Appendix K. Action Plan Summary of Recommendations Rev 06 June 26, 2011		**COST**	**Status**
Category / Recommendation - Action		**(estimate)**	**Color Code**
The recommendations have been made and are divided into Four Overall Categories:			**Priority Item**
Health and Comfort (Items 101-199)			**Item that is on the list to do**
Preserve the Building (Items 201-299)			**Item - work is underway**
Save Energy (Items 301-399 - includes actions for Senior Center/ Shop)			**Completed Item or cancelled item**
Grow the Business Incubator (Items 401-499)			**Open Item**
Within each category, the recommendations have been further divided accoriding to ease and cost into 3 Phases:			
Phase I - Quick Items –"the low hanging fruit" (are in BOLD and listed first in each section)			
Phase II - Medium Items – the projects requiring some minor construction (are listed next)			
Phase III - Major Items - the projects requiring major construction			
Kennedy Senior Center and City Shop Actions (Items 501-599)			
Health and Comfort			
Phase I - Quick Items			
101	**Clean out the moldy items stored in various class rooms. The air is now dry and the tunnels are getting dried out so the mold problem should be reduced for the winter. However, if the moldy items remain – the mold will continue to spread. Make sure moldy items are disposed of in a legal landfill area.**	**low**	Nearly Complete
102	**Check to see if the two window type air conditioners installed in the office have tight covers outside to prevent air ingress, (similarly to the Kennedy Senior Center which has good covers). If not, cover the air conditioners from the inside with plastic sheeting.**	**low**	Complete
Phase II - Medium Items			
103	Cover the air slots under the wall radiators to prevent damp (possibly moldy) air from entering the offices and classrooms. A contractor should be able to do this in a straightforward manner. The front of the slot is a vertical ¾" board, so it should be straightforward to install treated 1x4 or 1x6 boards horizontally on this board with a small bead of building adhesive to hold the board in place and act as a seal.	**$1000 + labor**	
104	Begin installing boards in the offices and then move to the rooms now in active use. Additional rooms can have boards installed after the other rooms are done.	**see above**	
105	Look at options to modify the two existing air handler plenum ducts in order to provide fresh air and ventilation that does not use the tunnels.		
106	Seal the tunnels going to the East and Center wings		
107	Seal the tunnels (if possible) to the North under the front sidewalk.		

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108	Place a portable fan in the tunnel where it enters the furnace room that will pull air from the tunnel.			
109	If this is successful, build a 1/8 HP fan into a "hinged door" to the tunnel where it enters the furnace room that will pull air from the tunnel. Run this April to October.			
110	Once the temperature outside is above 40degF, crack open the floor covers at the South end of the wings in order to provide a place for air to enter the tunnels for ventilation.			
111	Place an exhaust fan in the furnace room for the spring and summer to send the air the tunnels to the outside.			
112	Establish a new fresh air system to meet ASHRAE standards. The tunnels cannot be used as fresh air ducts any longer. We will propose some designs to re-use the existing air handlers to run the system. It is likely that ducts will have to be installed near the ceiling parallel to the Main Hall. The existing fresh air intakes from the roof can be reused if passive heat exchangers can be added.			
Phase III - Major Items				
106	Site Drainage Issue – The tunnels will continue to have moisture and water during the spring, summer and fall. This will lead to musty air in the building and problems with the electrical and plumbing piping and junctions in the tunnels. The constant water will require that sump pumps are periodically installed to remove the water.			
107	Plan to begin to address the site drainage issues in 2010. Review proposal to work with the watershed district to improve the drainage (draft is attached). Currently, the roof drains cause the cisterns to overflow and this raises the local ground water level. This caused the excess water to flow into the tunnels. In addition, as these drains back up, several of the downspouts (pipes) also cause water to flow into the tunnels. (recommended firm: Ulteig Engineering, Farego office/ Pete Abelson, contact)			
108	Have an engineer inspect the site for drainage issues in 2011. (recommended firm: Ulteig Engineering, Fargo office/ Pete Abelson, contact)			
Preserve the Building				
Phase I - Quick Items				
201	Do not consider restarting the old furnaces. This could be an expensive project – to clean the sediment from the oil tanks, lines and burners as well as leak testing and repairing many traps throughout the building. Further, this would be seen as a big step backwards for the project.			
202	Instead, rent one to three portable propane furnaces for four months and install at each end of the Main Hall and one in the gym in case of extended below zero weather. Todd Electric has these in stock. These furnaces need to be on hand before the cold weather so that the system can keep up. The heat pump system is not designed to handle the heating load of below zero temperatures in such a large space. Without extra heat input, the loop field could freeze and the temperatures in parts of the building could also fall below freezing. This could lead to frost heaving under the floors and jeopardize the main structure and the gym floor as well.			
203	Remove boxes from top of transformer in furnace room - fire hazard.			
204	Remove other combustable items near the transformer in furnace room - fire hazard.			

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	Phase II - Medium Items			
205	Flashing on roof of elementary wing is separating from the building. This will be a problem when snow starts to melt. Have a contractor reattach flashing around the building to make certain no water will be trapped behind the flashing during snow melt or rain events.			
	Phase III - Major Items			
206	Develop a plan to bring the heating load in balance with the heating system.			
	Save Energy			
	Phase I - Quick Items			
301	**Seal leaks in the building. The envelope needs to be sealed – even in the wings not being used. From our preliminary analysis, it appears that the building overall is fairly tight. The construction is sound and the window walls and block walls are good from an air leakage standpoint. The windows, doors and other openings present a sharp contrast to this overall picture. There are many leaks with or just adjacent to the latter items – many are so large that it is possible to see the outside through the leaks.**			
302	**The process to seal the leaks was begun during the seminars 12/1 and 12/2 by sealing the holes adjacent to some of the windows with insulating foam.**		Partially Complete	
303	Replace the windows with the worst frames.			
304	**Cover the remaining old windows and any leaky new windows (all of the hinged windows and about 1/2 of sliding windows (especially critical in rooms being heated by the heat pumps). Use 3M film (see the library windows as an example).**		Partially Complete	
305	**Cover the doors at the south ends of the wings with heavy (6mil?) polyethylene plastic sealed with duct tape. This can be quickly removed in case of fire – for egress.**			
306	Cover the other wing hall entrances with poly and tape to reduce leakage.		Partially Complete	
307	**Monthly: clean filters of heat pumps to maintain efficient air flow.**			
308	**Set up a formal Maintenance Schedule for Building. This will be important since a maintenance person is no longer at the facility and because of the current energy situation. See draft Maintenance Manual (attached).**			
309	**Put temporary covers over the exhaust fan intakes in the bathrooms during the 3- 4 coldest months, (e.g. magnetic plastic sheets will work) Leave in place except during large events so that the ventilation matches the current normal occupant loading.**			
310	**Ensure that exhaust fans are always shut off after events – bathrooms and kitchen and elsewhere.**			
311	**Ensure that all thermostats are turned down, lights are off and doors are closed at the end of the day and after events.**			
312	**Install a programmable thermostat in the office to drop temperature from 5PM to 4AM and on weekends.**			
313	**Shut off any appliances / copiers / computers during non-working hours.**			
314	**Close the inside front doors when below 30 deg. F.**			

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	Phase II - Medium Items			
313	Begin to plan for insulation of the un-insulated lower sections of the window walls. A next step will be to get some budgetary quotes for drilling holes and filling the wainscot walls with urethane foam. **NOT REQUIRED - FURTHER TESTS SHOWED THAT 4" OF FIBERLASS WOOL INSULATION WAS INSTALLED**		**CANCELLED ITEM**	
314	*Budget cost estimate: $3.00 / sq ft depending upon the number of holes that must be drilled and how costly it will be to deal with the asbestos aspect of the wall board (e.g. if drilling through the asbestos requires special employee protection, HEPA filters, etc.) The Main hall center section of the building – window walls cover 190' in length. This means that the wainscot wall is approximately 570 sq ft so, the cost would run in the range of $2,000 The entire building has 1,800 sq ft. of this type of wall – to do the entire building would run $6,000.*		**CANCELLED ITEM**	
315	*The next steps are to: do more test holes around the building to determine if any insulation was installed (note: this will be done January 11 2011); to have a sample of the wall board tested in to determine the percentage and type of asbestos that was used; and to then get budget quotes from local contractors.*		**CANCELLED ITEM**	
316	Begin to plan for insulation of the un-insulated end walls. A next step will be to get some budgetary quotes for installing an inner insulated wall inside the block brick end walls. This could be: a standard stud / fiberglass insulation / polyethylene sheet / drywall type wall or a prepared insulated panel wall that is installed directly over the cinder blocks.			
317	*Budget cost estimate for the stud / poly /fiberglass insulation / drywall - type wall:*			
318	*Per 10' long by 12' high section of stud wall: (2) carpenters on the job - 4 hours to put up studs, 1-1/2 hours to put up insulation and poly (vapor barrier); Drywall - 2 -1/2 hours to install; Drywall taping - 3 hours (1 hour per coat for 3 coats with sanding between); Painting - less than 1 hour using paint sprayer. Total: 12 hours at $60 per hour gross if a contractor does the work, (less if city employees do the work). Materials $80 for 10' section.*			
319	*Total cost: $800 per 10 foot section or $80 per lineal foot. The main hall and Middle Hall sections have 97 feet of this type of wall – this would cost $7700 if a contractor does the work or less if the city employees use this as fill in work.*			
320	*The entire building without the gym would cost $26,000 for insulated stud walls installed by a contractor. The gym would cost about $50,000 as the walls are higher and plywood would need to be used instead of drywall due to basketballs.*			
321	*The next steps are to: to investigate alternatives to insulate cinder block walls and to then get budget quotes from local contractors.*			
322	Determine what process was used to install each piece of the membrane roof. Was additional insulation installed? Normally a layer of fiber-board is installed under the membrane. This information is critical to planning the energy load of the building. After the snow melt, a detailed inspection should be made of each section of the roof.			
323	Get a price from a reputable roofing contractor to replace the Gym roof and add 8 to 12 inches of Styrofoam insulation under the membrane.			

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	Phase III - Major Items		
324	If sections of the new roof need to be installed, include enough money in the budget to add R48 insulation under the membrane. Also ensure that a white membrane roof is installed to reflect sunlight, make the building cooler and save energy in the summer. If the roof is over 10 year old or will need replacement in the next 10 years, plan to begin replacing the roof. Budget cost estimate: $3.00 - $4.00 / sq ft depending upon amount of installation and the number of irregular shapes on the roof which require cutting and flashing.		
325	**The Main hall center section of the building** is approximately 12,000 sq ft, so the cost would run in the range of $35,000 to $50,000.	**$35,000 - $50,000**	
326	**The gym roof** would cost about the same.	**$35,000 - $50,000**	
327	**The entire building is 47,000 sq ft.** so the entire insulated roof would run $150,000 to $200,000.	**$150,000 - $200,000**	
328	If the roof is determined to be serviceable for a long time, evaluate installing insulation on the ceiling using a polyurethane foam spray or a suspended ceiling above the lights that would have R 48 insulation. **Note: Records indicate that roof is 15 - 35 years old and needs replacement in the next few years.**		**CANCELLED ITEM**
	Grow the Business Incubator		
	Phase I - Quick Items		
401	**Make the building look like a business center. Get Green Suppliers and manufacturers to put posters / or equipment in the display cases. Make the front look like a business building.**		Work Started
402	**Clean out key rooms and the shop to make more inviting for prospective businesses.**		Work Started
403	**Prepare one room as a demonstration office space (move-in ready).**		Work Started
404	**Move all of the Kennedy School, treasures, photos, trophies, etc. into one room located away from the front entrance. Make this room the Kennedy School Memorial room.**		Work Started
405	**Have an event at the facility each month to continue to bring people to the site.**		
	Phase II - Medium Items		
406	Turn the Library into a Green computer center with Green information references and exhibits.		
407	Remove the letters Kennedy Public School from the wall next to the front door.		
408	Put Business- like signage at the front of the building.		
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	Phase III - Major Items		

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	To be determined			
	Kennedy Senior Center and City Shop Actions			
	The Kennedy Senior Center is a wooden frame building built during the 1980s. As such it appears to be well insulated. It has electric baseboard space heating and two large self-contained window air conditioners mounted in the walls of the building.			
	Phase I - Quick Items			
501	**Issue – Winter Ventilation – since the building appears to be fairly tight from an air leakage standpoint, with electric heat, there is concern about having enough air exchanges – especially when a large group of people are present and/ or any cooking is going on with the gas stove (fueled with LP Gas).**			
502	**Use the exhaust hoods over the range in the kitchen exhaust air when ever people are in the building or cooking is being done. There are two hoods with variable speed fans. One of these could be run on low speed if a small group is present. Both should be run on higher speed if a large group is present or if the range or oven is being used.**			
503	**Have one window opened slightly (1/2") if any cooking is being and/ or if there are more than 10 people done during the winter.**			
504	**Have one window opened during the spring and fall if any cooking is being and/ or if there are more than 10 people done.**			
505	**Energy Use - gather data on electricity and LP gas usage and cost for one year.**			
506	**Calculate HHI (Home Heating Index from USDOE) to determine where building energy usage compares to other buildings in this climate zone. If building is above average, less will need to be done. If building is average or below, more air sealing and insulation may be required.**			
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	Phase II - Medium Items			
506	Longer term, investigate installing a passive heat exchange unit on the exhaust fan in the kitchen of the building to exchange air when ever people are in the building or cooking is being done. This would have a damper that would allow fresh air to enter the building whenever the fan(s) is/ are being run.			
507	Issue – Older appliances – there are a number of old refrigerators and a freezer. These are likely far less efficient than new models. In addition, there is a health issue as older refriderators sometimes cannot maintain proper temperature and food can spoil.			

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508	Contact Otter tail Power to discuss their programs to help pay for replacements. Begin planning to replace these units over time or these units if any repairs are necessary. The new models have compressors that are much more efficient and will pay for themselves in just a year or a few years.			
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	Phase III - Major Items			
513	**To be determined**			
	Kennedy City Shop Actions			
	The Kennedy City Shop is a Quonset hut type structure constructed of corrugated galvanized steel sheeting over a steel frame. The ceiling inside of building has been insulated with fiber glass insulation. The walls have been covered with fiber board. The choices for insulation are as follows: remove the fiberboard on the walls and install fiberglass batt insulation or have a contractor drill holes in each frame section and pump in urethane foam.			
	Phase I - Quick Items			
551	**Issue – Inside temperature. The heat loss is proportional to temperature difference between the inside and the outside. The building interior is run at 68 degF.**			
552	**Recommendation: Build an office / shop / work bench enclosure inside the building. Insulate this enclosure and heat it to 68 deg F. Install a programmable thermostat to increase temperature to 68 degF from 5AM – 5PM weekdays, or on demand if overtime is required.**			
553	**Keep the main building at 45 deg F to protect the equipment and still make the diesel engines easier to start. This scheme could reduce energy usage by as much as 25- 30% each winter.**			
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	Phase II - Medium Items			
557	Issue – The walls are not insulated and have been covered with fiber board. The choices for insulation are as follows: remove the fiberboard on the walls and install fiberglass batt insulation or have a contractor drill holes in each frame section and pump in urethane foam.			
558	Recommendation: Get a bid from a contractor to insulate the walls. The choices for insulation are as follows: remove the fiberboard on the walls and install fiberglass insulation or have a contractor drill holes in each frame section and pump in urethane foam.			
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Phase III - Major Items				
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