



DOVER SCHOOL DISTRICT

JOINT BUILDING COMMITTEE – MINUTES

Meeting Type: Workshop Meeting – **Horne Street School**
Meeting Location: Office of the Superintendent – Conference Room
Meeting Date: **Tuesday, August 24, 2010**
Meeting Time: **5:30 p.m.**

MEETING # 96A

- A. CALL TO ORDER:** A meeting of the Horne Street School Addition & Renovations Joint Building Committee was called to order on Tuesday, August 24, 2010 at 5:31 p.m. at the Superintendent's office in the conference room.
- B. ROLL CALL:** Present were Karen Weston, Robert Carrier, Mark Geuther, Ray Bardwell and Carolyn Mebert. Also present were Laurie Verville, Business Administrator; Malcolm Forsman, Principal HSS; Michael Bliss, Clerk of the Works; John Urdi, Dennis Mires P.A.; Keith McBey, BPS; Mark Weissflog from KW Management, Catherine Cheney, Citizen; and Dave McCann, Citizen. Absent were Doris Grady and Jean Brigg Badger, Superintendent.
- C. Discussion on Photovoltaic Panels:** Mr. Urdi introduced Mark Weissflog from KW Management stating he was asked to come in and review the solar photovoltaic panels and answer any questions members may have. Mr. Weissflog stated he would like to talk about what solar does and doesn't do. Solar electricity doesn't save energy it's an alternative way to buy energy. When you want an alternative purchase of fuel, the town or school enters into a contract through a long-term purchase for a year and would have to pre-purchase energy and that's really what solar energy is. Solar electricity really is a pre-purchase of 30, 40 or 50 years of energy; it's not saving energy you're just buying it. Most cases you can count on utility rates going up along with fuel costs, it's a way for a business or municipality to lock in a certain portion of their energy for the future. One thing you want to look at is if it can be disassembled and if so how quickly it can be disassembled and put back together. They've been in business for 20 years and are commercial industrial electrical contractors. Back in 1998 the Solar on Schools Program took place and 10 schools were recipients of the program and they participated in installing most of them, which got them into solar, auditing, solar hot water, and geothermal heat pumps. They have a good understanding of building dynamics, building construction and envelopes. There's an importance of efficiencies and health and safety in an envelope design so you're not making it into a balloon and not having any pressure coming in; it's very efficient but unhealthy. The emphasis is on the envelope, which has already been taken care of for HSS. One issue is how much energy you're going to save. The base building is "x" amount of Kw hours a year and the addition is going to add to that and a lot of the efficiencies have been done in the base building. He'll try to get the numbers so they can get the CHPs points. Right now they're shooting for 10% which then gives 4 points, but if 4 points aren't needed for CHPs you can do a system for 3, 2 or 1 points, which would be a lower percentage of your energy. The 50 Kw system was going to start at approximately 22% of current and projected energy requirements for the electrical and the 26.4 Kw which is half is just over 10% over the energy and possibly a little more because a greater percentage would be on the gym roof which has a better tilt angle. There's a little easterly shading but would stay away from the east side of the roof so the shading wouldn't be as much of an issue. Approach wise what they would normally look at is trying to fill what the intentions are, to get CHPs or Leads points, and then try to capitalize on product selections/options. There are many companies out there now and as a contractor it doesn't make sense to buy everything from CLS, Graybar, etc. His company tries to stay ahead so they know what the industry is doing. Modules are a lot more plentiful but by the end of this year it will be thinned out. It will be a little harder to buy American made modules because of demand but not impossible. In the last 2 years they've seen a market decrease in module costs because the number of companies and demand. Right now the market is stable, the budget that's set could last another 3-6 months. They've used a dozen different types of modules and have installed for larger design firms and those that are looking for



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installers. They also have experience with products not usually seen on the open market. Solar modules are the work horse of the system when designing a system, he'll use the 26.4 Kw that is a peak production and is based on standard test conditions. Go with the 26.4 Kw systems at 77° within a radius of 1,000 watts per unit running perpendicular to the surface and this only happens when the ambient temperature is 40° without any winds. Cooler days produce better at spec. They would design for a 30Kw at 125% of 26.4 so the conductors and inverters can handle the extra load. February and March are the best months for production because of temperatures and summer has lower production days but a lot more of them. How they come up with 26.4 is it's calculated by looking at the modules proposed times the number of modules they have, which gives the STC rating (dc) then it has to go through the wires to the inverter and then out to the distribution system. Energy's used by Kw hour so comparing systems they need to look at Kw being produced with realistic production numbers and it's not a defined number because of unpredictability of the weather. The big thing to him is how long the companies been around and how stable they are. Also, is there a possibility they could be acquired or go away because the technology they have is too old. He suggests using multiple inverters versus central because if one goes you still have 90% working and they would just replace the inverter instead of trying to troubleshoot the problem. A central inverter is too heavy and would have to be serviced on-site, where multiple inverters can be replaced. Inverters should last around 10 years where it's electronic, modules from 30-40 years and racking systems are typically 5 years because of structure and what it's made out of, which is usually aluminum or stainless. This is the minimum the industry sees fit to put on it but installation should last longer than that. Ms. Weston asked for clarification on the difference between a module and inverter. Mr. Weissflog said the module collects sunlight and turns it into dc and the inverter takes dc and converts it into ac energy. Basic components are the module, which is the most expensive part of the system, racking, which is what the modules are mounted to, wiring, conduit and then goes into the inverter. Multiple inverters go into an ac panel that combines all into one output so you can feed a distribution panel in the building. The electrons are synchronized with the utility system so they're the same phase of voltage. As energies drawn off, it doesn't know how much is coming from sun. Mr. Geuther asked how it would work with the generator. Mr. Weissflog said where the generator wasn't hooked up for the whole building, you'd typically not connect a photovoltaic system on the load side of generator service or if the whole structure is feed, you'd have an active relay that would control the operation of the inverters if they went off-line. Also, the grid has the capacity to absorb the extra energy. The extra energy flows out of the building into the grid and goes to the nearest house/building in need of energy. He usually installs a secondary monitoring meter that's the low side of ac output panel so system accumulates energy and the meter keeps track of the information and is typically used for credit sales. NH has renewable portfolio standards where it mandates utility companies have to buy a certain portion of energy from solar, bio mass, hydro or wind using a sliding scale. Alternative compliance payments are what funds incentive and credits can be sold as green attribute and are currently trading at 30¢ Kw and if they don't buy at current rate they pay \$160.00 per Kw. Mr. Bardwell asked if he was in their position and money was no object, what system would he go with. Mr. Weissflog said they will always have to purchase electricity and have capital costs to get over. First three months of life already have half paid for. Ms. Mebert asked if he's done any schools; Mr. Weissflog stated KW Management has done around 60 schools in MA both big and small. Ms. Mebert asked how much the equipment has changed; Mr. Weissflog stated modules haven't changed much, inverters are always being improved and the racking systems and wiring have also had big changes. Inverters can now be plugged together which is easier and more efficient. Mr. Bardwell asked about bid documents and PSNH. Mr. Weissflog said a third party wrote specs and they went on the high side. KW Management did design to include what PSNH wanted. Mr. Bardwell asked who chose the inverters and modules; Mr. Weissflog said they did, not PSNH. They produced the designs with the building and electrical. He stated a flat roof mount with a slight tilt maybe a problem if they get more than 3" of snow because



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it will start to cover the modules and won't produce as much. Mr. Bardwell asked if they picked the degree of tilt; Mr. Weissflog said they usually go with a 10° tilt and sometimes depending on the degree of tilt it can add weight to a roof. Most designs try 5- 6 lbs per sf most buildings are designed for 20 lbs per sf. Mr. Bardwell asked about load at HSS; Mr. Urdi said HSS could handle 10 lbs per sf. Mr. Bardwell asked if the system was affixed to the roof; Mr. Weissflog said not usually because it's a low traffic area and the systems are usually weighted down. He stated out of the 60-70 systems they've done they only had one broken module. He stated they were looking to place part of the system on the gym roof because it has a better angle. Mr. Geuther stated it would be a better location so kids can't throw rocks and break the modules. Mr. Urdi asked if the modules were made out of Plexiglas; Mr. Weissflog stated they were made out of glass. (RECORD NOTE: Carolyn Mebert left at 6:33 p.m. and Malcolm Forsman left at 6:35 p.m.) Mr. Carrier asked if there was an alarm system to tell them of any failures. Mr. Weissflog said if they want to look into it he can; but the system includes a 2 check-ups during the first 2 years and something usually show up then if there are any major problems. It's very unusual to have a string of failures and they test the system again after it's installed. Mr. Bardwell asked if the computer program would let you look at individual inverters; Mr. Weissflog said it did and the industry is moving towards tracking each module because of micros that are placed on each module. Mr. Bardwell asked if as an industry panels stay the same size; Mr. Weissflog stated they all use a standard size along with a larger module. Efficiency is relative to the size of the roof. (RECORD NOTE: Catherine Cheney left at 6:44 p.m.) Mr. Weissflog stated if they go with a hot water system and it's not used much in the summer, they would have to drain the system so they don't destroy the glycol. Solar thermal is 60-70% efficient but they have no way to store hot water. It could an additional \$11,000.00-\$12,000.00 for a commercial collection system to store the hot water. They'd only be using the system 8 months out of the year and there'd be maintenance required for the system at an additional cost. He stated they've looked at the area and have accounted for shading, tilt, cover, etc. and believes they should get pretty close to what they're looking for with a photovoltaic system, but they can't predict changes in climate. (RECORD NOTE: Dave McCann left at 6:50 p.m.) Ms. Weston asked about the total cost for the 26.4 system. Mr. Weissflog stated it was \$141,000.00 less money from State incentives and possible \$900.00 from green credits that would leave them paying around \$63,500.00 overall. Ms. Weston asked what the weight of the panels was; Mr. Weissflog said he has the weight at 6 lbs square foot; Mr. Urdi said the roof could take 10 lbs per sf and said they could look at the tilt more. Mr. Bliss asked if they should submit this to the State and get pre-approval; Mr. Weissflog said it's a good idea if they want to get the State incentives and suggested going for the higher number. If approved for the higher kilowatt system and decide to go with the lower, they're all set. If they submitted paperwork for the smaller system and decided to go with the larger, they would only get incentives for the smaller system. He stated it was necessary to track to see if it's working over 10 Kw it required it be locked outside. Massachusetts schools have the disconnect on the outside of their buildings and none have been shut down. However, he feels it's not a good idea to put the shut off outside the building. Mr. Bliss stated he has an acquaintance who has worked with photovoltaic and he raised some questions on Trina modules and possible problems in the future. Mr. Weissflog stated he's used Trina in a couple of projects and the companies only been in business 13 years and is now listed as made in America. Trina is made in China but has factories in the States and he would prefer to buy American products. There are many local companies, many from Massachusetts. Mr. Bliss stated at this point there's no reason to change from Trina; Mr. Weissflog said not at this point. Mr. Urdi stated Mr. Weissflog has the information and asked where they go from here. Ms. Weston stated they can't do anything tonight because this is a workshop and need to discuss other items before they can make a decision. Mr. Carrier stated they need time to get a handle on the expenditures before they can make a decision. Mr. Bardwell asked if Mr. Weissflog could work on amending the proposal.



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Other Business:

- D. Schedule next JBC Meeting:** The next JBC meeting will be a workshop and is scheduled for Thursday, September 9, 2010 at 5:30 p.m. at the office of the Superintendent in the conference room.
- E. Adjournment:** Robert Carrier moved, Ray Bardwell seconded to adjourn the meeting at 7:10 p.m. An oral **VOTE PASSED: 4/0**

Respectfully submitted,

Karen Weston/pb

Karen Weston, Joint Building Committee Chair
Joint Building Committee
KW/pb