
California Underground Facilities Safe Excavation Board

July 13, 2021

Agenda Item No. 7 (Information Item) – Staff Report

Public Works Excavation Survey and Interviews: Preliminary Results

PRESENTER

Tony Marino, Executive Officer

SUMMARY

The Board decided during its May meeting to explore road construction as the next area of Safety Standards. To understand what requirements may exist, staff surveyed and interviewed municipal officials to understand what requirements their municipalities place on contractors and permittees. Municipalities use many different standards, but few go beyond the safe digging process in Government Code § 4216 *et al.* Staff recommend that the Board engage with road construction and maintenance contractors to understand their processes to ensure safe project completion.

STRATEGIC PLAN

2020 Strategic Plan Objective: Improve Excavation Safety and Location Practice Safety

Strategic Activity: Reasonable Care Standards

BACKGROUND

Statute¹ requires the Board to “develop a standard or set of standards relevant to safety practices in excavating around subsurface installations and procedures and guidance in encouraging those practices.” These standards are “not intended to replace other relevant standards... but are to inform areas

¹ [Gov't Code § 4216.18](#)

currently without established standards.”

The Board discussed safety standards on July 13, 2020² and outlined a general framework for developing such standards focusing on different methods, types of excavation, and stakeholder groups in the excavation industry beginning with trenchless excavation. Between August and November 2020, the Standards Development Committee and staff conducted a survey and two workshops to explore trenchless excavation.^{3,4,5} On May 11, 2021,⁶ the Board decided to next explore road construction and maintenance.

DISCUSSION

Municipalities Set and Enforce Standards

Municipalities serve a number of roles in determining the parameters of construction work in their jurisdictions; their city councils regulate construction activity through ordinances; their departments approve projects through permitting processes; and, as project owners, their public works departments determine the activities their contractors must undertake through contract provisions. As municipalities determine road construction activities through one or more of these roles, staff sought to understand how municipalities exercise this authority in excavation work.

Survey and Interviews

Staff undertook a Public Works Excavation Survey to understand the standards used by municipalities for different excavation methods, communication of damage prevention and safety policies on these projects, and the state of digitalization of as-built plans for these organizations. The majority of survey questions were not specific to road construction. Survey questions are presented in Attachment B, and preliminary survey data is presented in Attachment A.

During the Board’s May meeting, staff had proposed to begin holding workshops during the survey period. Having experienced difficulty in getting participants who were able to clear their schedules for the trenchless excavation workshops

² [July 13-14, 2020, Agenda Item No. 7, Discussion on Reasonable Care Standards Development](#)

³ [August 10-11, 2020, Agenda Item No. 6, Discussion of Reasonable Care Standards Workshop](#)

⁴ [September 14, 2020, Agenda Item No. 18, Discussion on Reasonable Care Standards Development for Trenchless Excavation Techniques](#)

⁵ [November 16, 2020, Agenda Item No. 9, Update on Reasonable Care Standards Development for Trenchless Excavation Techniques](#)

⁶ [May 11, 2021, Agenda Item No. 8, Update on Safety Standards](#)

in the fall, staff instead asked survey respondents if they could be contacted for a follow-up conversation to fit with their schedule. More than 80% of survey takers agreed to a follow-up. Staff contacted 16 respondents for follow-ups and held phone or teleconference conversations with the following eight:

1. Engineer for Tuolumne County Public Works
2. Plant Operations Manager for Calaveras County Water District (CCWD)
3. Construction and Maintenance Superintendent for East Bay Municipal Utility District (EBMUD)
4. Supervisor of Field Engineering and Planning for Westlands Water District
5. Collection Systems Crew Leader for Rodeo Sanitation District
6. Field Operations Manager and Safety and Risk Administrator for Helix Water District
7. Traffic Signal Systems Supervisor for Santa Clara County Roads and Airports Department
8. Utilities Coordinator for San Diego County Public Works Department

Survey respondents held a wide variety of roles in public works, including project management, inspectors, plan reviewers, and maintenance service workers. Other respondent roles were: supervisors, traffic engineering, coordinators, and a field operations manager.

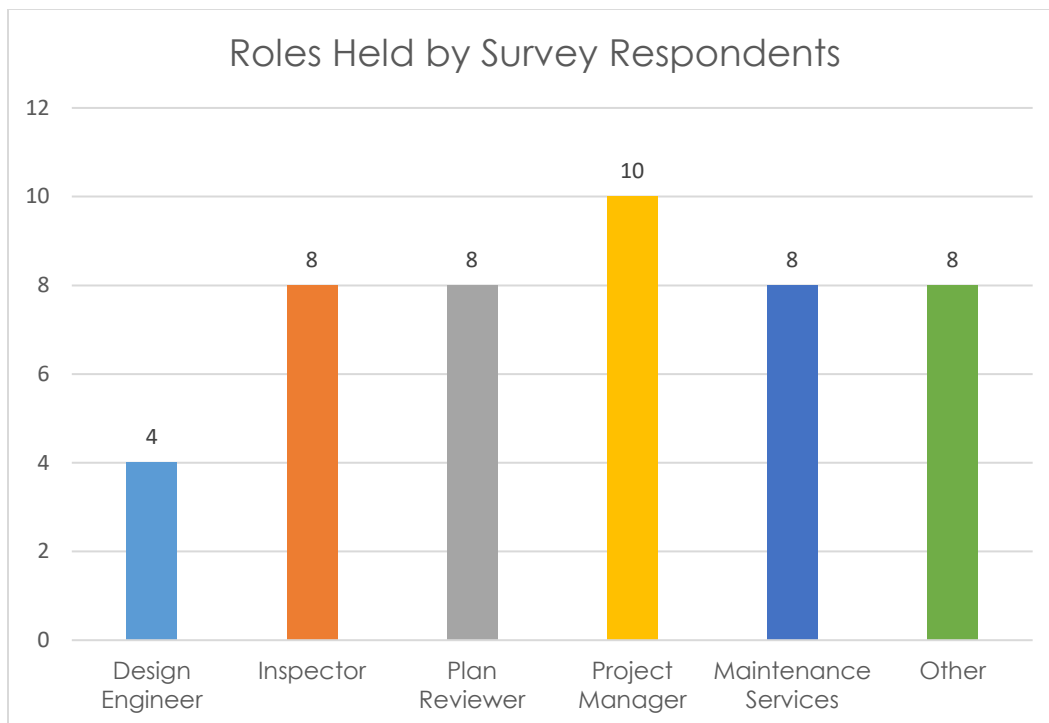


Figure 1: Survey Question 3 Preliminary Data

The survey received 22 responses.⁷ Respondents to the survey were initially drawn from special districts with a total of 9 respondents. To balance this figure, staff reached out to the California State Association of Counties (CSAC), and CSAC representatives forwarded the Board survey to its members, leading to 5 responses further from county representatives. The remaining responses were from a contractor, a private utility, a private company, state agencies, and one unknown response.

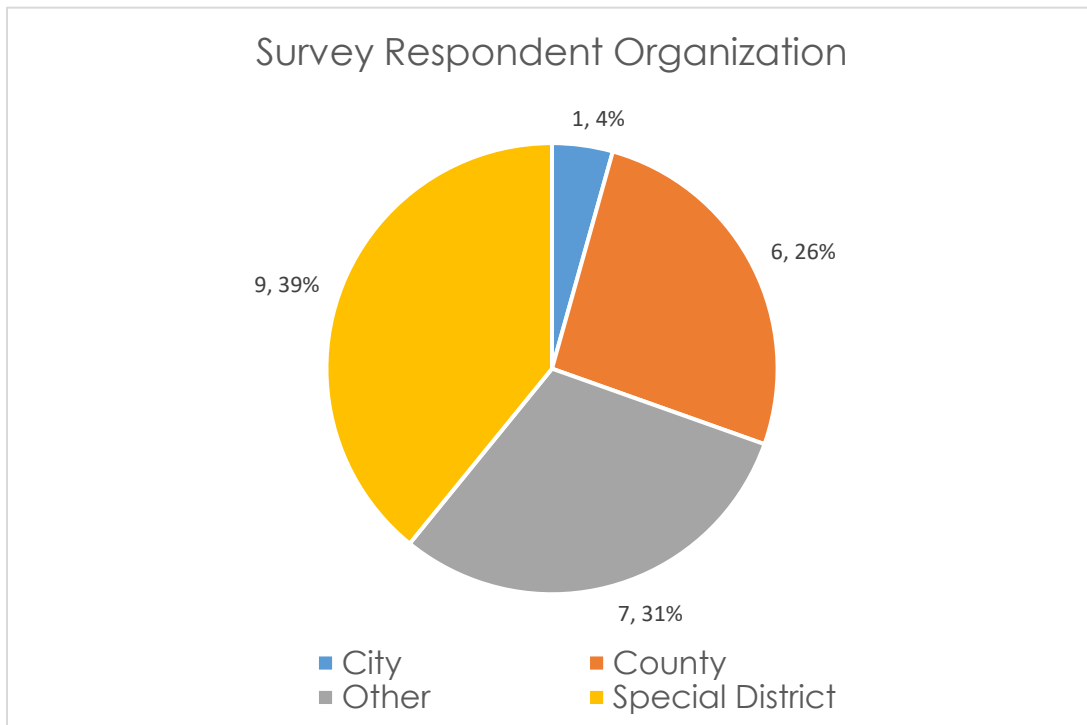


Figure 2: Survey Question 7 Preliminary Data

There was only one city representative to the survey. Board staff is working with the League of California Cities to send out the survey to their members and learn more about these standards at the city level. As this work is ongoing, this report reviews preliminary survey data.

Preliminary Results

The standards and requirements in contracting and permitting processes encompass everything from procedures of communication around roads and street improvement projects, reference to Gov't Code § 4216 *et al.* and the safe

⁷ One additional response was received from a representative of Oregon 811, but is left out of this discussion.

digging process, grading, trenching, utility installation and relocation, and related excavation topics.

Municipalities perform some public works projects themselves, and staff research suggests this is most often for surface improvements and road maintenance. For instance, the City of Los Angeles references these surface activities in their 2019 Annual Report.⁸ Much of the work, however, is contracted out.

Municipal Contracts and Permits have Extensive Requirements

Contracting provisions and permit requirements are often the same for a municipality. The permitting process allows construction to take place within the right-of-way of a municipal entity, permitting another entity to proceed with the proposed work as approved by a municipal engineer. Private developers are required to obtain certain permits whose type may vary depending on the jurisdiction such as encroachment permits to operate in the right of way, excavation permits, utility permits, or grading permits to plan out and present proposed work for review and approval. A municipality may require their own contractors to obtain a permit for the contracted work.⁹ Likewise, permits¹⁰ and construction plan notes¹¹ may contain reference to standard specifications, leading staff to conclude that these standards for permittees and public works contractors are often the same. This is complicated further in that some entities have separate improvement standards for permittees from their standard specifications for contracts. Sacramento County will be discussed below in this regard. In conversation with representatives of special districts, survey respondents reported operating within the right-of-way of cities and counties and therefore did not have permitting controls themselves.

Public works projects are often contracted out through bidding with contract terms often contained in the standard specifications. These standard specifications (or development standards, improvement standards, or construction standards, as they are sometimes called) contain standards for communication on a project as well as standards for grading, trenching, paving, and all other construction activities. In addition to these standard specifications,

⁸ [City of Los Angeles, Department of Public Works 2019 Annual Report, pages 36-37](#)

⁹ [City of Sacramento, Standard Specifications 2020, Section 6-3 Permits, Licenses, and Fees](#)

¹⁰ [County of Monterey, Municipal Code, Chapter 14.04 - Encroachments For Excavations, Construction And Special Events 14.04.120 - Construction requirements](#)

¹¹ [County of Santa Clara, Plans for Central and San Thomas Expressways Bicycle Signal Detection, General Notes Line 3](#)

municipal city engineers may specify Special Provisions to a contract that involve special conditions for the construction.

A majority of survey respondents reported that they collected Injury and Illness Prevention Plans (IIPP's) of the contractor for review. In conversation, a representative of Westlands Water District reported that these would be checked for meeting the minimum requirements following award of contract.

Municipalities Use Diverse Standards

While respondents report having excavation standards, those standards do not appear to be *standard*. While having much in common with one another, most organizations surveyed have their own set of requirements through their specifications, codes, and provisions. The most common reference for safety is to the Occupational Safety and Health Administration (OSHA), and the most common technical requirements for road construction often cite the latest edition of the Caltrans Standard Specifications.¹²

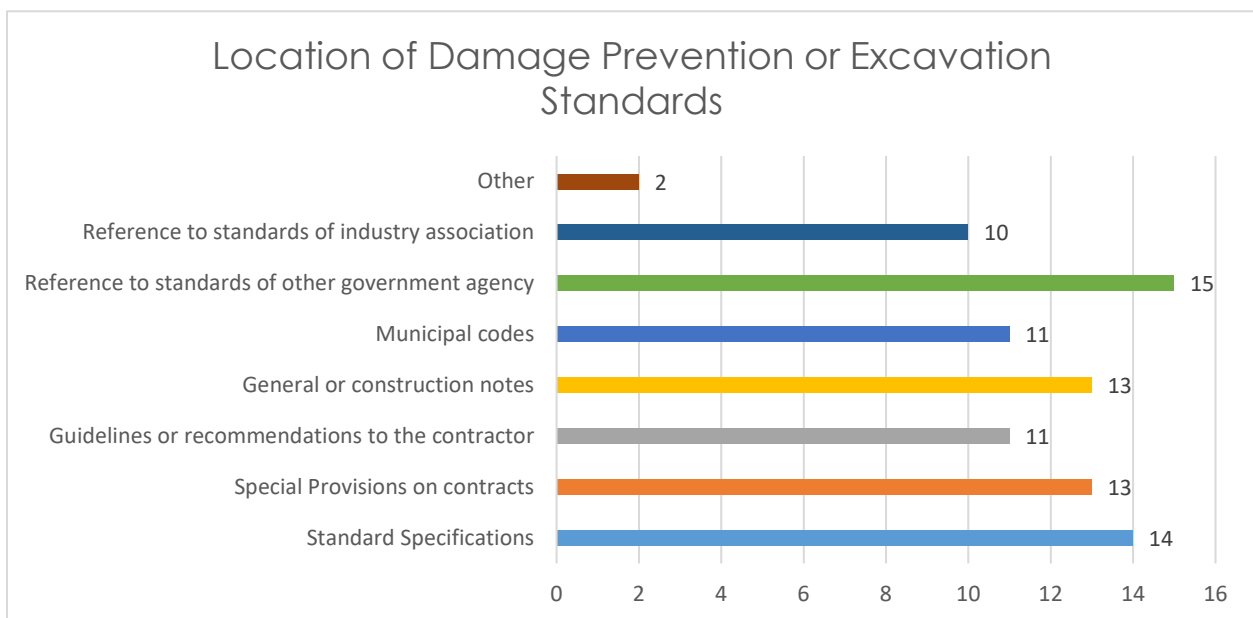


Figure 3: Survey Question 10 Preliminary Data

Interviews indicate that standardization processes are ongoing projects. A Santa Clara County representative spoke to the fact that contract special provisions can miss something pertinent and lead to communication problems on roles and responsibilities on the project. For that reason, the Santa Clara County Roads and Airports Department is looking to standardize all their special provisions. The survey

¹² [Caltrans 2018 Standard Plans and Standard Specifications](#)

data points to this as well, with more than 70% of respondents reporting that their organizations have a standard list of special provisions. Likewise, a Tuolumne County representative discussed ongoing standardization of their technical plans for street improvements, which are in a multi-year process of being reworked. In that process, Tuolumne is consulting neighboring Northern California area standards and the Caltrans Standard Specifications.

No universal public works standard exists. Of survey respondents, only one entity, Helix Water District, shared in the development and maintenance of a set of standards with a group of 7 other districts.¹³ The largest standardization project may be the Greenbook of Standard Specifications for Public Works Construction¹⁴ that is reported to be in use by 200 cities, counties, and districts in Southern California, and learning more about these standards and their extent is an important next step for staff research. The Greenbook is developed by volunteers of the American Public Works Association (APWA), Associated General Contractors of California (AGCC), Engineering Contractors Association (ECA), and Southern California Contractors Association (SCCA). These are not necessarily adopted without modification, as the City of Los Angeles issues a “Brownbook”¹⁵ of amendments to the “Greenbook” and the San Diego area has a Regional Standards Committee that at least develops their own sets of technical plans.¹⁶ For the remainder out of the 482 cities, 58 counties, and roughly 3400 special districts (as of 2002) in California, there may be operationally distinct standards.¹⁷

Safe Digging Provisions are Present, But Rarely Go Beyond 4216 Requirements

References to 4216 and the 811 safe digging process are often located early in specifications and permitting documents. For instance, the Calaveras County Department of Public Works has this as the 4th General Condition of their Utility

¹³ [San Diego Water Agencies' Standards](#)

¹⁴ [2021 Greenbook Standard Specifications for Public Works Construction, Public Works Standards, Inc.](#)

¹⁵ [City of Los Angeles Brownbook 7th Edition, Additions and Amendments to the 2012 Edition and 2014 Cumulative Supplement to the Standard Specifications for Public Works Construction](#)

¹⁶ [San Diego Regional Standards Committee](#)

¹⁷ [What's So Special About Special Districts? A Citizen's Guide to Special Districts in California, 2002. Kimia Mizany & April Manatt.](#)

Encroachment Permits¹⁸ and the City of Sacramento has reference on page 56 of 387 of their 2016 Standard Specifications.¹⁹

Respondents reported requirements for onsite meetings when crossing over the top of lines, and at time of backfill for inspection. Sacramento County has a standard for a thorough set of topics at a preconstruction meeting:

*Topics discussed will include mobilization, access, temporary facilities, utilities, subcontractors, schedules, procedures, correspondence, progress payments, payroll records, Storm Water Pollution Prevention Plans (SWPPP), coordination, safety, after-hour contacts for Contractor and Agency personnel, quality control/quality assurance, personnel assignments, and other appropriate topics.*²⁰

Respondents recommended the Gov't Code § 4216 *et al.* safe digging process and design phase engineering for unpaved roads and grading road shoulders. In conversation with Westlands Water District however, a representative noted that they were concerned for risers and valve boxes, which are access points to their facilities, under soil cover near unpaved county roads and in fields. The district representative noted that normally there was about 4 to 5 feet of cover over these risers, however over as many as 50 years erosion did impact these underground facilities and the district had seen some risers lose about half that cover over that time.

Requirements to Coordinate with Buried Infrastructure Owners are Uncommon

Coordination of public works projects with other utility operators may vary. On the one hand, these standards do specify this and create roles and responsibilities for coordination. For instance, for permittees, Sacramento County Improvement Standards requires preliminary plans to be distributed to all involved utility organizations and requires a copy of the transmittal letters for verification.²¹ And for contracts, the Sacramento County Standard Specifications require the further requirement that the contractor provide utilities

¹⁸ [County of Calaveras, Public Works Department, Utility Encroachment General Conditions](#)

¹⁹ [City of Sacramento, Standard Specifications 2020, Section 6-19 Main and Trunkline Facilities](#)

²⁰ [County of Sacramento, Standard Specifications 2016, Section 7-3 Preconstruction Conference and Progress Meetings](#)

²¹ [County of Sacramento, Improvement Standards 2018, General Requirements 2-17 Existing Utilities](#)

with the current schedule for the project every two weeks and provide a copy of all communications to the County as well.²²

This standard may not be the case with all entities, or it may be a standard ideal that does not always occur. Two water districts spoke of working toward greater coordination with other organizations as there were times they did not know what projects were upcoming with other agencies in the area or even discovered that a utility would need to be relocated at the time of the USA ticket, causing a delay. Calaveras County Water District reported working to improve coordination with other organizations through voluntary quarterly meetings.

In general, the responsibility to communicate and coordinate with utilities in the construction phase of a project is that of the contractor unless explicitly stated in the plans or contract terms, and the Gov't Code § 4216 *et al.* safe digging process is a primary mechanism for this communication. In conversation, respondents also pointed to the importance of working relations between engineering departments in the design phase as a key to coordination and indicated that there is an incentive there to minimize the chance of delays on a project.

Potholing was the single topic to receive specific outcome standardization. The City of Los Angeles Master Specifications require potholing of utilities within 3 feet of any trench or excavation and that a log must be kept both of these potholes and utility location information.²³ In addition, City of Los Angeles Municipal Code Section 62.03.1 requires when excavating within 6 feet of a utility carrying an unstable substance (such as petroleum, or methane above 60 PSIG) and crosses a street at an excavation, then there shall be at least two potholes locating the utility, and if there is a utility running along the street, potholes must be at least every 100 feet.²⁴

Grading Permits and Asphalt Removal Requirements are Opportunities

Staff have not been able to identify any features of grading permits or grading standards that go beyond the Gov't Code § 4216 *et al.* safe digging process and the requirement to protect existing facilities. Many cities and counties have a grading permit and grading section of their standard specifications and municipal codes. These standards generally cover sloping, movements of soil and its storage on a job site, retaining wall specifications, drainage, and cut and fill requirements. One survey respondent also spoke to the importance of design phase engineering and proper fills for grading eroded areas. These permits require

²² [County of Sacramento, Standard Specifications 2016, Section 6-11.01 Existing Utilities, General](#)

²³ [City of Los Angeles, Bureau of Engineering, Specification 01732, Additional Potholing](#)

²⁴ [City of Los Angeles, Municipal Code 62.03.1, Notification and Location Requirements](#)

extensive documentation which includes existing utility information, soil and water studies, and drainage plans. The City of San Diego guide to submittals for grading permits provides 12 pages of requirements.²⁵

Standards language for asphalt removal generally includes returning pavement back to its former state and the responsibility of contractors to maintain integrity of adjacent structures. Some entities have cooperation policies or incentives to not disturb newly constructed pavement. For instance, San Diego County Public Works has a policy to disallow cutting into pavement for 3-years following installation²⁶, and Sacramento City Municipal Code provides incentives for coordinating the time of utility maintenance and road maintenance activities.²⁷ Staff have so far not located any specific outcome standards that would specify certain processes or communication involved in the safe removal of pavement such as in saw cutting, jackhammering, or milling.

Digitalization of Records is Uneven

The survey showed that digitalization is a process that is beginning now, with a slim majority of our respondents reporting their organization was not yet digitalizing their contracted as-builts. Five respondents reported a known timeline for this process and for seven respondents the timeline was unknown. The Santa Clara County Roads and Airports Department website displays a fully implemented GIS database that shows locations of contracted roads and traffic signal projects and allows viewing of as-builts of each project.²⁸ In conversation, a Santa Clara representative reported that permittee projects are in the process of being uploaded to that database as well.

²⁵ [City of San Diego, Development Services Department, *Land Development Manual, Project Submittal Requirements, Section 3, Construction Permits, Grading and Right of Way*](#)

²⁶ [County of San Diego, Department of Public Works, *Policy RO-7*](#)

²⁷ [City of Sacramento, *City Code 12.12.190 Coordination of excavations.*](#)

²⁸ [County of Santa Clara, Roads and Airports Department, *Record Drawings Map*](#)

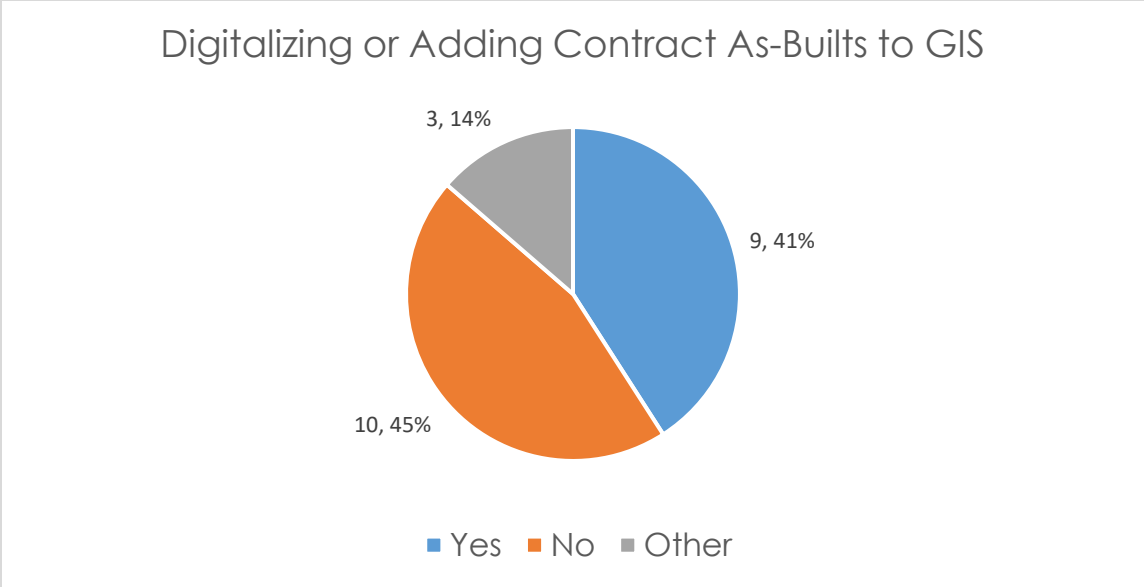


Figure 4: Survey Question 16 Preliminary Data

Next Steps

Municipalities have many public works and excavation practices, but few appear to go beyond Gov't Code § 4216 *et al.* for safe digging. Staff therefore proposes to engage with road construction contractors to understand what steps they take to ensure safe and uneventful completion of their projects. The apparent desire from municipalities to identify common standards for construction activities may provide the Board an opportunity in the future to promote the standards it develops.

RECOMMENDATION

Staff recommend that the Board engage with contractors on the methods they use to ensure safe and uneventful completion of road construction, earthwork, grading, and paving projects.

ATTACHMENTS

- A. [Preliminary Public Works Excavation Survey Data](#)
- B. [Public Works Excavation Survey Questions](#)