GEOTECHNICAL INVESTIGATION
PARADISE HILLS PROJECT
BADGER CANYON AREA
TENTATIVE TRACT MAP NO. 18140
CITY OF SAN BERNARDINO, CALIFORNIA
PREPARED FOR
INLAND COMMUNITIES CORPORATION
JOB NO. 05894-3

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May 18, 2006

Inland Communities Corporation
1801 Avenue of the Stars, Suite 1205
Los Angeles, California 90067
Attention: Mr. Jim Ahmad

Job No. 05894-3

Dear Mr. Ahmad:

Attached herewith is the Geotechnical Investigation report prepared for Tentative Tract Map No. 18140, the Paradise Hills Project in the Badger Canyon area of the City of San Bernardino, California.

This report was based upon a scope of services generally outlined in our proposal, dated January 26, 2005, and other written and verbal communications.

We appreciate this opportunity to provide engineering geologic services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
C.H.J., INCORPORATED

James F. Cooke, Senior Staff Engineer

JFC:jfc/dmg

Distribution: Inland Communities Corporation (6)

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INTRODUCTION

During February and March of 2006, a geotechnical investigation was performed by this firm for Tentative Tract Map No. 18140, an approximate 175-acre project site, located in the Badger Canyon area of the City of San Bernardino, California. The purpose of this investigation was to explore and evaluate the geotechnical conditions at the subject site and provide appropriate geotechnical engineering recommendations for design of the proposed development. The location of the site is shown on the attached Index Map (Enclosure "A-1").

The geologic conditions at the site have previously been addressed in the Subsurface Investigation of Faulting report prepared by C. H. J. Incorporated, dated January 31, 2006. The proposal and scope of work for this investigation was based, in part, upon that report. To orient our investigation at the site, a 200-scale Geologic Map and Site Plan, prepared by C.H.J. Incorporated, dated January 27, 2006, was utilized. In addition, an AutoCAD preliminary grading layout, prepared by PBS&J, was provided for our use. The preliminary grading layout included a proposed development scheme with grading contours. The location of the site is shown on the attached Index Map (Enclosure "A-1").

The results of our geotechnical investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this geotechnical investigation included the following:

- Review of published and unpublished literature and maps
- Logging and sampling of 35 exploratory borings for testing and evaluation
- Laboratory testing on selected samples
- Evaluation of the geotechnical engineering data to develop site specific recommendations for site grading, conventional static foundation design, preliminary slope stability, and mitigation of potential geotechnical constraints

PROJECT CONSIDERATIONS

It is proposed to develop the approximate 175-acre site for residential use, including open space. This is expected to entail construction of one- to two-story wood frame buildings and associated infrastructure. The area of this investigation includes all of the proposed development area located south of the Recommended Restricted Use Zone (RRUZ) as defined in our Subsurface Investigation of Faulting report.

The final project grading plan was not available at the time of our investigation. Based on the AutoCAD preliminary grading layout prepared by PBS&J, it appears that grading for the proposed building pads may require the use of cut and fill slopes up to 55 feet in height. The final project grading plan should be reviewed by the geotechnical engineer.

SITE DESCRIPTION

The site is located on the southern flank and bordering alluvial fans of the western San Bernardino Mountains in the City of San Bernardino, California. The San Andreas Fault Zone (SAFZ) trends through the central portion of the site along the base of the mountains. Badger Canyon flows southward through the central portion of the site and divides the site into two areas designated for this investigation - the West Parcels and East Parcels, respectively. Flood control/debris basins and access roads form the southern boundaries of the site. The northern portion of the site is bounded by lands of the San Bernardino National Forest.

The West Parcels include the site area west of Badger Canyon extending to the western site boundary. The Andy Jackson Airpark (a large fill pad) and a private residence and associated acreage are located along the western site boundary. The West Parcels area encompasses steep and rugged terrain north of the SAFZ with a more moderately-sloping alluvial fan surface south of the SAFZ. The alluvial fans slope from a topographic divide near the mouth of Badger Canyon toward the south-southwest at gradients of approximately 8 1/2 (h) to 1 vertical (v) and are dissected by several south-southwest trending gullies and shallow ravines. A 72-inch-diameter water pipeline operated by the San Bernardino Valley Municipal Water District and associated 50-foot-wide easement trend east-southeast through the West Parcels area. Several dirt roads and various dirt tracks cross the area. The West Parcels area includes a narrow strip of land along the western edge of Badger Canyon that is bordered to the west by rugged granitic terrain. Numerous trees, including native sycamore, are located within this area.

The East Parcels area includes the site area east of Badger Canyon extending to the eastern site boundary located near the mouth of Sycamore Canyon. This site area is divided by a north-south trending strip of land included within a flood-control easement. The easement of the 72-inch-diameter water line trends along the southern boundary of the East Parcels area. In addition, a power pole alignment trends eastward across the East Parcels area from a debris basin near Badger Canyon to beyond the eastern site limit. Several infiltration basins are located southwest of the East Parcels area.

At the time of our investigation, the site was covered by annual grasses, weeds, and native shrubs. Stands of sycamore and other tree species were located along the SAFZ at numerous locations. Eucalyptus trees bordered a topographic bench area located in the West Parcels area of the site. Indications of past irrigation activity in this bench area included several sections of steel pipe and a small building foundation located north of the SAFZ. A building ruin and associated foundation structures were observed west of the mouth of Badger Canyon within the SAFZ. A sediment settling box associated with a water supply system for the former building was observed approximately 450 feet north-northeast of the building ruin adjacent to Badger Canyon. A second, larger area with associated foundations and ruins was located northeast of the proposed development area in Badger Canyon. A sediment settling box near a spring, remains of a shallow swimming pool, seepage pits, several fill pads, and several concrete slab foundations were located in this area. These structures were located within the proposed development area.

FIELD INVESTIGATION

The soil conditions underlying the subject site were explored by means of 35 exploratory borings drilled to a maximum depth of 51 1/2 feet below the existing ground surface with a truck-mounted CME 55 drill rig and a limited access, track-mounted drill rig, both equipped for soil sampling. The approximate locations of our exploratory borings are indicated on the attached Geologic Map and Site Plan (Appendix "A-2").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Relatively undisturbed samples were obtained by driving a split-spoon ring sampler ahead of the borings at selected levels. Within selected borings a standard penetration test (SPT) sampler was utilized. After the required seating of the sampler, the number of hammer blows required to advance the sampler a total of 12 inches was converted to equivalent SPT data and recorded on the boring logs. The number is the SPT-N_{60} value and has been corrected for hammer type (automatic vs. manual cathead) and sampler size (California sampler vs. SPT sampler). Undisturbed as well as bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our equivalent SPT data, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content tests on all samples returned to the laboratory and field dry densities on all undisturbed samples. The results are included on the boring logs. Optimum moisture content - maximum dry density relationships were established for typical soil types in order that the relative compaction of the subsoils might be evaluated. Direct shear and consolidation tests were performed on selected samples in order to provide shear strength and consolidation parameters for slope stability, bearing capacity, earth pressure and settlement evaluations. Sieve analyses were performed on selected samples of soil for classification purposes. Selected samples of material were delivered to Schiff Associates for chemical/corrosivity testing.

Summaries of the laboratory test results appear in Appendix "C".

AERIAL PHOTOGRAPH REVIEW AND SITE GEOMORPHOLOGY

The geomorphology (landforms) of the site was assessed for indications of faulting and other geologic hazards by review of geologic maps, topographic maps, and historic aerial photographs of the site and surrounding area. The geomorphology of the site area is dominated by the west-northwest trending South Branch SAFZ that separates a rugged upland terrain of steep slopes and ravines north of the fault from more moderately-sloping alluvial fans south of the fault. Badger Canyon crosses the South Branch SAFZ and associated older fault splays located to the north, and bisects the site. Several landslides exhibiting geomorphic expression are located west and east of Badger Canyon and are identified based on scarp and bench topography, arcuate bedrock contacts and lineaments, and hummocky topography. However, landslides are not located within the area of this investigation.

Several types of features visible on aerial photographs identify the major traces of the SAFZ in the site area. These include vegetational lineaments, linear troughs, offset drainages, shutter ridges, linear ridges, scarps, and beheaded drainages. The surface expression of the South Branch SAFZ appears to be obscured by recent (in the geologic sense) stream activity and grading at the mouth of Badger Canyon. The aerial photographs reveal several lineaments within bedrock terrain north of the South Branch SAFZ. Some of these are associated with landslide features.

With the exception of the former residence located near the mouth of Badger Canyon and the historic settlement area in Badger Canyon, little modification of the site is apparent since the time of the earliest aerial photographs reviewed. The earliest photographs (1938) show several fire breaks along ridge tops within the upland terrain of the site and trending parallel to the toe of the mountain front just south of the South Branch SAFZ. These modified surfaces extend to approximately the southern limit of the topographic scarp of the South Branch SAFZ across the western and eastern portions of the site. Plowing or discing is evident on the earliest photographs at the following locations:

- topographic bench area located north of the South Branch SAFZ in the West Parcels area,
- between the branches of Badger Canyon north of the settlement area,
- in level terrain located in the upland area east of Badger Canyon and north of the North Branch SAFZ, and
- on a bench located west of Badger Canyon.

A road or narrow disced area extends along the linear trough of the South Branch SAFZ in the East Parcels area.

Later photographs show the presence of various dirt roads within the site, the presence of the flood-control levees and settling basins (1963, 1964, 1965, 1971, 2001, 2005) and disturbed ground associated with construction of the high-pressure water line (1971, 2005). The mouth of Badger Canyon appears to be unmodified until the time of the 1963 photographs that show a small detention basin formed in the fan deposits. In addition, the 1963-era photographs show a large borrow area at the mouth of Sycamore Canyon near the eastern edge of the site, the presence of the existing levee in this area, and the residence located within the South Branch SAFZ just east of Sycamore Canyon. A denuded area is visible on the 1971-era photographs on the ridge top located east of Badger Canyon and may indicate a prior burn area. The 2004- and 2005-era color photographs reveal the locations of older reddish-brown soils mantling bedrock (forming pedogenic surfaces) in the upland areas north of the South Branch SAFZ. These reddish-brown soils represent areas where stable surfaces existed during the past. The Mill Creek strand of the SAFZ is revealed as traversing the area of these pedogenic surfaces. Field relations suggest that these soils, overlying the Mill Creek strand, are unruptured by faulting.

PREVIOUS INVESTIGATIONS

Prior investigations at the site include a subsurface investigation of faulting (CHJ, Inc., 2006), a geotechnical feasibility investigation with several trench explorations (CHJ, Inc., 1989), and a preliminary engineering geology investigation with geologic mapping by Gary S. Rasmussen and Associates (1990). Copies of these reports were reviewed for pertinent information with regard to the currently proposed project.

SUBSURFACE SOIL CONDITIONS AND GEOLOGIC MATERIALS

As observed during geologic mapping of the site and in our current explorations, the geologic materials at the site included a variety of bedrock and surficial geologic units. The geologic units mapped at the site as part of this investigation (Enclosure "A-4") are discussed below. We have adapted the nomenclature of Miller et al. (2001) for the geologic units.

FILL (f):

Fill material derived from local alluvial fans and composed of silty sand with gravel and cobbles was observed in and adjacent to roadways, adjacent to the pipeline easement in the West Parcels and East Parcels areas, and as shotcrete-covered embankments in gullies crossing the pipeline access road. Minor amounts of fill were encountered locally in our exploratory trenches near roadways and utility crossings. The area of the former residence near Badger Canyon and detention basin areas also included areas of fill placement. The locations of the larger fill areas are shown on Enclosure "A-4". Fill was encountered within Exploratory Boring Nos. 15 and 16 to depths of 7 and 2 feet bgs, respectively. Minor amounts of fill may be present in other modified areas of the site.

VERY YOUNG WASH, ALLUVIAL-FAN, AND COLLUVIAL DEPOSITS (Qw, Qf, Qc):

Very young deposits of late Holocene age (as designated by Miller et al., 2001) occurred in active drainages, on alluvial-fan surfaces, and on slopes within the site. The very young materials were composed primarily of gray to brown clean sand and silty sand with gravei and cobbles. The colluvial materials tend to be finer-grained and lack cobble-sized clasts relative to the wash deposits that are transported in the higher energy stream beds. Due to rapid emplacement, these materials are typically unconsolidated and may have a potential for settlement.

YOUNG ALLUVIAL-FAN DEPOSITS (Qyf5, Qyf3, Qyf2, Qyf1):

Young alluvial-fan deposits of late Holocene to late Pleistocene age (as designated by Miller et al., 2001) occurred south of the South Branch SAFZ across the site. These fan materials are derived and transported from the upland areas of the site along the major canyons (Devil Canyon, Badger Canyon, and Sycamore Canyon) and smaller drainages in the site area. Alluvial-fan materials vary from fine-grained sand to cobble and boulder-size clasts, are typically rounded, and form interbedded coarse and fine-grained units of variable lateral extent. Miller et al. (2001) base the relative ages of these units on the degree of consolidation, landscape position, degree of dissection, and grain size (Miller et al., 2001).

YOUNG LANDSLIDE DEPOSITS (Qyls):

Young landslide deposits of Holocene to late Pleistocene age were mapped in the mountainous terrain north of the site by Miller et al (2001). These occurred outside of the site area and were interpreted by Miller to be inactive under current climatic and seismic conditions.

OLD ALLUVIAL-FAN DEPOSITS (Qof3, Qof2):

Old alluvial-fan deposits of late Pleistocene age were mapped by Miller et al. (2001) along the base of the mountain front in the Western and Eastern Parcels areas. As observed in our explorations, these materials consisted primarily of consolidated, interbedded gravel and cobble conglomerate with silty sand matrix locally with boulder-sized clasts. Imbricated fluvial and debris flow fabrics occurred locally within the fan deposits. Brown to dark brown color hues are typical. Locally, unconsolidated zones were encountered in some borings based on equivalent blow counts. These less-consolidated zones may be a result of rapid emplacement of materials during debris flow events.

VERY OLD ALLUVIAL-FAN DEPOSITS (Qvof1):

Very old alluvial-fan deposits of early Pleistocene age (as designated by Matti et al., 2003) occurred locally as remnants on the uplifted bedrock surface north of the South Branch SAFZ, as a "sliver" of material along the SAFZ in the Eastern Parcels area, and south of the South Branch SAFZ at the western boundary of the site. Elevation differences between outcrops of Qvof suggest landslide or fault offset east of Badger Canyon in the upland area. These were well consolidated, moderately to well dissected, and have reddish-brown surface horizons.

VERY OLD LANDSLIDE DEPOSITS (Qvols):

Very old landslide deposits of middle to early Pleistocene age, lacking geomorphic expression, were located in the western portion of the site north of the North Branch SAFZ and locally in the Sycamore Canyon area. These deposits were not within the current development area.

CONGLOMERATE AND ARKOSE (Tc):

Reddish- to purplish-brown arkosic sandstone of variable grain size occurred as an elongated "wedge" of bedrock material between the South Branch and Mill Creek strands of the SAFZ. These materials were studied previously by Hillenbrand (1990). This wedge narrowed toward the west and "tapered out" west of Badger Canyon; however, slivers of sandstone were encountered locally within the South Branch SAFZ in the trench exposures near the western site boundary. As encountered in our prior trenches, the sandstone was locally highly sheared and crushed within the SAFZ. Bedding was measured in cross-bedded and conglomeratic units observed in the eastern portion of the site in road cut and waterfall exposures. Locally, the sandstone forms resistant, steep topography. West of Badger Canyon, Trench WT-4 exposed sandstone materials as landslide deposits in contact with granitic landslide materials. This sandstone was texturally and visually similar to exposures of the Potato Sandstone mapped to the east of the site and locally include the characteristic rounded pebbles and cobbles of the Potato Sandstone in the type area.

BIOTITE MONZOGRANITE (Kmg):

Monzogranite (herein referred to as granitic) bedrock of Cretaceous age (as designated by Miller et al., 2001) crops out between the Mill Creek and North Branch segments of the SAFZ in the area of the site. These materials are variously sheared and crushed as landslide deposits with pervasive fracture and shear fabric or consist of fresh, intact-appearing rock separated by diffuse shear and fracture surfaces. Straight-trending, slope-normal erosion rills and gullies characterize the drainage patterns formed in these materials. Weathering is intense within the upper few feet of this unit, especially where topography is subdued. Preservation of igneous contacts within the landslide deposits is suggested, in some exposures, by the presence of foliation in a medium-grained, homogeneous-appearing granitic unit near a contact with very fine-grained (possibly hydrothermally altered?), pervasively crushed unit with dark mineral coatings and staining. This contact trends roughly east-west and occurs near the trend of the Mill Creek strand of the SAFZ. It appears that all of the near-surface granitic materials located between the North Branch and Mill Creek strands of the SAFZ are landslide deposits.

DEBRIS FLOWS

Debris flow scars were noted in slopes located in the upland area of the site and in adjacent off-site areas. Abundant evidence of past debris flow activity was observed within the western portion of the site in the form of transported surficial soils, grus, and soot-laden alluvial deposits mantling alluviated portions of the site. Recent debris flow activity is evidenced by deposits containing abundant cobbles and small boulders noted in several drainages emanating from the upland area of the site. Incision and down-cutting of older debris flow deposits was noted in historic (glass and metal debris containing) sediments north of the western portion of the site. A comparison of topography based on aerial surveys flown prior and subsequent to January 2005 shows a marked widening and deepening of the channel of Badger Canyon. Mitigation methods for both temporary and long-term debris flow hazard should be applied in site planning where structures and/or improvements are planned near or on existing drainage pathways due to the presence of steep, potentially fire-denuded hillsides in the upland areas near and within the site. Potential debris flow paths include drainages with materials designated Qw on the Geologic Map and Site Plan.

GROUNDWATER AND LIQUEFACTION

With the exception of surface water flowing in a small creek located in the East Parcels area, no evidence of springs or perched groundwater conditions was observed south of the South Branch SAFZ on the site during the geologic field reconnaissance, the geologic mapping, or on the aerial photographs reviewed. In contrast, abundant evidence of a significant groundwater barrier formed by the South Branch SAFZ was observed in the form of heavy water seepage in trench exposures that crossed the fault zone. In several cases, trenches were relocated, reconfigured, or abandoned during our prior investigation to mitigate the hazard of trench collapse in saturated alluvial materials north of the South Branch SAFZ.

According to our review of available groundwater data, water wells representative of the groundwater conditions in the alluvium south of the South Branch SAFZ are not present within the site. Wells located south of the Devil Canyon levee and Badger Hill showed groundwater depths of greater than 80 feet for the time period from 1993 to present. These wells are situated at a lower elevation than the site. No groundwater was encountered in our exploratory borings to maximum depths of 51.5 feet. The depth to groundwater within the alluvial fan sediments at the site is anticipated to be greater than 52 feet below ground surface (bgs). Based upon the anticipated depth to groundwater and the poorly-sorted, granular character of the materials that underlie the alluvial fans of the site, the hazard posed by liquefaction is expected to be low in the site area.

Liquefaction is a process in which strong ground shaking causes saturated soils to lose their strength and behave as a fluid (Matti and Carson, 1991). Ground failure associated with liquefaction can result in severe damage to structures. The geologic conditions for increased susceptibility to liquefaction are: 1) shallow depth to groundwater (i.e., less than 50 feet); 2) the presence of unconsolidated sandy alluvium, typically Holocene in age; and 3) strong ground shaking. All three of these conditions must be present for liquefaction to occur. Based upon available groundwater data and geologic conditions encountered during this investigation, only one of the three geologic conditions for increased liquefaction susceptibility (strong ground shaking) is expected to exist on the site after removal of any loose hydroconsolidatable soils. Therefore, liquefaction is not considered to be a potential hazard to the proposed development.

At exposed interfaces, such as the alluvium/bedrock contact and fill over cut slopes, a potential exists for springs or seeps to develop, especially when considering future landscape irrigation. The seeps may result in minor nuisances or, in extreme cases, may lead to slope failure. Such contacts will need to be evaluated on a case-by-case basis as part of the geologic in-grading observation, and remedial measures may be necessary. Potential mitigation methods for fill over cut slopes include construction of a stabilization fill with a back-drain system. Such stabilization fills could also provide cosmetic improvement of slopes.

Subdrains are expected to be recommended where drainages/canyons are filled. Final subdrain locations and design should be determined by the engineering geologist and geotechnical engineer during grading.

SLOPE STABILITY ANALYSES

After reviewing the proposed 2(h):1(v) slopes on the preliminary grading layout, we constructed two slope stability cross sections to be analyzed: fill over cut slope and fill slope. For fill over cut slopes, fill material should extend horizontally from the slope face to a distance equal to the proposed slope height, or 15 feet, whichever is greater. As such, we included a 15-foot wide compacted fill face on the fill over cut slope cross section. For the fill slope, fills were assumed to be constructed on native soils of approximately 15 percent slope, after complete removal of all loose surface soils.

The calculations were performed for rotational failures under static and seismic condition utilizing the SLIDE computer program, version 5.024 (Rocscience, Inc., 2006). The seismic stability calculations were performed using a lateral pseudostatic coefficient "*k*" of 0.20 due to the proximity of the San Andreas fault. The factor of safety was calculated by Bishop's simplified, Janbu's simplified, and Janbu's corrected methods which indicated similar results for these relatively simple slopes.

The direct shear test results of selected representative relatively undisturbed as well as remolded samples are summarized in Table 1.

Table 1: Summary of Strength Parameters of On-site Soils

Boring No.	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C_{peak} (psf)	ϕ_{peak} (°)	C_{res} (psf)	ϕ_{res} (°)	RC (%)
8	12	SM	116	6.7	60	33.2	84	31.9	Undisturbed
15	15.5	SP-SM	112	2.8	284	34.7	132	35.7	Undisturbed
2	0	SM	119	9.0	120	35.7	84	35.4	90
4	0	SM	119	8.0	96	38.6	96	37.8	90
10	0	SM	120	8.5	156	36.1	60	36.7	90
20	0	GW	119	6.5	60	38.1	0	38.5	90
23	0	SM	121	9.0	174	37.4	60	38.3	90

Based on our exploratory boring data and above direct shear results, we generalized the native soil profile to consist of 15 feet of silty sands (SM), underlain by sands (SP-SM, or SW-SM). Two types of fill materials, with higher friction angle and lower cohesion strength and lower friction angle and higher cohesion strength, were selected based on direct shear results of remolded samples. Due to the high value of the seismic coefficient, peak shear strengths were utilized in the calculations of seismic slope stability, while residual shear strengths were utilized for static slope stability. The strength parameters utilized are summarized in Table 2.

Table 2: Strength Parameters Utilized in Calculation

	Static Condition		Seismic Condition	
	C_{res} (psf)	ϕ_{res} (°)	C_{peak} (psf)	ϕ_{peak} (°)
Fill Type 1	0	38	60	38
Fill Type 2	80	35	120	35
Silty Sand	60	31	50	33
Sand	100	35	150	34

Due to the high seismic coefficient, the seismic condition controls the slope stability of this site. Therefore, in our calculations, we evaluated the maximum stable height of 2(h):1(v) slopes at the seismic condition (Seismic Factor of Safety≥1.1) and then confirmed the static stability (Static Factor of Safety≥1.5) using residual shear strength.

The results of our slope stability analyses are summarized in Table 3. Stability calculation results are included in Enclosure "E-1" and "E-8").

Table 3: Summary of Slope Stability Results

Slope Type	Fill Material	Maximum Slope Height (ft)	Minimum Bench (ft)
Fill Slope	Type 1	55	8
	Type 2	30	0
Fill Over Cut Slope	Type 1	40	6
	Type 2	40	6

Based on the results of our slope stability calculations, it is our conclusion that special fill reinforcement measures, such as utilization of Geogrid, will be necessary if slopes are planned that will be steeper than 2(h):1(v) or higher than those shown in Table 3.

Because the slope stability depends significantly on the cohesive strength of fill materials, the stability of the fill and fill over cut slopes should be further evaluated during grading by verifying the strength parameters of the fill materials with additional direct shear testing performed by the geotechnical engineer on a regular basis. Fill material having the requisite strength parameters as shown in Table 2 should extend horizontally from the slope face to a distance equal to the proposed slope height or 15 feet, whichever is greater.

SETTLEMENT

Field density tests and SPT data indicate that the upper younger alluvial soils are in place in a loose to dense state. Consolidation testing of these soils indicates they have a moderate (0.8 to 2.5 percent) potential for hydroconsolidation. Because of the hydroconsolidation potential, we recommend that all such soils be completely removed and replaced as properly compacted material. The estimated depths of removal at each boring location are shown on the Geologic Map and Site Plan (Enclosure "A-2").

EXCAVATION POTENTIAL

Bedrock was not exposed on the surface at the site, nor was any bedrock encountered in the exploratory borings conducted as part of this investigation. However, there is a possibility of shallow bedrock existing in the northern portions of the site. Deep cuts performed as part of development may expose bedrock. The bedrock is expected to be generally rippable with conventional grading equipment (D-9 bulldozer or equivalent) to the depths planned, although no geophysical analysis with respect to rippability has been performed.

CONCLUSIONS

On the basis of our field and laboratory investigations, it is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint, provided the recommendations contained in this report are implemented during grading and construction.

Based upon our field investigation and test data, it is our opinion that the undocumented fill and loose/hydroconsolidatable native soils will not, in their present condition, provide uniform or adequate support for the proposed structures. Our density testing indicated highly variable in-situ conditions of the native soils, ranging from loose to very dense states. This condition may cause unacceptable differential and/or overall settlement upon application of the anticipated foundation loads. Site clearing can be expected to further aggravate the settlement-prone conditions.

Because of site conditions, it will be necessary to remove at least the upper 36 inches of existing soil in areas to be graded. Following the minimum removal, the engineering geologist should observe the bottom of the excavation prior to scarification to confirm that all undocumented fill and loose/hydroconsolidatable native soils have been removed. We anticipate that additional removals deeper than the minimum will be required in some areas. The estimated depths of removal at each boring location are shown on Enclosure "A-2". Removal depths may vary from estimates shown. To provide adequate support for the proposed structures, it is our recommendation that the building areas be further subexcavated as necessary and recompacted to provide a compacted fill mat beneath footings and slabs.

A compacted fill mat will provide a dense, uniform, high-strength soil layer to distribute the foundation loads over the underlying soils. Conventional spread foundations, either individual spread footings and/or continuous wall footings, may be utilized in conjunction with a compacted fill mat. All fills should be compacted to at least 90 percent relative compaction. In addition, all fills placed below a depth of 10 feet below finish grade surface should be compacted to at least 95 percent relative compaction.

Cut slopes as high as 30 feet are expected to remain grossly stable at a maximum inclination of 2(h):1(v). Cut slopes will be subject to surficial raveling, particularly those comprised of young alluvial materials.

Based on the results of our slope stability calculations, it is our conclusion that special fill reinforcement measures, such as utilization of Geogrid, will be necessary if fill or fill over cut slopes are planned that will be steeper than 2(h):1(v) or higher than those shown in Table 3, under the section entitled SLOPE STABILITY ANALYSES. **Because the slope stability depends significantly on the cohesive strength of fill materials, the stability of the fill and fill over cut slopes should be further evaluated during grading by verifying the strength parameters of the fill materials with additional direct shear testing performed by the geotechnical engineer on a regular basis. Fill material having the requisite strength parameters should extend horizontally from the slope face to a distance equal to the proposed slope**. For fill over cut slopes, fill material should extend horizontally from the slope face to a distance equal to the proposed slope height or 15 feet, whichever is greater.

Due to the depth to groundwater and the required removal of any loose soils, liquefaction is not considered to be a significant hazard to the site.

The on-site soils are generally granular and are considered to be non-critically expansive.

Results of corrosivity testing are presented in the section entitled CHEMICAL/CORROSIVITY TESTS.

A Subsurface Investigation of Faulting report was prepared by C.H.J., Incorporated, and the recommendations contained within that report should be adhered to in addition to the recommendations contained below.

RECOMMENDATIONS

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site pre-job meeting with the developer, the contractor and the geotechnical engineer should occur prior to all grading-related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of California Building Code (CBC). The following recommendations are presented for your assistance in establishing proper grading criteria.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped of significant vegetation and other deleterious materials. These materials should be removed from the site for disposal. Any existing utility lines should be traced, removed and rerouted from the building area.

To assist in undocumented fill and loose/hydroconsolidatable native soil identification, removal, and densification, it is our opinion that a minimum depth of 36 inches of existing soil below the existing ground surface within all areas to be graded should be completely removed and cleaned of significant deleterious materials. The removed and cleaned soils may be reused as properly compacted fill. In areas where those loose soils are not removed by the mandatory 36-inch removal or site grading, additional removals will be necessary. The bottom of the excavations should be observed by the engineering geologist to verify the complete removal of undocumented fill material and loose/hydroconsolidatable native soils. Approximate anticipated removal depths at each boring location are shown on Enclosure "A-2". Removal depths may vary from estimates shown. Following approval, the bottom should be scarified to a depth of approximately 12 inches, brought to between optimum moisture content and 3 percent above, and recompacted to at least 90 percent relative compaction (ASTM D 1557) prior to refilling the excavation to grade as properly compacted. In addition, all fills placed below a depth of 10 feet below finish grade surface should be compacted to at least 95 percent relative compaction.

In all areas to be graded, all existing uncontrolled fill and loose/hydroconsolidatable soils encountered during construction should be completely removed, cleaned of significant deleterious materials and may be reused as compacted fill. This includes all geologic and trench backfill created during the previous investigations.

If encountered, the abandonment of seepage pits will require that any existing effluent and water be pumped from the pits. Following the pumping, any loose and/or organic material that remains in the pits should be removed. The pits should be then backfilled with a one-sack sand slurry mixture to within approximately 6 feet of the finish grade elevation. Following the backfill, the area surrounding the seepage pits should be then excavated to a depth of approximately 6 feet below finish grade elevation.

The excavation should include all loose material surrounding the pit. In addition, the excavation should allow access for compaction equipment. The excavation should then be backfilled to finish grade elevation as properly compacted fill.

Cavities created by removal of subsurface obstructions such as structures, individual effluent disposal systems, and trees, and by the exploratory trenches utilized for the prior subsurface investigation of faulting, should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended for site fill.

PREPARATION OF FILL AREAS:

Prior to placing fill, the surfaces of all areas to receive fill should be scarified to a depth of 12 inches or more. The scarified soils should be brought to between optimum moisture content and 3 percent above and recompacted to a minimum relative compaction of 90 percent in accordance with ASTM D 1557.

PREPARATION OF FOOTING AREAS:

All footings should rest upon at least 18 inches of properly compacted fill material. In areas where the required thickness of compacted fill is not accomplished by site rough grading or mandatory removals, the footing areas should be subexcavated to a depth of 18 inches or more below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines. This subexcavation operation should include a minimum of the upper 36 inches of existing material, even though planned filling will be sufficient to satisfy compacted fill thickness requirements. The removal of the upper 36 inches of soil, regardless, is to assist in fill identification, revealing buried obstructions and removal of loose/hydroconsolidatable soils. The bottom of this excavation should then be scarified to a depth of at least 12 inches, brought to between optimum moisture content and 3 percent above, and recompacted to a minimum of 90 percent relative compaction in accordance with ASTM D 1557, prior to refilling the excavation to grade as properly compacted fill. In addition, all fills placed below a depth of 10 feet below finish grade surface should be compacted to at least 95 percent relative compaction.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from organic matter and other deleterious materials. Rock or similar irreducible material with a maximum dimension greater than 12 inches should be buried or placed in fills in accordance with recommendations described under the section entitled OVERSIZED MATERIALS.

Import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 8 inches in maximum dimension. Sources for import fill should be observed and approved by the geotechnical engineer prior to their use.

Fill should be spread in near-horizontal layers, approximately 8 inches in thickness. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift shall be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to between optimum moisture content and 3 percent above, and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D 1557. In addition, all fills placed below a depth of 10 feet below finish grade surface should be compacted to at least 95 percent relative compaction.

Based upon the relative compaction of the native soils determined during this investigation, and the relative compaction anticipated for compacted fill soils, we estimate a compaction shrinkage of approximately 10 to 15 percent. Therefore, 1.10 cubic yards to 1.15 cubic yards of in-place soil material would be necessary to yield one cubic yard of properly compacted fill material. In addition, we would anticipate subsidence of approximately 0.1 foot. These values are exclusive of losses due to stripping, tree removal, or the removal of other subsurface obstructions, if encountered, and may vary due to differing conditions within the project boundaries and the limitations of this investigation.

Values presented for shrinkage and subsidence are estimates only. Final grades should be adjusted, and/or contingency plans to import or export material should be made to accommodate possible variations in actual quantities during site grading.

OVERSIZED MATERIAL:

It is anticipated that 1 to 5 percent of oversized material (boulders greater than 12 inches) requiring special handling for disposal may be encountered during grading. While site-specific recommendations may be developed during grading plan preparation or in the field during construction, we are providing general methods for disposing of oversized rock on site for preliminary consideration.

Rocks greater than 12± inches in size should not be placed within 10 feet of finish grade. It should be cautioned that large rock below a depth of 10 feet may present difficulties in installing structures or utilities below that depth. Oversized material should not be "nested". Large rocks should be spread out when placed within the fill in a manner that will allow compaction of soil fill around the individual oversized rocks.

SLOPE CONSTRUCTION:

We have prepared the following general recommendations for slope construction that are typical for projects of this type.

Cut slopes as high as 30 feet are expected to remain stable at a maximum inclination of 2(h):1(v). Nevertheless, all cut slopes will be subject to surficial raveling and should be evaluated on a case-by-case basis during grading by the project engineering geologist. Cut slopes higher than 30 feet should be evaluated during site grading by the project engineering geologist.

Fill and fill over cut slopes should be constructed no steeper than 2(h):1(v). Based on the results of our slope stability calculations, it is our conclusion that special fill reinforcement measures, such as utilization of Geogrid, will be necessary if slopes are planned that will be steeper than 2(h):1(v) or higher than those shown in Table 3 under the section entitled SLOPE STABILITY ANALYSES. **Because the slope stability depends significantly on the cohesive strength of fill materials, the stability of the fill and fill over cut slopes should be further evaluated during grading by verifying the strength parameters of the fill materials with additional direct shear testing performed by the geotechnical engineer on a regular basis. Fill material having the requisite strength parameters should extend horizontally from the slope face to a distance equal to the proposed slope height.** For fill over cut slopes, fill material should extend horizontally from the slope face to a distance equal to the proposed slope height or 15 feet, whichever is greater.

Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. Where fills are to be placed against existing slopes steeper than 5(h):1(v), the existing slopes should be benched into competent native materials to provide a series of level benches to seat the fill and to remove the compressive and permeable topsoils. The benches should be a minimum of 8 feet in width, constructed at approximately 4-foot vertical intervals. In addition, a shear key should be a constructed across the toe of the slope. The shear key should be a minimum of 15 feet wide and should penetrate a minimum of 2 feet beneath the toe of the slope into firm competent soils (Appendix "D").

Where fill over cut slopes are designed, removal and replacement as compacted fill of the cut portion of the slope face should be performed. Fill should be keyed, benched, and compacted as described above and under the section entitled COMPACTED FILLS. Horizontal thickness of the fill from the slope face should be a minimum of 15 feet. Within the cut portion of the slope, horizontal thickness should not be greater at the top than at the bottom.

Potentially unstable boulders exposed in the slope faces should be removed during construction.

SLOPE CREEP:

The outer, upper portions of cut and fill slopes will be subject to potential long-term movements due to creep or erosion forces. All proposed improvements planned near or on the top of slopes, including garden walls, flatwork, and pools, should be designed and constructed to reduce the effects of this movement. Where possible, improvements should be designed as far from the top of slope as possible. At a minimum, footings should be designed so that there is a least a 5-foot separation from the face of slope to the face of the footing. This may necessitate deepened footings. The actual design of walls near the tops of slopes will be based on the wall loading conditions and the earth pressure required to resist these loads. This will fall under the purview of the wall designer, who should consult this firm if actual earth pressure information is required.

SLOPE PROTECTION:

Inasmuch as the native materials are susceptible to erosion by running water, it is our recommendation that the slopes at the project be planted as soon as possible after completion. The use of succulent ground covers, such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the water system and to prevent over watering.

Measures should be provided to prevent surface water from flowing over slope faces.

SUBDRAINS:

Fill construction may involve placement of relatively permeable fill over native older alluvium. The result may be conditions conducive to ponding or perching of landscape irrigation water at the fill/native interfaces. Additionally, cuts may also expose perched water, springs, and seeps. Subdrains may be recommended based on conditions observed by the engineering geologist at the time of grading. A typical subdrain design is included in Appendix "D" of this report.

If encountered, springs and seeps in cut areas or areas with a potential for springs and seeps will need evaluation on a case-by-case basis as to the most practical mitigation recommendations. The need for subdrains or alternative mitigation recommendations should be made by the engineering geologist at the time of grading.

FOUNDATION DESIGN:

If the site is prepared as recommended, the proposed residential structures may be safely founded on conventional spread foundations, either individual spread footings and/or continuous wall footings, bearing on a minimum of 18 inches of compacted fill. Footings should be a minimum of 12 inches wide and should be established at a minimum depth of 12 inches below lowest adjacent final subgrade level. For the minimum width and depth, footings may be designed for a maximum safe soil bearing pressure of 2,000 pounds per square foot (psf) for dead plus live loads. This allowable bearing pressure may be increased by 500 psf for each additional foot of width and by 1,000 psf for each additional foot of depth to a maximum safe soil bearing pressure of 3,500 psf for dead plus live loads. These bearing values may be increased by one-third for wind or seismic loading.

Footings should be set back from all slopes in accordance with information contained in Appendix "D".

For footings thus designed and constructed, we would anticipate a maximum settlement of less 1 inch. Differential settlement between similarly loaded adjacent footings is expected to be approximately one-half the total settlement.

Conventional spread foundations, either individual spread footings and/or continuous wall footings should not be allowed to span from shallow fill to deep fill soil conditions. Should grading result in a situation within any single structure where footings bear on more than 5 feet of compacted fill, the subexcavation for that structure area should be deepened as necessary so as to provide a relatively uniform fill mat below bottom of the footing. For fill depths less than 16 feet, minimum fill thickness should be one-half the maximum depth of fill. For fills depths deeper than 16 feet, minimum fill thickness should not be less than the maximum fill thickness minus 8 feet. This deepening of the subexcavation may involve additional removals of older alluvium soils. The "structure area" includes the structure footprint and the zone of influence consisting of a 1(h):1(v) downward projection from 5 feet outside the structure footing. A differential fill detail is included in Appendix "D" to this report. Where the depth of subexcavation exceeds 5 feet below finish grade, the overexcavation should extend beyond the footing lines at the bottom of the excavation laterally a minimum distance equal to the depth of subexcavation plus 5 feet (i.e., should subexcavation equal a depth of 15 feet below bottom of footing, the bottom of the subexcavation should extend laterally a distance of 20 feet beyond the footing lines). A determination of specific structural pad areas that require additional subexcavation should be performed at the time of grading. In addition, all fills placed below a depth of 10 feet below finish grade surface should be compacted to at least 95 percent relative compaction.

LATERAL LOADING:

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 450 psf per foot of depth. Base friction may be computed at 0.40 times the normal load. Base friction and passive earth pressure may be combined without reduction.

For preliminary retaining wall design purposes with level, properly drained backfill and no additional surcharge loadings, a lateral active earth pressure developed at a rate of 35 psf per foot of depth should be utilized for unrestrained conditions. For restrained conditions, an at-rest earth pressure of 65 psf per foot of depth should be utilized.

For walls with 2(h):1(v) inclined properly drained backfill with no additional surcharge loadings, a lateral active earth pressure developed at a rate of 50 psf per foot of depth should be utilized for unrestrained conditions. For restrained conditions, an at-rest earth pressure of 95 psf per foot of depth should be utilized.

For walls with 1.5(h):1(v) inclined properly drained backfill as provided for in the section entitled SLOPE CONSTRUCTION, with no additional surcharge loadings, a lateral active earth pressure developed at a rate of 75 psf per foot of depth should be utilized for unrestrained conditions. For restrained conditions, an at-rest earth pressure of 105 psf per foot of depth should be utilized.

The "at-rest" condition applies toward braced walls which are not free to tilt. The "active" condition applies toward unrestrained cantilevered walls where wall movement is anticipated. The structural designer should use judgment in determining the wall fixity and may utilize values interpolated between the "at-rest" and "active" conditions where appropriate. These values do not include a factor of safety other than conservative modeling of the soil strength parameters. If backfills inclined at other than 2(h):1(v) are proposed, this firm should be contacted to develop appropriate earth pressure parameters. If import material is to be utilized for backfill, an engineer from this firm should verify the backfill has equivalent or superior strength values.

These values should be verified prior to construction when the backfill materials and conditions have been determined and are applicable only to properly drained backfills with no additional surcharge loadings. Toe bearing pressure for walls on soils not bearing against compacted fill as described earlier under PREPARATION OF FOOTING AREAS should not exceed CBC values.

Backfill behind retaining walls should consist of a soil of sufficient granularity that the backfill will properly drain. The granular soil should be classified per the USCS as either a GW, GP, SW, SP, SW-SM, or SP-SM. Surface drainage should be provided to prevent ponding of water behind walls. A drainage system should be installed behind all retaining walls consisting of any of the following:

1. A 4-inch diameter perforated PVC (Schedule 40) pipe or equivalent at the base of the stem encased in 2 cubic feet of granular drain material per linear foot of pipe; or

2. Synthetic drains such as Enkadrain, Miradrain, Hydraway 300, or equivalent.

Perforations in the PVC pipe should be 3/8-inch diameter. Granular drain material should be wrapped with filter cloth to prevent clogging of the drains with fines. Walls should be waterproofed to prevent nuisance seepage. Water should outlet to an approved drain.

Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for site fill.

TRENCH EXCAVATION:

The soils encountered within our exploratory borings are generally classified as a Type "B" soil in accordance with the Cal/OSHA excavation standards. Unless specifically evaluated by our engineering geologist, all the trench excavations should be performed following the recommendation of Cal/OSHA Type "B" soil in accordance with the Cal/OSHA excavation standards. Based upon a soil classification of Type "B", the temporary excavation should not be inclined steeper than 1(h):1(v) for maximum trench depth of less than 20 feet. For trench excavation deeper than 20 feet, or for conditions that differ from those described for Type "B" in the Cal/OSHA excavation standards, this firm should be contacted.

SLABS-ON-GRADE:

To provide adequate support, concrete slabs-on-grade should bear on a minimum of 12 inches of compacted soil. Concrete slabs-on-grade should be a minimum of 4 inches in thickness. The soil should be compacted to 90 percent relative compaction. The final pad surfaces should be rolled to provide smooth dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor barrier. This vapor barrier should consist of polyethylene film, no less than 10 mil in thickness, and be in compliance with ASTM E 1745. The film should be properly sealed and protected from punctures and other damages. One inch of sand over the membrane will reduce punctures and aid in obtaining a satisfactory concrete cure. The sand should be moistened just prior to the placing of concrete.

EXPANSIVE SOILS:

Since all materials encountered during this investigation were granular and considered to be non-critically expansive, specialized construction procedures to specifically resist expansive soil forces are not anticipated at this time. Requirements for reinforcing steel to satisfy structural criteria are not affected by this recommendation. Additional evaluation of soils for expansion potential should be conducted by the geotechnical engineer during the grading operation.

POTENTIAL EROSION:

The potential for erosion should be mitigated by proper drainage design. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water.

CHEMICAL/CORROSIVITY TESTING:

Selected samples of materials were delivered to Schiff Associates for soil corrosivity testing. Laboratory testing consisted of pH, resistivity, and major soluble salts commonly found in soils. The results of the laboratory tests performed by Schiff Associates appear in Appendix "C".

These tests have been performed to screen the site for potentially corrosive soils. Although C.H.J., Incorporated does not practice corrosion engineering, values from the soil tested are considered potentially "mildly" corrosive to ferrous metals at as-received condition and "mildly" to "moderately" corrosive at saturated condition. Specific corrosion control measures, such as coating of the pipe with non-corrosive material or alternative non-metallic pipe material, are considered to be needed if there is a potential for saturated soils.

Testing indicated that the nitrate and ammonium testing was not considered corrosive to copper.

Results of the soluble sulfate testing indicate a "negligible" anticipated exposure to sulfate attack. Based upon the criteria from Table 4.3.1. of the American Concrete Institute Manual of Concrete Practice (2000), no special measures. such as specific cement types, water-cement ratios, etc., will be needed for this "negligible" exposure to sulfate attack.

The soluble chloride content of the soils tested was not at levels high enough to be of concern with respect to corrosion of reinforcing steel. The results should be considered in combination with the soluble chloride content of the hardened concrete in determining the effect of chloride on the corrosion of reinforcing steel.

C.H.J., Incorporated does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, are required, then a competent corrosion engineer could be consulted.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The presence of the geotechnical engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the contractor, his employees or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

C.H.J., Incorporated has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of C.H.J., Incorporated. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions be encountered in the field, by the client or any firm performing services for the client or the client's assign, that appear different from those described herein, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
C.H.J., INCORPORATED

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San Bernardino County Flood Control District, May 28, 1964, Black and White Aerial Photographs, Photograph Nos. 54 and 55.

San Bernardino County Flood Control District, January 4, 1965, Black and White Aerial Photograph, Photograph No. 158.

San Bernardino County Flood Control District, December 3, 1965, Black and White Aerial Photographs, Photograph Nos. 118 and 122.

San Bernardino County Flood Control District, October 8, 1971, Black and White Aerial Photographs, Photograph Nos. 18 and 19.

San Bernardino County Flood Control District, June 15, 2001, Black and White Aerial Photograph, Photograph No. C-541.

San Bernardino County Flood Control District, December 20, 2004, Color Aerial Photograph, Photograph No. C-550, 3-6.

San Bernardino County Flood Control District, January 19, 2005, Color Aerial Photographs, Photograph Nos. 17-37, -38, -39, 18-38, -39, -40, -41, and -42.

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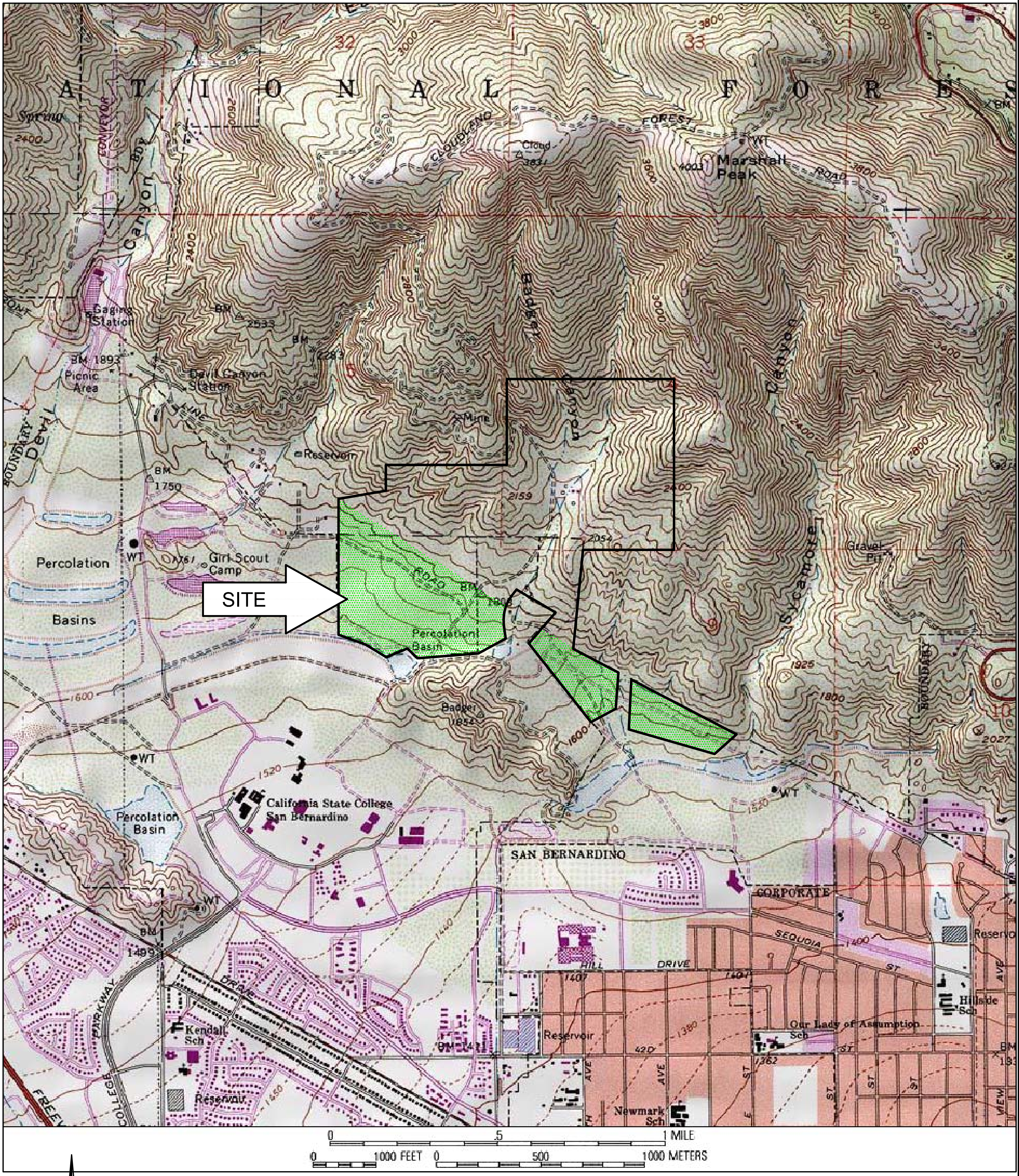
APPENDIX "A"

GEOTECHNICAL MAPS



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SCALE: 1"= 2,000'

INDEX MAP

FOR: INLAND COMMUNITIES CORPORATION	GEOTECHNICAL INVESTIGATION TENTATIVE TRACT MAP NO. 18140 BADGER CANYON AREA SAN BERNARDINO, CALIFORNIA	ENCLOSURE "A-1"
DATE: MAY 2006		JOB NUMBER 05894-3

C.H.J. Incorporated

C.H.J. Incorporated

GEOLOGIC MAP AND SITE PLAN

ENCLOSURE: "A-2"

PROJECT: PARADISE HILLS
SAN BERNARDINO, CALIFORNIA

PREPARED FOR:
INLAND COMMUNITIES CORPORATION
JOB NO.: 05894-3
DATE: MARCH 27, 2006

GEOLOGIC UNITS

Quaternary – Holocene / Pleistocene:
- Qc - very young colluvial deposits
- Qyf5 - young alluvial fan deposits (late Holocene)
- Qyf3 - young alluvial fan deposits (late and middle Holocene)
- Qyf2 - young alluvial fan deposits (early Holocene)
- Qyf1 - young alluvial fan deposits (early Holocene and late Pleistocene)
- Qyls - young landslide deposits (Holocene and late Pleistocene)
- Qof3 - old alluvial fan deposits (late Pleistocene)
- Qof2 - old alluvial fan deposits (late Pleistocene)
- Qols - old landslide deposits (late to middle Pleistocene)
- Qvof1 - very old alluvial fan deposits (early Pleistocene)
- Qvols - very old landslide deposits (middle to early Pleistocene)

Tertiary:
- Tc - Sandstone - conglomerate and arkose (landslide deposits locally)

Mesozoic:
- Kmg - granitic rock (landslide deposits of variable age)
- Mzdc - gneiss

Paleozoic:
- Pzcu - carbonate rocks

SCALE: 1" = 200'

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APPENDIX "B"

EXPLORATORY LOGS

KEY TO LOGS

LEGEND OF LAB/FIELD TESTS:

AL	Atterberg Limits (ASTM D 438)
Bulk	Indicates Disturbed or Bulk Sample
Consol.	Consolidation Test (ASTM D 2435)
Cor.	Chemical/Corrosivity Tests (ASTM G 57, ASTM C 51, ASTM C 114)
Dist.	Indicates Disturbed Sample
DS	Direct Shear Test (ASTM D 3080)
Exp.	Expansion Test (California Building Code Standard Test Method 18-2)
MDC	Maximum Density Optimum Moisture Determination (ASTM D 1557)
N.R.	Indicates No Recovery of Sample
Ring	Indicates Undisturbed Ring Sample. Undisturbed Ring Samples are obtained with a "California Sampler" (3.25" O.D. and 2.42" I.D.) driven with a 140-pound weight falling 30 inches. The blows per foot are converted to equivalent SPT values.
SA	Sieve Analysis (ASTM C 136)
SPT	Indicates Standard Penetration Test. The SPT N-value is the number of blows required to drive an SPT sampler 12 inches using a 140-pound weight falling 30 inches. The SPT sampler is 2" O.D. and 1 3/8" I.D.

ENGINEERING PROPERTIES FROM SPT BLOWS

Relationship of Penetration Resistance to Relative Density for Cohesionless Soils*
(After Mitchell and Katti, 1981)

Number of SPT Blows (N_{60})	Descriptive Relative Density	Approximate Relative Density (%)
<4	Very Loose	0-15
4-10	Loose	15-35
10-30	Medium Dense	35-65
30-50	Dense	65-85
>50	Very Dense	85-100

* At an effective overburden pressure of 1 ton per square foot (100 kPa)

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SEIVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SITLY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRANED SOILS	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 SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTY, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

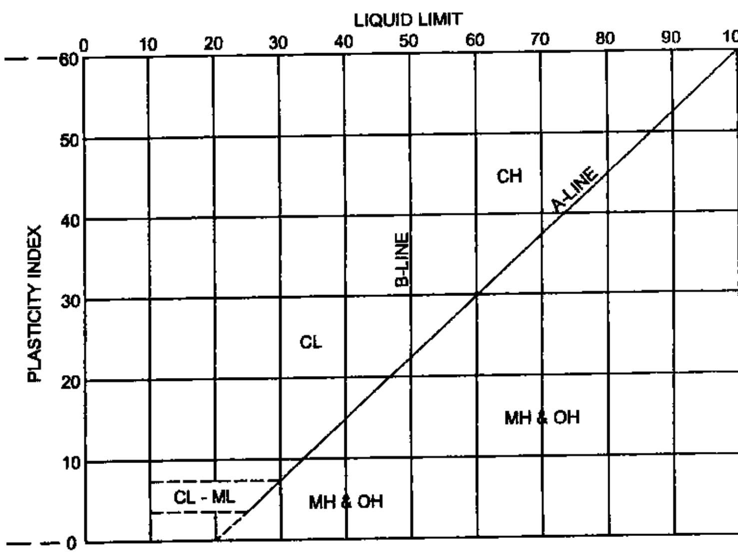
FOR LABORATORY CLASSIFICATION OF FIN-GRAINED SOILS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND				
FINE	.074	#200x	0.42	#40 x
MEDIUM	042	#40 x	2.00	#10 x
COARSE	200	#10 x	4.76	# 4 x
GRAVEL				
FINE	4.76	# 4 X	191	3/4
COARSE	191	3/4" •	76 2	3"
COBBLES	76.2	3"	304.8	12"
BOULDERS	304.8	12	914.4	36"

x US STANDARD • CLEAR SQUARE OPENINGS

PLASTICITY CHART



UNIFIED SOIL CLASSIFICATION SYSTEM

C.H.J. Incorporated

Enclosure "B" (2of2)
Job No. 05894-3

EXPLORATORY BORING NO. 1

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 2", brown	Native (Qw)		X		5.8		
				X		10	1.1	112	Ring
5				X		3	7.3	108	Ring
10			(Qof_3)	X		22	7.8	115	Ring
13		(SP-SM) Sand, fine to coarse with silt, gravel and cobbles to 5", light brown			X		4.2		
15				X		20	4.6	114	Ring
20				X		33	3.2	118	Ring
25				X		30/5"	N.R.	N.R.	Ring
28		(SM) Silty Sand, fine to medium with coarse, gravel and cobbles to 5", brown			X		4.7		
30				X		28	9.1	120	Ring
33		(SP-SM) Sand, fine to coarse with silt, gravel and cobbles to 4", light brown			X		2.0		

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-1a

EXPLORATORY BORING NO. 1

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine to coarse with silt, gravel and cobbles to 4", light brown		X		30/5"	2.5	116	Ring
40				X		30/5"	4.0	113	Ring
45				X		30/1.5"	N.R.	N.R.	Ring
50		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
55									
60									
65									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-1b

EXPLORATORY BORING NO. 2

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 3/4", brown	Native (Qof_3)		X		3.7		DS, MDC, SA
				X		32	4.5	114	Ring
5		(SM) Silty Sand, fine to medium with gravel to 2", light brown			X		3.4		
				X		11	5.4	103	Ring
10		(SP-SM) Sand, fine to coarse with silt and gravel to 1", light brown			X		3.6		
				X		18	3.5	110	Ring, Consol.
15									
		(SM) Silty Sand, fine to coarse with gravel and cobbles to 5", light brown			X		3.6		
				X		30/4"	5.7	119	Ring
20									
				X		42	4.5	119	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 3

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with gravel to 2", brown	Native (Qof$_3$)		X		2.5		
				X		23	2.4	Dist.	Ring
5		(SM) Silty Sand, fine to coarse with gravel and cobbles to 4", light brown			X		3.1		
				X		16	2.9	108	Ring
10				X		25	3.8	114	Ring
		(SM) Silty Sand, fine to medium with coarse, gravel and cobbles to 4", brown			X		6.4		
15				X		36	6.9	117	Ring
		(SP-SM) Sand, fine to coarse with silt, gravel and cobbles to 4", light brown			X		4.2		
20				X		40	3.2	114	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 4

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 2", light brown	Native (Qof_3)		X		3.4		Cor., DS, MDC, SA
				X		33	4.1	114	Ring
5		(SM) Silty Sand, fine to medium with coarse and gravel to 2", light brown			X		2.6		
				X		50	3.0	123	Ring
10									
				X		30/3"	4.4	Dist.	Ring
14		END OF BORING NO BEDROCK REFUSAL AT 14.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER	Refusal						
15									
20									
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 5

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with gravel to 2", brown	Native (Qof_3)		X		4.4		
				X		49	2.3	102	Ring
5				X		31	4.5	111	Ring
8		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		3.1		
10				X		31	3.8	122	Ring
15				X		30/6"	6.4	121	Ring
18		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		5.3		
20				X		30/5"	4.7	Dist.	Ring
25				X		30/2"	N.R.	N.R.	Ring
26.5		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

EXPLORATORY BORING NO. 6

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with gravel to 1", brown	Native (Qof_3)		X		4.8		
				X		20	4.4	105	Ring
5									
				X		25	3.5	111	Ring
10									
				X		30/6"	4.7	Dist.	Ring
15									
				X		30/5"	4.9	Dist.	Ring
20									
				X		30/5"	10.1	Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 7

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 2", light brown	Native (Qof_3)		X		2.3		
				X		52	3.2	121	Ring
5				X		38	3.7	118	Ring
10				X		50	5.2	119	Ring
15				X		30/4"	2.7	Dist.	Ring
20				X		30/3"	9.3	Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-7

EXPLORATORY BORING NO. 8

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with gravel to 1", light brown	Native (Qof_3)				3.2		
						38	2.4	119	Ring
5									
						25	3.0	118	Ring
10							5.8		
						38	6.7	116	Ring, DS
15									
						30/6"	2.8	Dist.	Ring
20									
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

EXPLORATORY BORING NO. 9

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with gravel to 2", light brown	Native (Qyf_1)		X		5.6		Cor.
				X		13	6.5	124	Ring
3		(SM) Silty Sand, fine to coarse with gravel and cobbles to 5", light brown			X		2.6		
5			(Qof_3)	X		41	3.7	118	Ring
9		(SP-SM) Sand, fine to coarse with silt and gravel to 2", light brown			X				
10				X		41	2.8	116	Ring
15				X		28	3.5	Dist.	Ring
20				X		30/5"	5.9	Dist.	Ring
21.5		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 10

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 2", brown	Native (Qyf_1)		X		4.1		DS, MDC, SA
				X		17	4.1	116	Ring
5		(SP-SM) Sand, fine to coarse with silt and gravel to 2", light brown			X		2.0		
				X		26	2.0	119	Ring
10									
				X		17	4.0	116	Ring
15		(SM) Silty Sand, fine to medium with gravel and cobbles to 5", brown			X		7.5		
				X		20	9.6	111	Ring, Consol.
20									
				X		30/5"	N.R.	N.R.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 11

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with gravel to 2", brown	Native (Qyf_1)		X		3.9		
				X		16	4.7	117	Ring
3		(SM) Silty Sand, fine to medium with coarse and gravel to 1", light brown			X		2.6		
5				X		13	3.0	111	Ring
8		(SM) Silty Sand, fine to medium with coarse and clay, red brown	(Qof_3)		X		8.1		
10				X		29	10.1	124	Ring
15						30/0"	N.R.	N.R.	Ring
18.5		END OF BORING NO BEDROCK REFUSAL AT 18.5' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER	Refusal						
20									
25									
30									

EXPLORATORY BORING NO. 12

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 55 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 3", brown	Fill		X		3.9		
			(Qyf$_5$)	X		19	N.R.	N.R.	Ring
5									
				X		30/5"	N.R.	N.R.	Ring
10									
				X		30/5"	N.R.	N.R.	Ring
15		(SP-SM) Sand, fine to medium with silt, coarse, and gravel to 1 1/2", light brown			X		4.7		
				X		38	5.0	120	Ring
20									
				X		30/2"	N.R.	N.R.	Ring
23		END OF BORING	Refusal						
25		NO BEDROCK REFUSAL AT 23.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-12

EXPLORATORY BORING NO. 13

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with coarse and gravel to 2", brown	Native (Qof_3)		X		6.2		
				X		28			SPT
5									
				X		28			SPT
		(SM) Silty Sand, fine to medium with gravel to 1", brown			X		6.7		
10									
				X		55			SPT
		(SM) Silty Sand, fine to coarse, brown			X		7.5		
15									
				X		42			SPT
20									
				X		70/5"			SPT
25									
				X		70/5"			SPT
		(SM) Silty Sand, fine to coarse, brown			X				
30									
				X		70/5"			SPT

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-13a

EXPLORATORY BORING NO. 13

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to coarse, brown		X		70/5"			SPT
40				X		70/5"			SPT
45		END OF BORING NO BEDROCK REFUSAL AT 44.0' NO FILL MODERATE CAVING NO FREE GROUNDWATER	Refusal						
50									
55									
60									
65									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 14

Date Drilled: 2/22/06 — Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig — Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A — Logged by: J.S. — Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
			(Qyf_1)						
				X		31	2.4	120	Ring
		END OF BORING	Refusal						
5		NO BEDROCK REFUSAL AT 3.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER							
10									
15									
20									
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-14

EXPLORATORY BORING NO. 15

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1", brown	Fill		X		4.6		
				X		57	3.5	125	Ring
5				X		14	5.2	112	Ring
		(SP-SM) Sand, fine to medium with coarse, silt and gravel to 1", light brown	Native (Qyf_1)		X		2.3		
10				X		35	3.1	Dist.	Ring
15				X		38	2.8	112	Ring, DS
		(SM) Silty Sand, fine to coarse with gravel to 1", gray brown			X		6.4		
20				X		26	8.4	123	Ring
		(SP-SM) Sand, fine to coarse with silt and gravel to 1 1/2", light brow			X		6.4		
25				X		30/6"		Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL FILL TO 7.0' MODERATE CAVING NO FREE GROUNDWATER							
30									

EXPLORATORY BORING NO. 16

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Fill		X		3.4		
2		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qyf_1)	X		35	2.6	123	Ring
5		(SP-SM) Sand, fine to medium with coarse, silt and gravel to 1", light brown			X		3.1		
				X		25	3.5	123	Ring
10				X		36	2.4	115	Ring
15				X		30/3"	N.R.	N.R.	Ring
20				X		30/4"	3.4	Dist.	Ring
25		END OF BORING							

NO BEDROCK
NO REFUSAL
FILL TO 2.0'
MODERATE CAVING
NO FREE GROUNDWATER

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-16

EXPLORATORY BORING NO. 17

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with gravel to 1", light brown	Native (Qof_3)		X		2.3		
				X		35	2.1	126	Ring
5				X		37	2.9	Dist.	Ring
		(SP-SM) Sand, fine to coarse with silt and gravel to 3/8", light brown			X		2.8		SA
10				X		41	4.0	123	Ring
15				X		30/4"	6.0	Dist.	Ring
		(SP-SM) Sand, fine to medium with coarse and silt, light brown			X		8.7		
20				X		55/10"	7.5	119	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL SLIGHT CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-17

EXPLORATORY BORING NO. 18

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 75 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qof_3)		X		4.3		
3				X		10	3.3	112	Ring
5									
8				X		14	2.6	119	Ring
10		(SM) Silty Sand, fine to coarse with gravel to 2", brown			X		3.8		MDC, SA
13				X		25	3.5	125	Ring
15									
18				X		41	6.7	Dist.	Ring
20		(SP-SM) Sand, fine to coarse, silt and with gravel to 1", light brown			X		4.4		
23				X		23	3.8	123	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-18

EXPLORATORY BORING NO. 19

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 75 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with coarse, gravel to 2" and cobbles to 5", brown	Native (Qof_3)		X		3.5		
				X		10	3.6	111	Ring
5				X		24	2.2	Dist.	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		2.7		
10				X		31	2.8	Dist.	Ring
15				X		30/6"	3.4	121	Ring
20				X		30/6"	N.R.	N.R.	Ring
25				X		30/5"	2.9	Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 20

Date Drilled: 2/22/06

Client: Inland Communities Corporation

Equipment: CME 75 Drill Rig

Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A

Logged by: J.S.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(GW) Sandy Gravel, fine to coarse; gravel and cobbles to 5", brown	Native (Qyf_1)		X		2.3		Cor., DS, MDC, SA
				X		10	N.R.	N.R.	Ring
5									
				X		45/10"	2.3	110	Ring
10		(SM) Silty Sand, fine to coarse with gravel and cobbles to 5", light brown			X		2.4		
				X		12	3.9	111	Ring, Consol.
15									
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER	Sampler Broke						
20									
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 21

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 75 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with coarse and gravel to 2", brown	Native (Qyf_3)		X		5.0		
				X		25			SPT
		(SP-SM) Sand, fine to coarse with silt and gravel to 2", light brown	(Qof_3)		X		2.0		
5				X		27			SPT
10				X		98			SPT
15				X		70/4"			SPT
20				X		70/1"			SPT
25				X		70/2"			SPT
30				X		70/6"			SPT

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 21

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 75 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine to coarse with silt and gravel to 2", light brown							
		END OF BORING	Refusal						
40		NO BEDROCK REFUSAL AT 37.5' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER							
45									
50									
55									
60									
65									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 22

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine to coasre with silt and gravel and cobbles to 4", light brown	Native (Qof_3)		X		4.1		
				X		19	4.8	117	Ring
5									
				X		19	3.8	113	Ring
10									
				X		43	5.2	115	Ring
15									
				X		30/6"	7.1	121	Ring
19		END OF BORING NO BEDROCK REFUSAL AT 19.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER	Refusal						
20									
25									
30									

BORING LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-22

EXPLORATORY BORING NO. 23

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 1", brown	Native (Qof_3)		X		4.8		Cor., DS, MDC, SA
				X		28	4.6	122	Ring
5				X		30/6"	4.9	115	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1", brown			X		4.1		
10				X		56/11"	6.8	131	Ring
15				X		30/6"	6.6	115	Ring
20				X		30/5"	5.9	115	Ring
25				X		30/6"	4.0	Dist.	Ring
30				X		30/4"	4.3	Dist.	Ring
		(SP-SM) Sand, fine to coarse with gravel to 2", brown			X		3.6		

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-23a

EXPLORATORY BORING NO. 23

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine to coarse with gravel to 2", brown		X		30/4"	4.1	Dist.	Ring
40				X		30/2"	4.0	Dist.	Ring
45				X		30/3"	3.7	Dist.	Ring
50				X		30/5"	N.R.	N.R.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
55									
60									
65									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-23b

EXPLORATORY BORING NO. 24

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qyf_1)		X		7.6		
3				X		13	3.3	111	Ring
5									
8			(Qof_3)	X		35	2.5	122	Ring
10									
13				X		34	1.9	112	Ring
15									
18				X		30/6"	N.R.	N.R.	Ring
20									
23				X		30/5"	3.7		Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 25

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 1 1/2", brown	Native (Qof_3)		X		10.3		
				X		4	7.1	103	Ring
4		(SM) Silty Sand, fine to medium with coarse and gravel to 1", light brown			X		3.7		
5				X		7	3.6	110	Ring
8		(SP-SM) Sand, fine to coarse with silt and gravel to 1", light brown			X		3.4		
10				X		35	3.0	118	Ring
15				X		30/6"	5.4	Dist.	Ring
20				X		50	2.9	115	Ring
21.5		END OF BORING							
25									
30									

END OF BORING

NO BEDROCK
NO REFUSAL
NO FILL
MODERATE CAVING
NO FREE GROUNDWATER

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-25

EXPLORATORY BORING NO. 26

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 55 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 2", brown	Native (Qof_3)		X		9.4		
				X		23	4.6	118	Ring
5		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		4.4		
				X		30/5"	5.4	Dist.	Ring
10									
				X		32	3.9	119	Ring
15									
				X		30/6"	3.5	Dist.	Ring
20									
				X		30/4"	3.0	Dist.	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-26

EXPLORATORY BORING NO. 27

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 55 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 1 1/2", brown	Native (Qof_3)		X		9.4		
				X		19	6.4	Dist.	Ring
5				X		15	2.6	120	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1 1/2", light brown			X		4.1		
10				X		48	3.2	125	Ring
		(SP-SM) Sand, fine to medium with coarse and gravel to 1 1/2", light brown			X		3.6		
15				X		45	2.7	115	Ring
20				X		30/5"	2.8	Dist.	Ring
25				X		30/3"	N.R.	N.R.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-27

EXPLORATORY BORING NO. 28

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qof₃)						
				X		23	8.0	110	Ring
5		(SM) Silty Sand, fine to coarse with gravel to 1 1/2", light brown			X		3.4		
				X		26	N.R.	N.R.	Ring
10		(SP-SM) Sand, fine to coarse with silt and gravel to 1", light brown			X		4.7		
				X		50	3.6	124	Ring
15									
18		END OF BORING	Refusal	X		30/6"	N.R.	N.R.	Ring
20		NO BEDROCK REFUSAL AT 18.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 29

Date Drilled: 2/22/06

Client: Inland Communities Corporation

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A

Logged by: J.S.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qof_3)		X		8.6		
				X		43	8.6	Dist.	Ring
5				X		43	N.R.	N.R.	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		2.5		
10				X		31	2.5	115	Ring
15				X		28	5.9	125	Ring
		(SP-SM) Sand, fine to medium with silt and gravel to 1", light brown			X		4.2		
20				X		4	6.3	99	Ring, Consol.
25				X		30/5"	3.4	118	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 30

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: CME 75 Drill Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel to 2", light brown	Native (Qyf_3)		X		4.0		
				X		28	4.2	Dist.	Ring
5									
			(Qof_3)	X		44	2.8	115	Ring
10									
				X		44	3.7	125	Ring
15		(SM) Silty Sand, fine to medium with coarse and gravel to 1", light brown			X		6.0		
				X		30/4"	2.0	Dist.	Ring
20									
				X		30/6"	4.5	Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

EXPLORATORY BORING NO. 31

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: CME 75 Drill Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to coarse with gravel to 2", brown	Native (Qw)						
				X		21	4.6	Dist.	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1 1/2", brown			X		10.5		SA
5				X		12	10.0	119	Ring
10				X		16	10.7	115	Ring
		(SP-SM) Sand, fine to coarse with silt and gravel to 1", light brown	(Qof₃)		X		2.5		
15				X		46/10"	5.6	117	Ring
		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X		5.5		
20				X		30/6"	5.9	Dist.	Ring
		(SP-SM) Sand, fine to coarse with silt and gravel to 1", light brown			X		2.5		
25				X		38	3.6	124	Ring
30		NO BEDROCK REFUSAL AT 33.0' ON BOULDERS NO FILL MODERATE CAVING NO FREE GROUNDWATER		X		30/3"	3.2	Dist.	Ring
		END OF BORING	Refusal						

BORING LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-31

EXPLORATORY BORING NO. 32

Date Drilled: 2/22/06 | Client: Inland Communities Corporation

Equipment: Tract Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1", brown	Native (Qw)		X		6.6		
				X		8	6.2	111	Ring
5									
				X		10	4.7	109	Ring
10									
			(Qf)	X		30/5"	N.R.	N.R.	Ring
15		(SP-SM) Sand, fine to coarse with silt, light brown			X				
				X		29	3.4	123	Ring
20									
				X		45	2.9	123	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-32

EXPLORATORY BORING NO. 33

Date Drilled: 2/22/06
Client: Inland Communities Corporation
Equipment: Tract Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1", brown	Native		X		9.6		
			(Qw)	X		4	10.0	97	Ring
5			(Qf)	X		24	N.R.	N.R.	Ring
10				X		30/6"	N.R.	N.R.	Ring
		(SM) Silty Sand, fine to medium with coarse and gravel to 2", light brown			X		5.9		
15				X		26	7.5	117	Ring
20				X		30/5"	4.5	124	Ring
25		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
30									

EXPLORATORY BORING NO. 34

Date Drilled: 3/8/06
Client: Inland Communities Corporation
Equipment: Tract Rig
Driving Weight / Drop: 140 lbs/30 in
Surface Elevation(ft): N/A
Logged by: J.S.
Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to coarse with gravel and cobbles to 4", brown	Native (Qyf_2)		X		3.4		
7.5				X		37	N.R.	N.R.	Ring
10		(SP-SM) Sand, fine to coarse with silt and gravel to 1 1/2", light brown	(Qof_3)		X				
12.5				X		70	2.4	118	Ring
15		(SM) Silty Sand, fine to coarse with gravel to 1", light brown			X				
17.5				X		48	7.1	124	Ring
22.5				X		30/6"	5.6	115	Ring
25		END OF BORING							

NO BEDROCK
NO REFUSAL
NO FILL
MODERATE CAVING
NO FREE GROUNDWATER

C.H.J.

PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-34

EXPLORATORY BORING NO. 35

Date Drilled: 3/8/06 | Client: Inland Communities Corporation

Equipment: Tract Rig | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): N/A | Logged by: J.S. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", brown	Native (Qof_3)		X		4.0		
				X		5	7.3	107	Ring
5				X		7	2.7	104	Ring
10				X		10	3.4	107	Ring, Consol.
		(SM) Silty Sand, fine to medium with coarse and gravel to 1 1/2", light brown			X				
15				X		50/9"	4.8	104	Ring
20				X		30/6"	4.3	Dist.	Ring
		END OF BORING NO BEDROCK NO REFUSAL NO FILL MODERATE CAVING NO FREE GROUNDWATER							
25									
30									

BORING_LOG 05894-3.GPJ CHJ.GDT 5/12/06

C.H.J.

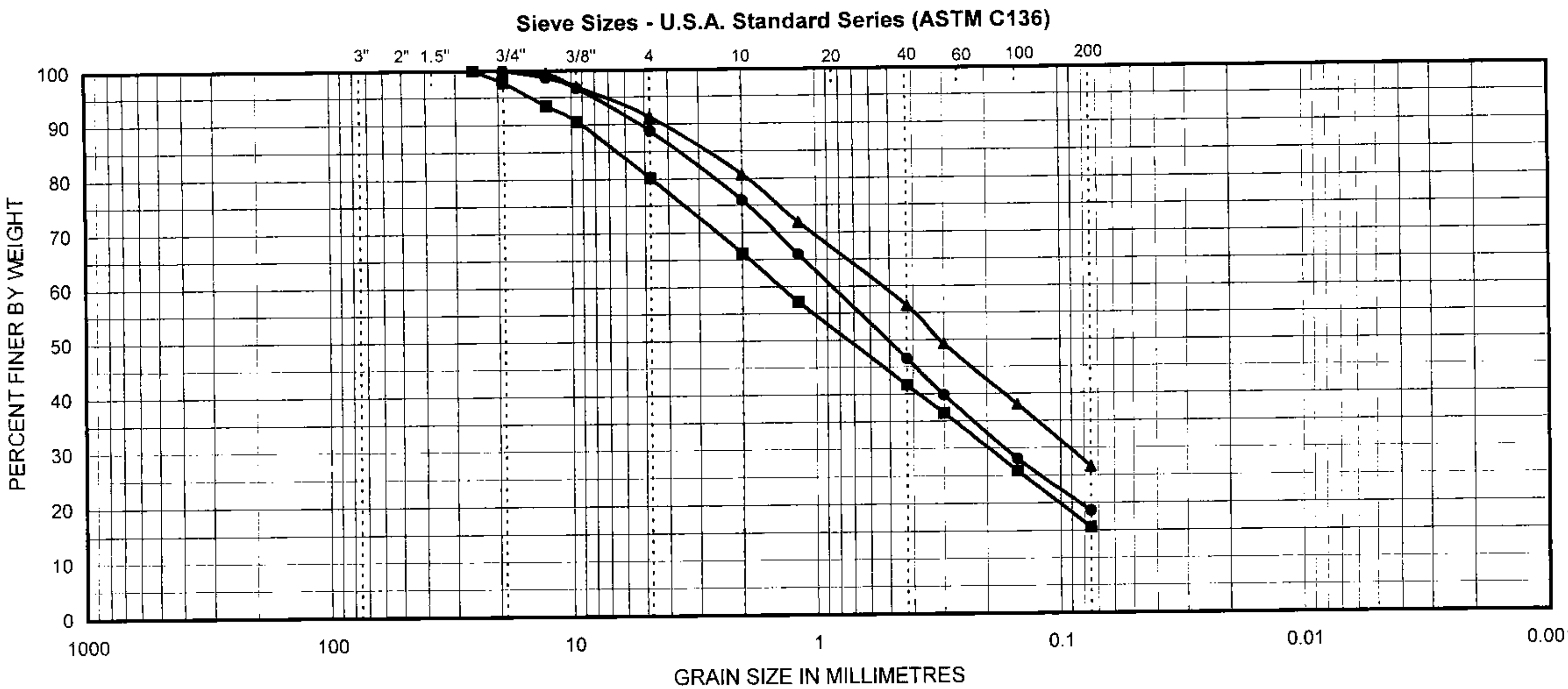
PARADISE HILLS PROJECT
BADGER CANYON AREA, CALIFORNIA

Job No. 05894-3

Enclosure B-35

APPENDIX "C"

LABORATORY TESTING



Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

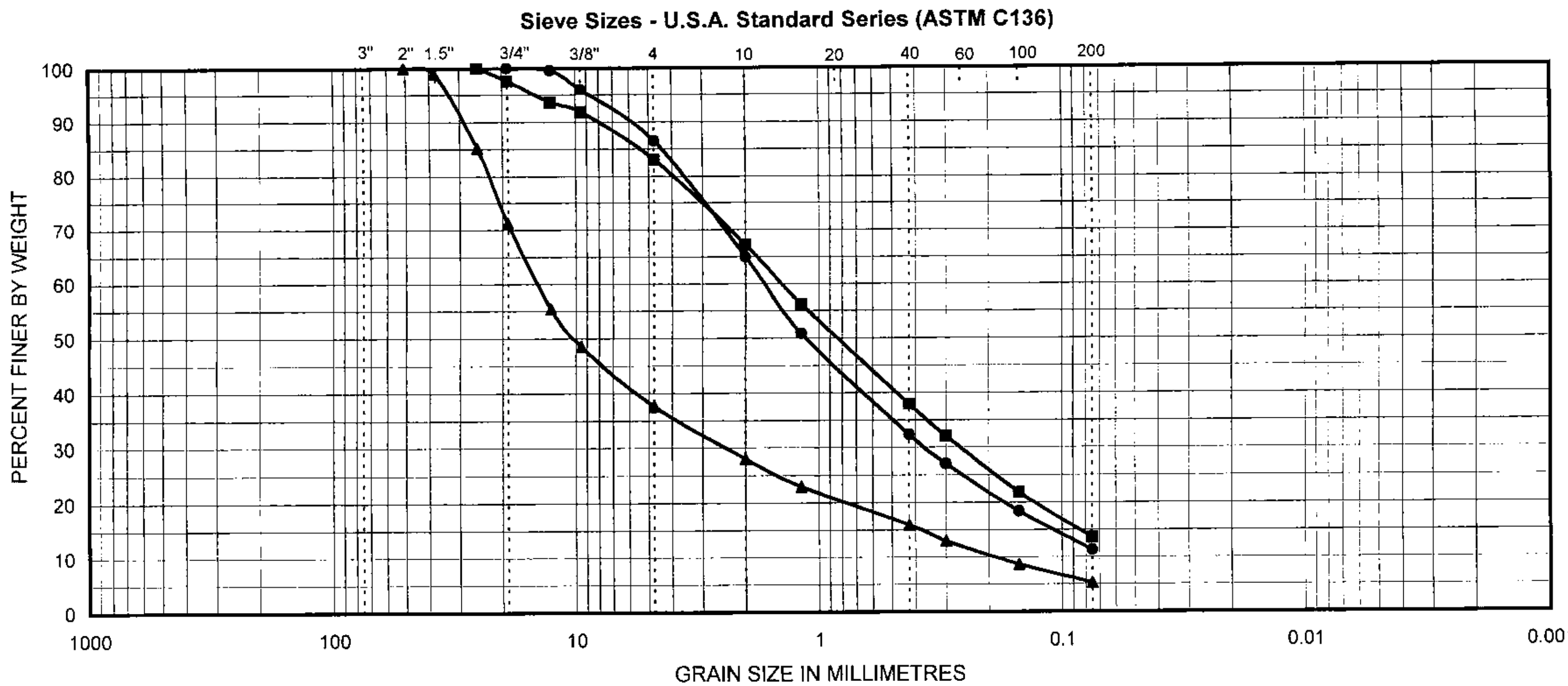
Symbol	Boring No.	Depth (ft)	Classification	D_{10} (mm)	D_{30} (mm)	D_{50} (mm)	D_{60} (mm)	C_u	C_c	SE
●	2	0	(SM) Silty sand, fine to coarse with gravel to 3/8"		0.168	0.509	0.864			
■	4	0	(SM) Silty sand, fine to coarse with gravel to 3/4"		0.197	0.736	1.393			
▲	10	0	(SM) Silty sand, fine to coarse with gravel to 3/8"		0.092	0.311	0.539			

C.H.J. Incorporated

GRADATION CURVES

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.
Location:	Badger Canyon Area, San Bernardino, CA
Job Number:	05894-3
Enclosure:	C-1

CHJ® LabSuite ver2.00. Programed by Dr. Fred Yi



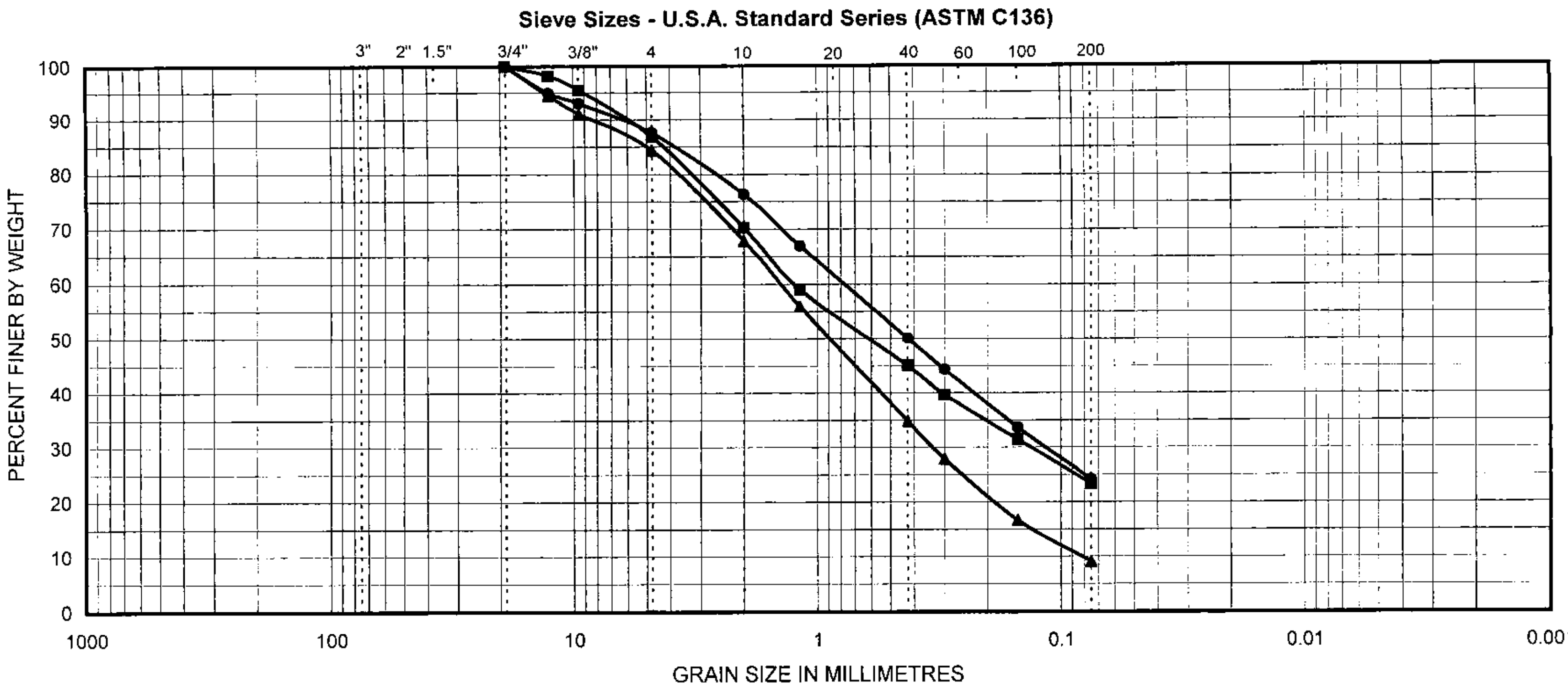
Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

Symbol	Boring No.	Depth (ft)	Classification	D_{10} (mm)	D_{30} (mm)	D_{50} (mm)	D_{60} (mm)	C_u	C_c	SE
●	17	8	(SP-SM) Sand, fine to coarse with gravel to 3/8"		0.364	1.127	1.663			
■	18	10	(SM) Silty sand, fine to coarse with gravel to 3/8"		0.260	0.836	1.418			
▲	20	0	(GW) Sandy gravel to 1", fine to coarse	0.1853	2.390	10.110	14.281	77.077	2.159	

C.H.J. Incorporated

GRADATION CURVES

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job Number:	05894-3	Enclosure:	C-2



Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

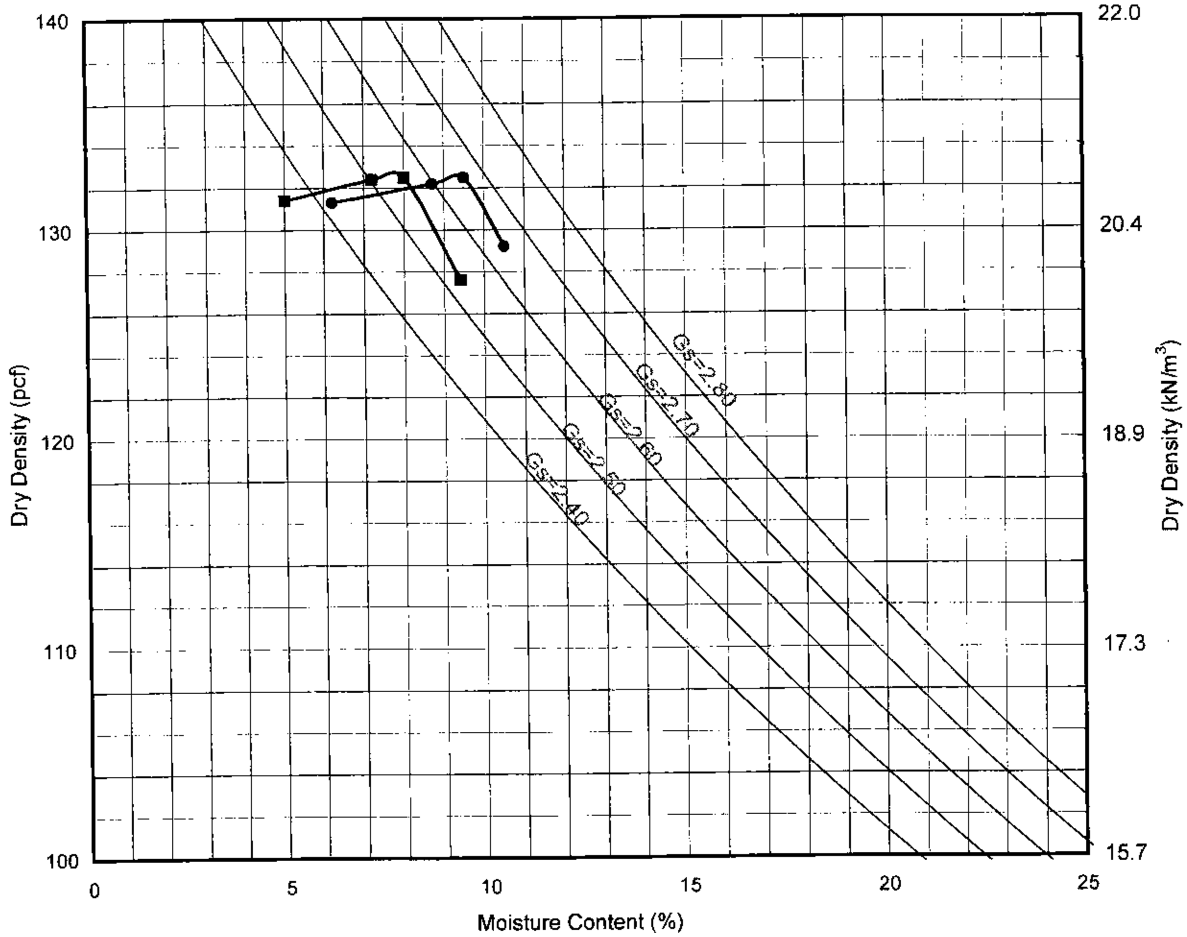
Symbol	Boring No.	Depth (ft)	Classification	D_{10} (mm)	D_{30} (mm)	D_{50} (mm)	D_{60} (mm)	C_u	C_c	SE
●	23	0	(SM) Silty sand, fine to coarse with gravel to 1/2"		0.115	0.423	0.775			
■	31	3	(SM) Silty sand, fine to coarse with gravel to 3/8"		0.133	0.610	1.237			
▲	A		(SP-SM) Sand, fine to coarse with gravel to 1/2"	0.0816	0.334	0.884	1.411	17.294	0.967	

C.H.J. Incorporated

GRADATION CURVES

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job Number:	05894-3	Enclosure:	C-3

Maximum Density Optimum Moisture Determination Test (ASTM 1557)

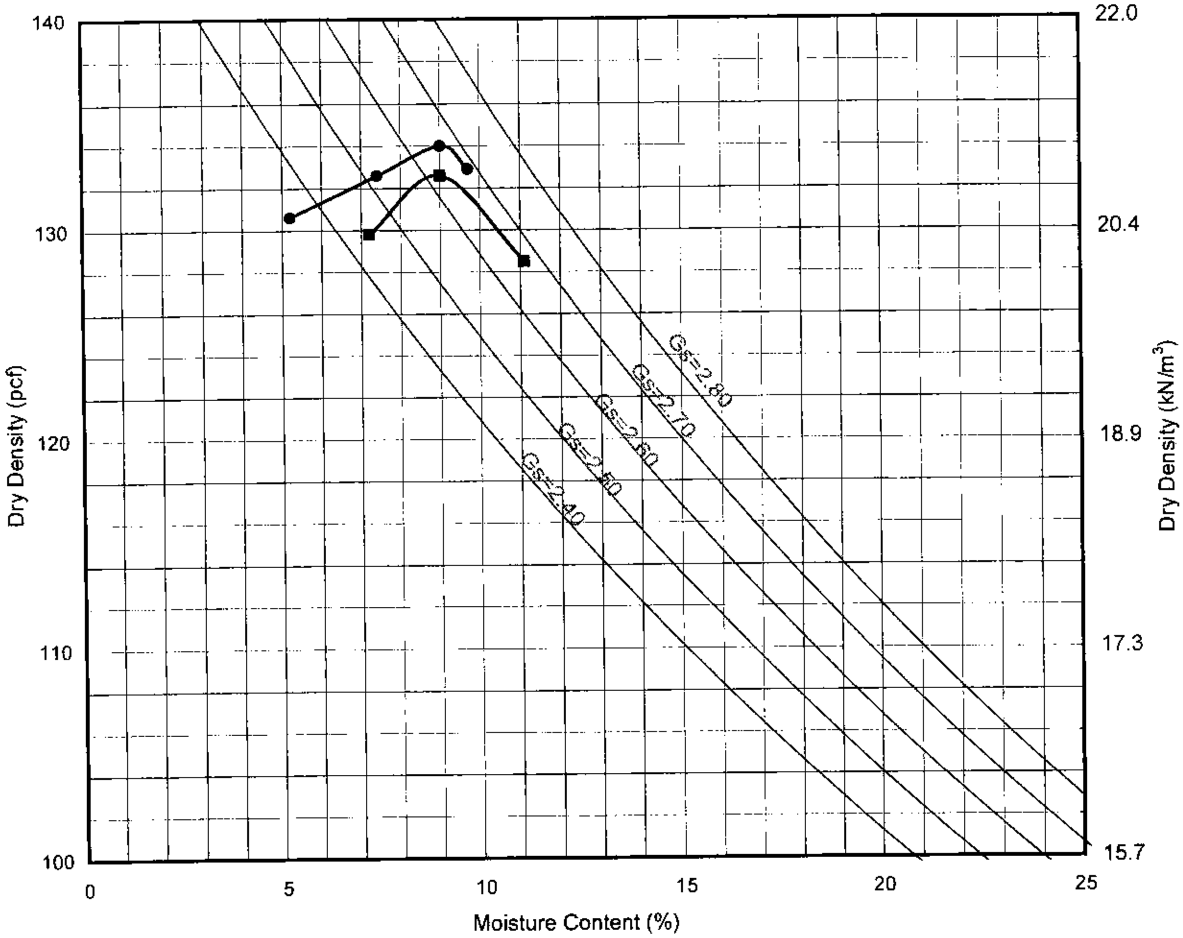


	Boring #	Depth(ft)	Soil/Sample Type	γ_{max} (pcf)	w_{opt} (%)
●	2	0	(SM) Silty sand, fine to coarse with gravel to 3/8"	132.5	9.5
■	4	0	(SM) Silty sand, fine to coarse with gravel to 3/4"	132.5	8.0

C.H.J. Incorporated

MAXIMUM DENSITY TESTS			
Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-4

Maximum Density Optimum Moisture Determination Test (ASTM 1557)



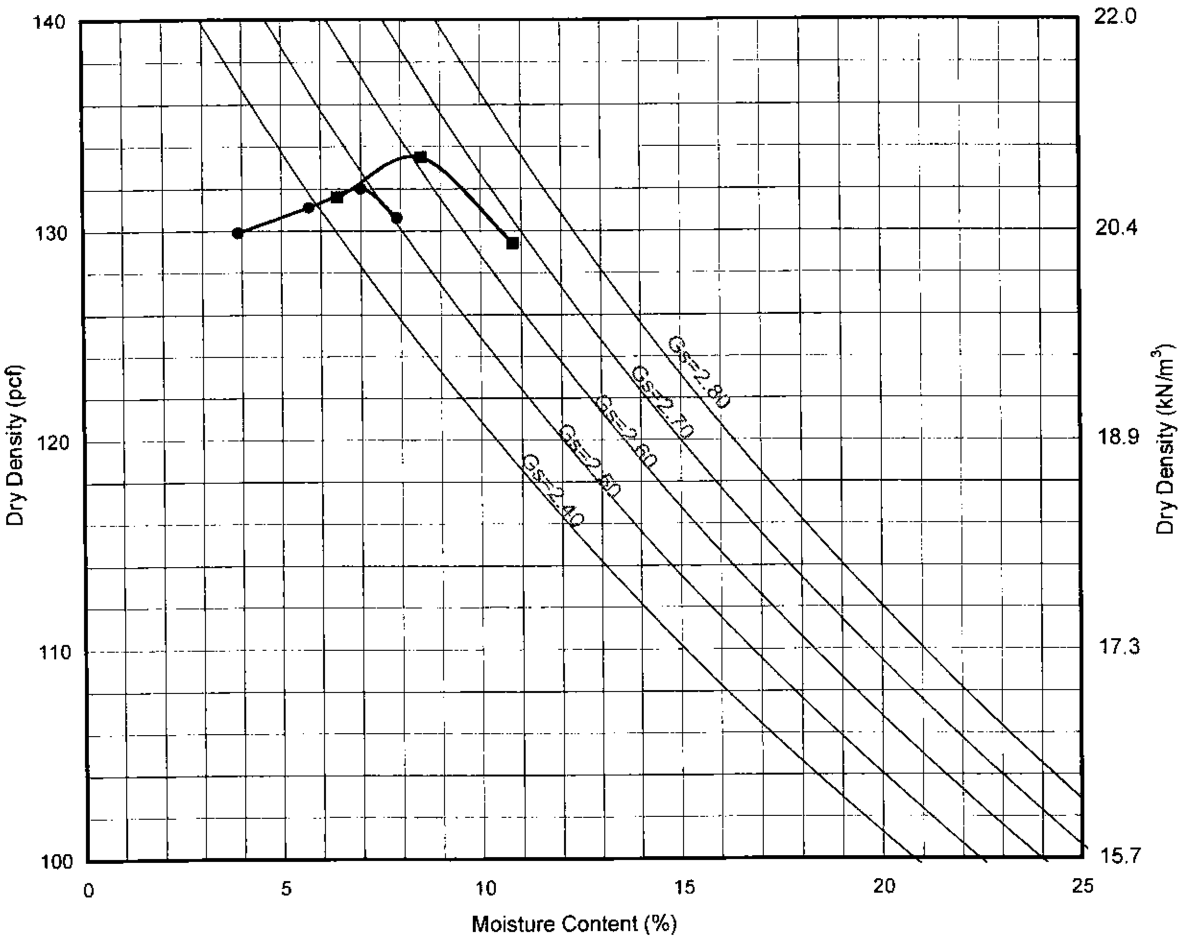
	Boring #	Depth(ft)	Soil/Sample Type	γ_{max} (pcf)	w_{opt} (%)
●	10	0	(SM) Silty sand, fine to coarse with gravel to 3/8"	134.0	9.0
■	18	10	(SM) Silty sand, fine to coarse with gravel to 3/8"	133.5	9.5

C.H.J. Incorporated

MAXIMUM DENSITY TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-5

Maximum Density Optimum Moisture Determination Test (ASTM 1557)



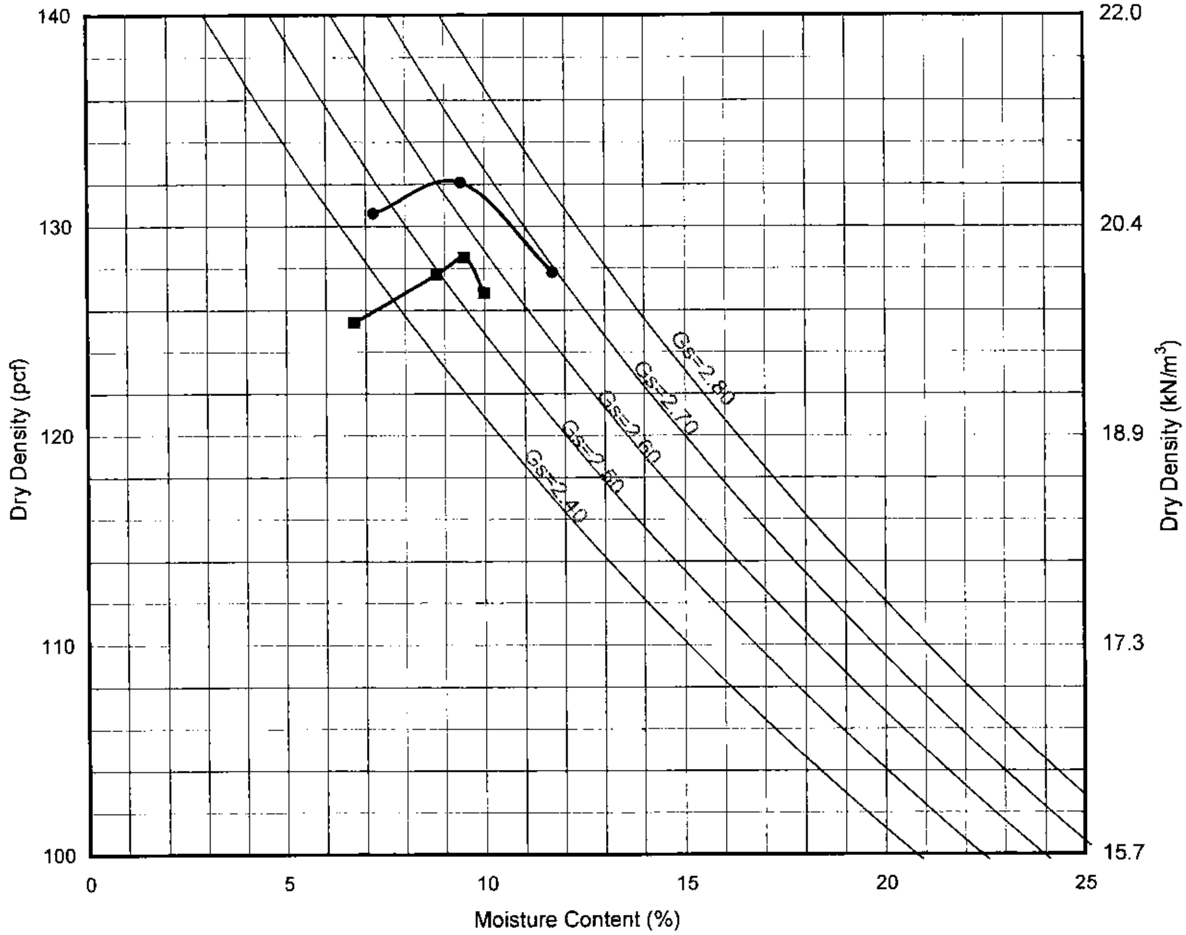
	Boring #	Depth(ft)	Soil/Sample Type	γ_{max} (pcf)	w_{opt} (%)
•	20	0	(GW) Sandy gravel to 1", fine to coarse	132.0	7.0
■	23	0	(SM) Silty sand, fine to coarse with gravel to 1/2"	134.0	9.0

C.H.J. Incorporated

MAXIMUM DENSITY TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-6

Maximum Density Optimum Moisture Determination Test (ASTM 1557)

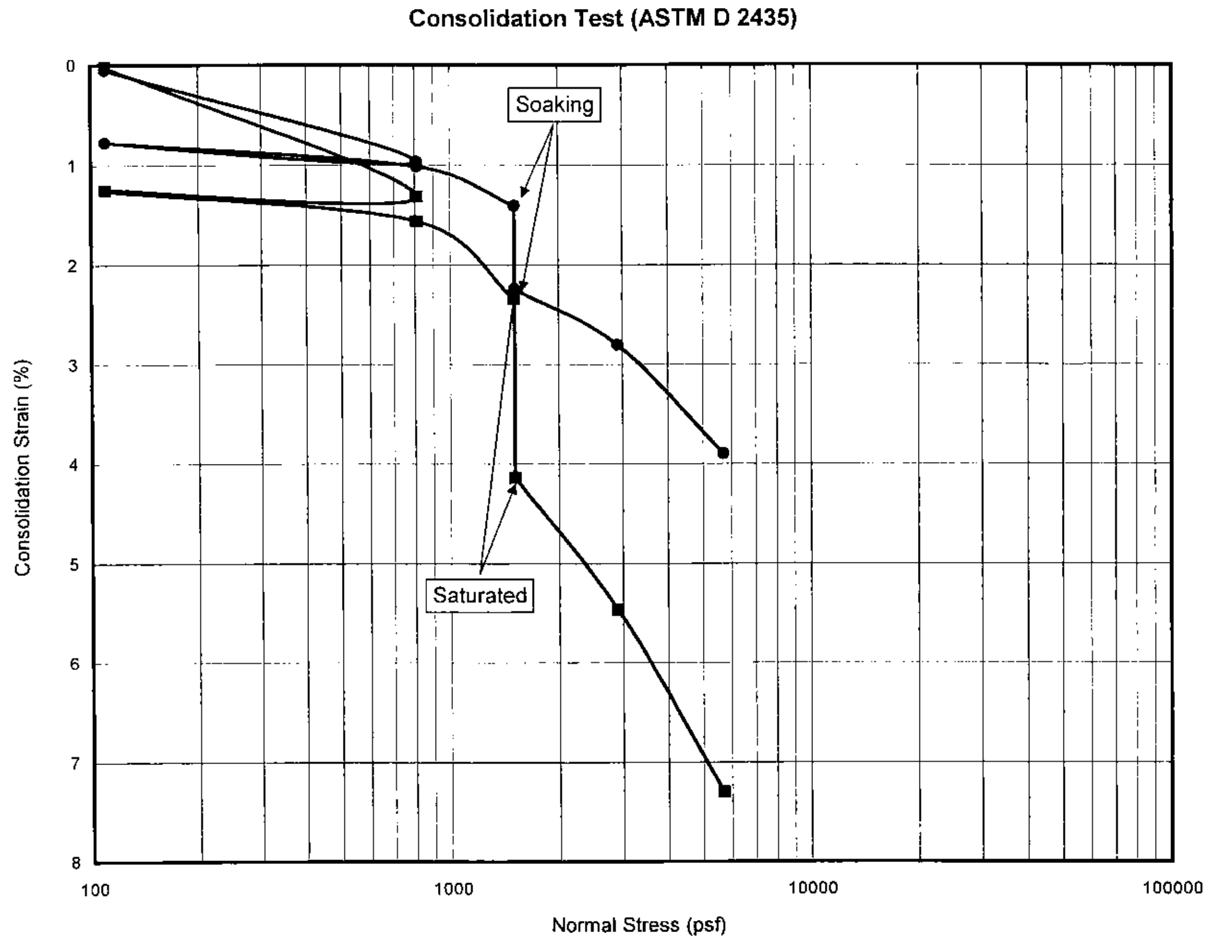


	Boring #	Depth(ft)	Soil/Sample Type	γ_{max} (pcf)	w_{opt} (%)
•	31	0	(SM) Silty sand, fine to coarse with gravel to 3/8"	132.5	10.0
■	A		(SP-SM) Sand, fine to coarse with gravel to 1/2"	128.5	9.5

C.H.J. Incorporated

MAXIMUM DENSITY TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-7



	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
●	2	12	(SP-SM) Sand, fine to coarse with silt and gravel to 1"	110	3.5	0.84
■	10	17	(SM) Silty sand, fine to medium with gravel and cobbles to 5"	111	9.6	1.80

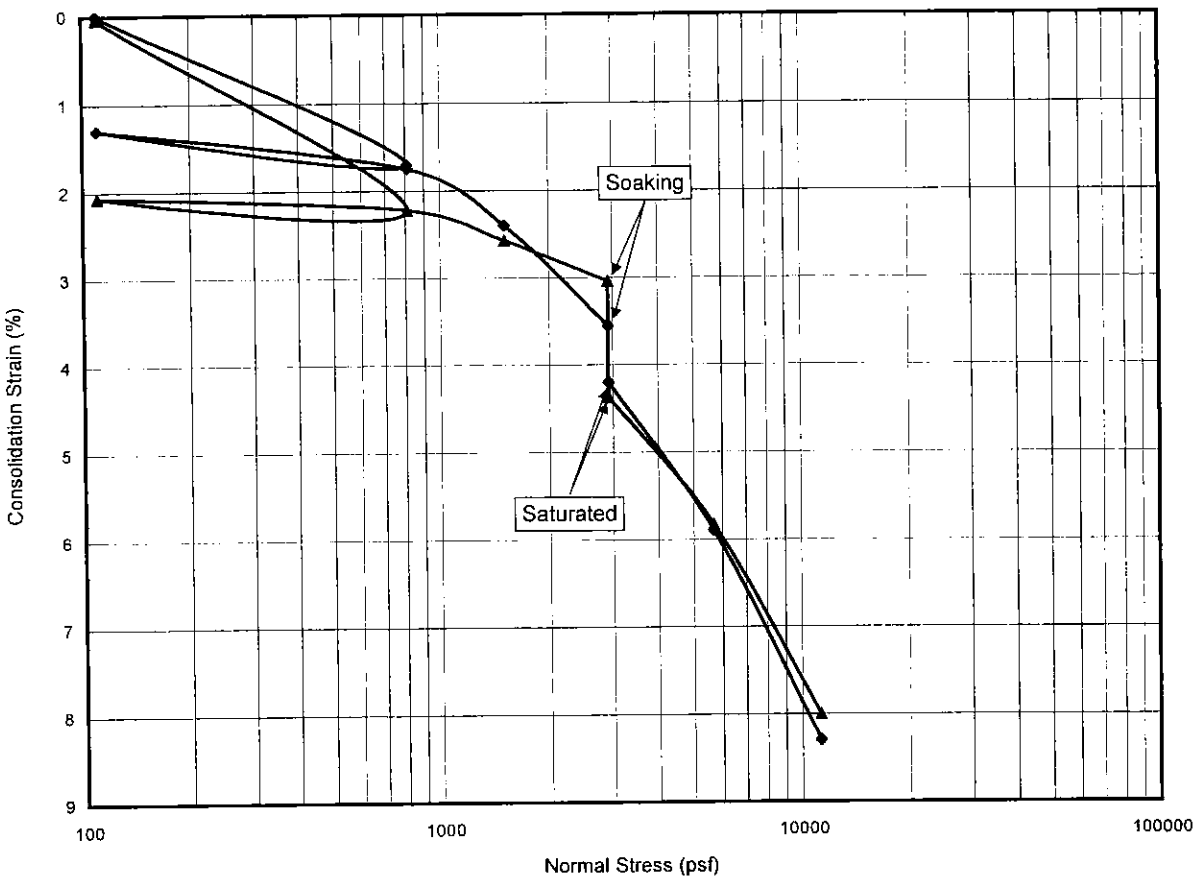
* HCS - Hydroconsolidation strain in percent.

C.H.J. Incorporated

CONSOLIDATION TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-8

Consolidation Test (ASTM D 2435)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
●	20	12	(SM) Silty sand, fine to coarse with gravel and cobbles to 5"	111	3.9	1.33
■	29	20	(SP) Sand, fine to medium with silt and gravel to 1"	99	6.3	0.65

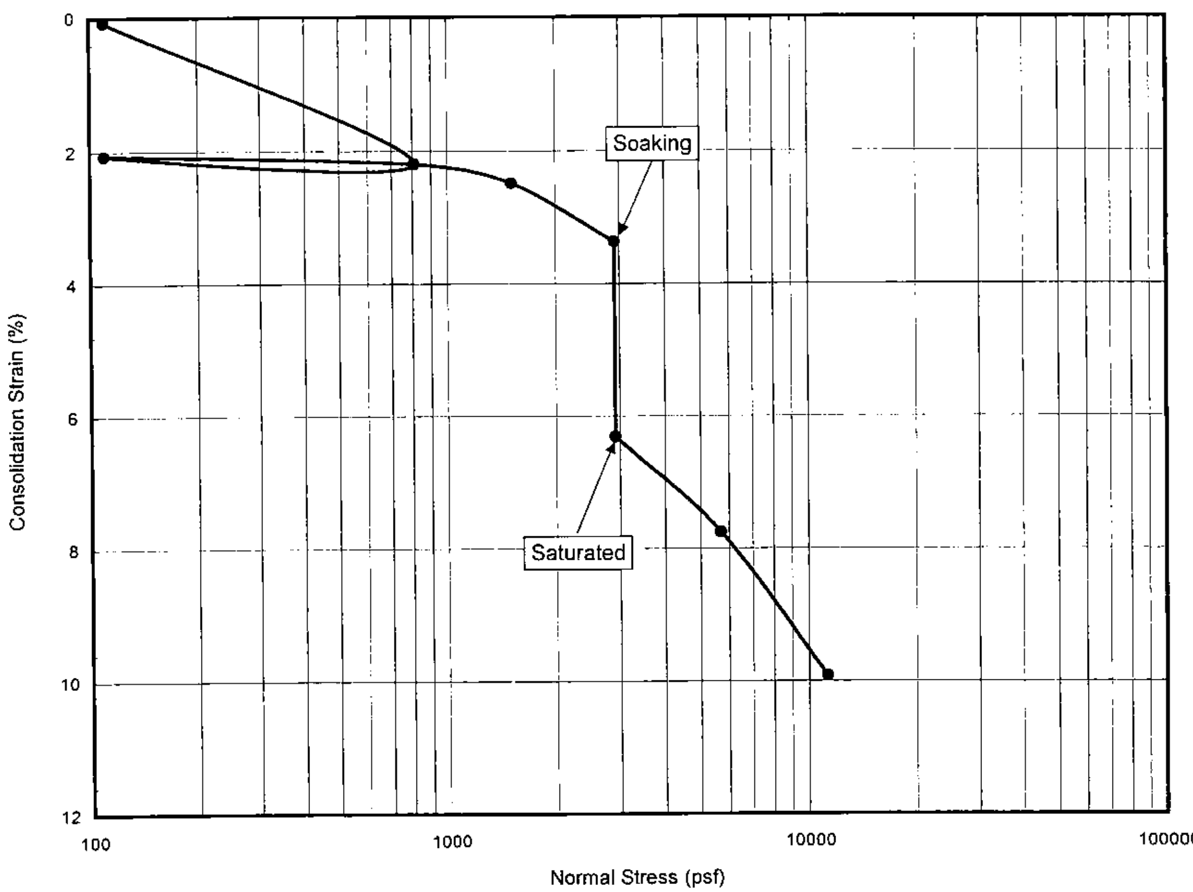
* HCS - Hydroconsolidation strain in percent.

C.H.J. Incorporated

CONSOLIDATION TESTS			
Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-9

CHJ® LabSuite ver2.00. Programed by Dr. Fred Yi

Consolidation Test (ASTM D 2435)



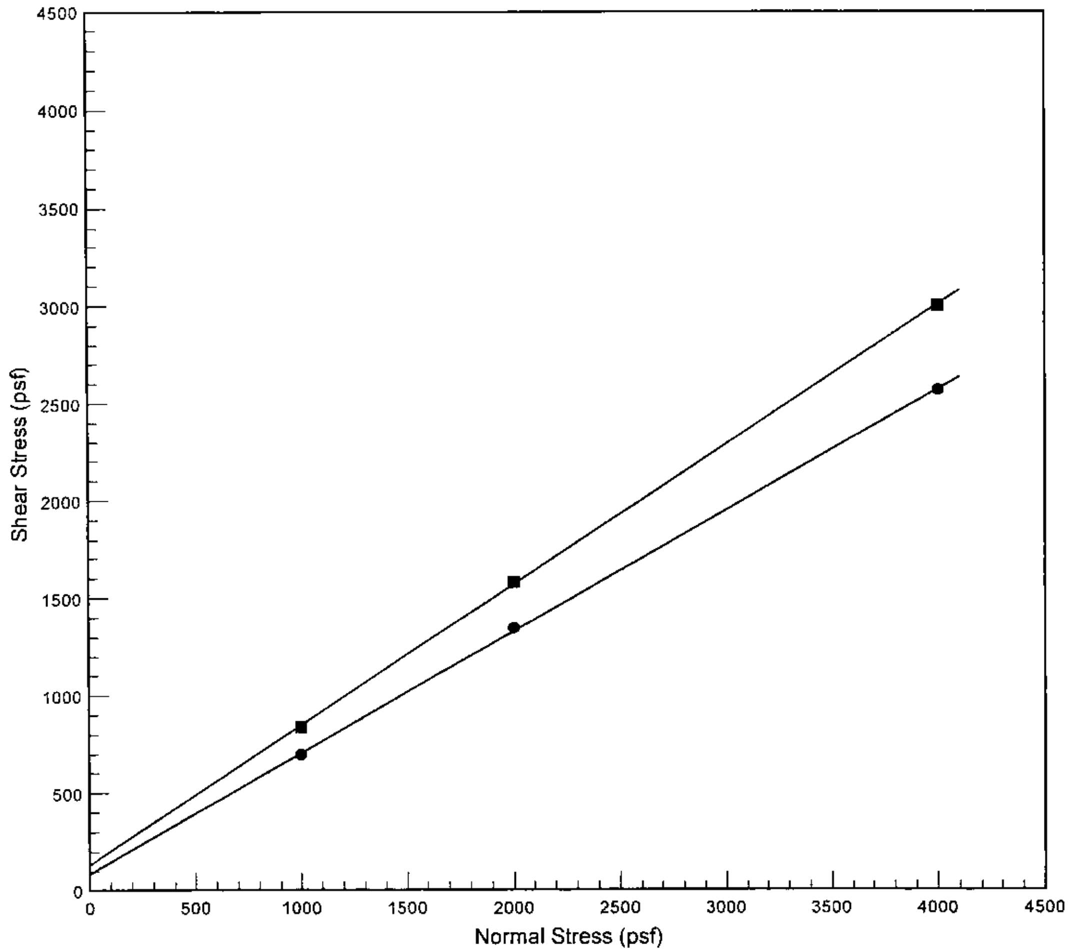
	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
•	35	10	(SM) Silty sand, fine to medium with coarse and gravel to 1 1/2"	107	3.4	2.94

* HCS - Hydroconsolidation strain in percent.

C.H.J. Incorporated

CONSOLIDATION TESTS			
Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-10

Direct Shear Test (ASTM D 3080)

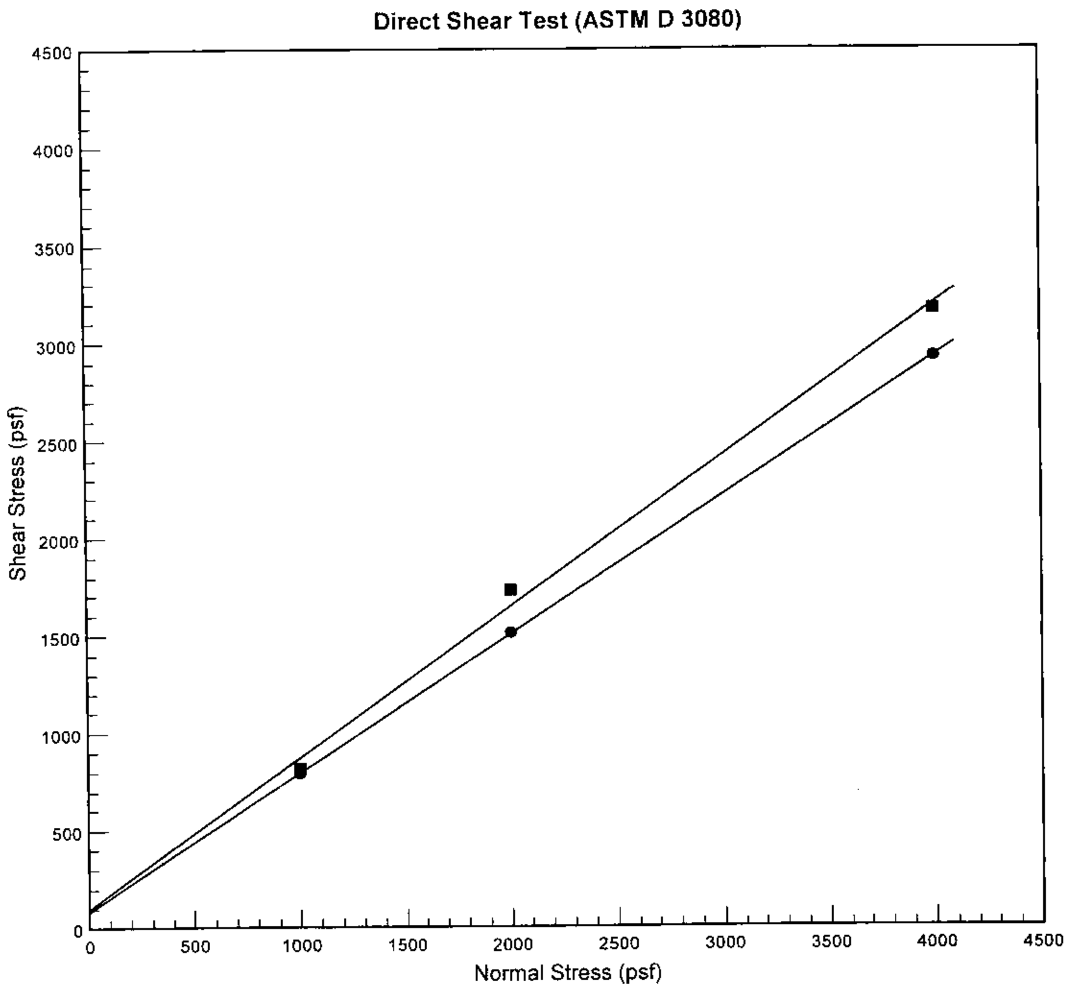


	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	C (psf)	φ(°)
●	8	12	(SM) Silty sand, fine to medium with gravel to 1"	116	6.7	84	32
■	15	15.5	(SP-SM) Sand, fine to medium with coarse , silt and gravel to 1"	112	2.8	132	36

C.H.J. Incorporated

UNDISTURBED DIRECT SHEAR TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-11



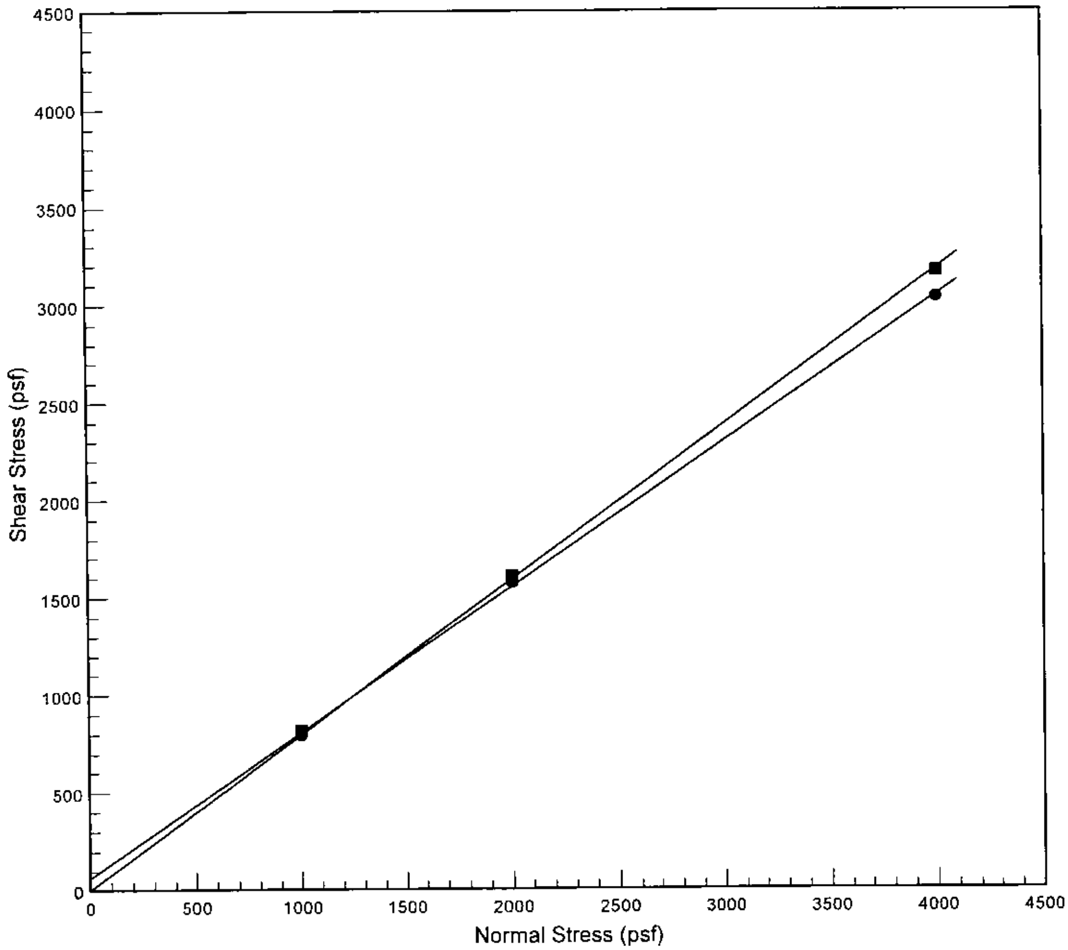
	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	C (psf)	φ(°)
●	2	0	(SM) Silty sand, fine to coarse with gravel to 3/4"	119	9.0	84	35
■	4	0	(SM) Silty sand, fine to coarse with gravel to 2"	119	8.0	96	38

C.H.J. Incorporated

REMOLDED DIRECT SHEAR TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-12

Direct Shear Test (ASTM D 3080)



	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	C (psf)	φ(°)
●	10	0	(SM) Silty sand, fine to coarse with gravel to 2"	120	8.5	60	37
■	20	0	(GW) Sandy gravel, fine to coarse with cobbles to 5"	119	6.5	0	38

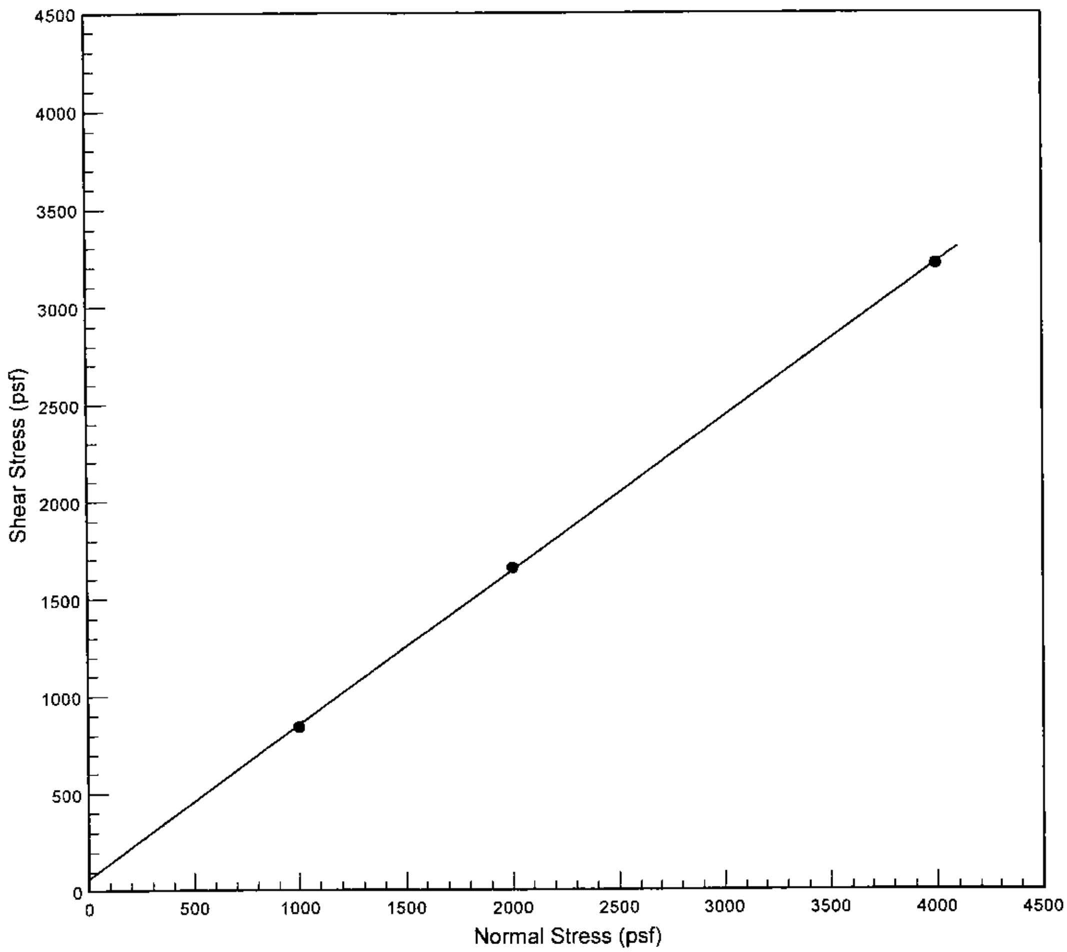
C.H.J. Incorporated

REMOLDED DIRECT SHEAR TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-13

CHJ® LabSuite ver2.00. Programed by Dr. Fred Yi

Direct Shear Test (ASTM D 3080)



	Boring #	Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	C (psf)	φ(°)
•	23	0	(SM) Silty sand, fine to coarse with gravel to 1"	121	9.0	60	38

C.H.J. Incorporated

REMOLDED DIRECT SHEAR TESTS

Project:	Tentative Tract Map No. 18140, Inland Communities Corp.		
Location:	Badger Canyon Area, San Bernardino, CA		
Job No.:	05894-3	Enclosure:	C-14

SCHIFF ASSOCIATES

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Table 1 - Laboratory Tests on Soil Samples

C.H.J., Inc.
Inland Communities
Your #05894-3, MJS&A #06-0489LAB
21-Mar-06

Sample ID

			23A	20A	4A	9A
Resistivity		**Units**				
as-received		ohm-cm	24,000	180,000	100,000	51,000
saturated		ohm-cm	6,100	5,800	18,000	11,000
pH			7.7	8.1	8.0	8.0
Electrical Conductivity		mS/cm	0.05	0.08	0.03	0.03
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	36	96	12	16
magnesium	Mg^{2+}	mg/kg	19	78	7	10
sodium	Na^{1+}	mg/kg	ND	ND	ND	ND
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	52	220	52	52
chloride	Cl^{1-}	mg/kg	ND	ND	ND	ND
sulfate	SO_4^{2-}	mg/kg	49	ND	ND	ND
Other Tests						
ammonium	NH_4^{1+}	mg/kg	5.5	5.9	5.4	6.4
nitrate	NO_3^{1-}	mg/kg	2.0	3.5	1.8	8.2
sulfide	S^{2-}	qual	na	na	na	na
Redox		mV	na	na	na	na

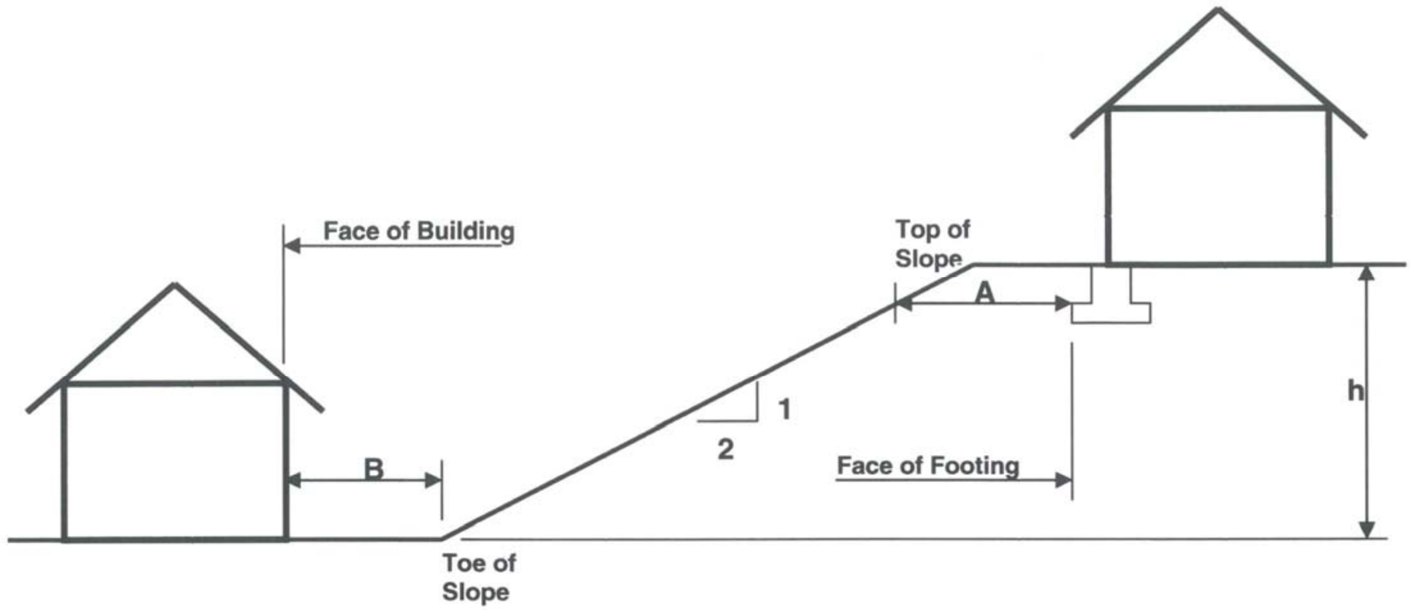
Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.626.0967 · Fax: 909.626.3316

APPENDIX "D"

GEOTECHNICAL DETAILS

Building Setback Requirement (Constructed Slopes)



TOP OF SLOPE

SLOPE HEIGHT (h) (feet)	SETBACK (A) (feet)
0-15'	5' min.
15'-120'	h/3 min.
120'+	40'*

TOE OF SLOPE

SLOPE HEIGHT (h) (feet)	SETBACK (B) (feet)
0-15'	5' min.
10'-30'	h/2 min.
30'+	15'

* or directed by project engineering geologist

SLOPE SETBACK DETAIL

FOR: INLAND COMMUNITIES CORPORATION

DATE: MAY 2006

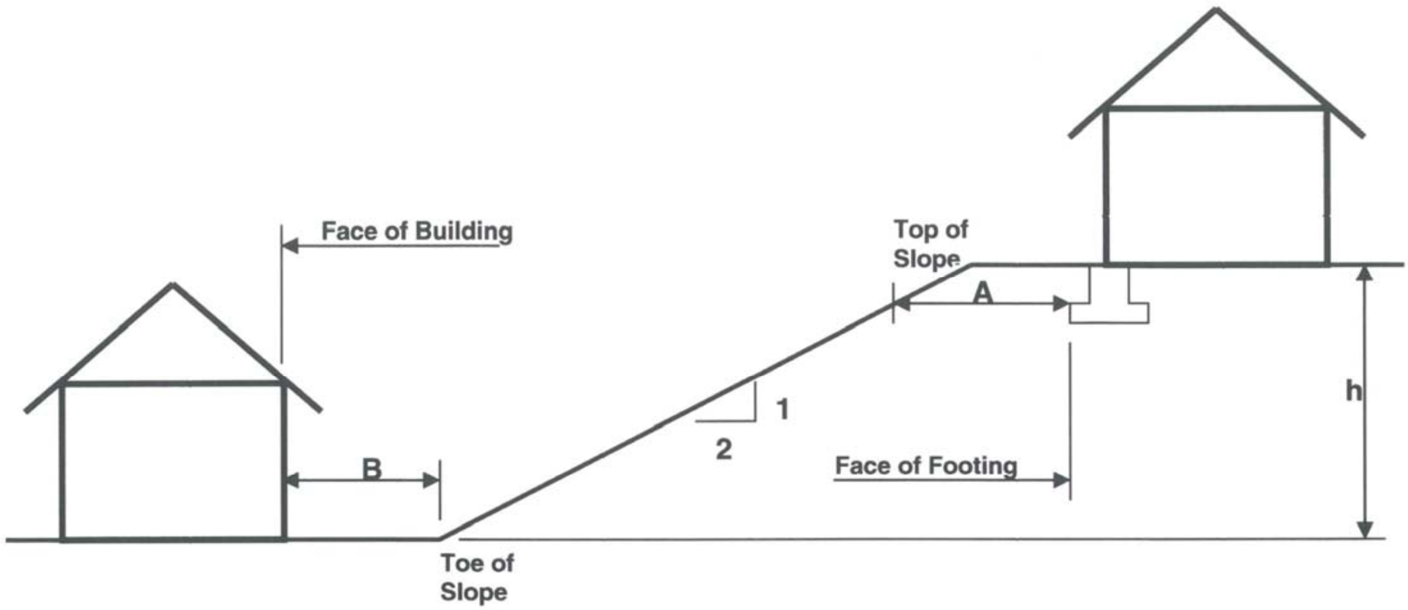
GEOTECHNICAL INVESTIGATION
TENTATIVE TRACT MAP NO. 18140
BADGER CANYON AREA
SAN BERNARDINO, CALIFORNIA

ENCLOSURE "D-1"

JOB NUMBER 05894-3

C.H.J. Incorporated

Building Setback Requirement (Constructed Slopes)



TOP OF SLOPE

SLOPE HEIGHT (h) (feet)	SETBACK (A) (feet)
0-15'	5' min.
15'-20'	h/3 min.
120'+	40'*

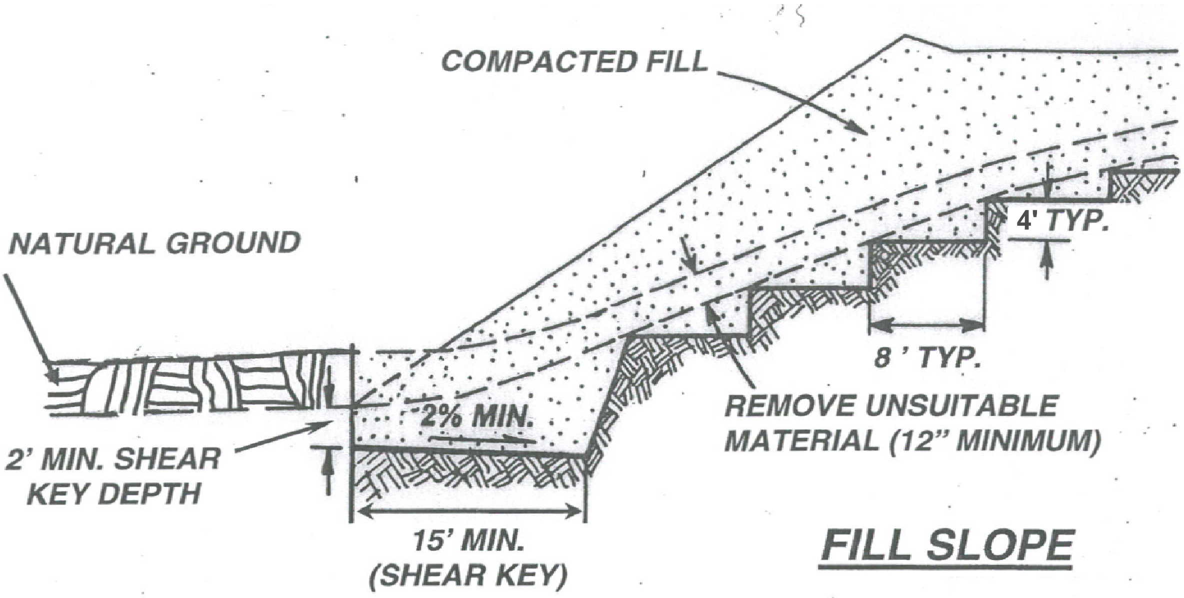
TOE OF SLOPE

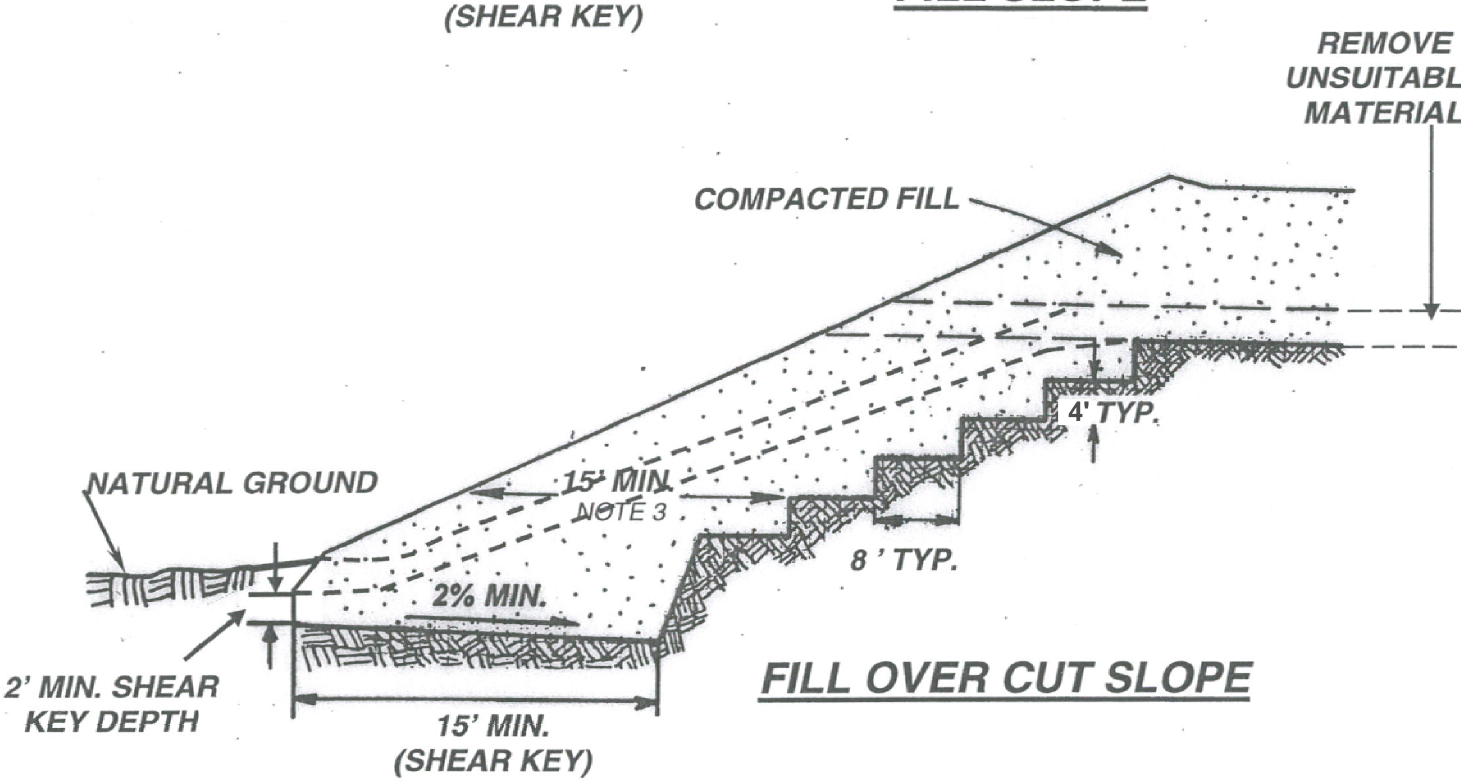
SLOPE HEIGHT (h) (feet)	SETBACK (B) (feet)
0-15'	5' min.
10'-30'	h/2 min.
30'+	15'

* or directed by project engineering geologist

SLOPE SETBACK DETAIL		
FOR: INLAND COMMUNITIES CORPORATION	GEOTECHNICAL INVESTIGATION TENTATIVE TRACT MAP NO. 18140 BADGER CANYON AREA SAN BERNARDINO, CALIFORNIA	ENCLOSURE "D-4"
DATE: MAY 2006		JOB NUMBER 05894-3

C.H.J. Incorporated



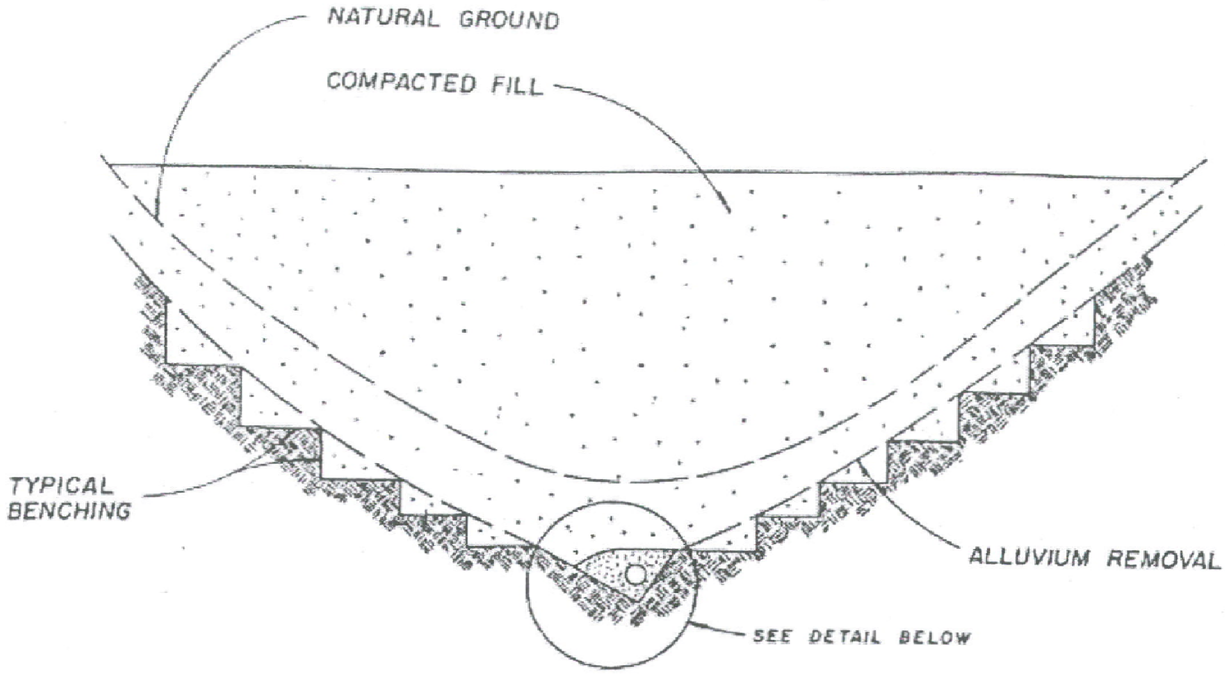


NOTES:

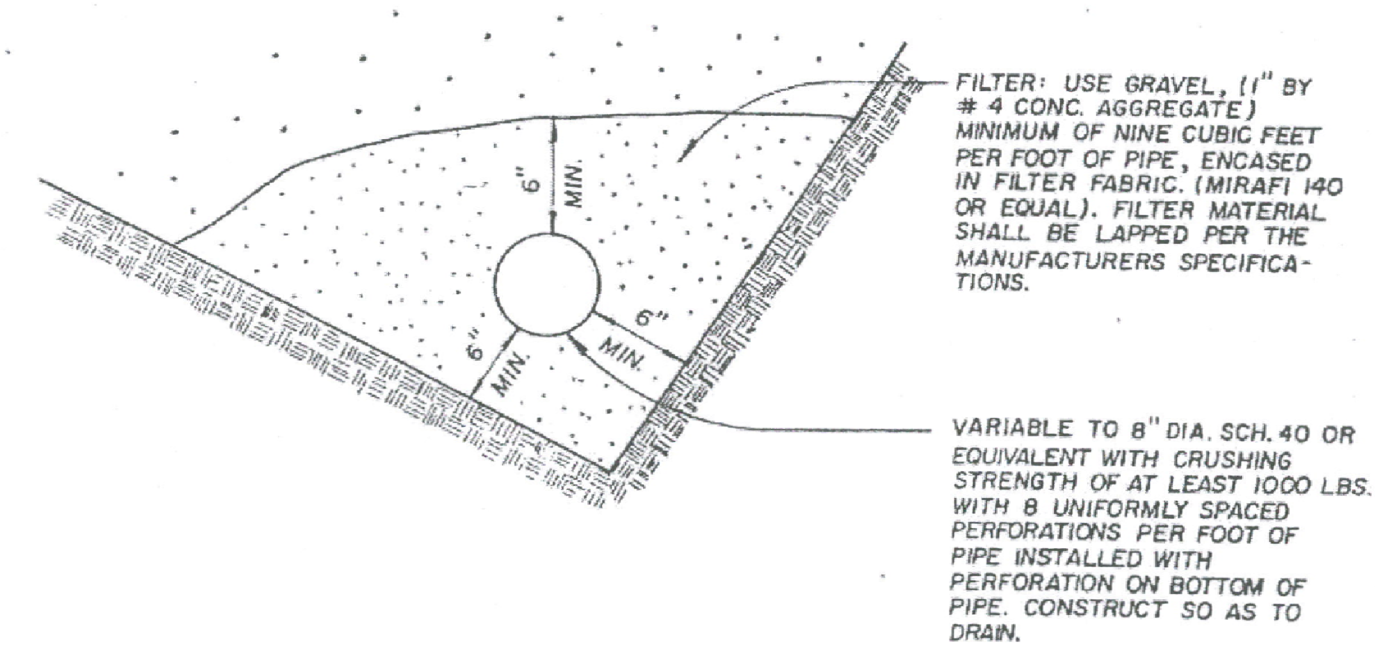
1. DIMENSIONS SHOWN SUBJECT TO FIELD CHANGE BASED ON ENGINEER'S JUDGEMENT
2. BENCHING REQUIRED WHEN FILLING OVER NATURAL GROUND STEPPER THAN 5H:1V
3. WITHIN THE CUT PORTION OF THE SLOPE, HORIZONTAL THICKNESS SHOULD NOT BE GREATER AT THE TOP THAN AT THE BOTTOM

KEYING AND BENCHING DETAIL		
FOR: INLAND COMMUNITIES CORPORATION	GEOTECHNICAL INVESTIGATION TENTATIVE TRACT MAP NO. 18140 BADGER CANYON AREA SAN BERNARDINO, CALIFORNIA	ENCLOSURE "D-2"
DATE: MAY 2006		JOB NUMBER 05894-3

C.H.J. Incorporated



NOTE: DOWNSTREAM 20' OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE GRAINED MATERIAL. OUTLET SHALL BE TO NON-NUISANCE AREA.



NOTE: PVC DIAMETER SIZE DEPENDS ON SURFACE GRADE AND CANYON SIZE, SUBJECT TO REVIEW BY GEOTECHNICAL ENGINEER.

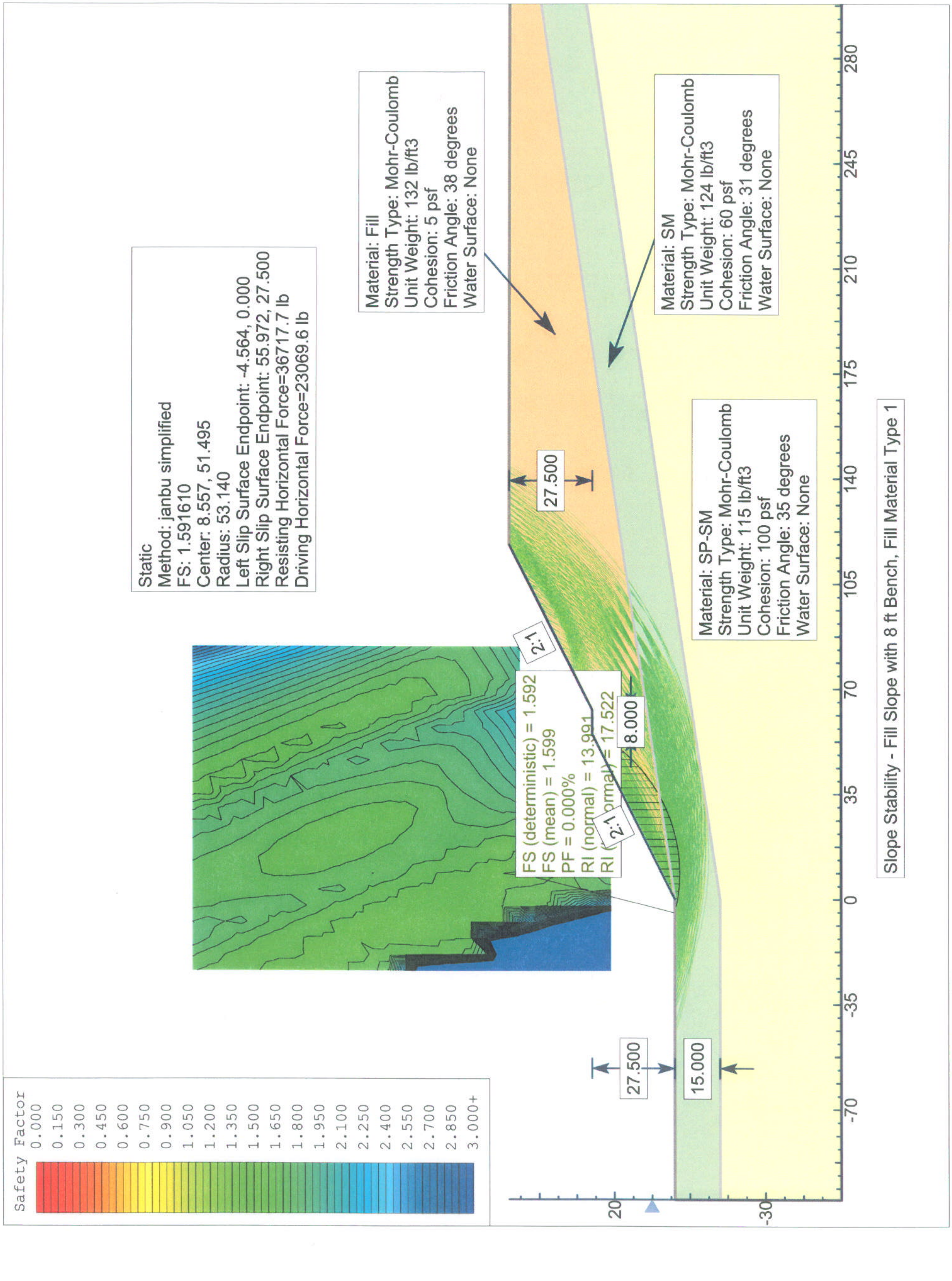
SUBDRAIN DETAIL

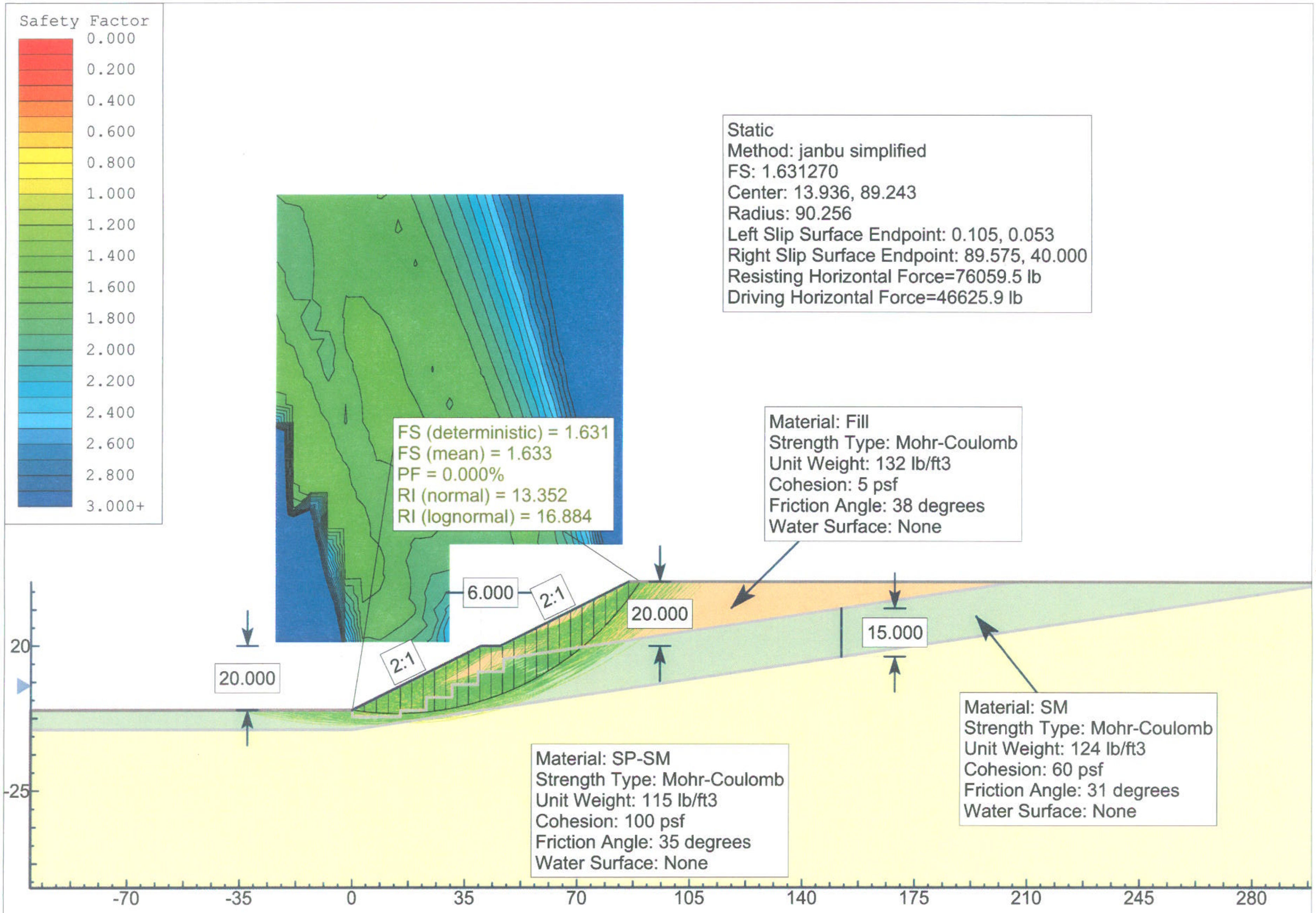
FOR: INLAND COMMUNITIES CORPORATION	GEOTECHNICAL INVESTIGATION TENTATIVE TRACT MAP NO. 18140 BADGER CANYON AREA SAN BERNARDINO, CALIFORNIA	ENCLOSURE "D-3"
DATE: MAY 2006		JOB NUMBER 05894-3

C.H.J. Incorporated

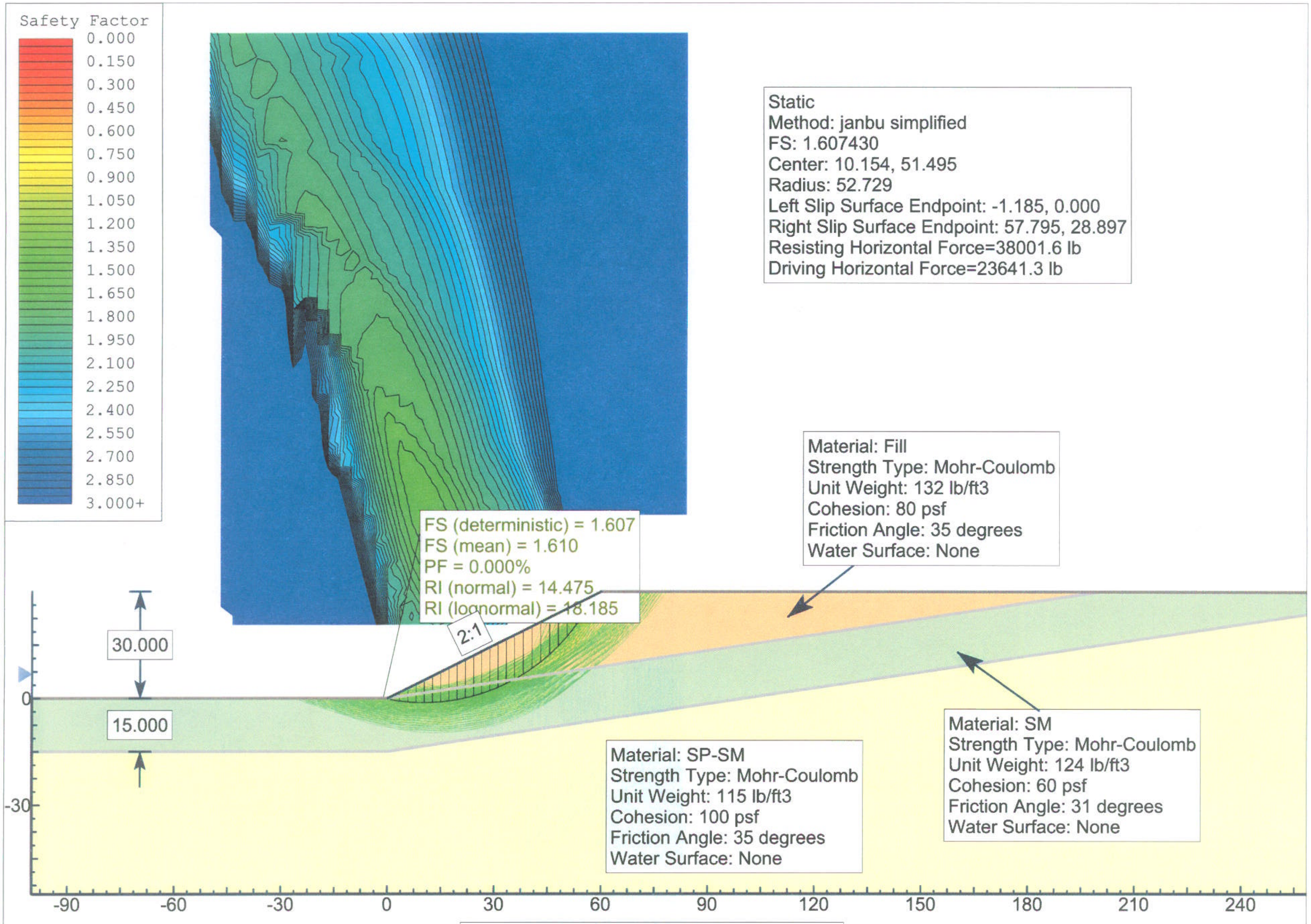
APPENDIX "E"

SLOPE STABILITY DATA

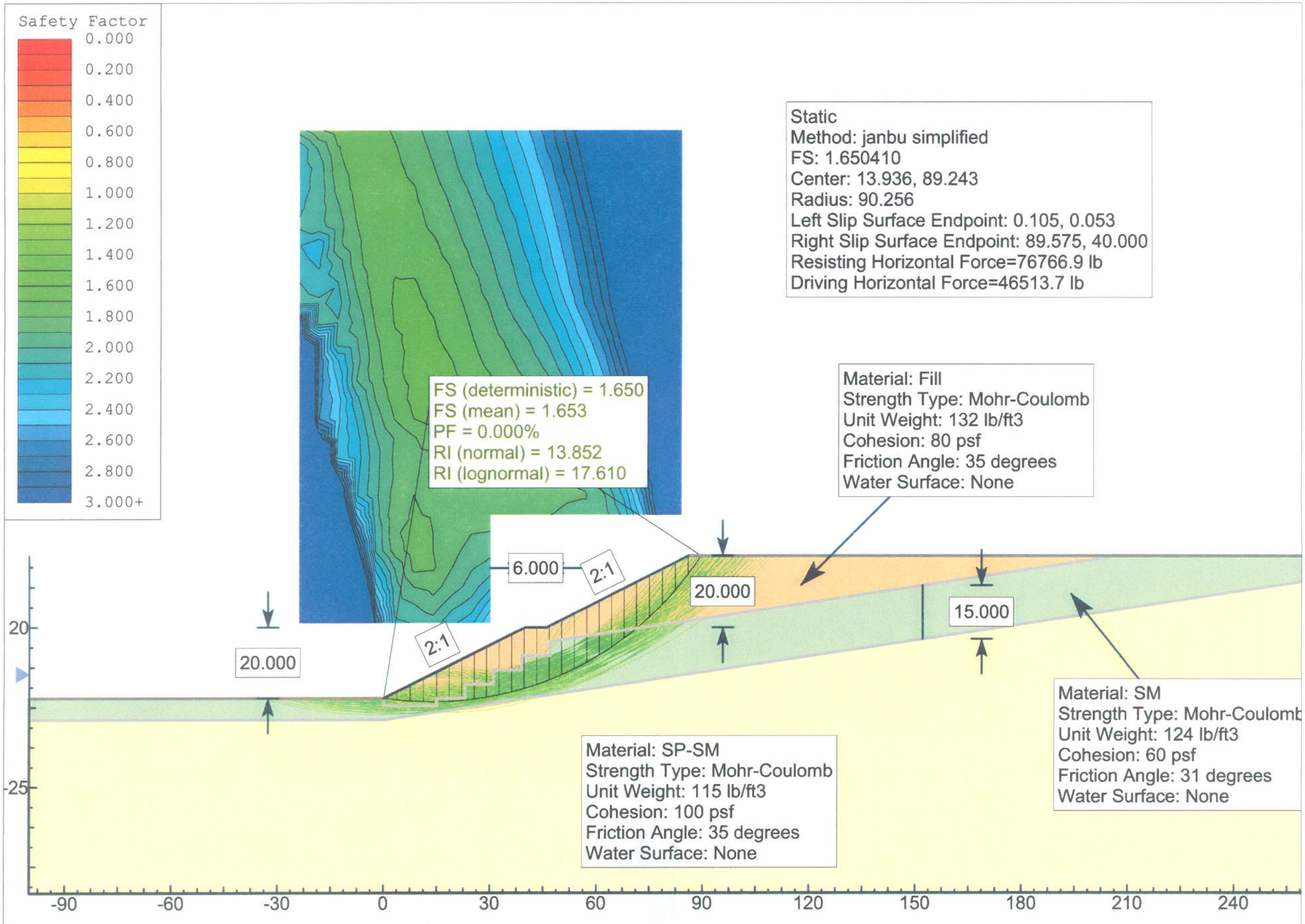

Safety Factor
0.000
0.150
0.300
0.450
0.600
0.750
0.900
1.050
1.200
1.350
1.500
1.650
1.800
1.950
2.100
2.250
2.400
2.550
2.700
2.850
3.000+
Static
Method: janbu simplified
FS: 1.591610
Center: 8.557, 51.495
Radius: 53.140
Left Slip Surface Endpoint: -4.564, 0.000
Right Slip Surface Endpoint: 55.972, 27.500
Resisting Horizontal Force=36717.7 lb
Driving Horizontal Force=23069.6 lb
Material: Fill
Strength Type: Mohr-Coulomb
Unit Weight: 132 lb/ft3
Cohesion: 5 psf
Friction Angle: 38 degrees
Water Surface: None
Material: SM
Strength Type: Mohr-Coulomb
Unit Weight: 124 lb/ft3
Cohesion: 60 psf
Friction Angle: 31 degrees
Water Surface: None
Material: SP-SM
Strength Type: Mohr-Coulomb
Unit Weight: 115 lb/ft3
Cohesion: 100 psf
Friction Angle: 35 degrees
Water Surface: None
FS (deterministic) = 1.592
FS (mean) = 1.599
PF = 0.000%
RI (normal) = 13.991
RI (lognormal) = 17.522
2:1
2:1
27.500
8.000
27.500
15.000
20
-30
-70
-35
0
35
70
105
140
175
210
245
280
Slope Stability - Fill Slope with 8 ft Bench, Fill Material Type 1



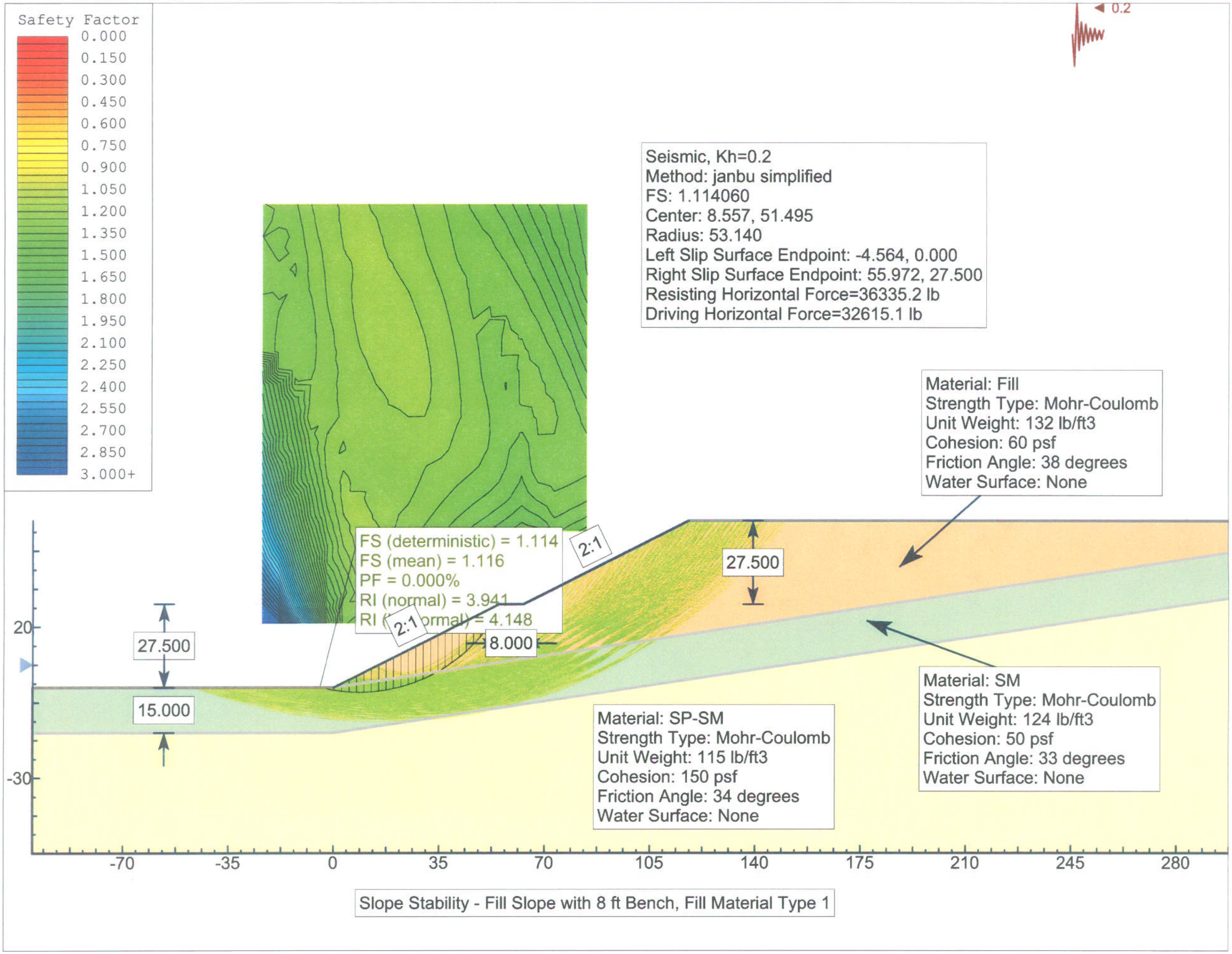
Slope Stability - Fill over Cut Slopes with 6 ft Bnech, Fill Material Type 1



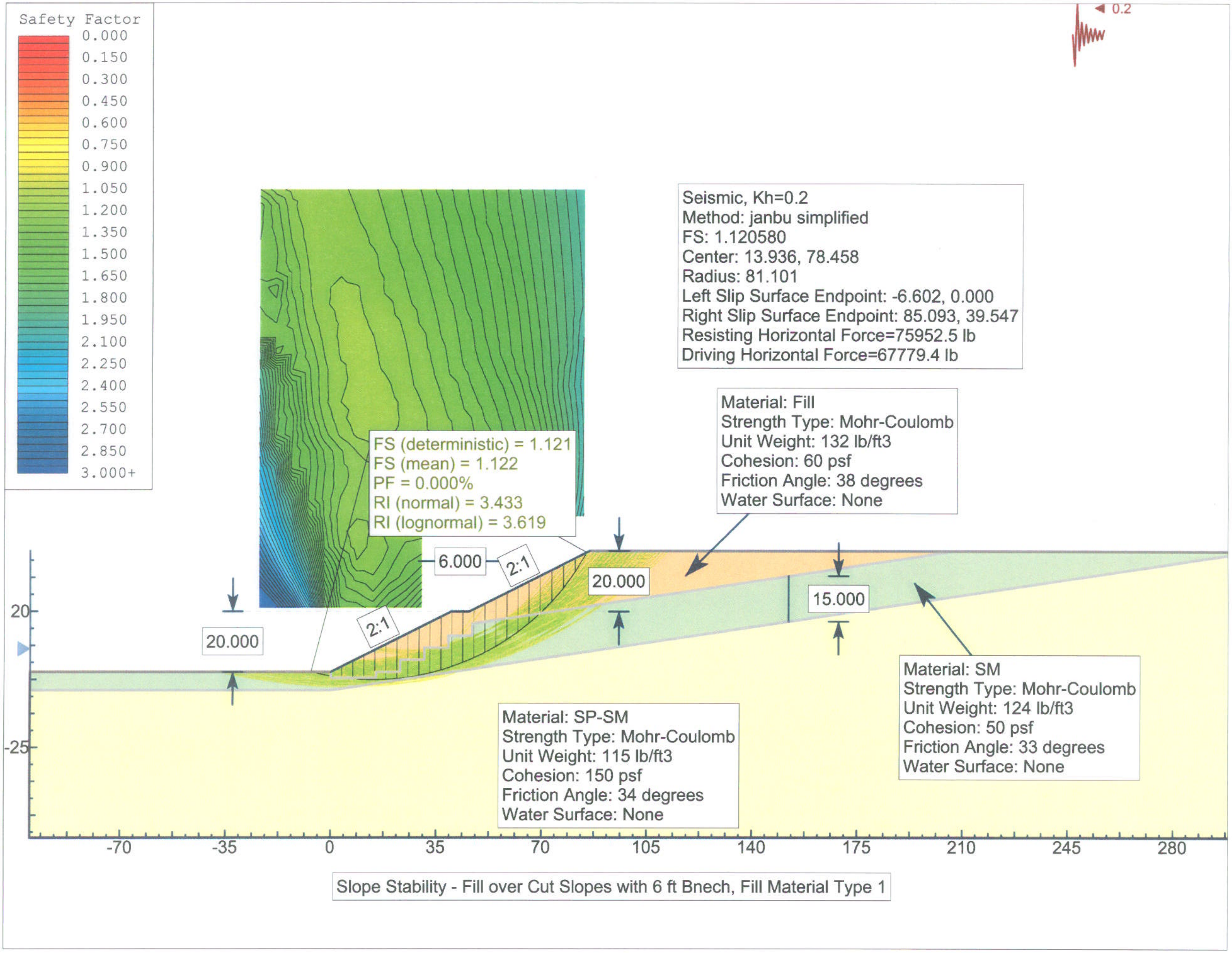
Slope Stability - Fill Slope, Fill Material Type 2

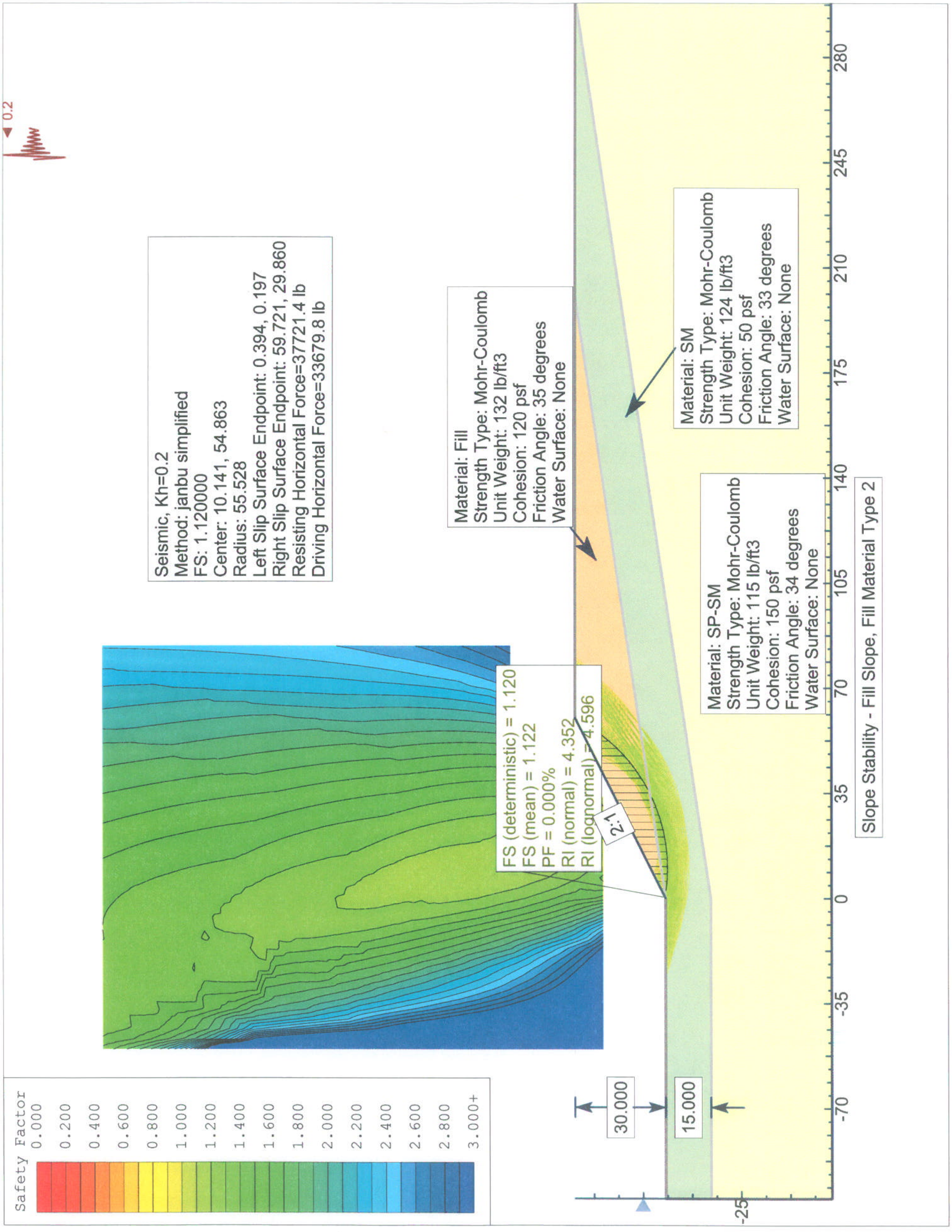


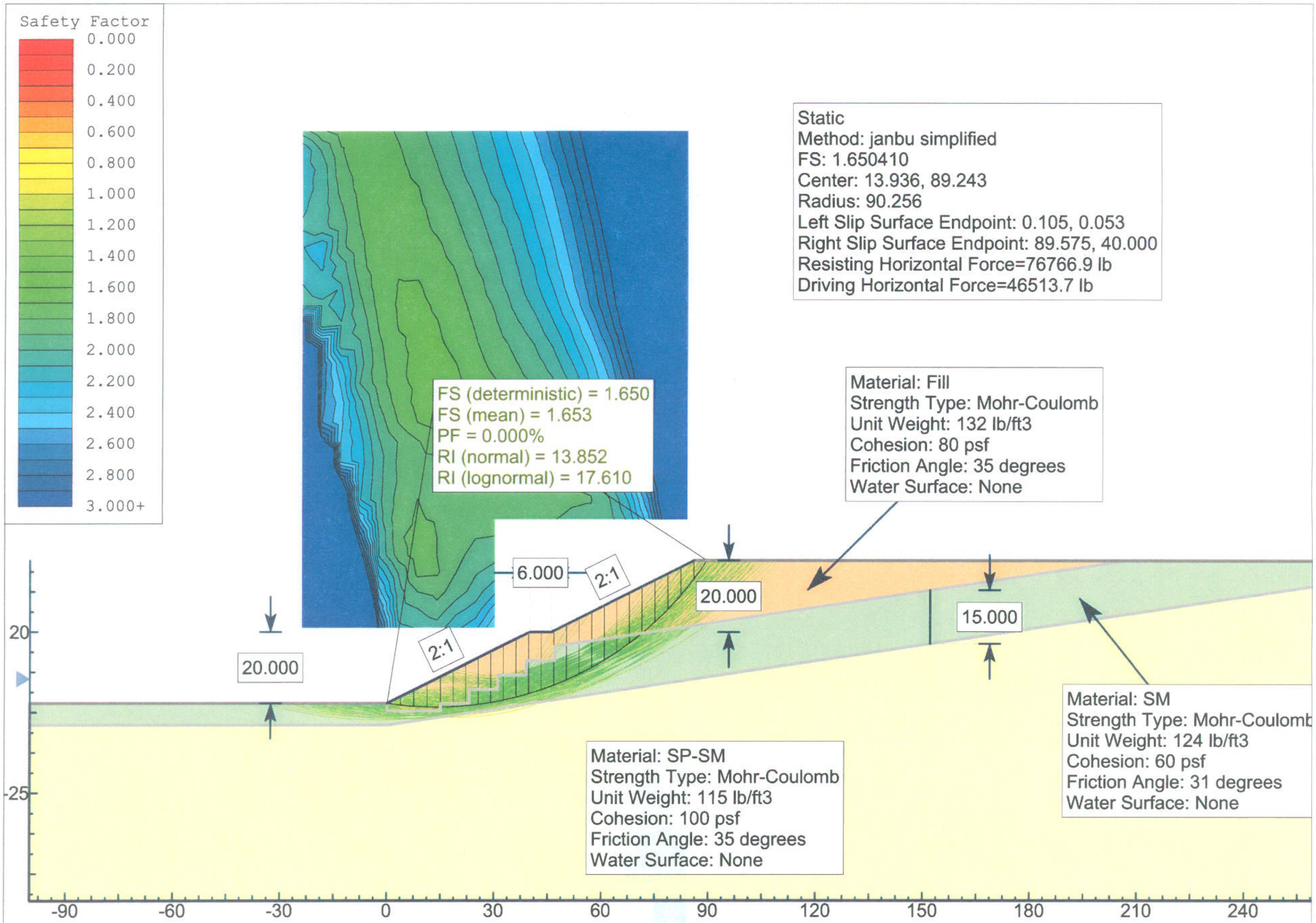
Slope Stability - Fill over Cut Slopes with 6 ft Bnech, Fill Material Type 2



Slope Stability - Fill Slope with 8 ft Bench, Fill Material Type 1


Safety Factor
0.000
0.150
0.300
0.450
0.600
0.750
0.900
1.050
1.200
1.350
1.500
1.650
1.800
1.950
2.100
2.250
2.400
2.550
2.700
2.850
3.000+
0.2
Seismic, Kh=0.2
Method: janbu simplified
FS: 1.120580
Center: 13.936, 78.458
Radius: 81.101
Left Slip Surface Endpoint: -6.602, 0.000
Right Slip Surface Endpoint: 85.093, 39.547
Resisting Horizontal Force=75952.5 lb
Driving Horizontal Force=67779.4 lb
FS (deterministic) = 1.121
FS (mean) = 1.122
PF = 0.000%
RI (normal) = 3.433
RI (lognormal) = 3.619
Material: Fill
Strength Type: Mohr-Coulomb
Unit Weight: 132 lb/ft3
Cohesion: 60 psf
Friction Angle: 38 degrees
Water Surface: None
6.000
2:1
2:1
20.000
20.000
15.000
Material: SM
Strength Type: Mohr-Coulomb
Unit Weight: 124 lb/ft3
Cohesion: 50 psf
Friction Angle: 33 degrees
Water Surface: None
Material: SP-SM
Strength Type: Mohr-Coulomb
Unit Weight: 115 lb/ft3
Cohesion: 150 psf
Friction Angle: 34 degrees
Water Surface: None
20
-25
-70
-35
0
35
70
105
140
175
210
245
280
Slope Stability - Fill over Cut Slopes with 6 ft Bnech, Fill Material Type 1


Safety Factor
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
2.600
2.800
3.000+
0.2
Seismic, Kh=0.2
Method: janbu simplified
FS: 1.120000
Center: 10.141, 54.863
Radius: 55.528
Left Slip Surface Endpoint: 0.394, 0.197
Right Slip Surface Endpoint: 59.721, 29.860
Resisting Horizontal Force=37721.4 lb
Driving Horizontal Force=33679.8 lb
FS (deterministic) = 1.120
FS (mean) = 1.122
PF = 0.000%
RI (normal) = 4.352
RI (lognormal) = 4.596
2:1
Material: Fill
Strength Type: Mohr-Coulomb
Unit Weight: 132 lb/ft3
Cohesion: 120 psf
Friction Angle: 35 degrees
Water Surface: None
Material: SM
Strength Type: Mohr-Coulomb
Unit Weight: 124 lb/ft3
Cohesion: 50 psf
Friction Angle: 33 degrees
Water Surface: None
Material: SP-SM
Strength Type: Mohr-Coulomb
Unit Weight: 115 lb/ft3
Cohesion: 150 psf
Friction Angle: 34 degrees
Water Surface: None
30.000
15.000
-25
-70
-35
0
35
70
105
140
175
210
245
280
Slope Stability - Fill Slope, Fill Material Type 2



Slope Stability - Fill over Cut Slopes with 6 ft Bnech, Fill Material Type 2