GEOTECHNICAL INVESTIGATION AND GEOLOGIC HAZARDS EVALUATION REPORT

PROPOSED SCIENCE BUILDING

COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

prepared by:

BROWN & MILLS, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS CONSTRUCTION MATERIALS TESTING

August 23, 2010
BMI Project No. 08S-294

College of the Siskiyous
c/o Karen Copsey
Nichols, Melburg & Rossetto
300 Knollcrest Drive
Redding, California 96002

Subject: Geotechnical Investigation
And Geologic Hazards Evaluation
Proposed Science Building
College of the Siskiyous
Weed, California

Dear Ms. Copsey:

Brown & Mills is pleased to present the attached geotechnical investigation and geologic hazards evaluation report for a proposed science building to be constructed within the existing College of the Siskiyou campus in Weed, California. Results of our study indicated the site is not within a current Earthquake Fault Zone or other area known to possess a significant geologic risk to site development. Further, we anticipate the site may be developed generally using conventional grading techniques and that shallow spread foundations may be used for support of the planned structure.

Though we anticipate the site may be developed generally using conventional grading and foundation construction techniques, it should be noted conditions were identified by our field exploration program that will likely require special design and/or construction provisions for some project components. A brief summary of these conditions as well as possible design and/or construction provisions to address these potential concerns are outlined below.

- Near-surface soils encountered during our field investigation across a majority of the site and to depths of about 5 to 10 feet below existing site grade were found to be relatively loose in consistency. Based on our experience at sites with similar soil conditions, we anticipate these soils may be compressible if subjected to heavy or concentrated foundation loads and/or earthquake-induced shaking. Compression of foundation soils could result in excessive foundation settlement which may be detrimental to the proposed structure. Though several options are available to reduce the potential for excessive foundation settlement due to compression of loose subgrade soils and/or limit the potential for structural distress, we anticipate the most viable option for this project would be to support the planned structure on

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shallow foundations designed using a relatively low bearing pressure and stiffened and connected to resist possible loss of bearing support due to limited (in areal extent) seismically-induced ground settlement.

- We anticipate existing, on-site structures and associated improvements will be demolished and resulting debris removed, prior to initial site development. During demolition, we recommend all footings, below-grade utilities, and other buried improvements (including, but not limited to, possible leach fields, cesspools, or septic tanks) which may be present (but not currently visible) be located, removed, and disposed of off-site or outside the construction limits. Further, we recommend a representative from Brown & Mills be present during all demolition and removal activities to assist in the contractor in identifying below-grade or buried improvements and evaluating and implementing any and all backfill operations.

- Though little-to-no fill was encountered within borings performed for this investigation, we anticipate some fill (and/or buried debris) may be encountered within the vicinity of existing, on-site structures (and possibly other areas of the site). In general, all debris encountered should be removed during initial site preparation and disposed of off-site. Any fill materials encountered (which will not be removed as part of an earthwork cut and are located within planned building, pavement, or fill areas) should be removed and replaced with (or as) engineered fill. The extent of removal should include the entire planned building, pavement, or fill areas and extend 5 feet beyond the limits of these improvements, or the depth of the fill, whichever is greater.

- Based on our review of published information pertaining to potential volcanic hazards, the project site is within an area likely to be affected by infrequent lava flows originating from volcanic vents on the flanks of nearby Mount Shasta. Hazards associated with lave flows are an inherent risk in the Weed area and likely can not be practically and/or economically mitigated (especially with respect to property damage). Therefore, this risk should be consider in the planning and operation of the proposed building. Such considerations could include an evacuation plan as well as other measures to reduce or eliminate possible injuries or loss of life in the event of a volcanic eruption.

Specific comments regarding the conditions outlined above, as well as recommendations regarding the geotechnical aspects of project design and construction, are presented in the following report.

We appreciate the opportunity of providing our services for this project. If you have questions regarding this report or if we may be of further assistance, please contact the undersigned.

Sincerely,

Brown & Mills, Inc.

REGISTERED PROFESSIONAL ENGINEER
R. KEITH BROWN
No. 2141
Exp. 12/31/2011
GEOTECHNICAL
STATE OF CALIFORNIA

R. Keith Brown, P.E. 08/23/2010
Principal

Reviewed by:

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Engineering Geologist

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AND GEOLOGIC HAZARDS EVALUATION REPORT
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

INTRODUCTION

GENERAL

This report presents the results of our geotechnical investigation and geologic hazards evaluation for a proposed science building to be constructed within the existing College of the Siskiyou campus in Weed, California. The purpose of our investigation was to explore and evaluate site subsurface conditions in order to develop recommendations related to the geotechnical aspects of project design and construction.

The project site is located within the southeast portion of the U.S Geological Survey 7.5 minute Weed quadrangle at coordinates[1] N 41 24 47 (41.4131), W 122 23 21 (122.3892). The approximate site location relative to existing topographic features and roads is shown on Plate 1.

PROPOSED CONSTRUCTION

We understand the proposed project will involve construction of a two-story science building encompassing approximately 22,000 square feet in total plan area. In general, the planned building will consist of a wood-frame structure with a concrete slab-on-grade (first) floor. Maximum anticipated wall and column loads will be about 4 kips per lineal foot and 130 kips, respectively. Appurtenant construction will include concrete walkways and underground utilities.

Grading plans were not available at the time this report was prepared; however, as site topography is relatively level, we anticipate minimal earthwork cuts and fills (i.e., less than about 1 to 2 feet in vertical extent) will be required to achieve a level building pad. Excavations for underground utilities are not anticipated to exceed about 6 feet below existing or final site grades.

A plot plan indicating the proposed project layout is shown on Plate 2.

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[1] Datum reference: North American Datum of 1927.

SCOPE OF SERVICES

The scope of our services was initially outlined in our proposal dated November 14, 2008, and included the following:

- ► A review of readily available literature pertaining to site geology, faulting, and seismicity.
- ► Exploration of site subsurface conditions using 4 exploratory borings.
- ► Preparation of this report which includes:
  - A description of the proposed project;
  - A summary of our field exploration program;
  - A discussion of site geology, faulting, and seismicity based on our review of readily available geologic literature;
  - A description of site surface and subsurface conditions encountered during our field investigation;
  - Our comments regarding potential geologic hazards which could affect the site or proposed project;
  - California Building Code (CBC) seismic parameters; and
  - Recommendations related to the geotechnical aspects of site preparation and engineered fill, temporary excavations and trench backfill, foundation design and construction, and concrete slabs supported-on-grade.

FIELD INVESTIGATION

Subsurface conditions at the site were explored on November 18, 2008, by drilling 4 borings (designated B-1 through B-4) to depths of about 11-1/2 to 21-1/2 feet below existing site grade. Borings were advanced using a CME 45B, truck-mounted drill rig equipped with a 6-inch-diameter, hollow-stem auger. The approximate locations of the borings performed for this investigation are indicated on Plate 2.

Our technician maintained a log of the borings, visually classified the soils encountered according to the Unified Soil Classification System (see Plate 3), and obtained relatively undisturbed samples of the subsurface materials. Soil samples were obtained from the borings with a Standard Penetration

Sampler driven 18 inches (unless otherwise noted) into undisturbed material using a 140-pound hammer falling 30 inches. After the borings were completed, they were backfilled with the drill cuttings. Logs of the borings performed for this investigation are presented on Plates 4 through 7.

SITE CONDITIONS

GEOLOGY AND SEISMICITY

Geologic Setting

The project site is located within along the western edge of the Modoc Plateau, which is generally considered a portion of the Great Basin province. The Modoc plateau consists of a series of northwest- to north-trending block-faulted ranges, with the intervening basins filled with broad-spreading "plateau" basalt flows, small shield volcanoes, steeper-sided lava or composite cones, cinder cones, and lake deposits resulting from disruption of the drainage by faulting or volcanism.

Based on our review of the California Division of Mines and Geology map titled: "Geologic Map of the Weed Quadrangle," 1987, the project site lies within an area of late Pleistocene age volcanic rock (possibly Shastina pyroclastic flow, though the specific designation was difficult to discern). Results of our subsurface investigation indicated the site is immediately underlain by loose-to-dense silty sand. We suspect deeper explorations would have encountered volcanic rock at depths only slightly greater than reached by this investigation (i.e., 21-1/2 feet below existing site grade).

A geologic map for the site area is presented on Plate 8.

Historic Earthquakes within Site Area

Siskiyou County is located within an area of California generally not characterized by an abundance of active faulting. The closest recorded earthquake with a magnitude greater than 5.5 was an event which occurred in 1884 (M 6.1) with an epicenter located approximately 65 miles west of the site[2].

[2] Reference: California Division of Mines and Geology map titled: "Epicenters of and Areas Damaged by M>5.5 California Earthquakes, 1800-1999, Map Sheet 49, T. Toppozada, D. Branum, M. Petersen, C. Hallstrom, C. Cramer, and M. Reichle, 2000.

Faulting and Seismicity

The closest, active[3] fault mapped by the California Division of Mines and Geology[4] is the Cedar Mountain Fault Zone, located about 26 miles to the east-northeast of the site. A map indicating faults within the site area is presented on Plate 9.

SURFACE

The project site consists of a regularly shaped area located within the existing College of the Siskiyou campus in Weed, California. The site is bounded to the north by Eddy Hall (an existing one-story classroom building), grass lawn areas, and concrete walkways; to the east by grass lawn areas and concrete walkways (with existing buildings beyond); to the south by grass lawn areas and concrete walkways (with an existing gymnasium beyond); and to the west by grass lawn areas and concrete walkways (with an existing vehicular parking lot beyond). At the time of our field investigation, the site was occupied by two existing one-story classroom buildings and appurtenant concrete walkways and landscape areas vegetated with grass. Existing topography within the immediate site area was relatively level.

SUBSURFACE

Near-surface soils encountered within a majority of the borings performed for this investigation consisted predominantly of loose silty sand to depths of about 5 to 10 feet below existing site grade. Below these loose near-surface soils, medium-dense-to-dense silty sand was generally encountered to the maximum depth explored (approximately 21-1/2 feet below existing site grade).

No free groundwater was encountered during our field investigation. However, it should be recognized that groundwater conditions can vary depending on the season, irrigation and/or groundwater pumping practices (both on- and off-site), precipitation, runoff conditions, the level of nearby bodies of water (including ponds, canals, creeks, and rivers), and possibly other factors. Therefore, groundwater conditions presented in this report may not be representative of those which may be encountered during or subsequent to construction.

A more detailed description of the subsurface conditions encountered during our field investigation is provided on the attached logs.

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[3] Within this report, a fault is considered active if there is evidence of Holocene (i.e., within the past 10,000 to 12,000 years) surface displacement along one or more of its segments or branches.

[4] Reference: California Division of Mines and Geology map titled: "Fault Activity Map of California and Adjacent Areas," compiled by Charles W. Jennings, published 1994.

GEOLOGIC HAZARDS

FAULTING AND SEISMICITY

Ground Rupture

No significant active faults (or fault zones) are located within the immediate site vicinity, nor is the site within a current Earthquake Fault Zone (formerly known as an Alquist Priolo Special Studies Zone). Therefore, it is our opinion that the potential for ground rupture at the site in the event of a seismic event is highly unlikely.

Site Characterization

Results of our subsurface investigation generally indicated the site is underlain by loose-to-dense silty sand. Given that volcanic rock has been mapped within the site area (and likely at depths only slightly greater than reached by this investigation (i.e., 21-1/2 feet below existing site grade)), it is our opinion the site may be characterized as a "very dense soil and soft rock" site.

Estimated Peak Ground Acceleration

In order to assess potential ground motions at the site due to seismic activity, we utilized the USGS Probabilistic Seismic Hazard Map 2008 gridded values via the Internet. Values of attenuated ground motion compiled within this database are based on the closest distance between the site and various measures of fault-plane rupture for each fault in the source model. For a Class C (very dense soil and soft rock) site, a peak ground acceleration (PGA) of 0.32[5]g (where "g" equals 32.2 feet per second per second) was obtained for the maximum considered earthquake event (i.e., 2 percent probability of exceedance in 50 years).

CBC Seismic Design Parameters

In the event the California Building Code (CBC, 2007 edition) is used for seismic design, it is our opinion encountered subsurface conditions (and those suspected below the maximum depth explored) would warrant a type C (i.e., very dense soil and soft rock) Site Classification. Further, using software provided by the United States Geological Survey (i.e. Java Ground Motion Parameter Calculator - Version 5.0.9a), site-specific spectral response acceleration parameters were obtained for the maximum considered earthquake and are summarized in the table on the following page.

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[5] Values obtained from the USGS Probabilistic Seismic Hazard Map database are for “firm rock” sites. The value obtained was adjusted for site-specific ground conditions using National Earthquake Hazards Reduction Program (NEHRP, 1994) correction factors.

Spectral Response Acceleration Parameters		Value
Mapped spectral acceleration for short periods	S_S	0.663g
Mapped spectral acceleration at 1-second period	S_1	0.255g
Site coefficient for short periods	Fa	1.135
Site coefficient at 1-second period	Fv	1.545
Adjusted earthquake spectral response acceleration for short periods	S_{MS}	0.753g
Adjusted earthquake spectral response acceleration at 1-second period	S_{M1}	0.393g
Design earthquake spectral response acceleration for short periods	S_{DS}	0.502g
Design earthquake spectral response acceleration at 1-second period	S_{D1}	0.262g

Liquefaction

Liquefaction is a phenomenon whereby loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from cyclic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits after an earthquake as excess pore pressures are dissipated (and hence settlements of overlying deposits). The primary factors deciding liquefaction potential of a soil deposit are: (1) the level and duration of seismic ground motions; (2) the type and consistency of the soils; and (3) the depth to groundwater.

Subsurface earth materials encountered during our field investigation generally consisted of alluvial soils composed predominantly of loose-to-dense silty sand. No free groundwater was encountered during our field investigation.

Based on the lack of free groundwater as well as site soils become relatively dense at depths in excess of about 10 feet, it is our professional opinion the potential for liquefaction at the site during or subsequent to a seismic event is unlikely.

Seismically-Induced Ground Subsidence

Ground subsidence within the site area would typically be due to densification of subsurface soils during or subsequent to a seismic event. Generally, loose, granular soils would be most susceptible to densification, resulting in ground subsidence.

Based on the subsurface conditions encountered during our field investigation, relatively loose, cohesionless surficial soils encountered during our field investigation to depths of about 5 to 10 feet below existing site grade may be susceptible to densification (resulting in ground subsidence) during or subsequent to a nearby seismic event. The magnitude of possible ground subsidence at the site would be highly dependent on the level and duration of seismic ground motions. In the event of a large earthquake, we estimate seismically induced ground subsidence could approach 1 to 2 inches[6].

In our opinion, the most significant adverse effect that seismically induced ground subsidence may have on the proposed project would involve settlement of the planned building. Typically, risks associated with seismically-induced ground subsidence can be mitigated using a deep foundation system (e.g., driven piles or drilled piers), removal and replacement of soils susceptible to liquefaction and/or seismically-induced ground subsidence, in-situ ground improvement (e.g., dynamic consolidation, compaction piles or grouting, gravel drains, etc.), and/or reinforced shallow foundations (e.g., a post-tensioned slab, a system of grade beams or continuous spread footings, and a stiffened concrete mat foundation).

We understand that the design of existing, on-site buildings did not consider seismically-induced ground subsidence and are founded on shallow spread footings. Hence, it is our opinion options involving deep foundation systems, removal and replacement, and in-situ ground improvement would not be practical, economically feasible, or appropriate for this project. Therefore, we have provided recommendations herein to support the planned building on shallow spread footings, stiffened and connected to resist possible loss of bearing support as well as limited (in areal extent) seismically-induced ground settlement (see section below titled: "SPREAD FOUNDATIONS").

Lurching and Lateral Spreading

Lurching and lateral spreading results from movement toward steep, unsupported embankments during seismic shaking. Since the project site is located within an area of relatively level topography, there are no unsupported banks of any significant height located within the immediately site vicinity. Hence, we consider the risk to the project resulting from lurching/lateral spreading to be insignificant.

[6] Reference: "Evaluation of Settlements in Sands Due to Earthquake Shaking," by Kohji Tokimatsu and H. Bolton Seed, *Journal of Geotechnical Engineering*, Volume 113, No. 8, August 2387. A spreadsheet summary of our calculations is presented on Plate A-5 of the appendix to this report for ; a legend to terms used in the spreadsheet is present on Plate A-6.

LANDSLIDES

The project site is located within an area of relatively level topography. Since little-to-no earthwork grading is anticipated for the project, it is our professional opinion that landsliding is unlikely at the site and that earthwork grading (if any) should not result in a potential for slope instability within or in the immediate vicinity of the site.

EXPANSIVE SOIL

Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall infiltration, landscape irrigation, utility leakage, roof drainage, elevated groundwater levels, drought, or other factors and may cause unacceptable settlement or heave of structures, concrete slabs supported-on-grade, or pavements supported over these materials. Based on the results of laboratory testing performed on selected samples obtained during our field investigation, near surface soils encountered across the site are predominantly granular and contain only low expansion potential clay fines. Therefore, it is our opinion the expansion potential of on-site earth materials would be nil.

FLOODING

General

Based on our review of the Federal Emergency Management Agency (FEMA) website, the site does not lie within a mapped flood-prone area (i.e., outside the 500 year flood plain).

Tsunamis and Seiches

A tsunami is a vast sea wave caused by the sudden dropping or rising of a section of the sea floor following an earthquake. Given the distance of the project site from the Pacific Ocean, we consider the potential for inundation at the site due to a tsunami to be nil.

A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin whose period and height generally depend on the physical characteristics of the basin. Seiches typically result from sudden local changes in atmospheric pressure, and can also be triggered by seismic ground motions or landslides.

The nearest, significant body of water is Dwight Hammond Reservoir, located approximately 2 miles south-southwest of the project site. Due to the presence of intervening hills (and other topographically elevated areas in excess of 200 feet above the level of Dwight Hammond Reservoir), we consider the potential for seiches at the site to be nil.

Earthquake-Induced Flooding

Earthquake-induced flooding generally results from failure of a dam (or other similar structure) located upstream of a site. Based on our review of USGS topographic maps and other sources, there are no significant dams upstream of the project site. Hence, we consider the potential for earthquake-induced flooding from dam failure to be nil.

VOLCANIC HAZARDS

The project site is located south of the Cascade Range, an active volcanic chain which extends northward into British Columbia. The most recent volcanic activity within the site vicinity was in 1914-1917, when eruptions of Lassen Peak (located approximately 45 miles east of the site) produced lava flows on the flank of the crater, numerous ash falls, and a large mudflow.

Based on our review of published information pertaining to potential volcanic hazards (i.e., Miller, C.D., 1981, "Potential Hazards from Future Volcanic Eruptions in the Vicinity of Mount Shasta Volcano, Northern California," U.S. Geological Survey Bulletin 1503), the project site is within an area likely to be affected by infrequent lava flows originating from volcanic vents on the flanks of nearby Mount Shasta. Hazards associated with lave flows are an inherent risk in the Weed area and likely can not be practically and/or economically mitigated (especially with respect to property damage). Therefore, this risk should be consider in the planning and operation of the proposed building. Such considerations could include an evacuation plan as well as other measures to reduce or eliminate possible injuries or loss of life in the event of a volcanic eruption.

EXCEPTIONAL GEOLOGIC HAZARDS

There are no other known exceptional geologic hazards (i.e., hydrocollapse of alluvial fan soils; regional subsidence; natural gas, tar seeps, or radon 222 gas[7]; naturally occurring asbestos[8]; high nitrates in groundwater or organic stockpiles) that pose a significant risk to the site.

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[7] References: "Geologic Controls on the Distribution of Radon in California," Ronald Churchill, California Department of Health Services, January 25, 1991; United States Environmental Protection Agency Map of Radon Zones; and/or California Department of Health Services radon levels database.

[8] Reference: "A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos," California Division of Mines and Geology, August, 2000.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Results of our study indicated the site is not within a current Earthquake Fault Zone or other area known to possess a significant geologic risk to site development. Further, we anticipate the site may be developed generally using conventional grading techniques and that shallow spread foundations may be used for support of the planned structure.

Though we anticipate the site may be developed generally using conventional grading and foundation construction techniques, it should be noted conditions were identified by our field exploration program that will likely require special design and/or construction provisions for some project components. A brief summary of these conditions as well as possible design and/or construction provisions to address these potential concerns are outlined below.

- Near-surface soils encountered during our field investigation across a majority of the site and to depths of about 5 to 10 feet below existing site grade were found to be relatively loose in consistency. Based on our experience at sites with similar soil conditions, we anticipate these soils may be compressible if subjected to heavy or concentrated foundation loads and/or earthquake-induced shaking. Compression of foundation soils could result in excessive foundation settlement which may be detrimental to the proposed structure. Though several options are available to reduce the potential for excessive foundation settlement due to compression of loose subgrade soils and/or limit the potential for structural distress, we anticipate the most viable option for this project would be to support the planned structure on shallow foundations designed using a relatively low bearing pressure and stiffened and connected to resist possible loss of bearing support due to limited (in areal extent) seismically-induced ground settlement.

- We anticipate existing, on-site structures and associated improvements will be demolished and resulting debris removed, prior to initial site development. During demolition, we recommend all footings, below-grade utilities, and other buried improvements (including, but not limited to, possible leach fields, cesspools, or septic tanks) which may be present (but not currently visible) be located, removed, and disposed of off-site or outside the construction limits. Further, we recommend a representative from Brown & Mills be present during all demolition and removal activities to assist in the contractor in identifying below-grade or buried improvements and evaluating and implementing any and all backfill operations.

- Though little-to-no fill was encountered within borings performed for this investigation, we anticipate some fill (and/or buried debris) may be encountered within the vicinity of existing, on-site structures (and possibly other areas of the site). In general, all debris encountered should be removed during initial site preparation and disposed of off-site. Any fill materials encountered (which will not be removed as part of an earthwork cut and are located within planned building, pavement, or fill areas) should be removed and replaced with (or as) engineered fill. The extent of removal should include the entire planned building, pavement, or fill areas and extend 5 feet beyond the limits of these improvements, or the depth of the fill, whichever is greater.

- Based on our review of published information pertaining to potential volcanic hazards, the project site is within an area likely to be affected by infrequent lava flows originating from volcanic vents on the flanks of nearby Mount Shasta. Hazards associated with lave flows are an inherent risk in the Weed area and likely can not be practically and/or economically mitigated (especially with respect to property damage). Therefore, this risk should be consider in the planning and operation of the proposed building. Such considerations could include an evacuation plan as well as other measures to reduce or eliminate possible injuries or loss of life in the event of a volcanic eruption.

Specific comments regarding the conditions outlined above, as well as recommendations regarding the geotechnical aspects of project design and construction, are presented in the following sections of this report.

SITE PREPARATION

Demolition and Removal of Existing Improvements

We anticipate existing, on-site structures and associated improvements will be demolished and resulting debris removed, prior to initial site development. During demolition, we recommend all footings, below-grade utilities, and other buried improvements (including, but not limited to, possible leach fields, cesspools, or septic tanks) which may be present (but not currently visible) be located, removed, and disposed of off-site or outside the construction limits. Further, we recommend a representative from Brown & Mills be present during all demolition and removal activities to assist in the contractor in identifying below-grade or buried improvements and evaluating and implementing any and all backfill operations.

Though little-to-no fill was encountered within borings performed for this investigation, we anticipate some fill (and/or buried debris) may be encountered within the vicinity of existing, on-site structures (and possibly other areas of the site). In general, all debris encountered should be removed during initial site preparation and disposed of off-site. Any fill materials encountered (which will not be removed as part of an earthwork cut and are located within planned building, pavement, or fill areas) should be removed and replaced with (or as) engineered fill. The extent of removal should include the entire planned building, pavement, or fill areas and extend 5 feet beyond the limits of these improvements, or the depth of the fill, whichever is greater.

Stripping and Grubbing

Prior to general site grading and/or construction of planned improvements, any existing vegetation, organic topsoil, or debris should be stripped (or otherwise removed) and disposed of off-site or outside the construction limits. Deep stripping or grubbing will be required where concentrations of organic soils, tree roots, or debris are encountered. Stripped topsoil (less any debris or large tree roots) may be stockpiled and reused for landscape purposes; however, this material should not be incorporated into any engineered fill.

Existing Utilities, Wells, and/or Foundations

Abandoned (or to be abandoned), below-grade utility lines, septic tanks, cesspools, leach lines, wells, foundations, or other similar improvements may exist within areas of the site other than those currently occupied by existing structures. All such items should be removed and disposed of off-site; existing wells should be abandoned in accordance with applicable regulatory requirements. Existing, below-grade utility pipelines (if any) which extend beyond the limits of the proposed construction and will be abandoned in-place should be plugged with cement grout to prevent migration of soil and/or water. All excavations resulting from removal activities should be cleaned of loose or disturbed material (including all previously placed backfill) prior to placing any fill or backfill.

Scarification and Compaction

Following site stripping and any required grubbing or overexcavation, all areas to receive engineered fill should be scarified to a depth of 8 inches, uniformly moisture-conditioned to between 0 and 5 percent above the optimum moisture content, and compacted to at least 90 percent of the maximum dry density as determined by ASTM (American Society for Testing and Materials) Test Method D 1557[9].

Overexcavation of Loose or Disturbed Material

Within areas grubbed or otherwise disturbed below a depth of about 12 inches, in-place scarification and compaction may not be adequate to densify all disturbed soil. Therefore, Overexcavation of the disturbed soil, scarification and compaction of the exposed subgrade, and replacement with engineered fill may be required in these areas.

[9] This test procedure should be used wherever relative compaction, maximum dry density, or optimum moisture content is referenced within this report.

Wet/Unstable Soil Conditions

If site preparation or grading is performed in the winter or spring season, or shortly after significant precipitation, near-surface site soils may be significantly over optimum moisture content. This condition could hinder construction equipment as well as efforts to compact site soils to a specified level of compaction. If over optimum soil moisture content conditions are encountered during construction, disking to aerate, replacement with imported material, chemical treatment, stabilization with a geotextile fabric, grid or coarse aggregates (such as cobbles or boulders), and/or other methods will likely be required to facilitate earthwork operations. The applicable method will depend on the contractor's capabilities as well as other project-related factors beyond the scope of this study. Therefore, if over-optimum soil conditions are encountered during construction, the project Geotechnical Engineer should review these conditions (as well as the contractor's capabilities) and, if appropriate, provide recommendations for their treatment.

TEMPORARY EXCAVATIONS

General

All temporary excavations must comply with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the responsibility of the contractor, who should be solely responsible for the means, methods, and sequencing of construction operations.

Construction Considerations

Construction equipment, building materials, excavated soil, vehicular traffic, and other similar loads should not be allowed near the top of any unshored or unbraced excavation. Where the stability of adjoining buildings, walls, pavements, or other similar improvements is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to protect personnel working within the excavation. Since excavation operations are dependent on construction methods and scheduling, the contractor should be solely responsible for the design, installation, maintenance, and performance of all shoring, bracing, underpinning, and other similar systems. Under no circumstances should comments provided herein be inferred to mean that Brown & Mills is assuming any responsibility for temporary excavations, or for the design, installation, maintenance, and performance of any shoring, bracing, underpinning, or other similar systems.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering all excavations. All runoff water within or adjacent to any excavation should be collected and disposed of outside the construction limits.

Excavation Conditions

Based on our experience in the site area and conditions encountered during our field exploration program, we anticipate trench (and other shallow) excavations should be possible with a conventional backhoe (such as a Case 580 or equivalent).

ENGINEERED FILL

Materials - General

Engineered fill should generally consist of soil and/or soil-aggregate mixtures less than 3 inches in maximum dimension, nearly-free of organic or other deleterious debris, and essentially non-plastic. Typically, well-graded mixtures of gravel, sand, silt, and/or low plasticity clay are acceptable for use as engineered fill. Specific requirements for engineered fill, as well as applicable test procedures to verify material suitability, are provided below.

Soil Property		ASTM Test Procedure	
Gradation		Test Designation	Test Description
Sieve Size	Percent Passing		
3-inch	100	D 422	Particle-Size Analysis of Soils
¾-inch	70 to 100	D 422	Particle-Size Analysis of Soils
200	Greater than about 10	D 422	Particle-Size Analysis of Soils
Plasticity			
Liquid Limit	Plasticity Index	D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils
Less than 30	Less than 12		
Organic Content			
Less than 3 percent		D 2974	Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
Maximum Dry Unit Weight			
More than 100 pounds per cubic foot		D 1557	Laboratory Compaction Characteristics of Soil Using Modified Effort

On-Site Soil Materials

In general, we anticipate a majority of the near-surface, on-site soils, free of organic or other deleterious debris, may be used for engineered fill.

Imported Materials

All imported soil and/or soil-aggregate mixtures used for engineered fill should: (1) meet the material requirements outlined above (see section titled: "Materials - General"); and (2) be sampled, tested and approved by the project Geotechnical Engineer prior to being transported to the site.

Placement and Compaction

Soil and/or soil-aggregate mixtures used for engineered fill should be uniformly moisture-conditioned to between 0 and 5 percent above the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. In pavement areas, engineered fill placed within 12 inches of finished subgrade[10] should be compacted to at least 95 percent relative compaction.

If fills in excess of 5 feet in vertical extent are planned for this project, we recommend the lower portion of these fills (i.e., fill located more than 5 feet below finished subgrade) be compacted to at least 93 percent relative compaction.

TRENCH BACKFILL

Materials

Pipe zone backfill (i.e., material beneath and in the immediate vicinity of the pipe) should consist of on-site or imported soil less than one inch in maximum dimension; trench zone backfill (i.e., material placed between the pipe zone backfill and finished subgrade) may consist of on-site soil which meets the material requirements previously-provided for engineered fill.

If imported material is used for pipe or trench zone backfill, we recommend it not consist of gravel due to the potential for soil migration into, and water seepage along, trenches backfilled with this type of material.

[10] Within this report, finished subgrade refers to the top surface of on-site soil compacted during site preparation, properly compacted trench backfill, and/or engineered fill.

Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipe. We recommend the project Civil Engineer develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this study.

Placement and Compaction

Trench backfill materials should be placed and compacted in accordance with recommendations previously-provided for engineered fill. Mechanical compaction is strongly recommended; ponding or jetting should not be allowed unless specifically reviewed and approved by the project Geotechnical Engineer prior to construction.

Important Note: All pipe zone backfill should be placed on undisturbed earth materials. In the event earth materials located directly beneath the planned pipe zone backfill are disturbed during construction, these materials should either be compacted in-place (if the depth of disturbance is less than about 12 inches), or removed (if the depth of disturbance is greater than about 12 inches) and replaced in accordance with recommendations previously-provided for engineered fill.

SPREAD FOUNDATIONS

General

In our opinion, shallow, continuous spread footings, constructed of reinforced concrete and founded on undisturbed native soil and/or engineered fill, may be used for support of the planned structure. In general, we recommend all such footings be a minimum of 12 inches wide and embedded a minimum of 18 inches below the lowest adjacent final subgrade[11]. In general, isolated spread footings should not be used for this project due to the potential for loss of bearing support as well as limited (in areal extent) seismically-induced ground settlement.

Structural Design Parameters for Continuous Spread Footings

Proposed continuous spread footings used for this project should be designed to resist excessive bending stresses and deflections associated with loss of subgrade support due to possible loss of bearing support as well as limited (in areal extent) seismically-induced ground settlement. To account for possible loss of subgrade support along the perimeter or within interior areas, we recommend all grade beams be designed for an unsupported simple span length of 10 feet.

[11] Within this report, final subgrade refers to the top surface of undisturbed native soil, on-site soil compacted during site preparation, or engineered fill.

Design of all continuous spread footings should also consider the support and deflection characteristics of the subgrade soils. For this site, we recommend a vertical subgrade modulus of 100 pounds per square inch per inch of deflection and an allowable bearing pressure of 1,000 pounds per square foot be used for design purposes. The allowable bearing pressure applies to dead plus live loads, includes a calculated factor of safety of at least 3, and may be increased by 1/3 for short-term loading due to wind or seismic forces.

We also recommend the project Structural Engineer not only verify that stresses within the proposed foundation are within a tolerable range, but also limit possible deflections. A commonly used criteria of a 1/2-inch maximum vertical deflection in 20 feet (horizontal) is suggested for design.

Lateral Resistance

Resistance to lateral loads (including those due to wind or seismic forces) may be provided by frictional resistance between the bottom of concrete foundations and the underlying soils, and by passive earth pressure against the sides of the foundations. A coefficient of friction of 0.25 may be used between cast-in-place concrete foundations and the underlying soil. Passive pressure available in undisturbed native soil and/or engineered fill may be taken as equivalent to the pressure exerted by a fluid weighing 225 pounds per cubic foot (pcf). To account for possible future loss of subgrade support due to surface disturbance, we recommend earth materials located within the uppermost 1/2-foot of the embedded portion of the foundations be neglected when evaluating passive resistance.

Lateral resistance parameters provided above are ultimate values. Therefore, a suitable factor of safety should be applied to these values for design purposes. The appropriate factor of safety will depend on the design condition and should be determined by the project Structural Engineer. Depending on the application, typical factors of safety could range from 1.0 to 1.5. Frictional and passive resistance may be used in combination, provided a suitable factor of safety is applied to these values during design.

Setbacks

Structures located near the top (or bottom) of a slope steeper than 3(h):1(v) should maintain a minimum set-back in accordance with requirements outlined in Section 1805.3 of the California Building Code (CBC, 2007 edition), or 3 feet (measured horizontally from the top or bottom of slope to the closest point of approach of the structure), whichever is greater.

Construction Considerations

Prior to placing reinforcing steel or concrete, footing excavations should be cleaned of all debris, loose or disturbed soil, and any water.

INTERIOR CONCRETE FLOOR SLABS SUPPORTED-ON-GRADE

Subgrade Preparation

Subgrade soils supporting interior concrete floor slabs should be scarified to a minimum depth of 8 inches, uniformly moisture-conditioned to between 0 and 5 percent above the optimum moisture content, and compacted to at least 90 percent relative compaction. Scarification and compaction may be omitted if interior slabs are to be placed directly on undisturbed engineered fill and if approved by the project Geotechnical Engineer during construction.

Surrounding Grades

It has been our experience that ground surface grades surrounding structures can affect the post-construction presence and quantity of water beneath such structures, as well as vapor emissions from interior concrete floor slabs. In order to reduce the possibility for these potentially adverse conditions, we recommend areas adjacent to all structures be graded, or floor slabs raised, so that the bottoms of all interior concrete floor slabs are elevated at least 4 inches above adjacent, finished pad grades.

Rock Capillary Break

Interior concrete floor slabs supported-on-grade should be underlain by a capillary break consisting of free-draining durable rock at least 4 inches thick, graded such that 100 percent passes the 1-inch sieve and less than 5 percent passes the No. 4 sieve[12]. This rock should be compacted to the extent possible using light vibratory equipment prior to placing any vapor membranes or slab concrete. Further, precautions should be taken during construction to reduce contamination of the rock with soil or other materials. Contamination of the rock with soil or other materials may significantly reduce the effectiveness of the capillary break, possibly resulting in excessive (and adverse) free water transmission to the bottom of the overlying slab.

Vapor Emission Considerations

Though generally not a geotechnical consideration, it has been our experience that a plastic or vinyl membrane is often placed directly over the rock capillary break to reduce water migration from the subgrade soils up to the overlying concrete floor slab. If used, we suggest this membrane be installed in a manner to reduce punctures and penetrations. Where penetrations are unavoidable, or adjacent to footings or other similar obstruction, the vapor membrane should be placed tightly against these

[12] In general, Caltrans Class 2 aggregate base (or other similar material) will not meet the gradation requirements provided above for a capillary break. Therefore, we recommend this material not be used for a capillary break beneath interior concrete floor slabs supported-on-grade.

features. Further, it has been our experience that sand, 1 to 2 inches thick, is often placed on top of the membrane prior to placing slab concrete to promote more uniform curing of the slab. If sand is placed over the membrane, we strongly suggest that concrete not be placed if this sand has been allowed to become wet (due to precipitation or excessive moistening), or if standing water is present above the membrane. It has been our experience that excessive water beneath interior floor slabs can result in significant, post-construction vapor transmission through the slab, adversely affecting floor coverings, and possibly resulting in potentially hazardous molds.

In addition to a capillary break and vapor membrane, it has also been our experience that concrete quality is critical to the ability of concrete floor slabs to resist vapor transmission. As a minimum, we suggest that concrete used for floor slab construction possess a maximum water/cement ratio of 0.5. Since water is often added to uncured concrete to increase workability, it is important that strict quality control be exercised during the installation of all slab concrete to insure water/cement ratios are not altered prior or during placement.

It must be recognized comments provided above are suggestions only. These comments are intended to assist the project Architect, Structural Engineer, or other design professional, and should not be inferred to mean that Brown & Mills is assuming the design responsibility for interior concrete floor slabs or appurtenant vapor reduction provisions. In all cases, it is solely the responsibility of the project Architect, Structural Engineer, or other design professional to determine the design based on project specific requirements (which were beyond our knowledge or involvement with the project). In the event the project Architect, Structural Engineer, or other design professional is unfamiliar with concrete slab-on-grade issues, or if the project will include floor coverings sensitive to slab vapor emissions, a professional specializing in vapor transmission should be consulted to provide project specific recommendations and design provisions.

Vapor Emission Testing

Prior to placing floor coverings, we recommend testing be conducted to evaluate vapor emissions from all interior concrete floor slabs supported-on-grade. The purpose of this testing would be to verify that water vapor emissions are below levels normally required by the flooring manufacturer. In the event floor slab vapor emissions are above levels normally required by the flooring manufacturer, additional curing/drying time and/or the application of sealants (or other similar product intended to reduce slab vapor emissions) may be required prior to placing any and all floor coverings.

EXTERIOR CONCRETE SLABS SUPPORTED-ON-GRADE

Subgrade soils supporting exterior concrete slabs[13] should be scarified to a minimum depth of 8 inches, uniformly moisture-conditioned to between 0 and 5 percent above the optimum moisture content, and compacted to at least 90 percent relative compaction. Scarification and compaction may be omitted if exterior slabs are to be placed directly on undisturbed engineered fill and if approved by the project Geotechnical Engineer during construction.

[13] Within this report exterior concrete slabs supported-on-grade refers to walkways, driveways, patios, etc. and specifically excludes pavements used (or to be used) for vehicular traffic.

ADDITIONAL SERVICES

We recommend Brown & Mills review final grading and foundation plans and specifications to evaluate that recommendations contained herein have been properly interpreted and implemented during design. Further, all site earthwork activities (including site preparation, placement of engineered fill and trench backfill, construction of slab and pavement subgrades, and all foundation excavations) should be monitored by a representative from Brown & Mills.

Monitoring services are an essential component of our design services. Monitoring allows us to observe the subsurface conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

LIMITATIONS

This report has been prepared in substantial accordance with the generally accepted geotechnical engineering practice as it existed in the site area at the time our services were rendered. No warranty is either expressed or implied.

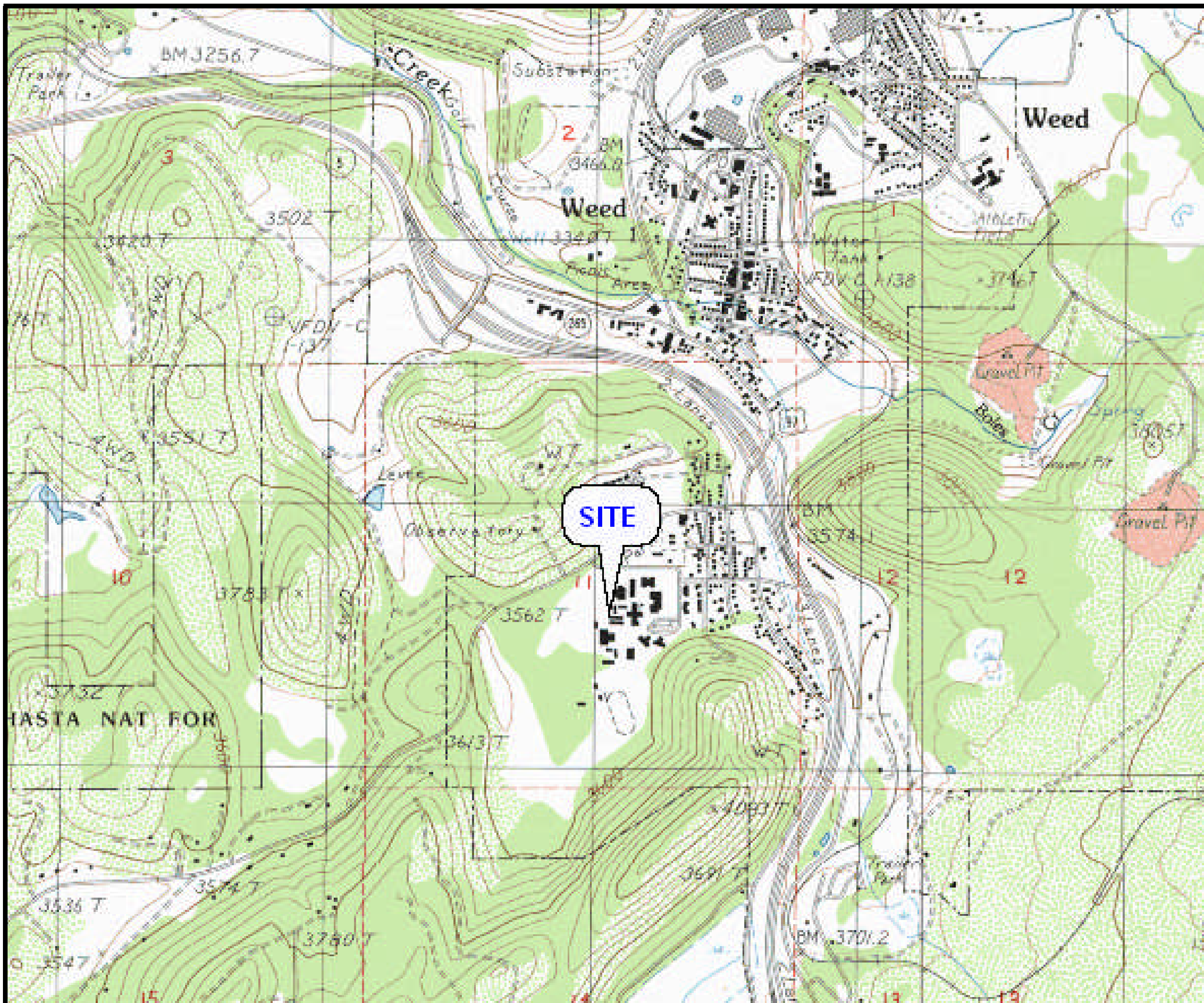
Conclusions and recommendations contained in this report were based on the conditions encountered during our field investigation and are applicable only to those project features described herein (see section titled: "PROPOSED CONSTRUCTION"). It is possible subsurface conditions could vary between or beyond the points explored. If conditions are encountered during construction which differ from those described in this report, or if the scope or nature of the proposed construction changes, we should be notified immediately in order to review and, if deemed necessary, conduct additional studies and/or provide supplemental recommendations.

Recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by Brown & Mills during the construction phase in order to evaluate compliance with our recommendations.

The scope of services provided by Brown & Mills for this project did not include the investigation and/or evaluation of toxic substances, or soil or groundwater contamination of any type. If such conditions are encountered during site development, additional studies may be required. Further, services provided by Brown & Mills for this project did not include the investigation and/or evaluation of soil corrosivity. Depending on planned pipe types, bedding conditions, and other factors beyond the scope of this study, it may be appropriate to evaluate soil corrosivity prior to development.

This report may be used only by our client and only for the purposes stated herein, within a reasonable time from its issuance. Land use, site conditions, and other factors may change over time which may require additional studies. In the event a significant period of time elapses between the date of this report and construction, Brown & Mills shall be notified of such occurrence in order to review current conditions. Depending on that review, Brown & Mills may require that additional studies be conducted and that an updated or revised report be issued.

Any party other than our client who wishes to use all or any portion of this report shall notify Brown & Mills of such intended use. Based on the intended use as well as other site-related factors, Brown & Mills may require that additional studies be conducted and that an updated or revised report be issued. Failure to comply with any of the requirements outlined above by the client or any other party shall release Brown & Mills from any liability arising from the unauthorized use of this report.



NORTH

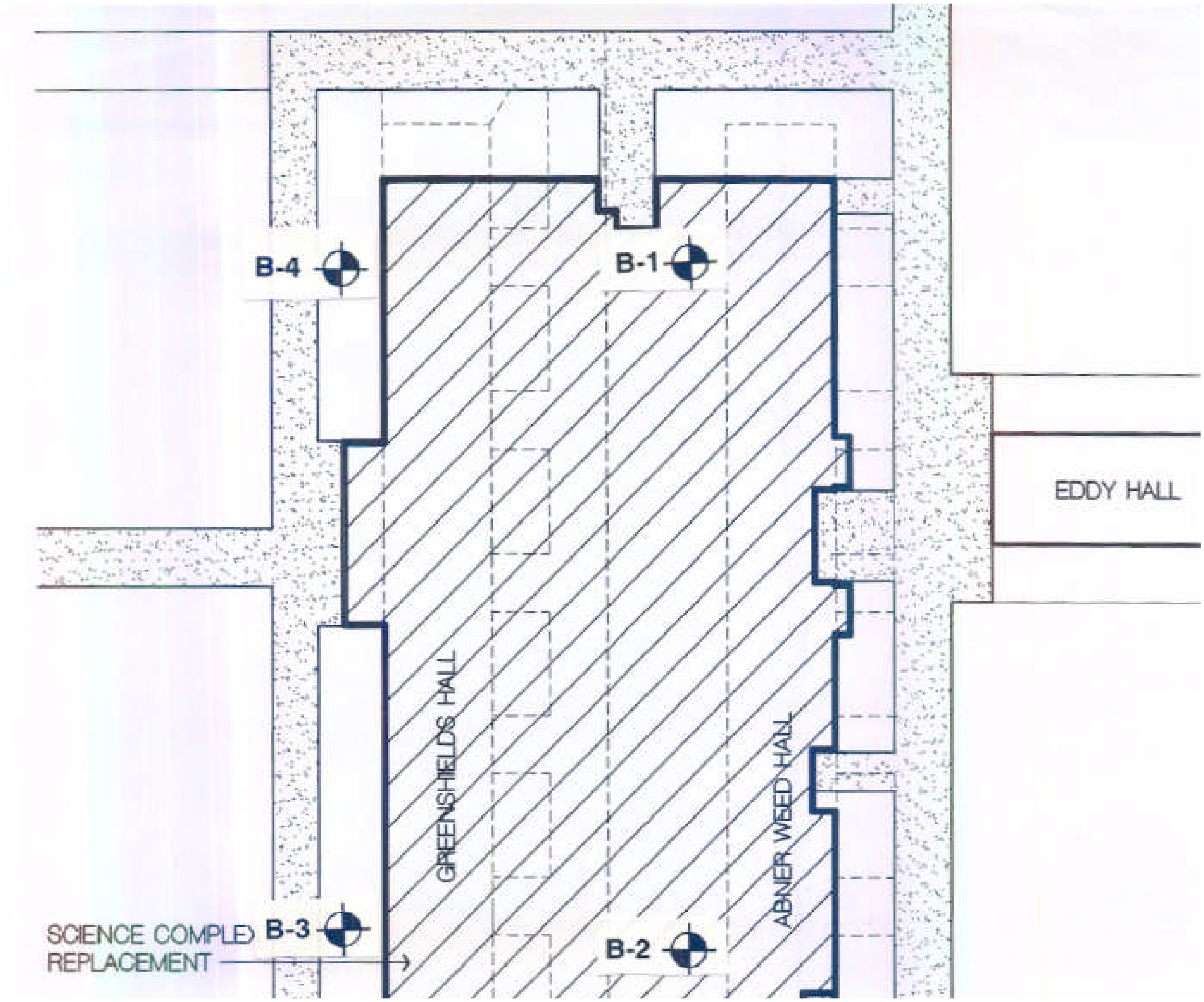
SCALE 1:24,000

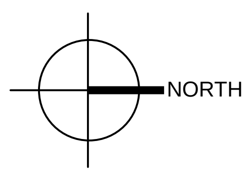
1 1/2 1/4 0 MILES 1/2 1

2 1 1/2 0 KILOMETERS 1 2

REFERENCE: WEED QUADRANGLE, CALIFORNIA, 7.5 MINUTE SERIES, UNITED STATES GEOLOGIC SURVEY.

BMI PROJECT NO. ▶ 08S-294	**VICINITY MAP** **PROPOSED SCIENCE BUILDING** **COLLEGE OF THE SISKIYOUS** **WEED, CALIFORNIA**	PLATE **1**





NO SCALE

LEGEND

BORING LOCATION AND DESIGNATION

NOTE: Borings were located in the field by visual methods. Therefore, the locations of the borings shown on this plan should be considered highly approximate.

REFERENCE: Plan prepared by Nichols, Melburg & Rossetto titled "PLOT PLAN," Sheet 1, dated November 2008.

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SITE PLAN
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

PLATE

2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYM.	DESCRIPTION
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS GREATER THAN NO. 200 SIEVE	**GRAVELS** MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	**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
		GRAVELS (APPRECIABLE FINES)	**GM**	Silty gravels, poorly-graded gravel-sand-silt mixtures
			GC	Clayey gravels, poorly-graded gravel-sand-clay mixtures
	SANDS MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	**SANDS** (LITTLE OR NO FINES)	**SW**	Well-graded sands, gravelly sands, little or no fines
			SP	Poorly-graded sand, gravelly sands, little or no fines
		SANDS (APPRECIABLE FINES)	**SM**	Silty sands, poorly-graded sand-gravel-silt mixtures
			SC	Clayey sands, poorly-graded sand-gravel-clay mixtures
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO.200 SIEVE	**SILTS AND CLAYS** LIQUID LIMIT LESS THAN 50		**ML**	Inorganic silts and very fine sands, silty or clayey fine sands, 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 clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		**MH**	Inorganic silts, micaceous or diatomaceous fine sands or silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic silts and clays of high plasticity
HIGHLY ORGANIC SOILS			**PT**	Peat, humus, swamp soils with high organic content

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LOG SYMBOLS AND DEFINITIONS

FIELD		LABORTORY	
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2-INCH OUTSIDE DIAMETER)	-4	% PASSING NO.4 SIEVE (ASTM TEST METHOD C 136)
	CALIFORNIA SAMPLER (3-INCH OUTSIDE DIAMETER)	-200	% PASSING NO. 200 SIEVE (ASTM TEST METHOD C 117)
	MODIFIED CALIFORNIA SAMPLER (2.5-INCH OUTSIDE DIAMETER)	LL	LIQUID LIMIT (ASTM TEST METHOD D 4318)
	BAG/BULK	PI	PLASTICITY INDEX (ASTM TEST METHOD D 4318)
	THIN-WALLED SHELBY TUBE (3-INCH OUTSIDE DIAMETER)	R-VAL	RESISTANCE VALUE (CALTRANS TEST 301)
	WATER LEVEL (LEVEL ESTABLISHED AS NOTED ON LOGS)	EI	EXPANSION INDEX (UBC STANDARD 29-2)
	WATER OR SEEPAGE ENCOUNTERED (LEVEL NOT ESTABLISHED)	COL	COLLAPSE POTENTIAL (ASTM TEST METHOD D 5333)

GENERAL NOTES:

1. Lines separating soil or rock strata on logs are approximate boundaries only. Actual transitions may be gradual and, in the case of selectively sampled boring, may vary by as much as the sample interval.
2. In general, Unified Soil Classification designations shown on the logs were evaluated using visual methods only. Actual designations (based on laboratory tests) may vary.
3. Logs represent general soil conditions on the date and at the location indicated. No warranty is provided as to the continuity of soil conditions between individual sample locations.
4. Unconfined comprehensive strengths reported on the logs (if any) were obtained using a pocket penetrometer.

EXPLORATION DATE	LOGGED BY	TOTAL DEPTH	BORING NO.
November 18, 2008	Mark Mills	21-1/2 feet	**B-1**
EXPLORATION EQUIPMENT		BACKFILL MATERIAL	
CME 45B equipped with a 6-inch-diameter, hollow-stem auger		Drill cuttings	

SURFACE CONDITIONS: Relatively level; grass lawn

GROUNDWATER CONDITIONS: No free groundwater encountered

APPROX. GROUND SURFACE ELEVATION (IN FEET): N/A

DEPTH (IN FEET)	SAMPLE TYPE	SAMPLE NO.	BLOWS/FOOT	UNCONFINED COMP. STRENGTH (TSF)	USCS LETTER SYMBOL	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	OTHER LAB TESTS SEE LOG LEGEND FOR ABBREVIATION DEFINITIONS
					SM	***Silty SAND:*** Brown, dry-to-moist, loose, fine-to-medium grained, with trace clay			
		1	4						
5		2	5			grades light gray-brown with trace fine gravel			
10		3	22			grades medium dense			
15		4	18						
20		5	33			grades gray-brown, dense, with more fine sand and less medium-to-coarse sand			

LOG OF EXPLORATORY BORING
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

BMI PROJECT NO. 08S-294

PLATE 4

EXPLORATION DATE	LOGGED BY	TOTAL DEPTH	BORING NO.
November 18, 2008	Mark Mills	11-1/2 feet	**B-2**
EXPLORATION EQUIPMENT		BACKFILL MATERIAL	
CME 45B equipped with a 6-inch-diameter, hollow-stem auger		Drill cuttings	

FIELD						DESCRIPTION	LABORATORY		
DEPTH (IN FEET)	SAMPLE TYPE	SAMPLE NO.	BLOWS/FOOT	UNCONFINED COMP. STRENGTH (TSF)	USCS LETTER SYMBOL	SURFACE CONDITIONS: Relatively level; grass lawn GROUNDWATER CONDITIONS: No free groundwater encountered APPROX. GROUND SURFACE ELEVATION (IN FEET) ▶ N/A	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	OTHER LAB TESTS SEE LOG LEGEND FOR ABBREVIATION DEFINITIONS
					SM	***Silty SAND:*** Brown, dry-to-moist, medium dense, fine-to-medium grained, with trace clay			
		1	13						
5		2	14			grades light gray-brown with trace fine gravel			
10		3	23			grades with trace coarse gravel			
15									
20									

LOG OF EXPLORATORY BORING
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

BMI PROJECT NO. ▶ 08S-294

PLATE 5

EXPLORATION DATE	LOGGED BY	TOTAL DEPTH	BORING NO.
November 18, 2008	Mark Mills	11-1/2 feet	**B-3**
EXPLORATION EQUIPMENT		BACKFILL MATERIAL	
CME 45B equipped with a 6-inch-diameter, hollow-stem auger		Drill cuttings	

FIELD						DESCRIPTION	LABORATORY		
DEPTH (IN FEET)	SAMPLE TYPE	SAMPLE NO.	BLOWS/FOOT	UNCONFINED COMP. STRENGTH (TSF)	USCS LETTER SYMBOL	SURFACE CONDITIONS: Relatively level; grass lawn GROUNDWATER CONDITIONS: No free groundwater encountered APPROX. GROUND SURFACE ELEVATION (IN FEET) ▶ N/A	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	OTHER LAB TESTS SEE LOG LEGEND FOR ABBREVIATION DEFINITIONS
					SM	***Silty SAND:*** Brown, dry-to-moist, loose, fine-to-medium grained, with trace clay			
		1	7						
5		2	10			grades gray-brown, medium dense, with trace fine gravel			
10		3	35			grades light gray-brown, dense			
15									
20									

LOG OF EXPLORATORY BORING
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

BMI PROJECT NO. ▶ 08S-294

PLATE 6

EXPLORATION DATE	LOGGED BY	TOTAL DEPTH
November 18, 2008	Mark Mills	11-1/2 feet
EXPLORATION EQUIPMENT		BACKFILL MATERIAL
CME 45B equipped with a 6-inch-diameter, hollow-stem auger		Drill cuttings

BORING NO.

B-4

FIELD						DESCRIPTION	LABORATORY		
DEPTH (IN FEET)	SAMPLE TYPE	SAMPLE NO.	BLOWS/FOOT	UNCONFINED COMP. STRENGTH (TSF)	USCS LETTER SYMBOL	SURFACE CONDITIONS: Relatively level; grass lawn GROUNDWATER CONDITIONS: No free groundwater encountered APPROX. GROUND SURFACE ELEVATION (IN FEET) ▶ N/A	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	OTHER LAB TESTS SEE LOG LEGEND FOR ABBREVIATION DEFINITIONS
					SM	***Silty SAND:*** Brown, dry-to-moist, loose, fine-to-medium grained, with trace clay			
		1	5						
5		2	8			grades gray-brown, with trace fine gravel			
10		3	22			grades light gray-brown, medium dense			
15									
20									

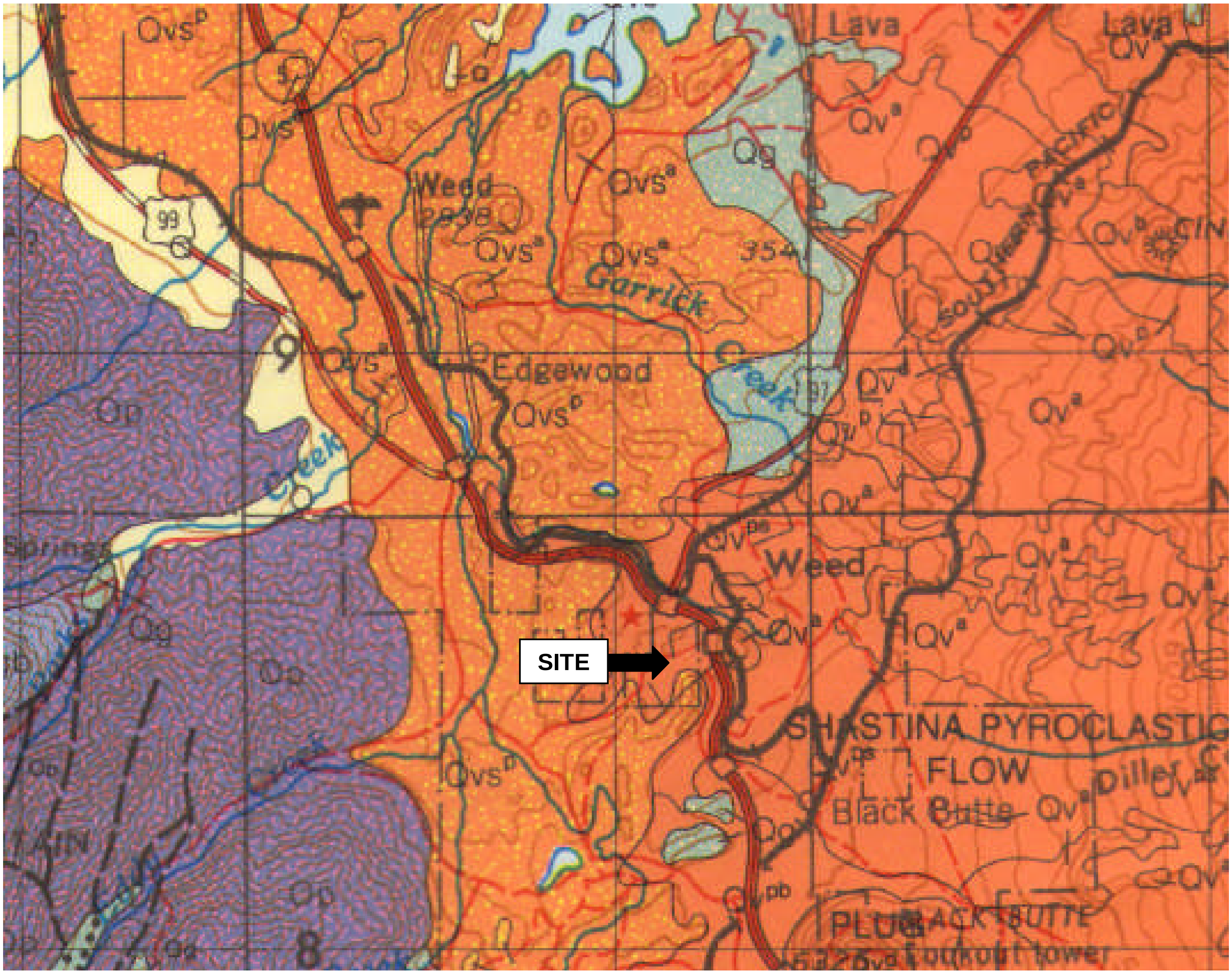
BMI

BMI PROJECT NO. ▶ 08S-294

LOG OF EXPLORATORY BORING
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

PLATE

7



NORTH

LEGEND

Qv	Volcanic rocks *(a-andesite; b-basalt d-dacite; p-pyroclastic deposits pb-Black Butte pyroclastic flow ps-Shastina pyroclastic flow)* ✲ - Cinder cone or volcano
Qvs	Volcanic rocks of Shasta Valley *(a-andesite; p-pyroclastic deposits)*

SCALE 1:125,500

4 2 1 0 MILES 2 4

8 4 2 0 KILOMETERS 4 8

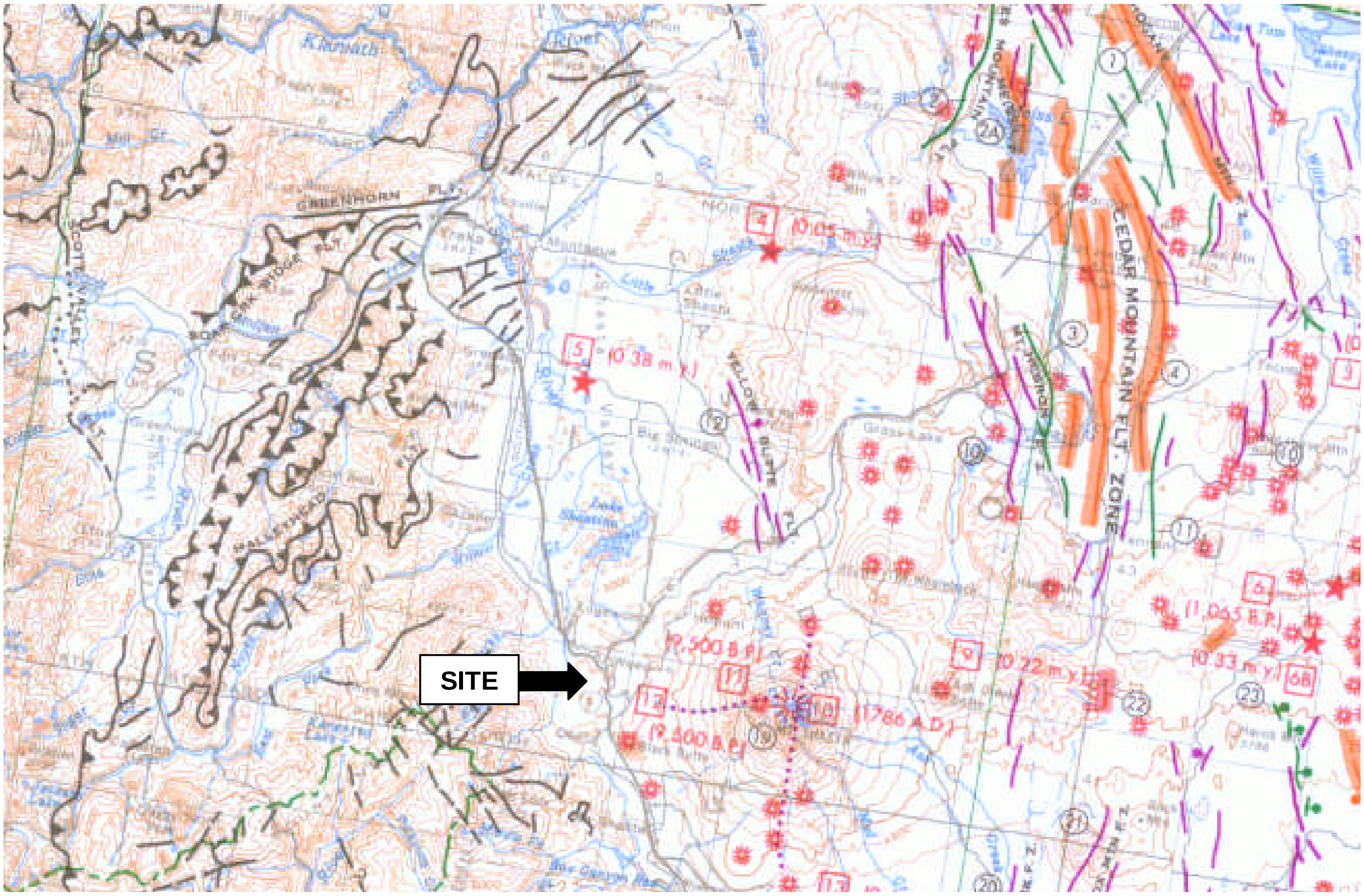
REFERENCE: Geologic Map of the Weed Quadrangle, California, California Division of Mines and Geology, compiled by Wagner and Saucedo, 1987..

BMI PROJECT NO. ▶ 08S-294

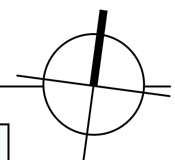
GEOLOGY MAP
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

PLATE

8



NORTH



LEGEND

Geologic Time Scale		Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
					ON LAND	OFFSHORE
Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
	Holocene	10,000		? ? ? ?	Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.

SCALE 1:750,000

24 12 6 0 MILES 12 24

48 24 12 0 KILOMETERS 24 48

REFERENCE: California Division of Mines and Geology map titled: "Fault Activity Map of California and Adjacent Areas," compiled by Charles W. Jennings, published 1994.

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FAULT MAP
PROPOSED SCIENCE BUILDING
COLLEGE OF THE SISKIYOUS
WEED, CALIFORNIA

PLATE

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