

**OMB Control Number: 1218-0137**

**Design of Cave-In Protection Systems**

### § 1926.652, Requirements for protective systems

The purpose of this Standard is to protect each employee in excavation from cave-ins by an adequate protective system designed in accordance with paragraph (b) and (c) of the Standard. (Note §1926.652(a)(1) lists several exceptions.) There are four options to provide protective systems listed under paragraph (b): options 3 and 4, paragraphs (b)(3), *Designs using other tabulated data*, and (b)(4), *Design by a registered professional engineer*, contain collections of information.

While each excavation project is unique, most employers can use either Option 1 or 2 to design and use protective cave-in systems. Options 3 and 4 were promulgated for the small percentage of commercial sites that may have unique situations based on the size of the project, the configuration of the building, location, and climate.

Based on staff's experience in the field and the Agency's review of fatality data, OSHA believes no more than 10% of the 200,000 commercial sites may use Options 3 or 4. The use of trench box protective systems continues to increase over the years because trenchboxes are used in a wide range of conditions and for various depths. It should be noted that the use of a trench box, option 4, is the preferred method of protection on commercial sites. Using a trench box does not involve a collection of information. The Agency has attached a Table, "Percent Distribution of Trench Anti-Cave-in protection methods" that summarizes a survey that was submitted to the Agency in 1987 on which types of anti-cave-in protection methods employers were using. The survey identified five means for anti-cave in design: 1. Timber shoring, 2. Sloping, 3. Trench Shields, 4. Hydraulic shoring, and 5. Other. Options 3 and 4 are represented by "Sloping" and "Trench Shields" which account for 89%. In these operations trench boxes are used. The other three, Timber shoring, . Hydraulic shoring, and Other, account for 11% and are likely to use Option 3 and 4. Given that the trench box protective systems were used in 89% of the commercial sites in 1987, and based on experience that the use of trenchboxes continues to increase over the years, OSHA believes 10% is a realistic estimate.

## Percent Distribution of Trench Anti-cave-in Protection Methods

| Identifier          |  | Timber shoring | Sloping | Trench Shields | Hydraulic shoring | Other |
|---------------------|--|----------------|---------|----------------|-------------------|-------|
| <b>Type of Work</b> |  |                |         |                |                   |       |
| A                   | Utilities Underground  | 0%             | 80%     | 15%            | 5%                | 0     |
| B                   | Water works 4'to6' foot  | 0%             | 0%      | 100%           | 0%                | 0     |
| C                   | Utility Const. Sewers & Water  | 0%             | 5%      | 85%            | 10%               | 0     |
| D                   | Bit-paving Site Work -Sewer &<br>Water - Rock Quarry<br>Utility Installations, Road<br>Construction, Bituminous Concrete | 0%             | 85%     | 15%            | 0%                | 0     |
| E                   | Production   | 5%             | 20%     | 75%            | 0%                | 0     |
| F                   | Sewer, Water and Strom Drainage  | 0%             | 50%     | 50%            | 0%                | 0     |
| G                   | Excavators/Loaders/Compactors<br>Bridge Const; Road & Highway;<br>Sewer/Water Main; Gas;                                 | 0%             | 0%      | 95%            | 5%                | 0     |
| H                   | Excavation<br>Utility; Water, Storm Drainage;  | 5%             | 75%     | 20%            | 0%                | 0     |
| I                   | Pump Stations  | 3%             | 10%     | 85%            | 2%                | 0     |
| J                   | Sewers, Water Mains<br>Storm Sewers; Sanitary Sewers;  | 1%             | 39%     | 10%            | 50%               | 0     |
| K                   | Water mains  | 10%            | 30%     | 50%            | 10%               | 0     |
| L                   | Underground Utilities  | 10%            | 0%      | 0%             | 0%                | 0     |
| M                   | Installation of Sewers-Storm Drains  | 5%             | 45%     | 50%            | 0%                | 0     |
| N                   | Water Sewers/Storm Drain<br>Underground Utility Installation and   | 5%             | 60%     | 10%            | 25%               | 0     |
| O                   | Paving<br>Grading, Excavating, Sewer and<br>Water Line Construction Building   | 10%            | 90%     | 0%             | 0%                | 0     |
| P                   | demolition, and trucking<br>Public Works - Sewer & Water;  | 1%             | 29%     | 70%            | 0%                | 0     |
| Q                   | Tunneling  | 20%            | 20%     | 55%            | 5%                | 0     |
| R                   | Average  | 0%             | 80%     | 15%            | 5%                | 0     |
|                     |  | 4%             | 42%     | 47%            | 7%                | 0     |

Source: OSHA, Excavation Docket S-204 Exhibit 5

**SUPPORTING STATEMENT FOR  
THE INFORMATION COLLECTION REQUIREMENTS OF  
29 CFR PART 1926, SUBPART P (“EXCAVATIONS”)<sup>1</sup>  
(OFFICE OF MANAGEMENT AND BUDGET (OMB))  
Control Number 1218-0137 (May 2008)**

**JUSTIFICATION**

**1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.**

The main purpose of the Occupational Safety and Health Act (OSH Act) is to “assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources” (29 U.S.C. 651). To achieve this objective, the OSH Act specifically authorizes “the development and promulgation of occupational safety and health standards” (29 U.S.C. 651). In addition, the OSH Act specifies that “[e]ach employer shall make, keep and preserve, and make available to the Secretary . . . such records . . . as the Secretary . . . may prescribe by regulation as necessary or appropriate for the enforcement of this Act . . .” (29 U.S.C. 657).

Under the authority granted by the OSH Act, the Occupational Safety and Health Administration (“OSHA” or “the Agency”) published 29 CFR part 1926, subpart P (“Excavations”) to use protective systems to prevent cave-ins during excavation work. Paragraphs (b) and (c) of § 1926.652 (“Requirements for Protective Systems”; the “Standard”) contain the only paperwork requirements in 29 CFR part 1926, subpart P that impose burden hours or costs on employers as specified by the Paperwork Reduction Act of 1995 (PRA-95).<sup>2</sup> Items 2 and 12 below list and describe the specific information collection requirements of the Standard.

**2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.**

Paragraphs (a) and (b) of the Standard require employers to use protective systems to prevent cave-ins during excavation work; these systems include sloping the side of the trench, benching

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<sup>1</sup>The purpose of this Supporting Statement is to analyze and describe the burden hours and costs associated with provisions of this standard that contain paperwork requirements; this Supporting Statement does not provide information or guidance on how to comply with, or how to enforce, the standard.

<sup>2</sup>Paragraph (b)(2) of § 1926.651 (“Specific Excavation Requirements”) requires that employers, before excavating, request local utility companies to locate underground utility installations. However, the Agency considers such a request to be a usual and customary business practice and, therefore, excluded from coverage under PRA-95.

the soil away from the excavation, or using a support system or shield (such as a trench box). The Standard specifies allowable configurations and slopes for excavations, and provides appendices to assist employers in designing protective systems. However, paragraphs (b)(3) and (b)(4) of the Standard permit employers to design sloping or benching systems based on tabulated data (Option 1), or to use a design approved by a registered engineer (Option 2).

Under Option 1, employers must provide the tabulated data in a written form that also identifies the registered professional engineer who approved the data and the parameters used to select the sloping or benching system drawn from the data, as well as the limitations of the data (including the magnitude and configuration of slopes determined to be safe); the document must also provide any explanatory information necessary to select the correct sloping or benching system based on the data. Option 2 requires employers to develop a written design approved by a registered professional engineer. The design information must include the magnitude and configuration of the slopes determined to be safe, and the identity of the registered professional engineer who approved the design.

Paragraphs (c)(2), (c)(3), and (c)(4) allow employers to design support systems, shield systems, and other protective systems based on tabulated data provided by a system manufacturer (Option 3) or obtained from other sources and approved by a registered engineer (Option 4); they can also use a design approved by a registered engineer (Option 5). If they select Option 3, employers must complete a written form that provides the manufacturer's specifications, recommendations, and limitations, as well as any deviations approved by the manufacturer. The paperwork requirements of Option 4 are the same as Option 1. Option 5 requires a written form that provides a plan indicating the sizes, types, and configurations of the materials used in the protective system and the identity of the registered professional engineer who approved the design.

Each of these provisions requires employers to maintain a copy of the documents described in these options at the jobsite during construction. After construction is complete, employers may store the documents offsite provided they make them available to an OSHA compliance officer on request. These documents provide both the employer and the compliance officer with information needed to determine if the selection and design of a protection system are appropriate to the excavation work, thereby assuring employees of maximum protection against cave-ins.

**3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.**

Employers may use improved information technology to establish and maintain the required records. The Agency wrote the paperwork requirements of the Standard in performance-oriented language, i.e., in terms of what data to collect, not how to record the data.

**4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use of the purpose described in item 2 above.**

The information collection requirements in the Standard are specific to each employer involved, and no other source or agency duplicates these requirements or can make the required information available to OSHA (i.e., the required information is available only from employers).

**5. If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods used to minimize burdens.**

The information collection requirements specified by Subpart P do not have a significant impact on a substantial number of small entities

**6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.**

Employers need to comply with each paperwork requirement specified by the Standard only once for each protective system constructed at a jobsite. Any reduction in frequency would eliminate the requirements entirely, thereby jeopardizing the safety of employees who rely on properly constructed protective systems to prevent cave-ins during excavation work. The requirement also allows employers and OSHA compliance officers to assess if the selection and design of a protection system are appropriate to the excavation work.

**7. Explain any special circumstances that would cause an information collection to be conducted in a manner:**

- **Requiring respondents to report information to the agency more often than quarterly;**
- **Requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
- **Requiring respondents to submit more than an original and two copies of any document;**
- **Requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records for more than three years;**
- **In connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
- **Requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
- **That includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**
- **Requiring respondents to submit proprietary trade secret, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

No special circumstances exist that require employers to collect information in the manner or using the procedures described in this item.

**8. If applicable, provide a copy and identify the data and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.**

Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

Consultation with representative of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years – even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3506(c)(2)(A)), OSHA published a notice in the *Federal Register* on February 13, 2008, (73 FR 8374), Docket No. OSHA-2008-0008 requesting public comment on its proposed extension of the information collection requirements contained in Design of Cave-in Protection Systems. This notice was part of a preclearance consultation program that provided those interested parties the opportunity to comment on OSHA's request for an extension by the Office of Management and Budget (OMB) of a previous approval of the information collection requirements found in the above standard. The Agency received no comments to this notice.

**9. Explain any decision to provide any payment of gift to respondents, other than remuneration of contractors or grantees.**

The Agency will not provide payments or gifts to the respondents.

**10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.**

The paperwork requirements specified by the Standard do not involve confidential information.

**11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.**

The paperwork requirements specified by the Standard do not involve sensitive information.

**12. Provide estimates of the hour burden of the collection of information. The statement should:**

- Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons

for the variance. Generally, estimates should not include burden hours for customary and usual business practices.

- If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens in Item 13 of OMB Form 83-I.

- Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage-rate categories.

In 2004, OSHA staff familiar with the construction industry estimated that 1.4 million construction starts occur each year, about 1.2 million of which were residential units. The Agency believes that none of the employers at residential jobsites elect to use the options specified by paragraphs (b)(3), (b)(4), (c)(2), (c)(3), and (c)(4) of the Standard to construct protective systems, since it is not practical, i.e. most of the options are used at large sites with deeper excavations, and/or not cost effective. Moreover, OSHA estimated that no more than 10% of the 200,000 commercial (non-residential) starts (i.e., 20,000) use such protective systems. The Agency estimated that half, or 10,000, of the commercial jobsite employers will hire a professional engineer to design the protection systems and will incur costs. See Item 13 of the Supporting Statement.

For the other 10,000 commercial jobsites, the Agency estimated that an employer requires 2 hours to obtain the necessary information to design the protective systems needed at each commercial jobsite using one of the options specified by paragraphs (b)(3), (b)(4), (c)(2), (c)(3), and (c)(4) of the Standard for a total of 20,000 burden hours for the 10,000 commercial jobsites involved (i.e., 10,000 jobsites x 2 hours = 20,000 hours). In addition, OSHA believed that an employer takes 5 minutes (.08 hour) to retrieve the required documentation for review by a compliance officer during an inspection. As shown in Item 14 below, the Agency estimated that it will conduct 280 inspections at the 20,000 jobsites each year (i.e., 280 inspections x .08 hour = 22 hours).

While there have been shifts in construction and in the credit market since the initial estimates were developed, the Agency has not identified any reliable data to adjust these numbers.

Therefore, the annual burden hours and cost of this paperwork requirement are:

**Burden hours:** 20,000 hours (to obtain design information) +  
22 hours (for OSHA inspections) = 20,022 hours  
**Cost:** 20,022 hours x \$33.71<sup>3</sup> = \$674,941

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<sup>3</sup>Based on an hourly wage rate of \$33.71 for a Construction supervisor including benefits (source: Employer Cost for Employee Compensation, U.S. Department of Labor (DOL), Bureau of Labor Statistics (September 2007))



**13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 12 and 14).**

• The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life); and (b) a total operation and maintenance and purchase of service component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.

• If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondent (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.

• Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.

OSHA believes that half (i.e., 10,000) of the 20,000 commercial construction starts using one of the options specified by paragraphs (b)(3), (b)(4), (c)(2), (c)(3), and (c)(4) of the Standard will contract for a registered professional engineer to design the protection systems.<sup>4</sup> In addition, the Agency estimates that the engineer requires 2 hours to develop each design, for a total of 20,000 burden hours for the 10,000 commercial jobsites involved (i.e., 10,000 jobsites x 2 hours = 20,000 hours). Therefore, the annual cost to employers for these engineering services at an hourly wage rate of \$40.77<sup>5</sup> is:

$$\text{Cost: } 20,000 \text{ hours} \times \$40.77 = \$815,400$$

**14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies also may aggregate cost estimates from Item 12, 13, and 14, in a single table.**

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<sup>4</sup>Employers will design the remaining half themselves.

<sup>5</sup>Based on an hourly wage rate of \$40.77 for a civil engineer including benefits (source: Employment and Earnings, U.S. Department of Labor (DOL), Bureau of Labor Statistics (BLS), May 2006.

The Agency estimates that a compliance officer (GS-12, step 5), at an hourly wage rate of \$37.89, spends 5 minutes (.08 hour) reviewing the documents required by the Standard. OSHA determines that its compliance officers will conduct 280 inspections during each year covered by this ICR.<sup>6</sup> The Agency considers other expenses, such as equipment, overhead, and support staff salaries, as normal operating expenses that would occur without the collection-of-information requirements specified by the Standard. Therefore, the total cost of these paperwork requirements to the Federal government is:

$$\text{Cost: } 280 \text{ inspections} \times .08 \text{ hour} \times \$37.89 = \$849$$

**15. Explain the reasons for any program changes or adjustments reporting in Items 12 or 13 of the Justification.**

There are no program changes or adjustments in Item 12 of the Justification. The Agency is requesting an adjustment increase to the costs to respondents by \$94,400 as a result of increasing the hourly wage of a civil engineer from \$36.05 to \$40.77. OSHA found an administrative error in calculating the number responses; the total should be 10,280 responses not 20,000.

**16. For collections of information whose results will be published, outline plans for tabulation, and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.**

The Agency will not publish the information collected under this standard.

**17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.**

OSHA is not seeking such approval. No forms are available for the Agency to display the expiration date

**18. Explain each exception to the certification statement identified in Item 19, "Certification for Paperwork Reduction Act Submission," of OMB 83-I.**

The Agency is not seeking an exception to the certification statement in item 19.

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<sup>6</sup>OSHA determined the number of inspections by calculating an overall inspection rate of 1.4% (0.014) for all employers under its jurisdiction, then applying this percentage to the number of commercial construction jobsites (i.e., 20,000; see Item 12) covered by these paperwork requirements (0.014% x 20,000 jobsites = 280 inspections).