California Underground Facilities Safe Excavation Board

April 14-15, 2025

Agenda Item No. 29 (Information Item) – Staff Report

Potholing Standards: Potholing Activity Matrix and Potholing Survey

PRESENTER

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SUMMARY

When the topic of potholing was last discussed at the September 2024 board meeting, members recommended that staff look at potholing methods and reasons why excavators pothole. Staff began developing a Potholing Activity Matrix to assist excavators in determining an appropriate method for exposing buried facilities given the planned method of excavation. This matrix might serve as a tool for developing the Board's guidance through solicitation of stakeholder feedback. Staff released a survey about potholing methods and project types to gather more information to continue the development of the Potholing Activity Matrix and the Board's safe excavation standards for potholing.

STRATEGIC PLAN

2020 Strategic Plan Objective: Improve Excavation and Location Practice Safety

2023 Strategic Activity: Develop Standards to Assist Excavators in Identifying Locations to Pothole

BACKGROUND

The Board and its stakeholders frequently discuss potholing and the safety implications of facility exposure before construction. The Board's Draft Safe Excavation Standards[1] have some guidelines concerning where and how frequently to pothole. Over time, Board staff has solicited feedback from stakeholders to revise these standards by holding public workshops and conducting surveys.

[1] July 2023 Staff Report and September 2024 Staff Report

Government Code Requirements and Board Regulations

The Dig Safe Act and Board regulations have sections that relate to the requirement that excavators determine the location of underground facilities in certain situations. Excavators must determine the exact location of facilities with hand tools[2] or in some cases with a vacuum device[3], excavators and operators must hold on-site meetings in the vicinity of high-priority facilities to determine how to verify the location of the facility[4], and an excavator must request additional information regarding the location of a facility if they cannot determine its location with hand tools[5]. If they cannot safely expose a facility with hand tools or allowed power tools, excavators may request consultation with an operator.[6]

California Government Code section 4216.18 requires the Underground Safety Board develop safety standards for excavation around subsurface installations. The purpose of developing safety standards is to provide utility operators, locators, project designers, prime contractors, and excavators with a better understanding of their safety tasks and responsibilities before and during an excavation project. In addition, the Board's standards should be informed by publicly available data whenever possible.

Recent Board Work Focused on Parallel Excavations, Potholing "Frequency," and Excavators Receiving Depth Information Before Potholing

Board staff released two surveys on potholing in June 2024. These focused on the way depth information was used by stakeholders during potholing and the minimum distance between potholes when existing facilities were parallel to the proposed construction. Three draft standards[7] were updated using the information gathered from the surveys and from follow-up interviews with survey respondents.

Discussion

Standards development is ongoing and staff seeks information from stakeholders across the state. Potholing is a practice that belongs in the toolkit of every excavator, professional or otherwise.

Potholing Activity Matrix: Guidance for "Everyday Excavators"

At their September 2024 meeting, the Board recommended that staff step back and look at the basic types of potholes and reasons excavators pothole when considering future topics for guidance. Staff began developing a tool to help excavators match an appropriate method for exposing buried facilities to an excavation activity. This "matrix" lists potholing methods on the left side and project activities across the top.

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[2] Gov. Code Section 4216.4(a)(1)

[3] Gov. Code Section 4216.4(a)(2)(A)

[4] Gov. Code Section 4216.2(c)

[5] Gov. Code Section 4216.4(b)

[6] 19 CCR § 4501

[7] Staff Report. Potholing Survey Work and Standards Update. Attachment 1: Draft Standards for Potholing Revised for this Report

The following exposure methods are listed:

- Pothole with Hand Tools[8]
- Use of Hand Tools and Vacuum Excavation[9]
- Subsurface Utility Field Investigation Recommended[10]
- Advanced Mechanical Exposure[11]

The following activities or project types are listed:

- Homeowner Project on Private Property
- Point Excavation (Fence or Sign Post)
- Service Line Install
- Localized Utility Maintenance/Leak Repair
- Grading
- High-Priority Line(s) in the Project Area
- Pavement Milling
- Civil/Transportation Project Designed by a Professional Engineer
- Right-of Way Utility Construction/Trenching
- Utility Horizontal Directional Drilling/Boring
- Contractor Subgrade Engineering Work/Soil Sampling
- Utility Long Linear Construction/Long Pipeline Construction

Each exposure method is indicated for an activity:

- Always
- Recommended
- Sometimes
- Not Recommended

Please see *Attachment 1: Potholing Activity Matrix* to view a draft of the proposed guidance.

2025 Potholing Survey

Staff released a survey to stakeholders on potholing methods and the information gained from potholing. The survey includes questions about the Potholing Activity Matrix. Since the Board identified motivations for potholing as a topic of further investigation, the survey also asked why different types of excavators pothole and how multiple facilities of the same type were treated when potholing. The responses gathered regarding potholing groups of facilities of the same type will help continue the investigation into a possible standard of potholing plan

[8] Defined in Gov. Code § 4216(i) as equipment used for excavating that uses human power and is not powered by any motor, engine, hydraulic, or pneumatic device. Also includes approved equipment per 19 CCR §4501.

[9] Vacuum excavation includes: a vacuum excavation device used in accordance with standard "5.32 Vacuum Excavation" in the Best Practices guide of the Common Ground Alliance. Also includes vacuum, air knife, hydrovac, or any combination thereof.

[10] Before construction, buried utility facilities in the project area will be surveyed, exposed where necessary, and depicted on design plans according to ASCE 38-22 standard. Work must be performed in the field to gather data on utility positions, as opposed to QLD (or similar) data which refers to existing records and personal accounts of utility positions.

[11] This portion of the matrix has been left open to discuss circumstances in which an excavator/backhoe is the only practical tool to expose facilities in the tolerance zone. The operator and excavator will have agreed beforehand to the use of such a tool according to requirements in 19 CCR § 4501(c).

attributes recommended for these facilities when they are indicated by an operator's marks.

Survey participants can also indicate if they would like to engage with staff and the Potholing and Planning and Design Committee to help further develop the Potholing Activity Matrix and provide information on the potholing methods they use for the projects listed in the Matrix. In addition, staff will be conducting post-survey interviews to obtain additional details regarding responses from those participants who indicated on the survey that they would be willing to discuss their responses further. Survey results, including the information learned from follow-up, will be used to revise and add to the current draft standards for potholing. These draft standards will be presented to the Board and public later in the year.

RECOMMENDATION

Staff recommends the Board discuss the content of the potholing matrix and provide feedback and additional potholing methods or activity types for the potholing matrix.

Attachments:

1. *Potholing Activity Matrix*

ATTACHMENT 1: POTHOLING ACTIVITY MATRIX

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Activity Matrix for Determining Pothole Method

Activity Type →

Potholing Method ↓	Homeowner Project on Private Property	Point Excavation (Fence or Sign Post)	Service Line Install	Localized Utility Maintenance / Leak Repair	Grading	High-Priority Line(s) in the Project Area	Pavement Milling	Civil/Transportation Project Designed by a Professional Engineer	Right-of Way Utility Construction / Trenching	Utility Horizontal Directional Drilling / Boring	Contractor Subgrade Engineering Work / Soil Sampling	Utility Long Linear Construction / Long Pipeline Construction
Pothole with **Hand Tools** Primarily	**R**	**R**	**R**	**S**	**S**	**S**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**
Use of Hand Tools and **Vacuum Excavation**	**NR**	**S***	**S***	**R**	**R***	**R**	**R**	**R**	**R**	**R**	**R**	**R**
Subsurface Utility Field Investigation Recommended	**NR**	**NR**	**NR**	**NR**	**R***	**R***	**R***	**R**	**R**	**R**	**R**	**R**
Advanced Mechanical Exposure	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**

***Recommended for longer projects of this type, projects that cover a larger footprint, and projects that are likely to have more direct conflicts with existing facilities.**

Matrix Key

Always	**A**
Recommended	**R**
Sometimes	**S**
Not Recommended	**NR**

Notes

- This is draft guidance. The recommendations in this matrix are subject to change pending feedback from stakeholders.
- Potholing Methods and Activity Types may be suggested for inclusion into the matrix
- Many of the Activity Types have broad possibilities for the scope of work - especially "Grading."
- In all instances, excavators should use reasonable care when planning and performing any excavation work.

Potholing Methods

Hand Tools
- Per CA G.C. § 4216(i) (Dig Safe Statute) Equipment used for excavating that uses human power and is not powered by any motor, engine, hydraulic, or pneumatic device
- Also includes approved equipment per 19 CCR § 4501 (Board Regulations)

Vacuum Excavation
- Vacuum excavation device used in accordance with standard "5.32 Vacuum Excavation" in the Best Practices guide of the Common Ground Alliance
- Includes vacuum, air knife, hydrovac, or any combination thereof

Subsurface Utility Field Investigation
- Before construction, buried utility facilities in the project area will be surveyed, exposed where necessary, and depicted on design plans according to ASCE 38-22 standard
- Work must be performed in the field to gather data on utility positions, as opposed to QLD (or similar) data which refers to existing records and personal accounts of utility positions

Advanced Mechanical Exposure
- Left open to discuss circumstances in which an excavator / backhoe is the only *safe and effective means* to expose a facility in the tolerance zone. The operator and excavator will have agreed beforehand to the use of such a tool according to requirements in 19 CCR § 4501(c) (Board Regulations)