

KITCOM Administrative Board Meeting Minutes

February 13, 2020

700 Elmview Rd, Ellensburg

Attendance: Bill Dickinson, Fire District 7; Mary Morgan & John Akers, City of Ellensburg; Darren Higashiyama & Cory Wright, Kittitas County; Glenn Huffman, Kittitas Valley Fire & Rescue; Rob Omans, City of Cle Elum. Bob Johnson & Darlene Mainwaring, KITTCOM. John Sinclair, Kittitas Valley Fire & Rescue arrived at 1:51 pm. Cory Wright departed the meeting at 2:51 pm.

Geoff Scherer notified the director he would not be attending the meeting.

Called to Order at 1:31 pm.

Approval of the Meeting Agenda: John Akers moved to approve the agenda as presented, Glenn Huffman seconded, approved.

Approval of the January 9, 2020 Regular Meeting Minutes: John Akers moved to approve the January 9, 2020 regular meeting minutes, Bill Dickinson seconded, approved.

Approval of the February 2020 Blanket Vouchers: Darlene Mainwaring led discussion regarding the vouchers. Payroll Benefit & Deductions in the amount of \$56,664.20 (check numbers 025485 through 025496 and 025515 through 025526), Payroll Direct Deposit in the amount of \$70,154.02 (check numbers 025466 through 025484 and 025498 through 025514), and Claims Fund in the amount of \$56,950.44 (check numbers 025527 through 025573). Darren Higashiyama moved to approve the Blanket Vouchers, Glenn Huffman seconded, approved.

Engineer's Report: Bob Johnson reported the following: 1. A Memorandum of Lease in regards to the King County PSERN project will be in front of the Board in the near future; A master services agreement is being completed for dark fiber from Fairpoint (Consolidated Communications). Mary Morgan asked "why a lease with Fairpoint rather than the City of Ellensburg?" Bob Johnson explained we also have fiber with the City, this provides resiliency in case the city fiber is cut, and also noted the City fiber is dominant.

HVAC Update: Bob Johnson led the discussion. He reported we are now 60 days into the Project, he spoke with Brad & Burke who provided a good suggestion of a system with boiler heat using natural gas. If this were the selected method for the HVAC, two (2) boilers would be needed, one (1) with natural gas & one with LPG (liquefied petroleum gas) or emergency electric heat for redundancy. Bob discussed the options provided by the HVAC Consultant's report (attached to minutes for future reference). The following are the scenario/options:

The Baseline scenario/option includes those changes/updates which must be done;

#1 , the Mini-Splits,

#2 is to replace existing systems with new similar systems;

#3 is the VRF Multi-Head option; and

#4 is the Water Source Heat Pumps.

Bill Dickinson suggested for economy of operations, the mini-splits are economical and the cost of operation is not demonstrated in this document. John Akers suggested the quality of the water in this area is hard with a lot of iron, there is reason to believe it could be problematic. Bob Johnson stated the water would be brought into a heat exchanger, could be hard on the coil in the water stream. John

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Akers asked what GPM (gallons per minute) is required. Bob stated 25-35 GPM and it would be circulated back into the ground water. It is a minimal water right which has to be applied for to draw/inject water from & back into the ground. It would use one RU per day and inject it back into the ground. Bob Johnson stated it would return water back to the aquifer, it is net/net. Cory Wright asked if it is closed loop or open loop for those already in use. Bob Johnson stated it is open loop and would be more than a mile worth of coil. Rob Omans asked if it would be a procurement or out to bid. Bob Johnson suggested to hire an engineer and architect firm, the architect firm who built the building & a second consultant for engineering.

Bob Johnson reminded everyone the energy code changes on July 1, 2020, which will make it more difficult to meet new energy codes and would like to get permitting completed prior to June 30, 2020 if an actual upgrade/change is to occur for the HVAC after June 30, 2020. Rob Omans suggested we move forward. Mary Morgan suggested the mini splits and use of ground water should be taken off the table. Mary Morgan suggested based on what we know about DOE, looking forward a year out, the use of ground water is the most expensive and doesn't want to invest that amount of money for a 40 year plan for this building. We should look at Scenario 2 or 3 and get our permits completed by June 30, 2020. John Akers stated he is not sure DOE would be problematic, his concern is for the water, it could bio foul easily and we will spend in the long term on maintenance costs. DOE does this kind of system all over the state. Cory Wright suggested there could be some source of liability down the line with contamination with scenario 4. He asked about the redundancy factor, if the generator would hold capacity enough for electric heat to overcome the defrost cycle in the communications center? Bob Johnson stated with the new system, new controls will throttle air intake dampers to get best efficiency to keep zone fresh for the occupants. Bob discussed the backup process in which we would have 24 hours' worth of sub-base fuel in the tanks, we keep it down to eighteen hours to keep from getting mold/fungi. Bob further discussed the redundancy within our systems for power. Cory Wright suggested keeping the old system and added a new system for redundancy. John Akers asked if we could put new controls and economizers on current system. Bob Johnson responded stating dedicated outside air/zone economizers can meet the requirement for dedicated outside air to 4 dampers, 1 per zone. Financially it wouldn't pencil out; would cost more.

Board consensus to remove scenario 1 & 4 and pursue more information about 2 & 3 and to consider the boiler option.

Authorized Use of FCC Licenses held by KITTCOM: Bob Johnson led discussion regarding the proliferation of radios owned by individuals who work with the Fire and SAR (Search & Rescue) groups. This is not to disallow individual employees/volunteers from having their own radios, this is to ensure there is an agreement between the individual and the organization they are an employee or volunteer for use of the radio(s). Bob also reported of instances in which the FCC actually has stepped in to manage instances of violations of FCC rules. Cory Wright moved to approve adopting the Authorized Use of FCC licenses held by KITTCOM, Glenn Huffman seconded, motion approved.

Resolution 2020-2 (2020 Budget Resolution with Capital Projects): Darlene Mainwaring led discussion regarding the Capital Projects with the recommendations from the Budget Committee which included Geoff Scherer, Rob Omans & Glenn Huffman. The Budget for 2020 approved in November 2019 only included the operational costs as we opted to review the ebb and flow of the cash balance as 2019 came to an end which also allowed for a more in-depth review of the proposed capital projects. The proposed allocation of funding included the following:

- 1. Security System/ACCESS Control/Cameras at 700 Elmview Rd, 75,000
- 2. Succession Plan/Hiring next Director, 2 months' salary/benefits & advertising, 20,000
- 3. IT projects, 25,000
- 4. 2019 Carryover Projects, 56,247
 - a. Carpet Replacement Supv Ofc/Records/Training Rooms 3,747
 - b. Replace 16T1 Constellation with Alcatel MDR8000 OC3 9,500
 - c. PSTN Line Move geo-diverse telephone (via KVFR not EPD) 5,000
 - d. KITTCOM Admin PBX replacement & local VoIP for EOC 4,000
 - e. Fiber WDM w/ County, add transport capability diversity WB & EB 9,000
 - f. Edge Repair and Seal Parking Lot and re-Striping 10,000
 - g. CAD/RMS Interface to Fire Paging 15,000
- 5. Carpet: breakroom workroom, IT & Comm Engineer's Office, 6,000
- 6. Chair Replacement/Upgrade, 5,000
- 7. Consultant for 1/10 of 1% Emergency Communications Tax Study for NG Radio, 9,999
- 8. Update breakroom: new lockers, table/chairs, 2,000
- 9. Generator Server Replacement ILON (Sky Meadows), 4,500
- 10. Craig's Hill Project, 36,000

Total: \$239,746

John Akers moved to approve Resolution 2020-2, Rob Omans seconded, motion approved.

Director's Report: Darlene Mainwaring reported the following: 1. The Department of Homeland Security Assessment was completed on January 30, 2020, the report will be completed and delivered in 45 days; 2. The representative for Homeland Security emailed accolades for Communication Engineer, Bob Johnson's technical knowledge; 3. KITTCOM's staffing has improved, On February 17, 2020 we will be staffed with 12 of the 14 positions; 4. With the increased coverage, we are now able to provide the Emergency Services Dispatchers with needed training for the assigned tasks or position. At the end of March, Supervisor Shuey will be on a Monday – Thursday schedule to shadow the director providing more depth, as well she will complete her supervisor duties and assist with coverage; 5. Currently coordinating the next hiring process for the end of March; 6. Staff will be finishing the 2019 financials with the City of Ellensburg Finance Department in the next few months; 7. The GIS analyst started on January 21st and has "jumped in with both feet" and 8. The director will be completing the retirement process and will have a letter for the Board at the March meeting.

Meeting Adjourned at 2:59 pm.

KITTCOM Administrative Board Member

KITTCOM Administrative Board Member

KITTCOM Administrative Board Member

ATTEST: Board Secretary Darlene Mainwaring

February 12, 2020

Attn: Bob Johnson, Communications Engineer

Re: HVAC Project and Energy Analysis of KITTCOM (Kittitas County 911) Facility

Bob,

As per your request, I spent several hours today rewriting the document to emphasize key options that you mentioned in your email. I also created a Priorities, Specifications and Important Principles section. (see below) to ensure that you get quality work and equipment during the bid and installation process.

I am still not a strong supporter of a ductless VRF system unless it is integrated into the existing HVAC fire damper control system and can implement a Dedicated Outside Air Supply (DOAS) and Demand Controlled Ventilation (DCV) controls for optimum indoor air quality conditions for the employees, especially those that work in the 24/7 call center area. It is also important to remember a redundancy approach must be adopted in all zones that provide emergency services.

Contact me any time to discuss this report or if my services are still needed for your organization.

Respectfully,

Greg Jourdan



Emphasizing Education and Energy Conservation
for Residences, Commercial Buildings
and Industrial Facilities Including
Energy Audits, Applied Research,
Thermal Analysis, and Energy Code Compliance
Level I Certified Thermographer
4425 #2 Canyon Road
Wenatchee, Washington 98801
Email gjourdan@msn.com

Priorities, Specifications and Important Principles for the HVAC upgrade at KITTCOM Call Center

1. The building's existing fire smoke control dampers must continue to operate during and after the HVAC upgrade. This includes fan shutdown, zone isolation, flushing smoke generated by fire, flushing the dispatch area, and a control method to lockout the Outside Air (OSA).
2. HVAC systems serving Zone 1 and Zone 3 (see building map) should have redundancy, including backup mechanical equipment, to ensure that the mission critical 911 service will not be incapacitated by typical HVAC mechanical failures. Mechanical heat pumps must have backup electric resistive heat with controls to modulate and maintain indoor controls at +/- 1°F from the customer's setpoint. Cooling dominant zones such as the computer room should have the capacity to operate in a free cooling economizer mode or from mechanical compressor cooling. If outside air temperature rise above a predetermined ambient temperature, the compressor(s) will be allowed to cool the zone. Furthermore, these mission critical zones must have their associated electrical switch gear powered from the building's "G2" emergency power panel.
3. The replacement HVAC systems must be commercial grade equipment, with fully integrated economizers and BACNet control capability. Residential grade equipment should not be allowed.
4. All replacement HVAC systems and sub-systems must meet or exceed the current Washington State Non-residential Energy Code (NREC), as determined by the AHJ, and the National Electric Code (NEC). This includes any required economizers, dedicated outside air systems (DOAS), and demand-controlled ventilation (DCV) systems that monitor and control optimum indoor CO2 conditions for all employees within the building. Note-commissioning is now part of the NREC code to verify that all systems are installed and operating per the requirements upon completion of the project.
5. The supply air that serves the 911 dispatcher zone, must provide consistent room temperature control within approximately +/- 1°F of setpoint. This can be accomplished with methods such as fully electronic heating or by modulating fan and heat pump compressor controls. Short cycling of compressor equipment of either on or off to maintain temperature should be considered an unacceptable approach.
6. The HVAC systems and sub-systems should meet or exceed the temperature criteria used when creating the original building specification. This includes unimpaired operations during extreme conditions such as high ambient temperature during summers of up to 105°F and during winters when temperatures are as low as a sustained 0° F. ambient outside air temperature.

7. The system(s) Energy Management Control System (EMCS) must automatically control and shed electrical kW load as necessary, based upon a predetermined kW setpoint by the owner's representative to stay within the facility's generator capacity. If the kW demand must be increased by more than 5KW in the next generation of HVAC, the controls must automatically shed less-essential electrical loads within the facility to stay within specified KW capability. Note-the backup generator must have enough capacity to operate the entire building during a loss of power, or during any extreme ambient conditions. This may require upgrading the existing generator from a 100 kW to a 150 kW if load shedding is not viable or undesired.
8. All HVAC heat pump equipment must meet or exceed performance as needed for extreme cold temperatures as found in the Kittitas valley.

Scenario/ Options	Description	Pro's	Con's	Cost Estimate	Energy Issues	Controls & Automation
<p>Baseline "MUST DOs" to make building work properly</p>	<p>Repair and make function all outside air damper controls, including per zone to fully modulate. Today they are held in one position by the DDC control system .</p>	<p>Allows control system to utilize economizer function.</p>	<p>May require new modulating dampers at some locations</p>	<p>Need quote from vendor. Recommend an initial "place holder" budget of approximately \$20,000 for this "must do" work; subject to revision once scoped and quoted by control's contractor.</p>	<p>Will save energy costs, and improve indoor air comfort.</p>	<p>Can be easily completed. Allows customer to see entire building operation remotely.</p>
<p>Baseline "Must Do"</p>	<p>Install CO2 Monitoring and Demand Control Ventilation (DCV) with associated economizers, if applicable. Upgrade and expand controls including temp sensors, CO2, BACNet. Install temperature sensors in return air, mixed air, and supply air for remote monitoring and likely control.</p>	<p>Provided optimum indoor air quality to employees. Allows system to monitor various air temps and communicate to all equipment via BACNet.</p>	<p>Adds cost to job. Adds cost to job</p>	<p>Customer can purchase CO2 sensors to avoid markup.</p>		<p>Minimum and maximum CO2 levels can be obtained and used to control HVAC logic</p>

Scenario/ Options	Description	Pro's	Con's	Cost Estimate	Energy Issues	Controls and Automation
<p>Scenario #1 Mini-Splits</p> <p>I do not, recommend this for a governmental mission critical 24/7 building.</p>	<p>Replace the existing heat pump units with 1:1 mini-splits or multiple mini-splits per zone.</p>	<p>Simple, lowest price of the ductless system options.</p>	<p>More of a residential solution to a commercial building problem.</p> <p>Redundant outdoor condensing units are required for Dispatch and Equipment room areas.</p> <p>Will require installing multiple ductless units on walls of building, plus installing copper refrigeration piping and new electrical power to each unit throughout. Expect extensive concrete coring and electrical work. Will also require modifying control system.</p> <p>Electrical conduits and/or refrigerant piping will be visible on interior and/or exterior walls, or ceiling mount cassettes should be considered to hide new conduit and piping.</p>	<p>TBD</p>	<p>TBD</p>	<p>Does not integrate into control system.</p> <p>Expect that this will have the least reliability; consistent with residential use.</p>

Scenario/ Options	Description	Pro's	Con's	Cost Estimate	Energy Issues	Controls and Automation
<p>Scenario #2</p> <p>Replace existing systems with new similar systems.</p>	<p>Utilizing contractor grade equipment, with high efficiency. Install four (4) new air source heat pumps to replace all existing heat pumps.</p> <p>Note: this does not meet the current energy code requirements unless a fully functioning economizer mode with DOAS functionality is implemented by controls contractor.</p>	<p>This will not require changing anything except the indoor and outdoor units.</p>	<p>This may not totally fix the heat pump short cycling problem.</p> <p>Does not have redundant systems.</p> <p>Cold air may occasionally blow on customers during defrost cycle. <i>BJ: Controls may be able to solve most of ongoing this issue.</i></p>	<p>\$20,000 /zone x 4 zones. \$ (need firm quote from mechanical contractors)</p> <p>Add two "zones" (total 40K more) for redundancy.</p>	<p>Minimum improvement in energy efficiency, newer units use variable speed modulated compressors and fan speeds, more efficient and reduces short cycling.</p>	<p>This system will need to be integrated into the control system to minimize or reduce cold air complaints.</p> <p>10 to 15 year equipment life expectancy</p>

Scenario/ Options	Description	Pro's	Con's	Cost Estimate	Energy Issues	Controls and Automation
<p>Scenario #3</p> <p>VRF Multi-Head</p>	<p>Install four (4) new commercial grade (not residential) low temperature rated ductless air source (VRF) Variable Refrigerant Flow heat pumps with BacNet capability to replace all existing heat pumps, utilizing high efficiency equipment which exceeds the current energy code requirements.</p> <p>1 (or 2?) non-redundant unit(s) serve offices in administrative portions of the building. The dispatch and equipment areas require redundancy of 2 large units serving both zones or 2 smaller units in each of the 2 zones to meet the need for emergency services reliability. Requires a fully functioning economizer mode with DOAS functionality be implemented by controls contractor.</p>	<p>Very energy efficient, and will move heat from server room to heat the call center room or other zones as needed. Single zone indoor heads will not be adequate to properly distribute the air throughout the zone.</p>	<p>Redundant outdoor condensing units are required for the Dispatch and Equipment room areas.</p> <p>Will also require modifying control system.</p> <p>Electrical conduits and/or refrigerant piping must be provisioned to each room/space for the installation of wall mount units or ceiling grid "cassettes".</p> <p>BI: Note that this puts piping above the ceiling spaces which was minimized in the original building design to limit the effects of piping leaks.</p>	<p>Need firm quote from mechanical contractor(s) and controls contractor.</p> <p>Estimate \$25,000 /zone for 4 zones, plus two zones for redundancy.</p> <p>Plus controls upgrade.</p> <p>Requires substantial costly additional wiring and copper piping be installed within the building.</p>	<p>Improves energy efficiency to maximum possible with ductless heat pump technology.</p>	<p>Can be integrated with existing controls assuming BACNet upgrade is implemented.</p> <p>10 to 15 year equipment life expectancy.</p>

Scenario/ Options	Description	Pro's	Con's	Cost Estimate	Energy Issues	Controls and Automation
<p>Scenario #4</p> <p>Water Source Heat Pumps</p> <p>(Best long term solution with lowest operating costs and best ROI-Return on Investment.)</p>	<p>Install four (4) new commercial grade geothermal (water source) heat pumps with BacNet capability to replace all existing heat pumps, utilizing equipment with highest efficiency possible, exceeding the current energy code requirements.</p> <p>Requires a fully functioning economizer mode with DOAS functionality is implemented by controls contractor.</p>	<p>Most energy efficient option available on the HVAC market.</p>	<p>Equipment replacement costs may exceed other solutions due to higher efficiency of equipment and the additional upfront costs to install a geothermal water source (if allowed)</p>	<p>Need firm quote from well driller, mechanical contractor(s) and controls contractor.</p> <p>Estimate \$20,000 per plus well and feed water unit cost for up to \$100,000 total costs. Will need backup system for zones 1 and 3, (mission critical zones)in case of equipment failure.</p>	<p>Improves energy efficiency to maximum amount possible with geothermal (water source) heat pump technology.</p>	<p>Will require BACNet integration between the equipment and the controls vendor.</p> <p>20-30 year life expectancy with proper water treatment and/or cleaning</p>

BobJ Comment:

Washington State Energy Code changes to become more complex, more restrictive, and of course more costly on July 1, 2020. If KITTCOM is planning to implement changes to the HVAC systems, getting into permitting ahead of that date would be prudent. If we're planning to enter permitting after that date, we will need to design and fund to meet the upcoming version of energy code.

Useful links Related to Project

Washington State Commercial Energy Code
<https://fortress.wa.gov/ga/apps/SBCC/File.ashx?cid=6195>

Heat pump options

<https://www.consumerreports.org/cro/heat-pumps/buying-guide/index.htm>
https://www.youtube.com/watch?v=y_ZGBhy48YI
<https://www.youtube.com/watch?v=DAjr04G1ssQ>
<https://www.youtube.com/watch?v=4YKrGEPg-Oo>
<https://www.youtube.com/watch?v=DAjr04G1ssQ>

Demand Controlled Ventilation and Dedicated Outside Air Systems (DOAS)

https://www.krueger-hvac.com/files/white%20papers/article_demand_control_ventilation.pdf
https://www.energycodes.gov/sites/default/files/documents/cn_demand_control_ventilation.pdf
<https://www.youtube.com/watch?v=NJDkZ197rul>

