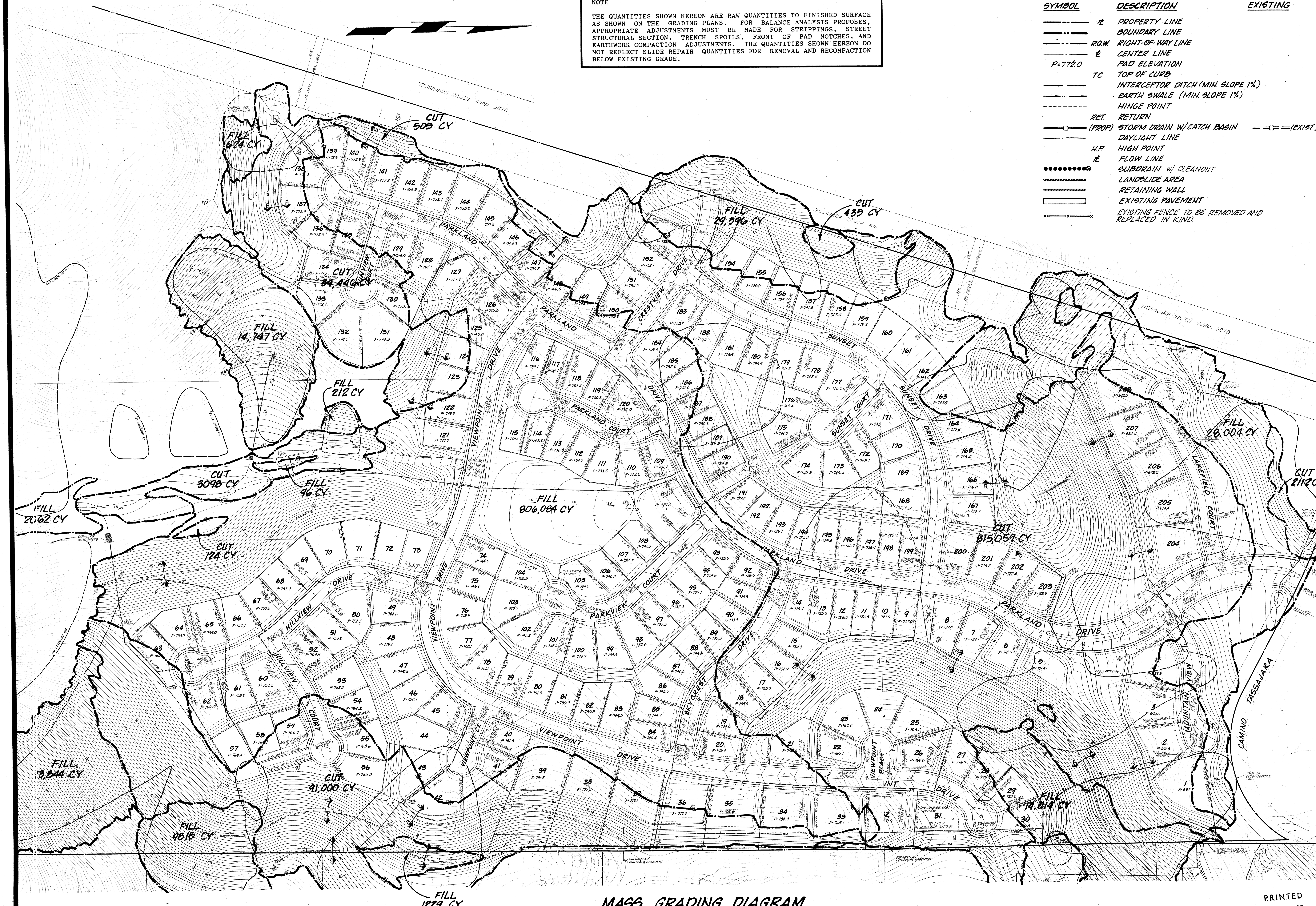
PROJECT NO. 86001-20-0134

NOTE

THE QUANTITIES SHOWN HEREON ARE RAW QUANTITIES TO FINISHED SURFACE AS SHOWN ON THE GRADING PLANS. FOR BALANCE ANALYSIS PROPOSES, APPROPRIATE ADJUSTMENTS MUST BE MADE FOR STRIPPINGS, STREET STRUCTURAL SECTION, TRENCH SPOILS, FRONT OF PAD NOTCHES, AND EARTHWORK COMPACTION ADJUSTMENTS. THE QUANTITIES SHOWN HEREON DO NOT REFLECT SLIDE REPAIR QUANTITIES FOR REMOVAL AND RECOMPACTION BELOW EXISTING GRADE.

LEGEND

SYMBOL	DESCRIPTION	EXISTING
℄	PROPERTY LINE	
	BOUNDARY LINE	
R.O.W.	RIGHT-OF-WAY LINE	
℄	CENTER LINE	
P=772.0	PAD ELEVATION	
TC	TOP OF CURB	
	INTERCEPTOR DITCH (MIN. SLOPE 1%)	
	EARTH SWALE (MIN. SLOPE 1%)	
	HINGE POINT	
RET.	RETURN	
(PROP)	STORM DRAIN W/CATCH BASIN	(EXIST)
	DAYLIGHT LINE	
H.P.	HIGH POINT	
℄	FLOW LINE	
	SUBDRAIN W/ CLEANOUT	
	LANDSLIDE AREA	
	RETAINING WALL	
	EXISTING PAVEMENT	
	EXISTING FENCE TO BE REMOVED AND REPLACED IN KIND.	



MASS GRADING DIAGRAM

SCALE 1"=100'

PRINTED AUG 30 1988

REV	DATE	DESCRIPTION	BY

DATE:
SCALE:
DESIGN:
DRAWN:
FIELDBOOK:

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SUBDIVISION 6736
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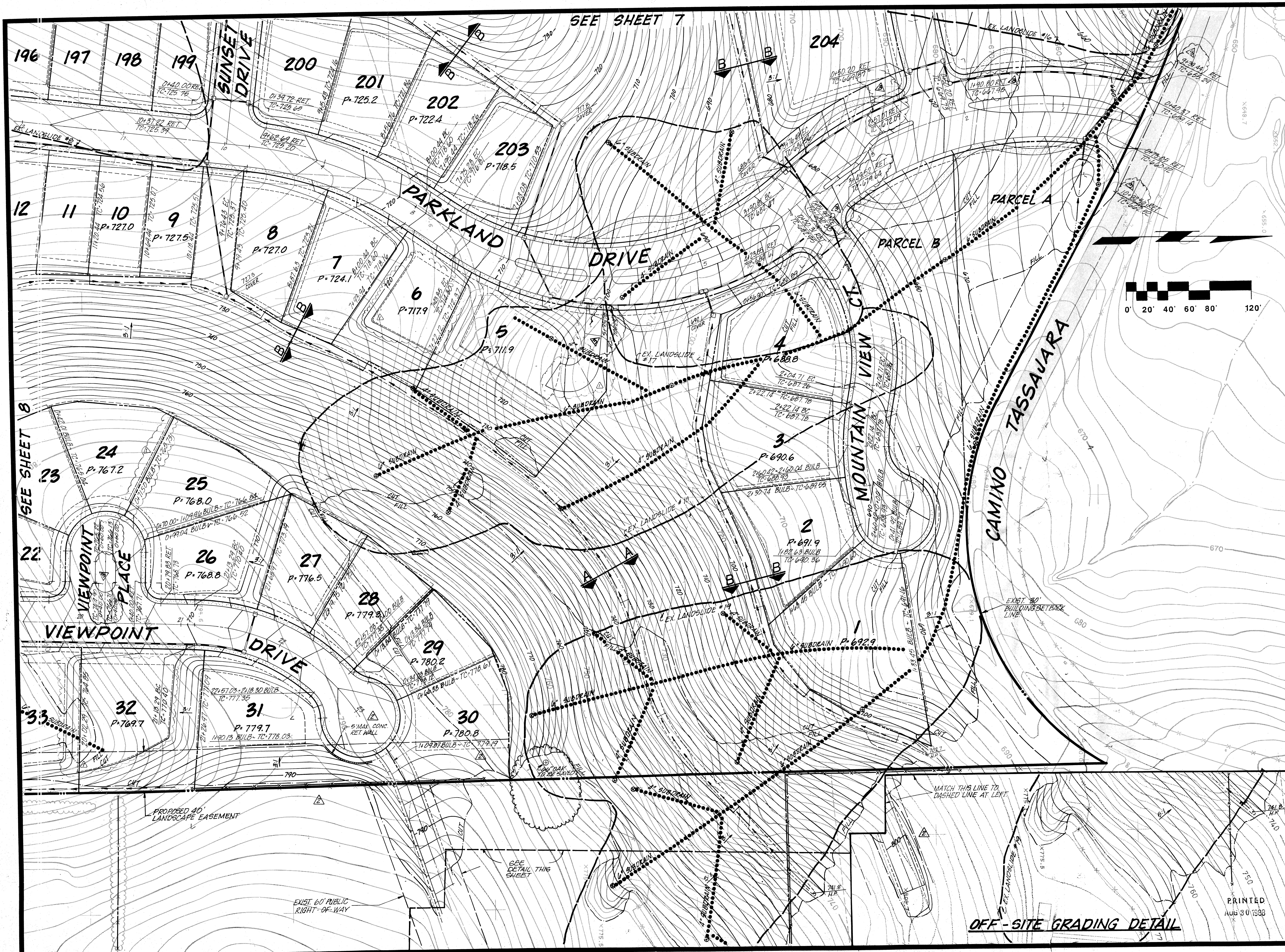
PROJECT NO. 86001-20-0134



VISTA TASSAJARA

SUBDIVISION 6736

GRADING PLANS

TOWN OF DANVILLE, CALIFORNIA

DATE: 2/17/88
SCALE: 1"=40'-0"
DESIGN: RMR
DRAWN:
FIELDBOOK:

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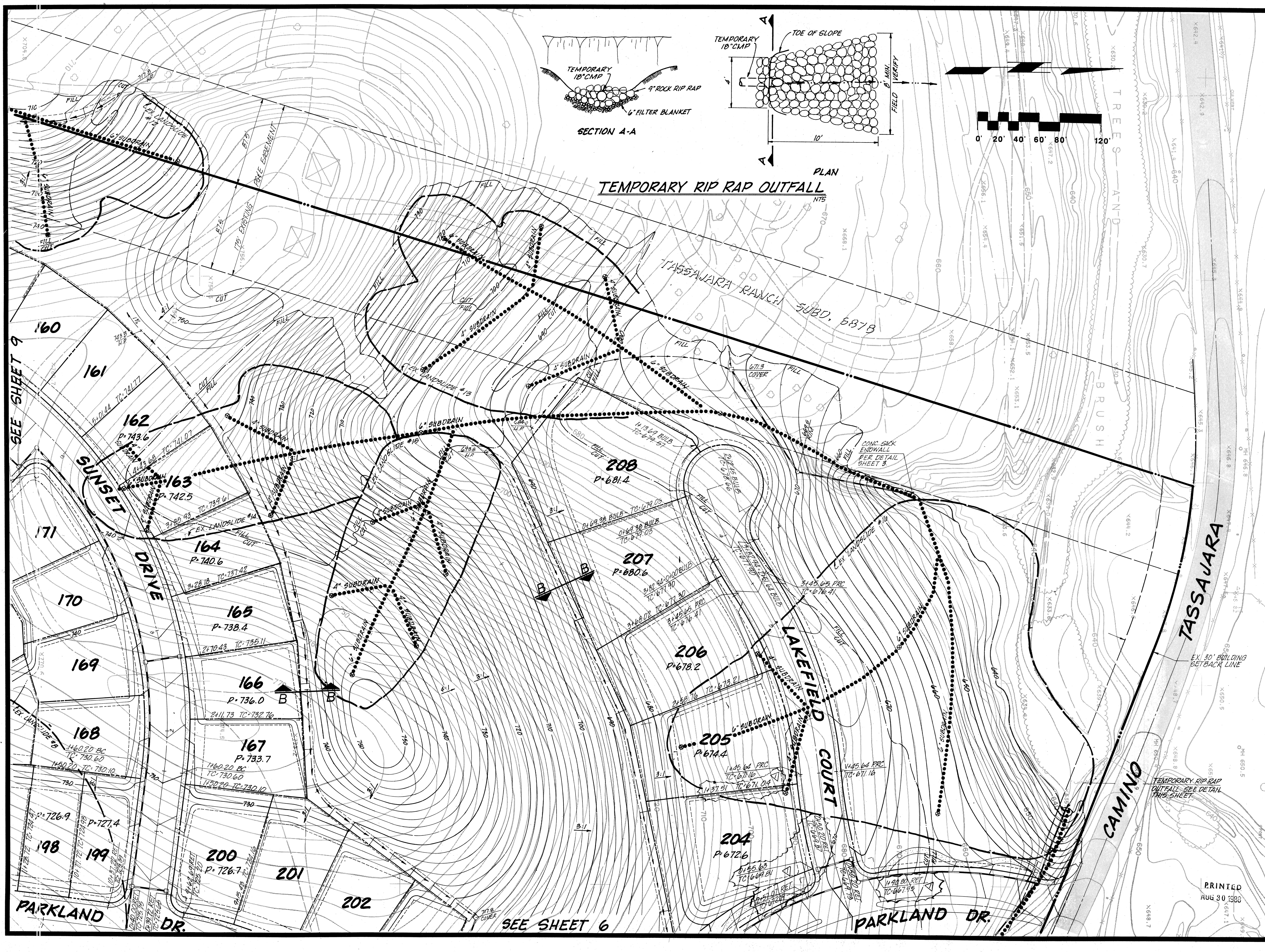

VISTA TASSAJARA
SUBDIVISION 6736
GRADING PLANS
TOWN OF DANVILLE, CALIFORNIA

REV	DATE	DESCRIPTION	BY
1	8/29/88	REV. TC ELEV. RET. LAKEFIELD CT.; REV. STA & TC LOT 204/205	SW

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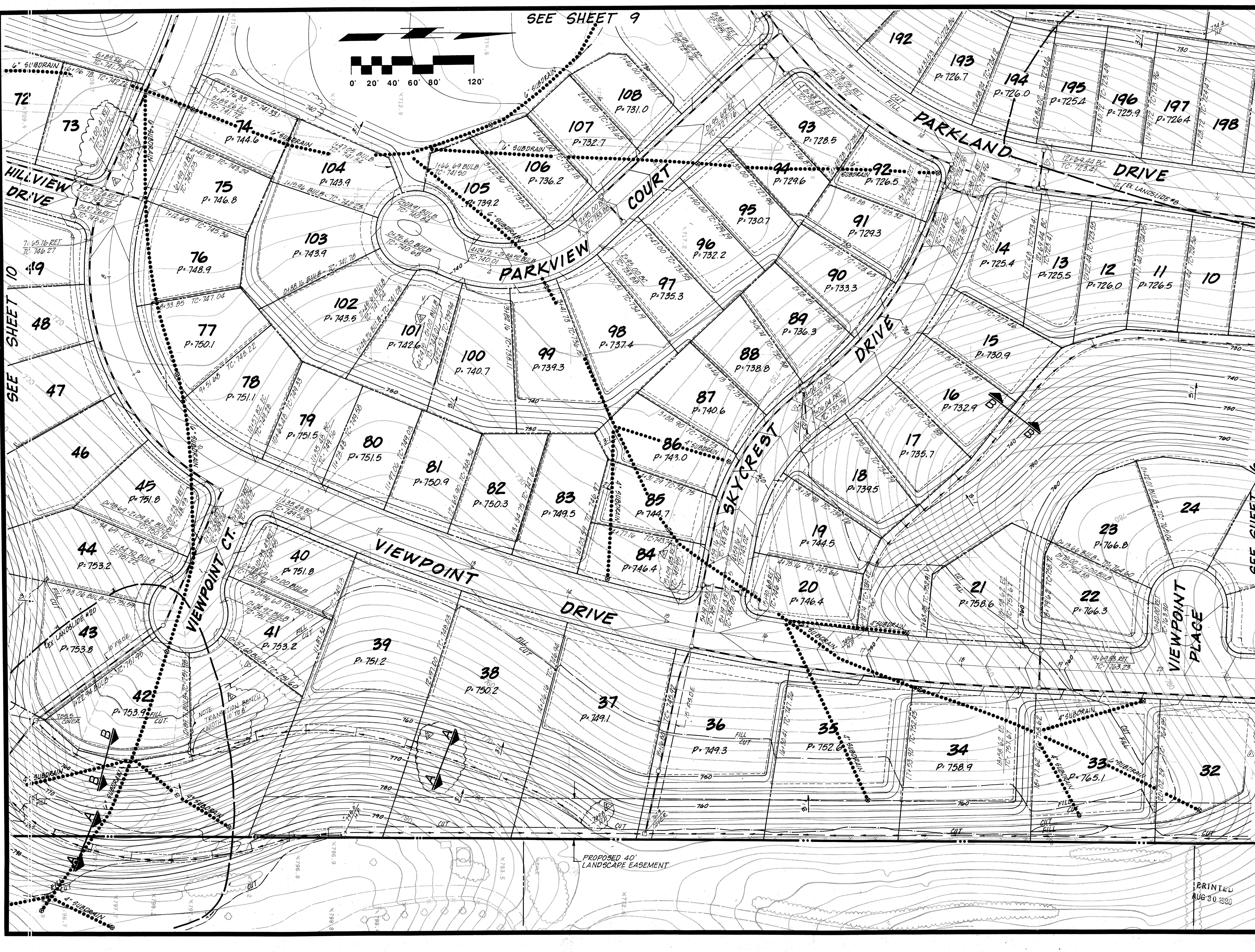

REV	DATE	DESCRIPTION	BY
1	7/29/88	REV. PAD ELEV @ LOT 32 & CONTOURS	
		RELOCATED CB @ LOT 18, 13 & 195	
		REV. LOT LINE, STA & TC ELEV. @ LOT 41/	
		OPEN SPACE & LOT 74/ OPEN SPACE	LR
2	8/29/88	REV. STA LOT 84, 101; ADD/REV STA &	
		ELEV. LOT 73; REV. DITCH HP LOT 37	
		ADD NOTE TO DITCH LOT 38 & BTWN 41-42	GW

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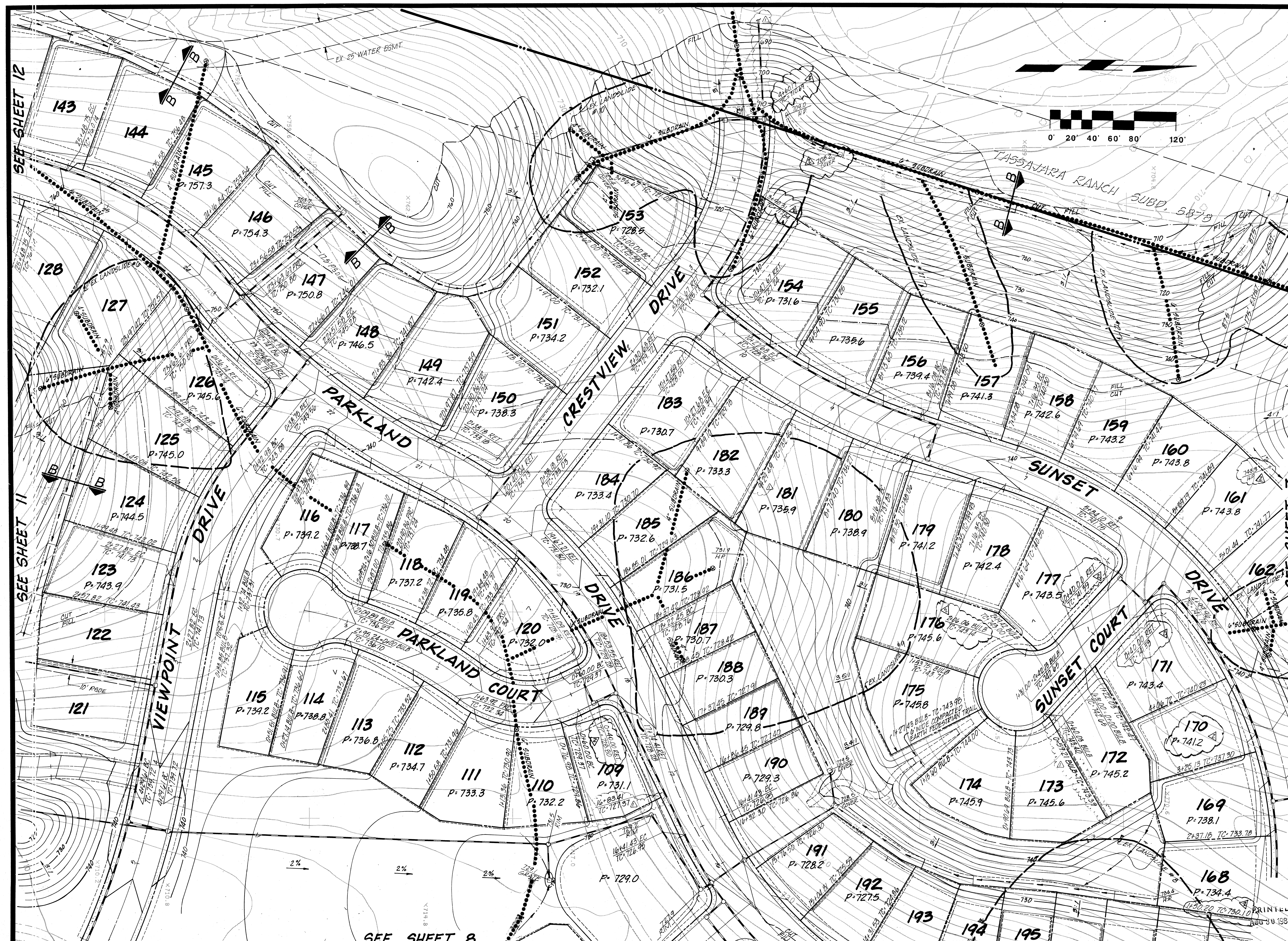

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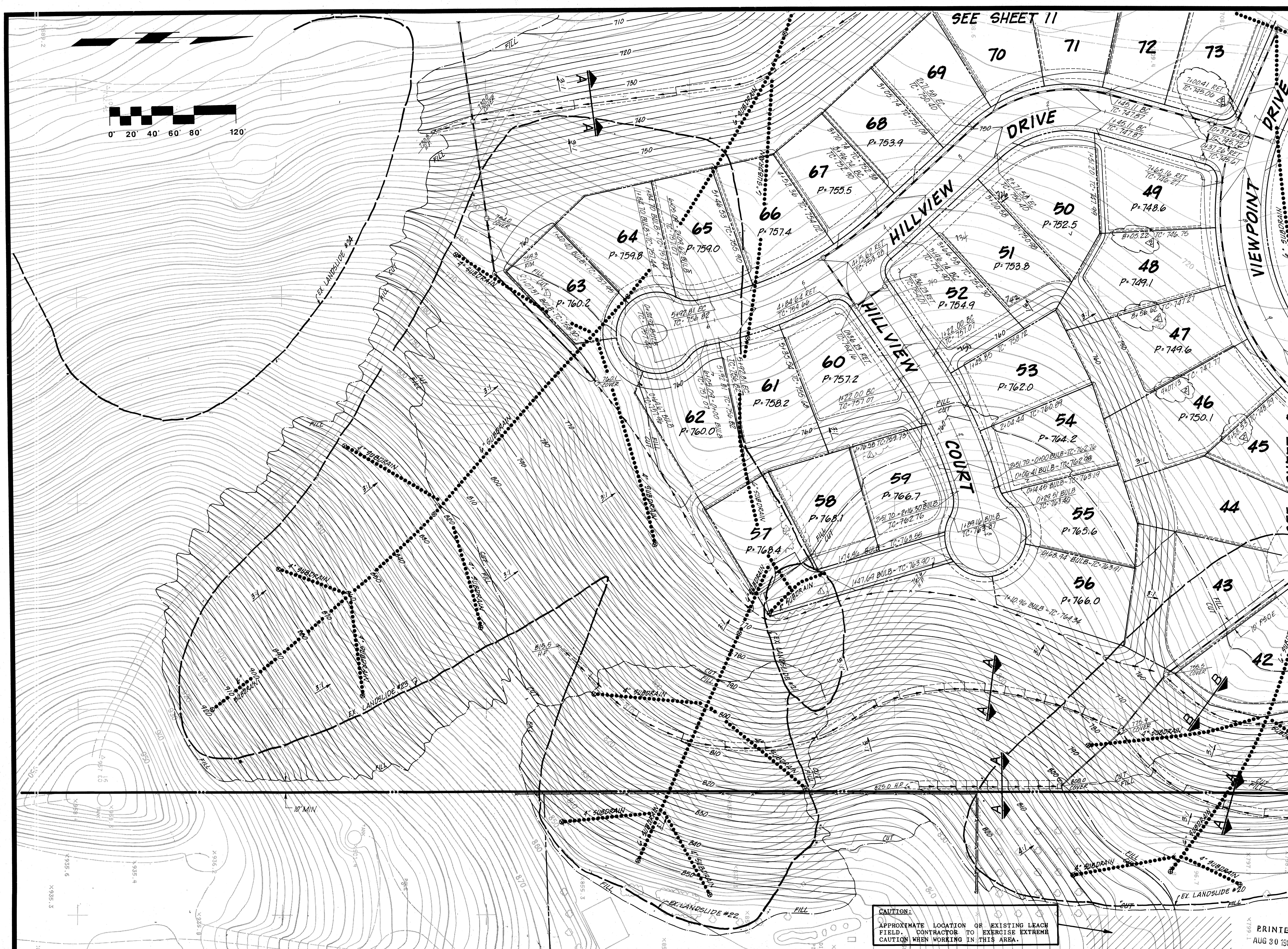

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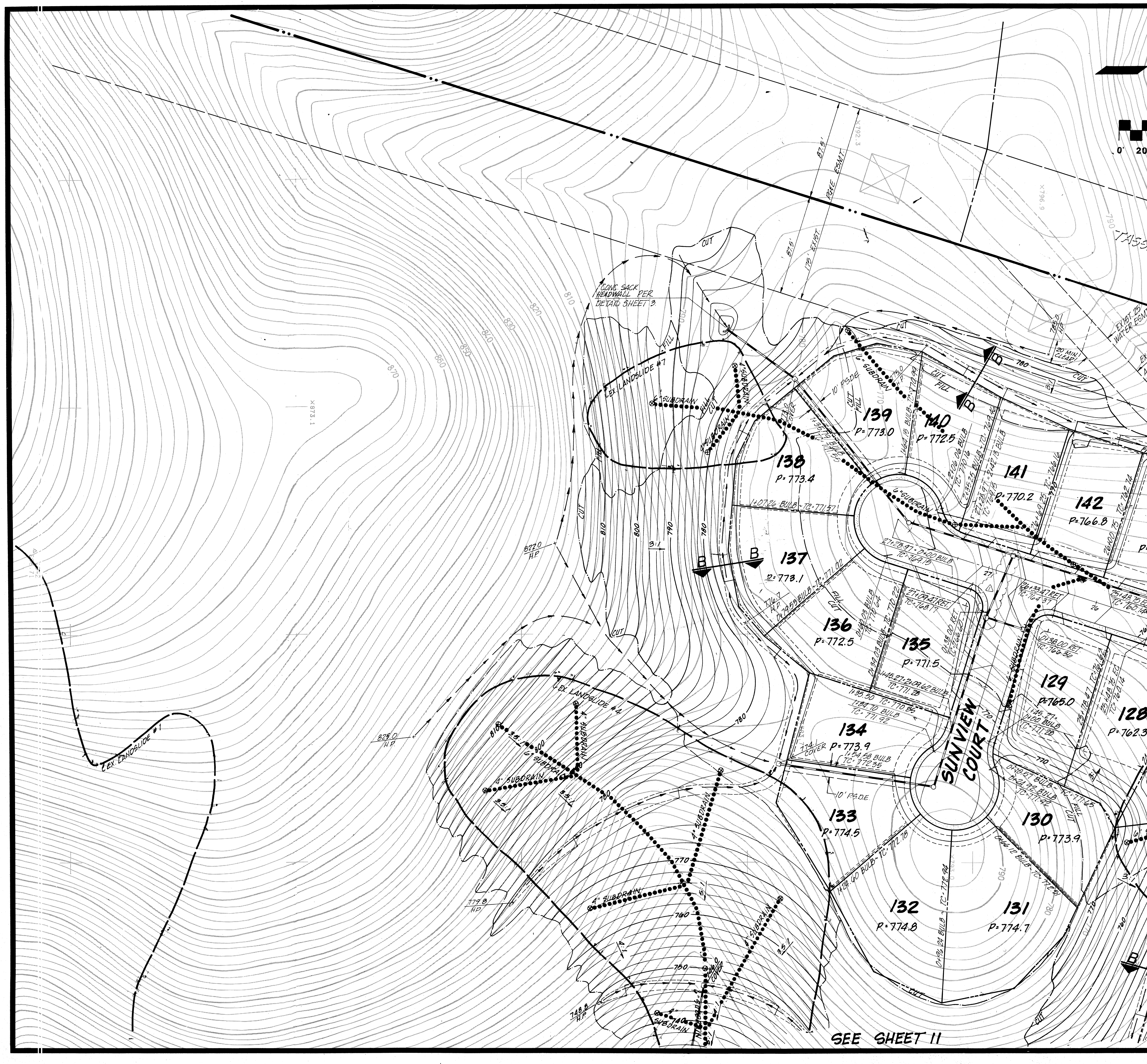

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TOWN OF DANVILLE, CALIFORNIA

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REV	DATE	DESCRIPTION	BY
1	7/29/88	RELOCATED C.B. @ LOT 141	LR

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EROSION CONTROL PLAN NOTES

GENERAL:

THE EROSION CONTROL PLAN IS PREDICATED ON STORM DRAIN SYSTEM, INCLUDING PAVED DITCHES, BEING IN PLACE AND FUNCTIONAL. IF WINTERIZATION OF THE SITE IS REQUIRED PRIOR TO COMPLETION OF THE STORM DRAIN SYSTEM THE ENGINEER SHOULD BE CALLED TO DESIGN A NEW PLAN.

TEMPORARY EARTH BERM

MATERIALS

1. STRIPPING MATERIAL FROM STRIPPING STOCKPILE.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF THE BERM IS TO BE A MINIMUM OF ONE FOOT ABOVE THE ADJACENT PAD ELEVATION.
2. SIDE SLOPES SHALL NOT EXCEED 2:1 AND THE TOP OF BERM SHALL BE A MINIMUM OF 2 FEET WIDE.
3. ALL BERMS SHALL BE MACHINE COMPACTED WITH THE TIRES OR TRACKS GOING OVER AT LEAST 90% OF THE SURFACE. THERE SHALL BE A MAXIMUM OF 6 INCHES OF LIFT BETWEEN EACH COMPACTION.
4. THE BERM SHALL BE INSPECTED PERIODICALLY AND MAINTAINED AS REQUIRED.

SILT FENCE

MATERIALS

1. FILTER FABRIC SHALL BE A PERVIOUS SHEET OF SYNTHETIC POLYMER COMPOSED OF AT LEAST 85% BY WEIGHT ETHYLENE, PROPYLENE, AMIDE, ESTER OF VINYLIDENE YARN, WOVEN OR NON-WOVEN, AND SHALL CONTAIN STABILIZERS AND/OR INHIBITORS TO RESIST DETERIORATION BY HEAT, WATER AND ULTRA-VIOLET LIGHT. THE FABRIC SHALL CONFORM TO THE FOLLOWING CRITERIA:
   (A) THE EQUIVALENT OPENING SIZE (U.S. STANDARD SIEVE) SHALL BE WITHIN THE RANGE 70-100.
   (B) THE TENSILE STRENGTH (ASTM D1682G) SHALL BE AT LEAST 120 POUNDS. THE STRENGTH OF FABRIC REQUIRED DEPENDS ON THE WIRE SUPPORT FENCE. THE STRENGTH GIVEN IS THE MINIMUM FOR A 6-INCH SQUARE MESH WIRE SUPPORT FENCE. IF EXTRA-STRENGTH FABRIC IS USED WITHOUT A SUPPORT FENCE, THE STRENGTH REQUIRED SHALL BE 200 POUNDS MINIMUM WITH POSTS SPACED ON 6 FOOT CENTERS.
2. POSTS FOR SILT FENCES SHALL BE EITHER 4-INCH-DIAMETER WOOD OR 1.33-POUNDS-PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE TO THEM.
3. WIRE FENCE REINFORCEMENT FOR SILT FENCES SHALL BE A MINIMUM OF 42 INCHES IN HEIGHT, SHALL BE A MINIMUM OF 14-GAUGE, AND SHALL HAVE A MAXIMUM MESH SPACING OF 6 INCHES.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES. ON SLOPES, THE FENCE LINE SHALL FOLLOW THE CONTOUR AS CLOSELY AS POSSIBLE. IN SMALL SWALES, THE FENCE LINE SHALL BE CURVED UPSTREAM AT THE SIDES TO DIRECT THE FLOW TOWARD THE MIDDLE OF THE FENCE.
2. IF POSSIBLE, THE FILTER FABRIC SHALL BE CUT FROM A CONTINUOUS ROLL TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP AND BOTH ENDS SECURELY FASTENED TO THE POST.
3. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA-STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
5. WHEN STANDARD-STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
6. THE STANDARD-STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
7. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF NO. 6 ABOVE APPLYING.
8. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE TOE OF THE FILTER FABRIC.
9. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

MAINTENANCE

1. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE BARRIER'S EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

CONSTRUCTION ENTRANCE

DESIGN AND CONSTRUCTION SPECIFICATIONS

1. THE MATERIAL FOR CONSTRUCTION OF THE PAD SHALL BE 2 TO 3 INCH STONE.
2. THE THICKNESS OF THE PAD SHALL NOT BE LESS THAN 8 INCHES.
3. THE WIDTH OF THE PAD SHALL NOT BE LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. THE LENGTH OF THE PAD SHALL BE AS REQUIRED, BUT NOT LESS THAN 50 FEET.
5. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY.
6. WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS OR OTHER APPROVED METHODS.

HYDROSEEDING

HYDROSEED SPECIFICATIONS

MIX:

BLANDO BROME GRASS	(38%)	27 LBS/ACRE
ROSE CLOVER	(38%)	27 LBS/ACRE
ZORRO FESCUE	(24%)	17 LBS/ACRE
	TOTAL:	71 LBS/ACRE

ALL SEED SHALL BE PURCHASED BY THE CONTRACTOR AND PROVIDED TO THE SITE IN SEALED CONTAINERS WITH THE ANALYSIS AND PURITY FACTORS INDICATED THEREON. ALL SEED SHALL BE FRESH, CURRENT YEARS PRODUCTION, CLEAN AND SHALL MEET THE APPROPRIATE GOVERNMENT REQUIREMENTS IN FORCE AT THE TIME FOR PURITY, PERCENTAGE OF GERMINATION, ETC.

MATERIALS:

WOOD CELLULOSE FIBER	2000 LBS/ACRE
AMMONIUM NITRATE	300 LBS/ACRE
SOIL STABILIZER (TYPE M BINDER BURGER & PLATE).	100 LBS/ACRE

LOADING & MIXING:

WITH AGITATION SYSTEM OPERATING AT PARTIAL SPEED, WATER SHALL BE ADDED TO TANK, GOOD RECIRCULATION SHALL BE ESTABLISHED. SEED AND MATERIALS SHALL BE ADDED IN SUCH A MANNER THAT THEY ARE UNIFORMLY BLENDED INTO THE MIXTURE.

TEMPORARY SEDIMENT TRAP

CONSTRUCTION SPECIFICATIONS

1. THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO WITHIN ONE FOOT OF THE OUTLET ELEVATION. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
6. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT-AND-FILL SLOPES SHALL BE 2:1 OR FLATTER.
8. IF A RISER IS USED, ALL PIPE JOINTS SHALL BE WATERTIGHT.

VELOCITY CHECK DAM

CONSTRUCTION SPECIFICATIONS

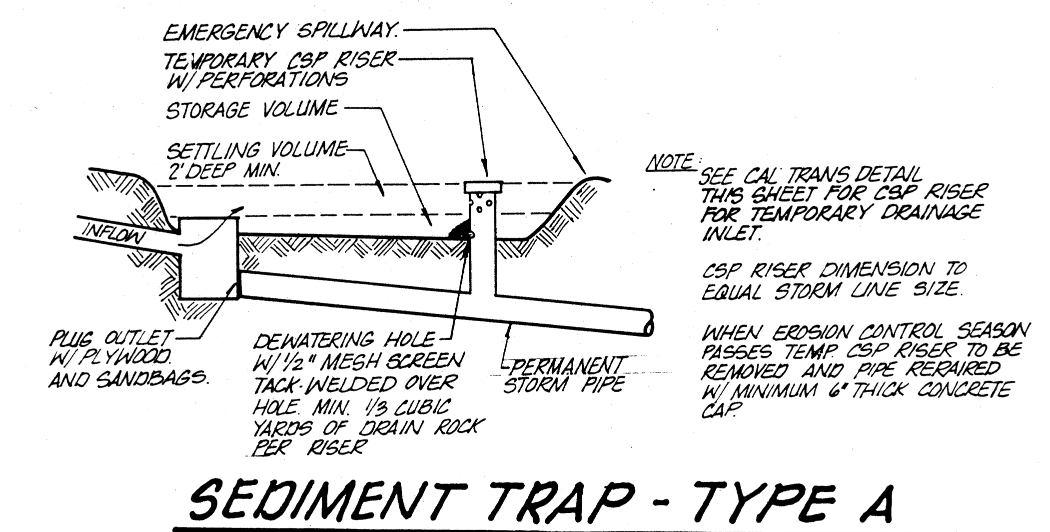
1. PROVIDE VELOCITY CHECK DAMS IN ALL UNPAVED STREET AREAS AT THE INTERVALS INDICATED BELOW. VELOCITY CHECK DAMS SHALL BE CONSTRUCTED OF SANDBAGS, TIMBER, OR OTHER EROSION RESISTANT MATERIALS APPROVED BY THE INSPECTOR, AND SHALL EXTEND COMPLETELY ACROSS THE STREET OR CHANNEL AT RIGHT ANGLES TO THE CENTERLINE. EARTH DIKES SHALL NOT BE USED AS VELOCITY CHECK DAMS.

GRADE OF GROUND SURFACE OR STREET	INTERVAL
LESS THAN 2%	AS REQUIRED BY INSPECTOR
2% TO 4%	100 FEET
4% TO 10%	50 FEET
OVER 10%	25 FEET

TEMPORARY SEDIMENT BASIN

CONSTRUCTION SPECIFICATIONS

1. AREAS UNDER THE EMBANKMENT AND ANY STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOTMAT. IN ORDER TO FACILITATE CLEANOUT AND RESTORATION, THE BASIN AREA SHALL BE CLEARED ALSO.
2. A CUT-OFF TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF EARTH-FILL EMBANKMENTS. THE MINIMUM DEPTH SHALL BE 2 FEET. THE CUT-OFF TRENCH SHALL EXTEND UP BOTH ABUTMENTS TO THE RISER CREST ELEVATION. THE BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT AND A MINIMUM OF 4 FEET. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTION REQUIREMENTS SHALL BE THE SAME AS THOSE FOR THE EMBANKMENT. THE TRENCH SHALL BE DEWATERED DURING THE BACKFILLING-COMPACTING OPERATIONS.
3. FILL MATERIAL FOR THE EMBANKMENT SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS OR OTHER OBJECTIONABLE MATERIAL. RELATIVELY PERVIOUS MATERIALS SUCH AS SAND OR GRAVEL (UNIFIED SOIL CLASSES GW, GP, SW AND SP) SHALL NOT BE PLACED IN THE EMBANKMENT. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED BY HAND INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION. FILL MATERIAL SHALL BE PLACED IN 6 TO 8-INCH THICK CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. COMPACTION SHALL BE OBTAINED BY ROUTING THE HAULING EQUIPMENT OVER THE FILL SO THAT THE ENTIRE SURFACE OF EACH LAYER OF THE FILL IS TRAVERSED BY AT LEAST ONE WHEEL OR TREAD TRACK OF THE EQUIPMENT, OR BY THE USE OF A COMPACTOR. THE EMBANKMENT SHALL BE CONSTRUCTED TO AN ELEVATION 10% HIGHER THAN THE DESIGN HEIGHT TO ALLOW FOR SETTLEMENT IF COMPACTION IS OBTAINED WITH HAULING EQUIPMENT. IF COMPACTORS ARE USED FOR COMPACTION, THE OVERBUILD MAY BE REDUCED TO NOT LESS THAN 5%.
4. THE PRINCIPAL SPILLWAY RISER SHALL BE SECURELY ATTACHED TO THE DISCHARGE PIPE BY WELDING ALL AROUND AND ALL CONNECTIONS SHALL BE WATERTIGHT. THE PIPE AND RISER SHALL BE PLACED ON A FIRM, SMOOTH SOIL FOUNDATION. THE CONNECTION BETWEEN THE RISER AND THE RISER BASE SHALL BE WATERTIGHT. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL, OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE PIPE OR ANTI-SEEP COLLARS. THE FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE PLACED IN 4-INCH LAYERS AND COMPACTED UNDER THE SHOULDERS AND AROUND THE PIPE TO AT LEAST THE SAME DENSITY AS THE ADJACENT EMBANKMENT. A MINIMUM OF 2 FEET OF HAND-COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT. STEEL BASE PLATES SHALL HAVE AT LEAST 2-1/2 FEET OF COMPACTED EARTH, STONE OR GRAVEL PLACED OVER THEM TO PREVENT FLOTATION.
5. THE EMERGENCY SPILLWAY SHALL NOT BE INSTALLED IN FILL. ELEVATIONS, DESIGN WIDTH, AND ENTRANCE AND EXIT CHANNEL SLOPES ARE CRITICAL TO THE SUCCESSFUL OPERATION OF THE EMERGENCY SPILLWAY.
6. BAFFLES SHALL BE CONSTRUCTED OF 4 X 4-INCH POSTS AND 4 X 8-FEET X 1/2-INCH EXTERIOR PLYWOOD. THE POSTS SHALL BE SET AT LEAST 3 FEET INTO THE GROUND, NO FURTHER APART THAN 8 FEET CENTER TO CENTER, AND SHALL REACH A HEIGHT 6 INCHES BELOW THE RISER CREST ELEVATION. THE PLYWOOD SHALL BE SECURELY FASTENED TO THE UPSTREAM SIDE OF THE POSTS.
7. THE EMBANKMENT AND EMERGENCY SPILLWAY SHALL BE STABILIZED WITH HYDROSEEDED MIX IMMEDIATELY FOLLOWING CONSTRUCTION (SEE STANDARD AND SAMPLE SPECIFICATIONS FOR PLANTING OF EXPOSED SOILS).
8. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION WILL BE MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT SHALL BE COMPLIED WITH.
9. STATE AND LOCAL REQUIREMENTS SHALL BE MET CONCERNING FENCING AND SIGNS WARNING THE PUBLIC OF HAZARDS OF SOFT SEDIMENT AND FLOODWATER.
10. MAINTENANCE AND REPAIRS SHALL BE CARRIED OUT AS FOLLOWS:
    (A) ALL DAMAGES CAUSED BY SOIL EROSION OR CONSTRUCTION EQUIPMENT SHALL BE REPAIRED BEFORE THE END OF EACH WORKING DAY.
    (B) SEDIMENT SHALL BE REMOVED FROM THE BASIN WHEN IT REACHES THE SPECIFIED DISTANCE BELOW THE TOP OF THE RISER. THIS SEDIMENT SHALL BE PLACED IN SUCH A MANNER THAT IT WILL NOT ERODE FROM THE SITE. THE SEDIMENT SHALL NOT BE DEPOSITED DOWNSTREAM FROM THE EMBANKMENT OR IN OR ADJACENT TO A STREAM OR FLOODPLAIN.
11. WHEN TEMPORARY STRUCTURES HAVE SERVED THEIR INTENDED PURPOSE AND THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, THE EMBANKMENT AND RESULTING SEDIMENT DEPOSITS SHALL BE LEVELED OR OTHERWISE DISPOSED OF IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.



SEDIMENT TRAP - TYPE A

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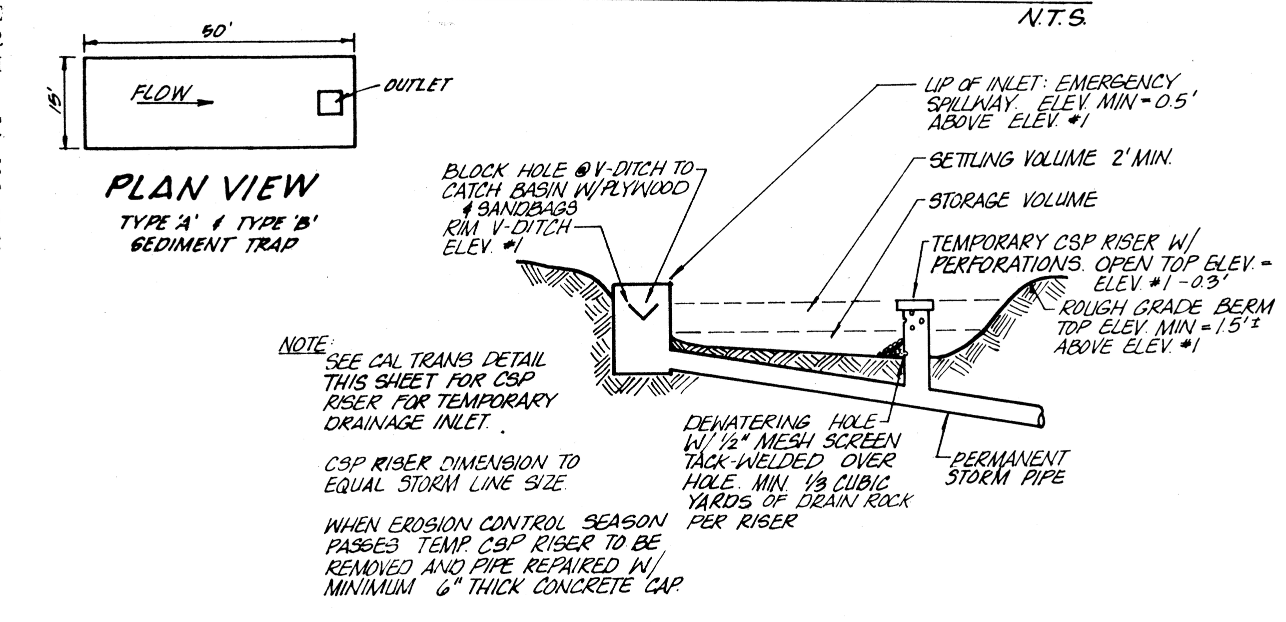


SEDIMENT TRAP - TYPE B

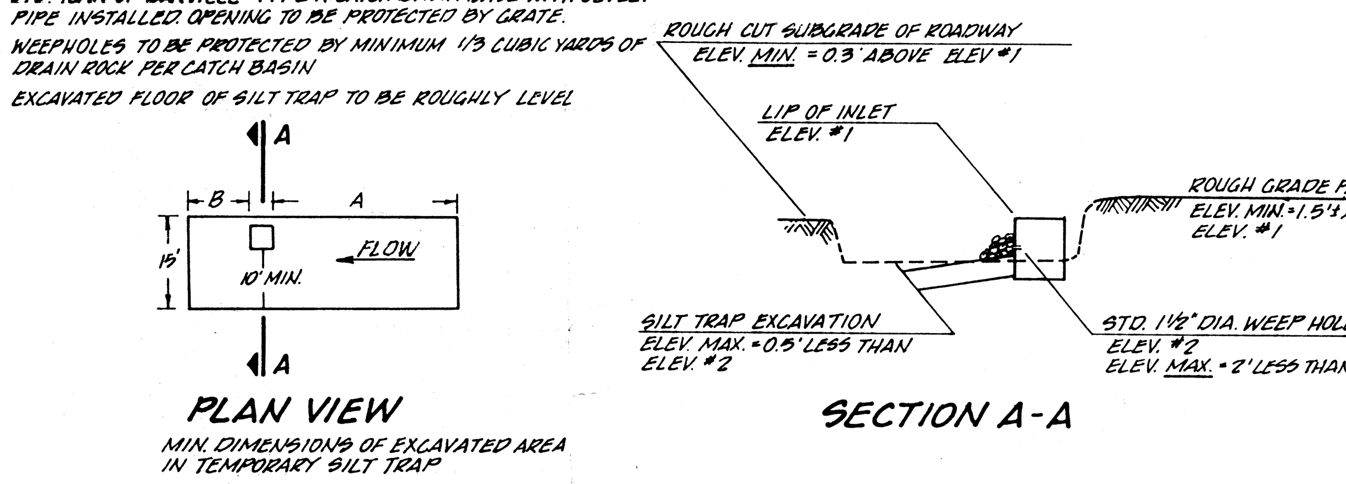
N.T.S.

NOTES:

STD. TOWN OF DANVILLE TYPE A CATCH BASIN BASE WITH OUTLET PIPE INSTALLED OPENING TO BE PROTECTED BY GRATE.

WEEPHOLES TO BE PROTECTED BY MINIMUM 1/3 CUBIC YARDS OF DRAIN ROCK PER CATCH BASIN

EXCAVATED FLOOR OF SILT TRAP TO BE ROUGHLY LEVEL



SEDIMENT TRAP - TYPE C

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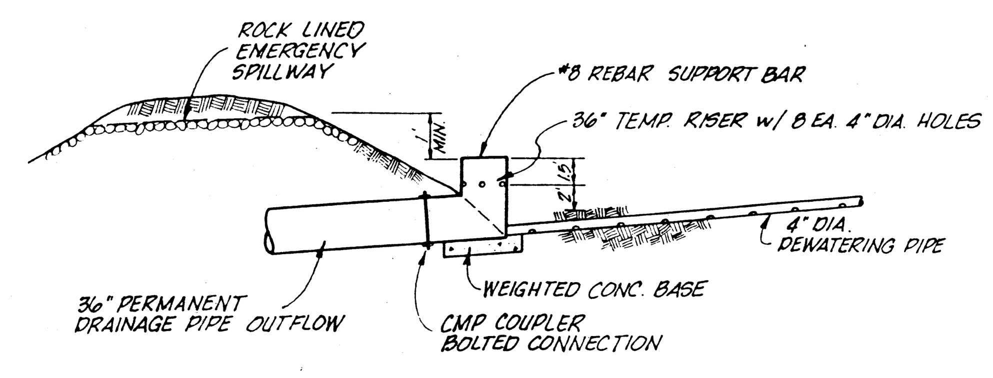

SEDIMENT BASIN

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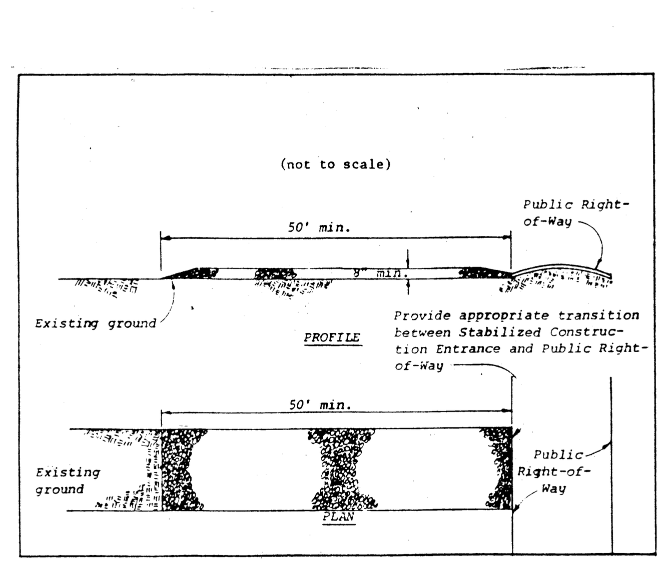
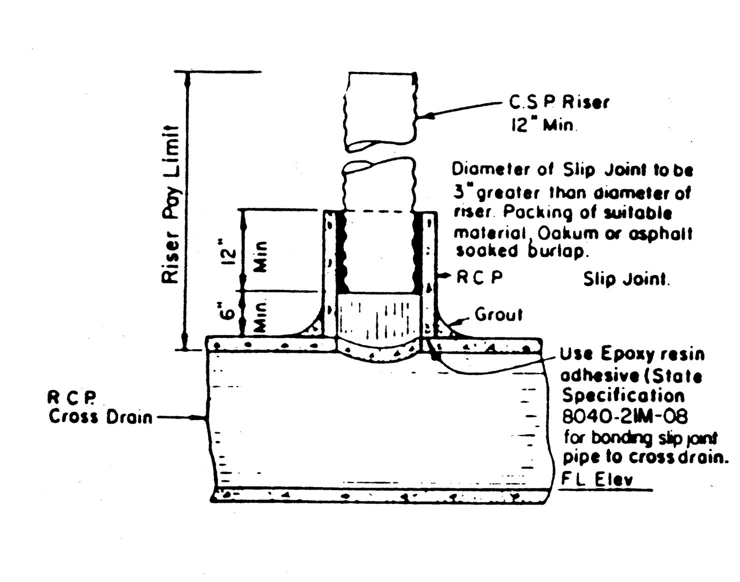


CONSTRUCTION ENTRANCE DETAIL

N.T.S.



TEMPORARY CSP RISER

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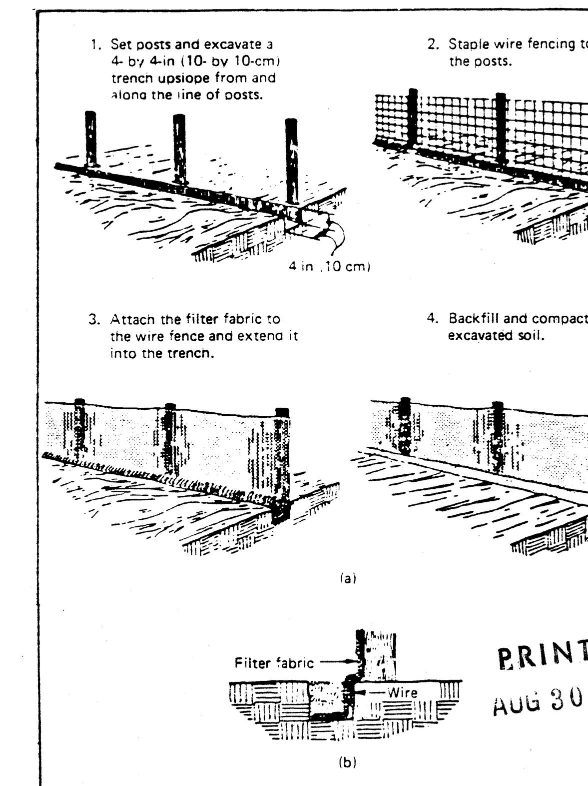

PRINTED AUG 30 1988

SILT FENCE DETAIL

N.T.S.

REV	DATE	DESCRIPTION	BY

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SHEET **13** OF 14 SHEETS

PROJECT NO. 86001-20-0134

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SHEET
14
OF 14 SHEETS

PROJECT NO.
86001-20-0134

BY: JEP

DATE 10-12-88

JOB NUMBER: 1888.300

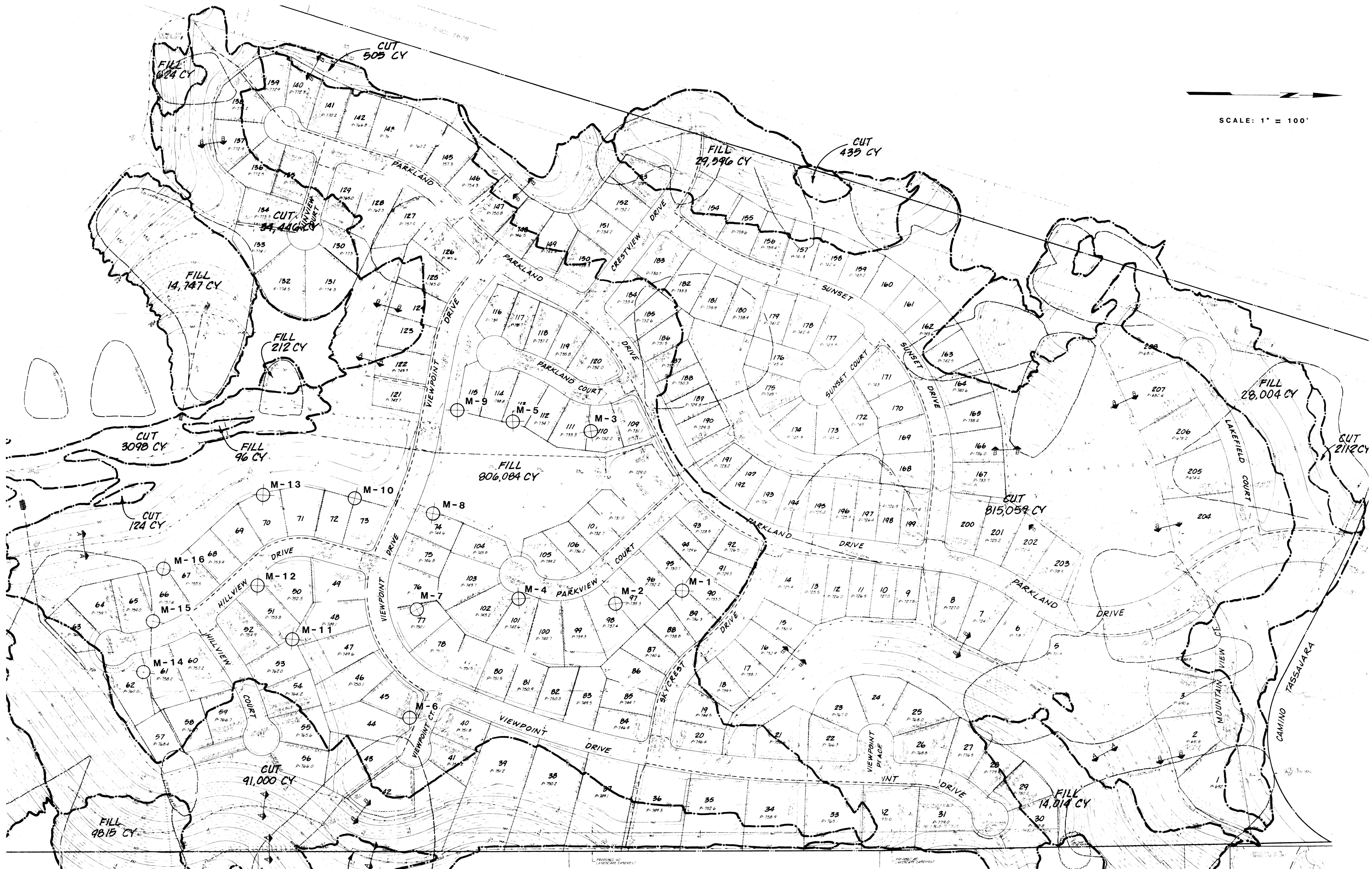
BASE: PLAN TITLED "VISTA, SUBDRAIN TOPO", DATED AUGUST 16, 1988, BY PARSONS & WALKER, AT A SCALE OF 1" = 100'.

SUBDRAIN LOCATION PLAN

VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC OF NORTHERN CALIFORNIA

Berlogar Geotechnical Consultants
SOIL ENGINEERS • ENGINEERING GEOLOGISTS

PLATE 1



EXPLANATION

M-16 LOCATION OF SETTLEMENT MONUMENT

BASE: GRADING PLANS, SHEET 5 OF 14, VISTA TASSAJARA, SUBDIVISION 6736, DANVILLE, CALIFORNIA, PREPARED BY PRW AND ASSOCIATES, UNDATED, PRINTED 8-11-88, AT A SCALE OF 1" = 100'.

SETTLEMENT MONUMENT LOCATION PLAN

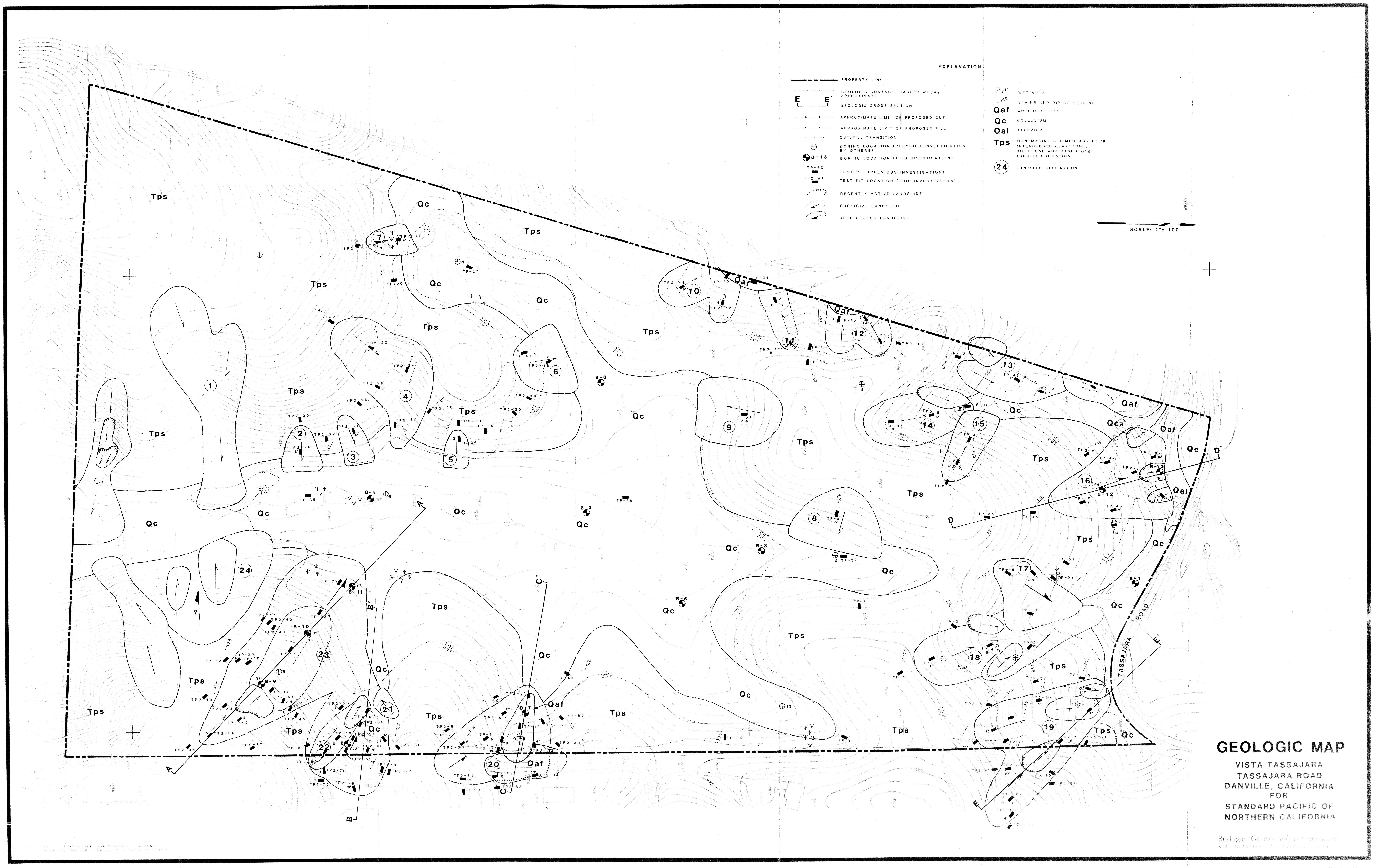
VISTA TASSAJARA
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC
OF NORTHERN CALIFORNIA

Berlogar Geotechnical Consultants
SOIL ENGINEERS • ENGINEERING GEOLOGISTS

JOB NUMBER: 1358.300 DATE: 9-6-88 BY: PT/RV

86964

PLATE 1



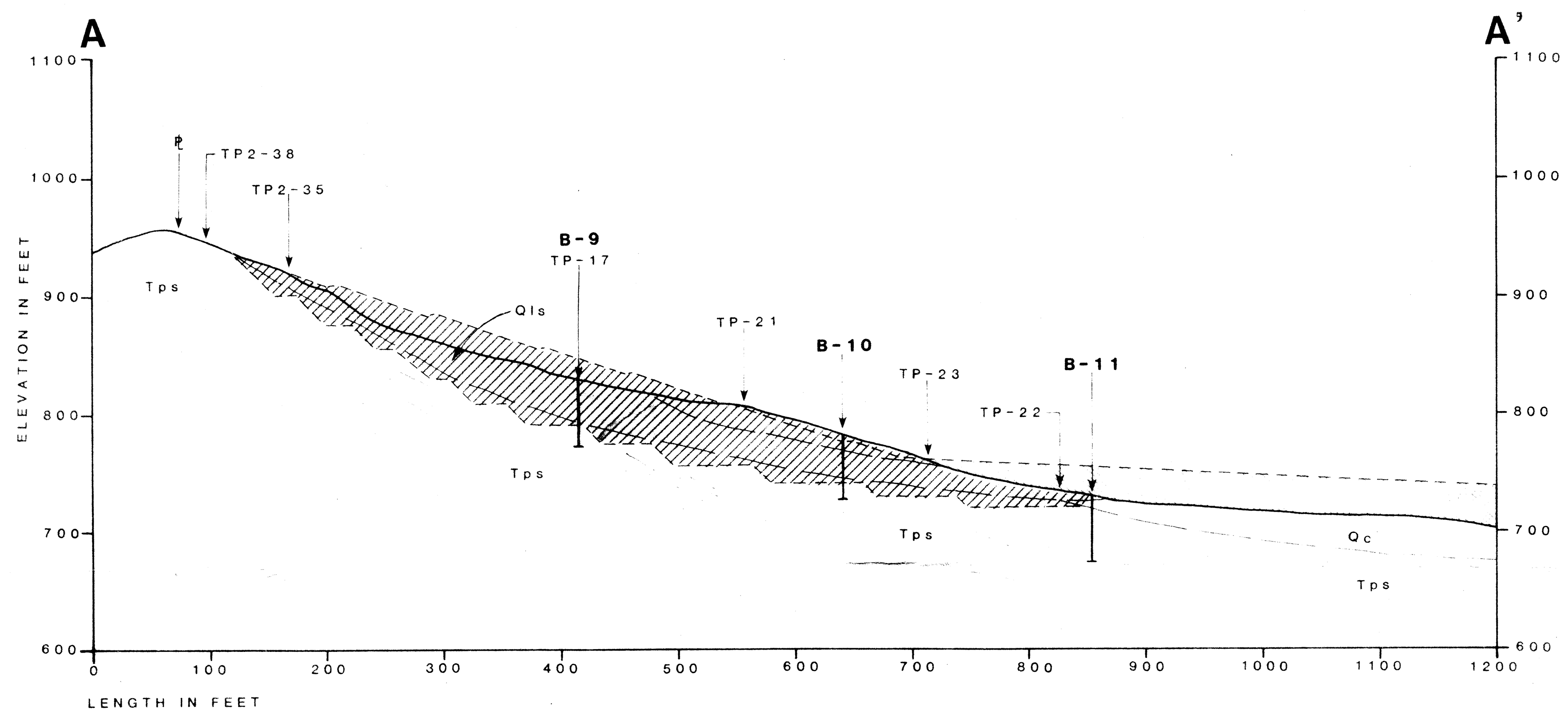
GEOLOGIC MAP

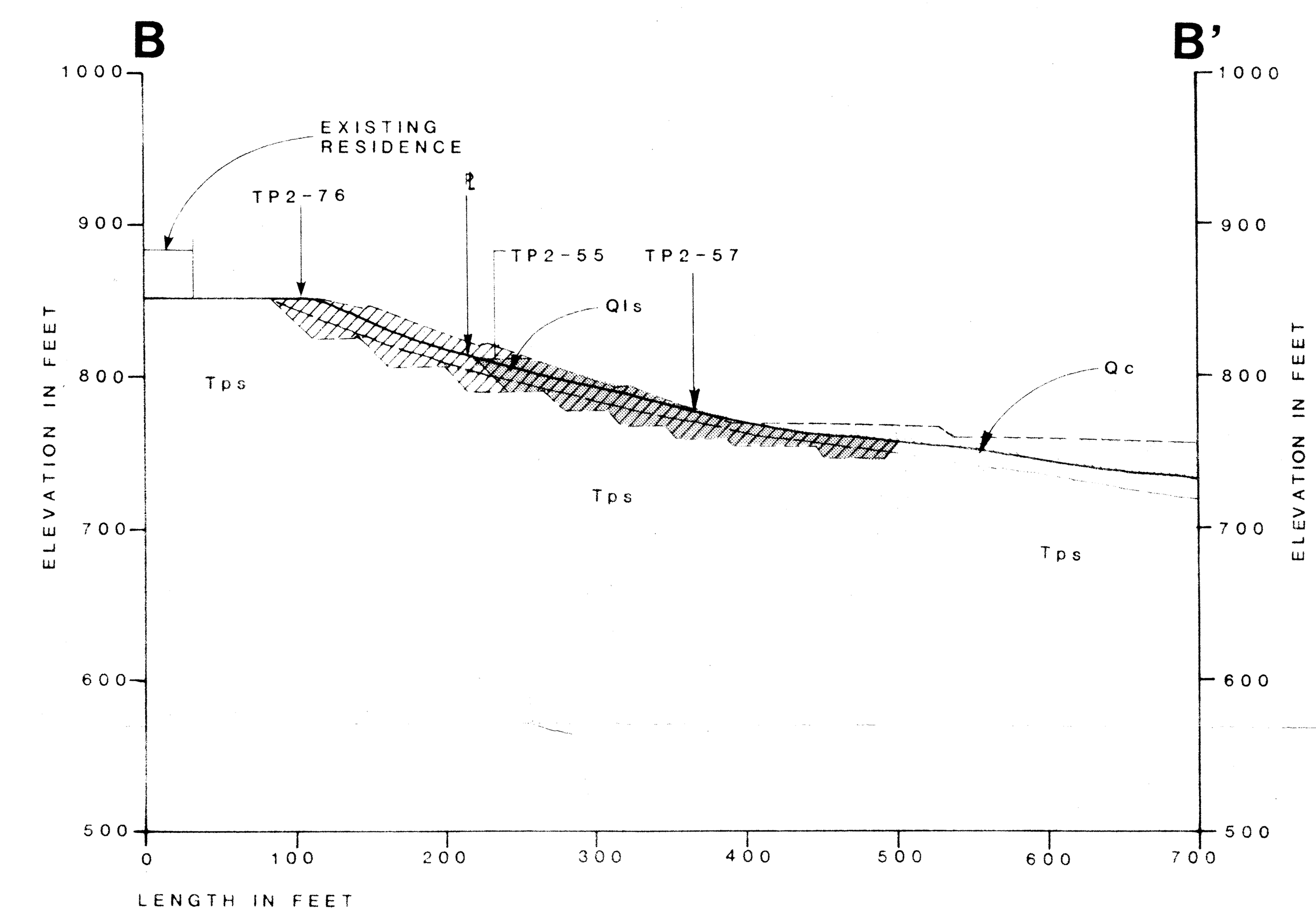
VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC OF
NORTHERN CALIFORNIA

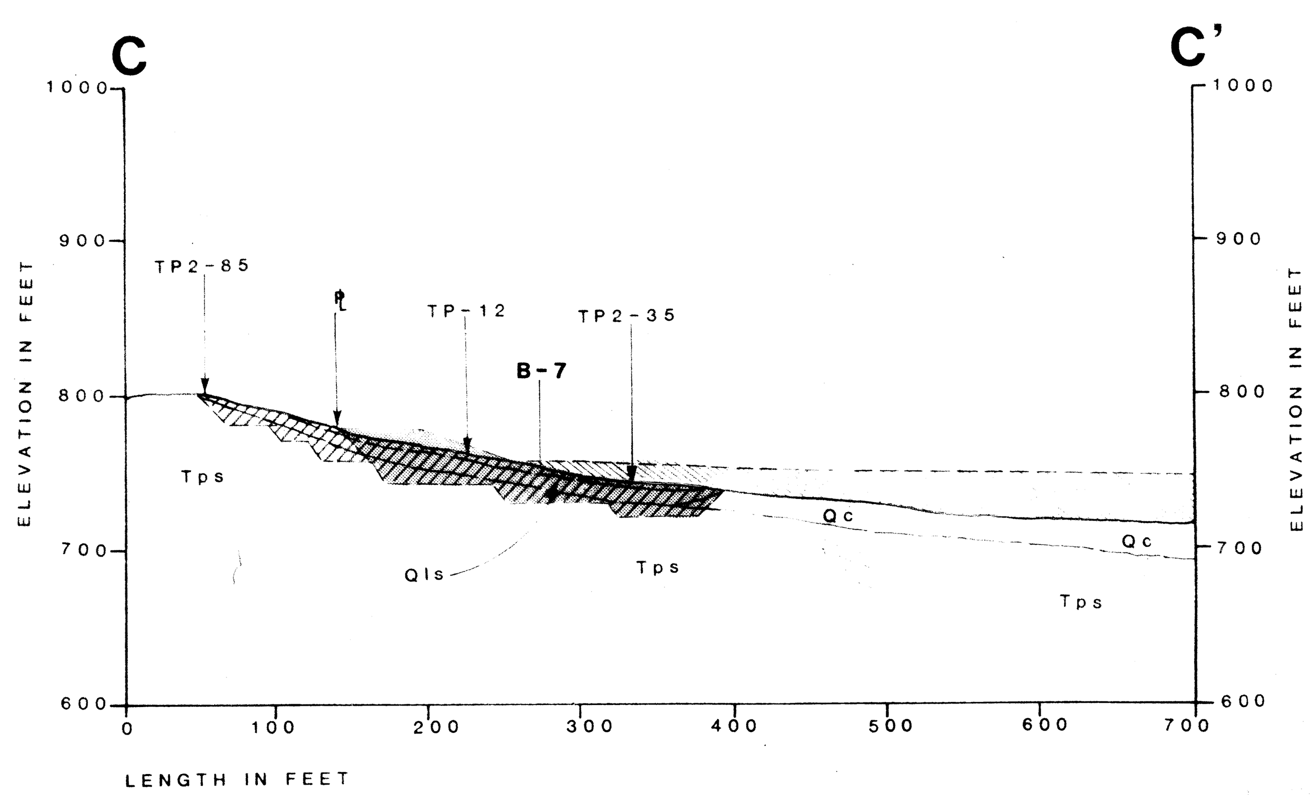
BY: RPS/CR

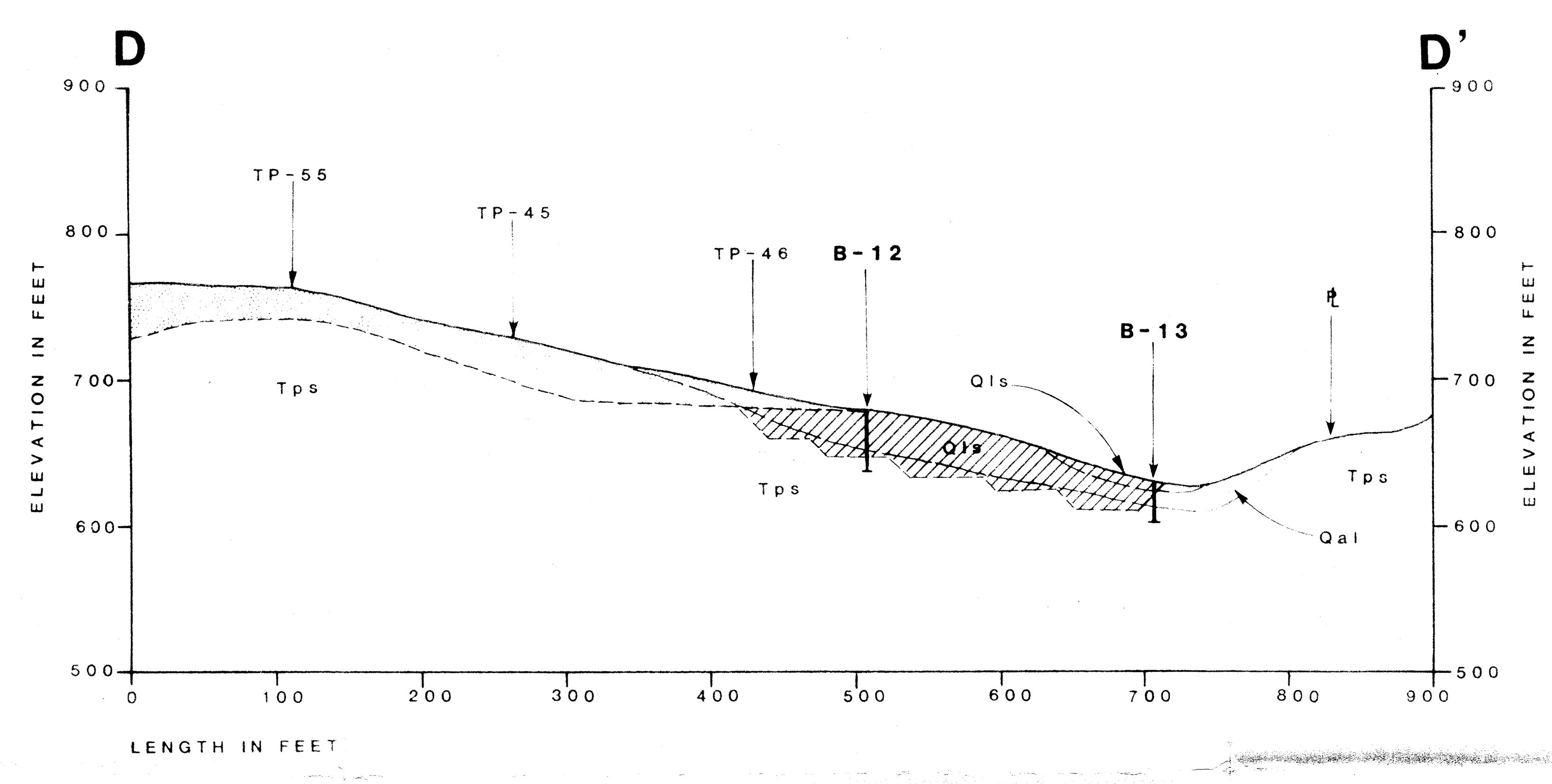
DATE: 1-6-87

JOB NUMBER: 1358.102.1

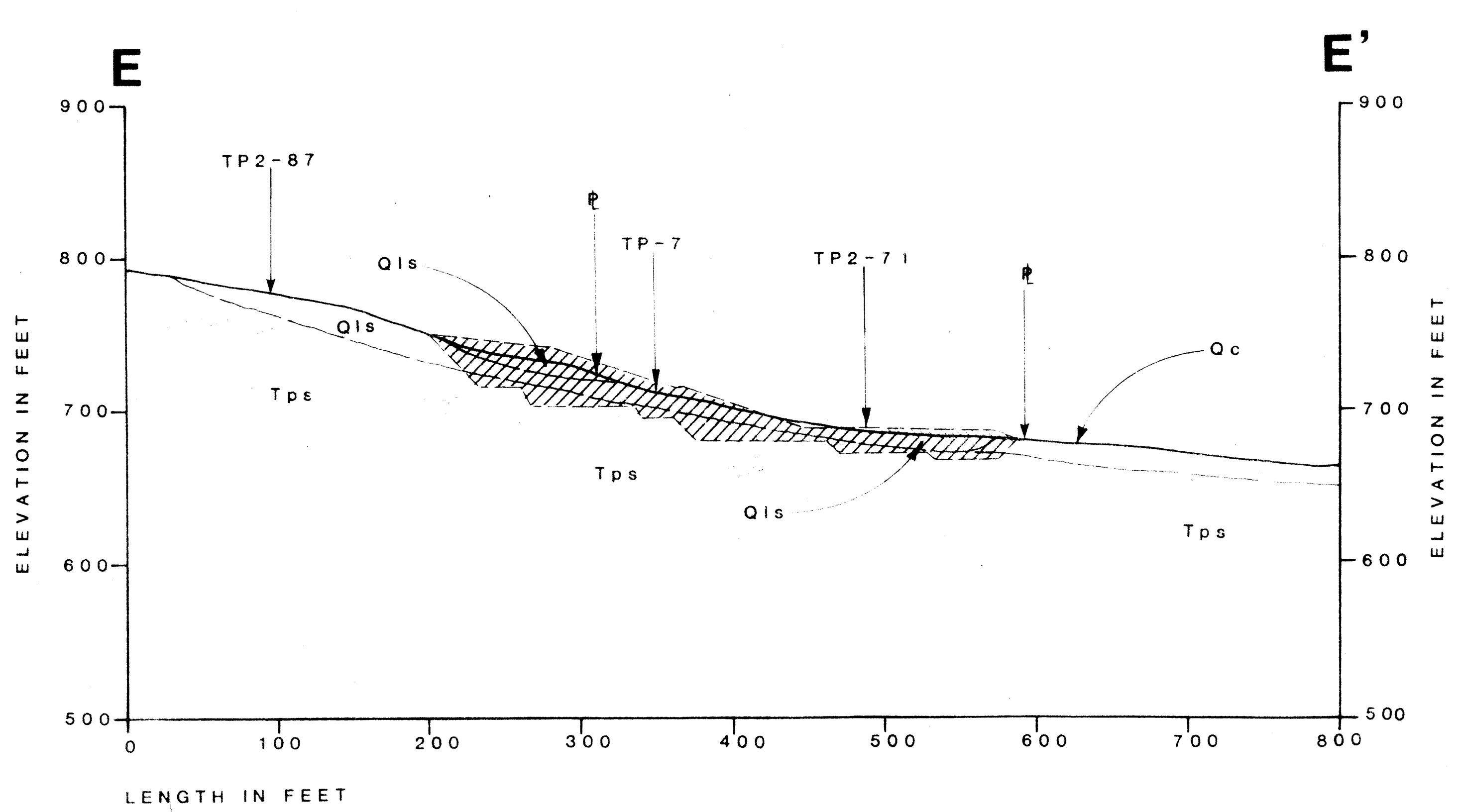








SCALE: 1"=100'
HORIZONTAL
AND VERTICAL



EXPLANATION

———	EXISTING GROUND SURFACE
— · —	GEOLOGIC CONTACT
- - -	PROPOSED GRADING
☐	PROPOSED FILL
☐	PROPOSED CUT
▨	REMEDIAL GRADING ALTERNATIVES
B-13	BORING LOCATION
TP2-87	TEST PIT LOCATION
Qls	LANDSLIDE DEBRIS
Qal	ALLUVIUM
Qc	COLLUVIUM
Tps	PLIOCENE NON-MARINE SEDIMENTARY ROCK
	APPARENT BEDDING ATTITUDE

GEOLOGIC CROSS SECTIONS A-A' THROUGH E-E'

VISTA TASSAJARA
TASSAJARA ROAD
DANVILLE, CALIFORNIA
FOR
STANDARD PACIFIC OF NORTHERN CALIFORNIA

Berlogar Geotechnical Consultants
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PLATE 5

APPENDIX C
CONTROL MAP BY MERIDIAN ASSOCIATES

Point Table

Point #	Raw Description	Elevation	Northing	Easting
101	CTL REBAR	761.206	2113535.9871	6155262.2972
600	TAG ON SIDEWALK	758.112	2113533.9434	6155209.5590
601	REPAR AND CAP	760.500	2113493.3279	6155215.2268
602	NAIL AND SHINER	773.356	2113344.0905	6155138.0600
603	NAIL AND SHINER	765.893	2113600.7283	6155389.6351
604	NAIL AND SHINER	755.364	2113681.2557	6155159.7730
605	NAIL AND SHINER	751.463	2113866.8895	6155064.2279
606	NAIL AND SHINER	747.471	2114011.3257	6154973.5331
609	MON DISK	753.617	2113748.5143	6155133.8592
610	MON DISK	757.532	2113572.2910	6155196.4709

M:\Jobs\17-06-50\sheet 1.dwg Plot Date:7-07-17

DATE: APRIL 14, 2017
SCALE:
DRAWN: TJB
DESIGNED:
ENGINEER: PC
MANAGER: HK

NO.	BY	DATE	REVISIONS

PREPARED BY, OR UNDER THE DIRECTION OF:

MERIDIAN ASSOCIATES, INC.
CIVIL ENGINEERING • PLANNING • SURVEYING
1470 CIVIC COURT, SUITE 360
CONCORD, CA 94520
PHONE: 925-691-7300
FAX: 925-691-7110

PREPARED FOR:

SUBDIVISION 6736 VISTA TASSAJARA

CONTROL MAP

DANVILLE CONTRA COSTA COUNTY CALIFORNIA

SHEET NO. 1 OF 1 SHEETS

JOB NO. 17-06-50