

Excavation Due Diligence

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State of California Construction Safety

SECTION 1540 EXCAVATIONS

1541. General requirements

(b) Underground installations

(c) Access and Egress

(g) Hazardous Atmospheres

- Where oxygen deficiencies or hazardous atmospheres exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmosphere must be tested before employees enter excavations greater than **four feet in depth**.

(2) Emergency Rescue Equipment

- Employees entering bell-bottom pier holes, or other deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h) Protection from hazards associated with water accumulations.

(I) Stability of adjacent structures

- Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:
 1. A support system is provided
 2. The excavation is in stable rock
 3. A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(j) Protecting employees from loose rock and soil.

1541.1 Requirements for protective systems,

- Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with section 1541.1(b) and (c) except when:

(A) Excavations are made entirely in stable rock

(B) Excavations are less than **five feet in depth** and examination of the ground by a competent person provides no indication of a potential cave-in.

How can excavation impact your project?

Re-imagining the façade of your dealership can be exiting, but it is surely not all fun and games. In doing research on the GM image program façade it became apparent to us that the most prevalent unknown is not in the façade itself but in what lies under ground. When remodeling a dealership the most important thing is to keep selling cars. While spending thousands of dollars, how do you insure your chances of making this happen.

In the past year we have seen many designs for the entry element of the GM facility Image program. All seem to have some good ideas .Toady's experienced companies are able to add value using technology like HDS scanning and 3D design. Computer aided CNC fabrication and electronic product tracking to minimize on site impacts. Even the use of motorized man lift equipment can help reduce the footprint utilized on site. So what is left if your contractor has all this to offer. Well, this really leaves us with one major concern to look out for, foundation design. While it may seem simple to dig a hole and fill it with concrete, there is a big difference in impact according to how deep you are excavating. So what is the magic depth? From my research **five feet deep or less** is optimum. The reason for this is some what three part.

The first of these concerns is **safety**. Per **CAL/OSHA** there are many safety rules that start to come into effect as you reach the four foot mark. Rules that govern issues like monitoring air quality, water mitigation, cave-in protection, and stability of adjacent structure. With so many rules, how do you know when they apply? Well that can be tough. These rules are written in a way that leave interpretation open. You never really know if you comply unless you follow all of the rules. How much time and money would this cost? Your guess is as good as mine. To the left hand side I have included some excerpts from the State of California Construction Safety Orders published by CAL/OSHA for your review.

The second thing would be to contact DigAlert and obtain a full understanding of what utilities are in the area and make sure they will not be affected by your excavation. This will allow you to at least judge what some of the impacts will be before you settle on a final foundation design.

Last is the impact of **car lot space**. Footings up to **five feet deep** can be dug by hand with electric and pneumatic hand tools, spoils are minimal and can be removed from site using a standard pick up truck. Beyond five feet you can expect to see heavy equipment on site, large spoils piles and dump trucks. Not including dumping fees. If I had to make a guess I would say that the footprint impact would be five to ten times more for a footing deeper than five feet.

So how do you know if this will impact your project? Well if you are looking at a center support Pylon design you can expect the footings to be as deep as thirteen and a half feet. If drawings are supplied with the bid it makes it even easier to determine. What I would suggest is to look for a conventional frame structure that is designed to distribute the stress on the footing over its area and this will help minimize your footing depth to around five feet or less. Choose a local engineer that understands local codes and soil types so that the design is specific to your project and not just a one size fits all attempt.