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September 13, 2017

City of Decatur
1 Gary Anderson Plaza
Decatur, Illinois 62523

Attention: Mr. Tim Gleason, Decatur City Manager

Re: Documentation of chronological events related to capacity of Oakley Sediment Basin
City Project No. W1314 (Chastain project 6067)

Dear Tim:

We are hereby submitting to you project documentation related to the contract capacity requirements for the Oakley Sediment Basin (OSB) in Oakley, Illinois. The reason for submitting this information is the contractor for the project, GLDD, informed us on August 17, 2017 they are getting close to filling the OSB with the work remaining in Area 1 and 2 of Basin 3. Area 3 of Basin 3, and Basin 4 are yet to be dredged. It appears at this time, the OSB may not have the capacity to store the remaining sediment and additional " means and methods" by the Contractor may need to be taken to allow this to happen.

The following information outlines the intent and the contract measures that were taken to ensure adequate capacity was available for this contract. It also includes the additional measures that were written into the contract to preserve capacity of the OSB and to ensure the City of Decatur would be responsible only for payment of the 'actual" work performed by the Contractor.

Project Overview

This project was intended to dredge Basins 1-4 of Lake Decatur. Basins 5 and 6 were dredged under previous contracts. This project combined the work of individual basins into one large contract to maximize the water capacity benefits of dredging while minimizing overall project costs. Chastain & Associates, LLC (Chastain) worked closely with City staff, sub-consultants and permitting agencies to include all necessary information during the proposal and bidding process to ensure a successful project could be completed.

The Capacity of the OSB prior to dredging

Chastain redesigned the OSB to raise the exterior and interior berms by 10 feet to store approximately 10,736,733 cubic yards of sediment from Basins 1-4 of Lake Decatur, including Big Creek, Sand Creek and some minor work in Basin 6.

At the preliminary design phase of the project, a Request for Proposal of May 2013 (attached as Exhibit 1) was issued to all Contractors expressing interest in the project. At that time, the amount of sediment to be removed from Lake Decatur was 10,340,000 cubic yards. A drawing (Exhibit 3) was created and published within this RFP of May 2013 showing how this volume could be stored within the OSB and the anticipated elevations of storage. A small allowance for material swell (1 to 2 %) was allowed for in the calculation. The drawing outlined the intent of the work for the Contractor, but not the specific "methods and means" to be employed by the Contractor to achieve the project intent.

The floor of the existing OSB would be lowered accordingly to provide the embankment necessary to raise all berms by 10 feet to elevation 713.5. The result of using material from within the OSB would allow for 9.37 million cubic yards to be stored to elevation 710.5. The remainder of the sediment would be stored above this elevation. The actual "neat" volume of material stored to the top of the berm would be 11.74 million cubic yards.

Measures taken in contract to ensure availability of capacity in the OSB

A maximum pay line was shown for all dredging to be performed in Basins 1-4. This pay line was an elevation for the new floor of the basins. The purpose for this pay line was to ensure a positive gradient on the floor of the lake allowing water to flow from basin to basin south to the water intake at the dam.

A specification "SP-5 Over Depth Dredging" (Exhibit 2) was also written to deter the Contractor from dredging lower than the pay line elevation in an attempt to not send additional sediment to the OSB thereby reducing capacity. It was noted in this specification the Contractor would not be paid for dredging below the pay line.

The Contractor has consistently dredged lower than the pay line in the plans in order to reach maximum payment for his work. This has generated approximately 0.4 million cubic yards of material being sent to the OSB thereby reducing overall capacity.

Additional Sediment sent to OSB by Contractor

The Contractor is placing new 16" water main across Lake Decatur in Basins 2 and 3. A trench was to be excavated to place the main within in both basins (Exhibit 4). These two trenches were excavated using the dredge and the excavated material, approximately 1,500 cubic yards were also sent to the OSB.

The Contractor dredged a significant area in Area 2 of Basin 1 to an elevation one foot below the pay line elevation of 599. Only a portion of this material was able to be paid for as additional water capacity. The remainder of this material was transported to the OSB.

This use of the OSB to store material that does not produce additional water capacity in Lake Decatur has further reduced the overall sediment capacity of the OSB.

Swell or Bulking Factor and its impact on OSB capacity

Chastain allowed for a swell factor of 1-2% in determining the capacity requirements for the OSB. Our feeling was the sediment would reach the basin in a saturated condition and would settle out in a similar manner. This layer of material as it became higher would begin to settle under its own weight and with time would settle further down. Dewatering of the site during the off season would enhance settlement.

GLDD has stated the actual swell factor in their operations has been calculated to be 5.7 %. The Contractor has been working at a "twenty- four-seven" production rate for this project over almost a four year period. This additional 4.2% plus or minus swell factor creates approximately 450,943 cubic yards of additional required space within the OSB. This theoretically requires a total space of 11,187,676 cubic yards to leave room for the contract quantity of 10,736,733 cubic yards of sediment. This total space requirement falls within the "neat" volume of space designed for the OSB of 11,740,000 cubic yards.

IDNR coordination and cooperation

GLDD stated they had reached elevation 710.5 (free board elevation) which is 3 feet below the top of berm elevation during the week prior to Weekly Progress Meeting No. 116 on April 11, 2017. A discussion was held on possible measures to store material above the free board elevation. GLDD stated this has been done on previous past projects.

Chastain began coordination with Paul Mauer of IDNR on April 11th. Through a series of phone calls and concept details, IDNR approved placing material above the free board elevation on May 23, 2017 to elevation 718.0 (4.5 feet above the exterior berms) within an interior portion of the basin and as shown on a detail developed by Chastain. (Attached Exhibit 5).

A significant amount of stackable material was mined from the Sand Creek basin. The Contractor did not use this material in this manner at the time of mining.

Contractor work to be completed yet this year (September – October 2017)

GLDD is presently constructing an interior berm near the outlets of the OSB and within the "polishing pond". This work is the responsibility of the Contractor, and was planned to be accomplished at a later date in the project. This effort will free up space for approximately 600,000 cubic yards of sediment from Basin 3, Areas 1 and 2. This will bring the project total for dredging to approximately 8.8 million cubic yards.

Current "Swell" factor for project to date (through end of 2017)
The Contractor has estimated the swell factor for his work to date to be 5.7%. This factor would allow all of the plan quantity for dredging to fit within the OSB as designed.

The estimated amount of material to be placed in the OSB by the end of 2017 is estimated to be 8.8 million cubic yards (paid) and approximately 9.2 million cubic yards total. Assuming this material occupies the space of the plan quantity of 10,736,733 cubic yards, a current "swell" factor of 17 % has been realized from the "means and methods" used by the Contractor.

This actual swell factor to date will not allow the majority of the remaining dredge work to be placed within the OSB.

Contractor potential work to be completed (2018-December 31, 2019)
The remaining dredge work to be performed is for Basin 3 (Area 3), Basin 4 and cleaning of the sediment trap in Basin 6. This is an estimated dredging quantity of 1.8 million cubic yards. A recent "rough" survey of the sediment trap in Basin 6 shows it has not filled up and has significant storage capacity remaining. To perform this work, the Contractor would need to dismantle-move-reassemble the dredge from Basin 4 to Basin 6. As this work at this time appears to not be necessary, this work should be considered for elimination from the contract. This would reduce the remaining dredge work to be approximately 1.5 million cubic yards.

Conclusions based on work performed to date (September 12, 2017)
Chastain, working in conjunction with City staff, designed the OSB to accept all of the plan dredge quantity for this project. This quantity and the final elevation for this material within the storage basin was developed and included as Exhibit 3 in the Request for Proposals from Contractors in May 2013. The purpose of this exhibit was to clearly show the intent of this project and the necessary action needed by the Contractor to plan his operations (methods and means) to achieve the project intentions.

The construction documents were prepared to support this intent. Some additional dredging was included for minimal work in Basin 6. At the present time, it appears this work may not be necessary.

Chastain prepared a special provision to alert the Contractor that work performed below the pay line would not be paid for in the contract. The reasoning for this provision was to leave room available for paid dredge material. Over dredging was discouraged by excluding it from payment. The Contractor has consistently over dredged in order to reach maximum payment. This over dredging has resulted in additional reduced capacity in the OSB.

Contract time

Chastain assigned a completion date to this contract of December 31, 2019. The Contractor agreed to this completion date and has been working ahead of schedule in his work. This leaves more than two years for the remaining work to be completed.

During the course of the project, the Contractor also requested an extension of time to the contract as work on the OSB was behind schedule due to poor weather conditions. (Exhibit 6). This extension has not been granted to date.

Chastain believes the dredge material will slowly settle with time creating additional storage capacity in the OSB. Draining the basin at the end of the dredge season will accelerate the settlement process.

The City should consider granting the requested time extension as needed to achieve maximum benefits from this project, and also based upon the following options available to the Owner.

Options going forward to Owner

1. Acceptance of project with less than plan quantity- This is probably the largest infrastructure project performed in the history of the City of Decatur. Due to its complexity and unknown conditions, Chastain recommended a unit price contract be prepared for bid to the Contractors. The intent of the contract is for the Owner to pay for all work actually completed, which could be more or less than the plan quantity. The Owner also reserves the right to reduce or increase quantities within the contract.

   We estimate approximately 8.8 million cubic yards can be realized from the project if no other measures are taken to allow the project to be extended. This additional water capacity would provide the Owner with 48 days of additional water supply in the time of a drought. A short but severe drought occurred in 2011. We feel this amount of additional water supply would have prevented the need for significant measures to be imposed in 2011.

   A significant amount of the over dredge material sent to the OSB can be included as additional water supply due to the consistent manner in which the Contractor performed his work. We estimate this quantity to by 0.3 million cubic yards. While this quantity is not paid, it does result in a total additional water supply of 9.1 million cubic yards and 50 days of additional water supply. The value to the Owner of this unpaid work is a savings of approximately $ 1.75 million to the contract (Exhibit 7).

   Chastain worked closely with the Contractor during the rebuilding of the berms at the OSB. A significant amount of embankment did not have to take place by having personnel on site to observe the condition of the interior of the OSB prior to placing

embankment thereby reducing the quantity of unsuitable material to be removed and replaced by furnished excavation (Combined unit price of $ 15.40 per cubic yard). We estimate the savings at the OSB to be approximately $ 600,000 (Exhibit 8).

Ending the contract prior to the completion date may also result in savings from the Mobilization pay item. The Contractor is being paid 5% per year of this pay item which equals $ 535,000.

2. Modify berm height to gain plan quantity

The Contractor has submitted a preliminary proposal to raise the berms of the OSB by 3 feet in order to gain plan quantity. Their initial proposal was estimated to be $ 2.2 Million to perform this work, based on the contract unit price of $ 12.70.

Chastain has developed a typical section allowing less embankment to be needed to gain a 3 foot additional height. This typical section allows for a berm modification to the outside of the berm and will save significant materials from being placed on top of recently placed silt. The Contractor's revised estimate is approximately $ 1.8 Million (Exhibit 9). The Contractor would obtain embankment outside of the OSB, but within the property owned by the City. The Contractor is currently seeking pricing for this potential work.

The berm height along the Northwest portion of the OSB is the highest portion of embankment as the existing ground falls away from the facility. This area has been monitored closely during the raising of the embankment earlier in the project. This modification would not change the overall berm height but would add additional loading to the completed berm. This area will need to be monitored closely for the remainder of this contract.

Chastain is currently coordinating with IDNR (Paul Mauer) to determine the permitting process necessary to allow this work to take place. The goal would be to have the permit in place to allow the Contractor to begin work in spring 2018.

This project required a Macon County Special Use Permit, similar to the permit gained for the dredging of Basin 6. This permit would also need to be updated to allow this work to take place. The goal would be to gain this permit over the winter to allow the Contractor to begin work in spring 2018.

This option would allow residents residing near the north end of Basin 3 and Basin 4 to enjoy the benefits of having a deeper lake, especially during periods of drought. This project was planned around dredging of all the remaining basins in Lake Decatur. Fulfilling this commitment would be beneficial for the City.

The Contractor has stated the swell of the dredge material to be approximately 5.7% . The OSB should store all of the plan quantity at this percentage. Chastain believes the actual swell factor to be closer to 17% as stated earlier in this documentation. The need for this option is due to the additional swell. The Contractor is responsible for the "methods and means" to produce the intent of the project. The City should consider this option being performed at the expense of the Contractor.

3. Extend contract time to allow for settlement and more dredging
   Chastain believes the dredge material will settle with time and will allow for more dredging to take place.

   We do not expect this option to be acceptable to the Contractor, but it is a method and means measure that could result in additional dredging being allowed to take place and it meets the conditions of the contract.

   This measure would reduce or eliminate the need to place additional embankment, but we cannot guarantee what degree of success will occur.

The City, Chastain and GLDD have worked together in an informal partnering process with the goal of making this project as successful as possible. The Contractor has been very cooperative during this development and feel he is sincerely interested in performing all of the work within the contract.

Chastain has been involved in the dredging of Lake Decatur for 15 of the 25 years of this project to date. We will also support the City and the Contractor in any way possible to maximize the benefits of this project for the City and our community.

We look forward to discussing this matter with you at your convenience.

Sincerely,
CHASTAIN & ASSOCIATES LLC

[redacted]

Gregg L. Foltz, P.E.
Project Manager

Cc: file