CTL|THOMPSON INCORPORATED

July 20, 2020

AIPA COLORADO INVESTMENTS, LLC
5601 6th Avenue South, Suite 350
Seattle, Washington 98108

Attention: Mr. Ryland Halffman

SUBJECT: Response to Colorado Geologic Survey Comment Letter
Dated October 19, 2019
Gold Hill Mesa Filing No. 10
North of Park Place and
East of North Raven Mine Drive
Colorado Springs, Colorado
CGS Unique No. EP-20-20-0018
City of Colorado Springs AR DP 17-00674
CTL|T Project No. CS19106-105 & CS18893-105

We have read the comments contained in a letter dated October 19, 2019 prepared by the Colorado Geologic Survey (CGS) regarding a Geologic Hazards Evaluation Update and Preliminary Site Grading Recommendations report we prepared for Filing Nos. 8, 9, 10 and dam face of the Gold Hill Mesa development. We understand this report was submitted to CGS in support of a plat revision for Filing No. 10. The purpose of this letter is to respond to those comments. The CGS review letter for Filing 10 is similar to the letter CGS prepared for their review of Filing 11. We have prepared this response to the Filing 10 review. This letter references some of the information from our Filing 11 report.

Comment:

"The City's geologic hazards ordinance requires that all submitted geologic hazards studies be signed and properly certified by the professional who prepared the study…."

Response:

Apparently an unsigned, draft copy of our report was submitted to CGS rather than the "official" version dated June 7, 2018, which was signed and stamped by a Colorado licensed registered professional engineer. A copy of the "certified" report that CGS refers to is included with this letter.

Comment:

On page 4 of CGS's review letter, CGS makes several demands for additional information to gain their approval. The quote is presented below:

"CGS cannot recommend approval of Filing No. 10 until: the underlying mill tailings (at Filing 10) are fully characterized in terms of fines versus sands both laterally and vertically; sampling and testing is completed of the fines and saturated fines, to their full depth; settlement calculations are performed for the actual materials located beneath Filing No. 10; impacts to Filing 10 from settlement of adjacent deep fill and underlying dam embankment are analyzed; slope stability analysis accounts for variable saturation of the slimes; a liquefaction analysis for the entire Gold Hill Mesa is conducted."

Responses to the individual items within this quote are presented below.

Comment:

"underlying mill tailings (at Filing 10) are fully characterized in terms of fines versus sands both laterally and vertically; sampling and testing is completed of the fines and saturated fines, to their full depth"

Response:

We drilled four borings within Filing 10 to depths that extended into bedrock below the tailings. Three additional test holes were drilled about mid-height of the slope below, and to the north of Filing 10, to depths that extended into the bedrock underlying the tailings. Numerous test holes were drilled in future development areas to the west of Filing 10 and just north of Villa de Mesa, the 1960's era development built on the crest of a section of the original tailings dam. The borings were extensively sampled. Numerous samples were tested from the test holes to determine their classification and engineering properties as a means to "characterize" the materials vertically and laterally. The subsurface cross sections developed from this information were used to refine our slope stability analysis previously conducted in 2005 and 2018.

Just as we did for Filing 11, we subcontracted with Olson Engineering to conduct geophysical testing on Filing 10, and to the west, to define the depth to bedrock and the seismic site classification of the surficial materials (Seismic Refraction Tomography (SRT) and Multi-Channel Analysis of Surface Waves (MASW) surveys). We also subcontracted with ConeTec to conduct continuous cone penetrometer testing of the tailings and underlying materials to aid in material characterization and provide data for liquefaction and consolidation (settlement) evaluations. This testing was conducted in the central portion of Filing 10, and in the area to the west, north of Villa de Mesa.

Comment:

"settlement calculations are performed for the actual materials located beneath Filing No. 10; impacts to Filing 10 from settlement of adjacent deep fill and underlying dam embankment are analyzed"

Response:

Grading of Filing 10 mainly included cuts of 5 feet or less. Fills of up to about 10 feet were placed along a limited section of the northeast rim. This fill was placed almost one year ago. Our subsurface investigation indicates the subgrade materials are sands that consolidate rapidly as loads are applied. We recommended the installation of monuments to monitor lateral and vertical movement in the areas of the deeper fills. The results of that physical survey indicate negligible movement over a three-month period.

Comment:

"*slope stability analysis accounts for variable saturation of the slimes*"

Response:

Laboratory testing of the silt tailings (referred to as "slimes") and the sand tailings, conducted for both our 2004 and recent investigations, were conducted on samples under wetted or saturated conditions, which satisfies CGS's comment. We also conducted what CGS refers to as a "sensitivity" analysis, evaluating the influence that varying the strength of the materials has on the calculated factor of safety. Our analysis using the recent characterization of the materials, combined with our more refined definition of the subsurface profile for slope stability analysis purposes, confirms our 2018 analysis. That analysis was conservative and the calculated factor of safety for slope failure using realistic strength values is above 1.5, which is the minimum value considered to be the standard of practice for habitable structures under static loads. We also calculated slope stability factors of safety under earthquake loads to be greater than 1.0, which is considered to be acceptable.

Comment:

"a liquefaction analysis for the entire Gold Hill Mesa is conducted."

Response:

While we assessed the risk of liquefaction at Filling 10 to be low in our 2004 evaluation, the technology of subsurface investigation and analytical evaluation has evolved over the last few years. Liquefaction is associated with materials that are saturated (under water or ponding) and subjected to conditions that generate repetitive stresses, like a sizable earthquake (shaking). During operation of the ore mill, the saturated conditions existed. The water ponding condition no longer exists and based on field and laboratory measurements, most of the ponded water has drained.

Colorado Springs is in an arid climatic zone where evaporation exceeds precipitation. This results in the soils drying to significant depths in the absence of irrigation. We have seen the depth of this type of drying exceed 40 feet over a 20-year period in this area. Since the ore mill has been dormant (no water source) for 50+ years, the tailings have dried surficially and have drained due to gravity and the granular composition of the materials. Based on this fact, one requirement for liquefaction does not exist. The development was designed to minimize infiltration of precipitation and landscape irrigation. Subdrains were also provided below sanitary sewer mains.

Exclusive of the above conditions, an extensive discussion of seismic risk is presented in our report for Gold Hill Mesa Filing No. 11. That work concluded there is a low risk of seismic activity and liquefaction. We identified comparatively soft/loose tailings materials with elevated moisture conditions in a limited area within Filing 11 where although having a higher risk of liquefaction, our analysis still resulted in satisfactory factors of safety. The same soft/loose, high moisture content conditions do not exist below Filing 10 or the dam face to the areas west and south (Filings 9, 8 and 7). The results of our analysis indicate the risk of liquefaction is even lower in the vicinity of Filing 10 than in the isolated area identified in Filing 11.

Based on investigations for the land extending from South 21st Street, east to the thickest places of the Gold Hill Mesa tailings impoundment, we judge the risk of damage due to liquefaction to be low as presented in our 2004 evaluation of the overall residential development portion of this project.

CONCLUSIONS

Based on the results of our investigation, Gold Hill Mesa, Filing No. 10 can be developed as planned. Extensive testing, including a thorough characterization of subsurface conditions and comprehensive liquefaction study has been performed to address the Colorado Geologic Survey's (CGS) comments. Subsurface conditions were evaluated based on exploratory borings to bedrock and laboratory testing, which were supplemented by our additional investigations that included geophysical analysis and cone penetrometer testing to further characterize the depth (thickness) of the tailings and their material properties. Liquefaction potential was evaluated using analytical methods considered to be the current best practice, based on geophysical field testing, cone penetrometer testing, and standard penetration testing. Results confirm Filing 10 is not prone to liquefaction during earthquakes with appropriate design parameters. We refined our slope stability analysis, supplemented by drilling of additional test holes and extensive laboratory test results, which confirmed values above those deemed to be the minimums acceptable by regulatory agencies and engineering standards. The results of our comprehensive investigation address CGS's comments and support that Filing 10 is suitable for development.

LIMITATIONS

The purpose of this letter was to respond to comments contained in the October 19, 2019 Colorado Geologic Survey review of the subject report. If we can be of further service in discussing the contents of this letter or in the analysis of the influence of the subsurface conditions on the design of the project, please call.

Very truly yours,

CTL | THOMPSON, INC.

William C. Hoffmann, Jr., P.E.
Senior Engineering Consultant

Reviewed by:

Timothy A. Mitchell, P.E.
Division Manager

WCH:GEE:TAM:wch
Via email: rylandh@hadleyproperties.com; stephanie@goldhillmesa.com; roberth@hadleyproperties.com; MonteM@HadleyProperties.com; john@civicdesignpartnership.com

Edited 8/1/17

COLORADO SPRINGS
OLYMPIC CITY USA

Geologic Hazard Study Report

Applicant:	Civil Design Partnership, John Olson	Telephone:	719-600-8366
Address:	142 S. Raven Mine, Suite 100	Email:	John@CivilDesignPartnership.com
City/State:	Colorado Springs, Co.	Fax:	
Zip Code:	80905		

The following documents have been included and considered as part of this report (checked off by individual(s) preparing the geologic report):

- [x] Development Plan
- [ ] Landscape Plan (if applicable)
- [x] Grading Plan
- [ ] Drainage Report (necessary if debris and/or mud flow hazard is present)

ENGINEER'S STATEMENT

I hereby attest that I am qualified to prepare a Geologic Hazard Study in accordance with the provisions of Section 504 of the Geologic Hazards Ordinance of Colorado Springs. I am qualified as:

- [ ] A Professional Geologist as defined by CRS 34-1-201(3); or,
- [x] A Professional Engineer as defined by Board Policy Statement 50.2 - "Engineers in Natural Hazard Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. Board authority as defined by CRS 12-25-107(1).

Submitted by: CTLIThompson, Inc. William C. Hoffmann Jr. Date: July 20, 2020

William C. Hoffmann, Jr., P.E., FACEC

This Geologic Hazard Study is filed in accordance with the Zoning Code of Colorado Springs, 2001, as amended.

City Engineer — Date: 7/28/2020

Planning & Development Manager — Date: 7/27/20

AIPA COLORADO INVESTMENTS, LLC
GOLD HILL MESA FILING NO. 10
CTLT PROJECT NO. CS19106-105

CTL | THOMPSON INCORPORATED

GEOLOGIC HAZARDS EVALUATION UPDATE AND PRELIMINARY SITE GRADING RECOMMENDATIONS FILINGS 8, 9, 10, AND DAM FACE EASTERLY ONE-THIRD OF GOLD HILL MESA COLORADO SPRINGS, COLORADO

Prepared for:

GOLD HILL NEIGHBORHOOD, LLC
142 Raven Mine Drive
Colorado Springs, Colorado 80904

Attention: Mr. Barry Brinton

CTL|T Project No. CS18893.000-105

June 7, 2018

5170 Mark Dabling Blvd | Colorado Springs, Colorado 80918 | Telephone: 719-528-8300 Fax: 719-528-5362

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SCOPE

This report presents the results of our Geologic Hazards Evaluation Update and Preliminary Site grading recommendations for Filings 8, 9, 10, and the tailings dam face within the eastern one-third of the overall Gold Hill Mesa Development, in Colorado Springs, Colorado. The investigated parcels are planned for development of single-family, residential buildings. Our purpose was to update and summarize past geologic hazards evaluations and slope stability analysis we have conducted since 1992 and to provided preliminary site development recommendations.

This report was prepared based on a review of numerous prior studies we prepared and recent conditions interpreted from field reconnaissance of the site, conditions found in our exploratory borings, results of laboratory tests, our engineering analysis, and our experience. Observations made during grading or construction may indicate conditions that require revision or re-evaluation of some of the criteria presented in this report. The criteria presented are for the development as described. Revision in the scope of the project could influence our recommendations. If changes occur, we should review the development plans and their effect on our preliminary design criteria. Evaluation of the property for the possible presence of potentially hazardous materials (environmental site assessment) is beyond the scope of our investigation. Assessment of the site for the potential for wildfire hazards, corrosive soils, erosion problems, or flooding is also beyond the scope of this investigation.

The following section summarizes the report. A more complete description of the conditions found, our interpretations, and our recommendations are included in the report.

EXECUTIVE SUMMARY

The general geologic conditions and potential geologic hazards identified in our 2002 and 2004 reports, that covered the entire residential development, remain applicable. The 2002 report included a limited evaluation of the stability of the then existing

dam face and concluded it to have adequate factors of safety. In 2005, plans were considering development of the dam face with grading to accommodate streets and walk-out basements. Slope stability analysis we conducted for the planned dam face modifications resulted in factors of safety above the minimums normally deemed appropriate. Between 2006 and 2007 the dam face was graded to eliminate deep erosional rills. The fills were engineered and placed under controlled conditions. Subsequent to our 2007 work, the flatter mesa top was developed in general conformance with our recommendations. In 2017 and 2018, placement of thick fills occurred in the area of Filing 8, approaching the crest of the dam face in a transitional area between the flat mesa top and the steep dam face. These fills were engineered and placed under controlled conditions.

The current plan eliminates development of the dam face, but includes the placement of thick fills near the slope crest. With the grading of the dam face in 2007, some of the east slopes have become potentially unstable in isolated areas. One of the steeper areas, where natural materials existed, failed at the slope toe in May of 2015 as a result of significant precipitation events (Fig. 1). We recommend slopes be flattened to ratios of 3:1 (horizontal to vertical). New fills need to be compacted to high density and benched into existing slopes, as has been in the past.

Because of the thickness of the new fills, consolidation of the underlaying materials will occur, as will internal compression of the new thick fills. We recommend installing settlement monitors where new fills that support improvements (dwellings, utilities) exceed 10 feet to evaluate the consolidation prior to site development and construction of dwellings.

PREVIOUS INVESTIGATIONS

Our firm has prepared numerous geotechnical, geologic and slope stability evaluations on the property since 2002. We were involved in the development of the property to the south (Crown Hill Mesa) which predates development of Gold Hill Mesa. Our evaluations were conducted after the requirements for Geologic Hazards Evaluations was established. Most of our previous reports have been reviewed by the City of Colorado Springs. We are aware our initial reports that covered the entire residential devel-

opment portion of Gold Hill Mesa was reviewed by the Colorado Geological Survey (CGS). The following is a list of past reports we believe are relevant to the Geological and Geotechnical conditions of the subject parcels.

- Dames & Moore (May 7, 1999). Preliminary Geotechnical Investigation, Gold Hill Mesa Property, Colorado Springs, Colorado, Job No. 38057-003-035.

- CTLIThompson, Inc. (October 9, 2002). Preliminary Geologic Hazards Evaluation and Preliminary Geotechnical Investigation, Residential 150 Acres of Gold Hill Mesa, Southeast of Highway 24 and 21st Street, Colorado Springs, Colorado, Job No. CS-12,853.

- CTLIThompson, Inc. (December 14, 2004). Geologic Hazards Evaluation and Preliminary Geotechnical Investigation, Gold Hill Mesa, Filings 1 & 2, Phase I Development, Colorado Springs, Colorado, Job No. CS-12,853.

- CTLIThompson, Inc. (August 24, 2005). Slope Stability Evaluation, Gold Hill Mesa Phase III, Lower Gold Camp Rd. and 21st Street, Colorado Springs, Colorado, Project No. CS15280-145.

- CTLIThompson, Inc. (December 22, 2005). Geotechnical Investigation, Fountain Creek, Gold Hill Mesa Drop Structures, Colorado Springs, Colorado, Project No. CS15725-125.

- CTLIThompson, Inc. (April 3, 2006 to May 15, 2007). Observation of Grading and Field Density Testing, Gold Hill Mesa Dam Face, Gold Hill Mesa Subdivision, Colorado Springs, Colorado, Project No. CS16003-345.

- CTLIThompson, Inc. (September 4, 2009). Slope Stability Evaluation, Southwest Corner, Along 21st Street, Colorado Springs, Colorado, Project No. CS17405-130.

- CTLIThompson, Inc. (January 22, 2016). East Slope Failure Evaluation and Mitigation Recommendations, Gold Hill Mesa, West of Gardner St., Colorado Springs, Colorado, Project No. CS18733.002-145.

SITE CONDITIONS

This updated geologic hazard report includes Filings 8, 9, 10, and the adjoining dam faces. It does not include the planned commercial development at the north toe of the dam face. The area included encompasses about 50 acres. The area is generally

northeast of Gold Hill Mesa Dr. and South Raven Mine Dr., and northeast of Olympian Dr. and Lady Campbell Dr. as shown on Fig. 1. The area addressed by this report was undeveloped but some fill had recently been placed in the Filing 8 area and to the east of the Heirloom Filing. The topography of the eastern area is comparatively flat to the slope crest then drops down at about a 3:1 (horizontal to vertical) ratio for a height of about 40 feet to an intermediate, gently sloping bench. The bench is up to about 150 feet wide. To the east of the bench, grades steepen to ratios of steeper than 3:1 and for heights of about 50 feet. One of the steeper slope areas failed in May of 2015 as a result of an historic, prolonged, precipitation period. The area of that slope failure is shown on Fig. 1 along with topography that existed at the time this report was prepared.

The northern portion of the evaluated area tended to slope to the northwest and north east at gentle grades of about 5 percent to the slope crest. The slope was more continuous than the east facing slope and had grades between about 5:1 and 3:1 (horizontal to vertical) and heights of about 75 feet. The slope faces were essential devoid of vegetation and have some shallow erosional rills.

PROPOSED DEVELOPMENT

The subject area is being developed for the construction of single family dwellings similar to the existing Gold Hill Mesa development. In the flat laying areas, cuts and fills of 5 feet or less are expected. Near the slope crest, up to 40 feet of fill is planned at the northeast corner; however, fills planned are generally less than 20-foot fill. The deeper fills are planned well beyond the currently planned areas of residential development. The dam face is also to be graded to eliminate slopes steeper than 3:1 (horizontal to vertical). Flattening the slope along the southeast side will involve cutting the steep slope face. The cutting is expected to remove the slide mass from the slope failure, but if it doesn't, the displaced material is to be removed in total and the slope rebuilt. Fig. 1 presents the planned grading plan. That plan shows the location of seven cross-section lines, six of which correspond to our 2005 slope stability analysis sections for the then-planned, step and bench grading (CTLIT Project No. CS15280-145, dated August 24, 2005). Figs. 2 and 3 present the seven cross sections of the existing and currently proposed topography.

Fill for the grading will be developed from materials stockpiled at various locations throughout the existing development (residential and commercial) and new grading. Experience indicates the materials will consist of a combination of sand tailings, clay, and claystone classifying as a very sandy clay to a very clayey sand.

GEOLOIC AND GEOTECHNICAL CONDITIONS

The overall geologic and subsurface conditions at depth remain unchanged from those discussed in the 1999 Dames & Moore report, and our 2002 and 2004 evaluations. Since 2004, the dam face has been modified to remove the deep erosion rills that existed and to smooth grades. These fills were constructed with geotechnical input and included benching of new fills and construction of at least two key trenches at the toe of the slope in the northeast section of the dam face. There have also been thick fills recently placed along the perimeter of the crest of the upper mesa in an area that sloped to a wide bench located above the dam face slope on the east central area (east of Filing 8, Heirloom). These fills were constructed with geotechnical input and were benched into existing slopes. Representative of our firm periodically visited the sites during the placement of fills to observe the contractor's methods and to perform field density testing. The materials placed consisted of combinations of relatively clean and coarse tailings, silty and clayey tailings, sandy clay and clayey sand soils, and claystone bedrock. The compaction specification ranged between 95 and 100 percent of maximum standard Proctor dry density (ASTM D 698) at moisture contents within 2 percent of optimum for cohesive materials, depending on the depth of the fill. Non-cohesive materials were compacted to 95 percent of maximum modified Proctor dry density (ASTM D 1557) at moisture contents within 2 percent of optimum. Reports of our observations and results of field and laboratory testing were submitted during construction.

SLOPE STABILITY EVALUATIONS

The 2004 development plan included grading the dam face to accommodate dwellings with walkout basements serviced by roadways following topographic contours.

This would result in a “step and bench” topography requiring varying extents of cut and fill. We conducted slope stability evaluations for the then-planned configuration and presented our results in a report dated August 24, 2005. The subsurface profile was developed using the geotechnical data available at that time, developed by Dames and Moore, CTLIThompson, and a geophysical survey. Six cross sections were developed extending from deep within the mesa top to well beyond the toe of the dam face. The analysis considered new fills consisted of the sand tailings. The evaluation concluded factors of safety for static and seismic conditions met or exceeded minimum acceptable values. The Colorado Geologic Survey apparently reviewed the report and their primary comment related to the use of a seismic loading of 0.09g were they felt a more conservative value of 0.10g should be used. Ultimately the analysis was accepted.

Given the proposed changes in the grading versus the 2004 concept, we re-evaluated the slope stability analysis. The same six cross-sections from 2004 were used and a seventh (B-1) was added. The analysis sections began more within the area of planned new grading and extended to the toes of the steeper slopes. The ground surface configuration as it existed in late 2017 was also used. Figure 1 presents the cross-section locations. Figures 2 and 3 present comparisons of the existing topography (2017) and the planned grading.

Based on the cross-sections, we selected the areas we considered to be the more critical changes or steepnesses for slope stability evaluation. Sections A and C involved areas of thick fill placement. Section F is located in an area where the slope toe is steeper than a 3:1 (horizontal to vertical) ratio and is to be flattened by grading. Section F is also adjacent to an area where a section of very steep slopes failed as a result of the spring of 2015 precipitation events. Evaluation of that slope failure and recommendations for remediation are discussed later in this section.

The subsurface profiles below the existing ground surface were copied from that used in our 2005 evaluation, as were the material properties. Our experience with the construction of various fills throughout the development over the years suggests new fills will likely consist of clayey sand or very sandy clay. For the purpose of our evaluation, two separate evaluations were made for the potential variations of new fill. We also

increased the seismic loading from the 0.09g used in 2005 to 0.10g as desired by the Colorado Geologic Survey. The results of the analysis, presented in Appendix A, indicate static and seismic factors of safety greater than the minimums accepted by Geotechnical and Geologic professionals practicing in this area.

2015 SLOPE FAILURE EVALUATION

Figure 1 shows the approximate extent of a section of the east mesa slope that failed in the spring of 2015. Our investigation concluded this was a reactivation of the west end of a 30+ year old slope creep failure that exists along the south side of the mobile home park that lays east of Gold Hill Mesa along Gardner Street. The natural materials consist of clay and claystone bedrock. This section of the larger failure was masked or covered by regrading of the mesa slope face in the late 2000's and early 2010's. The slope ratios in the failure area were steeper than 3:1 (horizontal to vertical) and as steep as 1.5:1. Existing slopes extending about 500 feet to the north and about 100 feet to the south from the failure are also steeper than 3:1. We recommend flattening slopes steeper than 3:1 to no steeper than 3:1 along the east face, as well in general throughout the development. Based on the planned grading plan, slopes are to be flattened, in this area, as shown on Cross Section F (Fig. 3). While it appears the cuts in the area of the 2015 slope failure will remove most of the failure mass, we recommend we observe conditions exposed in the cut area to confirm the slide material is removed.

CONCLUSIONS/RECOMMENDATIONS

We believe the general Geologic Hazards Evaluations and Preliminary Geotechnical Investigations we prepared for the overall residential property in 2002 and 2004 remain applicable to this next development phase. Our engineering analysis indicates the proposed slopes and fills to be placed to extend the mesa crest. The fills should be benched into existing slopes where they exist at ratios of 5:1 (horizontal to vertical) or steeper. Fills should be placed under controlled conditions and compacted to high density in accordance with recommendations provided by the project geotechnical engineer. The construction of new fills should be periodically observed and tested by a geotechnical engineer.

Relatively thick fills are to be placed along the north slope crest and elsewhere. As discussed in our 2004 report, placement of thick fills will cause the underlaying tailings to consolidate. In addition, relatively thick fills will compress within their mass. The time-rate of these consolidations are dependent upon the type of materials. Relatively clean granular materials consolidate rapidly. The more clayey the materials, the longer consolidation or compression will take place. The time can last months and potentially over several years. We recommend installing survey monuments at the surface of completed fills to monitor consolidation. At this time, no structure or improvements are planned in the deep fill areas. The monitoring program should be followed if plans change. We are available to develop a survey plan that considers the thickness of new fill and thickness of the tailings.

LIMITATIONS

The recommendations and conclusions presented in this report were prepared based on conditions disclosed by our exploratory borings, geologic reconnaissance, engineering analyses, and our review of previous reports we prepared for the development.

We believe this report was prepared with that level of skill and care ordinarily used by geologists and geotechnical engineers practicing under similar conditions. No warranty, express or implied, is made.

Should you have any questions regarding the contents of this report or the project from a geotechnical engineering point-of-view, please call.

CTL | THOMPSON, INC.

William C. Hoffmann, Jr., P.E.
Senior Principal Engineer

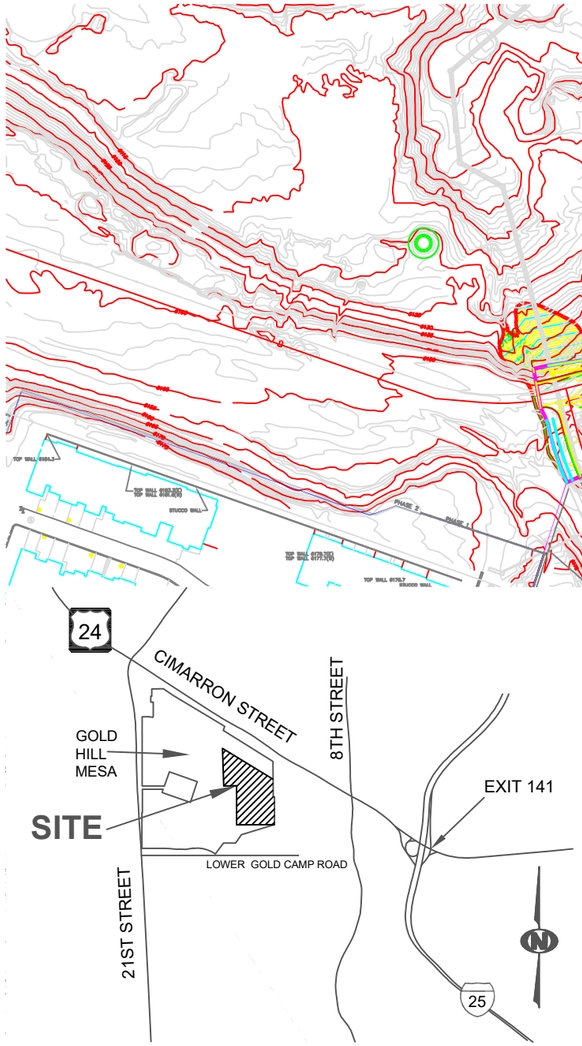
Reviewed by:

Timothy A. Mitchell, P.E.
Division Manager

WCH:TAM:lc

2 cc Sent

Via email: BBrinton@comcast.net
rylandh@hadleyproperties.com
quentin.armijo@tnesinc.com
abarlow@nescolorado.com



VICINITY MAP

(NOT TO SCALE)

EXISTING TOPOGRAPHY

PROPOSED GRADING CONTOURS

A — A LOCATION OF CROSS SECTION.

NOTE:
PLAN PREPARED BY TERRA NOVA
(PROJECT NO. 1713.00, DATED JANUARY 18, 2018).

GOLD HILL NEIGHBORHOOD, LLC
GOLD HILL MESA FILINGS, 8,9,10 & DAM FACE
CTL|T PROJECT NO. CS18893-105

FOUNTAIN CREEK

SOLITAIRE STREET

GOLD HILL MESA DRIVE

SOUTH RAVEN MINE DRIVE

SOUTH FAVORITE STREET

MAYFLOWER STREET

CRESSION MINE DRIVE

OLYMPIAN DRIVE

LADY CAMPBELL DRIVE

BIRMINGHAM STREET

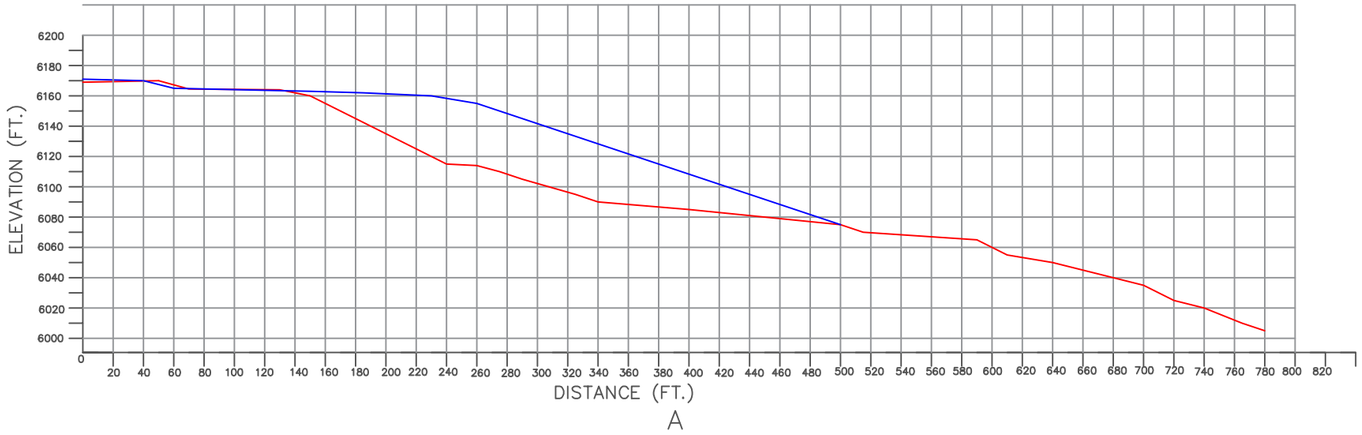
PAGOSA STREET

APPROXIMATE EXTENT OF 2015 SLOPE FAILURE.

0 100' 200'
SCALE: 1" = 200'

Development Plan

FIG. 1



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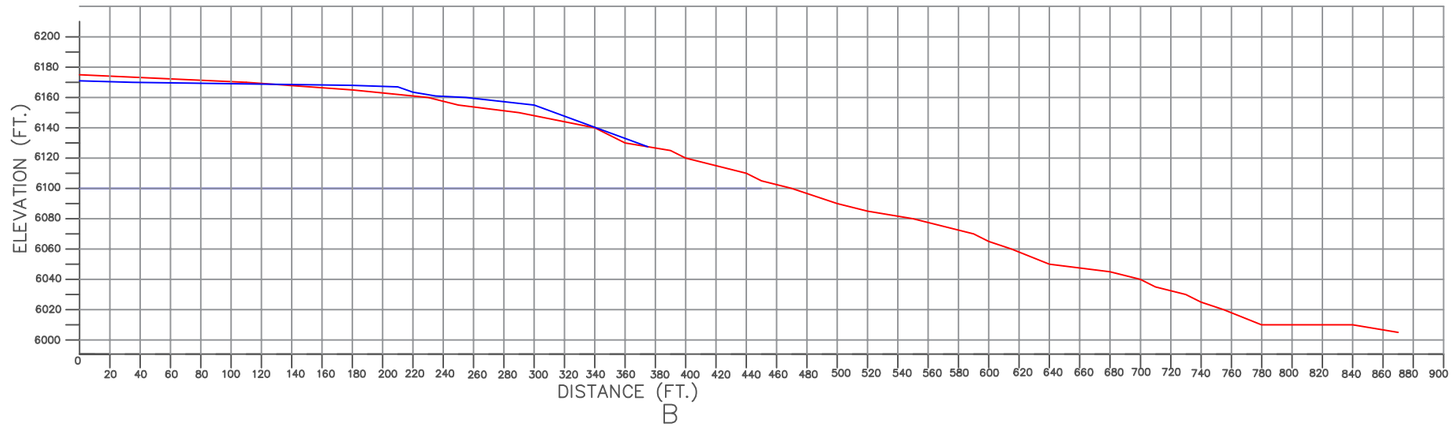

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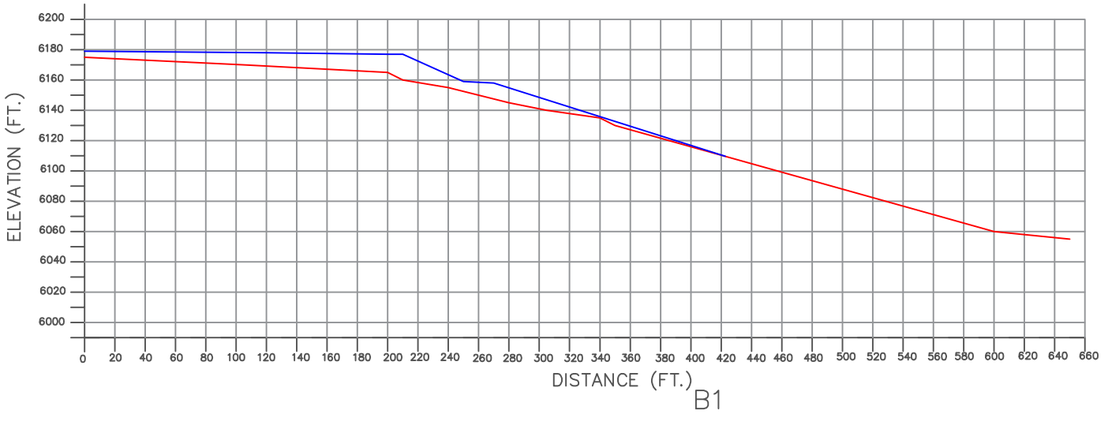

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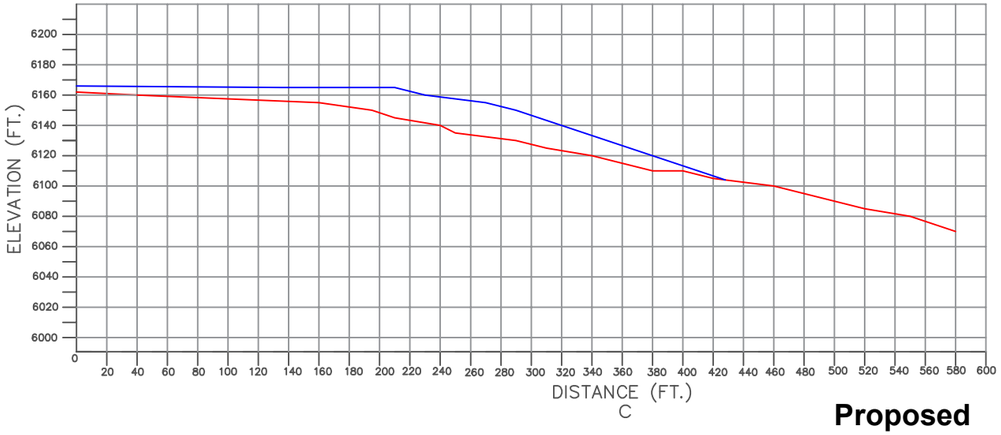

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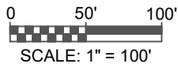


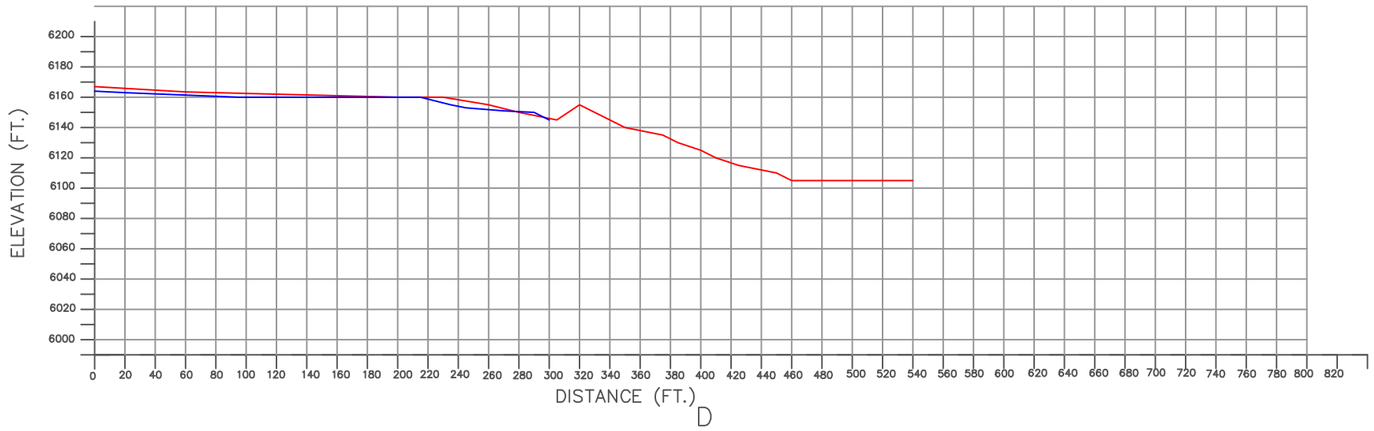
PROPOSED GRADING.

EXISTING GROUND SURFACE.

GOLD HILL NEIGHBORHOOD, LLC
GOLD HILL MESA FILINGS, 8,9,10 & DAM FACE
CTL|T PROJECT NO. CS18893-105

Proposed Grading Cross-Sections

FIG. 2



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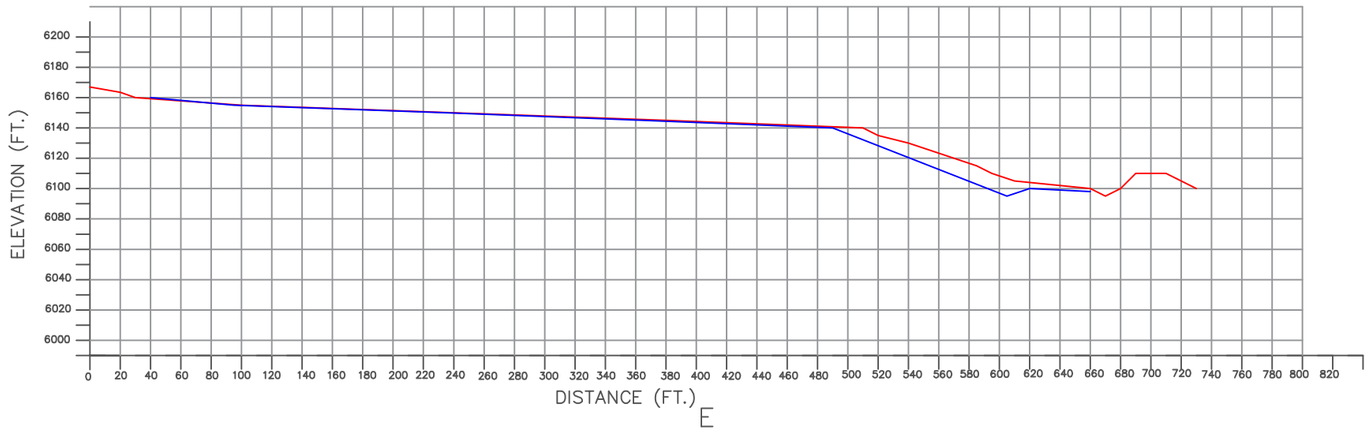

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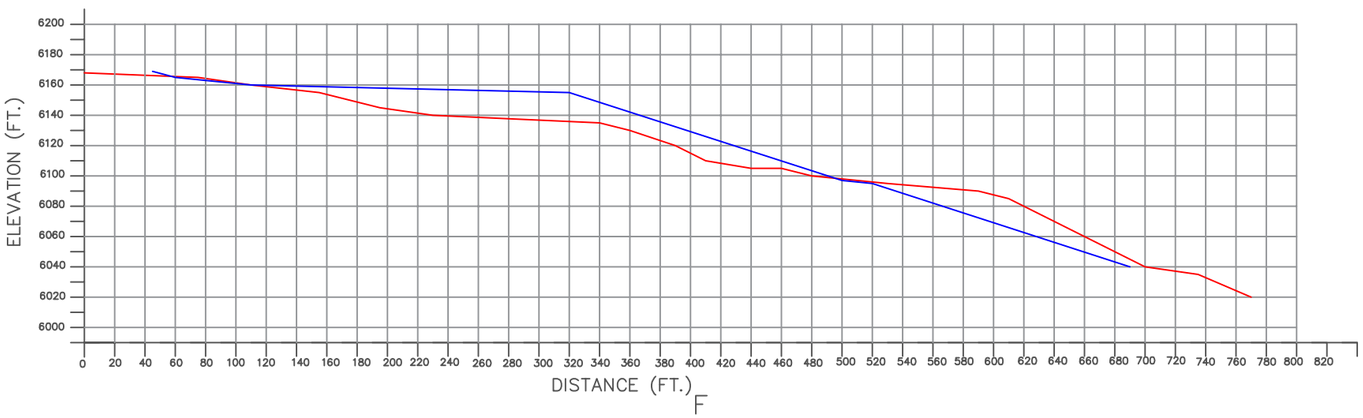

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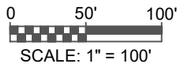


PROPOSED GRADING.

EXISTING GROUND SURFACE.

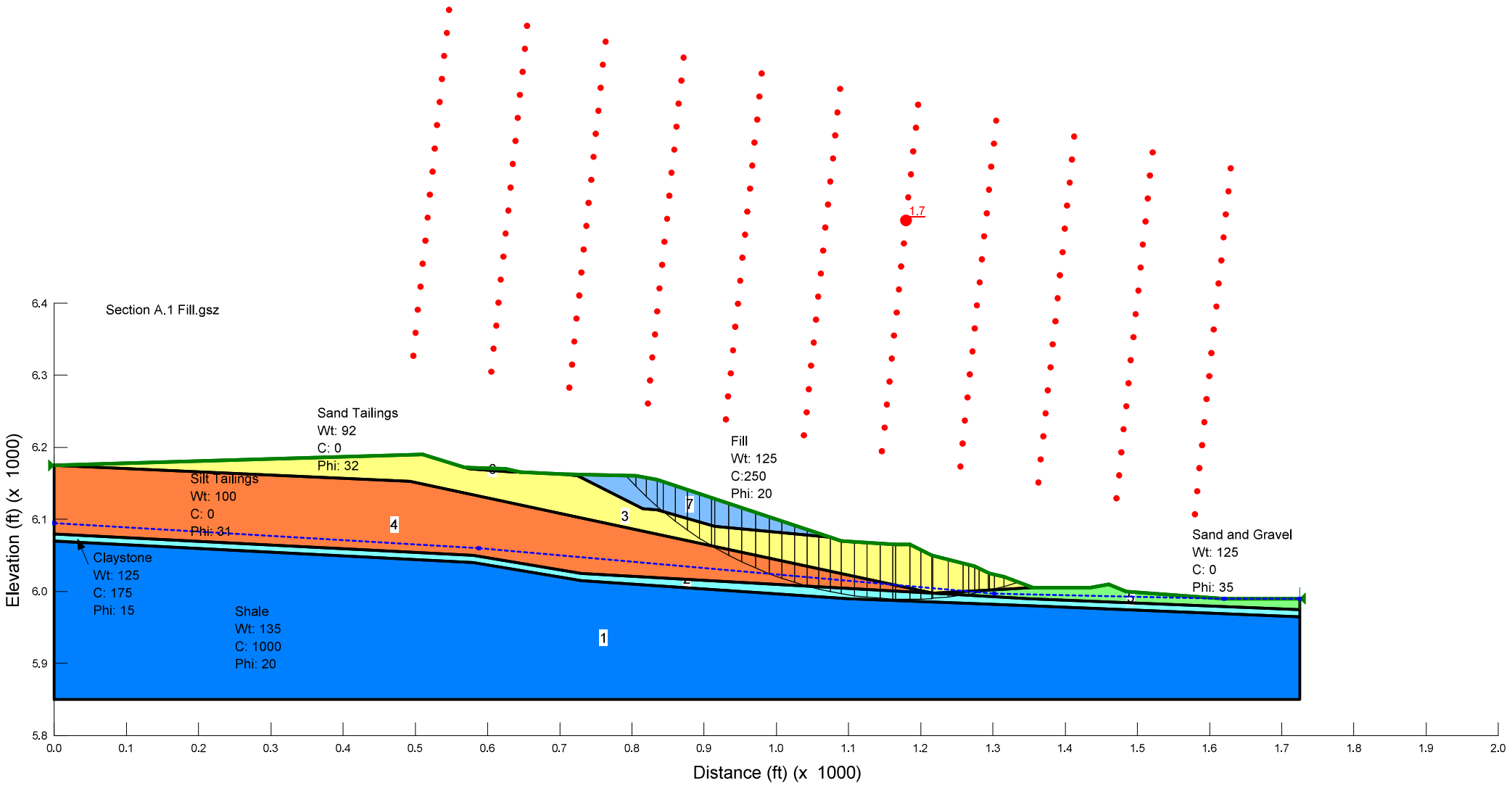
GOLD HILL NEIGHBORHOOD, LLC
GOLD HILL MESA FILINGS, 8,9,10 & DAM FACE
CTL|T PROJECT NO. CS18893-105

Proposed Grading Cross-Sections

FIG. 3

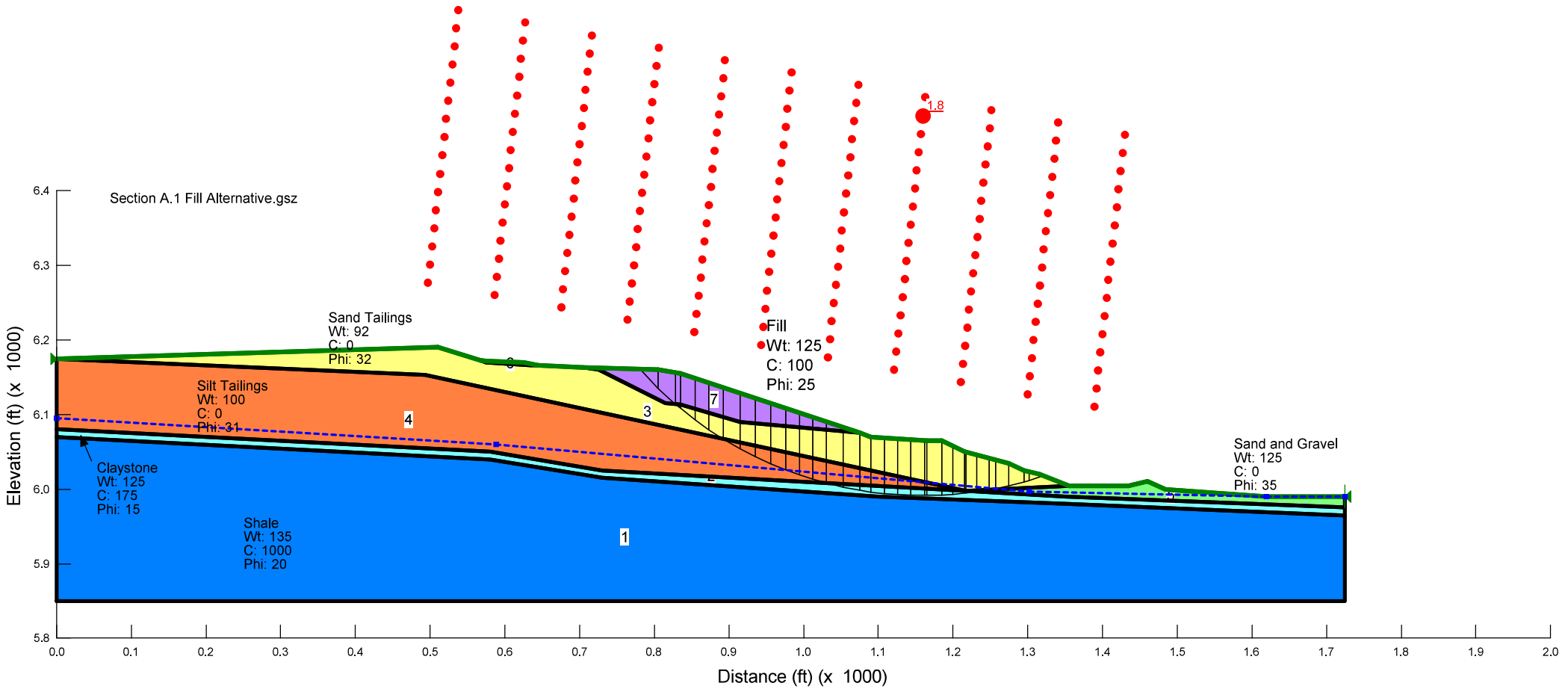
APPENDIX A

SLOPE STABILITY ANALYSIS



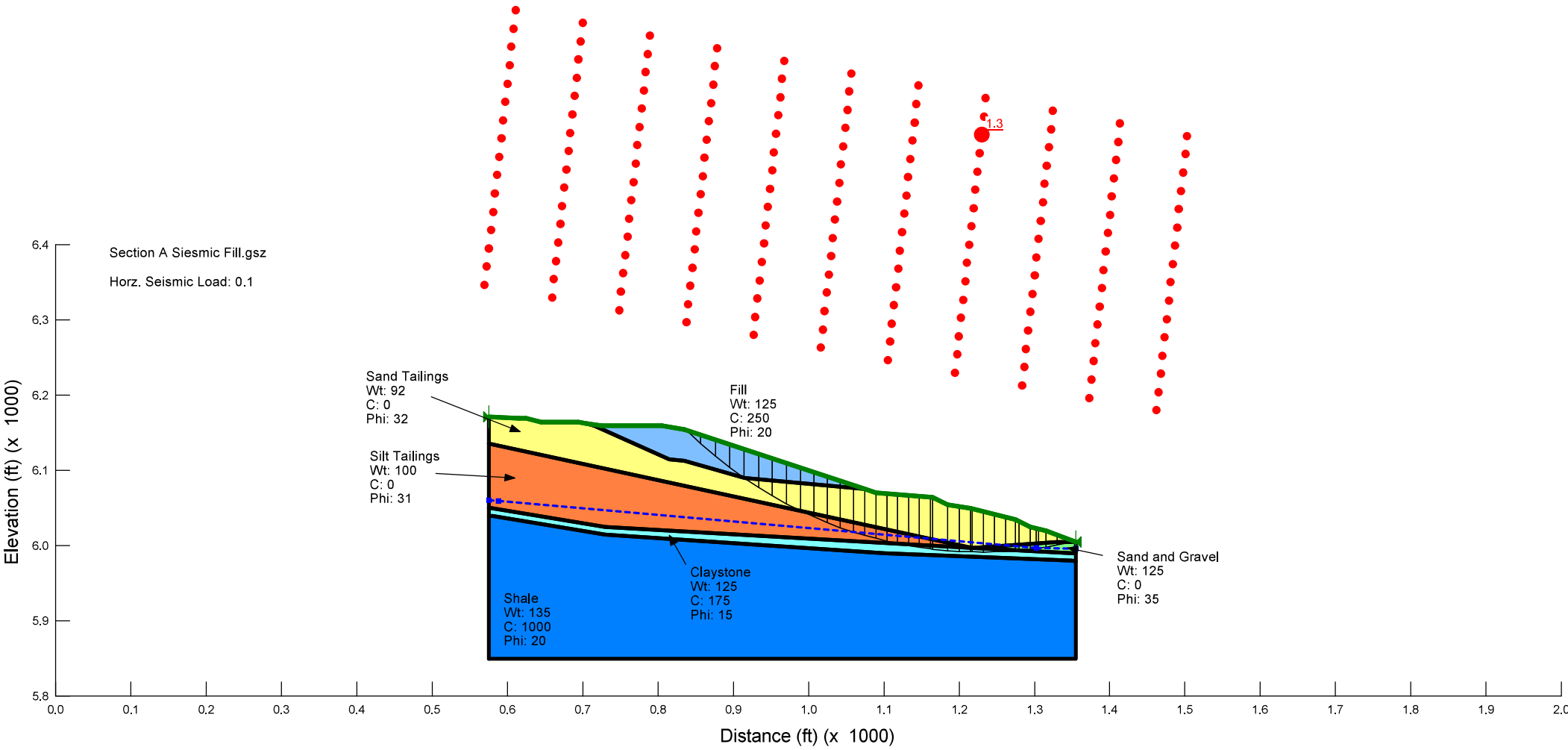
Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-1
Cross Section A



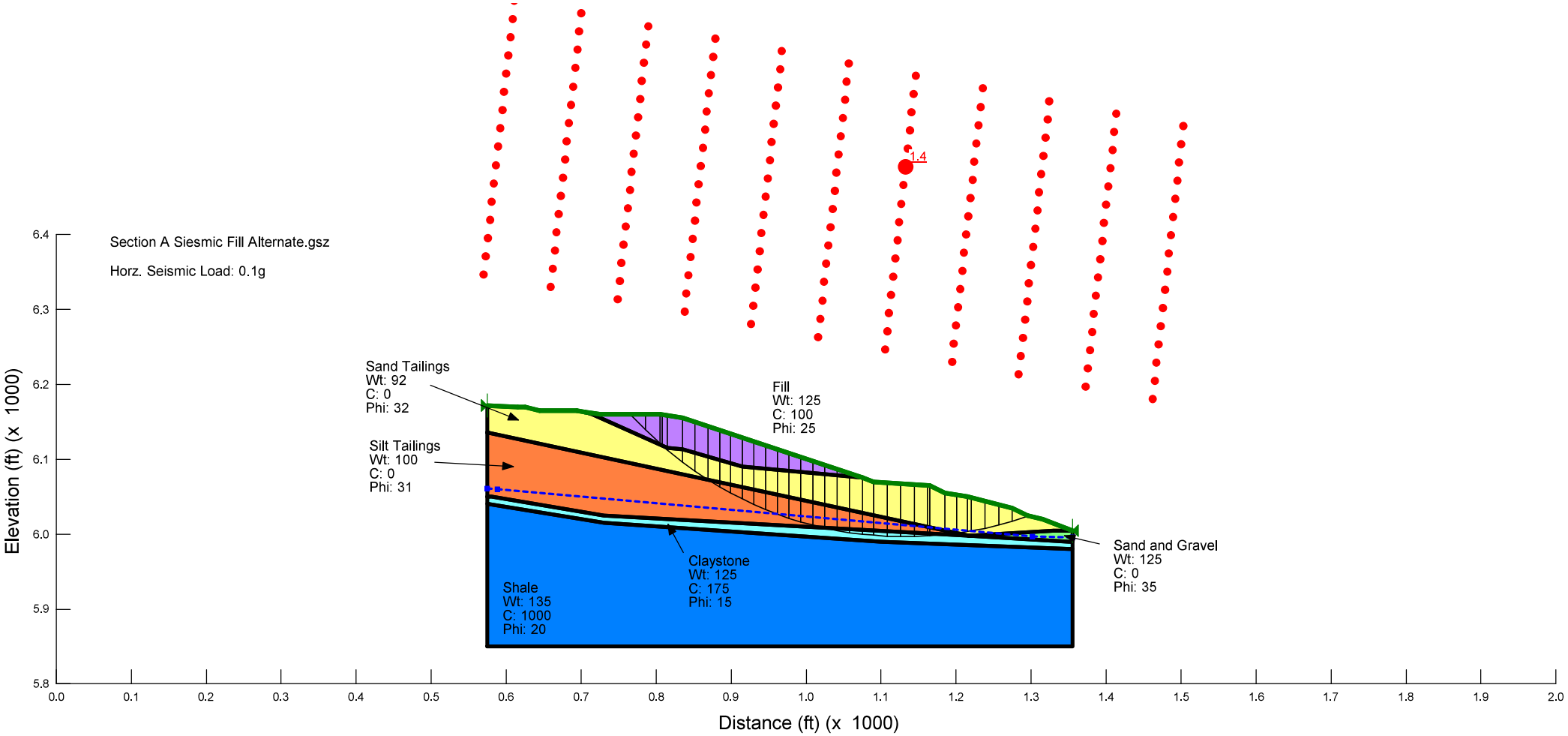
Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-2
Cross Section A



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-3
Cross Section A



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
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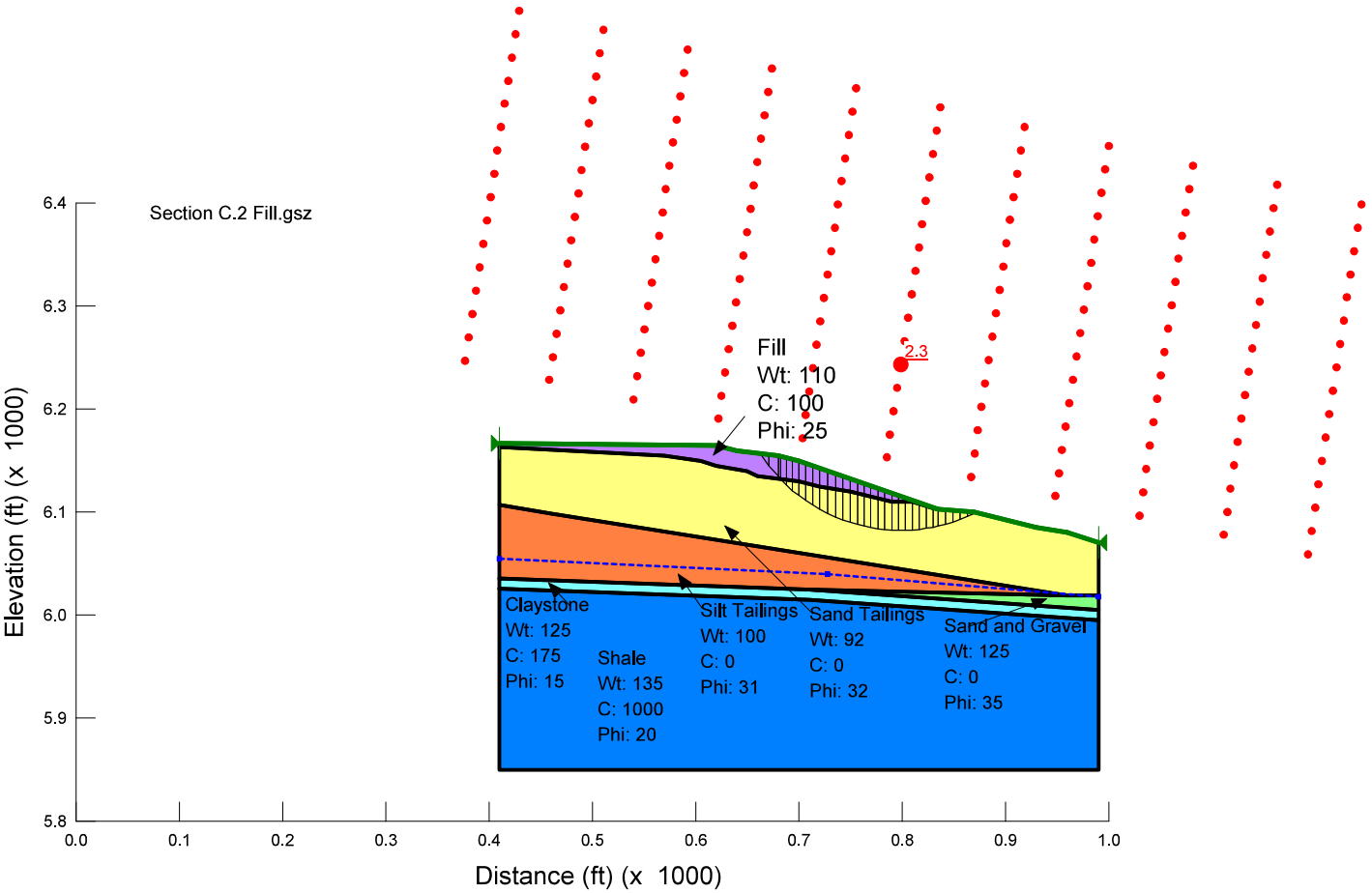
Fig. No. A-4
Cross Section A



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
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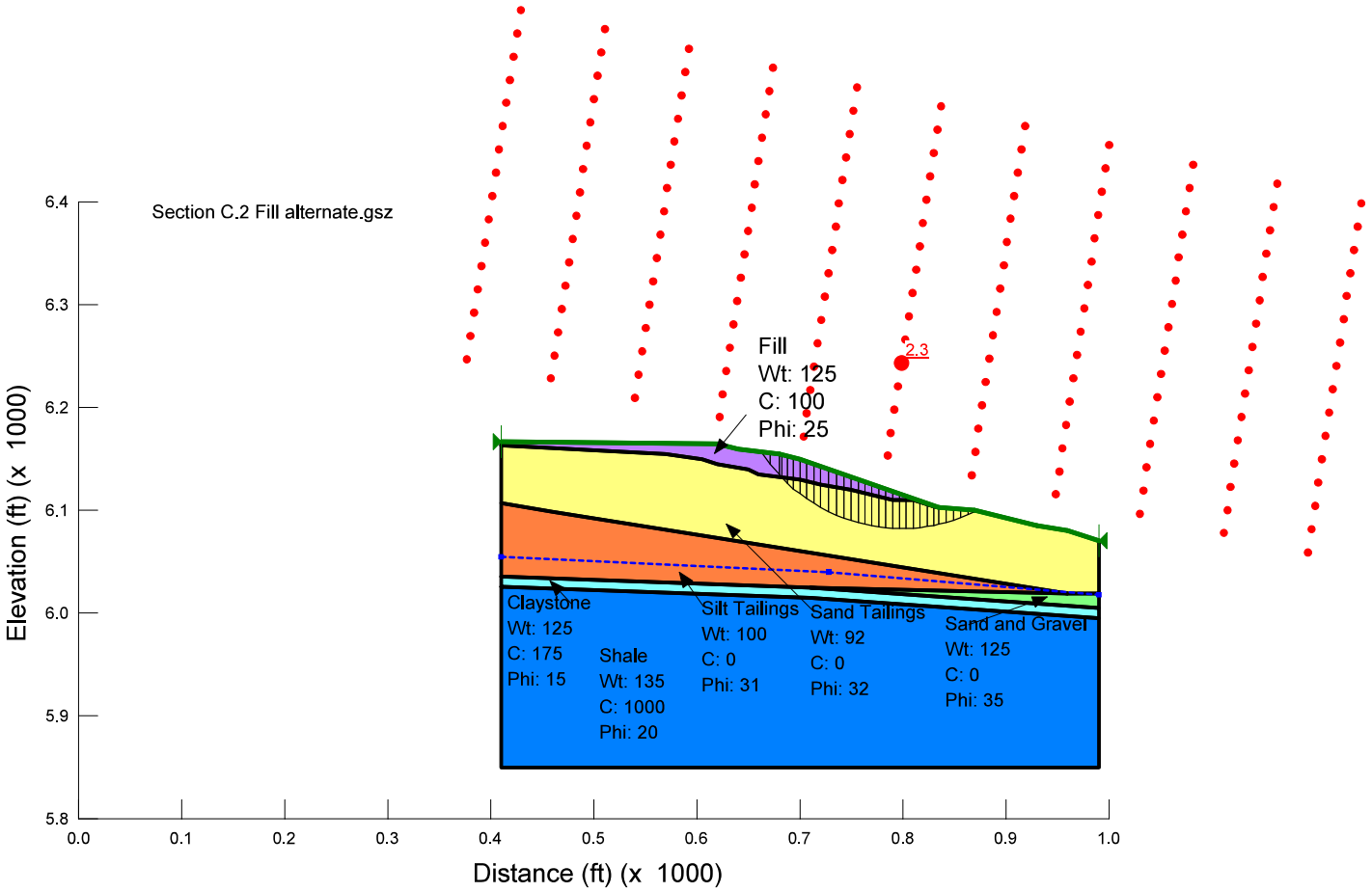
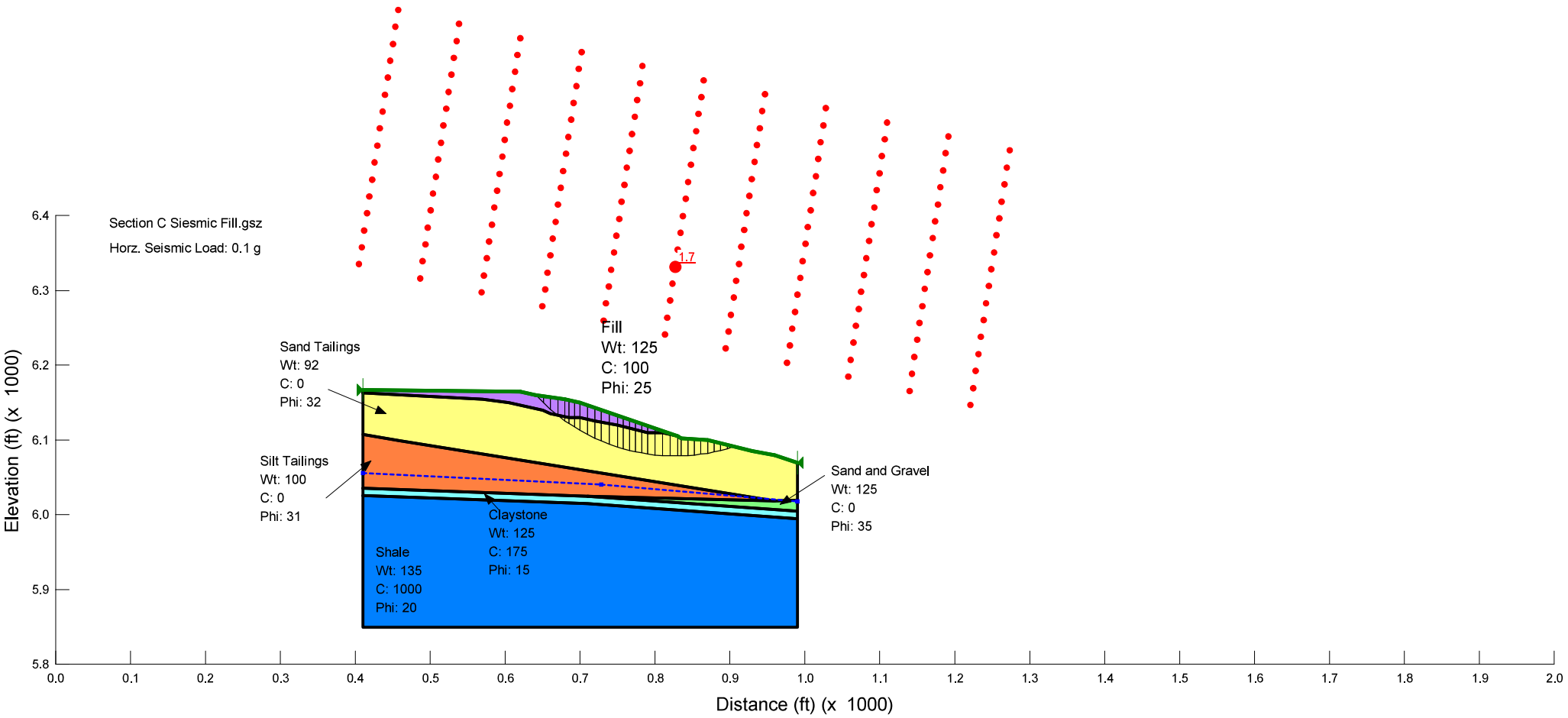
Fig. No. A-5
Cross Section C



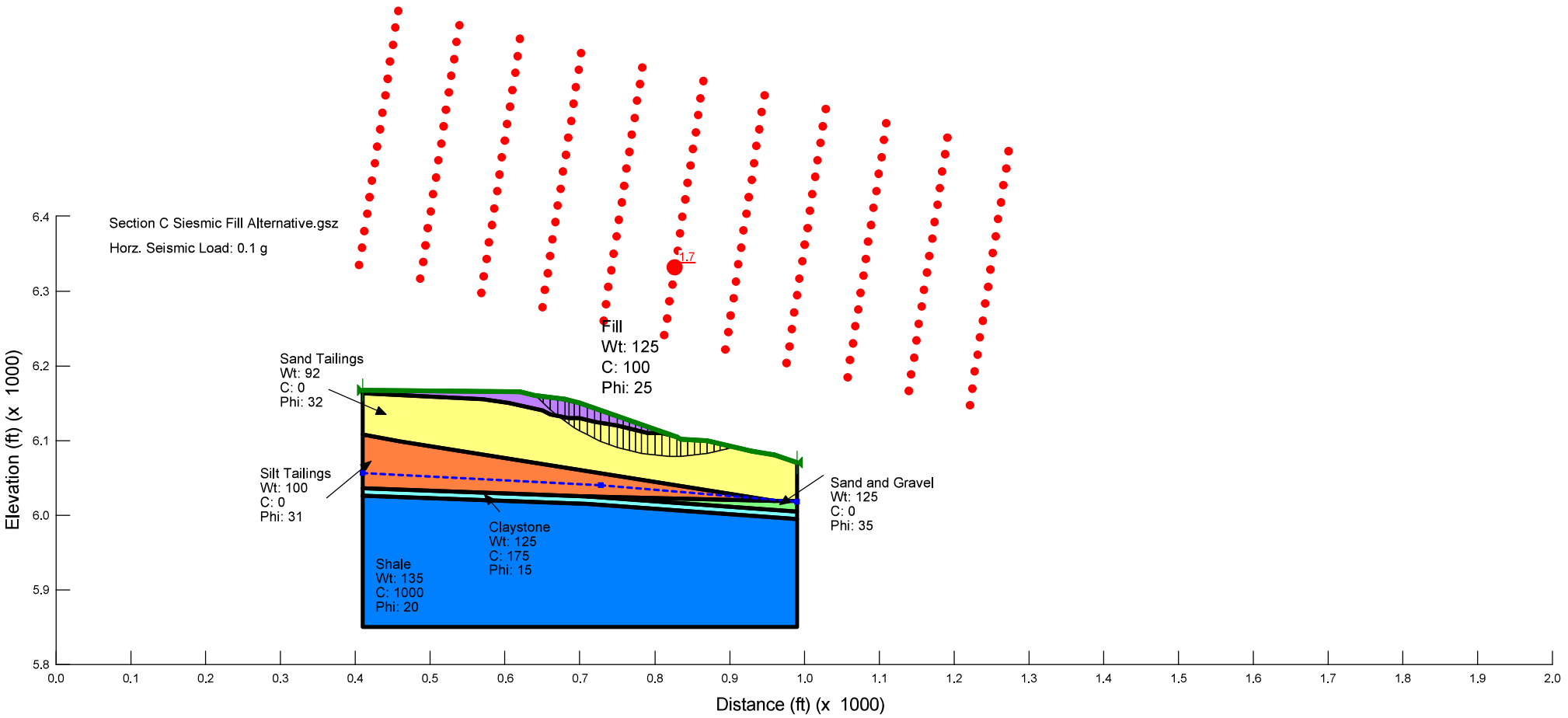
Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-6
Cross Section C



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-7
Cross Section C



Gold Hill Mesa Neighborhood, LLC.
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
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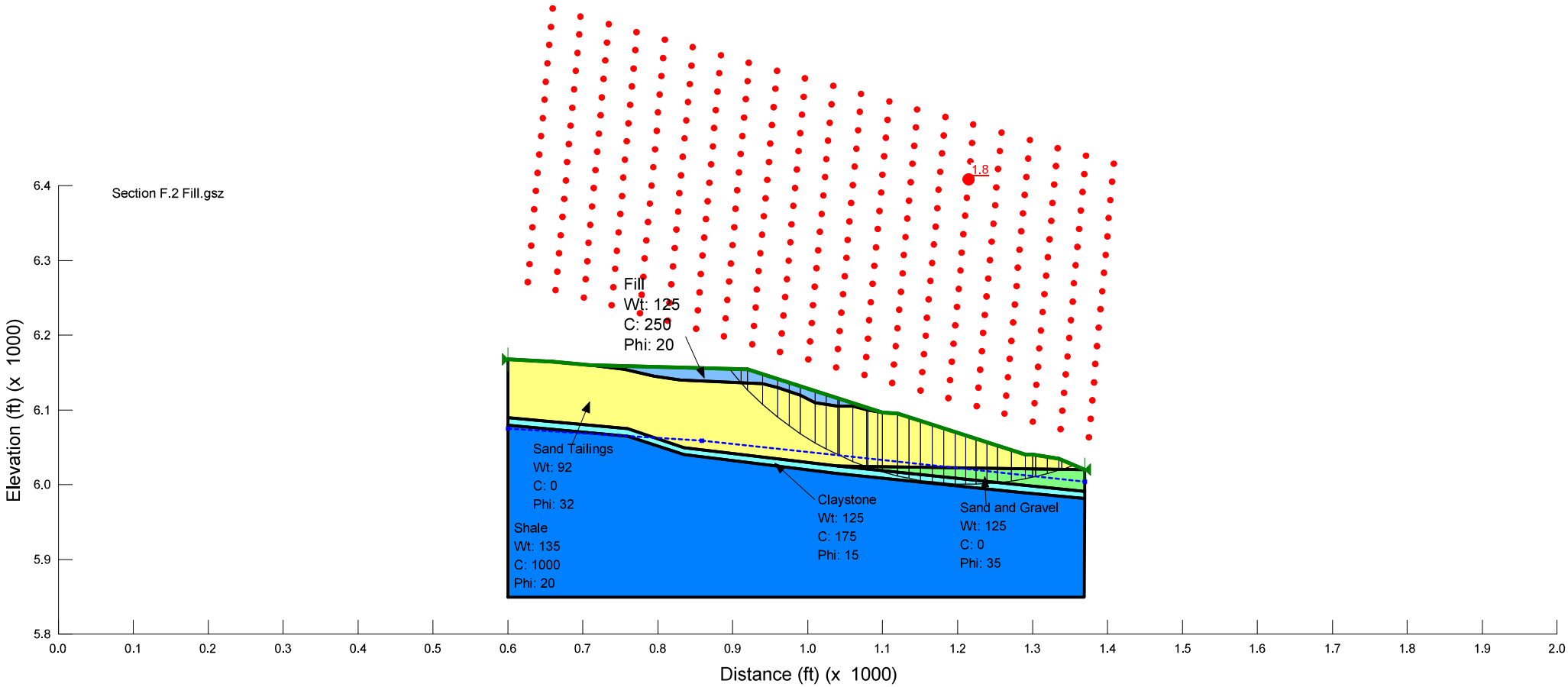
Fig. No. A-8
Cross Section C



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
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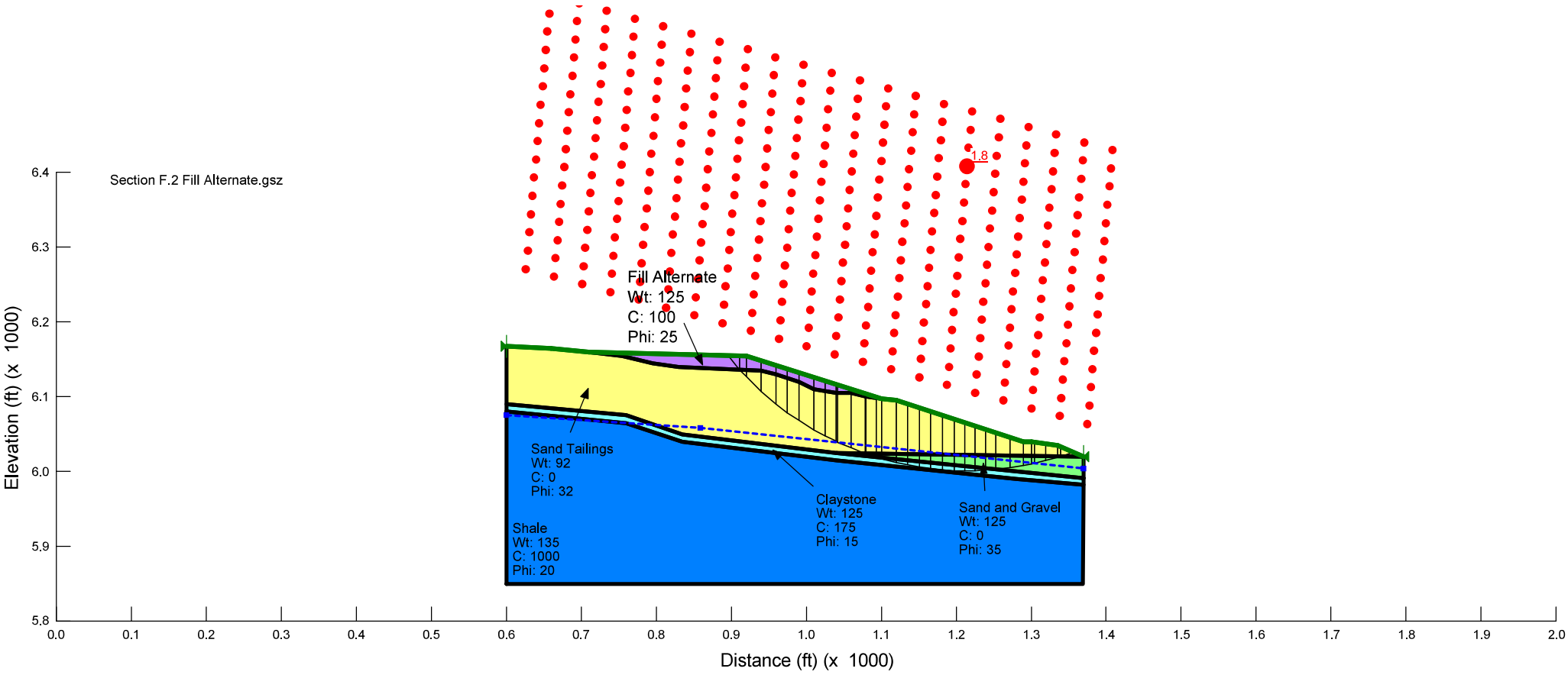
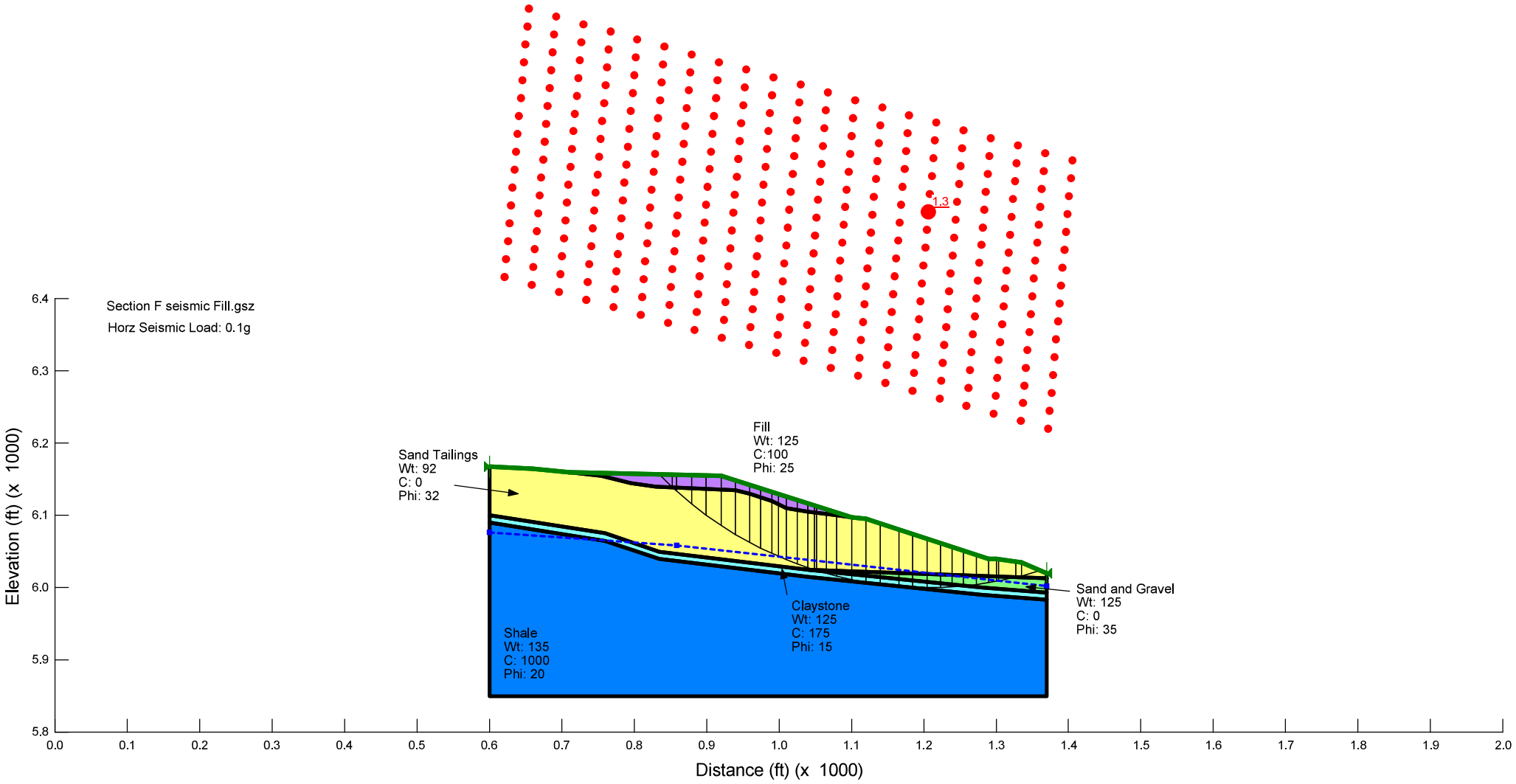
Fig. No. A-9
Cross Section F



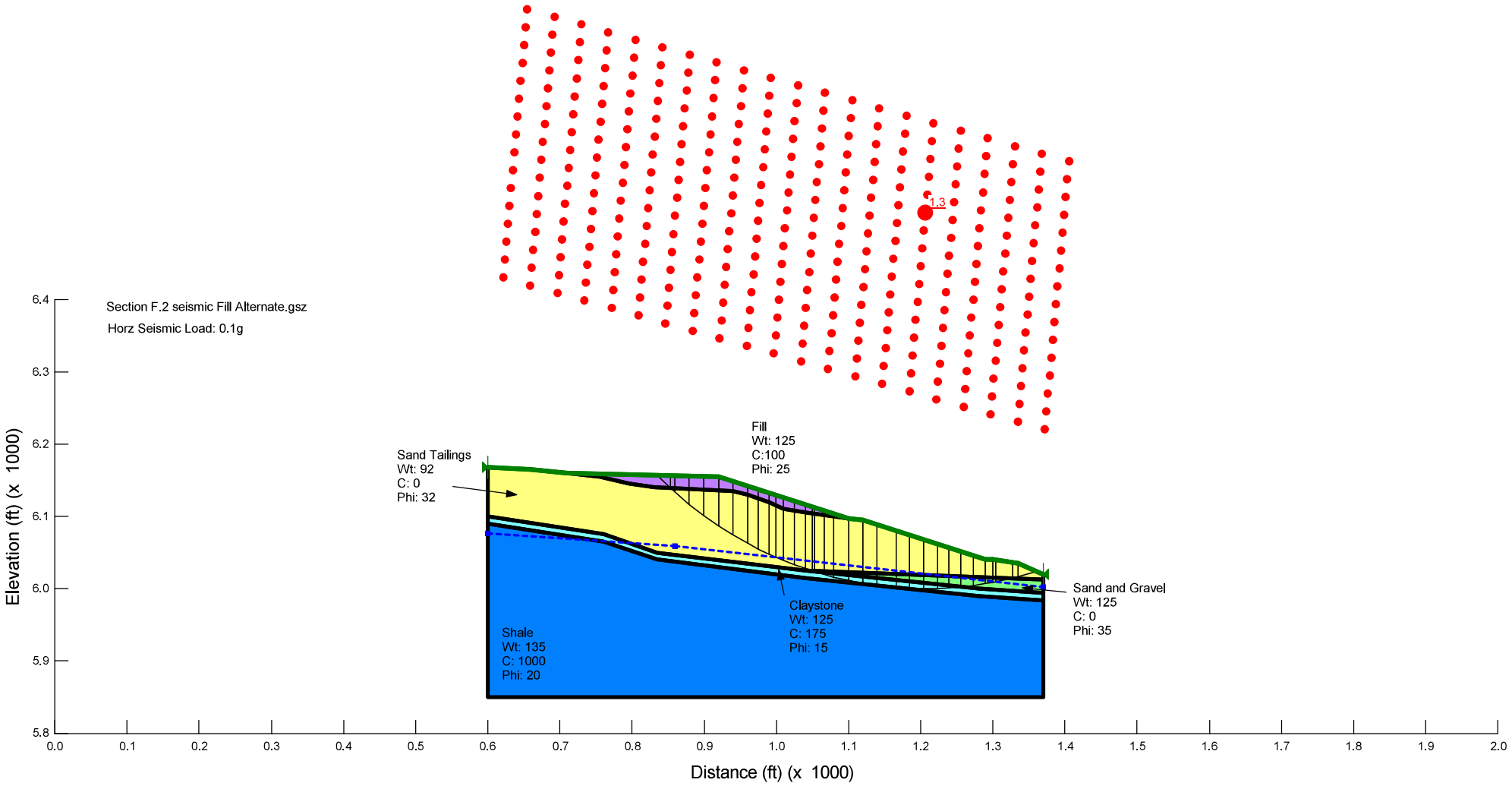
Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-10
Cross Section F



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
CTL|T PROJECT NO. CS18893-105

Fig. No. A-11
Cross Section F



Gold Hill Mesa Neighborhood, LLC
Gold Hill Mesa Filings 8, 9, 10, and Dam Face
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Fig. No. A-12
Cross Section F