Board of Contract Appeals

General Services Administration
Washington, D.C. 20405

DENIED: September 15, 2006

GSBCA 16588

PCL CONSTRUCTION SERVICES, INC.,

Appellant,

v.

GENERAL SERVICES ADMINISTRATION,

Respondent.

Milton L. Smith of Sherman & Howard L.L.C., Colorado Springs, CO, counsel for Appellant.

Robert C. Smith, Office of General Counsel, General Services Administration, Washington, DC, counsel for Respondent.

Before Board Judges **BORWICK**, **DeGRAFF**, and **GOODMAN**.

DeGRAFF, Board Judge.

Appellant contracted with respondent to construct a federal courthouse. According to appellant, it encountered subsurface conditions at the site which were materially different from the conditions indicated in the contract documents. The agency denied appellant's claim for costs associated with the alleged differing site condition and appellant filed this appeal. The Board held a hearing on January 10 and 11, 2006.

In order to prevail, appellant must establish that the contract documents, reasonably read, affirmatively indicated the subsurface conditions which form the basis of its claim. It must also establish it relied upon its interpretation of the contract's indications of subsurface conditions when it prepared its offer and entered into the contract. Because the evidence does not prove either of these points, we deny the appeal.

Findings of Fact

Requests for Proposals

In January 2002, the General Services Administration (GSA) began the process of selecting a contractor to design and construct a United States courthouse in Cape Girardeau, Missouri. The agency divided the selection process into two stages. The Stage 1 request for proposals (RFP) asked potential offerors to submit their qualifications to GSA, and explained GSA would review the submissions and invite some of the potential offerors to participate in Stage 2 of the selection process. Exhibit 1 at C-4, C-8.[1] In March 2002, PCL Construction Services, Inc. submitted its qualifications to GSA in response to the Stage 1 RFP. Exhibit 4.

In June 2002, GSA issued the RFP for Stage 2 of the selection process. Exhibit 5 (Proposal Documents cover sheet). The Stage 2 RFP invited three offerors, including PCL, to submit proposals to GSA, so GSA could evaluate them, conduct negotiations, obtain best and final offers, and select the successful offeror. Exhibit 5 (Proposal Procedures at 6-7, 13-14). The resulting firm fixed price contract was to include all design services and construction services needed for the project. Exhibit 5 (Proposal Procedures at 15). The provisions of the Stage 2 RFP were to become part of the contract between GSA and the successful offeror. Exhibit 5 (Proposal Procedures at 18).

The Stage 2 RFP incorporated by reference the Differing Site Conditions clause found at Federal Acquisition Regulation (FAR) 52.236-2, dated April 1984. Exhibit 5 (Part II, Section I at 2). This clause reads, in part, as follows:

> (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of –
>
> > (1) Subsurface or latent physical conditions at the site which differ materially from those indicated in this contract . . .

[1] All exhibits are found in the appeal file.

. . . .

> (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or a decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

Exhibit 13 at 12.

The Stage 2 RFP also incorporated by reference the clause governing site investigation and conditions affecting the work, FAR 52.236-3, dated April 1984. Exhibit 5 (Part II, Section I at 2). This clause reads, in part, as follows:

> The contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost . . . . The contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

Exhibit 13 at 13. Consistent with this provision, the Stage 2 RFP required offerors to certify they had "become familiar with local site conditions" and "correlated personal observations with the requirements of the RFP." Exhibit 5 (Exhibit 1 - Proposal Form at 1).

The Stage 2 RFP contained a section titled "Design Criteria," and appended to this section was a geotechnical report prepared for GSA by Sverdrup Civil, Inc. in January 2001.[2] Exhibits 5, 16, 101, 127. The Stage 2 RFP said the Sverdrup report was "advisory" and was intended to provide "preliminary design information only." The RFP also said GSA would not attest to the completeness or accuracy of the report. The RFP explained the successful

[2] Sverdrup Civil was part of Jacobs Engineering Group, Inc. Transcript at 206.

offeror was responsible for identifying all of the testing required for the geotechnical work, and for engaging the services of its own geotechnical engineer to provide appropriate assistance for conducting a geotechnical analysis of the site. Exhibit 5 (Design Criteria, Site Development at 25; Statement of Design/Build Services at 14).

Sverdrup's geotechnical report contained a section which discussed the geology of the area. The report said bedrock in the Cape Girardeau area consists of Ordovician limestones and shales. It went on to say:

> The Ordovician Kimmswick and Plattin limestone formations are found in Cape Girardeau and contain abundant karst features,[3] including prominent, wide, nearly vertical clay-filled joints.
>
> The Missouri Department of Natural Resources "Bedrock Geologic Map of Cape Girardeau-McClure 7.5' Quadrangles," Figure 2, indicate [sic] that the project site contains both the Kimmswick and the Plattin formations. The Kimmswick formation is shown on the northern portion of the site, the Plattin formation to the south on the majority of the site.
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> The Kimmswick formation is grayish-white to pinkish, mostly coarsely crystalline fossiliferous, thick-bedded limestone. . . .
>
> The Plattin formation is a light-gray to dark-gray, thick-bedded and thin-bedded, fossiliferous limestone. . . .
>
> Information provided from conversations with members of the City of Cape Girardeau Planning Office and Engineering Office indicate [sic] that the nearly vertical clay-filled slots mentioned above are quite common in the Plattin formation. These slots can be found relatively close, on the order of 20 feet, to one another with solid, intact limestone "pinnacles" or "blocks" separating

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[3] Karst, as explained in other appeal file exhibits and testimony, is a term used to characterize the conditions which develop when limestone is weathered by various mechanisms involving water. Karst features include slots, which are gaps or fissures between intact blocks of rock. They also include blocks, which are pieces of intact rock wider than they are high, and pinnacles, which are pieces of intact rock higher than they are wide. Another karst feature is a solution cavity, which is a large continuous passage or conduit formed by the solutioning of the limestone rock. Exhibit 29. A boulder is a type of weathered rock. Transcript at 128, 246. Karstic conditions are irregular and unpredictable. Transcript at 179-82.

> them. Another common karst feature results in large, intact limestone blocks with solution joints between, resulting in a "masonry" appearance when exposed to view. Solution joints or slots are typically filled with residual soil. Residual soil derived from limestone is typically a sandy, silty clay. Within the solutioned slots, the soil becomes softer with depth since it is shielded from the weight of the soil above. Other soils may also have been deposited within the slots. Slots may also tend to collect groundwater which may contribute to the "softening" of the soil.

Exhibit 16 at 3-4.

Sverdrup explained it had drilled thirteen test borings at locations selected by its engineering personnel in order to determine the nature and condition of the subsurface materials at the building site. A map included in the report showed these locations. The borings were drilled in four rows, more or less, running west to east. The first row, at the north end of the site, contained boring locations B-1 and B-2. The second row contained boring locations B-3, B-4, and B-5. The third row contained boring locations B-6, B-7, B-10, and B-11. The fourth row, at the south end of the site, contained boring locations B-8, B-9, B-12, and B-13. The report explained how Sverdrup recovered its samples and how it tested the samples. It also appended the boring logs and its test results. According to the logs, Sverdrup used a 3.75" hollow stem auger to bore down to limestone and then used another tool to collect limestone samples.[4] Sverdrup terminated four of the thirteen borings (locations B-10 through B-13) as it planned to do at a depth of ten feet below the surface. It also terminated one of the remaining nine borings (location B-8) at a depth of 27.5' before reaching bedrock because it encountered a petroleum odor in the soil samples. Exhibits 16, 101, 127.

Sverdrup's report provided information about the remaining eight test borings in the data contained in the boring logs, which showed the depth of each boring, the types of soil and rock encountered within each boring, the type of samples taken and the locations from which they were taken, tests run on the borings, and the results of the tests. The report also provided information about the test borings in the narrative section of the report. At location B-1, Sverdrup encountered limestone bedrock at elevation 355.5', approximately 39.5' below the surface, and described the core sample as excellent quality. At location B-2, the auger refused to penetrate more than 33' below the surface, stopping at elevation 361'. Although no core sample was obtained, a standard penetration test suggested the bedrock Sverdrup encountered was very good quality. At location B-3, Sverdrup encountered limestone

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[4] 3.75" is the inside diameter dimension of the auger. The outside dimension is 8". Exhibit 29 at 4.

bedrock at elevation 363', approximately 30' below the surface, and described the core sample as excellent quality. At location B-4, Sverdrup encountered limestone bedrock at elevation 359', approximately 33' below the surface, and described the core sample as excellent quality. At location B-5, Sverdrup encountered approximately one and one-half feet of weathered limestone beginning at elevation 349', approximately 42' below the surface. Below the weathered limestone was bedrock and within the bedrock was what Sverdrup referred to in the narrative portion of its report as a minor solution joint and as a "one-foot thick solution cavity." The boring log referred to the area as a solution cavity above a porous area. The bedrock core samples varied from good to excellent, with the less than excellent bedrock located between areas of excellent bedrock. At location B-6, the auger refused to penetrate below elevation 375', approximately 21' below the surface. Although no core sample was obtained, a standard penetration test suggested the bedrock Sverdrup encountered was fairly good quality. Sverdrup noted the refusal at location B-6 was much shallower than the bedrock encountered across the rest of the site, and said it did not know whether this indicated a dramatic change in bedrock elevation or whether the boring encountered a pinnacle or a boulder. At location B-7, Sverdrup said it possibly encountered a "major karst formation." At this location, the auger hit weathered limestone at elevation 355', approximately 39' below the surface. Sverdrup drilled into the weathered limestone for approximately eleven feet, when its auger seized and it abandoned drilling. The boring log for this location described the weathered limestone as caprock overlying possible clay, sand, and gravel filled solution cavities. The boring at location B-7 never reached competent bedrock and no core sample was obtained. At location B-9, Sverdrup encountered weathered limestone at elevation 359', approximately 38' below the surface. Sverdrup drilled into the weathered limestone for approximately five and one-half feet before it hit limestone bedrock. The bedrock initially drilled through was moderately weathered and of poor quality, and approximately four feet below the top of the bedrock there was a solution cavity approximately two feet deep which Sverdrup referred to as a minor solution joint. The core sample of the bedrock taken from five or six feet below the top of the bedrock, at elevation 348', was of excellent quality. Exhibits 16, 101, 127; Transcript at 106, 108.

Sverdrup characterized the materials encountered in the test borings as generally "soft to stiff, non to medium plastic silts interbedded with fine sand overlying soft to stiff, highly plastic residual clays." Sverdrup said soft to very soft strata were encountered at boring locations B-4 (ten feet of very soft soil), B-5 (two zones, one nine feet deep and the other ten and one-half feet deep of very soft soil), B-6 (one and one-half feet of very soft soil), and B-7. Sverdrup also said the bedrock was "generally hard and solid with slight weathering." Exhibit 16 at 5.

The report contained two subsurface profiles, one looking at the site from south to north, and the other looking at it from west to east. The report said the profiles presented generalized subsurface conditions across the site. The profiles contained a line showing the

ground surface, and below this line the profiles depicted the results of most of the test borings. Neither profile included the boring at location B-6, where the auger refused to penetrate below elevation 375'. The south to north profile took into account boring locations B-9, B-7, B-3, and B-1, and showed competent limestone bedrock being encountered between elevations 363' and 353.5', with no competent bedrock ever encountered at location B-7. The average depth to competent limestone bedrock of the four boring locations (using a depth of 344' for location B-7, which is where boring was stopped without encountering competent bedrock) is elevation 354'. This average depth would increase if one were to take into account the fact that the bedrock initially encountered at location B-9 was poor quality. The west to east profile took into account boring locations B-1 through B-5, and showed competent limestone bedrock being encountered between elevations 363' and 347.5', with the auger refusing to penetrate below elevation 361' at location B-2. The average depth to competent limestone bedrock of the five boring locations is elevation 357.2'. This average depth would increase if one were to take into account the fact that the bedrock encountered at location B-5 contained a solution cavity and was of variable quality. Exhibits 16 and 101 at 5, Figures 4 and 5.

Sverdrup said it was likely that the northern part of the building would be located above the Kimmswick Foundation, and the southern part of the building above the Plattin Formation. Based upon the materials it encountered during its subsurface investigation and upon what it learned from the city's planning and engineering offices, Sverdrup said it was "likely that the Plattin Formation is highly prone to karstic solution slots." It also said, "The locations and extent of the solution slots has [sic] not been determined." Sverdrup also said, "Although the Kimmswick formation can be karstic, the bedrock at the site, except as noted above, only exhibited minor karst features and, in the rock core obtained, is of excellent quality." Exhibit 16 at 6-7.

In the final section of its report, Sverdrup presented its conclusions and recommendations. Here, Sverdrup discussed foundation support in karst areas:

> [T]he area is generally known to have karst features such as sinkholes, at locations where discontinuities such as joints, fractures, and bedding planes in the bedrock mass are present. The soil cover over the site precludes the exact definition of locations of these discontinuities even using current geophysical technology. Karst regions are known to have significant variation on bedrock elevation due to pinnacles, blocks and solution cavities. Thick layers of soft, unconsolidated residual soil with perched water above the bedrock are common in the karst areas. Combination of the thick unconsolidated residual clay and water results in material of low strength and susceptible to significant consolidation. The presence of pinnacles, blocks and

> solution cavities provides the danger of dropouts due to increase in the overburden pressure.
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> There is a potential for sinkhole formation in the soil that overlies the limestone bedrock . . . . For this reason, the preferred foundation types to support the courthouse in order of preference are: mat foundation, drilled shafts, and driven piles.
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> In lieu [sic] of the problems anticipated due to the karstic environment of the site, additional borings at the column locations to determine the actual depth and condition of the bedrock is [sic] recommended.

Exhibit 16 at 10-11.

The report went on to discuss the relative merits of a mat foundation, drilled shafts, and piles for the project.[5] Regarding both drilled shafts and driven piles, Sverdrup noted the bedrock elevation varied across the site and said the contractor should anticipate piles or drilled shafts of varying lengths due to the differences in bedrock elevation. Sverdrup said the variation in lengths would result in the need for "significant contingencies" in foundation construction. Exhibit 16 at 11.

Regarding drilled shafts, Sverdrup said they could provide an economical foundation system where a firm bearing layer was present at a moderate depth below relatively soft or unsuitable soils, and where groundwater was not a major concern. However, its experience with drilled piers in solutioned limestone indicated that major difficulty could be experienced in determining an adequate bearing condition in the rock, on a pier-by-pier basis. This difficulty was the result of the variability in the elevation and quality of the rock, as well as the possible presence of voids and solutioned areas filled with compressible material beneath the base of any given pier. Sverdrup said in solutioned limestone, piers must frequently be extended to substantial depths, with resulting schedule delays and cost overruns. Accordingly, Sverdrup cautioned, "It is not possible to estimate accurately in advance the bearing level or the amount of production rock drilling that will be required to achieve a satisfactory foundation system on the basis of rock cores taken during the geotechnical survey." Sverdrup said due to the karstic nature of the region, one or more pilot holes ought to be drilled below the base of the drilled shaft in order to locate clay seams or possible

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[5] Throughout the record, the terms pier, drilled pier, and drilled shaft are used interchangeably. Transcript at 26. We do the same in this opinion, although we gather from the record that a drilled shaft is a hole into which steel and concrete are placed in order to form a pier which is part of a drilled pier foundation system.

solution cavities under the foundation, and so as to be sure the shaft was resting upon bedrock and not on a thin bedrock ledge or a pinnacle or blocks, which should be anticipated due to the geology of the site. Exhibit 16 at 11-12.

Regarding piles, Sverdrup said driving piles to rest upon limestone involved some degree of risk associated with the presence of solution features within the rock mass. Sverdrup said the contractor should expect substantial variations in the length of the piles. It mentioned that weathering of the rock surface, added to solution activity which results in widened joints and fractures, leads to the formation of pinnacles, wide vertical openings, and isolated boulders of blocks of intact rock near the bedrock surface. The report said the piles had to be driven to sound bedrock, and not rest upon a thin bedrock ledge or a pinnacle or blocks, which should be anticipated due to the geology of the site. Exhibit 16 at 13-14.

The Stage 2 RFP said offerors should assume the building was in a seismic category specified according to the standards developed by the International Code Council, and noted this was different from the information contained in the geotechnical report. Exhibit 5 (Design Criteria, Structural at 157). Sverdrup's geotechnical report, which concluded a mat foundation was preferable to either drilled shafts or driven piles, was based upon seismic standards developed by Building Officials and Code Administrators International, Inc. Exhibit 20 at 17. Due to the difference between the two standards, a mat foundation was no longer a practical choice for the building's foundation and drilled piers became a more attractive alternative. Transcript at 101-02, 230. If the Sverdrup report had been prepared in anticipation of a drilled pier foundation instead of a mat foundation, Sverdrup would have proposed to GSA that it make many more test borings. Transcript at 231.

URS's Memoranda

Before PCL submitted its initial offer to GSA in response to the Stage 2 RFP, it engaged URS Corporation as its geophysical consultant. Transcript at 88. At the hearing, an expert in the field of geotechnical engineering who worked for URS testified that he concluded from reading the Sverdrup report that it should have been easy to penetrate the soils and reach rock, and that there was not "much reason to suspect that there were very bad weathered limestone conditions" because most of the borings did not encounter weathered limestone and because Sverdrup said the limestone bedrock was excellent. Transcript at 93-94. After reading the Sverdrup report, he concluded that although the region is karstic, and although karstic conditions are variable, and although it was possible the project site contained karstic features, he relied upon the boring results to determine how realistic such a possibility was, and concluded there was "very little indication of extensive weathered rock" at the site. Transcript at 100-01, 152-53. Although the report conveyed "qualitatively" that the project site might contain karstic features, his review of the boring logs led him to conclude that PCL would have no problem drilling through the soil and that it would reach

good quality bedrock "almost immediately in more than half the cases." Transcript at 110, 154. He did not get the impression from the Sverdrup report that Sverdrup was especially concerned about boring B-7. If Sverdrup had been concerned, he said it could have drilled another boring adjacent to B-7 to see what it would find. He said Sverdrup "abandoned" the boring before "finding out much of anything." URS made an estimate of where solid rock might be encountered in the area of boring B-7 by looking at the logs of the other borings, and decided the bedrock in this area probably was not much below where Sverdrup terminated the boring. Transcript at 111-12, 114, 154-55. This URS engineer co-authored three documents sent by URS to PCL, which are discussed in the remainder of this section.

PCL received URS's interpretation of subsurface conditions at the site and URS's foundation design recommendation in a memorandum dated July 30, 2002. Regarding subsurface conditions, URS stated:

> As indicated by Sverdrup, the project site overlies both the Kimmswick and Plattin limestone formations. The Kimmswick formation is anticipated at the northern end of the site, while the Plattin will be encountered at the southern end.
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> Numerous faults developed in the region over geologic time due to tectonic forces. These faults are not considered active today. Regional faulting likely accelerated weathering and solutioning of the limestone bedrock, leading to the formation of karst features and sinkholes, and also to the development and/or deposition of soft clayey materials at depth. The karstic features observed in the area are generally considered to be "paleokarst," i.e., they are not actively undergoing solutioning. The large depression to the northeast of the site likely is an example of a paleokarstic feature. One exception may be the large depression at the southeast corner of the site. Sverdrup indicated that water typically ponds in this area, and URS identified ponded water in that area in aerial photographs. Because water is actively entering the subsurface at this location, solutioning may be occurring.

Exhibit 102 at 2.

URS recommended against the use of a mat foundation because, URS's memorandum said, a mat foundation would be too expensive. Attached to URS's memorandum were two design charts for drilled shafts, and both of the charts showed URS had ignored the first two feet of bedrock socket length when making its design calculations. One design chart was for end bearing shafts, which support their loads on the base of each shaft, and the other chart was for side friction bearing shafts, which support their loads through friction between the sides of the shafts and the surrounding rock. Exhibit 102, Figures 8 and 9; Transcript at 102-

03. URS recommended the side friction bearing shafts because, the memorandum said, although side friction bearing shafts required a longer socket length, inspection costs would be reduced, worker safety would be improved, and the shafts would have a higher uplift capacity. Exhibit 102 at 4. The URS engineer testified the side friction design reduced the concern, expressed by Sverdrup in its report, about not being able to use rock cores to make an accurate estimate of the bearing level or the amount of rock drilling that would be required to achieve a satisfactory drilled shaft foundation. He said this concern was reduced because, using a side friction design, PCL would not have to evaluate what was below the base of a pier. Transcript at 104.

As part of its recommendation, URS prepared a drawing which showed the presumed approximate location of the building on the site, and which showed the average depth to the top of sound limestone at elevation 345' for part of the site and at elevation 360' for the remainder of the site. Exhibit 102 at Figure 10. URS included three subsurface profiles in its recommendation, and one of its profiles included boring locations B-6 and B-7. Although at location B-6 the auger refused to penetrate below elevation 375' and although Sverdrup's report noted the refusal at location B-6 was much shallower than the bedrock encountered across the rest of the site and said it did not know whether this indicated a dramatic change in bedrock elevation or whether the boring encountered a pinnacle or a boulder, URS's subsurface profile considered elevation 375' to be the bedrock elevation. Although the boring at location B-7 was abandoned after drilling through eleven feet of weathered limestone and before reaching competent bedrock and although Sverdrup's report described this as a possible major karst formation, URS's subsurface profile showed bedrock "probably wasn't that much farther below" where Sverdrup terminated the boring. Exhibit 102 at Figure 4; Transcript at 114.

On August 9, URS supplemented its July 30, 2002 memorandum, based upon changes to the design of the building and URS's further evaluation of the data it had about the site. Exhibit 103; Transcript at 116. In the supplement, URS said it "anticipated that the depth to bedrock will vary considerably across the site" and that "the limestone may be solutioned and pinnacled." Exhibit 103 at 1. The supplement also contained a contour map created by URS, which showed the same presumed approximate location of the building on the site as did the drawing which was a part of the July 30 recommendation. The map showed URS expected the top of good bedrock would be encountered between elevation 350' and 360', for the most part. Exhibit 103 at Figure 1.

URS provided PCL with a memorandum dated August 16, 2002, which was a compilation of its July 30 and August 9 memoranda, and which repeated much of the information contained in them. The August 16 memorandum said drilled shafts would provide the most efficient support of the building. The memorandum attached the contour map which was part of URS's August 9 memorandum, and said the map "can be used to

estimate drilled shaft lengths for the foundation system." Exhibit 104 at 3. In the August 16 memorandum, URS said it ignored the first two feet of socket length when it made its recommended design calculations "to account for weathering." Exhibit 104 at 3. URS gave this information to PCL, expecting PCL would give it to drilling subcontractors for use in developing a bid. Transcript at 118.

The URS engineer explained the recommendation to ignore the first two feet of socket length to account for weathering meant URS estimated that PCL would have to drill through two feet of weathered rock, on average, before it would encounter good bedrock. Transcript at 117. He also explained that URS developed its estimate of an average of two feet of weathered rock as follows: It added the feet of weathered rock found at boring locations B-1 (0'), B-2 (0'), B-3 (0'), B-4 (0'), B-5 (1.0'),[6] B-6 (0'), B-7 (≥11'), and B-9 (5.5'), and it added three extra feet to account for the fact that URS "had no way of knowing" the elevation of the bedrock at boring location B-7. The sum of the figures was 20.5', which URS divided by the eight boring locations, to obtain an average of 2.56'. URS rounded this figure down to two feet because it felt the "overall picture of the site was generally a good quality site," because there was "little undulation" in the bedrock, and because five of the borings had not encountered any weathered rock. URS would probably not have rounded the 2.56' down to two feet if it had been working with an owner instead of a contractor. URS understands owners like to avoid additional costs and would rather receive a conservative estimate which overstates the conditions actually encountered, while contractors have to be somewhat aggressive in order to win contracts and can rely upon clauses such as the differing site condition clause if their estimates of conditions turn out to understate the conditions they encounter. URS was "pretty comfortable" and "fairly confident" with the estimate of two feet of weathered rock, given the overall picture it had of the site. Transcript at 118-22. The URS engineer said the estimate was "within the range of reason" and was "supported by the boring logs," even though karstic conditions can be "extremely variable." Transcript at 132-33, 281.

PCL's Initial and Final Offers and GSA's Award

On September 6, 2002, PCL submitted its initial offer in response to the Stage 2 RFP. Exhibit 7. Section 2 of PCL's technical proposal contained PCL's design description. The subsection titled "Structural Narrative - Foundations" said the contractor's geotechnical

[6] Apparently, URS used 1.0' for boring location B-5 because the text of the Sverdrup report states this was the depth of the "severely weathered/solution zone" encountered at this location. The boring log for location B-5 shows weathered rock with a depth of 1.5' above the bedrock. Within the bedrock, the log shows a 1.0' deep area of solution conditions. Exhibit 16.

engineer would make soil borings and provide a site-specific soils report with criteria for drilled piers, footings, and seismic design. It also said the foundation structure for the primary structural frame would be reinforced, cast-in-place concrete drilled piers founded in limestone bedrock and extending below the water table. Exhibit 7 (Section 2).

Section 1 of PCL's technical proposal contained a cost summary which included $131,800 for geophysical consulting work to be performed by URS Corporation and $92,300 for borings and tests to be performed by Smith & Company. Exhibit 7 (Section 1).

The conceptual estimate detail portion of Section 1 of the technical proposal contained a section regarding drilled piers. For 24" diameter piers, the detail estimated 602 meters of soil excavation and temporary casing, and 85 meters of rock excavation. For 30" piers, the detail estimated 179 meters of soil excavation and temporary casing, and 34 meters of rock excavation. For 36" piers, the detail estimated 61 meters of soil excavation and temporary casing, and 16 meters of rock excavation. For 42" piers, the detail estimated 267 meters of soil excavation and temporary casing, and 53 meters of rock excavation. The detail estimated using 145 metric tons of reinforcing steel in the piers. In addition, the detail estimated the need for some 12' deep 24" piers, a test probe, and rig mobilization. The total amount included in the estimate for drilled piers was $399,090, which included excavation, casing, 145 metric tons of reinforcing steel, concrete, the test probe, and rig mobilization. Exhibit 7 (Section 1, PCL Conceptual Estimate at 3-4). The conceptual estimate detail did not say how many piers PCL planned to place. It did not differentiate between the number of meters of excavation required in sound limestone and the number of meters of excavation required in weathered limestone. No mention was made of any allowance for possible drilling overruns.

PCL submitted its best and final offer on October 22, 2002. It contained the same proposed costs as did its initial offer for the geophysical consulting work to be performed by URS and Smith & Company. It also contained the same amount for drilled piers and the same information regarding the piers as did the initial offer. Exhibit 9.

No documentary evidence establishes how, or if, PCL used the URS estimate of an average of two feet of weathered rock per pier when it prepared either its initial offer or its best and final offer. The testimonial evidence regarding how PCL used the URS estimate came from PCL's construction manager. He said URS provided its estimate of two feet of weathered rock for PCL to "bid against as a preliminary number." Transcript at 19. When he was asked how PCL accounted for the two feet of weathered rock in its proposal, he testified PCL "had the subcontractors carry the two foot per the documents that we provided to them." Transcript at 75. As discussed below, however, the evidence shows it was after PCL submitted its best and final offer and GSA awarded the contract to PCL that PCL provided potential subcontractors with documents which mentioned the estimate of two feet

of weathered rock. Also, PCL's construction manager did not have any role in developing PCL's best and final offer, and there is no evidence to show he had a role in developing PCL's initial offer. Transcript at 81, 198.

On June 2, 2003, GSA awarded the design and construction contract to PCL. The award amount was $44 million. Exhibit 11. GSA issued the notice to proceed on June 17, 2003. Exhibit 19.

URS's Post-Award Report

On June 3, 2003, PCL hired URS to perform a post-award field investigation and to provide inspections during construction. They agreed URS would perform several types of work for PCL for a price of $304,982, which included $61,618 for pier inspection work to be performed by URS and for drilling work and laboratory testing to be performed by Smith & Company. Exhibits 20 at 1-1, 148. In June and July 2003, Smith & Company drilled six test borings and URS performed geophysical testing in two boring holes and laboratory testing of selected boring samples. Exhibit 20 at 2-1.

On September 17, 2003, URS provided PCL with a final geotechnical engineering report which included recommendations for site work, building foundations, seismic design, and other items requested by the structural designers. The report repeated the information set out in URS's earlier submission to PCL regarding the geology in the area. URS's report also quoted several sentences from Sverdrup's report which said clay-filled slots are common in Plattin formations and can be relatively close together, with pinnacles or blocks separating them. URS said its field investigation likely encountered one such slot at one of its test borings (location B-02b-03). URS said the quality of the limestone under the site varied significantly, ranging from severely weathered to unweathered, and was known to be vertically jointed and karstic. In fact, URS said, its boring at location B-02b-03 encountered a nearly 40-foot deep mud seam after drilling through approximately nine feet of limestone. Below the mud seam, URS encountered five feet of highly weathered limestone before it terminated its boring. URS said the depth of the severely weathered limestone ranged from zero to ten feet, and "on average" it appeared to URS that the typical depth of significant weathering was "on the order of" two feet. Due to the pinnacled and highly weathered or solutioned bedrock conditions and also due to seismic considerations, URS recommended using friction bearing drilled shafts for foundation support. It suggested that PCL "neglect the first two feet of bedrock penetration to account for weathering," and said the actual depth of weathering would have to be determined by field inspection of individual shafts during construction. Excluding the boring at location B-02b-03, the boring logs showed limestone was encountered anywhere from 39' to 57' below the surface. Exhibit 20 at 3-1, 3-2, 3-5, 5-1, test hole drilling logs, figure 3-6. URS felt that, generally, its borings were consistent with

Sverdrup's borings and it encountered little to no weathered rock except at boring location B-02b-03. Transcript at 123.

Like URS's pre-award memoranda, its September 17, 2003 report contained a drawing which showed the presumed approximate location of the building on the site. In its September 17 report, URS said the drawing was made according to the conceptual master plan prepared by PCL's architect. There is a difference between the drawing attached to the September 17 report and the drawings attached to the pre-award memoranda. The pre-award drawings showed the building would be located further north and east on the site than did the post-award drawing. The pre-award drawings showed the building far enough north and east so it was located nearly on top of boring locations B-1 and B-2, and not on top of boring locations B-6, B-7 and B-9. The post-award drawing showed the building far enough to the south and west so it was no longer located near boring locations B-1 and B-2, but was on top of boring locations B-6, B-7 and B-9. The shift to the south brought the building further into the portion of the site which the Sverdrup report said contained the more problematic of the two karst formations underlying the site. Exhibits 102-05.

After PCL received URS's report, its structural engineer and URS developed a foundation design. PCL found there was an increase in the number and sizing of piers, which the structural engineer explained was due in part to a change made by GSA (for which PCL was compensated in a modification to the contract) and due in part to the information contained in the URS report. Exhibits 14, 114. PCL developed new estimated quantities, which it refers to as "adjusted" quantities and which differ from the quantities set out in the conceptual estimate detail portion of its best and final offer. For 24" diameter piers, the detail estimated 602 meters of soil excavation and temporary casing, and 85 meters of rock excavation. The adjusted estimate was for 550 meters of soil excavation and 63 meters of rock excavation. For 30" piers, the detail estimated 179 meters of soil excavation and temporary casing, and 34 meters of rock excavation. The adjusted estimate was for 99 meters of soil excavation and 15 meters of rock excavation. For 36" piers, the detail estimated 61 meters of soil excavation and temporary casing, and 16 meters of rock excavation. The adjusted estimate was for 431 meters of soil excavation and 93 meters of rock excavation. For 42" piers, the detail estimated 267 meters of soil excavation and temporary casing, and 53 meters of rock excavation. The adjusted estimate was for 281 meters of soil excavation and 100.3 meters of rock excavation. Exhibits 114, 114B.

PCL's Subcontracts

PCL prepared a set of drawings and sent them to potential subcontractors as part of a bid package. Transcript at 20-25. One of these drawings includes a drilled pier schedule which says how far into good bedrock each pier would have to be embedded, and which also

says, "For bid purposes 'good bedrock' is [two feet] below top of rock."[7] This same drawing tells bidders to expect to encounter good bedrock at elevation 351'. Exhibits 29, 138. Another drawing also defined "good rock," for bid purposes, as being two feet below the top of bedrock. Exhibit 134. A third drawing said to include an allowance of thirty meters for each of four diameters of drilled piers. Each thirty meter allowance included twenty-one meters of soil penetration and nine meters of bedrock penetration. The allowances were in addition to the amount of drilling into rock shown on the first drawing, which was two feet into the top of the rock plus the required embedment depth into good bedrock. Exhibit 133; Transcript at 25-26. A fourth drawing showed a total of 170 piers. Exhibit 135.

There is no evidence to show PCL sent potential subcontractors any drawings or any part of a bid package before PCL submitted its offers to GSA or before GSA awarded the contract to PCL. So far as our record shows, PCL's first bid package for some construction elements was dated October 15, 2003, and the first bid package for drilled piers was scheduled for November 7, 2003. Consistent with these dates, the relevant drawings contained in the appeal file are dated November 6, 2003. Exhibits 133-35, 137-38. Also, one of the drawings refers to a report dated August 11, 2003, which was after GSA awarded the contract to PCL. Exhibit 134. In addition, PCL's claim represents that the information it provided to potential subcontractors was based, in part, upon the report URS prepared after GSA awarded the contract to PCL. Exhibit 114 at 1. Taking into account the consistency of the available evidence and the lack of any evidence to the contrary, we find as fact that PCL provided its potential subcontractors with drawings and bid packages after GSA awarded the contract to PCL, not before.

PCL received a bid from a drilling company on a form dated November 19, 2003, and entered into a subcontract for drilling services in January 2004, in the amount of $392,980. Exhibit 147. It received a bid from a company to install reinforcing material into the concrete of the piers and entered into a subcontract with this company in February 2004, in the amount of $209,300. Exhibit 145. In early December 2003, PCL received a quote from a company to perform some excavation work, to dispose of the material created when the piers were drilled, and to place the concrete for the piers. PCL entered into a subcontract with this company in mid-December 2003, in the amount of $489,757. Of this, approximately $175,000 to $190,000 was for work related to the piers. When this company prepared its bid, it assumed there would be 687 meters of 24" piers, 63.7 meters of 30" piers, 673.3 meters of 36" piers, and 381.9 meters of 42" piers. Exhibits 149, 150; Transcript at 200, 203. These numbers are not consistent with either PCL's conceptual estimate detail or its "adjusted" quantities. In January 2004, PCL placed an order for 338.25 tons of

[7] PCL's drawings expressed this measurement as 600 millimeters, which is slightly less than two feet.

reinforcing steel to be used in the piers, at a cost of $192,803.[8] Exhibit 144. The total of the bids for drilling services, reinforcing steel, installation of the reinforcing steel, removal of spoil material, and concrete for the piers was between $970,083 and $985,083.

Drilled Pier Work Conditions

Drilled pier work began on February 18, 2004. Exhibit 31. The drilling services subcontractor used a soil auger, a rock auger, and a core barrel. The core barrel allowed URS to inspect the pieces of core and determine whether there was going to be sufficient contact between the surface area of the good limestone and the surface of the concrete piers used in the friction bearing design. Casings were used to line the drilled holes, to prevent collapse of adjacent material and the inflow of water into the holes. Transcript at 136-37.

On April 16, 2004, PCL told GSA it had encountered a differing site condition. PCL identified these conditions as follows: (1) additional, deeper drilling that was required to reach solid limestone, (2) the need to use oversized casings in order to drill to reach the deeper limestone, and (3) soil ballooning caused by water displacement in the soil due to deeper drilling. PCL said it could not then calculate the total cost of the effects of the differing condition. Exhibit 21.

Jacobs Facilities, Inc., GSA's project manager, responded to PCL on April 21, 2004.[9] Jacobs said it did not regard the conditions PCL described as differing site conditions because the contract documents identified the drilled pier conditions PCL had encountered. Exhibit 22. On May 4, Jacobs asked PCL to explain specifically what it believed constituted a differing site condition. Exhibit 24. On June 10, PCL said it was in the process of gathering information regarding its claim. Exhibit 25.

By June 18, 2004, PCL was more than half finished with drilling and it provided GSA with a written explanation of why it believed it had encountered a differing site condition. PCL said the Sverdrup report did not identify the areas of boulders and residual clay which PCL encountered when it drilled. PCL said only two of the Sverdrup borings (at locations

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[8] The purchase order does not say whether the 338.25 tons is metric tons (2204.6 pounds per ton) or the United States standard short tons (2000 pounds per ton). If the order was for short tons, it was the equivalent of 306.85 metric tons. Either way, the order was for more than the 145 metric tons included in the best and final offer's conceptual estimate detail.

[9] Jacobs Facilities is part of Jacobs Engineering Group, Inc. Exhibit 24.

B-7 and B-9) showed material closest to that encountered by PCL. PCL said it had assumed it would be able to drill in soils either to bedrock or to and through a minimal layer of weathered rock to good bedrock. Instead, PCL said, it encountered boulders, clay, and some fracturing. PCL said it needed a time extension and wanted to be reimbursed for its additional costs, although it did not specify either the schedule or price adjustment it wanted. Exhibit 26.

Jacobs reviewed PCL's request and the Sverdrup report. Jacobs concluded PCL should have expected the conditions it found at the site, given the numerous mentions in the Sverdrup report of pinnacles, blocks, and solution cavities, as well as the report's warning that it was not possible to predict the amount of drilling that would be required to achieve a satisfactory foundation system. Jacobs also pointed out the report's statement that schedule delays and cost overruns would result if piers had to be extended to substantial depths. Exhibit 27.

PCL encountered weathered rock which was, on average, 9.2' deep across the construction site. Exhibit 129. The amount of weathered rock varied considerably within the site. The weathered rock encountered in approximately 10% of 176 drilled holes accounted for slightly more than 39% of all of the weathered rock encountered on the project, and the average depth of weathered rock in these holes was nearly 38'. The depth of the weathered rock encountered in the remaining 90% of the holes averaged 6.2', including twenty-five holes where no weathered rock was encountered. Exhibit 129.

In the URS engineer's expert opinion, the quantity of weathered rock PCL encountered was not foreseeable, and the difference between the two feet of weathered rock which URS estimated PCL would encounter on average based upon the boring logs, and the approximately nine feet of weathered rock PCL actually encountered on average was a differing site condition. Transcript at 146, 281. He believed the difference was material and significant because drilling through rock requires the use of different tools and equipment than are used to drill through soil, and drilling through rock is more time-consuming than drilling through soil. It also required the removal of more soil and the placement of more concrete and reinforcing steel, because the holes had to be made larger at the surface than at depth. Transcript at 125, 127-28, 138. Five holes had to be abandoned because no good limestone was ever encountered, which required the structural engineers to revise the foundation design. In addition to encountering weathered rock, in some instances the good rock was not as good as URS expected it to be and PCL had to drill deeper into good rock in order to achieve the required contact between the surface area of the surrounding rock and the concrete pier. Transcript at 140-42, 144-46.

The URS engineer's supervisor, also an expert in geotechnical engineering, agreed with the engineer's opinion regarding the existence of a differing site condition. He agreed

with the way the estimate of an average of two feet of weathered rock had been developed and the manner in which the information about the boring at location B-7 had been used. In his view, the difference between two feet of weathered rock and the amount of weathered rock actually encountered was a material difference, and he thought the amount of weathered rock PCL encountered was a differing site condition. Transcript at 168-69.

A third expert in the field of geotechnical engineering testified that PCL encountered a differing site condition because there was such a large difference between two feet of weathered rock and the amount of weathered rock actually encountered. Transcript at 175. He concluded URS and PCL reasonably interpreted the Sverdrup report, even though the report contained warnings of karstic conditions in the area, because there would have been no way for PCL to have prepared a competitive offer if it had tried to take into account all of the contingencies mentioned in the Sverdrup report. Transcript at 176-77. In his written report, he said it is the normal practice in the industry to rely upon owner-provided boring logs when bidding, and that to go beyond the boring logs when developing contingencies for bid purposes would require a contractor to make a guess as to what it might encounter. Exhibit 121 at 2, 5. In his written report, he said there was no way to have made a reasonable prediction as to the amount of weathered rock anticipated at the site other than by using the boring logs. Exhibit 121 at 2, 4. He testified that URS made a reasonable determination when it used the boring logs to calculate an allowance of two feet for weathered rock. Transcript at 178. In his written report, he arrived at the two feet by adding the weathered rock encountered at boring locations B-5 (1.5'), B-7 (11'), and B-9 (5.5'), and dividing the total (18') by nine boring locations, which must have included the one abandoned boring location (B-8). He noted that adding an extra three feet to allow for the fact that boring B-7 never encountered bedrock, and dividing the total (21') by eight, the average depth of the weathered rock was 2.6'. Exhibit 121 at 2. This witness explained that although the conditions PCL encountered were foreseeable because the report warned PCL it could encounter such conditions, the conditions PCL encountered were not predictable due to the irregular nature of karstic conditions and the limits of available technology in assessing such conditions. Transcript at 179-82.

A fourth expert in the field of geotechnical engineering testified regarding URS's estimate of two feet of weathered rock. This expert was the author of the Sverdrup report. He did not believe URS's interpretation of the Sverdrup report was reasonable when it suggested there would be two feet of weathered rock, on average, at the site. He explained the Sverdrup report does not contain any "baseline" for predicting the amount of karstic features which might be encountered across the site. Using only the boring logs, he said one could have arrived at an average of three feet of weathered rock by looking at the boring logs for locations B-5, B-7, and B-9. However, he said the normal practice in the industry is to rely upon boring logs and any other geotechnical information provided by the owner when preparing a bid. In his view, of the eight relevant borings, one (at location B-6) terminated

at an unusually high elevation, which could be interpreted as encountering a boulder or a pinnacle. This expert agreed that a bidder could have interpreted the information provided by the boring log at location B-6 to mean good bedrock was encountered at the unusually high elevation instead of a boulder or a pinnacle, although he described such an interpretation as one made with "blinders on," given that the text of the report said the site was in a karstic area. Another boring (at location B-7) could be interpreted as encountering a slot or some other karstic feature. In his opinion, looking at the boring logs and the report itself, because the project site was in a karstic area, a reasonable assumption would have been that, at a minimum, one in eight drilled shafts would terminate on top of a boulder or pinnacle (B-6), one in eight would encounter a slot or have to be drilled to an unusually deep elevation or be abandoned (B-7) , and two in eight drilled shafts would encounter weathered rock averaging roughly 6.5 feet. The 6.5 feet is the average of the depth of weathered limestone encountered at boring location B-5 and the depth of the weathered limestone and poor quality bedrock, which contained a solution slot, encountered at boring location B-9. In his opinion, the URS calculation basically ignored the information provided by the borings at locations B-6 and B-7. He thought a reasonable assumption would have been to expect an added three meters of drilling when a boulder was encountered, and an added five meters of drilling when a slot or unreasonably deep weathered rock was encountered. He also believed PCL should have anticipated the conditions it encountered, considering the project site is located in a karstic area and taking into account the formations at the site documented in the Sverdrup report. Exhibit 29; Transcript at 213-18, 232-36, 247, 249-50.

PCL's Claim

PCL submitted a certified claim to GSA on August 16, 2004, requesting a sixty-two day adjustment to the schedule and an equitable adjustment of $1,004,899 to the contract price. PCL said it developed a foundation design based upon GSA's requirements, the Sverdrup report, and the post-award URS report. PCL said it told its subcontractors to assume they would be drilling through two feet of weathered rock at each pier location. PCL said it believed this was reasonable, because only one of the Sverdrup borings indicated karstic rock, and the URS report "did little" to change PCL's "interpretation" of Sverdrup's findings. PCL said the total drilled pier depths were "slightly" more than the anticipated depths, and there was a "major variance between anticipated (that identified within the boring logs) vs. actual conditions related to the quantity and types of rock drilling." Exhibit 114.

In support of its claim, PCL attached a summary of its drilling of 158 piers. The summary showed for 24" piers, PCL thought it would be required to drill 29 meters of good rock and 33.6 meters of weathered rock; for 30" piers, PCL thought it would be required to drill 7.03 meters of good rock and 7.8 meters of weathered rock; for 36" piers, PCL thought it would be required to drill 65.8 meters of good rock and 27.6 meters of weathered rock; and

for 42" piers, PCL thought it would be required to drill 75.16 meters of good rock and 25.2 meters of weathered rock. According to the claim, the total depth PCL thought it would be required to drill into good rock was 177 meters (581 feet) and the total depth it thought it would be required to drill into weathered rock was 94.2 meters (309 feet).[10] Exhibit 114C. PCL's figures are not taken from the conceptual estimate detail portion of PCL's offer. Instead, they are taken from the figures as they were adjusted by PCL after it received the URS post-award report.

Also in support of its claim, PCL attached an August 9, 2004 analysis prepared by URS. URS explained that its recommendation not to use a mat foundation was "in part due to the thickness and heavy reinforcement required to span potentially large soft, karstic zones and/or potentially large, seismic liquefaction-induced settlements predicted for the site." URS did not recommend a driven pile foundation due in part to "the tremendous uncertainty in the bearing conditions of the karstic bedrock . . . . As indicated in the Sverdrup Soils Report, it would not be possible to know if [driven] piles refused on a boulder, weathered rock, or competent bedrock." URS said the use of drilled piers appeared to offer the most attractive foundation option in "this difficult geologic setting" and "[g]iven the prior knowledge that the geology of the site is karstic." Exhibit 114A at 2, 6.

URS's analysis said the conditions described in the Sverdrup report were materially different from the conditions encountered at the site because the report did not disclose the presence of boulders in the residual soils, which are the soils derived from weathering and deterioration of bedrock. URS said although Sverdrup's report described the residual soils as typically a sandy, silty clay, excavation at the site indicated that boulders were pervasive in the residual soils. URS said the presence of boulders in the residual soil was not evident from Sverdrup's boring logs and was not "broadly discussed" by Sverdrup as a possible problem during construction. URS said Sverdrup's boring logs showed one potentially significant karstic feature (location B-7) and two minor weathering features (locations B-5 and B-9). URS noted that the Sverdrup report mentioned boulders when it discussed pile foundations. However, URS said, the presence of boulders in residual soil profiles is "not a foregone conclusion." Exhibit 114A at 3. URS also said the borings by Sverdrup indicated that karstic conditions were possible, although their extent was rather limited. Exhibit 114A at 6. The portion of the Sverdrup report which refers to residual soils as typically a sandy, silty clay is quoted earlier in our findings of fact, and we repeat it here in part: "Another common karst feature results in large, intact limestone blocks with solution joints between . . . . Solution joints or slots are typically filled with residual soil. Residual

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[10] This is 309' instead of 316' (158 piers x 2' per pier) because the drilling summary says PCL anticipated encountering 600 millimeters of weathered rock per pier and as mentioned earlier 600 millimeters is slightly less than two feet.

soil derived from limestone is typically a sandy, silty clay." Exhibit 16 at 3-4.

URS said when PCL encountered boulders during drilling in the residual soils, auger refusal occurred well above the top of either weathered or competent bedrock and PCL's work became more time-consuming because it had to drill through the boulders in order to reach competent bedrock. Exhibit 114A at 3. URS compared the material shown in the boring logs at four of Sverdrup's boring locations to the material PCL encountered when it drilled piers near those four locations. In describing the conditions PCL encountered, URS said a layer of clay with boulders was above the limestone bedrock. Exhibit 114A, Figures 7 through 10.

URS's analysis also said the Sverdrup report showed the variations in the depth to competent bedrock were "relatively modest," while the actual depths were significantly more variable. In addition, URS said, the Sverdrup report showed the top of competent bedrock was higher than it actually was. Exhibit 114A at 5. As mentioned previously, before award of the contract to PCL, based upon the Sverdrup report, URS said it anticipated the depth to bedrock would "vary considerably across the site." Exhibit 103 at 1.

Jacobs reviewed PCL's claim. While agreeing that using a drilled pier foundation was an appropriate choice, Jacobs noted that the Sverdrup report recommended additional borings be made at column locations in order to determine the actual depth and condition of the bedrock, due to the karstic environment of the site. PCL did not make these borings. In addition, Jacobs pointed out that the Sverdrup boring logs ought to have led PCL to conclude that 12.5% of the Sverdrup borings (one of eight) had to be abandoned or would have required significant drilling beyond planned elevations in weathered, unacceptable rock. The logs also should have led PCL to conclude that 25% of the Sverdrup borings (two of eight) encountered several feet of a weathered limestone layer or poor quality bedrock before reaching acceptable bedrock. Exhibit 31.

GSA asked Terracon Consulting Engineers & Scientists to review the Sverdrup report in order to determine whether the report adequately described the subsurface conditions likely to be encountered at the project site. After reviewing the Sverdrup report and the URS reports, Terracon concluded that the Sverdrup report identified the geologic formations present below the site and the likely presence of karst features, and contained an adequate warning regarding the uncertainty of encountering competent bedrock strata. Terracon said URS confirmed Sverdrup's observations and was uncertain based upon the Sverdrup report as to the depth to competent limestone in certain areas. Terracon's report discusses the narrative portion of the Sverdrup and URS reports as well as the information contained in the boring logs, the subsurface profiles, and one of URS's contour maps. In Terracon's opinion, the Sverdrup report described the potential existence of subsurface conditions substantially similar to the conditions which PCL encountered. Exhibit 32.

At the hearing, the author of the Terracon report testified as an expert in geotechnical engineering. In his opinion, the information presented in the Sverdrup report reflected the conditions likely to be encountered and which were, in fact, substantially the conditions actually encountered by PCL. He said in his view, the subsurface conditions actually encountered were reasonably foreseeable. In reaching his opinion, he did not consider the quantity of rock drilling performed by PCL to be an important piece of information because he looked at the issue from a qualitative perspective, rather than a quantitative perspective. He explained that, based upon the information contained in the Sverdrup report, it was possible that weathered rock deeper than two feet could be encountered at any location and, in his view, PCL ought to have made this assumption when it prepared its offer. He believed the boring logs provided data regarding the specific locations of the borings, not for the entire site. He believed that one reasonable way to prepare an offer for the project was to calculate an average amount of weathered rock. He also thought that, based upon the boring logs, the actual subsurface conditions encountered could not have been reasonably predicted. However, he did not believe it was normal practice in the industry to rely exclusively upon boring logs when preparing a bid. Transcript at 265, 269, 271-72, 274-75.

On October 8, 2004, PCL provided GSA with additional information regarding its claim. PCL said that out of nine borings Sverdrup drilled to a depth where it encountered limestone, only two borings encountered "clay pockets or lenses with the rock formations." Therefore, PCL said, it ought to have encountered "rock formations with clay lenses or pockets" approximately two piers out of every nine, or 22% of the time it drilled. Instead, it encountered "rock with clay lenses" in approximately 78% of the pier locations. The increased presence of the "clay pockets or lenses within the rock" was the differing site condition which PCL said was the basis for its claim. Exhibit 33.

The contracting officer reviewed the terms of the solicitation and the contract, the Sverdrup report, and the URS reports. The contracting officer also took into account Terracon's views and subsequent discussions with PCL. On November 24, 2004, GSA's contracting officer denied PCL's claim because he decided the Sverdrup report provided an adequate warning of the likelihood of substantial variations in subsurface conditions. Exhibit 36.

PCL filed this appeal on February 7, 2005. Exhibit 37.

PCL's Claimed Damages

After PCL filed the appeal, it refined its damages estimate to claim $604,407.[11] In doing so, it also clarified the basis for its claim. This consisted of the cost to PCL of additional reinforcing steel ($7049), plus amounts claimed on behalf of URS ($102,969), the architects ($14,706), the subcontractors who performed the drilling ($254,341) and concrete reinforcement ($6990) work, and the subcontractor who disposed of the material created when the piers were drilled and placed the concrete for the piers ($144,653), plus markups for bond, insurance, and profit. Exhibit 152.

The $6990 PCL claims for concrete reinforcement work is based upon the quantity of steel installed by PCL's concrete reinforcement subcontractor over and above the quantity of steel the subcontractor originally planned to install according to the subcontract, at a price contained in a modification to the subcontract. Exhibit 145; Transcript at 52-53. The $7049 PCL claims for additional reinforcing steel is based upon the additional quantity of steel installed by PCL's concrete reinforcement subcontractor, multiplied by the price PCL paid for steel. Transcript at 53-55. We do not know how much PCL's best and final offer included for either concrete reinforcement work or reinforcing steel. Amounts for these individual items were not shown in PCL's conceptual estimate detail except as part of the amount it included for drilled pier work, and the subcontract for the reinforcement work and the purchase order for the steel were dated after PCL was awarded the contract by GSA. Exhibit 9 (Section 1, PCL Conceptual Estimate at 3-4).

The $254,341 PCL claims for drilling services consists of five amounts: (1) PCL multiplied the unit prices for rock drilling contained in the drilling service contractor's subcontract times the difference between the actual depth of weathered rock encountered in all of the piers and the "bid depth" of weathered rock expected to be encountered in all of the piers, which PCL says was two feet per pier. (2) PCL multiplied the unit prices for soil drilling contained in the drilling service contractor's subcontract times the difference between the actual depth of soil drilling encountered in all piers and the "bid depth" of soil drilling. PCL said it calculated the "bid depth" of soil drilling by taking the measurement at the top of a pier, and subtracting what it had estimated would be the top of good rock (elevation 351') and also subtracting URS's estimate of two feet of weathered rock. PCL's "bid depth" of soil drilling, however, is not based upon the amount of soil excavation contained in the conceptual estimate detail portion of PCL's offer. Instead, its "bid depth" of soil drilling is based upon the amount of soil excavation as adjusted by PCL after it

[11] In addition, it withdrew its request for an adjustment to the contract schedule. Appellant's Post-Hearing Brief at 8.

received the URS post-award report.[12] (3) PCL included an amount for the drilling service contractor's overtime charges. (4) PCL included an amount to cover one-half the cost of additional drilling into good rock, using the unit prices for rock drilling contained in the drilling service contractor's subcontract. Assuming PCL used its estimate of two feet per pier of weathered rock when it formulated its offer, PCL's calculation of the cost of additional drilling into good rock is not based upon the amount of good rock excavation contained in the conceptual estimate detail portion of PCL's offer. Instead, its calculation is based upon the amount of good rock excavation as adjusted by PCL after it received the URS post-award report.[13] (5) After adding the first four amounts together, PCL subtracted an amount for the allowance shown on one of the drawings for nine meters of bedrock penetration for each of four diameters of drilled piers in addition to the two feet of drilling into the top of the rock and the required embedment into good rock. PCL calculated the value of the allowance using the unit prices for rock drilling contained in the drilling service contractor's subcontract. The result of the additions and the subtraction is $254,341. Exhibits 114C, 129, 151; Transcript at 43-50.

In arriving at the $254,341 portion of its damages claim, PCL included a total of 176 piers in its calculations. Exhibit 129. We do not know how many piers PCL planned to drill and place when it made its best and final offer. We do know, however that the contract was modified to add approximately twenty-three piers and to pay PCL for the additional piers. We also know that another change resulted in additional drilling into good rock. Exhibit 114, 114B. We cannot tell whether PCL took the additional piers and the added drilling into account when it refined its damages request. At the hearing, PCL's construction manager was asked whether the $254,341 PCL is claiming for drilling services "is in addition to the original scope of work that was contained in the [best and final offer]." The construction

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[12] For example, for 24" diameter piers, the damages calculation which accompanied PCL's claim was based upon a "bid depth" of 550 meters of soil drilling. Compare this to the conceptual estimate detail portion of PCL's offer, which contained 602 meters of soil excavation, and what PCL referred to as "adjusted" quantities of 550 meters of soil excavation. The same is true for all four diameters of piers. PCL used the same depths when it submitted its claim as it did when it refined its damages estimate after filing this appeal. Exhibits 9, 114C, 129.

[13] For example, for 24" diameter piers, the damages calculation which accompanied PCL's claim was based upon a "bid depth" of 62.6 meters of rock drilling (33,600 mm of weathered rock plus 29,020 mm of good rock). Compare this to the conceptual estimate detail portion of PCL's offer, which contained 85 meters of rock excavation, and what PCL referred to as "adjusted" quantities of 63 meters of rock excavation. The same is true for all four diameters of piers. Exhibits 9, 114C, 129.

manager responded, "The [best and final offer] price really has no relevance to this." Transcript at 83.

The $144,653 PCL claims for spoils removal and concrete includes $7545 and $971, which were paid to PCL's subcontractor as part of modifications to the subcontract price for work in connection with three abandoned piers. The remaining $136,137 consists of $30,617, which is the amount PCL's subcontractor's price was modified to compensate the subcontractor for spoils removal, and $105,520, which is, according to a letter to PCL from the subcontractor, based upon prices set out in the subcontractor's original quote or its subcontract with PCL for disposal of dirt on the site and for concrete. The subcontractor said the quantity of concrete it placed, the quantity of spoil material it removed and hauled away, and the lengths of the piers were all greater than it planned. The record does not show, however, the connection between the subcontractor's planned quantities and the quantities contained in PCL's best and final offer. Exhibits 149, 150; Transcript at 61-68.

The $102,969 PCL claims for URS's services is based upon the amount charged by URS in addition to the $61,618 PCL had agreed to pay URS to perform pier inspection work. Exhibit 148; Transcript at 59-61. We do not know how much PCL's best and final offer included solely for pier inspection work, and the agreement between PCL and URS was entered into after PCL submitted its best and final offer to GSA.

The $14,706 PCL claims for the fee charged by its architect is for additional structural design services which were required to address conditions discovered during construction of the foundation. Exhibit 146. The example PCL gave of the need for additional design services concerned a pier which was abandoned when no solid limestone was encountered after drilling to a depth of eighty-five feet. PCL asked the architect for advice regarding where to locate a new pier, and the architect consulted with a structural engineer and provided PCL with the assistance it needed. Exhibit 143; Transcript at 38, 56.

Discussion

According to the contract's Differing Site Conditions clause, a differing site condition exists if the subsurface or latent physical conditions PCL encountered at the site differed materially from the conditions indicated in the contract. If a differing site condition caused PCL's performance costs to increase, the contract price ought to be equitably adjusted.

In order to establish its entitlement to an equitable adjustment due to a differing site condition, PCL must prove the contract documents affirmatively indicated or represented the subsurface conditions which form the basis of its claim. Determining whether a contract contained indications of a particular site condition is a matter of contract interpretation, which presents a question of law. In order to persuade us to resolve this question in its favor,

PCL must convince us that it acted as a reasonable and prudent contractor when it interpreted the contract documents. PCL must also prove it reasonably relied upon its interpretation of the contract's indications of subsurface conditions when it entered into the contract. Also, it must prove the subsurface conditions it actually encountered differed materially from those indicated in the contract and were reasonably unforeseeable, based upon all the information available to PCL when it submitted its offer. In addition, PCL's claimed costs must be attributable solely to the materially different site conditions. *Comtrol, Inc. v. United States*, 294 F.3d 1357 (Fed. Cir. 2002); *Randa/Madison Joint Venture III v. Dahlberg*, 239 F.3d 1264 (Fed. Cir. 2001); *H.B. Mac, Inc. v. United States*, 153 F.3d 1338 (Fed. Cir. 1998); *Stuyvesant Dredging Co. v. United States*, 834 F.2d 1576 (Fed. Cir. 1987); *Weeks Dredging & Contracting, Inc. v. United States*, 13 Cl. Ct. 193 (1987), *aff'd*, 861 F.2d 728 (Fed. Cir. 1988) (table).

The Contract Indications

PCL contends the Sverdrup report, which was part of the solicitation, affirmatively indicated the subsurface conditions which form the basis of its claim. PCL says it, with the assistance of URS, interpreted the report as indicating there would be an average of two feet of weathered rock per drilled pier. PCL asserts this was a reasonable interpretation of the information contained in the report's logs of test borings which it says were made to determine the nature and condition of the subsurface materials at the site and to show representative subsurface conditions at the site. PCL says that of the thirteen test borings, the boring logs showed only one location where a major karst feature was possibly encountered. PCL points out the boring logs indicated the bedrock was generally hard and solid, and the materials encountered in the borings showed silts interbedded with sand overlaying residual clays. PCL says it had little reason to suspect it would encounter much badly weathered rock. PCL also contends that when it interpreted the Sverdrup report, it had a right to rely heavily upon the "quantitative" information provided in the boring logs rather than rely upon the "qualitative" information contained in the narrative portion of the report because test borings are the most reliable source of information about subsurface conditions. PCL also says a pattern of test borings across a site is reasonably representative of the entire site. Appellant's Post-Hearing Brief at 21, 23, 26-27.

Boring logs are usually the best indicators of subsurface conditions and bidders ought to rely heavily on them. In addition, a pattern of test borings is usually reasonably representative of the entire site. However, when interpreting contract documents in order to determine whether they indicate the presence of a particular site condition, a reasonable contractor must consider all of the information provided by the Government. For example, the contractor must consider whether the borings are numerous and well-spaced, or whether they are few and far between. The contractor must also consider whether the boring results are relatively consistent with one another. In addition, the contractor must consider the

general description of the site and any warnings of conditions which might be encountered. Vague warnings of possible unusual or abnormal conditions are, not surprisingly, to be given little weight when balanced against boring logs. Specific warnings, however, are entitled to more weight, especially if the presence of such conditions is confirmed by the test borings. Inconsistencies between test borings and other information provided regarding subsurface conditions should also cause a reasonable contractor to be cautious about relying too heavily upon boring logs and too little upon other available information. The contractor should consider whether the Government's design documents and specifications reinforce or detract from the boring results. Precedent suggests that when interpreting contract documents in order to determine what indications they contain regarding subsurface conditions, a reasonable contractor will consider the information provided by boring logs and then consider how other available information sheds light upon the results of the test borings and upon the extent to which the test borings are representative of conditions throughout the site.[14] *Weeks Dredging & Contracting*; *United Contractors v. United States*, 368 F.2d 585 (Ct. Cl. 1966); *Flippin Materials Co. v. United States*, 312 F.2d 408 (Ct. Cl. 1963); *Whiting-Turner/A.L. Johnson v. General Services Administration*, GSBCA 15401, 02-1 BCA ¶ 31,708 (2001); *Renda Marine, Inc. v. United States*, 66 Fed. Cl. 639 (2005); *Kit-San-Azusa v. United States*, 32 Fed. Cl. 647 (1995), *aff'd in part*, 86 F.3d 1175 (Fed. Cir. 1996); *Erickson-Shaver Contracting Corp. v. United States*, 9 Cl. Ct. 302 (1985); *SAE/Americon-Mid Atlantic, Inc. v. General Services Administration*, GSBCA 12294, et al., 98-2 BCA ¶30,084; *Cherry Hill Construction v. General Services Administration*, GSBCA 11217, 92-3 BCA ¶ 25,179.[15]

We are not convinced a reasonable and prudent contractor would have interpreted the Sverdrup report as containing "reasonably plain or positive indications" that a contractor would encounter an average of two feet of weathered rock per drilled pier. *Pacific Alaska*

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[14] PCL says GSA admitted the boring logs indicated quantity information for weathered rock, so PCL says it was reasonable to use the logs to develop the two feet average. Appellant's Reply Brief at 2. Although GSA admitted that some of the logs showed a certain number of feet of weathered rock, GSA did not admit that the logs were the only information a contractor should take into account when preparing an offer. Exhibit 100.

[15] PCL relies in part upon portions of *Foster Construction v. United States*, 435 F.2d 873 (Ct. Cl. 1970). As printed in the reporter, *Foster* contains the opinion of the trial commissioner, which discusses boring logs at some length. The court, however, held it neither agreed nor disagreed with the portion of the commissioner's opinion which discussed the boring logs, and treated the case "as if there had been no boring logs at all." 435 F.2d at 875. Thus, we do not rely upon *Foster* because it does not aid us in our analysis.

Contractors, Inc. v. United States, 436 F.2d 461, 469 (Ct. Cl. 1971). The report contained logs of test borings depicted individually and as part of two generalized subsurface profiles and it included a narrative, and each of these provided PCL and other potential offerors with information regarding subsurface conditions.

The logs of eight of the test borings provided information relevant to the subsurface conditions at the site. The borings at locations B-1, B-2, B-3, and B-4 did not encounter any weathered rock, and the core samples of limestone bedrock recovered from three of the borings was excellent. No core sample was recovered from location B-2, where the auger refused to penetrate below elevation 361', but the bedrock was determined to be very good. The boring at location B-5 encountered approximately 1.5' of weathered rock, and the limestone below the weathered rock contained a solution cavity above a porous area. The bedrock at location B-5 ranged from good to excellent. The auger at boring location B-6 refused to penetrate below elevation 375', where it encountered bedrock at an elevation significantly higher than the elevations at which any of the other borings encountered bedrock. At location B-7, the auger seized after drilling through eleven feet of weathered rock, and no competent bedrock was ever encountered. The boring log described the weathered limestone as caprock overlying possible clay, sand, and gravel filled solution cavities. The boring at location B-9 encountered 5.5' of weathered rock, below which it encountered moderately weathered and poor quality bedrock. Approximately four feet below the top of this bedrock there was a solution cavity approximately two feet deep. A core sample taken from five or six feet below the top of the bedrock was of excellent quality.

The two generalized subsurface profiles of the site contained the same information as was contained in most of the boring logs and also contained a line depicting the ground surface. The south to north profile showed competent bedrock being encountered between elevations 363' and 353.5', with no competent bedrock ever encountered at location B-7 after drilling to a depth of 344'. The west to east profile showed competent bedrock being encountered between elevations 363' and 347.5', with the auger refusing to penetrate below elevation 361' at location B-2. Taken together, the profiles showed the depth of the bedrock ranged from an unknown depth at location B-7, to a high of 363'. Neither profile took into account the boring at location B-6, where the auger refused to penetrate below elevation 375'.

The narrative portion of the Sverdrup report said the boring at location B-7 was the only one where a major karst formation was possibly encountered, although minor solution slots were encountered at locations B-5 and B-9. The bedrock was described as generally hard and solid with slight weathering. It also said the bedrock at location B-6 was much shallower than the bedrock encountered across the rest of the site and said Sverdrup did not know whether this indicated a dramatic change in bedrock elevation or whether the boring encountered a pinnacle or a boulder. The narrative recommended additional borings be made

at column locations due to the karstic environment of the site, in order to determine the condition of the bedrock. It noted that the bedrock elevation varied across the site.

The narrative portion of report also said the two types of limestone formations found in Cape Girardeau, Missouri, contain abundant karst features, including prominent, wide, nearly vertical clay-filled joints. It said the type of limestone formation found at the northern end of the site, where test borings B-1 through B-5 were made, could be karstic, although the bedrock at the site, except as noted in the report, exhibited only minor karst features. The type of limestone formation found to the south on the majority of the site, where test borings B-6 through B-9 were made, was highly prone to karstic solution slots, the location of which had not been determined. The narrative said karst's vertical clay-filled joints are quite common and can be found relatively close, on the order of twenty feet from one another, separated by pinnacles and blocks. The solution joints between the large, intact limestone blocks are typically filled with a sandy, silty clay. Karst regions are known to have significant variation in bedrock elevation due to pinnacles, blocks, and solution cavities. The narrative also said pinnacles or blocks should be anticipated due to the geology of the site.

The narrative portion of the report discussed three types of foundations. In the course of the discussion, the narrative noted the variability in the elevation and quality of the rock, as well as the possible presence of voids and solutioned areas. Regarding drilled shafts, it said in solutioned limestone, piers must frequently be extended to substantial depths and as a result, it was not possible to use the rock cores taken during the geotechnical survey as a basis for estimating accurately the amount of production rock drilling that would be required to achieve a satisfactory foundation system. In its discussion of piles, the narrative said weathering of the rock added to solution activity which results in widened joints and fractures and leads to the formation of pinnacles, wide vertical openings, and isolated boulders of blocks of intact rock near the bedrock surface.

Neither the boring logs nor the narrative contained an explicit estimate of the average depth of the weathered rock a contractor might expect to encounter. PCL contends, however, it reasonably interpreted the Sverdrup report as indicating there would be an average of two feet of weathered rock per drilled pier.

According to PCL, the boring logs suggested there would be an average of 2.56' of weathered rock per pier and it used this figure as a starting point for interpreting the Sverdrup report as indicating it would encounter an average of two feet of weathered rock per pier. Appellant's Post-Hearing Brief at 12. The 2.56' figure is an average of the depths of weathered rock PCL says are shown on the boring logs of the eight relevant test borings. This average, however, does not take into account the possibility that boring B-6 encountered a boulder, which was likely given the nature of the site and the difference between the depth to bedrock at B-6 and the depth to bedrock at other boring locations. Also, the 2.56' figure

does not take into account the depth of the weathered rock plus other bad rock shown on the log for boring locations B-5 and B-9. In addition, the 2.56' figure assumed that with an additional three feet of drilling, the test boring at location B-7 would have reached competent bedrock. This test boring, however, never encountered competent bedrock and the report does not suggest at what depth competent bedrock would have been encountered at this location, much less suggest it would have been encountered if drilling had proceeded for an additional three feet. The 2.56' figure is PCL's extrapolation based in part upon some, but not all, of the information contained in the Sverdrup report's boring logs, and based not at all upon the narrative portion of the Sverdrup report.

Given how the 2.56' figure was derived, we are not persuaded it is reasonable to interpret the Sverdrup report as indicating there would be an average of 2.56' of weathered rock per pier. PCL does not contend, however, that it interpreted the Sverdrup report as indicating there would be an average of 2.56' of weathered rock per pier. It says it used the 2.56' figure as a starting point and interpreted the report as indicating it would encounter an average of two feet of weathered rock per pier.

PCL says it read the Sverdrup report as indicating there would be less than 2.56' of weathered rock per pier and rounded down this figure to two feet based in part upon indications of the overall picture of the site. The overall picture painted by the narrative portion of the Sverdrup report was that the area was karstic and that the site was sitting on two karst-producing formations. A limited number of test borings were made and some of them showed karstic features, which was consistent with the narrative. The narrative said the nature of karst is that it is unpredictable, and also said subsurface conditions encountered at one drilled hole might be different from the conditions experienced at other nearby drilled holes. This was also consistent with the boring results. We are not convinced the overall picture of the site painted by the Sverdrup report indicated a contractor would encounter less than 2.56' of weathered rock on average per pier, much less indicated a contractor would encounter an average of two feet of weathered rock per pier.

PCL also says it read the Sverdrup report as indicating there would be less than 2.56' of weathered rock per pier and rounded down this figure to two feet because the boring logs showed there was little undulation in the bedrock. Actually, the boring logs showed considerable variations in the depth to bedrock. Six of the eight logs showed bedrock was encountered between elevation 363' and elevation 347.5'. At location B-7, drilling ended at elevation 344' without any bedrock having been encountered, and at location B-6, the auger refused to penetrate below elevation 375', which the Sverdrup report said indicated either a dramatic change in bedrock elevation or a pinnacle or a boulder. The narrative portion of the report said if a contractor planned to place piers or piles, it should expect them to be of varying lengths because the bedrock elevation varied across the site. URS's July 30, 2002 recommendation, which was based upon the information contained in the Sverdrup report,

showed the average depth to the top of competent bedrock at elevation 345' for part of the site and 360' for another part of the site. In its August 9, 2002 submission to PCL, which was also based upon information contained in the Sverdrup report, URS revised its conclusion and said the average depth to the top of competent bedrock would be between elevations 340' and 360' for most of the site, and at elevation 375' for a part of the site. URS also said on August 9 that it anticipated the depth to bedrock would vary considerably across the site. We agree with this assessment, made by URS before the claim arose, and conclude the information provided by the Government in the Sverdrup report indicated the depth to bedrock would vary considerably. Looking beyond the boring logs and viewing the undulations in light of the information provided in the narrative portion of the Sverdrup report, they look more sinister than benign. Regardless of whether we consult the narrative portion of the Sverdrup report, however, the undulations in the bedrock do not indicate that a contractor would encounter less than 2.56' of weathered rock on average per pier, much less indicate a contractor would encounter an average of two feet of weathered rock per pier.

In addition, PCL says it read the Sverdrup report as indicating there would be less than 2.56' of weathered rock per pier and rounded this figure down to two feet based upon the number of boring locations, which PCL counts as five out of eight, where no weathered rock was encountered. If PCL had considered that the test boring at location B-6 might have revealed a pinnacle or a boulder due to the karstic conditions at the site and due to the unusually high elevation at which bedrock was encountered at this location, it would have decided that only four of the eight borings did not encounter any weathered rock. Whether four or five is the correct number to use in support of PCL's argument, the argument fails because there is no reason to place more emphasis upon the borings where no weathered rock was found than upon the borings where weathered rock was found, especially given the Sverdrup report's narrative regarding the conditions at the site and the unpredictable nature of karstic features. PCL has not explained why it is any more logical to assume the 2.56' figure ought to be decreased to two feet because one half the borings contained no indications of weathered rock, than it is to assume the figure ought to be increased because the other half of the borings contained indications of weathered rock. The fact that some of the borings contained no weathered rock does not indicate that a contractor would encounter less than 2.56' of weathered rock on average per pier, much less indicate a contractor would encounter an average of two feet of weathered rock per pier.

URS said it probably would not have suggested rounding the 2.56' figure down to two feet if it had been working with an owner instead of a contractor. URS explained that because contractors have to be somewhat aggressive in order to win contracts and because they can rely upon clauses such as the Differing Site Conditions clause if their estimates turn out to understate the conditions they encounter, contractors generally prefer to receive lower estimates. URS's explanation tells us why the 2.56' figure was rounded down to two feet, and might also give us some insight into why the 2.56' figure was developed as it was.

However, the proclivities of contractors do not amount to a contract indication that a contractor would encounter, on average, two feet of weathered rock per pier.

PCL says it included an additional thirty-six meter allowance for possible rock drilling overruns, and it suggests this is evidence of the reasonableness of its interpretation of the Sverdrup report. Appellant's Post-Hearing Brief at 27. We do not know whether the allowance, which amounted to .67' per pier for 176 piers, was an allowance for good rock, weathered rock, or both. We also do not know whether PCL included this allowance in its best and final offer. In any event, the allowance does not establish PCL reasonably interpreted the Sverdrup report as indicating an average of two feet of weathered rock per pier.

PCL says its reading of the Sverdrup report as indicating two feet of weathered rock per pier was reasonable because the experts who testified at the hearing agreed that two feet of weathered rock per pier is a reasonable estimate. Appellant's Reply Brief at 5. The evidence shows, however, that the expert who authored the Sverdrup report did not agree that an estimate of two feet was reasonable and the expert who authored the Terracon report did not consider the differing site condition issue from a "quantitative" perspective. The URS expert who developed the average of two feet and the expert's supervisor, who was also an expert, believed the average was reasonable, but they developed the figure of 2.56', which is a poor starting point for the reasons explained previously, and then lowered this number to two feet based upon reasons which are unsupported by the whole of the Sverdrup report, also as explained previously. The written report of the remaining expert shows he developed an average of two feet per pier by taking into account the logs of nine borings, instead of only the eight relevant borings, and without considering any of the information contained in the narrative portion of the Sverdrup report. Thus, not all of the experts who testified at the hearing agreed that two feet of weathered rock per pier is a reasonable interpretation of the information provided by the Sverdrup report, and those who believed the figure is reasonable did not base their conclusions upon a consideration of all of the information provided by the Sverdrup report. The conclusions of the experts do not persuade us that the contract documents indicated PCL would encounter an average of two feet of weathered rock per pier.

Finally, PCL says the purpose of the Differing Site Conditions clause would not be fulfilled if qualitative warnings and admonitions "trumped" quantitative information contained in boring logs and if contractors were required to include significant contingencies in their bids despite the presence of the clause. Appellant's Post-Hearing Brief at 21. We are not suggesting that qualitative warnings and admonitions ought to outweigh quantitative information. We are simply following well-established precedent which holds that when interpreting contract documents in order to determine what indications they contain regarding subsurface conditions, a reasonable contractor is obliged to take into account all of the information provided to it. Such a contractor will consider the information provided by

boring logs and then consider how other available information sheds light upon the results of the test borings and upon the extent to which the test borings are representative of conditions throughout the site. The purpose of the Differing Site Conditions clause is to permit contractors to submit more accurate bids by basing them upon the information provided by the Government. *H.B. Mac*, 153 F.3d at 1343. This purpose is not furthered when a contractor places near-complete weight upon some of the information provided by the Government and views it, to quote one of the expert witnesses, "with blinders on" instead of in light of other available information.

The Differing Site Conditions clause shifts the risk to the Government if it indicates to a contractor that subsurface conditions will be different from those actually encountered. The contract indications in this case were contained in the Sverdrup report. The report included the results of a small number of test borings, and the logs of the borings showed considerable variations in the subsurface conditions. The results of the borings were enlightened by the narrative portion of the report, which said the site was located in a karstic area and sat atop two formations with karstic features. The narrative portion of the report also explained that karstic features do not occur uniformly or regularly and warned that karstic features such as pinnacles and blocks ought to be anticipated due to the geology of the site. The Sverdrup report does not contain an explicit indication of the depth of weathered rock which PCL could expect to encounter. PCL developed its interpretation of the contract documents by beginning with a figure (2.56') which was based upon information set out in the boring logs and not based upon information contained in the narrative portion of the report. Furthermore, the 2.56' figure was developed without taking into account all of the information provided by the boring logs and it included an assumption not contained in the report regarding the depth of weathered rock at one location. PCL's explanation of how its reading of the Sverdrup report caused it to lower the 2.56' figure to an arbitrary depth of two feet of weathered rock per pier is not persuasive. PCL has not established that, reasonably interpreted, the contract documents contain reasonably plain or positive indications that the subsurface conditions included, on average, two feet of weathered rock per drilled pier.

PCL's Reliance Upon the Contract Indications

If PCL could convince us that a reasonable contractor would have interpreted the Sverdrup report as indicating an average of two feet of weathered rock per drilled pier, it would also have to establish it relied upon this interpretation when it prepared its offer and entered into the contract with GSA. *Comtrol*; *H.B. Mac*; *Stuyvesant Dredging*; *Renda Marine*; *Erickson-Shaver Contracting*; *Billington Contracting, Inc.*, ASBCA 54149, 05-1 BCA ¶ 32,900; *Gerald Miller Construction Co.*, IBCA 2292, 91-2 BCA ¶ 23,829; *Peter Kiewit Sons' Co./J.F. Shea Co. (Joint Venture)*, ENGBCA 4861, 85-2 BCA ¶ 18,082.

PCL says it used the estimate of two feet of weathered rock per pier in its best and final offer. Appellant's Post-Hearing Brief at 28-29. However, the weight of the evidence establishes that PCL did not use the estimate of two feet of weathered rock per pier in its best and final offer, and only used the estimate after it was awarded the contract.

The testimonial evidence regarding how PCL used the estimate came from PCL's construction manager, who said URS provided the estimate of two feet of weathered rock for PCL to "bid against as a preliminary number." Transcript at 19. This tells us, although not precisely, why URS provided the estimate. However, this is not the same as telling us how PCL used the estimate. When the construction manager was asked how PCL accounted for the two feet of weathered rock in its offer, he testified that PCL gave its subcontractors documents which told them to assume there would be an average of two feet of weathered rock per pier. The evidence shows, however, that PCL provided potential subcontractors with documents which mentioned the estimate of two feet of weathered rock only after GSA awarded the contract to PCL, not before PCL prepared its best and final offer. Also, the construction manager did not prepare PCL's best and final offer, and we do not know what he knows about how the offer was prepared. In addition, the construction manager testified that, regarding part of the damages claim, the best and final offer was irrelevant. As discussed below, we believe this to be true, although it does not aid PCL's position. In summary, testimonial evidence does not support a conclusion that PCL relied upon an estimate of two feet of weathered rock per pier when it prepared its best and final offer and entered into the contract with GSA.

The documentary evidence regarding how PCL used the estimate of two feet of weathered rock per pier in its best and final offer is contained in the claim as well as in the best and final offer itself. Neither piece of evidence supports a conclusion that PCL used the estimate when it prepared its best and final offer.

PCL's claim is based upon assumptions and plans PCL made after it was awarded the contract. PCL's calculations of several portions of its claimed damages are based upon the amounts of rock drilling as they were adjusted by PCL after it received URS's post-award report, not upon the amounts of rock drilling PCL anticipated when it submitted its offer. Also, its claim is based upon post-award subcontract prices and quantities rather than upon prices and quantities PCL had in hand when it submitted its offer. Thus, PCL's claim and the documents supporting the claim do not evidence PCL's reliance upon whatever assumptions and interpretations it made before it was awarded the contract.

An examination of the quantity of rock drilling contained in PCL's best and final offer fails to show it relied upon its interpretation of two feet of weathered rock per pier when it submitted its offer. The best and final offer included a total of 617' of rock drilling. It does not distinguish between drilling through good rock and drilling through weathered rock, and

does not explain how many piers PCL planned to drill. Hoping to gain some insight into how the offer was prepared, we examined the information provided by PCL as part of its August 16, 2004 claim submission. There, PCL attached a summary of its drilling of 158 piers and said for these piers, it planned to drill through 309' of weathered rock and 581' of good rock. The total of these two amounts (890') substantially exceeds the total amount of rock drilling (617') included in PCL's best and final offer. Indeed, the total amount of all rock drilling shown in the best and final offer (617') is not much more than the amount of drilling which PCL's claim summary says it planned to perform into good rock alone (581'). Instead of supporting PCL's position regarding reliance, the claim suggests PCL's offer either did not contain an amount for drilling two feet of weathered rock per pier, or contained such an amount and greatly underestimated the amount of drilling into good rock it would need to perform. Either conclusion is plausible, which means we know no more about how the offer was prepared than we did before we examined the information provided by PCL as part of its claim. The quantity of rock drilling contained in PCL's best and final offer does not show that when it prepared the offer, it relied upon an interpretation of the Sverdrup report as indicating it would encounter an average of two feet of weathered rock per pier.

An examination of the dollars allocated to rock drilling in PCL's best and final offer also fails to show PCL relied upon its interpretation of two feet of weathered rock per pier when it submitted its offer. The total amount included in the offer for drilled pier work was $399,090, plus $224,100 for geophysical consulting and boring work. Post-award, PCL entered into subcontracts for drilled pier work totaling between $970,083 and $985,083, plus $304,982 for geophysical consulting and boring work. The subcontractors ought to have based their bids upon the assumption they would encounter an average of two feet of weathered rock per pier, because this is what PCL told them to do in the bid package drawings it provided to them after it was awarded the contract with GSA. If PCL based its offer upon the same assumption, we cannot account for the fact that the amount PCL's offer included for drilled pier work was less than half the amount its subcontractors bid for the work. The dollar amounts contained in PCL's best and final offer do not show that when it submitted the offer, it relied upon an interpretation of the Sverdrup report as indicating it would encounter an average of two feet of weathered rock per pier.

As mentioned in the previous section, the purpose of the Differing Site Conditions clause is to allow bidders to submit more accurate bids by basing them upon the information provided by the Government. To further this purpose, a contractor who makes a claim founded upon the Differing Site Conditions clause must show, by a preponderance of the evidence, it actually relied upon its professed interpretation of such information when it prepared its bid and entered into a contract with the Government. Here, neither the testimonial nor the documentary evidence allows us to conclude that when PCL prepared its best and final offer and entered into the contract with GSA, it relied upon an interpretation

of the Sverdrup report as indicating there would be an average of two feet of weathered rock per pier.

Decision

Because PCL has not established the contract documents affirmatively indicated or represented there were, on average, two feet of weathered rock below the surface of the site, and because it has not established it relied upon such an indication or representation when it prepared its offer and entered into the contract, the claim is **DENIED**.

MARTHA H. DeGRAFF
Board Judge

We concur:

ANTHONY S. BORWICK
Board Judge

ALLAN H. GOODMAN
Board Judge