DISPUTE REVIEW BOARD RECOMMENDATION

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Re: US 19 SR 55 W. Green Acres to Jump Court Citrus County, Fl.

FPN 405822-2-52-01

Contract No. T-7383

Disputes Review Board Recommendation

Date: February 2, 2021

D.A.B. Constructors Inc. (DAB) requested a hearing on entitlement for issues during US 19 construction in Homosassa Springs. DAB asked , ***" Is the Contractor entitled to additional compensation for Extra Work and Delay resulting from Differing Site Conditions that required dewatering in excess of ' normal pumping' throughout the project?" .***

The Department identified NOI # 11-Artesian Flow Encounters and NOI # 41-Extra Work and Delay Associated with Backfill Under Wet Conditions were the only areas DAB preserved to meet the Three Party Agreement criteria for a hearing as they were the only areas duly preserved under Special Provision 8-3.7.1. The Board concurred and DAB did not disagree.

A Hearing was initially conducted on January 11, 2021. However, due to objections of procedure by the Department during that hearing a second hearing date was held on January 19, 2021.

DAB's position paper and subsequent rebuttal paper along with the Department position paper and rebuttal along with the testimony on the hearing dates were analyzed and assessed by the Board.

Per Special Provision 8-3.7.1 the Boards findings is limited to the two areas the Contractor identified in NOI's 11 & 41.

In the Hearing, DAB stated that they are a very experienced contractor that has dealt with the hydrology in Citrus County for many years of construction experience. They explained how they

are very knowledgeable of the conditions they successfully overcame constructing projects while working in this area. They described the excessive amounts of water they encountered on this project. DAB identified the specific manufactures flow rates of the pumps they used in the dewatering operations. They presented numerous photos and videos to demonstrate why DAB determined there were artesian flows during construction. They asserted the plan notes advising of possible artesian flow to be "exculpatory" and similar notes had been used on other projects by the Department. In addition, the Contractor said the contract was silent to the potential for artesian conditions in pipe excavations.

The Department's position was that DAB's dewatering efforts were not continuous or consistent and to the Department's knowledge, no artesian flow had actually been encountered on the project. The Department's geotechnical engineer also concluded there was no artesian flow during his site visit. The Department stated the intermittent dewatering methods used by the Contractor were the cause for the Contractor's inability to successfully construct the project without the use of bedding stone. The Department presented a file of DWRs that identified this contention and presented numerous specifics in their presentation.

The Board appreciates the time and effort that each party spent to prepare and present their position papers and the information presented to the Board during the Hearing. The Board was tasked with understanding the differing condition on this project between the time it was bid and the time actual construction began. The plans identified the possibility of artesian flow and the project specific notes identified a possible head elevation of "...+5 feet, NGVD 29..." The plans also identified the water levels encountered at the boring locations. The Contractor was very thorough in presented their experience and knowledge of the conditions they had encountered on various other projects in Citrus County.

In regards to NOI #11

The contract provided numerous references to possible artesian conditions, high groundwater flow rates, and the requirement that the Contractor be prepared to accommodate flow rates up to an elevation of + 5' NGVD. The plans did reference "Groundwater control associated with the presence of the near surface limestone substrata and the natural potentiometric head (artesian conditions) will need to be considered for all excavations below the potentiometric head elevation along the corridor. The Contractor provided historical reference material showing underground flow lines (lineaments), aquifer stratums, and sinkhole locations. The Contractor stated that due to the project location adjacent to First Magnitude Homosassa Spring, it was the Department's responsibility to provide sufficient information on potential flow rates prior to the bid and that no potential bidder could have expected the actual flow rates encountered. ." The contract did not provide flow rates at any specific locations.

In regards to NOI # 41

In DAB's dewatering plan they state that the "...primary dewatering method will be the use of standard pumps." It also states "At appropriate locations a well point dewatering system will be

utilized." It did not address the use of aggregate or select bedding material for wet conditions. At the hearing the contractor stated that they bid the project using standard pumping methods to dewater for pipe excavations. They believed the Department would "partner" with them to pay for any bedding stone required. A well point system was employed adjacent to Homosassa Trail Rd. on the trunk line coming out of Pond 3. DAB contends that their experience with this pipe run that "conventional dewatering" did not work because of the subsurface conditions and requested payment for select bedding material. The Department had successfully laid this pipe with well points until inefficiencies in the Contractor's system resulted in slow progress. The Contractor notified the Department of artesian conditions in the pipe trench but each time the Engineer was available to review the site, the artesian conditions were not evident. The Department concluded it was inefficiencies in the Contractor's dewatering operation that caused the delay in progress and declined to authorize payment for select bedding material. The Contractor began using select material at their own risk and completed the pipe operations. It was noted that in locations the bedding material was not wrapped as required by the specification.

In reference to NOI #11 the Board unanimously found *no entitlement* for additional compensation for "Extra Work and Delay resulting from Differing Site Conditions that required dewatering in excess of normal pumping throughout the project". No information was presented by DAB that demonstrated a change in conditions between the time the project was bid and the time construction actually took place. No empirical data was presented that the dewatering process encountered potentiometeric surface water or artesian head pressure above +5' NGVD elevation identified in the plans. No actual measurements or documentation were provided that revealed the Contractor encountered artesian conditions above the elevation referenced throughout the Contract Plans. The Designer's plan notes consistently alerted potential bidders to the +5' NVGD elevation to be used during bid preparation and construction. Additionally, no information was provided that indicated a change in the geological or hydrostatic conditions encountered during construction from that provided in the contract documents.

In reference to NOI #41, the Board unanimously found *no entitlement* for extra cost or delay. The Contractor contends it demonstrated that normal dewatering methods were ineffective and they should have been allowed to proceed under "wet conditions" as per the specifications with direct payment for bedding material. The Department disagreed. At this point the Contractor's duty was to proceed with normal dewatering efforts and to seek immediate relief from the Board. This possibility was brought up early in the project but not acted upon. Instead the Contractor chose to complete the construction with his own means and methods using bedding stone at his risk and convenience. The Board must conclude from the Contractor's actions, evidence and direct testimony at the hearing that the use of bedding stone was used for the Contractor's convenience.

DISPUTE REVIEW BOARD RECOMMENDATION

The Board sincerely appreciates the cooperation of all parties and the information presented for the Board's review in making this recommendation.

The Board unanimously reached these recommendations and reminds the parties that it is only a recommendation. If the Board has not heard from either party within 15 days of receiving this recommendation, the recommendation will be considered accepted by both parties.

Submitted by the Disputes Review Board

Allan Adderley, Member *David Jameson, Member* *Marc Knapp, Chairman*

Signed for and with concurrence of all members

M J Knapp

D.A.B. Constructors, Inc.

Heavy Civil Construction Solutions

Position Paper

December 27, 2020

Extra Work and Delay due to Extreme Dewatering

Prepared by Foster Bachschmidt

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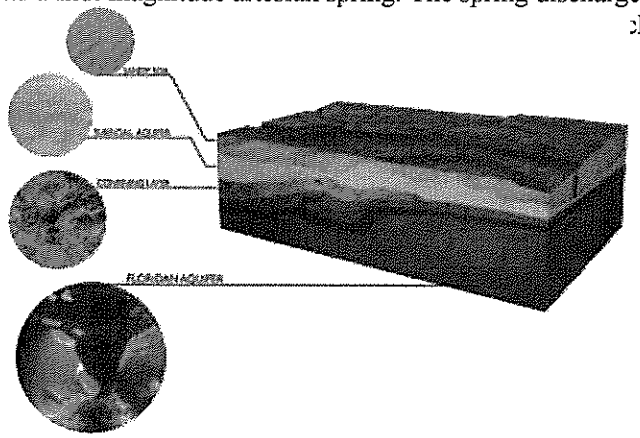
Introduction

D.A.B. Constructors, Inc. ("D.A.B.") was awarded Contract T7383 ("the Project") by the Florida Department of Transportation ("FDOT") in July of 2016. The project included resurfacing, widening, reconstruction, and drainage improvements throughout the US19 corridor in Homosassa Springs, Florida. The project is located adjacent to Homosassa Springs State Park, an area known for sensi- tive karst geological features and a first-magnitude artesian spring. The spring discharges 65 million gallons per day from a thinly :h approximately 70 feet deep.



Homosassa Springs is unique because the Upper Floridan Aquifer sits at or near the surface throughout the region. Moreover, the area is affected by two interlinked aquifers, the Upper Floridan Aquifer and a surficial aquifer, separated by a confining layer of thinly mantled limestone. Sinkholes and instability are common in the area due to the thinly mantled limestone layer and karst features. During the Proj- ect's construction, numerous sinkholes occurred, mostly near or adjacent to excavations that penetrated the thinly mantled limestone layer. When punc- tured, the thinly mantled limestone

released significant volumes of water.

Figure 1: Floridan Aquifer Schematic (https://www.bluewateraudit.org)

This release of water relieved the pressure and dramatically reduced the flow from the primary vents of Homosassa Springs, as documented by United States Geological Survey ("USGS") data attached hereto.

The area's unique hydrogeological features have led to numerous USGS studies, and several reports are readily available from USGS and other government agencies. USGS Studies have found that the Upper Floridan Aquifer is largely unconfined in the area of Citrus County, allowing for recharge from the nearby Gulf of Mexico and other surrounding water bodies. This unique aspect leads to salt- water-freshwater interfacing within the aquifer, specifically along the Upper Floridan Aquifer's coastal margins. The aquifer's ability to recharge from surrounding water bodies creates unique challenges to dewatering in this area, as incredibly high volumes of water can be encountered when the thin limestone overlying the aquifer is penetrated. These conditions pose a complex and unique risk for foundation design in the area. The Nuclear Regulatory Commission ("NRC") conducted a series of detailed studies of the surrounding groundwater flow paths in the vicinity of the project, which were necessitated by the design and construction of the now-closed Crystal River Nuclear Plant.

D.A.B. possessed more experience working near this particular first-magnitude artesian spring than any other bidder, having completed more than 50 projects within 15 miles of the spring head over the last 30 or more years. D.A.B. has significant experience with Citrus County and Homosassa Springs' unique hydrogeological feature, which is unique to Florida and the United States as a whole.
D.A.B. was well-versed in the dewatering efforts necessary to complete underground pipe installation in the project's immediate vicinity at the time of the bid. D.A.B. anticipated dewatering rates, normal for the area, in its proposal for the project. The expected dewatering rates were based on the conditions shown within the plans and general knowledge of what to expect in Homosassa Springs' vicinity, based

upon years spent working underground in this area.

The plans required the construction of storm sewer facilities and underground utilities near Homosassa Springs and within the shallow limestone aquifer. Several standard exculpatory notes were included on the Pond and Gravity wall plan sheets, drawing attention to potential artesian conditions in the project's vicinity. It is essential to recognize that these notes are commonly seen throughout District 7 on numerous other projects. To reference a few, Contract T7407 (adjacent to this project) and Contract T7438 (more than 50 miles from the nearest first-magnitude artesian spring) contain similar exculpatory notes to those provided for the contract at hand. This plan note provides a theoretical potentiometric surface elevation and other exculpatory information that does little to allow for dewa- tering calculations. This information is not relevant because of the Upper Floridan Aquifer's unconfined nature. According to the construction dewatering tome, *Construction Dewatering and Groundwater Control*, "the unconfined or water table aquifer illustrated in Fig. 4.7 differs from the confined aquifer in that it has a phreatic surfacing which rises and falls with changes in the recharge or pumping."

4. BASED ON A REVIEW OF THE "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA" MAPS PUBLISHED BY THE USGS, THE POTENTIOMETRIC SURFACE ELEVATION OF THE UPPER FLORIDAN AQUIFER ALONG THE PROJECT ALIGNMENT APPEARS TO BE ON THE ORDER OF +2 TO +5 FEET, NGVD 29. THE PROJECT IS LOCATED IN AN AREA KNOWN FOR SPRING ACTIVITY. FOUNDATION EXCAVATIONS WILL BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE. IN ADDITION, THE NEAR SURFACE LIMESTONE CAN BE POROUS, DIFFICULT TO DEWATER AND THEREFORE ALLOW FOR HIGH GROUNDWATER FLOW VOLUMES. THE CONTRACTOR'S METHODS AND DEWTAERING EQUIPMENT SHALL BE PREPARED TO HANDLE ARTESIAN WATER UP TO A HEAD ELEVATION OF +5 FEET, NGVD 29, AT NO ADDITIONAL COST TO THE DEPARTMENT.

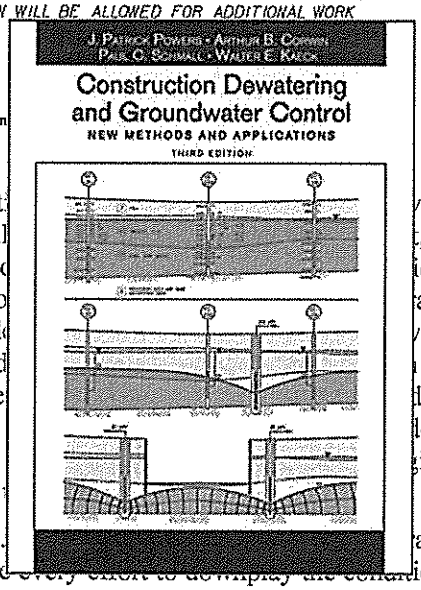
Figure 2: T7383 Plan Note for Artesian Conditions

3. BASED ON A REVIEW OF THE "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA" MAPS PUBLISHED BY THE USGS, THE POTENTIOMETRIC SURFACE ELEVATION OF THE UPPER FLORIDAN AQUIFER IN THE PROJECT VICINITY RANGES FROM APPROXIMATELY +0 TO +5 FEET NGVD. WHILE THE PROJECT SITE ELEVATIONS RANGE FROM APPROXIMATELY +0 TO +15 FEET, NGVD. NO ARTERSIAN CONDITIONS WERE ENCOUNTERED DURING SOIL INVESTIGATIONS. HOWEVER, IT SHOULD BE NOTED THAT THE PROJECT SITE IS IN AN AREA KNOWN FOR SPRING ACTIVITY. EXCAVATIONS ASSOCIATED WITH ROADWAY, SMFS, UTILITY INSTALLATIONS, DRAINAGE OR FOUNDATIONS (INCLUDING BOX CULVERT, SIGN OR SIGNAL FOUNDATIONS, ETC.) MAY BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE. IN ADDITION, THE NEAR-SURFACE LIMESTONE CAN BE POROUS AND THEREFORE ALLOW FOR HIGH ARTESIAN FLOW VOLUMES. THE CONTRACTOR SHALL BE PREPARED TO HANDLE THE POSSIBLE ARTESIAN CONDITIONS AND THE CONTRACTOR'S DEWATERING EQUIPMENT AND METHODS SHALL BE SUFFICIENT TO HANDLE ARTESIAN WATER UP TO A HEAD ELEVATION OF + 5 FEET NGVD.

Figure 3: T7407 Plan Note for Artesian Conditions

8. IT HAS BEEN THE EXPERIENCE OF FDOT, WITH PROJECTS CONSTRUCTED WITHIN THIS GENERAL GEOGRAPHICAL AREA, THAT THE POTENTIOMETRIC SURFACE ELEVATION OF THE UPPER FLORIDAN AQUIFER ALONG THE PROJECT ALIGNMENT RANGES FROM APPROXIMATELY +65 TO +70 FEET, NGVD 29. THEREFORE, THE CONTRACTOR SHOULD CONSIDER THE INCREASED COST OF ALL UNDERGROUND WORK ACTIVITIES WHILE PREPARING THEIR BID, WITH THE KNOWLEDGE THAT EQUIPMENT AND METHODS MAY BE REQUIRED TO HANDLE ARTESIAN FLOW CONDITIONS TO A HEAD ELEVATION OF +70 FEET, NGVD 29. ALL COSTS OF DEWATERING ACTIVITIES SHALL BE BE INCLUDED IN THE APPROPRIATE ITEMS OF WORK CONTAINED IN THE CONTRACT. NO EXTRA COMPENSATION OR TIME EXTENSION WILL BE ALLOWED FOR ADDITIONAL WORK OR EQUIPMENT DIRECTLY ASSOCIATED WITH THE DEWATERING ACTIVITIES.

Figure 4: T7438 Plan Note for Artesian



FDOT and the Construction Engineering and Inspect / on these notes to avoid compensating D.A.B. for additional , or bedding stone. Since specific dewatering rates cannot be ided in the plans, it appears that FDOT possessed superior kno ates and failed to provide this information to prospective bidd /een D.A.B. and FDOT exists. FDOT has maintained that the d the project were clearly defined within the Contract Docume l by the Contractor. D.A.B. fundamentally disagrees with this lous expense due to Extra Work and Delay attributed to gical conditions encountered during construction operations on

FDOT failed to provide support or aid to D.A.B. ates were encountered on the Project. FDOT and the CEI made every effort to downplay the conditions and place all responsibility upon the Contractor for the conditions encountered, thereby refusing to provide con- structive feedback and engineering assistance on how best to overcome the conditions encountered. The CEI refuted any suggestions proposed by D.A.B. on how best to address the circumstances and expedite construction, despite D.A.B.'s substantial local underground experience. While D.A.B. has completed many projects in the area, it is difficult to discern how much relevant experience the CEI Team possessed in dewatering in and around the Upper Floridian Aquifer and first-magnitude artesian springs in Citrus County.

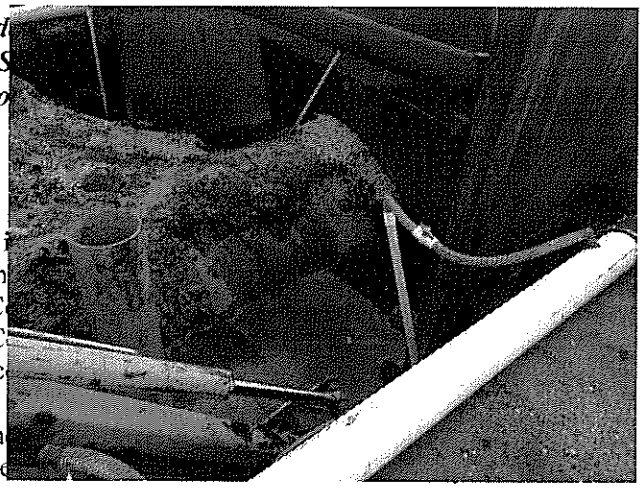
Due to FDOT and the CEI's failure to engage in resolving the unique dewatering challenges presented by the Project, D.A.B. retained Devo Seereeram, Ph.D., P.E. to aid in dewatering design and to provide feedback on actual and anticipated field conditions. Dr. Seereeram's helpful guidance allowed D.A.B.'s dewatering operation to gain efficiency as underground work progressed.

D.A.B. provided FDOT and the CEI with six (6) separate reports from Dr. Seereeram regarding the cause of the underlying conditions and appropriate dewatering tech- niques applicable to the conditions encountered. FDOT and the CEI largely dismissed these reports. D.A.B. also relied on *Construction Dewatering and Groundwater Control* by Powers, P.E., Corwin, P.E., Schmall, P.E., and Kaeck, P.E. to supplement its dewatering knowledge. Dr. Seereeram's expertise and Construction Dewatering and

Groundwater Control are heavily relied upon for the tech- nical information contained herein, as well as numerous reports from USGS.

Based upon the above information, a majority of which has been learned during the construction of the Project, D.A.B. has posed the following question to the Disputes Review Board for their review and recommendation:

"Is the Contractor entitled to ad
Delay resulting from Differing S
excess of "normal pumping" thro



Analysis of the Issues

D.A.B. began underground operations arte- sian conditions were encountered, un history of its operations in Citrus C materially from those stipulated in the C million gallons per day were regularly enc methods D.A.B. historically used when County broke down quickly. The storage an these initial operations as well. To plac perspective, 8 million gallons or 1,069,444cubic feet of water from an excavation of approximately 2,400 cubic feet (standard 10' X 24' Trench box), a volumetric ratio of 444:1. Peak dewatering rates exceeded 15 million gallons per day on numerous occasions.

The salient text on construction dewatering, *Construction Dewatering and Groundwater Control* shows the the- oretical maximum dewatering rate for a wellpoint system in a similar excavation to be 1,152,000 gallons per day. This rate is based upon the theoretical maximum dewatering rate of 25 GPM per well- point, 3 foot spacing for wellpoints, and a wellpoint system that is four times the length of the excavation (see chapters 16 and 19 of *Construction Dewatering and Groundwater Control* for substantiation of this calculation). When similar wellpoint systems were employed on the Project, the system extracted 550,000 gallons per

day on average or less than 50% of the

Figure 5: The results of a double row of wellpoint after more than one week of pumping.

theoretical rate. The actual dewatering rates required to construct the project exceeded the ideal well-point system's capability more than seven times and exceeded the actual system's capability by 14 times. Furthermore, *Construction Dewatering and Groundwater Control* states that wellpoint systems are ideal when "there are no impermeable strata at or near the excavation subgrade." The Project's geotechnical analysis shows limestone at or near the subgrade of almost all pipe excavations throughout the project, thus rendering wellpoint systems a flawed solution. Because most of the soil borings show limestone near or within the excavation subgrade, the theoretical maximum dewatering capability of the ideal wellpoint system shown above must be discounted to allow for this adverse condition.

In written correspondence, verbal communication, and third party reports, D.A.B. appealed to FDOT and the CEI's requirement that D.A.B. proceed to use wellpoints for all dewatering operations. The CEI's proposed approach was foolhardy and ill-informed based upon the available

information from independent third-party subject matter experts and readily available in educational texts. These independent sources agree that when using wellpoints to dewater an impermeable layer, "complete drainage of the permeable soil is physically not possible [...] and necessitate the use of open pumping techniques," which is the process that D.A.B. utilized, successfully, throughout the Project. The well- point systems available for use on the project were not capable of handling the volumes of water encountered in the excavation, added complexity and cost to the operation, and restricted the working area available to a given operation. For these reasons, D.A.B. elected to proceed with dewatering

using commonly accepted means and methods, i.e., open pumping through the use of gravel sumps known as Kelly wells.

D.A.B.'s proposal for the project accounted for dewatering rates more than double that of the ideal wellpoint system described above. In prior experience on projects nearby, including projects on Halls River Road, SR44, US19, CR486, CR491, Grover Cleveland, Blvd, et al., a maximum dewatering rate of 1.5 million gallons per day had historically been experienced. Based on the Project's proximity to Homosassa Springs and the exculpatory notes in the plans, D.A.B. increased its historical expecta- tion by more than 25% or 2.0 million gallons per day. D.A.B.'s bid proposal included dewatering and treatment systems capable of handling rates as high as 2.0 million gallons per day as a maximum anticipated dewatering rate. Still, D.A.B. expected daily average rates to be 40-60% of the maximum rate. Nothing in the plans serve to contradict or discount D.A.B.'s reasonable expectation for ground- water in the area. Furthermore, project T7407 to the North is experiencing dewatering rates within this expected range.

The Contract Documents simply do not provide a substantiative technical reason for D.A.B. to have increased its dewatering allowance for the Project. The use of standard notes, employed on other projects much further from Homosassa Springs, serves to downplay the Project's anticipated conditions. The FDOT's failure to clearly define expected dewatering rates is ambiguous and fails to define the conditions to be encountered clearly. As such, the actual conditions that significantly exceeded D.A.B.'s reasonable expectation differ materially from the conditions shown or expected from the evaluation of the Contract Documents.

Foundation Instability due to Artesian Conditions

As D.A.B. proceeded with the trench excavation operation to install underground facilities, countless artesian vents ("boils") were encountered throughout the bottom and sides of the excavation. These boils caused severe instability in the trench foundation, and D.A.B. struggled to maintain line and grade in nearly all pipe operations where boils were encountered. According to Construction Dewatering and Groundwater Control, "When water is entering up through the bottom of an excavation, it is necessary to over excavate 1 ft. (0.3m) or more and place a layer of gravel, which will drain the water to the sides and provide a dry and stable subgrade." *Construction Dewatering and Groundwater Control* goes on to state that "excavation in or near a boil is not advisable since this will aggravate the already unstable condition." Further consultation with Dr. Seereeram substantiated the guidance provided by Construction Dewatering and Groundwater Control.

When D.A.B. approached FDOT and the CEI with a request to utilize bedding stone per Specifi- cation 125-8.3.4, the request was denied. FDOT and the CEI cited D.A.B.'s failure to provide "normal pumping" methods as the reason for rejecting this request. Subsequently, FDOT and the CEI permitted the use of bedding stone on the Project but refused to participate in reimbursement for this additional work. D.A.B. was wholly unable to achieve progress in pursuit of underground work without the signif- icant use of bedding stone. More than 20,000 tons of bedding stone was incorporated into the project to provide a stable foundation for the installation of storm sewer throughout the project. FDOT and the CEI repeatedly told D.A.B. that the use of bedding stone was for D.A.B.'s "convenience" and was not required by the conditions encountered. D.A.B. has provided both FDOT and the CEI with numerous videos where boils are evident in the trench excavation subgrade and along the trench's sides, but FDOT and the CEI did not change their position.

FDOT and the CEI stated that the Standard Specifications do not apply uniformly to all projects and have taken the stance that this Project is unique and the Contract Documents required unique dewatering techniques. Their position is that the standard of "normal pumping" varies from project to

project based on each project's unique conditions. This stance is arbitrary and capricious. According to the definition of standard specifications (page 7 of the Standard Specifications for Road and Bridge Construction), they are "applicable to all Department Contracts containing adopted requirements, setting out or relating to the method or manner of performing work, or to the quantities and qualities of materials and labor." The statement that the term "normal pumping" applies differently to different projects is by nature arbitrary and capricious as the standard is then impossible to define and can be manipulated by FDOT, at its sole discretion, to avoid paying for clearly required additional work.

To further confound the issue, FDOT has granted entitlement for the placement of bedding stone in several locations on the project adjacent to T7383, Contract Number T7407 (N.B. the dewatering rates on this adjacent project have not yet exceeded 2.5 million gallons per day). Notably, the dewatering rates for the areas where entitlement has been granted on T7407 range from 650,000 to 2.4 million gallons per day, less than one-quarter of the dewatering rates experienced on Contract Number T7383. The disparity in interpretation between these two projects serves to clearly highlight FDOT's arbitrary and capricious interpretation of "normal pumping" on the Homosassa project (T7383). Suppose FDOT had wished to transfer additional risk to the Contractor or enhance this Project's pumping requirements. In that case, the FDOT should have modified Specification 125-8.3.4 via Special Provision or another contractual method. That did not happen. Only the Standard Specifications govern "Backfill Under Wet Conditions" on this project, much to FDOT's chagrin.

The FDOT and CEI's reversion to dewatering rates and pumping methods demonstrates a lack of understanding of bedding stone's purpose. They have failed to acknowledge the severe instability caused by the flow of artesian waters into a given excavation in the form of boils. As *Construction Dewatering and Groundwater Control* clearly states, when boils are present, and water is entering through the bottom of an excavation, the trench must be over excavated by a minimum of one foot and a stabilizing layer of gravel placed to allow for a dry and stable foundation. The general requirement to remove one foot of unstable material is also reflected in Standard Specification 124-4.1. In cases of severe artesian infiltrations, the excavation should be abandoned due to fears of instability. The FDOT and CEI wholly failed to direct the desperately necessary use of bedding stone. Yet, FDOT and the CEI refuse to participate in reimbursement for work required by general engineering standards and Specification 125-8.3.4. D.A.B. is entitled to compensation for the labor, equipment, and materials involved with installing bedding stone and throughout the project and corresponding delay due to production loss.

Design Changes and Alterations to the Work due to Artesian Conditions

In numerous areas on the project, items of work were wholly abandoned by FDOT due to severe foundation instability due to boils encountered in the excavation at these locations. D.A.B. faced severe instability in other locations on the Project that went unaddressed by FDOT and the CEI, who seemed only to address a problem when a "no-impact" option existed. D.A.B. provided written concern with these areas before commencing work or once severe instability was encountered that prevented progress. Still, FDOT and the CEI dismissed these concerns out of hand. In most instances, D.A.B.'s concerns proved to be valid. In the most extreme cases, work was either deleted or significantly altered due to the severe instability. Had FDOT and the CEI placed credence in D.A.B.'s initial concerns, hundreds of thousands of dollars and countless days of delay could have been avoided for some of these issues.

After months of unproductive work, D.A.B. could not achieve a stabilized foundation for the Sanitary Sewer installation at the South end of the project. Dewatering rates were extraordinarily high, water continuously flowed from the bottom of the excavation, and a stable foundation could not be achieved utilizing all available means and methods. When D.A.B. approached FDOT and the CEI, our concerns

were dismissed, and we continued to pound our proverbial head against the wall. After meeting inde- pendently with Citrus County Utilities, the owner of the Sanitary Sewer, it was agreed that the work would be altered to allow for construction to progress and that portions of the work in the most affected areas would be entirely abandoned. A formal revision was issued for this modification to the Project.

The Contract Documents for this project noted that artesian conditions should be expected during pond excavations. The Contract Documents provided a remedy for these artesian conditions in a Technical Special Provision ("TSP"), which incorporated Compaction Grouting as a remedy to abate the artesian conditions. The Compaction Grouting process was intended to plug and seal

avenues for artesian flows, thus allowing further pond excavation and construction. During the excavation of Pond #3 and after D.A.B. encountered artesian conditions, formalized by NOI #27 & #29, the FDOT directed the Compaction Crouting effort to commence per the TSP.

During the Compaction Grouting operation, wholly failed to abate the artesian flow into the exca- vation, even after multiple attempts. As the Compaction Grouting process stopped the artesian flow in a single vent or boil, new vents or boils opened within the excavation. The artesian vents continued to "move" as Compaction Grouting continued due to the extreme porosity of the thinly mantled limestone layer capping the Upper Floridan Aquifer in this area. D.A.B. forwarned FDOT and the CEI that the Compaction Grouting process was likely to fail as it does not account for this porosity of the karst limestone formation that overtops the Upper Floridan Aquifer. After continued failed attempts to abate the artesian flow using the Compaction Grouting process, FDOT and the CEI finally provided direction for D.A.B. to develop an ad-hoc solution to the problem. An underdrain system comprised of crushed concrete and bedding stone was constructed and allowed for pond excavation to continue almost immediately. This situation underscores the EOR, FDOT, and the CEI's limited experience in dealing with severe artesian conditions. Although the exculpatory language specifically addressed pond excavations, the FDOT acknowledged partial entitlement for Extra Work related to severe artesian conditions in Pond #3.

In another instance, before commencing work on the proposed gravity wall from station 2446+77 to 2451+09, D.A.B. again forewarned FDOT and the CEI of concerns with extreme dewatering in this area. The concerns arose from prior, small scale utility excavations in this area that generated tremendous dewatering rates for the excavations' size. Again, FDOT and the CEI dismissed these concerns out of hand. D.A.B. proceeded with the work under duress and attempted to dewater the area for more than three weeks, pumping more than 15 million gallons each day. Only after absurd levels of dewatering effort were attempted and failed did the CEI issue a stop-work order for the gravity wall. A subsequent revision was issued to delete the gravity wall and provide an earthen slope instead of a retaining wall.

D.A.B. provided this solution after desperately reviewing the plans for an alternative design. Had FDOT and the CEI placed credence in D.A.B.'s initial concerns for dewatering the gravity wall and conducted an engineering analysis, the contract could have achieved net savings through the deletion of the gravity wall. Instead, hundreds of thousands of dollars were spent, and nearly one hundred days of delay were incurred. Similar to the extra work in Pond #3, and although the Contract Documents included exculpatory notes regarding the potential encounter of artesian conditions during foundation excavations, the FDOT acknowledged partial entitlement for Extra Work and Delay. FDOT and the CEI relied upon D.A.B. to develop a solution to overcome the un-constructible condition created by extreme artesian flows. The gravity wall design error highlights the lack of understanding of the severe artesian conditions in the Project's design. Further, it serves to substantiate the truly unknowable and materially differing conditions that existed on this project.

Increased Discharge Difficulties due to Artesian Conditions

The extremely high dewatering rates required by this project, in conjunction with its proximity to an Outstanding Florida Waterway ("OFW"), required a unique treatment system capable of treating millions of gallons per day to incredibly high standards (1-2 NTU's). While the quality standards for effluent discharge from the site were achievable at the typical dewatering rates that D.A.B. anticipated in its proposal, the exceptionally high dewatering rates encountered on the Project required a substan- tial variation from the system included in D.A.B.'s bid for the Project. After evaluating the dewatering rates encountered, D.A.B. adopted a treatment system commonly utilized for dredging operations. Standard chemical flocculant systems proved wholly ineffective at treating effluent at a rate equivalent to the dewatering rates encountered on the Project. The automated chemical injection system and proprietary polymer flocculant system developed and manufactured by Gator Dredging proved to be the only effective means of treating the effluent at a sustainable rate.

It is important to note that no such treatment systems are necessary on the adjacent project to the North (T7407). Conventional treatment systems can handle the dewatering rates encountered on this adjacent project, which adjoins the Project under dispute. The geotechnical data for these two projects appear to be identical, but the dewatering rates vary substantially. D.A.B. could not anticipate the extremely high dewatering rates encountered on the Homosassa project because the plans fail to identify this condition clearly. As such, D.A.B.'s bid contained allowances for a more modest treatment system, as was initially employed but immediately overwhelmed. Both projects referenced herein adjoin an OFW, and both have the same effluent discharge criteria. Still, only one project cannot achieve this requirement with standard means and

methods, Contract Number T7383. The site conditions differed materially on this Project from those depicted in the Contract Documents. They required a substantially different water treatment system than what would be anticipated by any reasonable bidder.

Summary

How did this happen? How did the designer miss these conditions? *Construction Dewatering and Groundwater Control* provides some critical clues as to why the EOR did not anticipate the extreme dewatering rates on this Project. The use of piezometers is touted as a primary way to convey expected dewatering rates when designing a dewatering system. However, piezometers have their shortfalls and can provide misleading information. According to *Construction Dewatering and Groundwater Control*, "if there are discrete and multiple pressure zones within the aquifer, or vertical gradients, then the ordinary piezometer will indicate an average of the hydraulic head over the entire interval of sand backfill. This average result may be misleading when it is considered to be the water level at a discrete elevation. When two discrete aquifers are penetrated, as in Fig. 8.3, the average hydraulic head indicated by an ordinary piezometer is representative of neither aquifer."

As discussed in the Overview herein, this Project is underlain by two separate aquifers that create multiple pressure zones and vertical gradients, thus rendering the piezometric data within the geotech- nical report and design invalid. *Construction Dewatering and Groundwater Control* goes on to state that "dangerous boils have been observed in an excavation even when the surrounding piezometers indicate water levels below subgrade," which is due to the vertical gradients caused when a dewatering system only partially penetrates an aquifer. Had the EOR realized this during the project's design, perhaps a more accurate depiction of the subsurface conditions could have been provided. Perhaps some portions of the design could have been altered to reduce the impacts of artesian conditions on construction. Without conducting a Pump Test, which could have easily been accomplished, it would be difficult or impossible for the EOR to provide accurate dewatering rates for the Project. Without this information, it is impossible for a reasonable bidder to fully understand or anticipate the necessary dewatering in the unique hydrogeologic location of Homosassa Springs.

Entitlement Statement

D.A.B. is entitled to additional compensation for additional pumping and water treatment that resulted in Extra Work and Delay due to site conditions that differed materially from the conditions depicted in the plans and that a bidder would reasonably anticipate.

The plans use standard exculpatory notes and provide ambiguous information that cannot be used to calculate the dewatering necessary to construct the project accurately. The dewatering required by the actual conditions caused a significant reduction in production rates, resulting in delay. Furthermore, handling the water treatment system and its intrinsic limitations further reduced production rates. No reasonable bidder could have expected the dewatering rates encountered on this project based on the Contract Documents' information.

D.A.B. is entitled to additional compensation for backfilling under wet conditions and the necessary use of bedding stone, which resulted in Extra Work and Delay.

The Standard Specifications precisely state that when "normal pumping would not be effective, [...] The Department will pay for any select material which is not available from the grading as Unforeseeable Work. " The Standard Specifications go on to allow the "use of coarse aggregate below the elevation at which mechanical tampers would be effective." Based upon the standard engineering practices evidenced in *Construction Dewatering and Groundwater Control*, gravel bedding was required due to the infiltration of water from the bottom of the excavation, despite dewatering at rates over 15 million gallons per day in some instances.

FDOT Position Paper

Contract: T7383

FPN: 405822-2-52-01

INTRODUCTION

On 10/26/2020 DAB Constructors, Inc (The Contractor) submitted the following question to the Board for consideration:

"Is the Contractor entitled to additional compensation for Extra Work and Delay resulting from Differing Site Conditions that required dewatering in excess of "normal pumping" throughout the project?" (EXHIBIT 1)

The Contractor has posed a general question for consideration. However, the only duly preserved disputes which comply with Standard Specification 5-12 and are related to the question the Contractor poses above are described in Notices of Intent to Claim (NOI) #11 and #41 (EXHIBITS 2 & 3). These are the only NOIs which reference "normal dewatering (pumping)". As Section 5.4 of the DRB Operating Procedures and Special Provision 8-3.7.1 affirm, only disputes or claims that have been duly preserved under the terms of the Contract will be eligible to be heard by the DRB. As such, this paper will focus solely on discussing the issues which have been duly preserved in the above NOIs.

Additionally, the question above pre-supposes agreement that differing site conditions existed and dewatering in excess of "normal pumping" occurred. The Department does not agree with either of these assertions. To be clear, our understanding of the dispute is as follows:

- **Differing Site Conditions**
    - **The Contractor asserts there are differing site conditions, including artesian conditions, within storm sewer excavations than what is described in the contract documents.**
    - **The Department asserts the contract documents clearly spell out the site conditions through Standard Specifications and plan notes, which were acknowledged by the Contractor by virtue of executing the contract (and thereby accepting all contract documents) as well as in their own submittals.**
- **Normal Pumping**
    - **The Contractor asserts they had to employ above normal dewatering in storm sewer excavations due to the differing site condition.**
    - **The Department asserts the Contractor has failed to employ even normal dewatering methods on much of the project as required by the contract documents, including Standard Specifications and plan notes, and which were further acknowledged by the Contractor in their own submittals.**

Regarding the differing site conditions, this paper will prove the following:

1. *Contract Documents* - The Contract Documents available at the time of bid, prior to the issuance of NOIs #11 & #41, clearly indicated to the Contractor to expect shallow limestone, near surface water tables and subsurface features which would require the implementation of methods and equipment necessary to handle large volumes of groundwater.
2. *Contractor's Submittals* - The Contractor's submittals referenced the unique character of sub-surface groundwater.
3. *Contractor's Prior Knowledge* - The Contractor had affirmed written knowledge of the unique subsurface conditions prior to contract letting.
4. *Failure to Demonstrate Differing Site Condition* - The Contractor failed to provide evidence that "Differing Site Conditions" were present during the trench excavations associated with the construction of the storm water drainage system. At no time during the course of the Contract did the Contractor demonstrate that field conditions differed materially from those indicated in the Contract.

Regarding normal dewatering methods, this paper will prove the following:

1. *Required Dewatering Efforts* - The Contract requirements depict to the Contractor the necessary methods and equipment to control the groundwater for all stormwater sewer installations on the project.

2. *Successful Dewatering* - In the limited instances when the Contractor utilized normal dewatering methods in accordance with the contract, they were successful in storm sewer installation.

3. *Unsuccessful Dewatering* - Site source records will clearly show the lack of effort and inconsistent/intermittent efforts by the Contractor to provide normal dewatering methods per the contract requirements and the Contractor's submittals.

Differing Site Conditions

The Contractor's issuance of Notice of Intent to Claim #11 – Artesian Flow Encounters (NOI #11) (EXHIBIT 2) submitted January 17, 2017, states the Contract is silent on the presence of artesian conditions within pipe trench excavations. This section depicts the abundant information to the contrary, all of which was available to the Contractor at bid time and prior to the issuance of NOI #11. Ample plan notes and details, specification requirements, the Contractor's submittals as well as the Contractor's public statements indicate the Contractor was fully aware of the site conditions. Therefore, the Contractor was obligated to anticipate and bid methods to address the presence of high groundwater flows including artesian conditions during pipe installation. Accordingly, the presence of groundwater within the pipe trench does not constitute a "Differing Site Condition."

1. Contract Documents

Throughout the contract plans, there are numerous references and notes that the Contractor is to expect artesian conditions and to employ dewatering methods that can handle large volumes of groundwater flow including artesian conditions.

The original contract plans referenced the word "ARTESIAN, POTENTIOMETRIC SURFACE, OR POTENTIOMETRIC HEAD" no less than **173** times. The sheer magnitude of the number of these references is indicative of the Department's intent to alert the bidders to the character of the project and to demonstrate the field conditions the Contractor should have anticipated during construction. It also establishes a baseline for determining the presence of any "Differing Site Conditions" per Specification 4-3.7 (EXHIBIT 4).

The Contract references the subsurface geology and groundwater conditions within the project limits and general project vicinity in several notes on the Contract Plans. Pertinent examples include:

- **Project Notes** - Plan Sheet 33 (Exhibit 5)

  NOTE 4. LIMESTONE IS LOCATED AT SHALLOW DEPTHS ALONG THE PROPOSED ROADWAY IMPROVEMENTS. FOUNDATION, UTILITY AND STORMWATER POND EXCAVATIONS IN THOSE AREAS WILL BE DIFFICULT

- **Report of Core Borings Box Culverts** - Plan Sheets 146-147 (EXHIBIT 6)

  NOTE 4. BASED ON REVIEW OF THE "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA" MAPS PUBLISHED BY THE USGS, THE POTENTIOMETRIC SURFACE ELEVATION, OF THE UPPER FLORIDAN AQUIFER ALONG THE PROJECT ALIGNMENT APPEARS TO BE ON THE ORDER OF +2 TO +5 FEET, NGVD 29. THE PROJECT IS LOCATED IN AN AREA KNOWN FOR SPRING ACTIVITY. FOUNDATION EXCAVATIONS WILL BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE. IN ADDITION, THE NEAR SURFACE LIMESTONE CAN BE POROUS, DIFFICULT TO DEWATER AND THEREFORE ALLOW FOR HIGH GROUNDWATER FLOW VOLUMES. THE CONTRACTOR'S METHODS AND DEWATERING EQUIPMENT SHALL BE PREPARED TO HANDLE ARTESIAN WATER UP TO A HEAD ELEVATION OF +5 FEET, NGVD 29, AT NO-ADDITIONAL COST TO THE DEPARTMENT.

- **Roadway Soil Survey** - Plan Sheet 183 (EXHIBIT 7)

  NOTE 6. THE MATERIAL FROM STRATUM 7 IS ROCK (LIMESTONE)..... GROUNDWATER CONTROL ASSOCIATED WITH THE PRESENCE OF THE NEAR SURFACE LIMESTONE SUBSTRATA AND THE NATURAL POTENTIOMETRIC HEAD (ARTESIAN CONDITIONS) WILL NEED TO BE CONSIDERED FOR ALL EXCAVATIONS BELOW THE POTENTIOMETRIC HEAD ELEVATIONS ALONG THE CORRIDOR.

• **Stormwater Pollution Prevention Plan** - Plan Sheet 313 (EXHIBIT 8)

NOTE 5. DEWATERING OPERATIONS – THE DEWATERING PLAN TO BE SUBMITTED WILL INCLUDE TECHNIQUES AND MEASURES THAT CAN HANDLE LARGE VOLUME GROUNDWATER FLOWS UP TO +5 NGVD.

• **Report of Core Borings** - Plan Sheets 535-540 (Exhibit 9)

NOTE 2. WEATHERED LIMESTONE WAS ENCOUNTERED AT SHALLOW DEPTHS WITHIN THE BORINGS, VARIATIONS IN THE DEPTH AND RELATIVE DENSITY/HARDNESS OF THE LIMESTONE STRATUM SHALL BE ANTICIPATED. IN ADDITION, LIMESTONE IS POROUS AND WILL BE DIFFICULT TO DEWATER. EXCAVATIONS INTO AND THROUGH LIMESTONE WILL BE DIFFICULT AND WILL REQUIRE NON-CONVENTIONAL CONSTRUCTION TECHNIQUES AND SPECIALIZED EQUIPMENT.

NOTE 3. BASED ON REVIEW OF THE 'POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA' MAPS PUBLISHED BY THE USGS, THE POTENTIOMETRIC SURFACE ELEVATION, OF THE UPPER FLORIDAN AQUIFER AT THE PROPOSED GRAVITY WALL LOCATION IS ON THE ORDER OF APPROXIMATELY +5 Feet, NGVD. THE CONTRACTOR'S TOOLS AND CONSTRUCTION METHODS SHOULD ADDRESS AND HANDLE A POTENTIOMETRIC LEVEL UP TO +5 FEET, NGVD, AT NO ADDITIONAL COST TO THE DEPARTMENT."

• **Report of Core Borings** - Plan Sheets GT-1 – GT-3 (EXHIBIT 10)

NOTE BASED ON REVIEW OF THE 'POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA' MAPS PUBLISHED BY THE USGS, THE POTENTIOMETRIC SURFACE ELEVATION, OF THE UPPER FLORIDAN AQUIFER ALONG THE PROJECT ALIGNMENT IS APPROXIMATELY +2 to +5 FEET, NGVD 29. THE PROJECT IS LOCATED IN AREA KNOWN FOR SPRING ACTIVITY. FOUNDATION EXCAVATIONS WILL BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE. THE CONTRACTOR SHOULD BE PREPARED TO HANDLE THIS POTENTIOMETRIC LEVEL IF ENCOUNTERED AT NO ADDITIONAL COST TO THE DEPARTMENT."

It is also important to note that the Pond Boring Location Plan and Soil Profiles indicate the following conditions which provide additional information and details to be considered and utilized by the Contractor in determining the subsurface features present within the general project site:

• **Soil Profiles and Boring Location Plan (Ponds)** - Plan Sheets 152-160, 164-168, 173-180 (EXHIBIT 11)

NOTE 2. THE MATERIAL FROM STRATUM 7 IS ROCK (LIMESTONE) AND SHOULD BE ANTICIPATED TO BE ENCOUNTERED AT VARIOUS DEPTHS THROUGHOUT THE SUBSURFACE PROFILE. THE CONTRACTOR SHALL ANTICIPATE THE NEED FOR SPECIAL EQUIPMENT AND/OR PROCEDURES TO FACILITATE ROCK EXCAVATION...VARIATION IN THE DEPTH AND CONSISTENCY OF THIS MATERIAL SHALL BE ANTICIPATED. IN ADDITION, THIS MATERIAL MAY BE POROUS AND DIFFICULT TO DEWATER.

NOTE 4. BASED ON REVIEW OF THE 'POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA' MAPS PUBLISHED BY THE USGS, AND THE PROJECT SITE ELEVATIONS, ARTESIAN CONDITIONS SHOULD BE ANTICIPATED TO BE ENCOUNTERED AT VARIOUS LOCATIONS DURING THE POND EXCAVATIONS. IT SHOULD BE NOTED THAT THE PROJECT_SITE IS LOCATED IN AN AREA KNOWN FOR SPRING ACTIVITY, AND EXCAVATIONS MAY BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE, IN ADDITION THE NEAR-SURFACE

LIMESTONE CAN BE POROUS AND PERMIT HIGH ARTESIAN FLOW VOLUMES. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN WATER BY HAVING ADEQUATE DE-WATERING EQUIPMENT AND METHODS AVAILABLE ON-SITE DURING POND EXCAVATIONS, AT NO ADDITIONAL COST TO THE DEPARTMENT

- Furthermore, the SWPPP included with the Contract Plans (EXHIBIT 8) and adopted by the Contractor is in their signed and sealed SWPPP & ERCP (EXHIBIT 12) as required by Developmental Specification 104 (EXHIBIT 13). **Stormwater Pollution Prevention Plan - Plan Sheet 313** (EXHIBIT 8 – Page 2 & EXHIBIT 12 – Page 7)

NOTE 5. DEWATERING OPERATIONS - BASED ON REVIEW OF THE 'POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA' MAPS PUBLISHED BY THE USGS, AND THE PROJECT SITE ELEVATIONS, ARTESIAN CONDITIONS SHOULD BE ANTICIPATED TO BE ENCOUNTERED AT VARIOUS LOCATIONS DURING THE POND EXCAVATIONS. IT SHOULD BE NOTED THAT THE PROJECT SITE IS LOCATED IN AN AREA KNOWN FOR SPRING ACTIVITY, AND EXCAVATIONS MAY BE SUBJECT TO THE POTENTIOMETRIC WATER SURFACE, IN ADDITION THE NEAR-SURFACE LIMESTONE CAN BE POROUS AND PERMIT HIGH ARTESIAN FLOW VOLUMES. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN WATER BY HAVING ADEQUATE DE-WATERING EQUIPMENT AND METHODS AVAILABLE ON-SITE DURING POND EXCAVATIONS, AT NO ADDITIONAL COST TO THE DEPARTMENT.

The numerous references cited above reinforces the need for the Contractor to employ adequate means and methods to dewater all excavations also supports the argument that the presence of groundwater within pipe trench excavations alone and as outlined in NOI #11 is simply not sufficient to indicate the presence of a "Differing Site Condition". The presence of groundwater was to be expected and the Contractor simply did not employ adequate equipment and operations to dewater the excavation to place the pipe for the project even though the conditions were clearly identified in the contract documents.

2. Contractor Submittals

Additional proof the Contractor was aware of the site conditions is detailed below. The Contractor has acknowledged the presence of the field conditions and the contract notes by including the following information on their submittals. Pertinent examples below:

- **Contractor Submittals 3.0 Stormwater Pollution Prevention Plan & Erosion Control Plan** (EXHIBIT 12 – Page 7)

  Plan Sheets 313 "NOTE 5. DEWATERING OPERATIONS – THE DEWATERING PLAN TO BE SUBMITTED WILL INCLUDE TECHNIQUES AND MEASURES THAT CAN HANDLE LARGE VOLUME GROUNDWATER FLOWS UP TO +5 NGVD."

  Erosion & Sediment Control Plan Narrative – D.A.B. accepts the Storm Water Pollution Prevention Plan on plan sheets 312-339 of the construction plans as modified herein to comply with current FDOT and FDEP policies and incorporates same as a part of this plan.

- **Contractor Submittal 4.0 Signed & Sealed Dewatering Plan** (EXHIBIT 12 – Page 35)

  Dewatering Operations Narrative – The Department has informed D.A.B. that artesian conditions should be expected during pond excavations. It should be noted that the project site is in an area known for spring activity, and excavations may be subject to the potentiometric water surface. The Department has directed D.A.B. to have suitable dewatering equipment onsite to handle a potentiometric surface of up to elevation +5 NGVD.

3. Contractor's Prior Knowledge

The Contractor possessed superior knowledge of the groundwater conditions of this project prior to letting. The contract requires this knowledge to be considered at bid time in Special Provision Article 2-4 which states the following: (EXHIBIT 14)

"Examine the Contract Documents and the site of the proposed work carefully before submitting a proposal for the work contemplated. Investigate the conditions to be encountered, as to the character, quality, and quantities of work to be performed and

materials to be furnished and as to the requirements of all Contract Documents....The Department does not guarantee the details pertaining to borings, as shown on the plans, to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. The Contractor shall examine boring data, where available, and make his own interpretations and nary data, and shall base his bid on his own opinion of the conditions likely to be encountered. The Bidder's submission of a Proposal is prima facie evidence that the Bidder has made an examination as described in this Article. "

There is ample evidence that the Contractor undertook a careful examination of the site of the proposed work prior to the bid of this contract that would provide clear understanding of what is considered normal groundwater conditions in this area. The evidence for this examination is contained in the Contractor's Expanded Letter of Interest (EXHIBIT 15) that was submitted on March 14, 2014 in response to the Department's solicitation of design-build teams for precisely the same scope of work as this project. This design build contract was never awarded due to a procurement protest and the project was converted to a conventional bid-build contract. However, the excerpts below from the Contractor's Expanded Letter of Interest clearly show an understanding of the typical groundwater conditions in this area (bolded emphasis is taken directly from the Contractor's letter):

- Page 5 – D.A.B. Design Build Team Members

  "**James "Buddy" Ellis, Jr.** will serve as Construction Drainage Superintendent, and will manage all dewatering operations. Buddy will come to the project with more than 15 years of construction management experience, specifically in installing drainage and utility systems throughout Central Florida. He has recently completed a drainage project for Citrus County where significant artesianal flows and subsurface limestone were encountered and overcome."

- Page 9 – Subsurface Conditions

  "The D.A.B. Team has recent experience dealing with artesian water flows common to the Citrus County area. This experience will allow for efficient identification of artesian flows and implementation of appropriate abatement procedures. We acknowledge the Department's plan for stopping or curbing the artesian flow as detailed in the RFP and Concept Plans."

  "Potential for artesian flow condition - The project area is located in an area known for spring activity. Excavations associated with drainage or foundations will be subject to the potentiometric water surface and possibly an artesian flow condition up to elevation +5 feet, NGVD. In addition, the near surface limestone allows for high ground water flow volumes. Ground water control techniques will be developed during design to minimize the effects of the potential artesian conditions."

- Page 10 – Advantages and Added Value

  "More experience on US19 in Central Florida than any other Team, including working with artesianal flows and cap rock."

Based on this previous investigation of the site and written affirmations by the Contractor, it is clear the Contractor expected difficult groundwater conditions, including artesian flows. As such, there can be no claim of differing site conditions now.

4. Failure to Demonstrate Differing Site Condition

A "differing site condition" in defined in the contract (Standard Specification 4-3.7) [Check this reference against the project contract] as "...subsurface or latent physical conditions ...differing materially from those indicated in the Contract, or...unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract..."

In addition to this clause, the Contract requires, through the Plan Note below, the Contractor to establish the phreatic[3] groundwater levels in all areas of the project where excavations are expected. This Contract requirement is important because by establishing the groundwater condition prior to the excavation, any change in subsurface nature indicating a "Differing Site Condition" could be analyzed. The Contractor failed to follow this Contract requirement. This failure resulted in the Contractor not providing the required evidence for the Engineer to evaluate and determine whether a "Differing Site Condition" exists or not.

The Contractor did not provide "the specific differing conditions" required by Standard Specification 4-

3.7 and the Plan notes.

- Project Notes - Plan Sheet 33(EXHIBIT 5)

> GROUNDWATER ELEVATIONS SHOULD BE ESTABLISHED IN ALL AREAS WHERE EXCAVATIONS ARE EXPECTED. THE PHREATIC GROUNDWATER LEVELS ARE NOT TO BE MISTAKEN FOR ARTESIAN WATER/POTENTIOMETRIC LEVEL. BY ESTABLISHING THE PHREATIC GROUNDWATER LEVELS FIRST, WATER GRADIENT DIFFERENCES BETWEEN THE POTENTIOMETRIC HEAD AND PHREATIC HEAD CAN BE ESTABLISHED.

Differing Site Conditions Summary

In conclusion, it is the Department's position that, due to copious references to the subsurface stratum and features included in the Contract documents, the overt statements made on the Contractor's own submittals and the Contractor's previous knowledge, the presence of shallow porous limestone high water table, large volume groundwater flows and artesian conditions was a known condition. Even then, the Contractor failed to provide the required burden of proof for "the specific differing conditions" required by Standard Specification 4-3.7 and the Plan notes.

Considering the numerous examples of supporting evidence referenced above and especially detailed contract language, the Department requests that the Board recommend no entitlement to the Contractor for time or money associated with this alleged differing site condition.

Normal Dewatering

The Contractor issuance of Notice of Intent to Claim #11 – Artesian Flow Encounters and Notice of Intent to Claim #41 – Extra Work and Delay Associated with Backfill Under Wet Conditions (NOI#41) (EXHIBIT 3) *submitted January 19, 2018*-states, in summary, that normal dewatering efforts are not feasible as pipe trenches cannot be dewatered and coarse aggregate is required to be installed.

This section will review the contractually required dewatering efforts and demonstrate through evidence depicted in project records that the Contractor only deployed normal dewatering methods in a few isolated areas on the project which, when properly employed, were effective at controlling the groundwater. On most of the project site, the Contractor failed to install and utilize "normal dewatering" methods as called for in the Contract and continued to utilize coarse aggregate as bedding stone in lieu of "normal dewatering" methods. The bedding stone was utilized without direction from the Engineer and was done so for the Contractor's convenience.

1. Required Dewatering Efforts

Not only does the contract indicate artesian conditions, but it also provides pertinent information regarding typical groundwater conditions as well. The Seasonal High Water Table (SHWT) indicated on the Roadway Profile Sheets (EXHIBIT 16) ranges from +4.2 feet to +8.5 feet NGVD throughout the project, whereas the proposed flow line elevations of the storm sewer are between elevations –2 feet and +3 feet NGVD. Given the large elevation differences and the indication of artesian conditions, the Contractor should have anticipated the need for significant dewatering systems throughout the entire project.

Standard Specification 125 (EXHIBIT 17) governs the equipment and methods necessary for the construction of underground storm sewer installations. It states in part:

> *Specification 125-8.1.2 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps, wellpoints and header pipe and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, perforated pipe drains, sumps and siphons.*

It is important to note that the Specification outlines the methods in plurality. In conjunction with the other contract documents indicating high groundwater table and artesian conditions, this specification clearly indicates that a combination of methods referenced in this specification would need to be provided to effectively dewater storm sewer trenches. Indeed, the Contractor's signed and sealed Dewatering Plan as submitted (EXHIBIT 12) indicates the Contractor will utilize well points, sock drains and Kelly Wells (sump pumps).

To that end, the Erosion and Sediment Control Designer and Reviewer Manual, included in the contract via Developmental Specification 104, states common dewatering methods for use in Florida include rim ditches, sock drains and wellpoints (see excerpt below). These are "normal dewatering methods" for drainage pipe installations in Florida. However, the magnitude of their usage is predicated on the anticipated groundwater conditions that should have been expected by the contract. The number of concurrent dewatering methods (and pumps) will vary depending on the depth of the excavation, anticipated groundwater table and artesian conditions. For pipe trench dewatering, a common example includes installing well points and well point headers on both sides of the trench. Pumping should then commence prior to the anticipated trench excavation. This system should then be run continuously and

unabated to draw down the subsurface water and then employ localized Kelly Wells (sump pumps), if necessary.

State of Florida Erosion and Sediment Control Manual

Types of Dewatering Methods

In Florida, the following three types of dewatering methods are most commonly used:

Rim-ditching – Rim-ditching is a method where a ditch is excavated along the inside perimeter of the excavation area and a pump is used to keep the level of the ground water below the bottom surface of the excavation. This type of dewatering method is usually the least expensive of the methods, requiring only a trash pump and backhoe. However, it produces the dirtiest water, which must be treated prior to offsite discharge. While rim ditching may be the cheapest method of construction dewatering, potential costs of water treatment prior to discharge may result in much higher costs.

Sock pipe/Horizontal wells – This method of dewatering includes the installation of perforated plastic pipes, usually wrapped in geofabric, in a horizontal fashion on the inside of the excavation pit. The plastic pipes are then attached to a pump. While this method is more expensive to install than the traditional rim ditching, it does produce significantly cleaner discharge water. Initial installation of the sock pipe is limited to 15-20 feet; however, deeper dewatering depth can be achieved in phases. The use of sock pipe is limited in clay soils.

Well-point systems – This method of dewatering includes the installation of multiple shallow wells that are attached to a main collection pipe attached to a central pump. Well-point systems are typically used in linear projects such as installation of pipelines and culverts in roadways and shallow linear ponds. The cost of this method is the most expensive of the three methods; however, it produces the cleanest water.

It is common for underground Contractors to utilize multiple runs of well points and header pipes on both sides of the trench excavation (multi-stage) in areas of shallow water tables or where deep (>10') drainage installations are necessary. In fact, the State of Florida Erosion and Sediment Control Designer Manual (July 2013) states well points are typically used in linear projects such as installation of pipelines and culverts in roadways and shallow linear ponds. It is important to note that the Contractor never attempted the multi-stage approach even though many of the storm sewer installations on the project were in excess of ten (10) feet deep.

2. Successful Dewatering

In the instances where normal dewatering occurred, the Contractor successfully installed storm sewer in some of the deepest and widest excavations on the project. The main example of this success is 900 linear feet of Pond 3 trunk line along Homosassa Trail. This trunk line is among the largest diameter storm sewer pipe on the project (66" Reinforced Concrete Pipe (RCP) and 53" x 83" Elliptical Reinforced Concrete Pipe (ERCP)). On the few runs of pipe where well points were used, the Contractor began dewatering efforts with a single row of well points and header pipe offset to only one side of the proposed excavation. On January 17, 2017 during backfill and compaction efforts on Homosassa Trail, the excavation on the South side of the drainage pipe was experiencing saturated conditions and the Contractor claimed that artesian conditions were to blame. A meeting was held with the Contractor and the Dewatering subcontractor on January 24, 2017 to discuss the efficacy of the well points along Homosassa Trail. During this meeting, the Contractor and Subcontractor both conceded that the well points, installed only on one side, the North side, of the excavation, were ineffective due to an inadequate area of influence provided by the well points on the North side of the excavation. On January 26, 2017, the Contractor then installed a second header pipe with well points along the South side of the proposed excavation for the Pond 3 Trunk line along Homosassa Trail which proved to be effective in dewatering the trench.

It is important to note that when installed correctly, the well point system was effective with the inclusion of sumps (Kelly Wells) to draw down the water table to below the flow line of the pipe, thus demonstrating that "normal dewatering methods" were effective in some of the deepest and widest excavations on the project. This fact was re-affirmed by the Contractor in a letter entitled Dewatering Concerns Submittal dated February 24, 2017 (EXHIBIT 18). This letter indicated that the well point system and sump pumps completely controlled the groundwater. It is also important to note that the effectiveness of this 900 linear feet installation of well points refutes the statement in the Contractor's Dewatering Plan (EXHIBIT 12- Page 35) that states *"well points are not efficient for long runs of pipe"*.

During the Construction of the Pond 3 trunk line along Homosassa Trail, when operated correctly and continuously, the combination of the well point system and additional sump pumps was effective at drawing down the groundwater below the bottom of the storm sewer pipe. (EXHIBITS 50-52) On occasions, when the pumps were operated intermittently or experienced maintenance failures as reported on Daily Work Reports (DWR) on numerous dates between January 11, 2017 and August 18, 2017, groundwater levels within the pipe trench rose to levels above the flow line of the pipe. This fact is demonstrated visually through photographic evidence attached to the DWR. The intermittent use of pumps does not constitute "normal dewatering methods."

Due to the inability to dewater, primarily because of both the intermittent performance of the dewatering system pumps, and due to inadequate methods being employed, the Contractor under their own volition began installing coarse aggregate as bedding stone under the storm sewer pipe to aid in the dewatering effort. This method was utilized without direction from the Engineer and considered to be at the Contractor's convenience.

3. Unsuccessful Dewatering

The Department acknowledges that the Contractor had difficulty dewatering storm sewer trenches throughout the remainder of the job. There are several reasons for this, none of which relate to "above normal" pumping methods being used. Instead, the Contractor's difficulty and lack of success was attributable to the following poor methods of dewatering. Several instances of the following shortcomings are referenced on selected DWR between January 13, 2017 and August 7, 2020. (EXHIBITS 21-112)

- Abandonment of well point systems - Despite being successful on the Homosassa Trail run, after August 2017 when the connection of the Pond 3 system was completed and connected to the US 19 ROW at the intersection of Homosassa Trail near structure S-73A, the Contractor never attempted to install any additional well point systems for storm sewer installation.
- Relying solely on Kelly Wells - All dewatering efforts between August 2017 through the conclusion of the major drainage operations (Pond 3 & Pond 4 systems) on August 7, 2020 consisted of localized sump pumps operating only within the excavation during the pipe laying operations.
- Lack of maintenance of Kelly Wells – While the Contractor acknowledged that Kelly Wells will produce the most turbid discharge water in their Dewatering Plan 4.1 (Exhibit 19 – Page 6), they failed to properly maintain the system. As a result, the capacity of the Kelly Wells was greatly reduced and subsequent downtime to remove clogs allowed the groundwater to return to the trench excavation.
- Limited and intermittent usage of pumps - in most cases a singular Kelly Well in the excavation was installed each shift only after the excavation commenced and was only in operation during the active hours of drainage system installations. In other words, these pumps were only operating intermittently. The intermittent sump pumping operation alone is not an effective dewatering method typically deployed by contractors for underground installations.
- Inefficient operations by Contractor – several documented instances of inefficient dewatering operations hindered the Contractor's progress throughout the storm sewer installation process. Some pertinent examples include:
    - In Pond 3, within the interconnecting storm sewer between pond cells, the well points and header pipe were installed in direct conflict with the location of the storm sewer and trench. The well points were removed, and the storm sewer operation continued without reinstalling the dewatering components but with the use of coarse aggregate.
    - Failure to properly prevent recirculation – this failure occurred in multiple instances. In one documented instance, the CEI observed water flowing back into excavation from previously installed drainage pipe. The Contractor acknowledged the pipe was not appropriately plugged in an email (EXHIBIT 20).
    - When dewatering was attempted outside of active working hours, pumps would shut off or run out of fuel.

The Contractor's dewatering systems posed several inefficiencies such as non-continuous use, improper maintenance including pumps running out of fuel, improperly maintained pump hoses, under sized pumps, inadequate operation and poorly maintained sediment ponds were referenced frequently on the DWRs. Sometimes, the discharge hoses were even permitted to recirculate effluent back into the excavated trench producing low or reduced dewatering efficacy.

To be clear, when a dewatering operation is restricted to the sole use of Kelly Wells which are run intermittently, the drawdown of the water level is insufficient to excavate, place pipe, and properly compact the backfill in an efficient manner. Groundwater levels can and should be lowered using more than one method to accomplish the dewatering process. Doing so conforms to "normal dewatering methods" as described in the Standard Specification 125.

Normal Dewatering Summary

The Contractor did not adequately dewater the storm sewer trenches on the project by providing normal dewatering equipment or methods as clearly required by the contract documents. The Contractor failed to install additional well point systems or sock drains for the installation of the storm sewer system along US 19 and failed to properly use and maintain Kelly Wells. Instead, the Contractor deployed dewatering in a haphazard and inconsistent fashion which did not match the conditions as shown in the contract and was clearly inadequate to control site conditions.

The Contractor failed to demonstrate that normal methods would be ineffective. Had the Contractor demonstrated through deployment of consistent and continuous methods and equipment as outlined in Specification 125-8.1.2, the Department would have been able to address the question as to whether or not there was a requirement by the Contractor for "dewatering in excess of normal pumping throughout the project" as addressed in the question presented by the Contractor. As such, the Contractor is not due any payment for the use of select material and bedding stone in accordance with the following specification:

> *Specification 125-8.3.4 Backfill Under Wet Conditions: Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing. The Department will pay for any select material which is not available from the grading as Unforeseeable Work. The Department will not pay for select material that might be used by the Contractor for his own convenience instead of dewatering.*

The direct inclusion of the word "may" does not require the Engineer to direct the procedure which authorizes payment for the use of bedding stone as the Contractor has stated in NOI #41. The inclusion of the word "may" dictates the need for the Engineer to grant permission upon demonstration by the Contractor that normal dewatering methods were ineffective. As this demonstration was never provided by the Contractor, the Department did not specifically direct the use of bedding stone in the storm sewer pipe trenches and considers its use by the Contractor for his convenience.

Considering the numerous examples of supporting evidence referenced above and included as supporting backup the Department requests the Board recommend no entitlement to the Contractor for time or money associated with dewatering in excess of normal pumping.

D.A.B. Constructors, Inc.

Heavy Civil Construction Solutions

Rebuttal

January 6, 2020

Extra Work and Delay due to Extreme Dewatering

Prepared by Foster Bachschmidt

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Introduction

D.A.B. has carefully reviewed the Florida Department of Transportation's ("FDOT") twelve-page Position Paper along with its supporting documents. The Department's Position Paper was transmitted via email on December 27, 2020. After a careful review, several statements made by FDOT therein are presented as factual but are instead the opinion of the Construction Engineering and Inspection ("CEI") firm and FDOT. While D.A.B. has provided several reputable sources for the information pre- sented within our Position Paper, FDOT's paper sites no reputable outside sources, except for defining "artesian" via Wikipedia, which is a source that can be edited by anyone at any time. It is important to note that many of the statements made by FDOT in its Position Paper are conjecture and are not substantiated by the texts, reports, and expert advice available to D.A.B. at the time of this Rebuttal being drafted.

In its arguments, FDOT cites no sources other than the Contract Documents and uses no supporting information beyond that established within the Contract's bounds. As such, many of the statements made in FDOT's Position Paper are baseless and unsupported by anything other than their own opinion.
D.A.B. made every effort to support its position and basis for entitlement with the Contract Documents, relevant publications, expert advice, and experience. This fundamental difference in approach is telling, and it supports D.A.B.'s claim that FDOT and the CEI's position regarding the matter is arbitrary and capricious.

Differing Site Conditions

In their Position Paper, FDOT and the CEI assert that:

> *"... the contract documents clearly spell out the site conditions through Standard Specifications and plan notes, which were acknowledged by the Contractor by virtue*

of executing the contract (and thereby accepting all contract documents) as well as in their own submittals."

D.A.B. has stated clearly that the exculpatory plan notes are foreboding and worrisome. However, they are still standard in nature, as evidenced by comparing these notes to the plan notes on other projects subject to substantially less dewatering effort than the Project in question. FDOT's reliance upon these notes is foolhardy as each note wholly lacks specificity and does not clearly depict the tremendously unique and adverse conditions presented by the Project. In fact, the Plan Notes serve to support D.A.B.'s prior experiences in the area, and work on adjacent projects supports the same. The statements made by FDOT and the CEI in their Position Paper beg the following questions:

- Where can the Contractor find site-specific dewater- ing rates to be expected within the Contract Documents?
- Where can the Contractor find site-specific volu- metric results from pump tests conducted by FDOT and the EOR within the Contract Documents?
- Why did FDOT not remove or alter Standard Specifica- tion 125-8.3.4 if they expected such extreme dewatering?

Without the answers to the above questions, it would be all but impossible for a Contractor to reasonably presume that the conditions would be as bad as they were. Nothing contained within the Contract Documents serves to stear the Contractor to a valid understanding of the actual conditions and their severity.

We believe that FDOT and the EOR expected site-specific dewatering conditions to be challenging, as did D.A.B. Rather than attempting to clearly and legally define what to expect, FDOT and the EOR tried to include as many exculpatory notes as possible to account for any uncertainty. However, it is not the number of notes in a set of plans that alleviate the potential for differing site conditions. **The quality of a single note can, though.** Had the EOR conducted just a few pump tests during the Project's geotechnical evaluation, the conditions could have been clearly defined and bid appropriately. The bidders could not conduct such tests before the bid because applicable permits were not yet in place, but the EOR could have obtained these permits before completing the design. The failure to conduct a pump test only serves to downplay the concerns for dewatering efforts and indicates to bidders that the conditions would be similar to other dewatering efforts in the area. As such, not enough information is provided within the Contract Documents to raise concern amongst bidders or prompt a Bid Question to seek additional information.

Rather than providing specific information, the notes lead the bidder to conclude, as FDOT and the CEI have on Page 2 of their Position Paper, that "large volumes of groundwater flow" should be expected. The term "large volume" has no specificity and is wholly subjective. One reader could assume large volume relates to any other metric. Large volume compared to other projects in the State of Florida? Large volume compared to other projects in Citrus County? Large volume compared to other projects in Homosassa Springs? How can a reasonable bidder understand this as anything other than a generic warning? Without specificity, the plan notes are subject to interpretation. D.A.B.'s inter- pretation of the plan notes was fair and reasonable, but wrong based on actual conditions encountered. No reasonable bidder could gain a clear understanding of what to expect from the plan notes provided. Even USGS studies do not draw particular attention to the Homosassa Springs area; instead, they draw attention to the larger Citrus County area (see attached studies for reference).

Moreover, the plan notes state, "The Contractor's methods and dewatering equipment shall be prepared to handle artesian water up to a head elevation of +5 feet, NGVD 29, at no-additional cost to the Department." On its face, this note is concerning but is seen in other plan sets throughout the District, as evidenced in D.A.B.'s Position Paper. Importantly, this note cannot be used to calculate dewatering rates because it wholly lacks a critical piece of information – time. Once the aquifer is opened to the atmosphere, how fast does the water achieve the +5 feet, NGVD 29 head elevation? Does the aquifer have the capacity for recharge? At what rate does the aquifer recharge? Also, without information regarding the porosity or hydraulic conductivity of the "Weathered Limestone," dewatering rates cannot be predicted beyond an educated guess. This information is crucial in discerning the expected infiltration rates. Without these essential variables, most importantly – **time**, it is impossible to arrive at any expected dewatering rate, which is a ratio of ***volume over time***. Had some practical information been provided as to how long it takes a given excavation to fill to this potential head elevation (rate of inflow from the artesian source), the bidders would have had a better chance of understanding the conditions. Again, FDOT

and the EOR failed to do the work necessary to specify the conditions to be expected. Instead, they relied on broad sweeping generic exculpatory notes.

To make their point, the FDOT and CEI have cast a broad net, dragging in information that is neither relevant nor helpful to their case. D.A.B. is and was the most experienced bidder on the Project.

D.A.B. was the bidder best suited to understand the severity of the conditions these ambiguous excul- patory notes attempted to define. Yet, that experience did not prove sufficient in fully understanding the unique conditions to be encountered. D.A.B. expected, and our bid included dewatering "large volumes" and dealing with "artesian conditions" as specified by FDOT, that is not our dispute. The dispute is that the "large volumes" and "artesian conditions" anticipated in our bid were exceeded by seven times. The Contract Documents did nothing to inform D.A.B. that our understanding of "large volumes" and "artesian conditions" were fundamentally different than what would be encountered. The number of notes in a plan set does not alleviate a differing site condition; the notes' quality does. That was missing on this Project, and that is why a dispute over differing site conditions exists.

Normal Dewatering

Merriam-Webster defines normal as "according with, constituting, or ***not deviating from a norm***, rule, procedure, or principle." To say that the Contractor should interpret the word normal with site-spe- cific caveats is arbitrary and capricious. The Standard Specifications define normal dewatering equipment in Specification 125-8.1.2, which lists five specific types of dewatering equipment. D.A.B. consistently employed three of the five pieces of equipment listed under this specification. The CEI and FDOT's allegation that we did not is false. Surface pumps, sump pumps (Kelly wells), and trenching/ digging machinery were employed each day during underground construction operations. While using **most** of the equipment listed as "normal" in Specification 125-8.1.2, D.A.B. was consistently unable to achieve a stable foundation in almost all trench excavations. This instability is predicted by *Construc- tion Dewatering and Groundwater Control*, based upon the conditions to be encountered.

D.A.B. believes that the spirit and intent of Specification 125-8.3.4 directly correlates with the advice provided in *Construction Dewatering and Groundwater Control* in that when normal pumping methods are unable to achieve a stable foundation in a given excavation, gravel bedding stone must be used. Specifically, *Construction Dewatering and Groundwater Control* states that: "when water is entering up through the bottom of an excavation, it is necessary to overexcavate 1 ft. (0.3 m) or more and place a layer of gravel, which will drain the water to the sides and provide a dry and stable sub- grade." This statement correlates with Specification 125-8.3.4 as artesian conditions cause infiltration from the bottom (and sides) of a given excavation and often result in an unstable trench foundation. These conditions are not normal, as most trench excavation for underground work in Florida does **not** encounter artesian conditions.

The argument for the use of well-points is self-serving, and is the only basis FDOT and the CEI have for denying compensation for bedding stone placement. Moreover, the CEI and FDOT's argument for the use of well-points stands in direct conflict with the guidance provided by engineering texts and hydrogeological experts in the field of construction dewatering. Well-points are not capable of dewatering at a rate commiserate with the infiltration rates experienced on the Project, as demonstrated in D.A.B.'s Position Paper. Well-points have highly variable dewatering rates based upon the conditions in which they are employed. The variable dewatering rate is evidenced by the capacity range cited for well-points in Table 16.3 of *Construction Dewatering and Groundwater Control.* It is between 0.1 GPM and 25 GPM per well-point unit. For these reasons, Table 16.1 of *Construction Dewatering and Groundwater Control* states that "hard fissured rock" is one condition favorable to open pumping, as are "dense well-graded granular soils, especially those with some degree of cementation or cohesive binder." Moreover, the pump tests utilizing well-points conducted by D.A.B. along Homosassa Trail were an utter failur, which substantiates the guidance provided in *Construction Dewatering and Groundwater Control.* D.A.B. only succeeded on Homosassa Trail due to our use of surface pumps, large Kelly Wells and bedding stone.

As FDOT and the CEI highlight in their Position Paper, the soil conditions referenced above were clearly depicted in the Contract Documents, specifically in the Roadway Soil Survey. These soil conditions require open pumping. Because of this, D.A.B. bid and built the Project using means and methods that were most effective for the conditions shown and encountered. While the dewatering rates were tremen- dously higher than anticipated, the means and methods necessary to overcome them remained the same; it merely took substantially longer and significantly more

effort. Without using bedding stone to provide a stable foundation, constructing the Project would have been impossible. D.A.B. did not allow FDOT and the CEI's constant badgering and conjecture regarding our means and methods to deter us from doing the right thing. D.A.B. pursued the Project in the most efficient, efficacious, and expeditious manner possible. The CEI and FDOT refused to utilize D.A.B.'s experience, and they ignored third-party sources of information to either substantiate or disprove D.A.B.'s position. Instead, FDOT and the CEI relied upon their own opinions. Had D.A.B. listened to their advice, we would still be trying, fruitlessly, to construct the Project.

Conclusion

D.A.B. is entitled to compensation for Extra Work and Delay for dewatering efforts that exceeded "normal pumping," which resulted from a Differing Site Condition. FDOT and the CEI have made several valid arguments regarding D.A.B.'s experience in Citrus County. We have spent a lifetime working around Homosassa Springs, but all of that experience proved insufficient in saving FDOT from their failure to describe the Project's conditions accurately. The EOR, whose job was defining these conditions, also failed to do so accurately or adequately. Why should D.A.B. be penalized for these failures when we did everything we could to bid on the Project using all of the information available properly? With the information provided within the Contract Documents and our intimate knowledge of the area, even we could not have predicted the extreme dewatering we would encounter. When we encountered these conditions, we chose to educate ourselves further and learn from the situation to reduce time and cost overruns for the taxpayer. In comparison, FDOT and the CEI made every effort to obfuscate D.A.B.'s efforts and progress.

Contract # T7383 / FIN: 405822-2-52-01

SR 55 (US 19)

W. Green Acres to W. Jump Court

Citrus County, FL

FDOT Rebuttal Paper

DRB Hearing - January 11, 2021

Exhibit 1 Contractor's DRB Position

Exhibit 2 NOI 11 - Artesian Encounters

Exhibit 3 Exhibit 3NOI 41 Extra Work and Delay

Exhibit 4 Specification 4-3.7

Exhibit 5 Project Notes

Exhibit 6 Report of Core Boring Box Culvert C-3

Exhibit 7 Roadway Soil Survey

Exhibit 8 Bid Plans SWPPP Notes

Exhibit 9 Report of Core Borings Gravity Wall

Exhibit 10 Report of Core Borings Signals

Exhibit 11 Pond Boring Location Plans & Soil Profiles

Exhibit 12 DAB Dewatering Plan

Exhibit 13 Specification 104

Exhibit 14 Special Provision 2-4

Exhibit 15 E7J19 DAB Cardno DB ELOI

Exhibit 16 Roadway Profile Sheets

Exhibit 17 Specification 125

Exhibit 18 Dewatering Concerns L0042 Response

Exhibit 19 Dewatering Plan Sub 4.1

Exhibit 20 Dave Nyenhuis Email

Exhibit 21-112 Daily Work Reports

Exhibit 113 Pump Curves and Flow Rates

Exhibit 114 Construction Dewatering

Exhibit 115 DEP Email

Exhibit 116 Dietermer Headloss

Exhibit 117 1.24.17 Email W/ Tierra Findings

Exhibit 118 Pump Records

DEPARTMENT RESPONSE TO CONTRACTOR POSITION PAPER

Contract T7383

FPN: 405822-2-52-01

The Department would like the Board to consider the following rebuttal points including Exhibits 1-118 to assertions made in DAB's position paper. This rebuttal intends to clearly demonstrate the following pertinent points:

1. **Project Note Applicability – DAB claims that the project notes depicting artesian conditions do not apply to this project. We will show the project plan notes referring to artesian conditions accurately describe conditions that were encountered and are only used for**

appropriate projects with artesian conditions in conjunction with the Specifications at time of bid.

2. **Dewatering Calculations – DAB claims that the contract documents do not allow for accurate dewatering calculations. We will show the contract documents clearly allow the bidders to accurately estimate dewatering efforts.**

3. **Dewatering Magnitude – DAB claims that they have dewatered at rates of up to 15 million gallons per day (MGD). We will show evidence of the dewatering undertaken by DAB is significantly less than the rate they have asserted.**

4. **Department Response – DAB claims that the Department took an arbitrary stance on project dewatering and placed all responsibility on the contractor. On the contrary, we will show when the contract-required dewatering was not effective to facilitate underground construction, the Department responded by providing a re-design of the pertinent item.**

1. Project Note Applicability

As we demonstrated in our position paper, the Department provided ample plan notes to alert the contractor to the groundwater conditions that would be encountered. Despite claiming that the groundwater is a differing site condition, DAB freely acknowledges this fact in their position paper by indicating the plan notes are "drawing attention to potential artesian conditions in the project's vicinity".

First, DAB attempts to sidestep the project notes by identifying them as standard and exculpatory. They assert the use of similar plan notes on other projects with purportedly less difficult subsurface conditions invalidates the contract language. However, the use of these plan notes is far from standard and is carefully considered for projects where the karst geology would lend itself to the potential for artesian conditions. Furthermore, these projects referred to by DAB were let after the subject contract, refuting the notion that our plan notes were diminished by their inclusion. Even if they were let prior to this contract, the projects which DAB references qualify for the use of similar notes:

- **T7407 – this project is directly adjacent to Homosassa Springs, Halls River Springs and the spring network at Crystal River and has hydrogeological conditions virtually identical to this project.**
- **T7438 – this project is in northern Pasco County and is subject to some of the most frequent sinkhole activity in the State due to its interaction with the Upper Floridan aquifer. It is acknowledged that it is not as close to a spring as the current project. That is why any reference to the word "spring" is removed from the version of the note in this project. Finally, the elevation for which the contractor should expect the potentiometric surface has been adjusted. This adjustment to the note clearly indicates it is not exculpatory but alerts the bidders to the unique conditions they will encounter and base their bid on.**

Second, DAB asserts that the plan notes are irrelevant because of the Upper Floridan Aquifer's unconfined nature. However, in DAB's introduction, the statement is made that in the area of Homosassa Springs the Upper Floridan Aquifer is confined by a layer of thinly mantled limestone and has a surficial aquifer above it. It is unclear what DAB is asserting here. Still, it should come as no surprise that unconfined groundwater is present on this project. The groundwater table (GWT) elevations are clearly denoted on the plan cross-sections. Additionally, the project notes contemplate both unconfined (phreatic) groundwater elevations as well as confined (potentiometric) groundwater surfaces and require the Contractor to use piezometers to determine the difference between the two.

Lastly, in their position paper, DAB attempts to discount the validity of data provided by piezometers for this project by referencing that the EOR used misleading piezometer data to determine groundwater conditions. However, the project notes state that the potentiometric surface elevation was derived from "The Potentiometric Surface of the Upper Floridan Aquifer West-Central Florida" maps published by USGS. It is understandable why DAB has taken this position, as they never took piezometer readings in the vicinity of any pipe trench operations that would actually validate their argument of excessive dewatering. As noted in our position paper, this would have given FDOT the opportunity to accurately determine if a differing site conditions existed.

2. Dewatering Calculations

In their position paper, DAB asserts that specific dewatering rates cannot be calculated from information provided in the contract documents. However, the plans give appropriate information to perform such

calculations. For phreatic groundwater, the contract documents give GWT elevations for cross-sections throughout the job as well as soil borings for estimating hydraulic conductivity. For artesian conditions, the plan notes reference the Contractor's need to plan for large volume groundwater flows up to +5 NGVD. Therefore, the absolute minimum consideration the Contractor must assume for bid purposes is a drawdown of water from the potentiometric surface of +5 NGVD to the required excavation depth with a very high hydraulic conductivity. Instead, according to their position paper, DAB chose to bid 2 MGD based on "local project experience" with an arbitrary percentage increase. It should be noted that the flowrate DAB chose to bid is equivalent to less than 1500 GPM, which can be easily achieved with a single 6" pump. (EXHIBIT 113 pg. 7). By inspection, this bid assumption is entirely inadequate for conditions clearly indicated in the plans. Certainly, a poor choice for a company who touted themselves as having superior knowledge of the groundwater in Citrus County (EXHIBIT 15 pg. 5,9,10).

This explicit +5 feet NGVD elevation is useful in determining the dewatering methods to employ on the project. In their position paper, DAB references the book Construction Dewatering and Groundwater Control which they indicated "supplemented their dewatering knowledge". Section 16.3 (EXHIBIT 114 pg. 4) of that book states that the "wellpoint system is the most versatile of pre-drainage methods, being effective in all types of soils" and hydraulic conductivity ranges with rates of pumping from a few Gallons Per Minute (GPM) to thousands of GPM. The employment of these "wellpoint systems are most suitable in shallow aquifers where the water level needs be lowered by no more than 15 or 20ft." (EXHIBIT 114 pg. 4) By referencing the +5ft NGVD elevation in the plan notes for the potentiometric surface as well as similar values in the plans for the phreatic surface, this data informs all potential bidders the Department considered the application of practical normal dewatering methods. All the storm sewer excavations on the Project are within 10ft of the plan stated +5 feet elevation NGVD, making all Project storm sewer installations practical with normal dewatering methods as the head drawn down is well within well point capabilities.

In an attempt to belittle the efficacy of wellpoint dewatering in their position paper, DAB selects a system from a dewatering example in Construction Dewatering and Groundwater Control. They indicate this textbook example has a theoretical capacity of 1.152 MGD and they insist their wellpoint system is similar. For reasons unexplained, they indicate their system is only able to draw 550,000 gallons per day (GPD). However, upon review of the text they reference, it becomes apparent that DAB's wellpoint system is inferior to that of the text's example. The text's system calls for 2" wellpoints installed 3' apart. The system installed on the Project utilized 1.5" wellpoints and had a minimum spacing along Homosassa Trail of between 6' and 10' (Contractor's Position Paper pg. 6 Figure 5) for visual indication of the spacing). Even still, the referenced text notes that each 1.5" well point can handle 15 GPM or 22,000 GPD under continuous operation which would equate to 2.9 MGD for the 400 linear foot (double header = 800 LF) of wellpoints spaced 6' apart installed by the Contractor for the pipe installation along Homosassa Trail. However, it should be noted that to achieve this flowrate, more than one pump would be required running continuously. DAB only provided one 6" pump with both headers manifolded together which could never achieve the full capacity of the wellpoint system.

Construction Dewatering and Groundwater Control Section 19.14 (EXHIBIT 114 pg. 8) indicates that "as much as a week of pumping in advance of the excavation may be advisable". Constant maintenance is also recommended including continuous tuning (Section 19.9) or "the procedure of balancing the flow from the wellpoints, so that each draws its maximum potential water yield, without an excessive amount of air."(EXHIBIT 114 pg. 7) "When well points draw excessive amounts of air, this can overload the system causing a reduction of vacuum and thus failure to achieve the desired drawdown." (EXHIBIT 114 pg. 7) "The drawdown action is essential to wellpoint tuning." (EXHIBIT 114 pg. 5) To the CEI's knowledge, no level of well point tuning was ever performed on the system. The text also references that "Standby pumps are normally provided, installed and ready to operate....so that operation can continue during maintenance or repair," (EXHIBIT 114 pg. 6) which again the Contractor failed to provide as the Daily records show systemic intermittent use during pump maintenance.

Lastly, DAB states that a pump test would have provided the necessary information to provide accurate dewatering rates on the project. FDOT does not provide pumping tests prior to construction for the simple reason that pumping test logistics are dependent upon contractor-specific variables such as pump size to be utilized, maximum area, length and location of excavation and seasonal groundwater at time of construction. Florida contractors, including DAB, have been estimating dewatering efforts in artesian conditions for years with information similar to what is provided in this contract. Further, the pump test's effect is overstated for the purposes of estimating dewatering in pipe trenches as these excavations are relatively small.

3.Dewatering Magnitude

In their introduction, DAB correctly asserted several things regarding the nature of dewatering on the project:

- **They indicate the project is in the vicinity of Homosassa Springs.**
- **They also correctly state this artesian spring is a first magnitude spring (meaning flows of at least 100 cubic feet per second (CFS) or 64.6 million gallons/day (MGD)).**

- **It is true that over the life of the project, the project has experienced multiple depressions.**

However, contrary to their introductory statement, there is absolutely no evidence that the flow from Homosassa Springs vents were affected as a result of artesian pressure relief from project sinkholes. Indeed, this area of Citrus County is known for sinkhole activity. In fact, DAB provided evidence of this fact in their position paper (Contractor Position Paper pg. 298) where they show a database of known sinkholes in the vicinity of US 19 in Homosassa Springs. If it were true that the flowrate out of Homosassa Springs were to be negatively affected by nearby sinkholes, the springs would have long since dried up. In addition, based on conversations with Ron Basso, Chief Hydrogeologist with Southwest Florida Water Management District, typical conduits that feed the springs are found more than 35 feet below ground surface and as such, are unlikely to be significantly affected by the excavation depths of less than 10 ft associated with this project. In addition, per DAB's position paper, the spring vent itself is 70 feet below ground. While the issue above is not directly related to the dispute at hand, it is an important point as it is the first example of hyperbole throughout DAB's position paper used to overstate the level of dewatering efforts on underground construction activities.

In their "Analysis of Issues" section, DAB asserts that they immediately encountered artesian conditions when they began underground operations along Homosassa Trail and dewatered 8 MGD regularly with peak rates up to 15 MGD on "numerous occasions". It is important to note that these volumes and flowrates are completely unsubstantiated and, by DAB's submittals, impossible to achieve during storm sewer installations.

To illustrate this point, let's suppose that the wellpoint system only extracted 550,000 GPD as DAB has asserted. This leaves nearly 7.5 MGD that would still need to be dewatered through Kelly wells to achieve the 8 MGD flow rate. As photographic evidence from our position paper indicated, DAB was able to lower the water in the trench along Homosassa Trail with the wellpoint system and a single Kelly well. This means they would have had to extract over 5200 GPM to achieve the overall 8 MGD flowrate. Using pump flowrate information from DAB's dewatering plan (EXHIBIT 19 Page 11), the flowrate achievable by a Kelly Well is 1500 GPM.; this would require 4 pumps to achieve. This becomes even more problematic for the peak claim of 15 MGD, which would require 7 pumps to achieve. Site source records (EXHIBITS 21-112) never indicated a pumping effort anywhere near the level asserted by DAB during storm sewer installations.

This means that at least one of two things is true: 1) the wellpoint dewatering system was more effective than asserted; or 2) DAB encountered significantly less water than asserted. It is very likely that both are true, as additional pumps beyond those employed would still have been needed to achieve the alleged discharge rate even if the wellpoint system achieved DAB's alleged theoretical maximum flow rate of 1.15 MGD.

Another example of the greatly exaggerated assertions of required dewatering can be found in DAB's DEVO Engineering Report dated March 16, 2017. It is important to note that this report is NOT signed and sealed, likely due to statements such as the fourth bullet on PDF page 291 of DAB's position paper attachment. This bullet asserts that high levels of dewatering were connected to a drop in the flow rate out of Homosassa Springs. The associated Exhibit 8 (Contractors Position Paper pg. 297) shows two corresponding graphs and appears to show a correlation between dewatering rates and discharge flows from Homosassa Springs as measured by the USGS. However, there are several problems with this comparison:

- Based on Exhibit 8 (Contractors Position Paper pg. 297) referenced above, there are several days of alleged dewatering shown in the 3-4 MGD range. While this is 50% of the highest dewatering rate shown on the graph, there appears to be no corresponding effect on the spring discharge. There is also no appreciable change when dewatering ceases, as it did on 01/26/17. These facts cast serious doubt that there is even a remote correlation between project dewatering and spring discharge. In fact, if these dewatering rates are to be believed, this graph actually serves as evidence that DAB may have been pumping surficial groundwater instead of artesian.

- On 1/19/17, the alleged dewatering peaks at 9 MGD based on Exhibit 8. On approximately 1/24/17, the USGS graph records a low flow rate of 39 CFS which was a reduction from 93 CFS on 1/19/17. This 54 CFS drop is equivalent to over 34 MGD (EXHIBIT 115 pg. 4). It is nonsensical to assert that a pumping rate of 9 MGD is responsible for a 34 MGD reduction in spring discharge days later. Clearly the reduction of the spring's flowrate was caused by something other than DAB's dewatering efforts. In fact, DAB did not include key information that explains why the sudden drop in spring discharge occurred on the USGS chart. On January 20, 2017, the unstabilized 20' deep earthen sediment basin (not standard industry practice) being utilized by the Contractor's dewatering operation breached and, as a result, released turbid water into Pepper Creek, an Outstanding Florida Water (OFW). (EXHIBIT 115 pg. 5). This turbid water was noticed by the State Park Officials who were operating the boat trams between the Visitor Center and the Wildlife Park. The Park Officials quickly closed the control structure isolating what they called a "tsunami of dirty, slimy water filled with trash" to prevent the contamination from spreading into the Homosassa River. (EXHIBIT 115 pg. 2). The control structure remained closed over the weekend, reducing flow to the downstream USGS gage. This explanation makes much better sense as a sudden drop in flow of this magnitude is only explained by cutting off a

feeder channel upstream of the USGS site instead of diverting the aquifer flow with a couple of pumps from the dewatering operation.

- Although DAB asserts that there were numerous occasions that dewatering peaked at 15 MGD in their position paper, that rate is never recorded in this graph. This fact, coupled with DAB's failure to give the Department any data to substantiate dewatering flowrates, calls into question any claims by DAB that they excessively dewatered.

The well points were installed from January 2017 to May 2017 and their capability was exceeded when the operations were inconsistent and poorly maintained. When operated continuously the well points with the inclusion of a Kelly Well, the Contractor was able to effectively draw down the groundwater which was apparent in April 2017 (Exhibits 50-52).

Important to note that the inclusion of both well points and Kelly Wells into the system permitted both the unconfined and confined groundwater to be controlled. Limiting the operation to a sole inconsistent method could never prove as effective with the near surface limestone present in the geotechnical borings. The DEVO report noted (DAB Position Paper pg. 291), the confining layer of the Floridan Aquifer in the area is a thin mantle of limestone. The Contractor should have anticipated encountering both groundwater sources and the need to employ multiple dewatering systems when the limestone was encountered.

It appears DAB simply planned all along to use bedding stone for their convenience and had little intention of dewatering for the pipe trench work as described in their signed and sealed dewatering plan (EXHIBIT 19). Their arbitrary and capricious statement that they increased their expected dewatering volumes by an unsubstantiated 25%, was an incorrect assumption on their part. Instead, DAB chose to estimate 2 MGD which can be easily achieved with a single 6" pump. It should also be noted there were no Bid Questions asked to clarify the level of dewatering needed or concerns regarding differing site conditions.

4. Department Response - Design Changes and Alterations to the Work

DAB alleges that the Department has taken the stance that normal pumping as referenced in Specification 125 varies based on unique project conditions. DAB calls this position arbitrary and capricious and implies their position that, for all projects, normal dewatering is the same. DAB is correct in the sense that it would be arbitrary and capricious if the Department insisted on additional dewatering after normal methods have failed. However, the Contractor is obligated to assume a certain magnitude of dewatering utilizing normal methods based on unique project conditions. DAB clearly understands this concept by explaining in their position paper that they selected a dewatering rate based on "prior experience on projects nearby".

The Department applied this principle consistently across the project in accordance with the pertinent specifications. While DAB's assertion that the Department abandoned work is incorrect, design changes were made when the Contractor met the contract requirements for dewatering and those efforts proved unsuccessful. Alternate construction techniques were developed to meet the expectations of the Contract – it is important to note that the areas of redesign DAB references are not in entitlement dispute. However, the comments below will indicate how they are different from pipe installation efforts.

- The TSP associated with the Sanitary System as designed by Citrus County Utilities (CCU) for the Utility Work by Highway Contractor component of the project permitted the use of unwrapped coarse aggregate as a bedding and encasement backfill. When this method was utilized by the Contractor the larger gradation of the 57 stone permitted a higher hydraulic conductivity of the groundwater present in the trench. The Contractor also installed a localized well point system adjacent to a sanitary manhole and a sock drain to aid in the dewatering, however the Contractor argued the continued dewatering through the use of Kelly Wells extracted fine soils which led to voids in the soils beneath the utility installations creating foundation instability. The County had included the gravity sewer system into the contract as a "future use" system and ultimately revised its design and was changed through direct conversations between DAB and CCU.

- The Pond 3 dewatering requirements were governed by a contract TSP for the installation of clay liner which required dewatering to one foot below the lowest elevation of the clay material being installed (in the case of Pond 3, this elevation was as low as -7 NGVD). This elevation is more than 3' lower than the lowest pipe run. The Contractor deployed rim ditching and multiple Kelly Wells which, in combination, were effective at lowering the groundwater in the entire pond excavation (1.5 Acres) to the required level shown in the TSP as evidenced through piezometers (DAB Position Paper –NOI 29 pg. 266-269). The Department then deployed a compaction grouting operation to seal the locations of subsurface boils within the pond excavation and employed the use of rip rap to stabilize a portion of the pond slopes. Due to the slow production of the compaction grouting operation, the Department chose to implement the changes to pond bottom stability – it is important to note that there was not a dispute as to adequacy of the

dewatering systems deployed by the Contractor.

- The gravity wall from Sta. 2446+77 to 2451+09 was successfully excavated and dewatered using a sock drain and Kelly wells to the bottom elevation of the gravity wall. The problem arose that the Contractor could not achieve a foundation density per Specification 455 beneath the gravity wall, which has a more stringent density requirement than that specified for pipe installation. Again here, the redesign occurred after the Contractor demonstrated normal dewatering methods didn't work. The deployment of multiple simultaneous methods, albeit partially inefficient, demonstrated that foundation dewatering was possible, however, after analysis by the Department's EOR, the viable alternative to relocate the sidewalk behind the C&G was reviewed and deemed to be the best practical solution for both the Department and the Contractor. Furthermore, DAB's claim of pumping 15 MGD is grossly exaggerated. While the sockdrain and Kelly well each utilized their own 8" pumps, the two discharge hoses were manifolded together into a single 8" hose. To achieve the alleged 15 MGD flowrate in an 8" diameter hose, the water must be traveling 45 mph from the pump to the discharge point 1,000' away. More realistically, based on publish friction loss gradients (EXHIBIT 116), given the head losses in the manifold and exceedingly long run to the discharge, it is estimated the flowrate is equivalent to 1.4 MGD.

Summary

In their position paper, DAB states that this project encountered "truly phenomenal hydrogeological conditions." They also state they have significant experience with "Homosassa Springs' unique geological feature" and they have spent "years working underground in area". However, throughout their paper, they fail to explain how this project is "phenomenal" from a hydrogeological perspective compared to what a seasoned local underground contractor such as DAB typically encountered on past projects. What has changed since the last time they put a shovel in the ground on the "50 projects" they completed "within 15 miles" of the spring head?

The Department inserted copious plan notes to alert bidders of expected phreatic and potentiometric groundwater conditions and to allow them to properly estimate their impact. Even still, DAB indicated in their bid they estimated dewatering volumes equivalent to a single 6" pump. It is important to re-emphasize that no piezometric or similar method of investigation to establish the ground water elevations for the excavations on the project were ever deployed, contradictory to contract requirements. Why didn't they do this near trench excavations when it could have provided evidence to the Department to support their claim of a differing site condition? Indeed, the Contractor never demonstrated that the potentiometric ground water elevations exceeded the +5 NGVD called out in the contract documents. All piezometric data, albeit limited to Pond 3, shows a groundwater elevation of less than +5 NGVD.

Instead, DAB makes outrageous claims of dewatering volumes they encountered with no proof. They provided no evidence of countless boils. They could have provided flowrate evidence, easily obtained from their water treatment system to validate their claims of high dewatering rates. Instead, they try to correlate a 34 MGD reduction in spring flow to an alleged 9 MGD of dewatering created by just two or three pumps.

It is common practice for Contractor's to utilize specialized subcontractors for technical aspects of the project which includes those specifically focused on dewatering. The Contractor abandoned the use of professional dewatering subcontractors in the first year of the Contract with a majority of the underground work remaining. This project's sensitive location would be a poster child for any Contractor to employ the full time and continued use of a specialized dewatering subcontractor to aid in the efforts.

In the few areas where the Contractor deployed appropriate normal dewatering systems in accordance with Specification 125, the groundwater was drawn down effectively. In other areas of construction, where DAB met the dewatering requirements of the contract and was unable to proceed, the Department facilitated design changes and did not dispute differing site conditions.

Even knowing this, how did DAB proceed? They provided intermittent and inefficient dewatering systems which proved ineffective in dewatering pipe trenches. When they failed, DAB resorted to utilizing coarse aggregate for nearly the entire project without the Engineer's direction and made a claim against the Department to pay for their dewatering inadequacies disguised as a differing site condition. On January 11, 2017, after a claim of Artesian condition (EXHIBIT 2) in which the Contractor ceased work, the EOR's Geotechnical Engineer visited the project, refuted the existence of artesian conditions and went on to state that the use of coarse aggregate under the pipe could create a conduit for underground water to flow into the excavation thus increasing the demands on the dewatering system. (EXHIBIT 117 Page 3) Construction Dewatering and Groundwater Control also notes in 16.2 -Open Drainage Versus Predrainage that "open pumping can result in delays, cost overruns and occasionally catastrophic failure....If open pumping is proposed, the decision should be tentative." (EXHIBIT 114 pg. 3). Obviously, the Contractor neglected this key aspect of the text and their haphazard manner could have been cause to many roadway depressions experienced on the project.

The Department has thoroughly refuted the pertinent points in DAB's paper and reaffirms its request to

the Board to find no entitlement to a differing site condition and no entitlement to above normal dewatering.