# DSA IR A-4

# GEOHAZARD REPORT REQUIREMENTS: 2022 CBC

**Disciplines:** Structural

**History:** Revised 06/22/23
Last Revised 06/11/21 Under 2019 CBC
Original Issue 09/01/99

Division of the State Architect (DSA) documents referenced within this publication are available on the DSA Forms or DSA Publications webpages.

## PURPOSE

This Interpretation of Regulations (IR) clarifies requirements for the submission of a geohazard report to the California Geological Survey (CGS) for acceptance, and subsequently to DSA, for projects within the jurisdiction of DSA.

## SCOPE

This IR is applicable to all projects submitted to DSA. ←

## BACKGROUND

A geohazard is any geologic condition that is a potential danger to life or property. Geohazards include, but are not limited to, ground shaking, surface rupture, liquefaction, tsunami, and landslides.

The California Administrative Code (CAC), Section 4-317(e) includes requirements for the performance of geotechnical (soils) studies, geohazard studies, and their associated reports. Note that a "geotechnical report" (or soil investigation report) might not include complete geohazard studies. In addition, California Building Code (CBC) Section 1803A describes requirements for geotechnical investigations, with geohazard reports addressed specifically in Section 1803A.6.

## 1. GENERAL PROCEDURE

When a geohazard report is required for a project (see criteria in Section 2 below), the report must be submitted to CGS before the project is submitted to DSA. Final DSA approval will not occur until DSA receives the final (or provisional when applicable) acceptance letter from CGS. It is the responsibility of the applicant to provide the CGS acceptance letter to DSA and reference the DSA application number for the project. If a provisional acceptance letter is issued by CGS, as is often required for projects with ground improvements, see Section 6 below.

### 1.1 Submittal to CGS

School districts are responsible for the submittal of geohazard reports to CGS and for the cost of review.

**1.1.1** The report should be submitted to CGS approximately two months prior to submittal of the project to DSA; contact CGS for its current review timelines.

**1.1.2** Application and submittal information, including answers to frequently asked questions, is available on the school review page of the CGS website.

**1.1.3** The geohazard report submittal to CGS shall include a site data report as required by CBC Section 1603A.2.

**1.1.4** After CGS approval of the geohazard report, any further change proposed by the geotechnical engineer and related to the scope of CGS approval, shall be resubmitted to CGS

for review and approval.

### 1.2 Submittal to DSA

A copy of the geohazard report, site data report, and the application to CGS indicating the CGS project number shall be submitted to DSA along with the initial project application.

## 2. PROJECTS REQUIRING A GEOHAZARD REPORT

A geohazard report shall be submitted to CGS for projects as described below. Where more than one of the following categories listed below occurs in the same project application, any case requiring a geohazard report governs.

### 2.1 Site-Specific Ground Motion Analysis

A geohazard report is required for any project for which a site-specific ground motion hazard analysis is required or voluntarily used to develop seismic design parameters.

The site-specific ground motion hazard analysis requirements of American Society of Civil Engineers Standard 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7), Section 11.4.8 are not applicable to projects for which a geohazard report is not required per Section 3 below.

### 2.2 New Site

A geohazard report is required for all construction on a new site.

### 2.3 New Building on an Existing Site

A geohazard report is required for all new buildings or structures, except for exempt cases based on the characteristics of the building and site as defined in Section 3 below.

### 2.4 Rehabilitation of an Existing Building

A geohazard report is required for all rehabilitation projects, except for exempt cases based on the characteristics of the building and site as defined in Section 3 below. CAC Sections 4-306 and 4-307 address the equivalent nature of a rehabilitation to a new school building.

### 2.5 Addition to an Existing Building

A geohazard report is required for all additions, except for exempt cases based on the characteristics of the building and site as defined in Section 3 below.

### 2.6 Alteration to an Existing Building

A geohazard report is required for alteration scope that includes voluntary modifications to the lateral-force-resisting system per CAC Section 4-309(d) with new foundations carrying seismic forces and consisting of any of the following:

**2.6.1** Deep foundations.

**2.6.2** Shallow foundations designed for bearing pressures that exceed the maximum recommended foundation soil bearing pressures in an existing geotechnical report for that structure or, when a report is not available, the values set forth in CBC Table 1806A.2.

**2.6.3** Foundation elements for which the supporting subgrade stiffness differs substantially from the existing foundation (e.g., adding spread footings to a structure supported on deep foundations).

### 2.7 Reconstruction of an Existing Building

A geohazard report is required for reconstruction projects that include repair of structural earthquake damage per CAC Section 4-309(e).

### 2.8 Relocation of an Existing Building

A geohazard report is required for the site a building is relocated to, except for exempt cases based on the characteristics of the building and site as defined in Section 3 below.

Single-story relocatable buildings located in a mapped geologic hazard zone that are less than 2,160 square feet (SF) on nonpermanent foundations will require a geohazard report; however, if the report indicates that there are no geologic hazards at the site with potential impact on the building, DSA may waive the requirement for submittal to and approval of the report by CGS.

### 2.9 Structures Essential to Operation

Sitework, nonbuilding structures, and/or structures not intended for human occupancy, only require a geohazard report when such construction is essential to the operation of the facility. Structures deemed essential to operation include the following:

**2.9.1** Elevated water tanks necessary for fire protection.

**2.9.2** Earth retaining structures when failure of such structures could endanger occupied structures.

**2.9.3** Communications towers serving Risk Category IV (essential services) buildings.

**2.9.4** Other similar structures.

## 3. PROJECTS NOT REQUIRING A GEOHAZARD REPORT

For projects on existing sites, with scope limited to the conditions described in this section, a geohazard report is not required.

### 3.1 Site Improvements

Sitework, nonbuilding structures, or structures not intended for human occupancy, unless such construction is essential to the operation of the facility. See Section 2.9 above for examples of structures deemed essential to operation.

**3.1.1** Nonbuilding structures include, but are not limited to, light poles, flag poles, signs, scoreboards, ball walls, fences, and retaining walls. Nonbuilding structures do not include structures that shelter a use or occupancy such as canopies, lunch shelters, or carports.

**Exception:** See Section 3.4 below.

**3.1.2** A “structure for human occupancy” is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year in accordance with Title 14, California Code of Regulations (CCR), Division 2, Chapter 8, Subchapter 1, Article 3, Section 3601(e). Structures not intended for human occupancy include structures such as storage buildings not entered by students and teachers for school purposes and do not include structures that shelter a use or occupancy such as canopies, lunch shelters, or carports.

### 3.2 Non-School Buildings

Structures not defined as a “School Building” per CAC Section 4-314 and exempt from DSA structural review as indicated in *IR A-22: Construction Projects and Items Exempt from DSA Review,* Appendix A.

### 3.3 Temporary or Emergency Buildings

Temporary relocatable or emergency buildings as defined in CAC Section 4-302(b).

### 3.4 Fabric Shade Structures

Fabric shade structures used as shade canopies and lunch shelters of regular shape (e.g., hip,

flat, gable, pyramid) supported on all corners by columns (three minimum) with maximum column grid spacing of 40 feet complying with Section 3.4.1 and 3.4.2 or 3.4.3 below.

**3.4.1** Individual fabric shade structures 1,600 SF or less.

**3.4.2** Outside a mapped geological hazard zone (as defined in Section 4 below), fabric shade structures grouped adjacent to each other using common columns up to a maximum of 4,000 SF combined.

**3.4.3** Within a mapped geological hazard zone (as defined in Section 4 below), fabric shade structures grouped adjacent to each other using common columns up to a maximum of 4,000 SF combined, submitted with a geotechnical report stating that no liquefaction potential exists.

### 3.5 Existing Sites Outside of a Mapped Geologic Hazard Zone

Projects on existing sites which are outside of a "mapped geologic hazard zone" (as defined in Section 4 below) are exempt from the requirement to provide a geohazard report if their scope is limited to the following:

**3.5.1** In accordance with CBC Section 1803A.6, Exception 1, single-story, wood-frame or light-steel frame structures of Type II or V construction with a floor area of 4,000 SF or less. Floor area shall be taken independently for each seismically separated structure but shall include areas covered by roof overhangs. This exception is specific to geohazard report requirements and is not applicable to any other code requirement. Common structures complying with this exception include, but are not limited to, the following:

**3.5.1.1** Most relocatable buildings.

**3.5.1.2** Wood framed buildings with repetitive framing and light-frame shear walls.

**3.5.1.3** Cold-formed steel framed buildings with repetitive framing and light-frame shear walls.

**3.5.1.4** Structural steel buildings with bare metal deck (no concrete or insulating roof fill), including those with braced frames or moment frames.

**3.5.2** Isolated elevator towers serving no more than two levels.

**3.5.3** Open metal site structures (e.g., structural steel, aluminum, etc.) seismically separated into areas of 4,000 SF or less in covered area including all overhangs. Such structures may include but are not limited to shade structures, bleachers, canopies, and carports.

## 4. MAPPED GEOLOGIC HAZARD ZONE

A mapped geologic hazard zone as used in this IR are those designated by CGS or the local jurisdiction in accordance with CBC Section 1803A.6, Exception 1. To date CGS has mapped earthquake fault hazard zones throughout the state, and liquefaction hazard zones and landslide hazard zones in selected regions. Mapped geologic hazard zones designated by CGS, as well as those regions yet to be evaluated, can be found through the web-based earthquake zones of required investigation tool managed by CGS.

### 4.1 Sites Fully Mapped by CGS

Sites are considered to be in a mapped geologic hazard zone when any of the following apply:

**4.1.1** Earthquake Hazard Fault Zone as identified by the applicable CGS map.

**4.1.2** Liquefaction Hazard Zone as identified by the applicable CGS map.

**4.1.3** Landslide Hazard Zone as identified by the applicable CGS map.

### 4.2 Sites Not Yet Fully Mapped by CGS

Sites are considered to be in a mapped geologic hazard zone when any of the following apply:

**4.2.1** Earthquake Hazard Fault Zone as identified by the applicable CGS map.

**4.2.2** Liquefaction Hazard Zone as identified by the CGS map (if applicable) or the Safety Element of the Local General Plan.

**4.2.3** Landslide Hazard Zone as identified by the CGS map (if applicable) or the Safety Element of the Local General Plan.

## 5. GEOHAZARD STUDIES AND REPORTS

### 5.1 Scope of Geohazard Studies

For guidance in conducting a geohazard study and reporting evaluations and recommendations, refer to the following documents available on the CGS Publications webpage:

**5.1.1** *Special Publication 117A: Guidelines for Evaluating and Mitigating Seismic Hazards in California*.

**5.1.2** *Special Publication 42: Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California*.

**5.1.3** *CGS Note 48: Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings*, which is used as a guide for review by CGS.

### 5.2 Content of Geohazard Report

Requirements regarding the content of geohazard reports are addressed on the Geologic and Environmental Review webpage of the CGS website.

### 5.3 Reuse of Existing Geohazard Report

In accordance with CBC Section 1803A.6, Exception 2, an existing geohazard report may be used for a new project if the existing report is based on adequate studies (refer to CGS Note 48 for guidance), a reevaluation is made, and the report is found to be currently appropriate. The existing report for the site and the reevaluation must be submitted to CGS for approval for each project. A reevaluation is not required if **all three** of the following conditions are met:

**5.3.1** The original geohazard report included the scope of construction proposed for the project.

**5.3.2** The applicable building code has not changed since the original report was issued.

**5.3.3** The project is submitted to DSA within the time limit described in the original report.

**Note:** Subsequent significant geologic events may invalidate an existing geohazard report.

## 6. PROJECTS WITH CGS PROVISIONAL ACCEPTANCE PENDING SOIL IMPROVEMENT

When CGS issues a provisional acceptance letter for projects with soil improvement work, DSA approval of the construction documents will follow the requirements of this section. Soil improvement techniques might consist of compaction grouting, permeation grouting, vibro stone columns (refer to CBC Section 1813A), or other techniques recommended by the geotechnical engineer and accepted by CGS.

### 6.1 Procedural Requirements

Prior to submission of a project with soil improvement work to DSA, the applicant shall schedule and participate in a pre-application meeting with the DSA regional office having jurisdiction over the subject project.

**6.1.1** DSA approval of the construction documents may occur based on CGS provisional acceptance provided the conditions described herein are met. The approved construction

documents shall include items listed in Section 6.2 below.

**6.1.2** Upon DSA approval of the construction documents, soil improvement work may proceed subject to the quality assurance requirements described in Section 6.3 below.

**6.1.3** The geotechnical engineer shall submit to CGS a comprehensive report documenting the constructed soil improvements, test results, and analysis for review and final acceptance.

**6.1.3.1** Any additional information, testing, and/or analysis requested by CGS for their final acceptance shall be provided.

**6.1.3.2** Any additional soil improvement work required to obtain final acceptance by CGS shall be performed.

**6.1.4** CGS will issue a final acceptance letter when the soil improvement work and supporting tests, analysis, and documentation is deemed adequate. DSA will process the final acceptance letter from CGS as a deferred submittal.

**6.1.5** Foundation construction may not commence until the final acceptance letter issued by CGS has been processed by DSA as a deferred submittal.

**6.1.6** If foundation construction work begins prior to receipt of the CGS final acceptance letter, DSA may issue a stop work order as described in *IR A-13: Stop Work and Order to Comply*.

### 6.2 Construction Documents

When provisional CGS acceptance of a geohazard report is given pending completion of soil improvement work, the design professional shall comply with the following in the preparation of the construction documents.

**6.2.1** The following paragraph shall be placed on the project title sheet:

> "The Geotechnical Engineer shall submit a comprehensive report documenting final soil improvements constructed, construction observation, and the results of the confirmation testing and analysis to the California Geological Survey (CGS). The project foundation construction shall not commence until final CGS acceptance letter is issued and processed by DSA as a deferred submittal."

**6.2.2** The following shall be indicated as a deferred submittal on the construction documents: "Soil Improvement – CGS Final Acceptance of Geohazard Report".

### 6.3 Statement of Structural Tests and Special Inspections

The following items shall be added to the form *DSA 103: List of Required Structural Tests and Special Inspections,* under item "6. Other Soils":

| TEST OR SPECIAL INSPECTION | TYPE | PERFORMED BY | CODE REFERENCE AND NOTES |
|---|---|---|---|
| a. Soil Improvements | Test | GE* | Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS for final acceptance.<br>*By geotechnical engineer or his or her qualified representative. |

# GEOHAZARD REPORT REQUIREMENTS: 2022 CBC

| TEST OR SPECIAL INSPECTION | TYPE | PERFORMED BY | CODE REFERENCE AND NOTES |
|---|---|---|---|
| b. Inspection of Soil Improvements | Continuous | GE* | *By geotechnical engineer or his or her qualified representative. |

### 6.4 DSA eTracker

When provisional CGS acceptance of a geohazard report is given pending completion of soil improvement work, it will be documented in eTracker by the DSA lead plan reviewer as follows:

**6.4.1** The following shall be manually entered as a deferred submittal on the Plan Check Worksheet under one of the "Other" fields: "Soil Improvement – CGS Final Acceptance of Geohazard Report".

**6.4.2** The following note shall be added to the Plan Check Worksheet under the "Notes" field:

"The CGS final acceptance is not issued; Geotechnical engineer shall submit a comprehensive report documenting final soil improvements constructed, construction observation, and the results of the confirmation testing and analysis to CGS for final acceptance prior to foundation construction."

**REFERENCES:**

2022 California Code of Regulations, Title 24
Part 1: California Administrative Code (CAC), Sections 4-302, 4-306, 4-307, 4-309, 4-314, and 4-317.
Part 2: California Building Code (CBC), Sections 1603A.2, 1803A, 1803A.6, 1813A, and Table 1806A.2.