Minneapolis Public Schools
Special School District #1

Air Conditioning Cost Estimating Study Lake Harriet Community Lower Campus

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INTRODUCTION / KEY INFORMATION:

Wold Architects and Engineers was hired May 2021 to develop options with a recommended approach and construction cost estimate to expand the air-conditioned area at Lake Harriet Community Lower Campus. The study also reviewed dehumidification capabilities and outlines additional work necessary to provide active dehumidification control. The study approach included a tour of the building site, review of available building construction documents, and a review of previous ventilation studies. Wold collaborated with the District's facility leadership team to establish criteria and guiding principles for developing options and to determine the recommended approach. Cost estimates are developed to reflect construction bids to be received on January 1, 2022 and includes a semi-annual cost inflation escalation to extend bids to January 1, 2025. .

Key Information:

- Building Address: **Lake Harriet Community Lower Campus**
  Minneapolis Public Schools
  4030 Chowen Ave S
  Minneapolis, MN 55410
  Phone: (612) 668-3310
- Architect/Engineers: **Wold Architects and Engineers**
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  Phone: (651) 227-7773
- Study Participants: **Participants**
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EXECUTIVE SUMMARY:

Wold Architects and Engineers completed a study to determine the recommended approach and project budget to expand the air-conditioned area at the Lake Harriet Community Lower Campus. The options developed are organized around the priorities established by the District based on the use of each space and by grouping areas within each building geographically as served by common systems. In collaboration with the District, the recommendation was developed to serve the highest priority areas within the overall budget constraints. In addition, the building as a whole was evaluated to determine additional features and systems that are required to provide active dehumidification control.

Criteria / Guiding Principles:

Initial discussions provided a common understanding of the guiding principles to be used to develop options and a hierarchy of priorities based on the use of each space.

Guiding Principles:

- High quality proven system solutions preferred
- Systems shall be easy to operate and maintain
- A high level of temperature zone control required
- Centralized systems preferred
- Vertical unit ventilators may be an option depending on site factors
- DX or chilled water may be options depending on site factors
- Separate systems to serve administration areas should be considered
- COVID risk mitigation measures to focus on ventilation and filtration
- Window AC unit are not an option. Mini-splits may be is limited applications
- Heating for systems may be steam or hot water depending on site factors
- Systems shall be configured to allow for active dehumidification

Air-conditioning classrooms is the primary goal of this study. Additional spaces may be considered where possible within the overall budget constraints. Options were considered where space adjacencies allow opportunities to economically include additional areas. Gymnasiums are not typically air-conditioned but options were considered where they are central to a building and/or used as gathering spaces. It is not an intended outcome of the study to add ventilation and air conditioning to all spaces where it does not currently exist. The summary diagrams for each building identify the remaining unconditioned areas.

In addition, opportunities within each option were determined to provide added value scope where it is economically feasible to accomplish additional deferred maintenance needs within the scope of the air conditioning project i.e. ceilings, lights, and other room finishes.

Recommended Scope Summary:

Classroom Building Areas #2 (1,075 Sq Ft): Install a vertical unit ventilator with integral DX consistent with the classroom systems installed in 2004. Modify the existing steam distribution system to provide heating. The exterior louver will be installed through an existing window opening. The base project includes routing supply ductwork exposed along the exterior wall with registers for horizontal distribution. For consideration, an added scope option is included for providing a new lay-in ceiling and new LED lighting and controls. A perimeter soffit is included as may be required to accommodate the height of the exterior windows. Included with the ceilings and lights is overhead duct distribution to improve the sound performance and air distribution of the ventilation system.

The cost estimate includes a design contingency to cover risks identified that require further investigation. Identified risks include the following:

- Space heating and cooling loads are estimated to determine preliminary equipment selections as a basis for cost estimating. Final heating and cooling loads need to be completed.
- Integrity and capacity of the existing steam and condensate systems. The basis for cost estimating assumes that necessary piping modifications will be made within each classroom.
- Electrical connection location. It is assumed for budgeting that that a new electrical feeder will routed to the service location in the boiler room.

Construction Cost Estimate:	**$**	**85,000**
Add for Ceiling and Lights:	**$**	**36,000**

Gymnasium Building Areas #1 (3,650 Sq Ft): Install a roof mounted constant volume unit with integral cooling. Modify the existing steam distribution system to provide heating. The base project includes routing supply ductwork exposed within the gymnasium. Steam and condensate return are existing direct buried in the adjacent corridor. For consideration, added scope options are included to provide new LED lighting and controls and de-stratification fans.

The cost estimate includes a design contingency to cover risks identified that require further investigation. Identified risks include the following:

- Space heating and cooling loads are estimated to determine preliminary equipment selections as a basis for cost estimating. Final heating and cooling loads need to be completed.

- Integrity and capacity of the existing steam and condensate systems. The basis for cost estimating assumes that necessary piping modifications will be made within each classroom.
- Adequacy of the existing structure to support the new rooftop unit. The new unit will be placed centered on the existing beam similar to the project design in the year 2000. Minor structural work is required to frame the new unit footprint. Resolution of this risk requires a specific air handling unit selection and an analysis by a structural engineer.
- Electrical connection location. It is assumed for budgeting that that a new electrical feeder will routed to the service location in the boiler room.

Construction Cost Estimate:	**$**	**276,000**
Add to Replace Gym Lighting	**$**	**65,000**
Add for De-stratification Fans	**$**	**14,000**

EXISTING BUILDING INFORMATION

The original building was constructed in 1924. Two major additions were added in 1954 and 2012. A project in 2002 renovated the media center and installed a central VAV system with DX for cooling. A project in 2004 installed vertical unit ventilators with integral DX for cooling in the south wing of the 1954 addition and a central VAV air handling unit to serve the 1924 classrooms. A major addition was added in 2012.

A 130 ton air cooled chiller was installed in the 2012 project to provide cooling for the new systems serving the addition.

The building is heated with one large dual fuel fire tube steam boiler. A steam-to-hot water convertor system was installed in the 2012 project to provide hot water for new systems serving the addition.

A complete summary of the existing building systems is shown graphically in Appendix A.

Building Area Summary:

Year	Area (sq. ft.)
1924	14,730
1954	18,630
2012	30,300
Total	**63,660**

AIR CONDITIONING OPTIONS SUMMARY

The Primary driver of the overall project scope and budget is the decision about the air delivery method. The size of the equipment and the configuration within the building affects the work scope of multiple trades to provide pathways for ductwork and piping and to restore building finishes. With each air delivery method, there are multiple options to provide cooling and multiple options to provide heating which typically are part of the overall building central heating and cooling plant strategy. There are long-term benefits to the overall maintenance and operation of the facility to consider the heating and cooling approach for each air delivery option within the overall plan for the central heating and cooling plants that serve the building.

The range of air delivery options presented in this summary are narrowed to those that fit the District's criteria that includes centralizing systems to the extent possible to minimize regular and periodic maintenance. These options typically include vertical unit ventilators, variable air volume central air handling, and dedicated outside air displacement systems. The full range of options are discussed in more detail in the "Air Conditioning Options Detail" section of this report.

In addition to the first cost, the attributes of each system also have an effect on the quality of the learning environment and the on-going operational costs related to energy efficiency and the requirements for regular and periodic maintenance. As an aid for discussion, each of the air delivery options presented are rated relative to each other in terms of good, better, best in each of these performance categories as follows.

Attribute	Vertical Unit Vents	Central VAV	DOAS / Displacement
Environment Quality	Good	Better	Best
Energy Efficiency	Good	Better	Best
Maintenance	Good	Better	Best

A summary of the cost range for viable options for each of the air delivery methods is as follows. The options prioritize adding cooling to the classrooms and are summarized in total to cover all of the currently unconditioned classrooms in the building. Other areas that may include gymnasiums, auditoriums or other common areas are listed separately. All cost are presented as construction costs.

Vertical Unit Ventilators:

Install a vertical unit ventilator along the perimeter of each classroom. The work will include installing a new exterior louver through either a window or cutting a louver through the exterior wall. The range of costs includes is defined by the following approach to heating and cooling. The existing classrooms are served by vertical unit ventilators with integral DX and steam heat with the exception of one classrooms currently used by Minneapolis kids. There is a strong precedent to continue with the approach used in the adjacent rooms.

Low Cost Option: Integral DX, Modify existing steam

Medium Cost Option: Modify existing chilled water, Modify existing steam

High Cost Option: Modify existing chilled water, Modify existing hot water system

Vertical Unit Ventilators					
Building Area	**Serves**	**Area SF**	**Construction Budget**		
			Low	**Medium**	**High**
#1	Classrooms	1,075			
Total		**1,075**	**$85,000**	**$124,000**	**$145,000**

AIR CONDITIONING SCOPE DETAIL

The following options to expand air conditioning are noted as "Building Area #'s". The area to be air conditioned is annotated on the Proposed Systems Diagrams in Appendix B.

Building Area 1: Gymnasium (3,650 Sq. Ft.): The following is a summary of the range of possible options considered.

Options Cost Summary:

Building Area	Air Delivery Method	Cooling Plant	Heating Plant	Option
1 - Gymnasium	A - CV Rooftop Unit	A - Integral DX	A - None	1-AAA
			B - Steam	1-AAB
			C - Hot Water	1-AAC
		B - Remote DX	A - None	1-ABA
			B - Steam	1-ABB
			C - Hot Water	1-ABC
		C - Chilled Water	A - None	1-ACA
			B - Steam	1-ACB
			C - Hot Water	1-ACC

Air Delivery: The space is a strong candidate for a single zone constant volume central air handling unit. The most cost effective option is to locate the unit on the roof similar to the project design in the year 2000 bit not implemented. Ductwork is routed exposed in the space for distribution. The mezzanine on the stage area could be an alternate location however, it is currently used for storage and does not have code compliant access for maintenance. Other options not pursued include multiple fan coil units located in the space similar to the existing system. The existing space is ventilated by four fan coil units installed in the original building construction in 1954 with supplemental steam perimeter finned tube radiation for heating.

Cooling Plant: Viable options studied include integral packaged DX, remote DX, and connecting to the existing building chilled water plant. A 130 ton air cooled chiller was installed in the 2012 addition project and is located to the north of the boiler room on grade. The 2012 design drawings specifically state that the chiller was not designed with additional capacity for future expansion but the District staff noted that the chiller has been observed to be lightly loaded. There is no convenient interior path due to the limited structure height to route new chilled water piping from the existing distribution system to the proposed new gym air handling unit. The approach used to cost estimate this project is to route the chilled water piping though the west wall of the boiler room underground to the southeast corner of the gymnasium and extend up the exterior wall to enter the gym beneath the gym structure. The existing system is 35% propylene glycol which mitigates the risk of the chilled water systems freezing.

The existing chilled water system is configured as a variable primary with a single primary with a by-pass valve located in the 2012 penthouse mechanical room to maintain circulation and minimum flow. There is a single chilled water pump and the flow matches the sum of the design flow for the connected chilled water coils. Further study would be necessary to determine the optimal method to connect additional load to the existing chilled water system. Options include the following. The cost estimate assumes a second chilled water pump will be installed.

- Increase the capacity of the existing chilled water pump to match the sum of the connected coil design flows. The new design flow needs to be within the chiller's recommended flow range.
- Install a second chilled water pump and modify the control such that the pumps operate as lead/lag.
- Determine if the existing air handler chilled water coils are designed with excess capacity. If so, rebalance the peak flow rate lower so the sum of all peak design flow rates match the capacity of the chilled water pump.
- Determine the chilled water system diversity by comparing the load profiles of each space. Because the system is variable primary, the "built-in" diversity may allow for additional load to be added with no other systems modifications.
- Provide CO2 control of the outside air dampers for each of the three existing air handling systems. In review of the existing control sequences, the outside air dampers maintain a fixed minimum position. The systems appear to be provided with outside airflow stations that could be recalibrated and used to manage the amount of outside air based on air quality measurements. Adding CO2 control would greatly increase the chilled water system diversity.
- A combination of all of the above to optimize the chilled water system performance.

Heating Plant: Viable options studied leaving the existing steam systems in place and installing a cooling only system, connecting to the existing steam plant, connecting to the existing hot water plant. Four fan coil units with steam heating installed in the original 1954 building construction ventilate the existing space. Perimeter steam finned tube radiation provides supplemental heating.

Steam Option: An existing 6" steam main is located in a trench beneath the corridor on the south end of the gym. The 6" main currently serves the existing heating systems in the gym and is assumed to have capacity to serve the heating load of the proposed air handling system. The project would include connecting to the existing steam main beneath the corridor floor and routing up to the gym structure through the storage room at the south end of the gym. The condensate return will follow the same path. For the packaged DX air delivery option, the steam coil is assume to be in the ductwork below the roof. The existing fan coil units will be removed. The existing perimeter finned tube will remain as existing.

Hot water Option: The 2012 Addition project included the installation of two 100% redundant steam to hot water heat exchangers and two 100% redundant hot water circulating pumps. Further study would be needed to determine each of the H/X and pumps has excess capacity to maintain the 100% redundant approach. It would be certain that the system would have

capacity if both the heat exchanger and pumps were modified to operate as lead/lag. Options to route the piping would be either exposed below the structure in the corridor or out through the west wall of the boiler room similar to the proposed chilled water route. The estimate for this option assumes that the piping is routed exposed in the corridor. For the packaged DX option, the hot water coil is assumed to be in the ductwork below the roof.

Dehumidification: For options that include heating, the heating coil will be located downstream of the cooling coil in the reheat position. Active dehumidification would be possible if hot water is selected as the heating source. The 2012 project also installed a 400 MBH boiler to provide the availability of hot water through the summer. Further study would be necessary to determine the actual summer hot water reheat load. If the steam heating option is selected for heating, the steam plant will need to be operational through the summer to provide for active dehumidification.

Project Risks: The following are design risks identified in implementing this project. The cost estimate includes a 15% design contingency to cover these risks. Further investigation into each of these could better define the solution and allow the design contingency to be reduced.

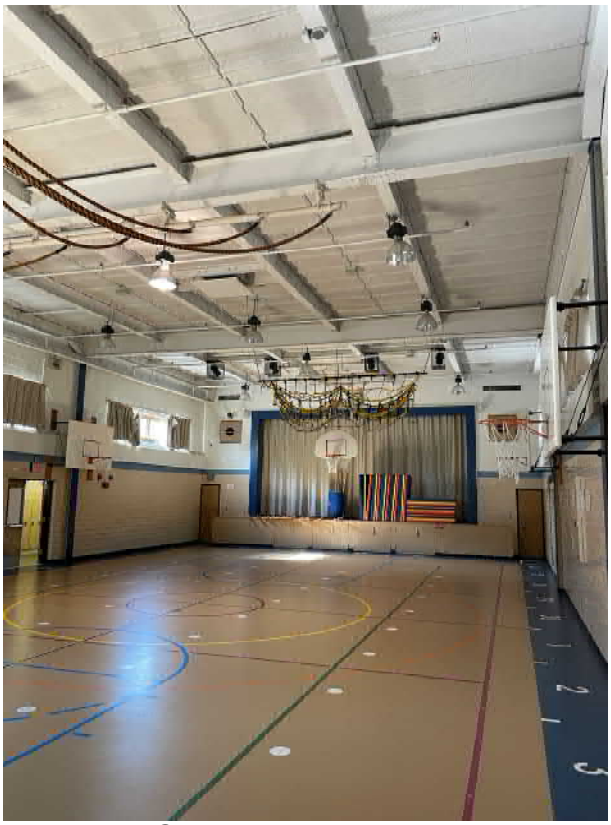
- Adequacy of the existing structure to support the new rooftop unit. The new unit will be placed centered on the existing beam similar to the project design in the year 2000. Minor structural work is required to frame the new unit footprint. Resolution of this risk requires a specific air handling unit selection and an analysis by a structural engineer.
- Concealed obstructions to the underground path from the boiler room to the gym. The existing building transformer and power service are located between the boiler room and the gym and a specific piping route from the existing chilled water pumps to the west exterior wall of the boiler room needs to be determined. Hiring a locate service for underground utilities would be helpful to determine the optimal piping route.
- Space heating and cooling loads are estimated based on typical loads for this type of space. Final heating and cooling loads need to be completed.
- Impact to the capacity and performance of the existing chilled water system. Further study is required to determine the optimal approach.
- Integrity of the existing steam pipe in the trench under the corridor. The pipe is not accessible without opening the corridor floor. A pipe in poor condition may necessitate additional pipe removal. The best method to mitigate this risk is to pursue the hot water heating solution as outlined in the heating section above.
- Capacity of the summer boiler used for dehumidification if hot water is selected for heating. Further study is necessary to estimate the peak summer reheat load.

Additional Scope Considerations: The following items could be considered for inclusion in the project work scope. These items are not directly related to adding air conditioning but there would be cost efficiency by including them in the project scope and the have added value as noted.

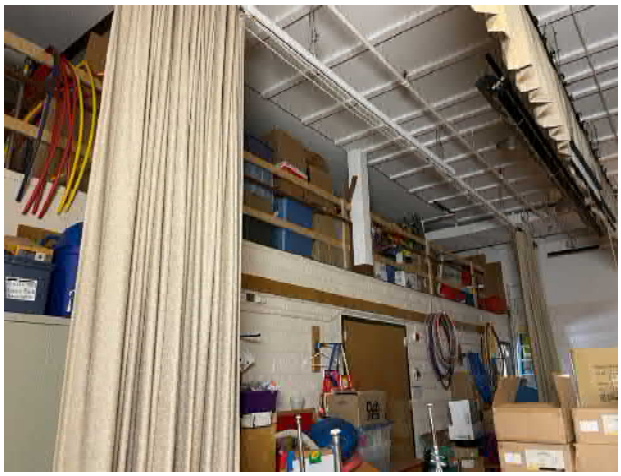
- *Replace Gym Lighting:* Replace existing metal halide gym lighting and controls with new LED lighting to improve the quality of the lighting in the space and operating efficiency.

- *Install De-stratification Fans:* Current design practice has been to install de-stratification fans in high volume spaces to improve air circulation and reduce thermal stratification. As an energy conservation strategy, the fans can be controlled as the first stage of heating.

Typical Photos:



Gym – Looking North



Mezzanine on Stage

Building Area 2: Minneapolis Kids (1,075 Sq. Ft.): Provide a vertical unit ventilator to serve the Minneapolis Kids room. Ductwork will be routed exposed below the existing ceiling similar to the solution in the 2004 ventilation upgrade project. The unit ventilator area is controlled as a single zone for heating and cooling. Cooling will be provided by connecting to the existing chiller. The chilled water branch line installed in Scope 2 for the gymnasium unit will be extended to the new unit ventilator. Heating will be provided by connecting to the existing steam and condensate lines that are direct buried below the floor. The unit ventilator solution is similar to the unit ventilators installed in the classrooms in the south wing of the 1954 addition with the exception of chilled water for cooling in lieu of integral DX.

Building Area	Air Delivery Method	Cooling Plant	Heating Plant	Option
2 - Minneapolis Kids	A - Vertical Unit Vent	A - Integral DX	A - None	2-AAA
			B - Steam	2-AAB
			C - Hot Water	2-AAC
		B - Remote DX	A - None	2-ABA
			B - Steam	2-ABB
			C - Hot Water	2-ABC
		C - Chilled Water	A - None	2-ACA
			B - Steam	2-ACB
			C - Hot Water	2-ACC

Air Delivery: The space is a strong candidate for a unit ventilator solution to replace the existing unit ventilator. Vertical unit ventilators with exposed ductwork were installed in the 2004 ventilation upgrade project. Other options not pursued include installing a single zone rooftop unit. The existing structure is steel beams with metal decking. It is likely additional structural upgrades would be required.

Cooling: Viable options studied include integral packaged DX similar to the units installed in 2004 and remote DX with a condensing unit located either on grade or on the roof. For connection to the existing chilled water plant, refer to the cooling discussion above under options to add cooling to the gymnasium. It is assumed that the branch piping serving the gymnasium will be sized to include the cooling load for the Minneapolis Kids area.

Heating: Viable options include either connecting to the existing plant or connecting to the existing hot water plant. A horizontal unit ventilator installed in the original 1954 construction ventilates the existing space. Perimeter steam finned tube radiation provides supplemental heating.

Steam Option: The existing steam and condensate piping serving the Minneapolis Kids room is routed on the underside of the floor slab. The new vertical unit ventilator can be connected to the existing piping similar to the approach in the 2004 Ventilation Upgrade project. The piping is not accessible and the condition is not known. The condensate return will follow the same path.

Hot Water Option: The 2012 Addition project included the installation of a hot water heating system. Refer to the heating option discussion for cooling the Gymnasium - Building Area 1. It is assumed that the branch piping serving the gymnasium will be sized to include the heating load for the Minneapolis Kids area

Dehumidification: The heating coil will be located downstream of the cooling coil in the reheat position. Active dehumidification would be possible if the hot water heating option is selected for the heating source. The 2012 project also installed a 400 MBH boiler to provide the availability of hot water through the summer. Further study would be necessary to determine the actual summer hot water reheat load. If the steam heating option is selected, the steam plant will need to be operational through the summer to provide for active dehumidification.

Project Risks: The following are design risks identified in implementing this project. The cost estimate includes a 15% design contingency to cover these risks. Further investigation into each of these could better define the solution and allow the design contingency to be reduced.

- Integrity of the existing steam pipe in the trench under the corridor. The pipe is not accessible without opening the corridor floor. A pipe in poor condition may necessitate additional pipe removal. The best method to mitigate this risk is to pursue the hot water heating solution as outlined in the heating section above.
- Electrical connection location. It is assumed for budgeting that that a new electrical feeder will routed to the service location in the boiler room. Further investigation is required.

Additional Scope Considerations: The following items could be considered for inclusion in the project work scope. These items are not directly related to adding air conditioning but there would be cost efficiency by including them in the project scope and the have added value as noted.

- *Provide New Lay-in Ceiling and LED Light Fixtures:* Install a new lay-in ceiling to conceal the new supply ductwork and provide improved sound control. The installation of the new ceiling would require replacement of the existing light fixture. Replacing the existing fluorescent light fixtures with new LED lighting and controls will improve the quality of the lighting in the space and operating efficiency.

Typical Photo:

Minneapolis Kids – Looking North

Appendix A:

Existing Systems Diagram

Redacted

Appendix B:

Proposed Systems Diagrams

Redacted

Appendix C:

Dehumidification Capabilities

The recommended option for each of the proposed areas to add air conditioning are to modify the existing steam system for heating. De-humidification in these areas is coincident with cooling. There is no option for active de-humidification in these areas as the building is currently configured.

Appendix D:

Cost Estimate Detail

SSD#1 Minneapolis Public Schools
Air Conditioning Cost Estimating

Cost Basis - June 2021

		Classrooms Building Area #2 11,250 SQ FT			Classrooms Building Area #2 1,075 SQ FT					
Specification Division		**Building Area #1 - Central CV, Integral DX, STM**			**Building Area #2 - VUV, Integral DX, Modify Steam**			**Area #2 - Add for Ceilings and Lights**		
		Sq. Ft. / Qty	**Unit Cost**	**Cost**	**Sq. Ft. / Qty**	**Unit Cost**	**Cost**	**Sq. Ft. / Qty**	**Unit Cost**	**Cost**
Division 02 - Demolition (excludes Div 21, 22, 23, and 26)				**$ 5,625**			**$ 538**			**$ 538**
Miscellaneous		11,250	$ 0.50	$ 5,625	1,075	$ 0.50	$ 538	1,075	$ 0.50	$ 538
Division 03 - Concrete				**$ -**			**$ -**			**$ -**
Floor Patch and Repair				$ -			$ -			$ -
Cast-in-place / Misc				$ -			$ -			$ -
Division4 - Masonary				**$ -**			**$ -**			**$ -**
Non-bearing Infill				$ -			$ -			$ -
Load bearing - new wall construction				$ -			$ -			$ -
Division 5 - Metals				**$ 12,000**			**$ -**			**$ -**
Structural Steel / Misc. Fabrications Allowance		1	$ 12,000	12,000			-			-
Division 6 - Carpentry				**$ -**			**$ -**			**$ -**
Rough Carpentry				$ -			$ -			$ -
Casework Modifications							$ -			$ -
Division 7 - Thermal / Moisture Protection				**$ 4,500**			**$ -**			**$ -**
Roof Patch and Repair		1	$ 4,500	$ 4,500			$ -			$ -
Roof New Construction				$ -			$ -			$ -
Fire Stopping / Miscellaneous				$ -			$ -			$ -
Division 8 - Openings				**$ -**			**$ 3,500**			**$ -**
Access Panels				-			-			-
Doors / Hardware				-			-			-
Windows				-			-			-
Louvers				-	1	$ 3,500	3,500			-
Division - 9 Finishes				**$ 24,875**			**$ 5,538**			**$ 9,963**
Soffits / Chases				$ -			$ -	1	$ 5,000	$ 5,000
Floor Patch and Repair		1	$ 8,000	$ 8,000	1	$ 5,000	$ 5,000			$ -
Acoustic Ceilings				$ -			$ -	1,075	$ 3.5	$ 3,763
Painting		11,250	$ 1.50	$ 16,875	1,075	$ 1	$ 538	1	$ 1,200	$ 1,200
Division 10 - Specialties				**$ -**			**$ -**			**$ -**
Miscellaneous				-			-			-
Division 11 - Equipment				**$ -**			**$ -**			**$ -**
Miscellaneous				$ -			$ -			$ -
Division 12 - Furnishings				**$ -**			**$ -**			**$ -**
Casework				$ -			$ -			$ -
Miscellaneous				$ -			$ -			$ -
Division 21 - Fire Protection				**$ 5,625**			**$ 538**			**$ 2,688**
Demolition				$ -			$ -			$ -
New / Modify Existing		11,250	$ 0.50	$ 5,625	1,075	$ 0.50	$ 538	1,075	$ 2.50	$ 2,688
Division 22 - Plumbing				**$ -**			**$ -**			**$ -**
Demolition				$ -			$ -			$ -
Plumbing Fixtures				$ -			$ -			$ -
Micellaneous				$ -			$ -			$ -
Division 23 - HVAC				**$ 138,625**			**$ 47,400**			**$ 5,000**
Air Handling Equipment (VUV's / AHU's / RTU's)		1	$ 24,000	$ 24,000	1	$ 18,500	$ 18,500			$ -
Cooling Plant Equipment (Chiller / DX / Heat Pump)				$ -			$ -			$ -
Heating Plant Equipment (Boiler)				$ -			$ -			$ -
Demolition		11,250	$ 1.00	$ 11,250	1	$ 1,200	$ 1,200			$ -
AHU Equipment Installation / Start-up		1	$ 15,000	$ 15,000	1	$ 2,500	$ 2,500			$ -
Cooling Plant Equipment Installation				$ -			$ -			$ -
Heating Plant Installation				$ -			$ -			$ -
Chilled Water Distribution				$ -			$ -			$ -
Steam / Condensate Distribution		11,250	$ 5.50	$ 61,875	1	$ 6,500	$ 6,500			$ -
Hot Water Distribution				$ -			$ -			$ -
Ductwork Distribution Misc. (VAV's / Exhaust)				$ -	1	$ 10,000	$ 10,000	1	$ 5,000	$ 5,000
Controls		1	$ 24,000	$ 24,000	1	$ 6,500	$ 6,500			$ -
Test and Balance		1	$ 2,500	$ 2,500	1	$ 2,200	$ 2,200			$ -
Division 26 - Electrical				**$ 7,500**			**$ 5,700**			**$ 8,600**
Demolition				$ -	1	$ 1,200	$ 1,200	1,075	$ 0.50	$ 538
Electrical Service				$ -						$ -
Power Connections		1	$ 7,500	$ 7,500	1	$ 4,500	$ 4,500			$ -
Lighting and Controls				$ -			$ -	1,075	$ 7.50	$ 8,063
Division 27 - Technology				**$ 5,625**			**$ -**			**$ -**
Demolition Allowance				$ -			$ -			$ -
Fire / Sound / Data Allowance		11,250	$ 0.50	$ 5,625			$ -			$ -
DIVISION SUB-TOTAL				**$ 204,375**			**$ 63,213**			**$ 26,788**
Division 1 - General Conditions				**$ 35,766**			**$ 11,062**			**$ 4,688**
OH & P	10%			$ 20,438			$ 6,321			$ 2,679
Liability Insurance	1%			$ 2,044			$ 632			$ 268
Performance Bond	2%			$ 3,066			$ 948			$ 402
General Contractor Misc.	5%			$ 10,219			$ 3,161			$ 1,339
CONSTRUCTION SUB-TOTAL				**$ 240,141**			**$ 74,275**			**$ 31,475**
CONTINGENCY	15%			**$ 36,021**			**$ 11,141**			**$ 4,721**
CONSTRUCTION GRAND-TOTAL				**$ 276,162**			**$ 85,416**			**$ 36,197**
COST per SQ FT				**$ 24.55**			**$ 79.46**			**$ 33.67**