RHODE ISLAND
BOARD OF EDUCATION

State of Rhode Island and Providence Plantations
Council on Postsecondary Education
OFFICE OF THE POSTSECONDARY COMMISSIONER
560 Jefferson Boulevard Suite 100
Warwick, Rhode Island 02886-1304

Enclosure 8c
February 24, 2016

TO: Members of the Council on Postsecondary Education

FROM: Jim Purcell, Ed.D, Commissioner for Postsecondary Education

DATE: January 28, 2016

RE: Approval of the renovations to the President's House at the University of Rhode Island in compliance with Dr. Dooley's employment contract.

Section 3(d) of the employment contract between the Board of Education (now Council for Postsecondary Education) and David M. Dooley is as follows:

> *President shall reside in and be provided with the use of a residence located on the Kingston campus of the University and he shall perform certain duties of his office at that location. Said residence shall be maintained at the expense of the University of Rhode Island and Board shall maintain and repair the President's residence and its grounds as necessary. All additions, remodeling or equipment purchases for the President's residence in excess of Ten Thousand ($10,000) Dollars shall be subject to Board's prior approval.*

At this time, the University has had the residence audited by RISE Engineering and received their report on upgrades that are necessary for increased energy efficiency as well as upgrades in the HVAC systems of the home.

Their report has detailed seven recommendations for the upgrade of the home's HVAC systems and associated insulation projects. At this time, the University would like to begin these projects as follows:

Projects 1-4 related to the home's insulation -	$14,500
Project 5 related to the installation of a Unico Central A/C system -	$33,120
Total	$47,620

The University seeks to have these projects completed by May 2016.

The remaining two project recommendations in the RISE report will be scheduled by the University for future fiscal years as follows:

Fiscal 2017 - Project 7 – Replace second floor electric heating system	$31,280
Future – Project 6 - Mitsubishi Hyper Heat system to provide HVAC to the third floor	$21,735

Accordingly, I recommend

THAT the Council on Postsecondary Education approves the improvements and renovations to the President's Home at the University of Rhode Island in accordance with the President's employment contract with the Council on Postsecondary Education as detailed in the attachments.

THE
UNIVERSITY
OF RHODE ISLAND

THINK BIG WE DO

On Feb 4, 2016, at 6:01 PM, Jerome Sidio <sidio@uri.edu> wrote:

PRESIDENT DOOLEY-

I have enclosed a copy of the RISE Engineering report on the installation of A/C in the residence. The report covers a full energy audit of the house, and a summary of the key findings includes:

1. The house is poorly insulated in the exterior cavities to include the attic. Attic insulation is estimated at R-9.
2. There is significant air leakage through the attack and basement; and the floor over the garage is not insulated.
3. The A/C for the 2nd and 3rd floors is best provided through two separate systems that can be constructed at different times, and defers the decision to install A/C to the 3rd floor bedrooms to a future time, if at all. The 2ndfloor will be a ducted high velocity system, similar to that used in the basement and 1st floor; it includes A/C for the 3rd floor hallway and bathroom, but excludes the individual bedrooms. The proposed 3rd floor system is a split-ductless system that works off of a heat pump with 3 separate evaporators.
4. The 2nd and 3rd floors are heated by electric baseboard units, but the new boiler, which provides for gas heated hot water for the basement and 1st floor, is properly sized to add the 2nd and 3rd floor to the hot water system. The proposal recommends converting the 2nd floor to hydronic baseboard heat using the boiler and removing the electric baseboards. The 3rd floor heating system is recommended to be replaced at the same time as the installation of the 3rd floor A/C system, using the heat pump capabilities of the recommended replacement units. However, we are also reviewing replacing the 3rd floor electric heat with hydronic heat as an alternate.
5. We propose organizing the 7 Recommendations in the RISE Report into three separate projects that allow for spacing the three over several years. All elements in project 1 are defined at this time, but there are several elements in projects 2 and 3 that we will review further and make recommendations at a future time:
    a. Project 1: FY 16

        (1.) Recommendations 1-4, all recommended insulation and air seal items: $ 14,500

        (2.) Recommendation 5, A/C to the 2nd floor, 3rd floor hallway and bathroom: $ 33,120

        Total: $ 47,620

b. Project 2: FY 17: Recommendation 7, Replace 2nd floor electric heat: $ 31,280

c. Project 3: Future: Recommendation 6, 3rd Floor A/C and heat. $21,735

The prices listed for Project 1 are slightly higher than the report as they were adjusted after the detailed site visit. We will need to move quickly to insure construction completion of the A/C by Commencement. There is a three week lead time on equipment after award of the PO, and the A/C construction is estimated at four weeks.

This is a complex proposal and we are prepared to meet with you to discuss the details.

Please call if you have any immediate questions or concerns

Jerry

Jerome B. Sidio
Director, Facilities Services
University Of Rhode Island
(401) 874-5488

To: David Lamb
University of Rhode Island
d.lamb@uri.edu
From: Steve Hines, RISE Engineering
Date: December 01, 2015
Re: Proposal to provide thermal envelope, air conditioning and heating upgrades to the **President's House**

Site visit performed and proposal compiled by:

Steve Hines
RISE Engineering
401-784-3700, ext. 117

Prices and descriptions, below, are based on two relatively brief visits to this home, scheduled to coincide with house cleaning staff work. Upon reading this proposal, if URI is interested in pursuing some of the measures offered, we would be happy to visit the site with in-house and subcontractor resources to better define the work requirements and the pricing we can offer.

Site Description:

President's House

The building is wood framed and clapboard sided with three stories above grade. Wings have been added over time. A tuck-under garage and a mechanical room are below the rear wing. The building is on a slight hill with walk-out egress from the basement level. Extensive remodeling has taken place in the kitchen, dining, bath and basement rooms, over time. All other rooms appear to have original floor, wall and ceiling surfaces. The building is heated by a gas fired, high efficiency forced-hot-water boiler, reportedly sized to handle the entire building's heating requirements. Domestic hot water is provided via an indirect tank that is served by the boiler. There is a full basement under the original house and a crawlspace below a north bedroom wing. There are split DX cooling systems serving the first story. Up to seven window mounted air conditioners are used to cool the second and third stories.
The building was constructed without cavity insulation. Insulation has been added, to a degree, in the course of remodeling.

Total measured floor area of conditioned space:	6,275 square feet *
Total volume of conditioned space:	53,340 cubic feet *

* includes basement

Findings and recommendations:

Air infiltration

A blower door test was performed, with the building configured as it is operated in winter months (i.e. fireplace dampers above gas logs open; all exterior windows and doors closed) to quantify air leakage rates. The house has no effective barrier to air leakage to the perimeter roof via the joist cavities between the second and third floors. Typical air leakage pathways are present, throughout.
Present leakage rate: 9548 cfm @ 50 Pascals. 0.50 air changes per hour

Recommendation #1:
Air seal. Perform blower door and combustion safety diagnostic tests to ensure that this home will be left in a healthful condition after the following work is completed.

Air seal the high attic space:
Weather-strip the access hatch. Seal openings around the vent pipes. Seal the seams where all wall top plates meet plaster. Seal the stud cavities at the gable ends at the level of the ceiling. Seal where the partition wall studs of the third story closets, dormers and gables join the sloped ceiling rafters.

Air seal the kneewall attic spaces:
The major air leakage pathway from this house is at the joist cavities just below the kneewalls. Those cavities are exposed to the kneewall crawlspaces and in series to the vented soffits and ridge. There are present access doors to the kneewall spaces at three corners of the building. In those three areas, densely packed cellulose insulation can be installed as an air barrier in each joist cavity by drilling through the exposed sub-flooring adjacent to the kneewalls. In the northeast corner an access panel is present within a closet. Adjacent to that closet are recessed drawers that extend deep into that kneewall space. We suspect that the drawers, exposed to the vented soffit, had been cold and as a result a somewhat haphazard remodeling attempt had been made to insulate behind those drawers by filling the kneewall space with blown fiberglass. That effort did not treat the major air leakage pathway of the joist cavities *below* the kneewall floor. Nor did that effort fill the kneewall space. The space is ¾ full with blown fiberglass and the insulation cannot be fully effective as installed. From the present access panel, remove the present blown fiberglass. Where sufficient worker room exists, seal the joist cavities below the kneewall floor with densely packed cellulose, as described above. Where insufficient room exits behind the drawers, access must be obtained. Remove the roof shingles from the front roof in this one area and temporarily remove roof sheathing. Reach in to access the sub-floor and drill to densely pack cellulose. (The cellulose does the job as an air barrier in this case. See separate insulation measures, below which will use this same roof access to properly install kneewall-drawer insulation.) Resurface the roof, employing a water and ice barrier before reapplying roof shingles.
Weather-strip all kneewall access doors at all edges.
Cost of all high attic and kneewall attic air sealing as described above: **$3,265**

Air seal within basement and crawlspace areas:
Within the unfinished basement and crawlspace areas, use expanding spray foam to seal all accessible wiring and plumbing penetrations below the sub-floor of the first story. Seal any accessible gaps at the house sill where it meets the top of the foundation with expanding spray foam.
Cost of all unfinished basement area and crawlspace air sealing: **$270**

Window and door air leakage:
The windows and doors are weather-stripped and good condition storm windows are present. Treating windows further for air leakage would not be cost effective. A low priority measure would be to someday consider replacing windows with Energy Star labeled models.

Attic insulation
All insulation in this building has been added since the time of original construction. By today's standards, the insulation in all attic areas of the original building is inadequate.

Recommendation #2:
Add insulation to accessible attic areas, as follows.

High attic flat:
Loose blown fiberglass is present among the ceiling joists to an average depth of 3 inches, for an existing effective R-value of 9.

Two options are available:

a. Blow Class 1 cellulose to R-40 over the existing insulation to result in R-49, total. This installation will leave any newly installed A/C equipment and distribution exposed to summer attic temperatures.
b. *Install ventilation chutes in every rafter bay to maintain roof ventilation from the kneewalls to the ridge, install R-19 fiberglass batts in the rafter bays, cover the face of the rafters with R-14, 2" Thermax insulation board and tape all seams.*

Option a. will be the most appropriate and cost effective measure if all air sealing and insulation measures recommended for the thermal envelope are also eventually implemented and second story cooling set-points are moderate. *Option b. would be appropriate if very long term maximized savings are your goal and second story air conditioning set-points would be low.*

Sloped ceilings:
No insulation is present. Install ventilation chutes to maintain roof ventilation from the kneewalls to the high attic and install densely packed cellulose insulation to R-19 in these 6" rafter cavities.

Kneewalls:
All kneewalls are framed with nominal 3" studs ~16" on center. No insulation is present on the kneewalls or in the floors behind the kneewalls. R-22 kraft faced fiberglass batts are poorly installed in the rafters beyond the kneewalls but this insulation is compromised

by the soffit ventilation and it blocks ventilation of the roof sheathing. The current configuration is ineffective.

In the *southeast* and *southwest* kneewall spaces, install R-13 fiberglass batts. Then install 1" foil faced semi-rigid fiberglass insulation board over the face of the studs. Seal all seams with tape.
Install densely packed Class 1 cellulose in the 8" joist cavities of kneewall floors to R-30. Insulate the back of the access doors in these two kneewall spaces with foil faced semi-rigid fiberglass insulation board or foam insulation board.

In the *northwest* kneewall space, the kneewall is at full height with a passage door and the space could be used as a semi-finished closet. Here, we recommend that the present fiberglass be removed from the rafters; that ventilation chutes be installed from soffit to kneewall within the full length of each rafter bay to maintain ventilation of the roof; that reduced dimension fiberglass batt be reinstalled to fill each rafter bay and that 1" foil faced semi-rigid fiberglass insulation board or Thermax™ rigid foam insulation board be installed over the face of the studs. Seal all seams with tape. The end wall at the gable would be treated in similar fashion. (½" drywall must also be installed over rigid foam if any other foam board than Thermax™ is used.) Also, densely pack the 8" joist cavities of kneewall floor to R-30 to block potential bypasses at the exterior perimeter.

In the *northeast* kneewall space, using the roof access created under the air sealing measure above, densely pack the kneewall floor with Class 1 cellulose and install R-19 fiberglass batts or Thermax rigid foam insulation board to the back of the recessed drawers, as appropriate.

Other roof spaces at the first story wings are either insulated (north wing and kitchen) or inaccessible to cost effectively add insulation (sunroom.)

Cost of all described attic insulation (with Option a., selected.): **$4,169**
Cost of all described attic insulation (with Option b., selected.): $5,892

Attic Ventilation
Continuous ridge vent and soffit vents are present. No more is required. However, ventilation chutes should be installed in the course of insulation work, as described above.

Exterior Walls
The walls are framed with nominal dimension 2 x 4" lumber. There is a 3.5" cavity behind the plaster. There is no insulation at the third story gable walls. Extensive remodeling has occurred at portions of the first story and based on our infra-red scan the walls appear to be insulated in those areas. For non-remodeled areas of the first and second stories the scans were inconclusive. Due to time constraints of the house manager during our visit, holes were not created to probe the walls there. We will return when it is convenient for you in order to investigate the wall insulation situation further.
For the purpose of this proposal we will assume that walls of the third and second stories, excluding remodeled bathrooms, require insulation.

Recommendation #3:
Have Class 1 cellulose blown densely into all exterior wall cavities of the third and second stories, excluding bathrooms.
3rd story cost: **$1,405**
2nd story cost: **$3,058**

Floor over garage
The 8" joist cavities above the plaster ceiling of the garage are uninsulated. However, recent remodeling has placed hydronic pipes within the garage and a 5 kW electric heater to protect them.

Have a pipe fitter relocate the hydronic pipes so that enter the home from the boiler room and do not pass through the garage. Have an electrician remove the electric unit heater. RISE can quote these two items, if desired.

Recommendation #4:
If the above is implemented, have Class 1 cellulose densely packed to R-30 in the garage ceiling by drilling through the plaster. Holes would be plugged and spackled to a rough finish. Finish sanding and painting would be the responsibility of others.
Cost of garage ceiling insulation: **$1,410**

HVAC

Air conditioning
In order to adequately and comfortably cool the third and second stories, the present multiple window units should be removed and replaced with high efficiency centralized systems. In order to maximize comfort and control within the two stories, we propose two separate a/c systems; one for the third story and one for the second story.

Recommendation #5:
We propose a ducted system for the second story. The second story a/c would be served by a Unico high velocity system located in the high attic. The duct distribution would run in the attic joist bays down into the kneewall spaces and into the second story room ceilings. A low velocity return would drop down in the corner of the president's office into the corner of the 2nd floor walk-in closet ceiling. A small return would be ducted to the master bedroom and another return grille would penetrate into the common hallway of the second story. A few high velocity branch lines would be run to the third story hallway and bathroom to provide cooling to those spaces. Refrigeration piping would be run down the exterior of the residence. Some ceiling framing modifications would be necessary to accommodate evaporator coil installation. Rough-in framing modification and closing with sheet rock is included in our proposal, however, we exclude joint taping, and compounding, sanding, painting and all finish trim labor and material as this will be the responsibility of others.
Cost to air condition the second story, as described: **$33,120**

Recommendation #6:
We propose a split-ductless system for the third story. The third story would be served by three (3) 9000 Btu Mitsubishi evaporators tied into one (1) 3-ton Mitsubishi Hyper heat pump. In our plan, the Hyper-Heat units would supply the cooling *and heating* to the third story and would allow for 3 separate zones in the third story. Refrigeration piping would be run down the exterior of the residence. Some framing modifications would be necessary to accommodate evaporator coil installation. Rough-in framing modification and closing with sheet rock is included in our proposal, however, we exclude joint taping, compounding, sanding, painting and all finish trim as this will be the responsibility of others.
Cost to air condition the third story, as described: **$21,735**

Heating system
Heat is supplied by a gas fired 352 MBH max. output Slant Fin condensing boiler. This system presently distributes heat to the basement and first story levels through zones of baseboard and air handler coil. This system is sized to provide heat sufficient for all building requirements. The second and third stories are presently heated by electric resistance baseboards and in the bathrooms by electric radiant towel warmers.

Recommendation #7:
We propose to extend hydronic distribution from the present gas fired boiler to serve the second story, with the exclusion of the bathrooms. We will remove electric baseboards from the second story. Heating for the second story will be provided by one zone of hot water baseboard run from the existing boiler located in the basement, across the basement, up though the first floor to the second. A small chase would have to be built on the first floor to enclose the hydronic piping.
The towel warmers are a luxury in the bathrooms, as electric radiant towel warmers react to user control within the space and can effectively be controlled for comfort. Radiant towel warmers served by hydronic heat can only supply heat when the hydronic distribution zone is also calling for heat. Therefore, we recommend that the electric towel warmers be retained in the bathrooms to maintain occupant control and comfort.
Cost to provide hydronic heat to the second story, as described: **$31,280***
* This is a "ballpark" cost estimate, based on our initial visits. We would like the opportunity to review the site with our installation subcontractor to better refine the price required.

As indicated earlier, the effective way to provide cooling to the third story is by split ductless systems. Very high heating efficiencies are available in split ductless **heat pumps**. Therefore, we recommend that the proposed third story split ductless a/c be heat pump systems. This avoids the added cost of hydronic zone piping to the third story.
We propose to remove power and abandon-in-place the electric baseboards of the third story. Cost to provide heat to the third story is included in the air conditioning measure description, above.

Project economy considerations:
It is not known to the extent that URI performs certain measures with in-house staff. Carpenters, painters and electricians may be on staff that could perform some work that is included above. The proposed measures carry costs associated with the removal of electric baseboards at the second story; abandonment-in-place of electric baseboards at the 3rd story; electric power brought to exterior coil locations and to the attic level for air conditioning systems; and framing/carpentry work required to bring air conditioning equipment to the attic and to frame duct chases and a heat pipe chase. If URI prefers to perform any of these items with in-house resources, we are able to accommodate that cooperative effort and costs quoted above may be reduced.

Summary of all recommended measures and costs.			
Recommendation	**Description**	**Area**	**Cost**
1	Air Seal	Attic spaces	$3,265
		Basement & crawlspaces	$270
2	Attic insulation	All (with "option a")	$4,169 [1]
3	Wall insulation	Exterior 3rd story	$1,405
		Exterior 2nd story	$3,058
4	Floor insulation	Garage ceiling	$1,410
5	Unico central A/C system	Provides 2nd story A/C	$33,120
6	Mitsubishi Hyper Heat	Provides 3rd story A/C & Heat	$21,735
7	Heating zone	Provides 2nd story heat	$31,280 [2]

[1] You may pick and choose any combination of measures to select a project to pursue. However, attic insulation must only be performed in conjunction with attic air sealing.

[2] Mechanical measure pricing is an estimate that may be refined with further analysis.

Any questions regarding this proposal should be directed to:

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