



Staff Report

Operations Department

Report To: Committee of the Whole
Meeting Date: November 17, 2020
Report Number: CSOPS.20.066
Subject: Thornbury WWTP Headworks Update
Prepared by: Allison Kershaw, Manager of Water and Wastewater Services &
Brent Rolufs, Senior Infrastructure Capital Project Coordinator

A. Recommendations

THAT Council receive Staff Report CSOPS.20.066, entitled "Thornbury WWTP Headworks Update" for their information;

B. Overview

This staff report provides an update on the construction and budget for the Thornbury WWTP Headworks Project.

C. Background

The Town is undertaking required upgrades to the Thornbury Wastewater Treatment Plant Headworks (the "Project") to ensure grit, rags and detritus debris is removed from the influent sewage before it reaches the treatment process. The headworks equipment that are being replaced were at the end of useful life. The current state of the headworks was causing additional operational problems in the plant which poses both a health and safety concern for the wastewater operators and the natural environment.

Staff undertook a Request for Prequalification to ensure that the contractors that bid on the construction work had both the financial means and technical capabilities to complete the work.

The Construction Tender of the Headworks was awarded to H2Ontario on March 13, 2020 with the contract value of \$3,635,200 plus a contingency of \$100,000. After completing a Value Engineering Exercise, Staff and H2Ontario have agreed upon \$119,397 of cost saving opportunities. Details of the Value Engineering Exercise can be found in Staff Reports CSOPS.20.016, CSOPS.20.019 and CSOPS.20.020. The contract with H2Ontario was adjusted downward to \$3,515,803 with the contingency adjusted to \$219,397.

At the time the contract was awarded to H2Ontario, the impact of COVID-19 and related potential delays were not fully understood. During the initial COVID-19 restrictions, the manufacturers of the major equipment (i.e. the vortex grit tank and the screening system) were

shut down under provincial order (i.e. *Emergency Management and Civil Protection Act*). The contractor, H2Ontario, issued essential business letters, prepared by the Town, to the manufacturers to allow for production to proceed and to minimize the project schedule impacts.

D. Analysis

The Town's contractor, H2Ontario, mobilized to the site during the last week of May 2020. The temporary by-pass to redirect the influent flow directly to the aeration basins was installed and operational by mid-June. This temporary line required the installation of flow monitoring equipment and an automatic sampler to ensure compliance with the Town's Environmental Compliance Approval issued by the Ministry of the Environment, Conservation & Parks (Photo No. 1 in the attachment).

During the installation of the temporary bypass lines it was determined that the historical record drawings were incorrect in identifying the location and size of the existing buried electrical concrete conduit. The result of these buried utilities not being correctly identified on the record drawings impacted the installation of all five influent lines that enter into the west side of the Headworks Building. The Town's consultant, JL Richards, was notified of the design conflict and a change in execution was required to resolve the buried piping alignment. Collaboration between JL Richards, H2Ontario and the Town resulted in an economical design modification. All five of the influent lines required realignment which in turn required additional piping quantities and time for both JL Richards and H2Ontario to complete the installation. The additional work was executed on a time and material basis to resolve the piping alignment conflict. The total anticipated cost of this Contract Change Order is \$24,427 and the staff project manager was on site full time to ensure the extra charges were correct. This Contract Change Order has not been approved. See Photos No. 2, 3 and 4 in the attachment.

During the month of July, the area to the north of the current headworks was excavated to allow for the installation of the pile foundation. During the excavation, the contractor encountered a significant concrete/grout mass left from the original construction in the 1990s. The concrete/grout mass likely resulted from the disposal of surplus concrete and grout that was dumped on the north side of the existing headworks building during the initial plant construction. There was no information in the engineering record drawing of such a large mass and this mass impacted the installation of 12 foundation piles for the headworks building expansion. There was a need to either remove or drill thru the concrete mass to install the pipe foundations. Again, good collaboration between JL Richards, H2Ontario and the Town resulted in removing some of the top concrete to elevation with a hydraulic jackhammer to ensure the correct top of concrete elevation and drilling thru the concrete mass at the pile locations so the piles could be installed. The contractor, through the consultant, prepared a change order request for the excavation of the mass, based on time and material. The total cost of this change order was \$17,142 and again the staff project manager was on site full time to ensure the extra charges were correct. See Photos No. 5 and 6 in the attachment.

During the month of August 2020, the current headworks building was gutted; removing all the equipment that had reached its end of useful life. The floor was excavated, and micro-piles installed to support the new equipment. The sump pump in the building required a new secure lid and this addition was not captured in the original scope of work. The contractor has sourced a lid and the additional cost of \$4,053 has been captured in a contract change order. The new floor has been poured in the existing headworks building and the walls have been washed and painted. See Photos No. 7, 8 & 9 in the attachment.

In order to reduce operational costs, Town staff have requested additional piping spools and victaulic couplings to allow for the easy removal of the influent flow meters. Without the spools and the couplings, replacement of the flow meters would require the sewage from the two pumping stations to be trucked to the plant and removal of the entire pipe manifold to access the meters. The contractor is preparing a Contract Change Order for approval prior to installation. The anticipated cost is \$9,500.

Due to inaccurate record drawings, provided by the previous engineering firm from the 1990s, the existing watermain on the east side of the current headworks was not properly identified. This created an additional conflict with the new piping. The contractor prepared a Change Order request to modify the influent line to dip below the watermain. The total cost of this change order was \$4,727. This change order is based on time and material. To prevent a similar occurrence and to ensure our records are accurate going forward, Town staff have been on-site for the construction. An elaborate photo log of the entire construction has been established, as well as the requirement for stamped record drawings for all buried infrastructure associated with these works.

The Consultant brought to the Town's attention a potential savings by replacing the electric overhead door with a manual overhead door, as per the tender agreement. This had resulted in \$18,910 savings and will be captured in a Contract Change Order still to come. This savings was missed in the first round of the valued engineering exercise, however Town staff, the consultant and the contractor are continuously looking for opportunities to reduce the cost of this project.

During the months of August and September, rebar inspections were completed by the Town's Building Department for the building foundations, floors and wall section. There were 3rd party consultants involved in the approval of granular backfill and concrete testing. During October the block wall construction commenced and is anticipated to be completed by mid-November. During November the interior structural steel will be installed in the existing building section. See Photos No. 10 and 11 in the attachment.

Next Steps

The project critical path is to have the building ready to receive the grit tank during the 2nd week of November followed by the roof installation at the end of November. The screening system will arrive the last week of November. Once the building is closed in the electrical and instrumentation work will proceed. The project schedule slip was identified back in May for about 6-7 weeks and this was due to the impact of COVID-19 on key equipment suppliers. The original project schedule had identified a substantial completion by end of 2020 prior to the

impact of COVID-19. The construction schedule has been updated since the confirmation of the key vendor delivery dates. As a result of the impact to the equipment suppliers, the revised substantial completion or the date that the system is ready for use is currently the first week of February 2021.

E. Strategic Priorities

1. Communications and Engagement

We will enhance communications and engagement between Town Staff, Town residents and stakeholders.

2. Organizational Excellence

We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community

We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life

We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

Efficient and effective headworks are a critical component of the treatment process. Upgrades to the headworks are critical to maintaining an effective treatment system to protect the natural environment and public health.

G. Financial Impact

A purchase order with a contract value of \$3,635,200 plus a contingency of \$100,000 has been issued to H2Ontario. Currently, the Town has agreed to a total of nine (9) Contract Change Orders. The contract to H2Ontario has been adjusted downward to \$3,515,803 with an adjusted contingency of \$183,300.

The overall net change to the original project contingency, in consideration of all signed contract change orders is a cost savings of \$83,300. There are additional contract change orders still to be finalized, including an anticipated savings of \$18,910 for replacement of the electric overhead door with a manual door opener.

Approved Contract Change Orders

Change Order Number	Description of Change	Change Order Value	Comments
1	Design Changes – Adjustments to the Vortex Grit Removal System	\$(30,160)	Value Engineering Exercise (Savings)
2	Design Changes – Adjustments to the Fine Screen System	\$(80,737)	Value Engineering Exercise (Savings)
3	Division 2 Changes – Adjustments to the Removal of Soil from the Site.	\$(8,500)	Value Engineering Exercise (Savings)
4	Additional Supplemental Support Framing for a Slab Opening is required at the Equipment Platform to facilitate	\$2,123	Engineering Design Adjustments
5	Modifications to certain variable control valves to facilitate the current control	\$6,954	Engineering Design Adjustments
6	Buried concrete/piling obstructions both inside and out of the headworks building	\$17,142	Inaccurate Record Drawings
7	Replacement of sump lid	\$4,053	Operational Improvement
8	Modifications to valves and piping to accommodate acceptable velocity	\$5,822	Engineering Design Adjustments
9	Revised screen location on equipment platform	No cost change	Operational Improvement

Town staff, the Consultant and the Contractor will continue to apply valued engineering to this project to look for additional cost savings. As of October 31, 2020, the Town has spent \$1,065,883 on the Headworks Project.

H. In Consultation With

Shawn Everitt, CAO

Sam Dinsmore, Deputy Treasurer / Manager of Accounting and Budgets

Michael Troop, Project Manager, JL Richards and Associates

I. Public Engagement

The topic of this Staff Report has not been subject to a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. Comments regarding this report should be submitted to Allison Kershaw, managerwww@thebluemountains.ca or Brent Rolufs, CPC@thebluemountains.ca

J. Attached

1. Photo Log
2. Site Map

Respectfully submitted,

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Senior Infrastructure Capital Project Coordinator

Shawn Carey
Director of Operations

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Headworks - Photo Log

Photo No. 1

Photo Description:

- Temporary Bypass piping around headworks building,
- Temporary Bypass piping allows full time access for the contractor to complete headworks expansion.



Photo No. 2

Photo Description:

- Electrical Duct bank that was installed during the original construction.
- Duct bank is not in the location of the Engineering Record Drawings resulting in re-engineering and additional construction activities to install the piping into the Headworks Building.



Photo No. 3

Photo Description:

- Electrical Duct bank being supported to allow for excavation under the electrical duct bank for installation of the piping.



Photo No. 4

Photo Description:

- Electrical Duct bank being supported to allow for excavation under the electrical duct bank for installation of the piping.



Photo No. 5

Photo Description:

- Northside of existing Headworks Building,
- Exposed abandon concrete/grout from original construction,
- At one location, concrete approximately 2.5 meters deep
- Excess concrete/grout not properly disposed during original construction.
- Extra project costs to remove portions of the concrete above future slab elevation,
- Extra project costs in pile foundation installation, drilling thru concrete



Photo No. 6

Photo Description:

- Northside of existing Headworks Building,
- Concrete portion not removed since micro pile foundation could drill thru remaining concrete.



Photo No. 7

Photo Description:

- Inside Existing Headworks Building
- Rebar installation prior to concrete being installed



Photo No. 8

Photo Description:

- Inside Existing Headworks Building
- Rebar installation prior to concrete



Photo No. 9

Photo Description:

- Inside Headworks Building as of Oct 5th,
- Foundations ready for arrival of structural steel to support mezzanine level.



Photo No. 10

Photo Description:

- Construction of the Additional Headworks Building
- Building will House vortex Grit Tank



Photo No. 11

Photo Description:

- Construction of the Additional Headworks Building
- Building will House vortex Grit Tank



Photo No. 12

Photo Description:

- Construction of the Additional Headworks Building
- Blockwall has been completed and starting vapour barrier and insulation



Photo No. 13

Photo Description:

- Construction of the MCC Room Expansion inside the existing building
- Blockwall has been completed and painting still to be completed





Image 1: Ariel Image of Thornbury Wastewater Treatment Plant and Lagoon System



Image 2: Ariel Image of Thornbury Wastewater Treatment Plant, Mechanical System

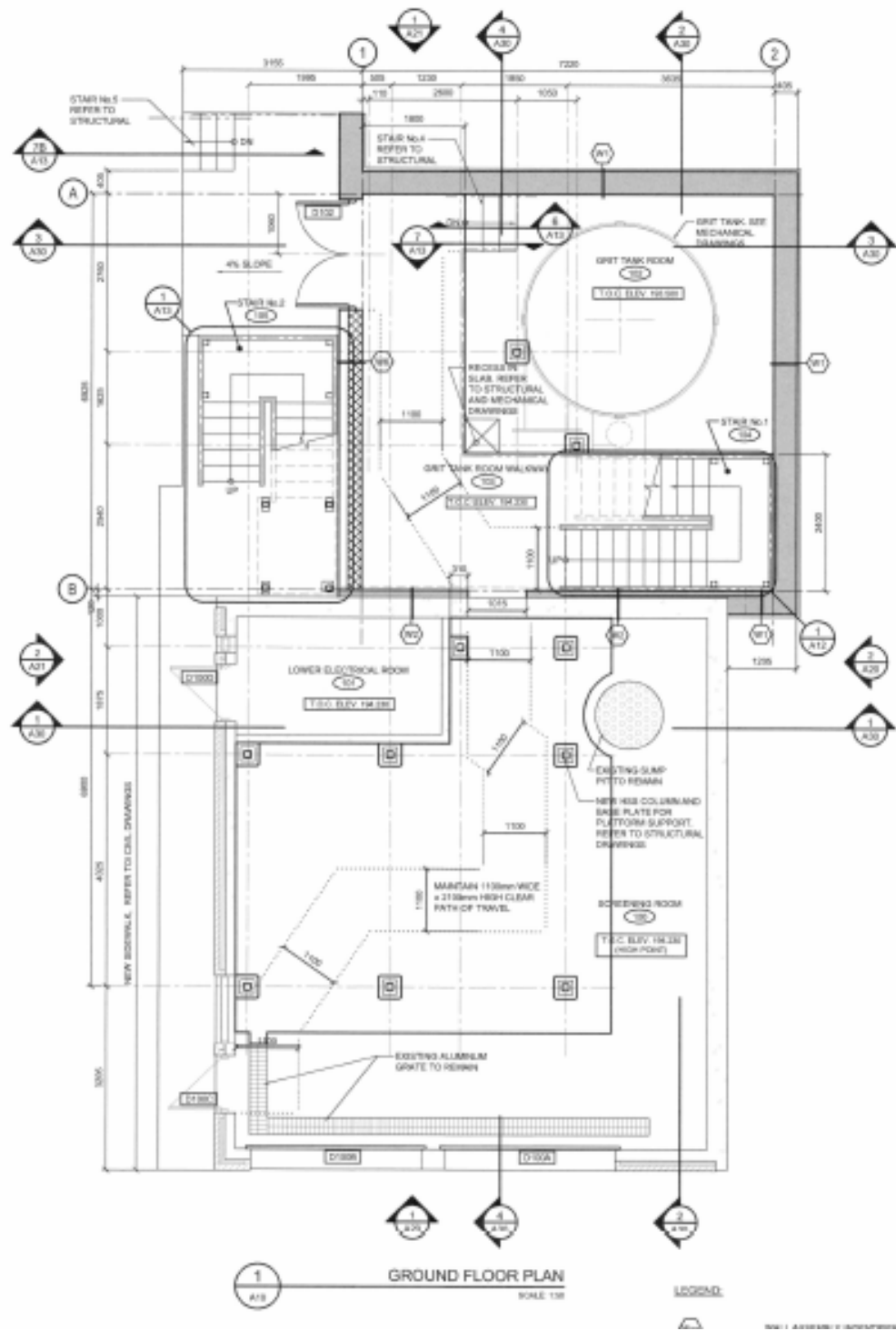


Image 3: Ground Floor

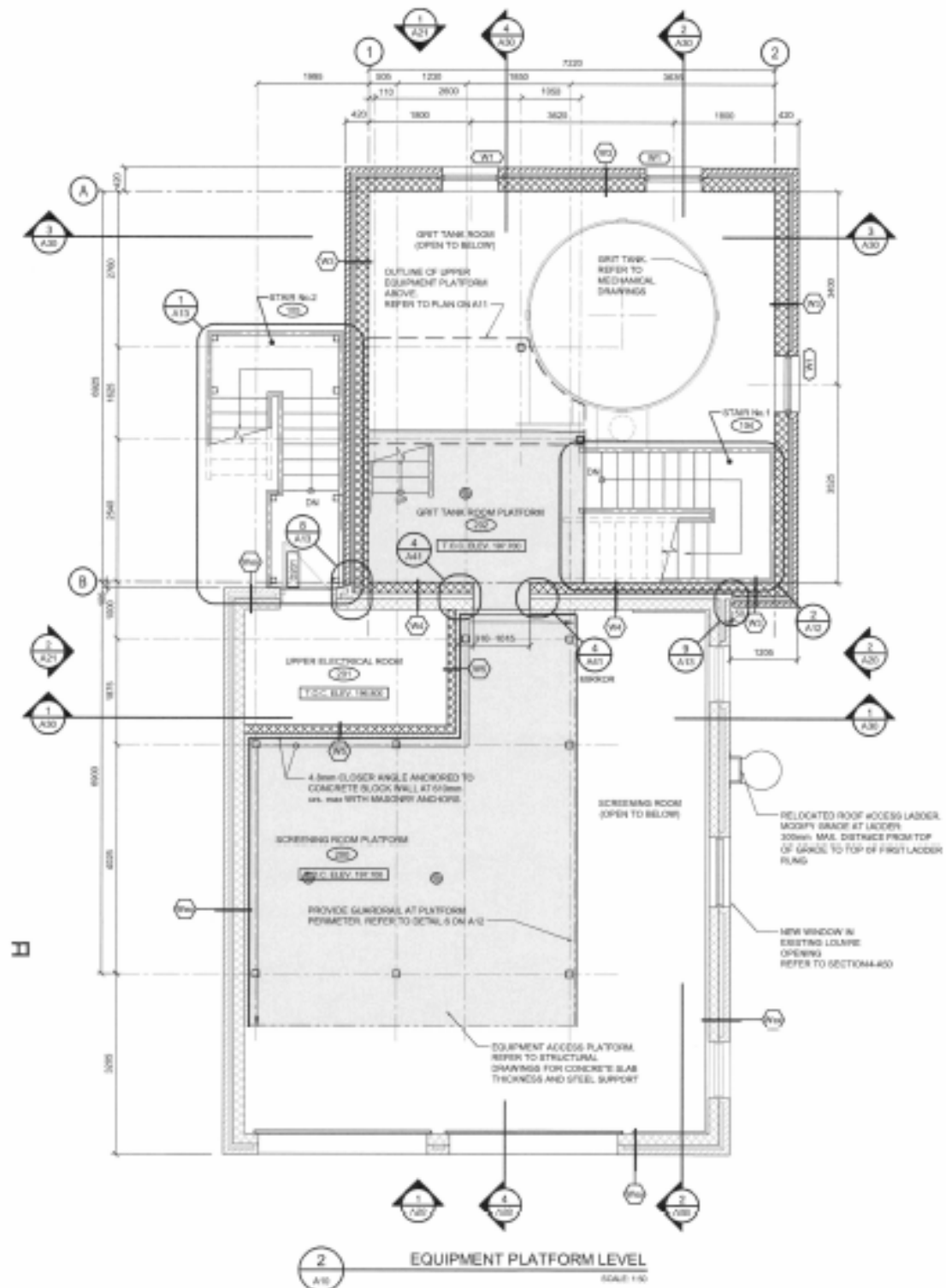


Image 4: Equipment Platform Level