

An Unsettling Situation

(Case 1015)

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The Case:

Your company is hired by a design-build team to provide geotechnical engineering services for the development of a complex of five, two-story office structures on an undeveloped, wooded site. The design-build team consists of a large contractor and a multi-disciplinary architectural-engineering (A/E) design firm. Neither the contractor nor the architect/engineer firm will retain any financial interest in the project once it is completed and purchased by one of several prospective buyers.

You are the geotechnical engineer in charge of the subsurface investigation, testing, engineering analysis, and site preparation and foundation design recommendations. Because of the moderately compressible nature of the subsoils at the site, your recommendation is to support the structures on piles to avoid long-term settlements that would not cause collapse of the structures, but would lead to cracking of floor slabs, some differential movement of the second stories and potential distress (cracking) to the brick masonry and glass exteriors of the buildings.

When advised of your recommendations by telephone, the contractor on the design-build team reviews the local building code and questions why they can't support the buildings on shallow spread footings designed on the basis of the allowable soil bearing pressures indicated in that code.

When you tell the contractor that excessive settlements will occur over time, the contractor questions if settlements will be excessive during the first year after completion of construction, which is also the warranty period for the project. Your analyses indicate that the settlements in the first year will not be excessive, rather the problems due to settlement will not manifest themselves until several years have elapsed.

The contractor requests that you write your report recommending shallow footing foundations designed in accordance with the local building code requirements, since he maintains that the design-build team obligation only extends to the first year following completion of construction. There is a clear implication that you may not get paid for your services if you do not comply with the contractor's request.

What do you do?

Alternate Approaches and Survey Results for “An Unsettling Situation” (Case 1015)

1. Do as the contractor asks. Even though your analyses show that the buildings will settle differentially over time creating cracks in the walls and floors, all buildings experience cracking. They will not collapse nor cause a threat to the safety and welfare of the occupants or the public.
Percentage of votes agreeing: 0%
2. Do as the contractor asks. It is his money that is paying for the project and for your consulting fees as well. If you don't, it appears that the contractor may not pay you for your work. As long as your recommendations do not violate the local building code (even though the buildings will experience long-term differential settlements), you have met your obligations as a professional engineer.
Percentage of votes agreeing: 1%
3. Do as the contractor asks, and submit your report recommending spread footings instead of piles. However, send a separate letter to him indicating that you originally recommended piles instead of spread footings to avoid the predicted long-term differential settlements and potential floor and wall cracking, and that at his insistence the recommendations were changed to spread footings. This will protect you legally should anything happen in the future.
Percentage of votes agreeing: 5%
4. Do as the contractor asks, but file a memo with the city building department indicating that even though the spread footing foundations recommended in your geotechnical report meet the letter of the building code, it is anticipated that long-term settlements will occur and that cracking of floors, walls and large windows over time may result. This way if prospective buyers ask to see the city's permit file for the building, they will be apprised of the potential settlements and the effects on the structures.
Percentage of votes agreeing: 7%
5. Do as the contractor asks, but indicate in your final report that while the use of spread footings will comply with the local building code with respect to bearing capacity protection against sudden failure and vertical penetration of the foundations and supported columns, there is the real potential of differential settlement with time, resulting in distress in the form of cracking in the floors and walls. Then indicate that in order to negate the effects of long-term settlements, use of piles for support of the buildings is recommended.
Percentage of votes agreeing: 14%

6. Tell the contractor you can do as he asks only if he will provide you and your company with a defend and hold harmless agreement (which includes the cost of legal defense) should future owners of the office complex bring a law suit against you or your company, either directly or as a third party defendant, as a result of the predicted wall and floor cracking due to long-term differential settlements.
Percentage of votes agreeing: 4%
7. It may be that the contractor is trying to look good in the eyes of the rest of the design-build team. Find out who the prime decision maker is among the design-build team (is it the A/E firm or the contractor?). If it is not the contractor, call a meeting with the A/E firm, inviting the contractor as well, to discuss the results of your geotechnical explorations, analyses and design recommendations. In the meeting, stress that professionally you cannot do analyses that indicate one type of foundation (piles) as most suitable for the proposed buildings, then write a report recommending an inferior foundation system (spread footings in this case). As a result, you are sticking to your original recommendations in your report.
Percentage of votes agreeing: 25%
8. Tell the contractor you cannot do ask he asks. You have a professional responsibility to report the results of your analyses fairly and accurately, even if the cost incurred by installing the pile foundations are greater than the spread footings. You do not want to be a party to recommending a foundation system which will induce anticipated distress in the building at some later date.
Percentage of votes agreeing: 33%
9. This happens all the time. You do your best to provide professional recommendations to your clients in accordance with good standards of practice, and they keep coming back looking for cheaper solutions, even if the total integrity of the structure is compromised to some degree. Tell him that you not only will not comply with his request, you will be happy to give your entire file to the city building department and suggest that they refuse to grant him building permits for any projects within the city limits in the future should he refuse to pay your fees.
Percentage of votes agreeing: 5%
10. Tell the contractor that you will consider his request, but you must wait for a few days for some additional information before finalizing your report. Then contact the lending institution (local bank) that is providing the funding for the construction of the project and discuss the situation with them. Since both the bank and your firm intends to continue to do business in the city for a long time to come, and the contractor and his team may not be around if they continue to do business in this manner, you want to be on the side of the bank. You agree with the bank to include recommendations for

whichever foundations they feel appropriate in your final report, whether the contractor agrees or not.

Percentage of votes agreeing: 5%

11. Mention the situation to your wife's cousin, who is a reporter for the local newspaper. Suggest that an article indicating that "usually reliable sources" have determined that the design-build team consisting of the A/E firm and the contractor are seeking to skimp as much as possible on the foundations for this new office complex, and that this may be a sign that other portions of the project could be poorly designed as well, since the designers and contractor are all in this project together to make as much money as possible. Have him call for an independent geotechnical analysis for the project to verify the allegations made by the "usually reliable source." In this way your original analyses will be confirmed, and the contractor will be unable to insist on changing your foundation design recommendations.

Percentage of votes agreeing: 1%

Forum Comments from Respondents

1. Call a one-on-one informal meeting with the contractor. In person, it will be easier to impress upon him the need to use piles...instead of shallow footings. The time between when the meeting is called and when it actually occurs is the time you have to 'crunch the numbers' and somehow make this situation look good from the contractor's point of view. Show him how his reputation has been built over the years and how it will be tarnished by a mediocre building. Find out exactly how much more the piles will cost and find a way to make it worth his while.
2. I am sure there is probably plenty of business out there without having to work with people like this. I believe most people with a conscience could not sleep at night knowing that they approved of something like this. I would also think to myself that I should have bugged the phones to get this all on tape.
3. I should make sure the contract for our services defines our duties as an impartial consultant. Explain to the contractor that this is the only way my company can do business. My ability to provide these services relies solely on our honest professional opinion.
4. Any time the engineer does as the contractor asks, he or she is neglecting the duty of care owed to the owner or occupants of the building at any point in time. Therefore, doing as the contractor asks is out of the question.
5. Being bound by Honor, even rigidly and strictly so, is, in my humble opinion, not a bad thing.

6. "Think about the public or civilians who may be killed if the building collapse. Someday your wife or some relative may be the one getting killed. Is not the money. We choose the career we want because it is exiting and bring us joy of helping other people. Tell the constructor that you will talk with the rest of the company to come with a desition". [sic]
7. "The constructor should not be pressuring the engineer to do something that will contribute to a bigger problem and many deads may be safe in the future". [sic]
8. As an engineer, your reputation is built on the quality of your work. When ...damage occurs, laymen and engineers alike will attribute you competence to this project.
9. Advise the contractor about statue of limitations that go beyond [one-year] guarantees. Recommend that the contractor consult their legal counsel on the matter. Get paid!
10. Ask the contractor if he has a good attorney who will help him with a lawsuit in a few years.
11. Find out for sure what the implied threat of withholding payment really meant. This has to be worked out before the engineer goes any further on the project.
12. In this situation losing the fee is a far far better thing to do than supporting a crummy design that will lead to real problems later on.
13. Redo the settlement calculations looking at the probable range of the coefficient of consolidation. It is a rare case that one can compute the time rate of settlement accurately. And even then most of the worst settlement usually happens in the first year anyway. Tell the contractor that while it can't be said for sure when the settlement will occur, it usually happens faster than the calculations indicate and this means there is a 95% probability there will be problems within the first year after construction. Putting it probabilistically gives the contractor the best idea of what the chances of a problem are.
14. Tell the contractor to blow it out his ear! 1) What he is asking is for your complicity in a fraud. 2) The statue of limitations for criminal conspiracy is longer than one year. 3) The statute of limitations for professional misconduct is longer than one year. 4) Your Errors and Omissions insurance will not cover deliberate misconduct. 5) You will lose your license.