
CONSTRUCTION PROJECTS COMMITTEE
THURSDAY, JUNE 26, 2008
NASHUA HIGH NORTH LECTURE HALL
6:00 PM

A meeting of the Construction Projects Committee was held at Nashua High North on **Thursday, June 26, 2008**. Alderman McCarthy called the meeting to order at **6:07 p.m.**

Present: Alderman McCarthy, Mr. Kelley, Mr. Hollowell, Mr. Dowd, Alderman Tabacsko

Also Present: Mr. Mealey, Mr. Smith, Mr. Vaughan, Alderman Teeboom, Mr. Harrison

Approval of Invoices

Mr. Mealey

This invoice is the final payment to Tri Turf. We took out some work that we needed to do, and they've agreed on this amount of \$72,905.

Alderman McCarthy

Does this extinguish all of the retainage?

Mr. Mealey

That's correct

Alderman McCarthy

And we've had adequate time to check the drainage over the past several weeks?

Mr. Smith

Yes, and it seems to be draining very well. We've retained some money because not all the seeding they did took, they didn't clean up where they staged everything, and we have to patch some of the asphalt.

ALDERMAN TABACSKO MOVED TO APPROVE FINAL PAYMENT TO TRI TURF IN THE AMOUNT OF \$3,725.22.

SO VOTED.

Discussion – HVAC Project

Mr. Mealey

We need to replace the HVAC system in 3 elementary schools. It's been given a high priority with the Capital Improvement Committee for the past several years. We hired Turner a while back to give us some design options, including a geothermal option. There is a movement across the country away from fossil fuel dependency and geothermal is one that many schools have been moving towards. There is a strong desire from most members to do geothermal, but we're not sure how we're going to do it. If we were just going to do a replacement of what we had, we would probably be recommending an air replacement system and geothermal seems like a good way to go. We've had luck with 2 of our schools with air displacement as opposed to unit ventilators. So it made sense to us to recommend air displacement with geothermal, which is the design Turner came up with for Fairgrounds. I'm not sure where to go from here, because we have some people who maintain that the best way to do geothermal is with unit ventilators and that's not the design we have. I have reached out to Gary Phetteplace to see if he would be

willing to evaluate the design that Turner has put forth. There seemed to be consensus that he is an expert in the field. So, I'm just setting the stage for tonight's discussion.

Alderman McCarthy

Some of the discussion is over the difference between doing a replacement system and doing a unit ventilator system. I have to say that after seeing some of the details that we've seen on the unit ventilator system, I'm less inclined to engage in that than I might have been before that. Mr. Smith, how many people do you have right now whose job it is to change air filters in the systems in our schools?

Mr. Smith

Currently the Head Custodians change them in addition to a designated person in each high school.

Alderman McCarthy

So I guess one of the things we should think about when we look at life cycle costs, is that the proposal to use unit ventilators called for 180 ceiling mounted filters for intake and outlet air... and they have to be changed 3 times a year. That would end up being late August, December and March. That's 540 times a year that a filter needs to be changed. That's more than 1,000 times a year up and down a ladder in the classroom. That's approximately another full time employee August to March just to keep up with that. It's not a trivial amount of work and I don't think we took that into consideration when looking at life cycle costs. We got into an issue with the piping from the roof-mounted vents to the unit ventilators, and then we have all the traditional problems we've had with unit ventilators. That has been a problem for us forever. On the other hand, the experience we have with the displacement air system we have at Fairgrounds Middle School is exceptional. We have very fresh air for the first time and virtually no noise.

If you ignore the geothermal part for a moment and ask if we want to do the unit ventilators or displacement air, I don't think there's any question that the displacement air has been much better for us. Then you look at the cost issues, much of which is actually generated by the displacement system and not by the fact that the water loop that powers it is geothermal.

I think that we need to pick a direction, and if it's not going to be the one that's been proposed, I suggest we return the matter back to the Board of Education for a determination of the scope of the project they desire. What I understood us to be asked to do was to renovate those systems to have clean air and to get those schools up to current codes and the standards that we have district air for clean air and classrooms. Because of that there are renovations that accompany that, and I don't think that's too much to ask for buildings that are 50 years old without much maintenance. I am inclined to go ahead with that.

I do think we need to talk about the phasing of how we're doing things. I think we agree that Fairgrounds is at the top of the list and really needs to have something done. I think we probably agree that Ledge is second. The question is whether we can defer Charlotte Avenue for some time to lessen the impact on our bonding capability to do all 3 schools at once. I guess I'd ask Mr. Smith if there's an immediate need to deal with the HVAC System at Charlotte, and if so is there something we can do that is less than the full project with the understanding that we'll revisit that when these are done and look at that as the next project in sequence.

Mr. Smith

Well, this began with the necessity to replace boilers, and Charlotte's boiler was replaced 10 years ago. So I'm confident that we'll have sufficient heat for that building for possibly even 20 years if we have to. The secondary boiler is over 50 years old, so on very cold days the single boiler is going to be maxxed out. But we also now have a temporary boiler in the trailer in case there is some failure.

Alderman McCarthy

So you feel that if we were to phase that in, even 5 years from now... which is not actually going to represent a substantial delay, we can maintain current systems without undue expense for that period of time.

Mr. Smith

Yes, and as we go through the other 2 schools we would grab the "pick of the litter" of the unit ventilators that are in the best condition and put them aside to use if we have to at Charlotte.

Alderman McCarthy

How would you assess the condition at Ledge Street at this time?

Mr. Smith

Slightly behind Fairgrounds. Fairgrounds definitely needs to be addressed as soon as we can. Ledge has the same age boilers and had a similar boiler fail about 10 years ago and could happen at any time. At this point the entire boiler would have to be replaced if it failed. To answer your question, Ledge could wait a year or two beyond Fairgrounds.

Alderman McCarthy

So if we were to phase Fairgrounds as soon as practical, which probably means next year at this point, with Ledge the year after that, with Charlotte a year or two after that... you feel that's a workable plan?

Mr. Smith

Yes I do. Plus you'd get the "lessons learned" from the first school if there are any adjustments that we'd have to make.

Mr. Kelley

Do we have any other schools, that by pushing this back a few years are getting closer to the point where we have to start working on them too?

Mr. Smith

We do have a couple of schools that probably in the next 8 years need to be addressed. That's Birch Hill and Main Dunstable. Those are getting older, plus they have the open concept. That's actually already on the Capital Improvement Plan for the past 2 years.

Mr. Kelley

But I think it gets closer as we talk about pushing back some of these repairs, we get into multiple schools that will need repairs too.

Alderman McCarthy

I suspect in that timeframe, our ability to get caught up on multiple schools will improve. We're about to take a substantial look at our bond position and given that we have a couple of expensive one-time projects, namely we're still working on this school and we potentially have the Broad Street/Parkway project coming up. I don't see projects of that scope in the 5-8 year time frame, so I think the magnitude that's probably required for those 2 schools is better even if it overlaps Charlotte a little bit.

Mr. Hallowell

I certainly concur that delaying Charlotte Avenue is one thing we can do. How old are the boilers at Birch Hill and Main Dunstable?

Mr. Smith

About 30-35 years old.

Mr. Hallowell

I still have some concerns about the geothermal design. I think the one expert everyone seemed to respect was Dr. Phetteplace, who had some issues with the design. I would encourage us to spend a little money to get that expert opinion as to how things should get developed. How these components are put together is fairly unique, which even Turner has admitted. I don't think we should prototyping a system with taxpayer's money and not monitor it in the future to see how well it's working and if it is matching what we were told in the beginning. I think we really need somebody to look at that design if that's the way we're going to go. I think everyone likes the idea of geothermal, but my one recommendation is that we do a little more work on the design.

Alderman McCarthy

I'm in support of doing peer review. When we did this and the South project, we employed review on the scope of all the projects and it was an extremely good investment. I think there is actually substantial gain in doing that as we're looking at new innovations than in the past, but I share your concern about being the "pioneers."

If Dr. Phetteplace is available to do that, I would certainly support that and I would hope that Turner would be amenable to having that peer review done.

Alderman Tabacsko

Can Turner comment on the time frame where we need decisions made to have things done for the school year.

Mr. Harrison

Based on the design from Turner, one of the things that was real important in the overall schedule was to start early in June. The 6-stage phasing that we discussed with the principals was based on beginning in early June. We really would have needed to be on the street with a structural steel package by early March. And the whole focus was to minimize disruption to administration, school staff and the children. If you wanted to go forward today, we'd have to find another way with temporary trailers to house administration, etc.

Alderman Tabacsko

What kind of cost estimate does a peer review element bring to the project? What did we experience in the past?

Alderman McCarthy

I suspect you're looking at numbers around or just under 20% of the design cost itself. They're not outrageous, but they're not insignificant either. You get what you pay for?

Alderman Tabacsko

Does anyone know how long the review process might take?

Mr. Harrison

It's probably a month and a half.

Alderman McCarthy

Would you agree that about 20% of the design cost is reasonable for the peer review?

Mr. Harrison

It depends on the level you're looking for. Are you looking to get the geothermal reviewed or the whole package? The 20% would probably be a full package review.

Mr. Dowd

Where are we if Fairgrounds boilers fail during this coming winter?

Mr. Smith

Well, we do have the portable boiler and we'd probably ask the Committee to engage Harvey to make all the necessary connections so we just have to put the trailer over there. If the boiler does go down, at most there might be one-day loss of school.

Mr. Dowd

Would we run with that temporary boiler through the winter?

Mr. Smith

Yes, it's sized to carry the load.

Mr. Vaughan

It sounds like the peer review you have in mind is a sort of checking, omissions and error check at a very detailed level. I wonder if the kind of review that people are actually looking for is of those things that already exist like the basic design and the assumptions they're in. And that might be leveraged to exploit this dead period we have and maybe accelerate things.

Alderman McCarthy

I would expect all of that to happen. It would certainly be my intent to start that design as soon as we can.

Mr. Dowd

You mentioned before about sending it back to the Board of Education. Do you expect to do that before we hire someone to do a review?

Alderman McCarthy

Not if we reach an agreement that that's what we want to do. We keep going back to square one, in part due to the confusion of geothermal vs. displacement. I think that's an issue we have to come to grips with. If the issue is not displacement, frankly I think we are throwing good money after bad to perpetuate the unit ventilator situation we have. If we're going to do that, I would recommend that we do whatever minimal boiler replacement we need to get back to a working system using the existing systems.

Mr. Vaughan

Unfortunately, we are not in a financial position to incur a lot of risk one way or another. While the rewards of a particularly innovative design may be large, if there are also risks for that, I'm not sure we're in a position to advance fully towards that design. We're really more in a financial position to do a very known payback, but less innovative design.

Alderman McCarthy

The risk we have is around the displacement system. If we abandon the displacement system, then we buy off a whole new set of risks with the system we install, with no fall back plan if they come true. It is a system that comes with a maintenance burden that I don't know that we can or will keep up with. And it will have implications in the classroom as well.

Mr. Vaughan

I didn't mean to suggest one way or another. At the end of the day, I want schools that work and that we feel comfortable with. I would leave the decision to the review. I was just suggesting that in our position, we can't incur a lot of risk.

Mr. Hallowell

Everyone I talk to about geothermal systems seem to be sold on putting individual units in the classrooms. I don't personally know, but agree with Alderman McCarthy that the life cycle issues will be a problem and I don't want to incur those costs. To me, the concern is the geothermal technology, which in many levels is not very complicated. But there are some unique things that we're doing. So to me, the peer review would be more focused just on the geothermal portion, which we're going to get some comments on about how to most efficiently do it. Having individual units may be more efficient, but when looking at maintenance costs, you might come to a different decision than that you would for a school district. So, do we need to make a formal motion to actually make that happen? And if we engage Dr. Phetteplace, I assume there will be some interaction between him and Turner.

Mr. Harrison

The discussion around a displacement first, is a central system. It's not really appropriate to mix geothermal into the mix as they're really two separate topics. If we're going to do displacement ventilation, even if we put in a boiler to do the job, it's going to be a central system. What we do to heat it with is irrelevant. So I don't want the displacement issue to get mixed up with geothermal. They're 2 different issues.

Mr. Hallowell

If we have a peer review, I'd suspect Dr. Phetteplace would have an opinion on whether we should do distributed or whatever and I would be interested in hearing that opinion and then we can evaluate if we feel that is right or not.

Alderman McCarthy

But I believe that the heart of the matter is exactly the point about displacement. Which is, if we were going to build a system like the one in here, you then have individual units that are in fact cheaper to put in. But when we make the decision to go to displacement air, that requires more centralized handlers. So, I think some of the argument

we're having is over the technology that has not been put together is those 2 things. People ask why we're doing all these complicated things to the geothermal system. We're not. We're doing a displacement system that happens to be fed by geothermal. And the complexities we're not used to are the ones from the displacement system. While displacement systems are extremely common in Europe with extremely good results, are not as common in the U.S. That's where we're into new ground, but that's also into greater return on the money for the quality product.

Mr. Hallowell

Again, I don't have a problem with the displacement system. To me the complication is things like the solar portion that is feeding hot water in. As far as I can tell, that is not done on any other geothermal design.

Alderman McCarthy

Because in the other geothermal designs there is no advantage to be gained with that, because you don't have the centralized system.

Mr. Hallowell

I'd rather have an expert tell me that.

Alderman McCarthy

Having listened to the discussions, I imagine that's the first debate that will happen with the peer review. As for the decision the committee has to make, I think there's actually a couple of them. We ought to decide if we're doing a displacement air system. We ought to decide if we're doing geothermal. If the answer to both of those is yes, then I think we should decide that we're going to have that design peer review. Then we ought to ask the JSSBC to recommend to the BOE that Charlotte be delayed by a period of about 2 years from the other schools and we essentially take up Fairgrounds and Ledge as the project at hand.

Alderman Teeboom

Mr. Harrison, has Turner, anywhere in the world installed a system with solar panels, peaking boilers, air displacements, concentric to designs that you've proposed.

Mr. Harrison

All these components in one system have not been put together yet.

Alderman Teeboom

Has anyone in the world installed a system with these components in one system?

Mr. Harrison

No, this is a combination that has not been made yet.

Alderman Teeboom

You mentioned Gorham as being your qualification. What exactly have you installed in Gorham?

Mr. Harrison

That would be a misunderstanding, because Gorham is a school that was done by somebody else. The work we've been doing is mostly in Farmington School and a lot of residential work.

Alderman Teeboom

What did Turner do in Farmington?

Mr. Harrison

We heated the swimming pool with geothermal.

Alderman Teeboom

What did you heat it with?

Mr. Harrison

With geothermal with double U tubes.

Alderman Teeboom

Have you used the concentric tubes anywhere?

Mr. Harrison

Yes, residentially.

Alderman Teeboom

Are you a certified geothermal designer?

Mr. Harrison

No, I am not.

Alderman Teeboom

I've asked for a peer review of your design because I submitted the design to an organization in D.C. The fellow looked at this and gave a negative review. He offered to come down to explain his review to this committee. Phetteplace did his own review and had a different take. You are recommending a system at an extremely high price without any practical experience. I find it very difficult to deal with.

Mr. Harrison

Again, most of the costs we're dealing with is with the displacement ventilation system itself. The work we've been doing is pioneering so that we don't have to use open loops anymore. We have many systems running to k now that it works well. The more systems that come on line, the more we can look at. If we go ahead here with just the design of the displacement ventilation system, there could be some flexibility with what geothermal system is designed. We could work with Dr. Phetteplace to design a system that you're comfortable with as a group. We're here to do what you want. We're just proposing what is available out there with new technology to save more money in the long run.

Alderman McCarthy

If we were to ask you to drop the peaking boilers and the solar component and go ahead with the geothermal replacement system, what other changes would you make to compensate?

Mr. Harrison

If we stayed with a closed loop system, it would become cost prohibitive and we couldn't do it.

Alderman McCarthy

If someone would like to make a motion that we proceed with the design of the geothermal displacement system, that we engage Dr. Phetteplace to do a peer review of that system and that we recommend that the renovations and improvements to Charlotte Avenue be delayed with this portion of the project.

MR. KELLEY MOVED TO PROCEED WITH THE DESIGN OF THE GEOTHERMAL DISPLACEMENT SYSTEM, AND TO ENGAGE DR. PHETTEPLACE TO DO A PEER REVIEW OF THAT DESIGN AND TO RECOMMEND TO THE BOARD OF EDUCATION THAT THE RENNOVATIONS AND IMPROVEMENTS TO CHARLOTTE AVENUE SCHOOL BE DELAYED OUT OF THIS PORTION OF THE HVAC PROJECT.

Mr. Vaughan

What is the advantage of putting both things in one motion? You're only asking the BOE to concur with the Charlotte piece of the motion.

Alderman Tabacsko

The motion would be for this committee to recommend that JSSBC make the statement back to the BOE on that particular piece. The other piece of moving forward with the geothermal design is what we're taking up here.

Alderman McCarthy

That's right. And I don't think commits us to anything more than the design to then get to a peer review.

Mr. Hallowell

Would it be worthwhile to put an amount of money to spend on the peer review?

Alderman McCarthy

We'll certainly need to approve a contract with Dr. Phetteplace before he would begin

Mr. Vaughan

So are we assuming the design will be on a particular design?

Alderman McCarthy

It would be the geothermal displacement system for Fairgrounds. We don't want to do other designs until we finished that one.

Mr. Vaughan

Does displacement vs. not displacement a design orientation discussion and not data driven?

Mr. Harrison

The displacement system is independent of where it would get its energy from. No matter which type of geothermal system would be installed it would still be the same amount of compressors and heat pumps. The only variation we may end up with in the end is what kind of holes we drill in the ground.

Mr. Dowd

Can we get a quick pros and cons of unit ventilators vs. displacement systems?

Mr. Harrison

The displacement system saves energy in its operation. It uses gravity instead of mixing the air in the classroom for good air quality. So it's a system that provides better indoor air quality with less energy. The unit ventilator system is mixing system, so the fans have to circulate air around the room at certain temperatures. The equipment is located in a place where the noise is a problem.

Mr. Dowd

And one vs. the other has heat control in individual rooms?

Mr. Harrison

They can both have control in individual rooms.

Mr. Smith

The proposed design has 7 air handlers with 7 filters to replace. The alternative of a unit ventilator design has 60-70 unit ventilators, with that many filters to replace. Every time we change a filter, we also have to get a vacuum cleaner to suck all the dirt out with a unit ventilator but not with air handlers.

Mr. Hallowell

And the cost difference to purchase 7 large air handlers vs. 60-70 small unit ventilators?

Mr. Smith

I suspect the initial cost is more for the 7 large air handlers. But maintenance wise, there is a huge difference.

Alderman McCarthy

A large portion of the expense is the ductwork associated with air handlers.

Alderman Teeboom

I had suggested to the Chairman that we try a wing in one of the schools over the summer. Then we can test if we like that approach or not. He turned me down. We talk about 3 schools, but I think we should take a look at 1 first to see if we're happy. I like geothermal, but am not at all convinced that geothermal coupled with air handling systems is justified. And I'm not at all convinced that the cost we're talking about is justified.

Mr. Hallowell

So I think what we're asking for in this motion is to give Turner direction as to what system we would like to have them design. Because we really don't have a complete design. If we end up getting a peer review that says this is ridiculous, then we can choose a direction. But we need to get out of this mode where we come to meeting after meeting and say thank you, and we'll see you at the next meeting.

Voting on Motion:

MR. KELLEY MOVED TO PROCEED WITH THE DESIGN OF THE GEOTHERMAL DISPLACEMENT SYSTEM, AND TO ENGAGE DR. PHETTEPLACE TO DO A PEER REVIEW OF THAT DESIGN AND TO RECOMMEND TO THE BOARD OF EDUCATION THAT THE RENNOVATIONS AND IMPROVEMENTS TO CHARLOTTE AVENUE SCHOOL BE DELAYED OUT OF THIS PORTION OF THE HVAC PROJECT.

SO VOTED.

Mr. Smith

I mentioned earlier that I'd like permission to proceed having Turner design a quick connect to the Fairground Elementary heating system and then have Harvey go out and get several bids to actually make that connection.

ALDERMAN TABSCSKO MOVED TO HAVE TURNER SYSTEMS DESIGN A QUICK CONNECT TO THE FAIRGROUNDS ELEMENTARY HEATING SYSTEM AND HARVEY CONSTRUCTION GET BIDS TO DO THE WORK.

SO VOTED.

Alderman McCarthy

I think we ought to put some thought into Ledge Street School as well.

Alderman Tabacsko moved to adjourn. **So voted at 7:16 p.m.**

Submitted by Jacki Waters