
**CONSTRUCTION PROJECTS COMMITTEE
THURSDAY, FEBRUARY 7, 2008
NASHUA HIGH NORTH LECTURE HALL
6:00 PM**

A meeting of the Construction Projects Committee was held at Nashua High North on **Thursday, February 7, 2008**. Alderman McCarthy called the meeting to order at **6:07 p.m.**

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

Also Present: Mr. Mealey, Mr. Smith, Mr. Vaughan, Mrs. Ziehm, Mr. Haas, Mr. DuBois (Harvey Construction), Steve Caulfield (Turner Systems), Kevin Drew (Harvey Construction)

Approval of Harvey Construction Contract

Mr. Mealey

This has been reviewed the city's legal department, and their suggestions have been incorporated into this contract.

Alderman Tabacsko

Can you tell us the relationship of the 2 documents in our packet?

Mr. Smith

One is strictly for general conditions and the other is actually the contract and the legal changes are in both documents.

Alderman McCarthy

Do we have to make a change in the payment terms from 30-45 days to allow for the payment cycle for JSSBC?

Mr. Mealey

We did not request that change.

Alderman McCarthy

I think in the past we have changed that on some of them.

Mr. Hollowell

Exactly what would we be voting on here?

Alderman McCarthy

We're voting on the general agreement, which is a standard contract to do a particular scope of work. We're not signing up yet to do the entire project. We're putting in place the terms and conditions for the pre-construction services, which is essential the schematic costing that we've asked Harvey to do.

Mr. Hollowell

So, this doesn't specify what kind of system you would use.

Mr. DuBois

The 121 CMC is a 2-part contract. The one you're looking at tonight is for pre-construction services. When you decide on a system and there's an amendment that has to be signed. So you're not binding yourself to any one system tonight.

ALDERMAN TABACSKO MOVED TO RECOMMEND SIGNING THE CONTRACT WITH HARVEY CONSTRUCTION AS PROVIDED WITH THE AGENDA.

SO VOTED.

Life Cycle Costing Update

Mr. Mealey

We had been asked to provide updated Life Cycle Cost Analysis, which has been handed out to all members.

Steve Caulfield, Turner Group

We've prepared several Life Cycle costs for the various options. The cost is for the 3 systems, which we're calling Unit Ventilator (replace in kind), Heating & Ventilation System and Geothermal System. The construction costs are based on relatively real world costs for these 3 options. Then we factored in receiving state aid for the project and also for 2 of the options (Heating & Ventilation and Geothermal) the possibility of 3% funding from the state for energy efficiency. We've taken into account escalation of natural gas, electricity, equipment replacement. We've also included the cost of financing and that's how we arrived at this set of numbers. We've assumed 5% escalation in fuel costs, 3% in electricity costs.

We came up with putting all those numbers in and coming up with a cost in today's dollars for each of the 3 options. There are 2 graphs for that. One assumes the 30% state aid, and the other assumes the 30% state aid plus the 3% energy efficiency. Under both scenarios, the geothermal option is slightly less expensive over time, although all 3 are roughly equal. Certainly if we get the 3% energy efficiency funding in there, the geothermal option ends up being \$1 million to \$1.5 million less over 25 years than the other 2 options. And that's strictly due to reduced fuel and electricity charges.

Mr. Hallowell

The thing that bothers me about these life cycle costs is the whole reason we would do geothermal is because it's going to save us energy. So I'm confused why at the end of 25 years we really save very little. If the state wasn't going to give us 3% in state aid, and we can't count on that over 25 years... that there really isn't any cost savings. Can someone speak to that? What am I missing?

Mr. Caulfield

Well there is an increased "first" cost to the geothermal. There's a lot of additional infrastructure that has to go into installing the geothermal system. It ends up that the economics are such that it doesn't pay back as quickly as you might think.

Mr. Hallowell

So this includes the base cost and operating costs of each system.

Mr. Caulfield

Yes, right.

Mr. Hallowell

I have some other documents, which show the natural gas price that you use as \$1.25. I know currently we're paying \$1.04 for CCF and I think the going rate is about \$1.20 to \$1.25. So where does the \$1.60 come from?

Mr. Caulfield

That was the price that you were paying the last time we had data. When we started this process we had data through 2006 and the average price you were paying was \$1.47 and \$1.60 was what you were paying during the heating season for that year. I've had this discussion with Shawn. I really don't think the \$1.04 is sustainable even as a starting point. Over the past ten years, the price has roughly doubled so it's going up really at greater than 5% a

year... absent of what you're getting this year. We're not going to complete the first of these projects until 2009-2010 heating season.

Mr. Hallowell

I did a little research on my own. There is this EIA study maintained by the federal government, which projects forward as to where they think energy costs will go. Their projection is that for the next 10 years things will stay relatively the same. If I were doing a cost projection I would put in our low bound and our high. Right now, I don't know whether \$1.60 is middle of the road, or is it the 90th percentile of the next 10 years. And that makes a huge difference.

Alderman McCarthy

There are a couple of other important variables that I'd like to point out. This is based on a 5% interest rate on the bonds. Our typical interest rate these days is substantially lower. It's now closer to 4%, which could make a difference of about \$200,000 in the first year and \$2 million in the bond payment for the life of the bond.

Mr. Hallowell

Why is that different for each of these scenarios?

Alderman McCarthy

Because the amount that is bonded is substantially less to replace the unit ventilators. But the fuel costs stay constant regardless of the interest rate. What we're seeing is not essentially a life cycle cost as much as it is a financing cycle cost. Because you'll still have the system when the 25 years are up and you'll continue to save money.

Mr. Hallowell

Your system includes this E-max technology, which is the solar energy portion of this system. Do you (Turner) have a system running full up with all these components to it?

Mr. Caulfield

Yes, but it's in early operation.

Mr. Hallowell

And, I am right that it is fairly unusual for geothermal to have a solar component?

Mr. Caulfield

Yes.

Mr. Hallowell

How do you calculate the replacement costs?

Mr. Caulfield

The replacement costs are strictly based on a percentage of the installed mechanical equipment. So we didn't do a detailed analysis of you will need this many of this thing. We took a percentage of the mechanical equipment installed for each option. The solar panels themselves are just panels with no moving parts. Basically panels like this are in place for over 30 years without needing replacement. Probably out 40-50 years it's going to need some piping replacement or individual panels.

Mr. Hallowell

So the replacement portion you think will be significantly less than the geothermal?

Mr. Caulfield

Well, you have moving parts in the geothermal system... compressors, pumps in the wells, etc. So you're going to expect to replace some of that. So, it's just a percentage of the total installed equipment. But the solar portion has got the least moving parts of any of it.

Mr. Hallowell

No disrespect intended by the next question. I'm seeing your background for why we need to have the additional solar panels, and it's a good theory and you've said there's really only one system installed and it's a little early on. I'm a little concerned that we're buying something brand new. It's kind of like buying the first year model of a new car, and I'm a little worried about that. Secondly, if you have decided that we need to have geothermal with solar panels, is that the only thing we're going to let somebody come in and specify as the system?

Mr. Caulfield

No, not necessarily. The fact that we're putting the pieces together... it's not new technology. Geothermal systems have been around for 20-30 years. Solar hot-water systems have certainly been around for 40-50 years. This is more like if we can make a hybrid Prius, why can't we make a hybrid Ford Escape? It's just putting established technologies together. It is a whole new way of doing it, but they are established technologies. The whole part of the solar part of the project is because in the winter what happens is you're taking heat out of the ground water to heat your building. So you take water that's coming out at 50 degrees and putting it back at 40 degrees. Eventually in mid-winter, you're taking out 40 degree water and putting back 30 degree water. The heat pumps are most efficient when they're operating between 50 and 60 degrees. So the solar blends some of the heat into that 50-degree water to keep it at between 50 and 60 degrees so it doesn't go back cold... making the water colder and colder. That would make the heat pumps less and less efficient, using more energy to get the heat out. This keeps it efficient all year round.

Mr. Hallowell

I have some colleagues who teach geothermal. They were not convinced this was needed. I'd really like to see some of that background information that justifies that this makes sense.

Mr. Caulfield

We understand that there are going to be extended periods of time with no sun. We built into this, a buffer tank that holds that solar energy. We've modeled the performance of that tank so that we don't go below a certain temperature. And that's how we size that tank. We can install systems without the solar, but it means more well and heat pump capacity, or a backup boiler at the front end.

Mr. Hallowell

At some point RFP's are going to be issued. Is the general contractor going to review those proposals and tell us which they feel are best or are going to be able to have independent reviews?

Alderman McCarthy

It depends. We can do it either way. Typically, we review proposals jointly with the professionals overseeing the project.

Mr. Hallowell

My concern is that this project is of very new technology and no one here that really has the kind of in-depth knowledge of these systems.

Mr. Mealey

We don't actually commit to this system right now. We would be putting it out to bid and looking for possible alternatives. Harvey, Turner, Shawn and myself have spent a couple of hours a day with Alderman Teeboom and Gary Maedl (who has installed geothermal systems) and looked at Fairgrounds Elementary School. I think we need to clarify that what has been designed so far here is replacing this current system with a geothermal system... people are saying that you could really do that for a lot less than what we see here. You could, and this committee will make their decision and recommend it to the JSSBC. You could leave the piping that's there in place, or utilize some of the existing equipment and just do a basic system. Part of this will include those options. But when we go in to do the work, we're saying that you should be taking this stuff out when you're putting a new system in. That's why there's a big disparity with some of these. This does include a lot of other things as well.

Alderman Teeboom

When Mr. Mealey, Mr. Smith, gentlemen from Turner and Harvey toured Fairgrounds Elementary School, we looked at the boilers, the steam part of the building, and the forced water part of the building.

Alderman McCarthy

Was this committee made aware of that meeting?

Mr. Mealey

What happened was, Alderman Teeboom had communicated with Alderman Bolton and wanted that person to come here and present. Alderman Bolton said he could come here and speak as a public speaker.

Alderman McCarthy

So we were giving a tour to that gentleman so he could see the existing conditions at schools. This was not a meeting?

Mr. Mealey

No, it was not a meeting at all.

Alderman Teeboom

Well, I don't care what you call it, we were given a tour through the school and met in a small room. You can call it what you want. Mr. Maedl, a well-known expert who installed many systems who I communicated with when I was shocked to see this thing go to \$23.5 million.

Alderman McCarthy

I call it "not a meeting" Alderman Teeboom for a specific reason. Which is, if it was a request by a member of the public to get a tour of the facility, that is one thing. If it was, in fact a meeting to discuss something that is before this Board, without proper notification then it is a violation of the Right-to-Know Law. So I suspect that we are best off to call it "not a meeting" at this point.

Alderman Teeboom

Well, I'm very familiar with the Right-to-Know Law and that's what I call an administrative meeting. Aldermen meet at the Mayor's office at all times requested by the Mayor and not requested by the Mayor. There was no quorum of any kind and no members of the public present.

Alderman McCarthy

And there's no notice to other members of the committee who would have liked to have been there if a substantive discussion was going to take place.

Alderman Teeboom

That is not true. I invited... I worked totally through Mr. Shawn Smith...

Mr. Kelley

Mr. Chairman, I would like to note that I was not invited nor notified that this meeting took place as a member of the Construction Committee.

Alderman Teeboom

I invited Mr. Bolton. I communicated to Mr. Bolton. He chose not to attend. He could have notified anybody he wished as Chairman. Anyway, let me go on. So we toured the building and met in a small room and talked at an engineering level. In summary, it was concluded that solar panels are not needed, in fact counter-productive... not if you're looking for heat from solar panels in this part of the country. And that's been proven in the past. Solar panels are absolutely unnecessary.

Alderman McCarthy

Once again, I...

Alderman Teeboom

Can I speak without all this interruption?

Alderman McCarthy

No, you can't actually. We're going to get this on the record correctly. There was no conclusion, as I understand it. There was an opinion given by the gentleman you brought, that solar panels are not needed. I assume that our professionals did not reach conclusion and certainly no one in authority to make the decision reached a conclusion because they weren't even invited to the meeting.

Alderman Teeboom

Anyway, let me go on. The opinion of this expert was that solar panels are not needed. You do not need to take out steam pipes. If you don't need them anymore you leave them in place. You do not need to take out the ventilators. You don't need back up boilers because the system is self-balancing. I asked a very informal... of the people there what was his estimate of doing this job. Pull the boilers out and replace them. His rough estimate, on the back of an envelope, which he said he would back up in writing to do geothermal and do everything we need to do. He gave estimates of all of that and turned out on the back of the envelope to be \$6 million, which is close to the original non-thermal estimate of \$4.8 million, which was requested in the first place. Mr. Maedl said that for \$2 million per school (\$6 million) he would do all 3 schools. I think he's going to submit a single letter of proposal to Mr. Mealey and we can take it further. Certainly, this committee ought to get the options. Option 1 was to do the geothermal as bare bones without a lot of other renovations. Then do some additional work to make things look pretty and go on from there and get clearly the options on the table so this committee and JSSBC can make decisions about what it is they can afford to do. I think Mr. Turner said, I like to do my job pretty and not leaves pipes in the ceiling. My answer was those decisions have to be made as a matter of policy by this committee and by the JSSBC. But this committee needs to have clear delineation of the options. Not just say geothermal or no geothermal. I guess geothermal option #3 would be the full \$18-23 million job.

Alderman Bolton

Alderman Teeboom, you and I have had some communication regarding this gentleman wanting to become involved in the project. But up to now, he's refused to provide his qualifications. You have been unable to identify to me whether he's a design professional (an architect or an engineer) or a contractor who would do the job. He admits, and you admit to me that he hasn't viewed the facilities and doesn't know the scope of work. So I asked that something be submitted in writing, and not has yet been. It's entirely hearsay from sources that we can't evaluate, who did not participate in the request for proposals process that we went through to qualify the design professional and the construction manager. So, frankly I think you and he are a day late and a dollar short. But I reiterate that anything submitted in writing will be reviewed. I've been saying that for weeks. I've yet to see the first sentence from this fellow.

Alderman Teeboom

I asked him to appear before the full JSSBC if he could sit down and answer questions. Alderman Bolton said he could address the Board like any other member of the public. I did not think that was an appropriate forum. Members of the Board ought to be able to ask questions. Members of the public do not go into debate with members of the committee. Finally it was arranged, through the good auspices of Mr. Shawn for a tour. We had a tour this afternoon and toured the entire facility and I just summed up the findings.

Mr. Mealey

We actually did not agree to take a proposal from Mr. Maedl, he just indicated he would put more detail into what he thinks a geothermal system would cost. What we really took away from the tour today is that we're talking about a scope. What is going to be the scope of the project? Because everyone is concerned about this \$23 million price tag and if you did everything, then I don't think there was much difference in opinion of what that would cost. Even he agreed that if we did all those things, that would be the cost. We have to decide what is going to be the scope of this project.

Alderman McCarthy

Are there any other questions on the life cycle costing?

Mr. Vaughan

Are maintenance costs built into the cost flows?

Mr. Caulfield

Per say, total maintenance costs are not built into the flow. What we built in was what we feel the reasonable difference in maintenance costs would be between the systems. We don't see a significant difference, except that in the unit ventilator option there would be much more equipment, so more maintenance. The 2 other options basically have the same amount of equipment and so would require lesser maintenance on an on-going basis.

Mr. Vaughan

The geothermal is eligible for 3% cost savings by the state. Is that under the Green Programs?

Mr. Mealey

It would be eligible for the 30% school building aid, and then there's an additional 3% if you meet certain criteria for going green. And that's a good possibility with this one.

Mr. Caulfield

We included that 3% in both the heating & ventilation option and the geothermal because the types of equipment we have proposed for heating & ventilation options includes very efficient boilers, energy recovery for the ventilation air, etc. that will qualify for an energy efficiency upgrade.

Mr. Hallowell

And the 3% comes off the initial price of the project?

Mr. Mealey

Right.

Mr. Hallowell

You obviously get cooling for very cheap cost with the geothermal. How is that factored into this life cycle for all the options?

Mr. Caulfield

We've included electric costs for some of the cooling during the school year, at least for the geothermal option.

Mr. Hallowell

But only the geothermal. At one point there was an estimate for a regular heating & ventilation system with the add on of air conditioning. If I look at this life cycle cost, what is a ballpark amount of that additional cost?

Mr. Caulfield

Probably in the \$3-5 million more range.

Mr. Hallowell

So if I consider the fact that I'm getting air conditioning for free, this delta for the life cycle becomes quite large at \$1.60 per cubic foot.

Mr. Caulfield

But the \$1.60 doesn't matter for the air conditioning part of it, because it's strictly electricity. Either way you're using electricity to cool the air. Also understand that the system we proposed is not air conditioning, per say. It's a dehumidification system, which is slightly different.

Mr. Vaughan

How do we begin to winnow things down? We certainly can't ask these people to evaluate every combination of every option that we can think of. Is there a normal path of progression for these projects or do we need to winnow it down ourselves?

Alderman McCarthy

We generally tend to sort of look at what the gross options are and get costs and figure out from that what budget we want to work to and then work backwards.

Mr. Haas

Do you have a sense of total tonnage required by school?

Mr. Caulfield

I don't have that off the top of my head. We were talking today and the numbers that Mr. Maedl talked about sound right. It's roughly about 120 tons per building. And that's heating tons and cooling tons.

Mr. Haas

How many wells and how deep do you perceive to need for that?

Mr. Caulfield

We were talking about 14 wells (per school) at 900 feet deep. We have been doing designs recently that are more effective at a deeper depth... up to 1,500 feet deep. It would depend on what we found with the first well. We would always run a test well first and analyze what we get. Right now we feel that our design is very conservative and likely will need less than that.

Mr. Haas

Open loop or closed loop?

Mr. Caulfield

Closed loop.

Temporary Boiler**Kevin Drew, Harvey Construction**

We have a spreadsheet that you have. We invited 3 different bidders to participate in this. One was able to do so, but we were able to get 2 prices. One from Granite State Plumbing and Heating and the other from NE Mechanical. Essentially, you're looking at the same thing. But Granite State has a new 1800 MBH Boiler. The other proposal has a 100 horsepower boiler, which is approximately twice the size but it is a refurbished boiler. There is quite a difference in the 2 costs. Granite State with the new boiler is \$71,193 and NE's refurbished but larger boiler is \$25,000 because the unit is already assembled and ready to go. Although it is a used boiler, it would have new tubes and would function like a new boiler. We also have a series of options. I did ask NE Mechanical what they would charge for a new boiler and although they didn't have a hard cost, but the range would be \$90,000 and \$100,000. Finally, we asked them to give us as monthly rental cost and that would be \$6,000 per month. We do have a recommendation of our own.

Alderman McCarthy

Is the \$6,000 per month for a new one or a used one?

Mr. Drew

It would probably be on a used one.

Alderman McCarthy

So the break even would be at 4 months, so for a 3-year project that would make that decision pretty easy. Is there anything about the refurbished boiler that would prevent it from being used in the 3rd school as a permanent boiler?

Mr. Drew

Other than it being over sized, probably not. Although I think I would probably recommend a new boiler.

Alderman McCarthy

Things like the oil burner conversion... is that something that could funded by the project and done later?

Mr. Drew

It could be done later. And actually, we don't need them as we're going to run them on gas.

Mr. Hallowell

So you just said you don't need this temporary boiler. So why are we getting it?

Mr. Drew

We don't need the oil function. We do need the temporary boiler because we're going to be taking the heating plant out of each school during heating season. Looking at this, I feel that a used boiler of 15 years old is going to be good enough for our purpose. But for that price differential I say we use the used boiler for the 3 years and then put in a new smaller boiler for the 3rd school. It pays for itself in that we're not paying \$6,000 a month for 3 years.

Mr. Hallowell

So if we don't buy a portable one, which I assume costs more money... what is the cost of just putting in a boiler?

Mr. Drew

Again, we'd put in a much smaller boiler than this and I'd say roughly \$20-40,000 range. You're going to have the fit up whether you put in this boiler or a new boiler. So, it's really the cost of the boiler. I'd say it would be closer to \$20,000 to put in a boiler to that this one's place.

Mr. Hallowell

Are there other schools whose boilers may soon fail other than these 3 schools?

Mr. Smith

Nothing on the immediate radar, no.

Alderman Teeboom

I've seen the boiler room with water on the floor. How does it get installed?

Mr. Drew

It's not actually installed in that boiler room. This is trailer-mounted outside and totally external to the building.

Alderman Tabacsko

It sounds like the logic is to use this for 3 years and then put in a right size boiler in the 3rd building when that's part of the project and be done with it. Are we looking for a recommendation tonight?

Alderman McCarthy

I don't think so.

Mr. Smith

Before that, there's a line for the hot water converter and pumps. We no longer think we'll have to do that if we phase this properly, so you can ignore that line as well.

Alderman McCarthy

So, we're really just looking at the \$25,500. Is that the recommendation?

Mr. Smith

Yes, definitely take the savings.

ALDERMAN TABACSKO MOVED TO APPROVE THE PURCHASE OF THE TEMPORARY BOILER FROM NE MECHANICAL FOR \$25,500 AS RECOMMENDED.

SO VOTED.

Mr. Hallowell

So what do we do with this boiler at the end of the project?

Mr. Smith

Being a facilities guy, I would love to have something like this in my hip pocket. There are going to be other renovations at other schools and we'll probably need a temporary boiler at that point.

Mr. DuBois

Just so we're clear, this is hard cost from the actual sub. So the purchase price would get rolled into our contract and marked up accordingly.

Alderman Tabacsko

At the end of the project, perhaps we could get into the rental market and generate a \$6,000 a month revenue.

Construction Alternates

Mr. Mealey

We're proposing a couple of things for the next meeting on the 21st. One is to get someone in here who is an expert on geothermal to give a presentation so we all have a better understanding of it. The other is to do a detailed presentation on all the components of the projects so we can work with what we have and wheedle it down.

Alderman Tabacsko moved to adjourn. **So voted at 7:15 p.m.**

Submitted by Jacki Waters