MEMORANDUM

To: **Takoma Park City Council**

From: **The City of Takoma Park, Department of Public Works and Library Department**

Date: **March 15, 2022**

Re: **Library Redevelopment Value Engineering Study**

In February 2022, the Library Redevelopment construction manager, Arcadis US, and a team of engineers (civil, structural, mechanical and electrical) conducted a value engineering study to identify means and methods to reduce the Library Redevelopment Project's construction costs while maintaining the overall design aesthetic and building functionality. Because the Project is in the final stages of the development process and near the start of construction, the study was limited to identifying cost reduction opportunities that did not require the Library to be 100% redesigned. The study and its findings are attached as Exhibit A.

The study produced 17 options for the City to consider that have the potential to save costs or improve design. The list of options – a summary of which is attached as Exhibit B – includes adjustments to the HVAC, electrical and structural systems, as well as changes to design features. The options also include some phasing suggestions which would allow for portions of the new Library to be constructed while postponing all or some of the adjacent Community Center renovations to some point in the future.

The value engineering options proposed by the construction manager were also reviewed by the project architect, RRMM, who was tasked with assessing the feasibility of each suggestion, estimating the additional cost to redesign, as well as the additional time required for permit resubmission. Of the 17 total options, RRMM identified ten items that could be implemented. RRMM's rationale for each of the selected items is also included in Exhibit B. The seven items that were not considered as viable options were removed for reasons that can be summarized into the following categories:

- Operationally Infeasible (HV-1, HV-3/HV-4, CE-4, E-3)
- Structurally Infeasible (CE-10, U-2)
- Net Cost Increase to the Project (HV-2)

This memo identifies the costs and benefits for each of the viable value engineering options within the current design and provides staff recommendations on how to proceed with the Library Redevelopment Project for the City Manager and City Council's consideration.

Feasible Value Engineering Options

The ten items identified as viable by RRMM fall into two categories: Design and Phasing. The Design related items range from a net cost savings of $12,500 to $50,000. Net savings equal gross savings minus the cost associated with architectural redesign, but exclude the additional cost of permitting. Estimates of the permit fee costs are expected to be less than $5,000 in total for all resubmissions including both Design and Phasing options.

The viable Design options identified by RRMM include:

Proposed Design Changes	Estimated Net Cost Savings
• Replacing the clerestory with skylights	$35,000
• Removing the conference area glass wall	$12,500
• Removing the lounge area glass wall	$13,000
• Replacing the motorized sunshades with manually operated sunshades	$50,000

These items are not mutually exclusive, so taken together they result in approximately $110,500 in total cost reductions. A cost reduction of this magnitude represents 0.94% of construction costs, assuming a total construction cost of $11.7M, as suggested by the Forella construction cost estimate provided to the Council on February 2, 2022

The Phasing related options produce the most cost savings with net cost savings (excluding permit fees) ranging from $46,000 to $1.2M. These Phasing options include the following:

Phasing Option (PO)	Description	Estimated Net Cost Savings
Phasing Option 1 (PO1)	Retain the Recreation Area as is and make it a construction contract Add Alternate	$1,178,000
Phasing Option 2 (PO2)	Retain the Recreation Area as is except for the office areas and include in the construction contract as an Add Alternate	$667,000
Phasing Option 3 (PO3)	Do not build out Computer, Senior, Lounge and MAC rooms and make these areas a construction Add Alternate	$135,000
Phasing Option 4 (PO4)	Do not build stand-alone canopy over entrance	$46,000

Phasing Option 1 and Phasing Option 2 are mutually exclusive, but can be combined with PO3 and/or PO4.

Phasing Option Descriptions

The phasing options suggested by the value engineering study allow for portions of the existing Project to be postponed to a future date or included as an add alternate. The immediate benefit to the Project is a net reduction in up front/early phase construction costs. The consequence to implementing the phasing options include a reduction in Community Center's functional design, increases in construction costs for later phases and, as is the case for PO3, a reduction in City services until the later phase is completed. Although each phasing option will require a permit resubmission, there will be no associated construction start delays. The existing building permit will allow the City to proceed with construction and submit revisions after construction has started; however, it is likely that approved revisions will be received even before the start of the bidding process.

Phasing Option 1

Phasing Option 1 eliminates the Recreation Department suite and Community Center renovations to the restrooms and City TV from the Project design. No existing offices will be redesigned and no gender-

neutral bathrooms will be constructed. Phasing Option 1 does, however, allow for the construction of the single new Recreation Department office that is being built in the footprint of the new library to remain. To access this office and the existing restrooms, a new corridor will need to be created. This corridor is not in the current project design. The new design will require that the corridor circle the existing restrooms in order to comply with local building code which does not allow a corridor longer than 20ft to dead end. A simple diagram of the corridor is attached as Exhibit C.

While Phasing Option 1 maintains the new Library's functionality and operations, the challenging existing conditions in the Recreation Department and Community Center will remain. The current Recreation Department suite is too small to provide adequate working space for all of the Department's fulltime staff. The existing layout does nothing to manage noise or provide basic privacy to those not in an office. The location of the transaction window in the corridor off the main hallway is not easily located by residents and there is limited space for patrons to queue. The existing restrooms are inadequate to serve the Community Center's demand, particularly for aftercare, summer camp and those with accessibility limitations. Each of these issues is addressed by the Project's current design. The net costs savings (excluding permit fees) to implementing the PO1 is an estimated $1,178,000. The redesign will also require a permit resubmission. The permitting process is estimated to take three to four months.

Phasing Option 2

Phasing Option 2 attempts to address the Recreation Department challenges by proceeding with the renovation of the Recreation office areas but excluding all other Community Center renovations. The existing gender specific restrooms in the Community City will remain in place in this option. However, to accommodate the existing location of the restroom entrance, the size of the new Recreation open office area will need to be reduced from its current design to allow for the construction of a corridor. As is the case for PO1, the corridor will circle the existing restrooms to prevent a dead end. This corridor will also provide access to the newly built Recreation office located in the footprint of the new library. If the corridor were not necessary, the office would be accessible from within the Recreation Department suite, as is the case in the existing design. The net cost savings (excluding permit fees) is an estimated $667,000. The redesign will also require a permit resubmission. The permitting process is estimated to take three to four months.

Phasing Option 3

Phasing Option 3 removes the computer lounge, senior lounge and MAC room from the existing design. The rooms will be built as shells and left unfinished and unusable until completed at some later date. This option has the most impact on the programmatic offering of the Library Department and Recreation Department, significantly reducing the City's ability to offer the services that it currently provides to residents. The net cost savings for Option 3 is $135,000. The redesign will also require a permit resubmission. The permitting process is estimated to take one to two months.

Phasing Option 4

Phasing Option 4 involves removing from the design the stand-alone canopy over the entrance to the Library from the parking lot. The standalone canopy was originally added to the design in order to better identify the Library entrance while also providing cover for patrons from inclement weather as they enter the building. The net cost savings would total approximately $46,000. The redesign will also require a permit resubmission. The permitting process is estimated to take one month.

Long Term Cost Implications

Each of the phasing options assumes that construction on the phase will occur at some point in the future. As such, the net monetary benefit of the initial cost savings should account for the likely increase in construction costs of the phased portions of the Project. Using the current cost estimates as a base, a projection for the future construction costs of the phased portions at three years, five years and seven years was determined using an annual escalation rate of 6%. The rate is based on the current rate of cost increases as determined by the project's cost estimators. In summary, the added construction costs associated with the delayed construction negate the immediate cost savings, resulting in a negative net benefit. Ultimately, by implementing the phasing options, the City is increasing the cost of completing the Project. A table showing the full analysis is attached as Exhibit D.

	Year 3	**Year 5**	**Year 7**
Phasing Options	*Net Benefit*	*Net Benefit*	*Net Benefit*
Phasing Option 1	$ (253,601.23)	$ (430,547.14)	$ (629,363.57)
Phasing Option 2	$ (127,216.66)	$ (225,258.23)	$ (335,417.75)
Phasing Option 3	$ (32,933.26)	$ (53,689.81)	$ (77,011.87)
Phasing Option 4	$ (11,168.77)	$ (18,234.83)	$ (26,174.25)

Additional Considerations

In addition to the added construction costs, the following other factors should be considered by City staff and the City Council.

1. **Phasing Extends Construction:** Phasing will require that construction take place at different times over multiple years. This is particularly important to this Project as the construction impacts the City's main facility. By prolonging the construction, you increase the number of instances in which City services are impacted and interrupted.

2. **Phasing Interrupts the Development Process**: Phasing requires restarting the development process. The development team for the Library Redevelopment is already assembled. However, in order to implement the phasing options at a later date, the City will have to again solicit and hire a contractor, construction manager and architect to oversee the remaining project phases adding cost and decreasing efficiency.

3. **Phasing Creates Underutilized Space**: Phasing Option 1 and 2 require that a corridor be created to allow access to the restrooms and offices. If left in its current design this space would otherwise be used to increase the square footage of the Recreation Department suite and provide new restrooms to patrons and City staff. Phasing Option 3 would require that "shell spaces" be built but not outfitted with the finishes that would make them functional. The spaces will be left empty and unusable until the later phases are funded and implemented.

City Staff Recommendations

Primary Recommendation

City staff recommend proceeding with the redevelopment of the Library and Community Center based on its current design for several reasons. First, implementing a phased strategy will increase the total cost of the project as construction costs rise in later years. Additionally, the existing design adequately addresses the programmatic and functional needs of the Library Department. It is conservatively designed as evident by the de minimis Design related cost savings identified by the value engineering study. It incorporates a LEED Gold standard to assist the City in meeting its sustainability goals. It addresses significant operational challenges for the Recreation Department and City TV while providing Community Center visitors with an adequate number of restrooms. Furthermore, the Project has reached several important milestones that would need to be revisited should the City pursue the value engineering options including redesigning plans and resubmitting permits. In short, none of the value engineering options outweigh the aggregate monetary, operating, programming or functional costs of their implementation.

Secondary Recommendation

In the event that the City's competing priorities mandate that the Project reduce its costs, City staff recommend adopting Phasing Option 1. Of all of the options presented by the value engineering study, PO1 provides the largest reduction in costs with an immediate net savings of $1.2M. Should the City pursue this option it should also incorporate the Design-related suggested alterations which would increase the total immediate net savings by $110,500. City staff do not recommend incorporating the Design-related suggestions unless a phasing option is also included due to the added cost and minimal benefit.

Exhibit A: Value Engineering Study

February 2022

City of Takoma Park

Library Replacement Project
Takoma Park, MD

Value Engineering
Alternative Proposals

Arcadis U.S., Inc.
7550 Teague Road
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Hanover
Maryland 21076
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Fax: 410 799 2533
www.arcadis.com

David Eubanks
Deputy Director, Department of Public Works
City of Takoma Park
31 Oswego Avenue
Takoma Park, Maryland 20912

February 18, 2022
Our Ref: 30115878
Takoma Park Library Replacement
Value Engineering Study Results

Dear Mr. Eubanks:

Arcadis U.S., Inc. is please to submit the results of the value engineering (VE) study conducted virtually February 10 and 11, 2022 on the Takoma Park Library Replacement Project. During the workshop, the VE team brainstormed numerous ideas for improving the value of the project and eventually developed 17 change proposals for your project team's consideration. Included are proposals that will reduce project costs, allow the project to be phased (add alternates), facilitate construction and, in one case, add cost but increase the energy efficiency of the completed project and potentially reduce the insulation cost of the building envelope.

Attached is a table summarizing all the proposals developed followed by documentation on each of the proposals. Please do not hesitate to contact me or Robert Jones if you or any project team members have any questions regarding the information presented. Arcadis appreciates the opportunity to participate with the City on this project.

Sincerely,
Arcadis U.S., Inc.

Howard Greenfield, CVS
Technical Specialist

howard.greenfield@arcadis.com
443.421.0326

cc: Robert Jones

Enclosures:
Summary of Value Engineering Proposals
Details of Value Engineering Proposals

SUMMARY OF VALUE ENGINEERING PROPOSALS

ARCADIS

PROJECT: **TAKOMA PARK MARYLAND LIBRARY REPLACEMENT**
City of Takoma Park

PRESENT WORTH OF COST SAVINGS

ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS
HVAC & CONTROLS				
HV-1	Use a variable refregerant flow system in lieu of variable air flow handling system for heating and cooling the building and reduce the building envelope insulation	$1,171,000	$1,095,000	$76,000
HV-2	Install a geothermal system utilizing a variable refrigerant flow system in lieu of a variable air handling system for heating and cooling the building	$1,171,000	$1,320,000	($149,000)
HV-3/HV-4	Reduce the number of VAV/SFB boxes in the adult and children sections	$151,000	$104,000	$47,000
CREATE ENVIRONMENT				
CE-1	Use a skylight in lieu of a clerestory	$86,000	$36,000	$50,000
CE-4	Eliminate curtainwall sunshade	$114,000	$0	$114,000
CE-5	Eliminate motorized sunshades and tint windows	$83,000	$32,000	$51,000
CE-7	Revise exterior wall at office and conference room (Rooms 117/118/119)	$38,000	$9,000	$29,000
CE-8	Revise exterior wall at lounge area (Room 130)	$21,000	$5,000	$16,000
CE-10	Attach a concrete corbel to the existing foundation wall to support the new firewall in lieu of extendting the masonry down to the existing low level footing	$44,000	$14,000	$30,000
CE-11	Use manually operated interior shades in lieu of motorized shades	$83,000	$32,000	$51,000
UTILITIES				
U-2	Insert a sleeve between the 8-inch sanitary sewer and 24-inch storm sewer to accept the new water line in lieu of digging a deep hole to run the water line under the sanitary sewer line	DESIGN SUGGESTION		
DEMOLITION				
D-1	Have solar panel vendor remove and reinstall panels in lieu of the contractor	DESIGN SUGGESTION		
ELECTRICAL				
E-3	Use a normal lighting system in lieu of digital lighting	$27,000	$20,000	$7,000

SUMMARY OF VALUE ENGINEERING PROPOSALS

ARCADIS

PROJECT: **TAKOMA PARK MARYLAND LIBRARY REPLACEMENT**
City of Takoma Park

PRESENT WORTH OF COST SAVINGS

ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS
PHASING				
PH-1	Retain the Recreation Area as is and make it a construction contract Add Alternate	$1,202,000	$4,000	$1,198,000
PH-2	Retain the Recreation Area as is except for the office areas and include in the construction contract as an Add Alternate	$1,202,000	$526,000	$676,000
PH-3	Do not build out Computer, Senior, Lounge and MAC rooms and make these areas a construction contract Add Alternate	$141,000	$0	$141,000
PH-4	Do not build stand-alone canopy	$48,000	$0	$48,000

VE PROPOSAL HV-1

USE A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING AND REDUCE THE BUILDING ENVELOPE INSULATION

Alternative Summary	
Total Potential Cost Avoidance:	$76,000
Change in Schedule:	None

1. **Description of Baseline Concept:** The design documents indicate a variable air flow air handling system utilizing two roof top units (RTUs) with zoned air terminal units consisting of variable air volume (VAV) and fan power air terminal units to provide heating and cooling for the building.

2. **Description of Alternative Concept:** Utilize a variable refrigerant flow system (VRF) and dedicated outdoor air supply system (see sketches on following page).

3. **Advantages:**
   - More efficient system
   - Less ductwork in ceiling
   - Ability to cool and heat spaces concurrently
   - Reduces conflicts above ceiling
   - Reduces noise
   - New technology

4. **Disadvantages:**
   - Adds copper tubing
   - Adds initial HVAC costs
   - Requires condensate piping above ceiling space
   - New technology

5. **Discussion:**

   The current design utilizes traditional rooftop air handling unit(s) with a combination of VAV boxes, and fan powered boxes to zone areas for temperature and air flow. The RTUs provided in the design will utilize electric energy and a heat pump refrigerant cycle to provide heating and cooling at the RTU. The terminal units will control the space (zones) through temperature sensors located in the respective space.

   An option to this system would be to utilize a variable VRF system. The VRF is designed to heat and cool the spaces through a network of small copper tubing distributed to terminal units located in the spaces. Air cooled (or water cooled) modular compressors are the heart of the system. The terminal units are designed to be ductless, or ceiling mounted (cassettes), or ducted in some cases. The design intent with the VRF system is to condition the space with recirculated air within the zone. A dedicated outdoor air supply unit (DOAS) will provide outdoor air into the spaces. This system has been utilized in similar buildings and provides an energy efficient design. Implementation would require a redesign of the heating, ventilating and air conditioning system and a rerun of the energy model to confirm the ability to reduce building envelope insulation.

VE PROPOSAL HV-1

USE A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING AND REDUCE THE BUILDING ENVELOPE INSULATION

6. **Discussion of Schedule Impacts:** No impact to schedule.

7. **Discussion of Risk Impacts:** Installation requires certified installers, and support from the manufacturer to lay out tubing properly. Additional startup service and training will be needed.

8. **Discussion of Operating Impacts:** Maintenance should be similar to the traditional VAV system, so no operations impacts or changes.

9. **Assumptions driving Cost Calculations:**

   - Assumption is based on an increase in heating/cooling demand of 20% when eliminating the 6" rood insulation and triple pane windows.

   - VRF system are normally more upfront cost by as much as 50%. Assuming the total cost of the VAV system is in the range of $ 300k, the VRF is in the range of $ 450k plus the cost for the MAU. There is an additional cost for copper tubing, but a reduction in ductwork.

COST EVALUATION

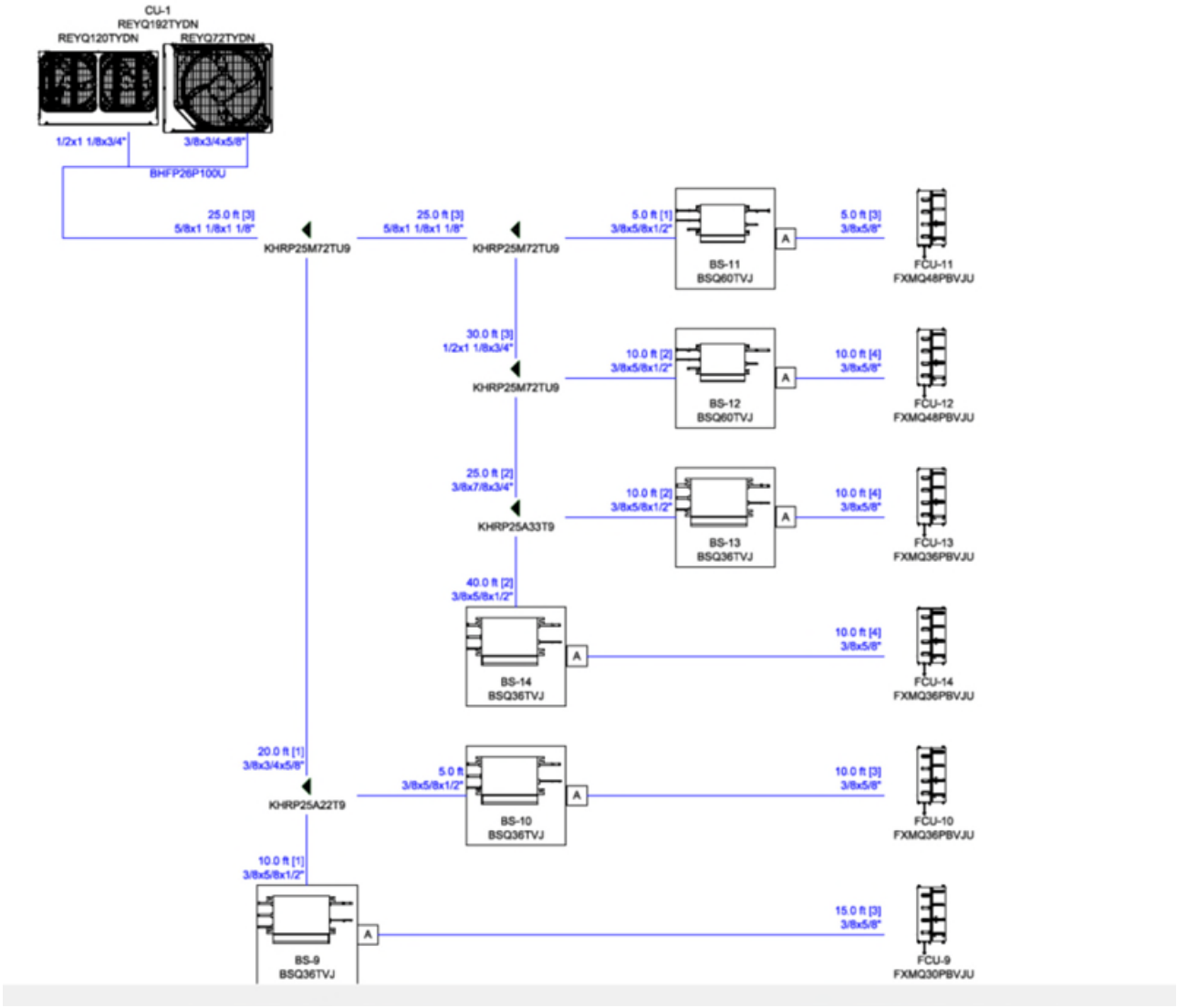
Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Delete RTUs		Lot	1	176,893	$176,893			
Delete SFBs		EA	18	5,110	$91,980			
Delete VAVs		EA	10	2,870	$28,700			
Delete Ductwork		Lot	1	300,000	$300,000			
Delete cost delta b/w triple and double pane		Lot	1	232,000	$232,000			
Delete cost delta b/w 6" and 4" roof		Lot	1	106,672	$106,672			
Add VRF System		EA				1.00	450,000	$450,000
Add copper refrigerant		EA				1.00	85,000	$85,000
Add Dedicated Outdoor Air Unit		Lot				1.00	90,000	$90,000
Add OA ductwork		Lot				1.00	250,000	$250,000
Subtotal					**$936,245**			**$875,000**
Markup Factor (%)	**25.10%**				**$234,997**			**$219,625**
Total					**$1,171,242**			**$1,094,625**
TOTAL (ROUNDED)					**$1,171,000**			**$1,095,000**
						Net Cost Avoidance*		**$76,000**
		*: Negative number is a cost INCREASE						

VE PROPOSAL HV-1

USE A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING AND REDUCE THE BUILDING ENVELOPE INSULATION

ALTERNATIVE SKETCHES

Below is an example of a VRV system line diagram. An outdoor compressor is connected to indoor terminal units (fan coils) through a network of small copper tubing. The fan coils communicate with the compressors to increase, decrease, heat, or cool, each area simultaneously.



VE PROPOSAL HV-1

USE A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING AND REDUCE THE BUILDING ENVELOPE INSULATION

Below are two common types of air distribution (terminal) units. A wall mounted ductless fan coil unit is used in office spaces and where there are wall spaces. Ceiling Cassette type units are installed in ceiling grid and are used in conference rooms and large spaces. There are other options for distributing air to the space. Each unit will be controlled by a space temperature sensor and will be zoned to control comfort.

FXAQ_PVJU

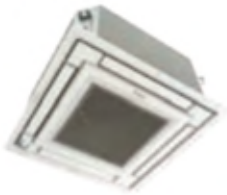
Wall-Mounted Unit

Unit ideal for cooling or heating smaller zones such as stores, offices and restaurants. Compact and stylish design.

FXZQ_TAVJU

VISTA 2x2 Cassette for *VRV*

2'x2' 4-way Cassette best for open plan applications such as classrooms, offices and retail.



VE PROPOSAL HV-2

INSTALL A GEOTHERMAL SYSTEM UTILIZING A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF A VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING

Alternative Summary	
Total Potential Cost Avoidance:	$ (149,000) but with annual energy savings of $15,000 to $20,000 a year
Change in Schedule:	None

1. **Description of Baseline Concept:** The design documents indicate a variable air flow air handling system utilizing two roof top units with zoned air terminal units consisting of variable air volume (VAV) and fan power air terminal units.

2. **Description of Alternative Concept:** Utilize a variable refrigerant flow system (VRF) and dedicated outdoor air supply system as in VE Proposal HV-1 and as an alternative approach to the air-cooled direct expansion (DX) refrigerant components of the roof top units use geothermal wells. Reduce the window glazing from three to two panes and the roofing insulation thickness (see sketches on following pages).

3. **Advantages:**
   - Energy efficient
   - Less noisy
   - Good use of renewable energy
   - Improve on LEED credit points
   - Available for Federal tax credits and rebates
   - Less operating cost
   - Applicable with VRVs or VAV air handling designs

4. **Disadvantages:**
   - Adds initial cost for drilling
   - Adds sitework
   - Potential for unforeseen conditions when digging

5. **Discussion:** The current design utilizes traditional rooftop air handling units (RTUs). There is a total of two RTUs that will provide approximately 48 tons of cooling capacity and 60 kw of electric heat. The City has decided not to use natural gas as a source of heat, and therefore, the units are designed to be all electric.

   An alternative approach to an air-air refrigerant cycle is to use a geothermal heat sink. To meet demands, roughly 20 wells approximately 500 feet deep would be needed. The parking lot would be a good location for the wells.

   Utilizing geothermal along with reducing the window glazing from triple to double, as well as roofing thickness, could impact the total cost analysis. Implementation would require a redesign of the heating, ventilating and air conditioning system and a rerun of the energy model to confirm the ability to reduce building envelope.

6. **Discussion of Schedule Impacts:** None.

VE PROPOSAL HV-2

INSTALL A GEOTHERMAL SYSTEM UTILIZING A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF A VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING

7. **Discussion of Risk Impacts:** Potential for improper is-situ soils for geothermal application. Conditions should be verified for thermal performance.

8. **Discussion of Operating Impacts:** New technology. Important to have a good geothermal system to guarantee performance.

9. **Assumptions driving Cost Calculations:**
   - Using $18/ft for drilling; $180,000 total
   - Assuming a 34% reduction in energy cost annually
   - Average energy cost is estimated to be 25kw X 8,760 X .08/kwh = $18,000
   - Potential 7-year payback

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Add for Geothermal wells		LF			$0.00	10000	18.00	$180,000.00
Delete RTUs		Lot	1	176,893	$176,893.00			$0.00
Delete SFBs		EA	18	5,110	$91,980.00			
Delete VAVs		EA	10	2,870	$28,700.00			$0.00
Delete Ductwork		Lot	1	300,000	$300,000.00			$0.00
Delete cost delta b/w triple and double pan		Lot	1	232,000	$232,000.00			
Delete cost delta b/w 6" and 4" roof		Lot	1	106,672	$106,672.00			
Add VRF System					$0.00	1	450,000	$450,000.00
Add copper refrigerant					$0.00	1	85,000	$85,000.00
Add Dedicated Outdoor Air Unit		Lot			$0.00	1	90,000	$90,000.00
Add OA ductwork		Lot			$0.00	1	250,000	$250,000.00
Subtotal					**$936,245**			**$1,055,000**
Markup Factor (%)	**25.10%**				**$234,997**			**$264,805**
Total					**$1,171,242**			**$1,319,805**
TOTAL (ROUNDED)					**$1,171,000**			**$1,320,000**
						Net Cost Avoidance*		**($149,000)**

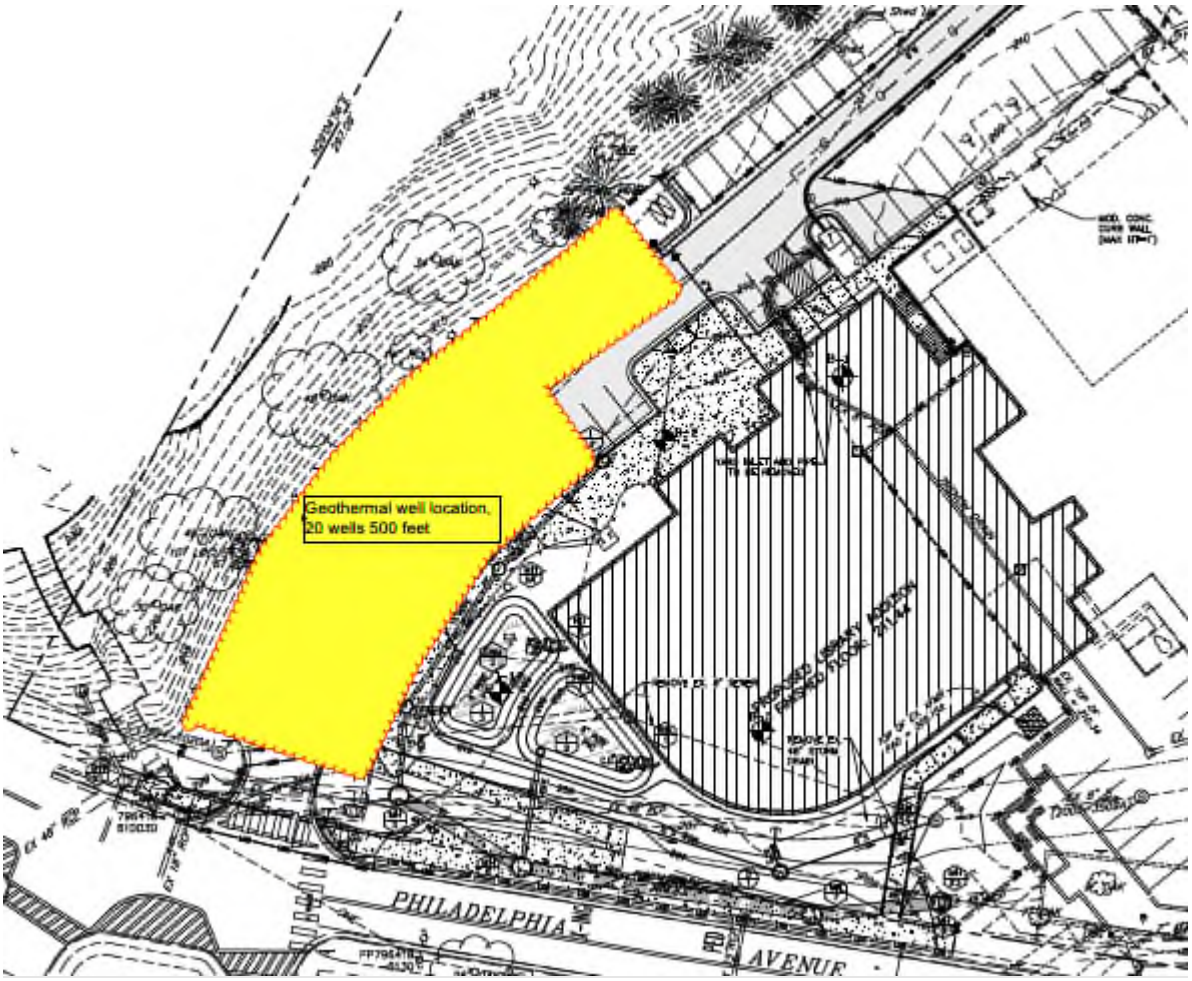
*: Negative number is a cost INCREASE

VE PROPOSAL HV-2

INSTALL A GEOTHERMAL SYSTEM UTILIZING A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF A VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING

ALTERNATIVE SKETCH

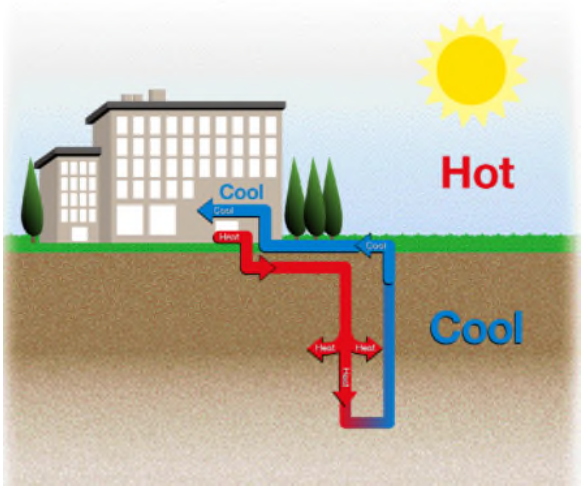
Proposed location of the geothermal wells



VE PROPOSAL HV-2

INSTALL A GEOTHERMAL SYSTEM UTILIZING A VARIABLE REFRIGERANT FLOW SYSTEM IN LIEU OF A VARIABLE AIR HANDLING SYSTEM FOR HEATING AND COOLING THE BUILDING

Principals of Geothermal Systems



Heat pumps, installed on the lower level, convey heat to and from the earth through a geothermal ground loop system. The geothermal system uses water in a closed loop/recirculating arrangement and transfer building heat to and from the ground. The geothermal system acts as a storage of heat.

The geothermal system is designed with a bank of wells. Each well contains a supply and return loop and is grouted to provide good heat transfer to the ground.

VE PROPOSAL HV-3/HV-4

REDUCE QUANTITY OF VAV/SFB BOXES IN ADULT AND CHILDREN SECTIONS

Alternative Summary	
Total Potential Cost Avoidance:	$ 47,000
Change in Schedule:	None

1. **Description of Baseline Concept:** The design documents indicate approximately 26 air terminal units (VAVs and SFBs) in the Library and Administration spaces and subsequent space temperature zones.

2. **Description of Alternative Concept:** Reduce the number of zones by combining air terminal units (see sketches on following page).

3. **Advantages:**
   - Less zones
   - Less maintenance and better access
   - Less ductwork
   - Potentially less conflicts with other utilities

4. **Disadvantages:**
   - Larger sized ductwork
   - Reduces temperature control zones

5. **Discussion:** In reviewing drawing M-102, we see several zones that could be combined, limiting the number of air terminal units. Proposed design optimizes the HVAC system in operations as well as in construction.

6. **Discussion of Schedule Impacts:** None

7. **Discussion of Risk Impacts:** No real risks.

8. **Discussion of Operating Impacts:** Reducing the number of air terminal units would reduce maintenance impacts. Operating costs would most likely remain the same.

9. **Assumptions driving Cost Calculations:**
   - Initial construction costs would be reduced
   - New SFBs are larger than the 18 SFBs removed

VE PROPOSAL HV-3/HV-4

REDUCE QUANTITY OF VAV/SFB BOXES IN ADULT AND CHILDREN SECTIONS

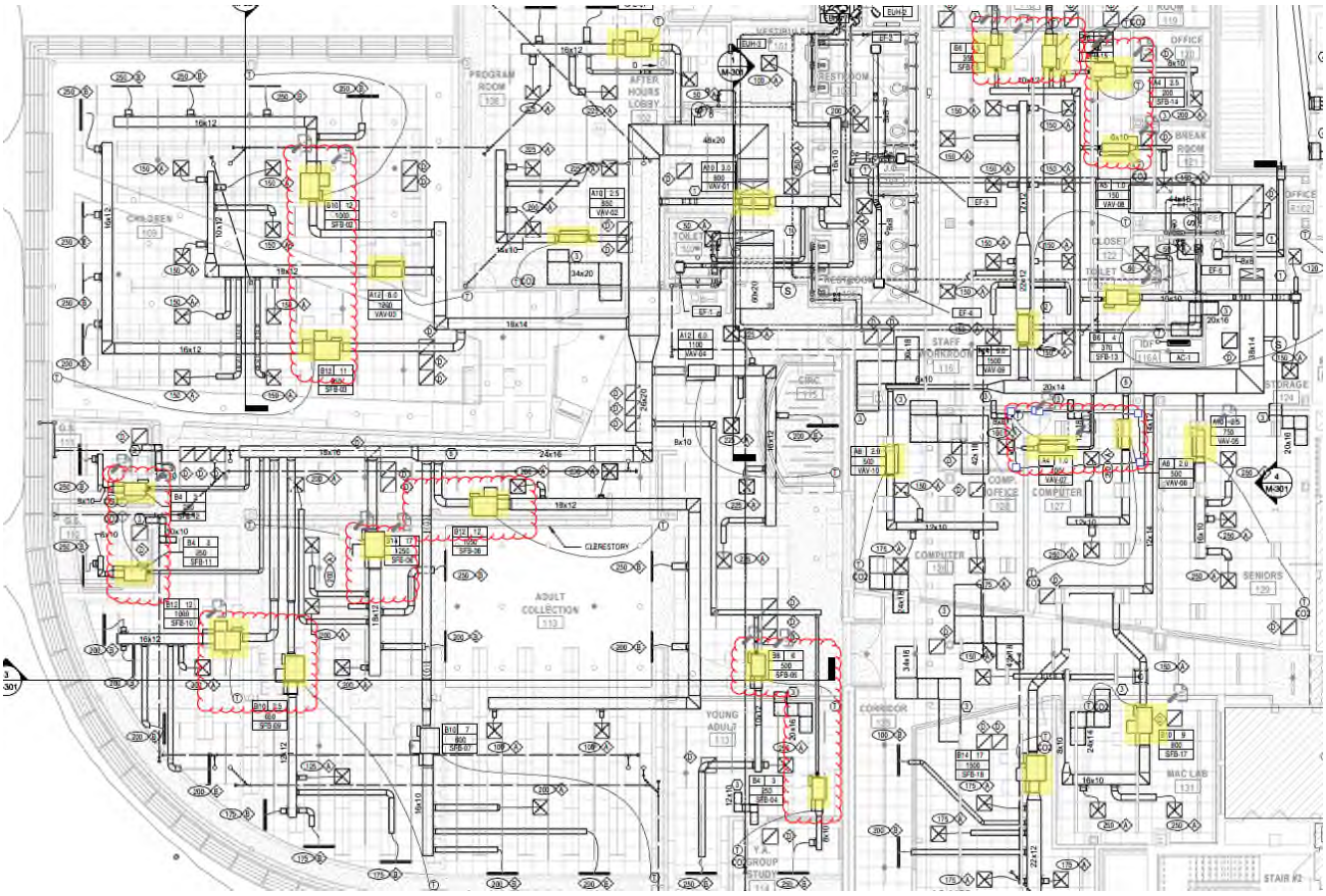
COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		Units	Qty	Unit $	Total	Qty	Unit $	Total
Delete SFBs		EA	18	5,110	$91,980.00			
Delete VAVs		EA	10	2,870	$28,700.00			
Add SFBs		EA				8	7,500	$60,000.00
Add VAVs		EA				8	2,870	$22,960.00
Subtotal					**$120,680**			**$82,960**
Markup Factor (%)	**25.10%**				**$30,291**			**$20,823**
Total					**$150,971**			**$103,783**
TOTAL (ROUNDED)					**$151,000**			**$104,000**
						Net Cost Avoidance*		**$47,000**

*: Negative number is a cost INCREASE

ALTERNATIVE SKETCH

Below is a section of M-102 showing the air terminal units (VAV/SFB) locations. Areas clouded in red should be considered for combining the zones and eliminating one of the terminal boxes.



VE PROPOSAL CE-1

USE A SKYLIGHT IN LIEU OF CLERESTORY

Alternative Summary	
Total Potential Cost Avoidance:	$ 50,000
Change in Schedule:	None

1. **Description of Baseline Concept:** A clerestory is used to bring natural light into the Adult Collection Area.
2. **Description of Alternative Concept:** Use skylight(s) to bring natural light into the Adult Collection Area. This proposal uses 4-barrel skylights to achieve a desired square footage. Kalwall makes a 24-foot diameter skylight for a more dramatic effect.

3. **Advantages:**
   - Cost savings
   - Simplifies construction
   - Still provides the desired natural light

4. **Disadvantages:**
   - Overall architectural effect may be diminished

5. **Discussion:** Cost savings may be realized by the reduction of building structure and wall framing by removing the clerestory and using a skylight or group of smaller skylights to maintain the desire for natural light in the Adult Collection Area.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule. Potential slight reduction in construction time.
7. **Discussion of Risk Impacts:** Potential supply chain risk on the availability of skylights.
8. **Discussion of Operating Impacts:** No operations impacts expected.

9. **Assumptions driving Cost Calculations:**
   - Suitable skylight(s) can be procured for $36,000.00. Dependent on final selection of manufacturer

VE PROPOSAL CE-1

USE A SKYLIGHT IN LIEU OF CLERESTORY

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Steel W16x26		LF	108.0	74.00	$7,992.00			
Steel L7x4 3/8"		LF	108.0	28.00	$3,024.00			
HSS4x4x1/4		LF	27.0	59.00	$1,593.00			
HSS8x8x1/4		LF	20.0	81.00	$1,620.00			
8" Stud Wall		SF	286.0	16.64	$4,759.04			
4" Stud Framing		SF	189.0	5.00	$945.00			
Roof Assembly		SF	240.0	23.00	$5,520.00			
Windows		SF	254.0	115.71	$29,390.34			
Gutters		LF	30.0	29.00	$870.00			
Metal Soffit		SF	189.0	67.97	$12,846.33			
5x12 Barrel Vault Skylights		EA				4.0	7,105.00	$28,420.00
Subtotal					**$68,560**			**$28,420**
Markup Factor (%)	**25.10%**				**$17,208**			**$7,133**
Total					**$85,768**			**$35,553**
TOTAL (ROUNDED)					**$86,000**			**$36,000**
							Net Cost Avoidance*	**$50,000**

*: Negative number is a cost INCREASE

VE PROPOSAL CE-4

ELIMINATE CURTAINWALL SUNSHADE

Alternative Summary	
Total Potential Cost Avoidance:	$ 114,000
Change in Schedule:	None

1. **Description of Baseline Concept:** The curtainwall has an integral sunshade (see sketch on following page).

2. **Description of Alternative Concept:** Eliminate the sunshade and use the roof overhang for shading the curtainwall.

3. **Advantages:**
   - Cost savings

4. **Disadvantages:**
   - May increase heat gain and affect the HVAC calculations
   - May adversely affect LEED points
   - Adverse effect on architectural aesthetics

5. **Discussion:** Cost savings would be realized by eliminating the curtainwall sunshade. The removal of the sunshade may result in additional heat gain on the building from the sun and increase the load on the HVAC system, however, the extended roof overhang would protect the windows in the summer months.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule.

7. **Discussion of Risk Impacts:** None identified.

8. **Discussion of Operating Impacts:** If the roof overhang does not provide enough shading during the summer, there may be an increased cooling load on the HVAC system.

9. **Assumptions driving Cost Calculations:**
   - Removing sunshade costs from the project

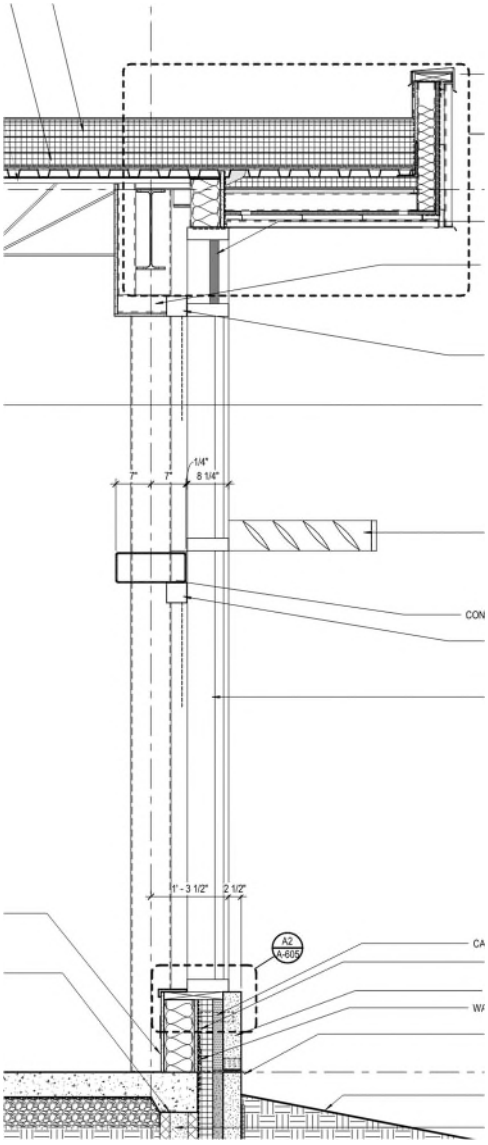
VE PROPOSAL CE-4

ELIMINATE CURTAINWALL SUNSHADE

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		Units	Qty	Unit $	Total	Qty	Unit $	Total
Curtainwall Sun Shade		LF	274.0	334.00	$91,516.00			
Subtotal					**$91,516**			**$0**
Markup Factor (%)	**25.10%**				**$22,971**			**$0**
Total					**$114,487**			**$0**
TOTAL (ROUNDED)					**$114,000**			**$0**
						Net Cost Avoidance*		**$114,000**
*: Negative number is a cost INCREASE								

ALTERNATIVE SKETCH



Remove

Takoma Park Library

VE PROPOSAL CE-4
ELIMINATE CURTAINWALL SUNSHADE

VE PROPOSAL CE-5

ELIMINATE INTERIOR MOTORIZED SUNSHADES AND TINT WINDOWS

Alternative Summary	
Total Potential Cost Avoidance:	$51,000
Change in Schedule:	No change

1. **Description of Baseline Concept:** The baseline design has motorized sunshades for windows.

2. **Description of Alternative Concept:** In lieu of motorized sunshades, use window tint to reduce sun glare.

3. **Advantages:**
   - Reduction in construction cost
   - Reduction in operations and maintenance costs

4. **Disadvantages:**
   - Lose the ability to control when and how much sunshine is allowed in
   - Window tint will naturally wear down and require replacement

5. **Discussion:** Motorized shades are expensive and natural lighting is preferred. By installing window tint, natural light is still allowed in, while reducing the heat, the glare, and the UV rays generated by sunlight. With tint, construction costs and electrical load is decreased.

6. **Discussion of Schedule Impacts:** Would not delay the project schedule. If anything, it could shorten the work without the need to install motors, conduits, and conductors.

7. **Discussion of Risk Impacts:** There is no risk associated with this change.

8. **Discussion of Operating Impacts:** Annual operating costs would be down without the motor loads and cost of maintaining the motors.

9. **Assumptions driving Cost Calculations:**
   - Replaced motorized sunshade cost per SF from the Forella estimate
   - Window tint installation cost of $8 per SF

VE PROPOSAL CE-5

ELIMINATE INTERIOR MOTORIZED SUNSHADES AND TINT WINDOWS

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Window Treatment, motorized		SF	3156.0	20.90	$65,960.40			
Window Treatment, Tint		SF				3156.0	8.00	$25,248.00
Subtotal					**$65,960**			**$25,248**
Markup Factor (%)	**25.10%**				**$16,556**			**$6,337**
Total					**$82,516**			**$31,585**
TOTAL (ROUNDED)					**$83,000**			**$32,000**
						Net Cost Avoidance*		**$51,000**

*: Negative number is a cost INCREASE

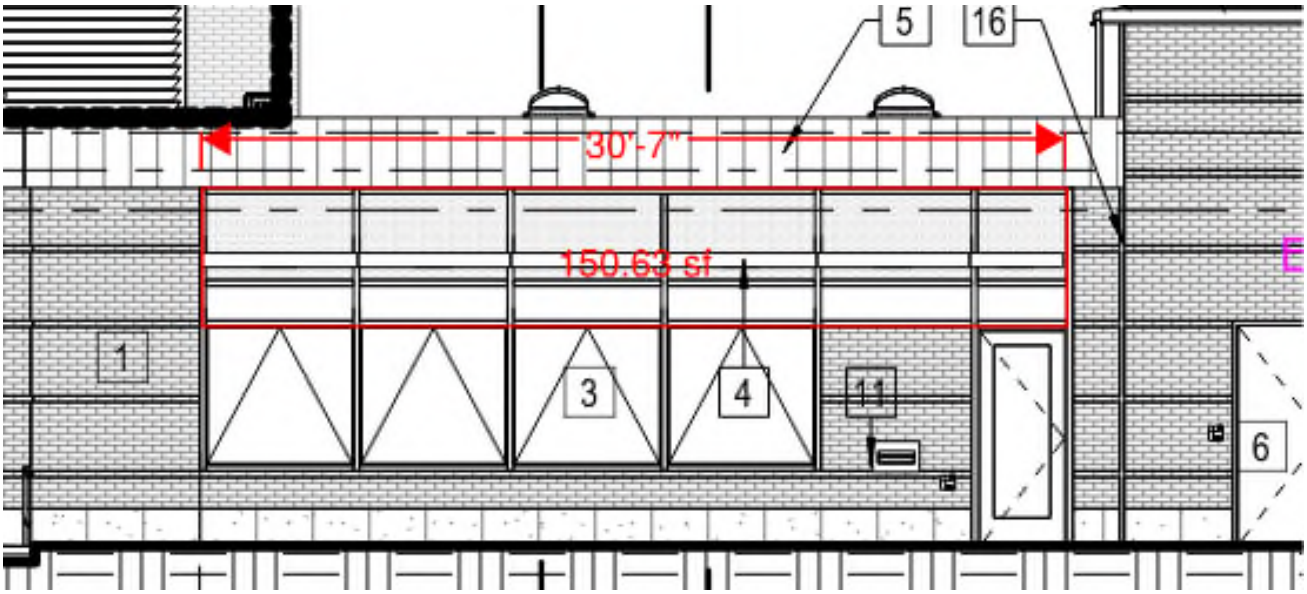
VE PROPOSAL CE-7

REVISE EXTERIOR WALL AT OFFICE AND CONFERENCE ROOM – (ROOMS 117/118/119)

Alternative Summary	
Total Potential Cost Avoidance:	$ 29,000
Change in Schedule:	None

1. **Description of Baseline Concept:** Windows on the north elevation in the Receiving, Office and Conference Rooms have a spandrel section and window shade. See sketch on following page.

2. **Description of Alternative Concept:** Eliminate the upper section of windows and associated sunshade and replace with brick veneer.



3. **Advantages:**
   - Cost savings
   - Increases thermal insulation on exterior wall

4. **Disadvantages:**
   - Window line is not maintained over entire elevation

5. **Discussion:** Cost savings may be realized by the reduction of curtainwall and sunshade. The increased thermal insulation may reduce the HVAC load. While the window line is not maintained over the entire elevation, the isolated nature of the window will have limited effect on the aesthetics.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule.

7. **Discussion of Risk Impacts:** None identified.

8. **Discussion of Operating Impacts:** No operating impacts expected.

VE PROPOSAL CE-7

REVISE EXTERIOR WALL AT OFFICE AND CONFERENCE ROOM – (ROOMS 117/118/119)

9. Assumptions driving Cost Calculations:

- Sunshade is not required on lower window height.

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Curtainwall System - Spandrel		SF	150.0	135.00	$20,250.00			
Curtainwall Sun Shade		LF	30.0	334.00	$10,020.00			
Brick Veneer Exterior Wall		SF				150.0	47.84	$7,176.00
Subtotal					**$30,270**			**$7,176**
Markup Factor (%)	**25.10%**				**$7,598**			**$1,801**
Total					**$37,868**			**$8,977**
TOTAL (ROUNDED)					**$38,000**			**$9,000**
							Net Cost Avoidance*	**$29,000**

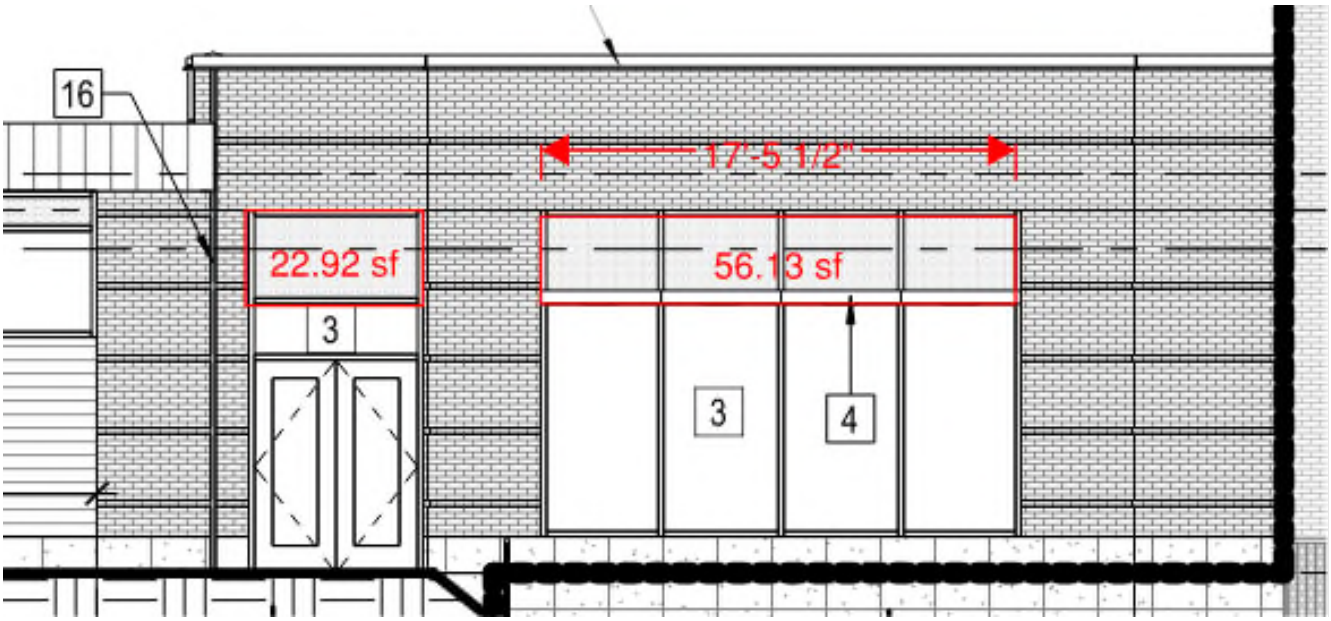
*: Negative number is a cost INCREASE

VE PROPOSAL CE-8

REVISE EXTERIOR WALL AT LOUNGE AREA – (ROOM 130)

Alternative Summary	
Total Potential Cost Avoidance:	$ 16,000
Change in Schedule:	None

1. **Description of Baseline Concept:** The windows on the south elevation at the Lounge Room have a spandrel section and window shade.



2. **Description of Alternative Concept:** Eliminate the upper section of windows and associated sunshade and replace with brick veneer.

3. **Advantages:**
   - Cost savings
   - Increases thermal insulation on exterior wall

4. **Disadvantages:**
   - Window line is not maintained over entire elevation

5. **Discussion:** Cost savings may be realized by the reduction of curtainwall and sunshade. The increased thermal insulation may reduce HVAC load. While the window line is not maintained over the entire elevation, the isolated nature of the window will have limited effect on the aesthetics.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule.

7. **Discussion of Risk Impacts:** None identified.

8. **Discussion of Operating Impacts:** No operating impacts expected.

VE PROPOSAL CE-8

REVISE EXTERIOR WALL AT LOUNGE AREA – (ROOM 130)

9. Assumptions driving Cost Calculations:

- Sunshade is not required on lower window height

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Curtainwall System - Spandrel		SF	80.0	135.00	$10,800.00			
Curtainwall Sun Shade		LF	17.0	334.00	$5,678.00			
Brick Veneer Exterior Wall		SF				80.0	47.84	$3,827.20
Subtotal					**$16,478**			**$3,827**
Markup Factor (%)	**25.10%**				**$4,136**			**$961**
Total					**$20,614**			**$4,788**
TOTAL (ROUNDED)					**$21,000**			**$5,000**
						Net Cost Avoidance*		**$16,000**

*: Negative number is a cost INCREASE

VE PROPOSAL CE-10

ATTACH A CONCRETE CORBEL TO THE EXISTING FOUNDATION WALL TO SUPPORT THE NEW FIREWALL MASONRY IN LIEU OF EXTENDING THE MASONRY DOWN TO THE EXISTING LOW LEVEL FOOTING

Alternative Summary	
Total Potential Cost Avoidance:	$30,000
Change in Schedule:	None

1. **Description of Baseline Concept:** The design documents indicate that the firewall is being constructed by placing a second 8-inch masonry wall adjacent to the existing wall and the new masonry to the lower level where an extended concrete footing will be constructed (see sketch on following page).
2. **Description of Alternative Concept:** Stop the new masonry wall five feet below grade and attach a concrete corbel to the existing concrete wall that supports the existing masonry wall (see sketch on following page).

3. **Advantages:**
   - Avoids having to excavate down to the low footing to install the new footing extension
   - Saves time and costs

4. **Disadvantages:**
   - Designer must confirm that the existing concrete wall can accept the unbalanced load and the existing footing can support the extra weight
5. **Discussion:** By not having to construct the lower portion of the new masonry wall the contractor will no longer need to excavate down to the lower-level footing. This avoids having to stockpile the excavated material and then replace it, saving time and costs. For this to be implemented the designer has to verify that the existing concrete wall is capable of accepting the new masonry wall.
6. **Discussion of Schedule Impacts:** Minor reduction in construction time.
7. **Discussion of Risk Impacts:** No risks if the existing concrete wall can be used.

8. **Discussion of Operating Impacts:** N/A

9. **Assumptions driving Cost Calculations:**
   - Contractor will excavate at a 1H:1V slope to get down to the existing footing

VE PROPOSAL CE-10

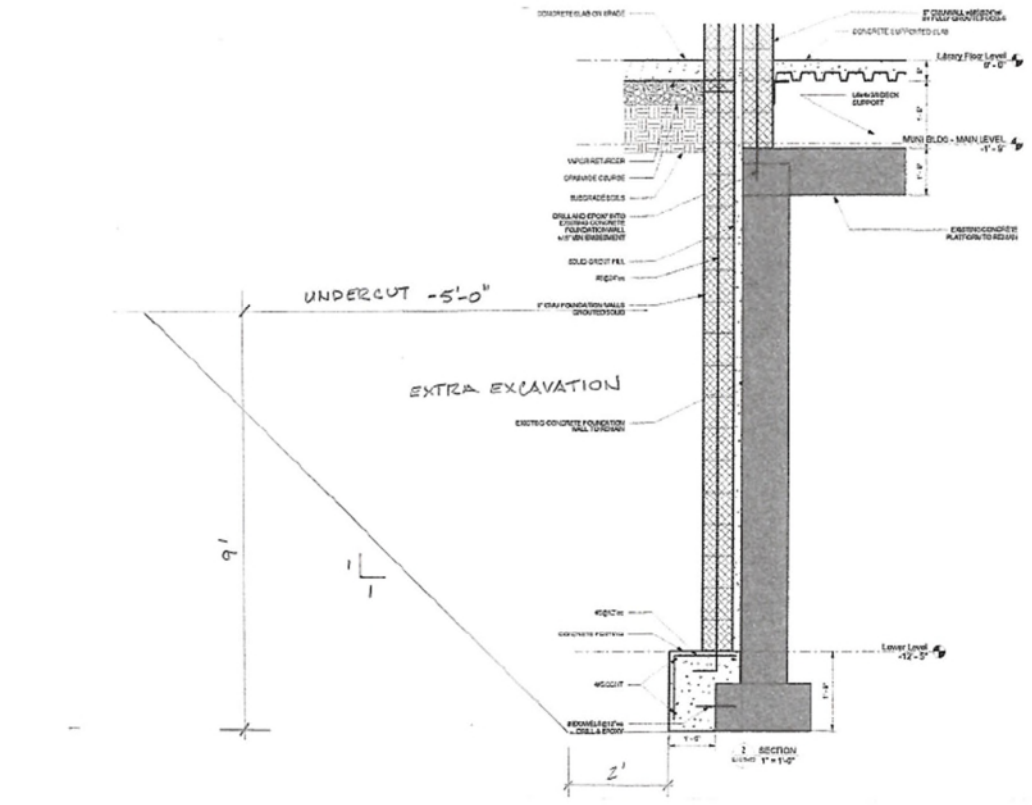
ATTACH A CONCRETE CORBEL TO THE EXISTING FOUNDATION WALL TO SUPPORT THE NEW FIREWALL MASONRY IN LIEU OF EXTENDING THE MASONRY DOWN TO THE EXISTING LOW LEVEL FOOTING

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Earthwork - Cut to Stockpile		CY	310	11.14	$3,453.40			
Earthwork - Fill and Compact		CY	271	12.54	$3,398.34			
Masonry		SF	1116	20.34	$22,699.44			
Foundation Concrete		CY	10	562.27	$5,622.70			
Concrete for Corbel		CY				7	733.28	$5,132.96
Dowels into existing concrete		EA				250	25.00	$6,250.00
Subtotal					**$35,174**			**$11,383**
Markup Factor (%)	**25.10%**				**$8,829**			**$2,857**
Total					**$44,003**			**$14,240**
TOTAL (ROUNDED)					**$44,000**			**$14,000**
							Net Cost Avoidance*	**$30,000**

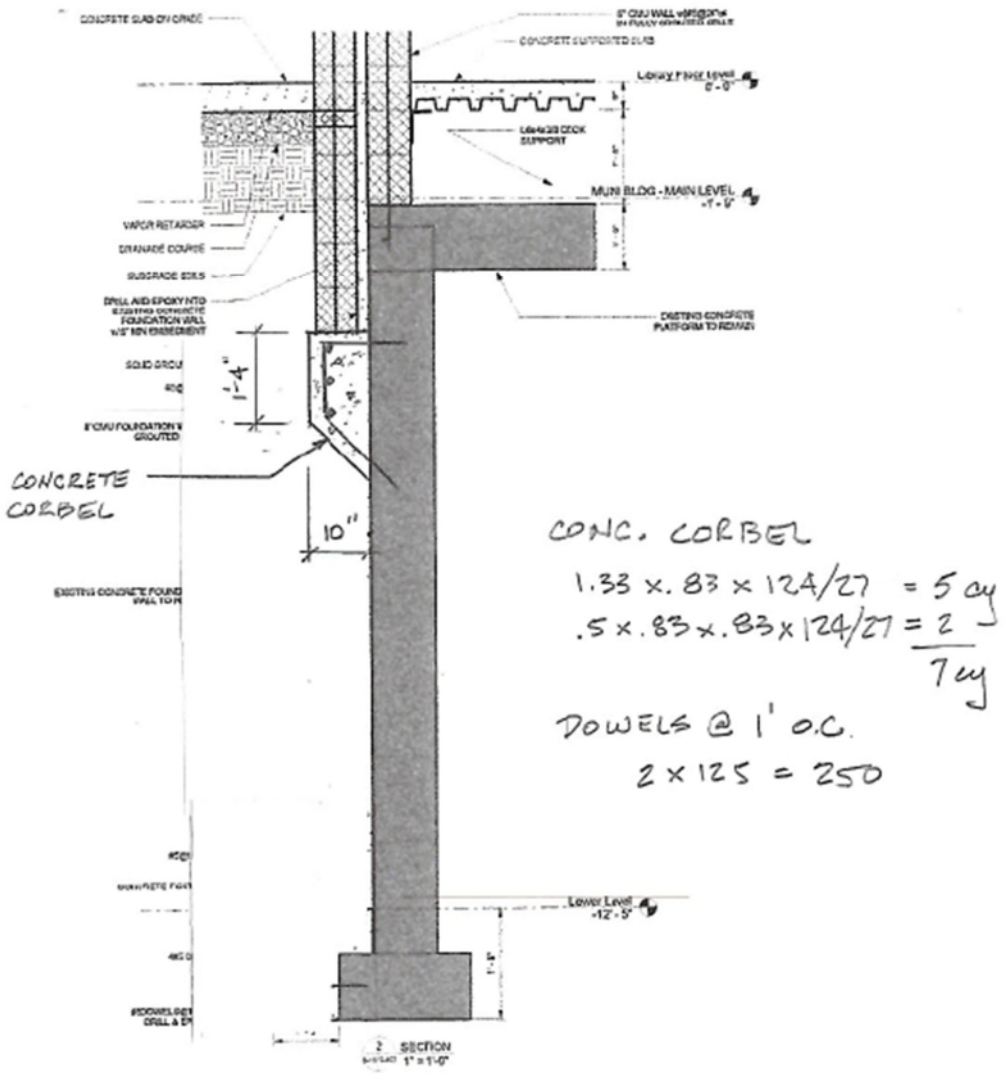
*: Negative number is a cost INCREASE

SKETCHES



VE PROPOSAL CE-10

ATTACH A CONCRETE CORBEL TO THE EXISTING FOUNDATION WALL TO SUPPORT THE NEW FIREWALL MASONRY IN LIEU OF EXTENDING THE MASONRY DOWN TO THE EXISTING LOW LEVEL FOOTING



ALTERNATIVE

VE PROPOSAL CE-11

USE MANUALLY OPERATED INTERIOR SHADES IN LIEU OF MOTORIZED SHADES

Alternative Summary	
Total Potential Cost Avoidance:	$51,000
Change in Schedule:	No change

1. **Description of Baseline Concept:** The baseline design has motorized sunshades for windows.

2. **Description of Alternative Concept:** In lieu of motorized sunshades, use manually operated shades.

3. **Advantages:**
   - Reduction in construction cost
   - Reduction in operations and maintenance cost: no motors to operate or maintain
   - Individuals could adjust specific windows to their working pleasure without the need to ask staff

4. **Disadvantages:**
   - Manually adjusting each window shade will take longer
   - Unauthorized personnel could mess with the position of the shades

5. **Discussion:** Motorized shades do not provide any significant advantage compared to manually operated shades, other than convenience. By installing manually operated shades, construction costs are decreased, and electrical load is decreased.

6. **Discussion of Schedule Impacts:** Would not delay the project schedule. If anything, it could shorten the work without the need to install motors, conduits, and conductors.

7. **Discussion of Risk Impacts:** There is no risk associated with this change.

8. **Discussion of Operating Impacts:** Annual operating costs would be down without the motor loads and maintenance.

9. **Assumptions driving Cost Calculations:**
   - Replaced motorized sunshade cost per SF from the Forella estimate with manually operated shades from RSMeans, plus 10%

VE PROPOSAL CE-11

USE MANUALLY OPERATED INTERIOR SHADES IN LIEU OF MOTORIZED SHADES

COST EVALUATION

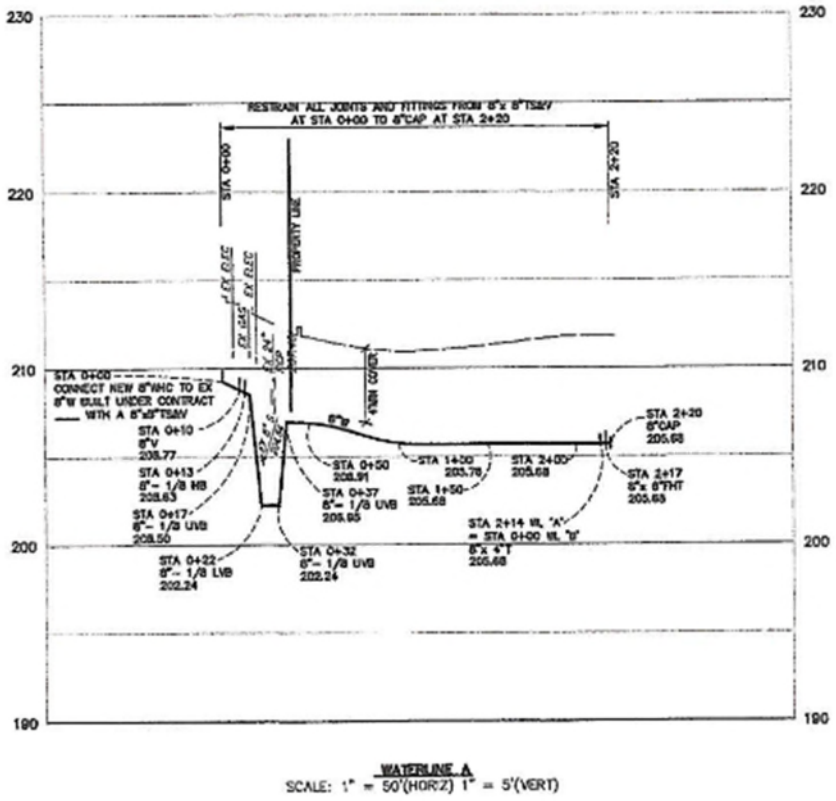
Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Window Treatment, motorized		SF	3156.0	20.90	$65,960.40			
Vinyl laminated fiberglass, translucent heavy duty shade		SF				3156.0	8.14	$25,689.84
Subtotal					**$65,960**			**$25,690**
Markup Factor (%)	**25.10%**				**$16,556**			**$6,448**
Total					**$82,516**			**$32,138**
TOTAL (ROUNDED)					**$83,000**			**$32,000**
							Net Cost Avoidance*	**$51,000**
		*: Negative number is a cost INCREASE						

VE PROPOSAL U-2

INSERT A SLEEVE BETWEEN THE 8-INCH SANITARY SEWER AND 24-INCH STORM SEWER TO ACCEPT THE NEW WATER LINE IN LIEU OF DIGGING A DEEP HOLE TO RUN THE WATER LINE UNDER THE SANITARY SEWER LINE

Alternative Summary	
Total Potential Cost Avoidance:	DESIGN SUGGESTION
Change in Schedule:	None

1. **Description of Baseline Concept:** The design documents indicate that a 10-foot-deep hole is to be dug so that the new water line can installed under the existing 8-inch sanitary sewer line which is below the 24-inch reinforced concrete stormwater pipe.

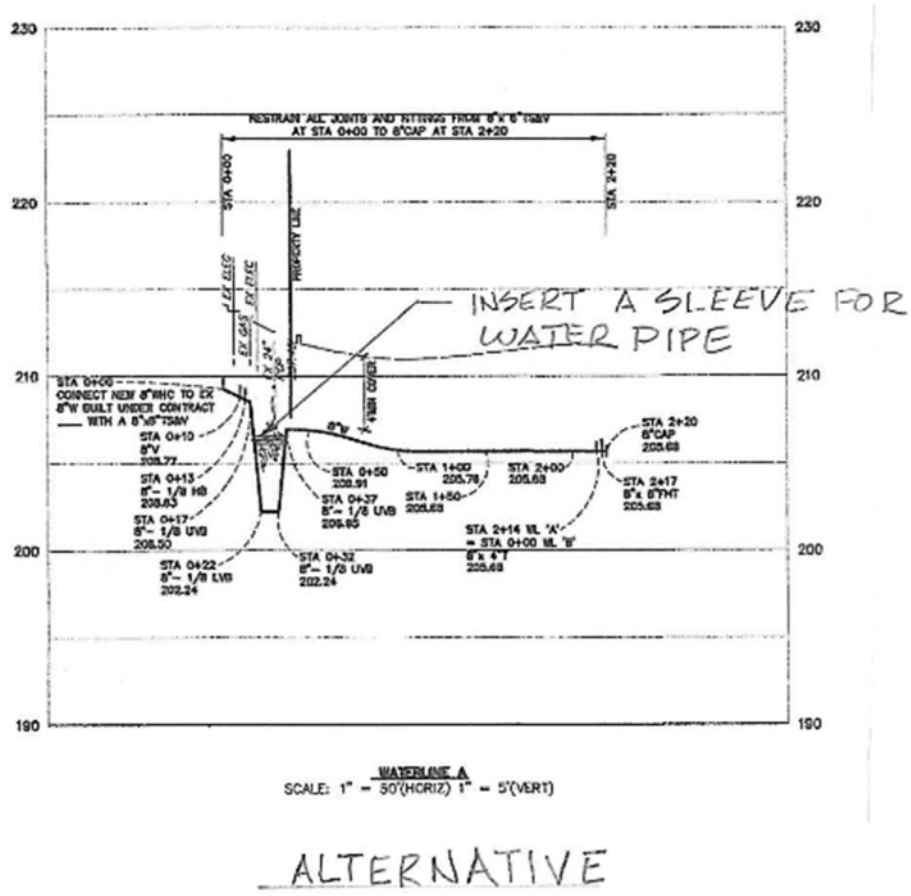


BASELINE DESIGN

2. **Description of Alternative Concept:** Jack a 10- or 12-inch diameter steel pipe sleeve under the 24-inch stormwater line and place the water line in the sleeve in lieu of digging the deep hole.

VE PROPOSAL U-2

INSERT A SLEEVE BETWEEN THE 8-INCH SANITARY SEWER AND 24-INCH STORM SEWER TO ACCEPT THE NEW WATER LINE IN LIEU OF DIGGING A DEEP HOLE TO RUN THE WATER LINE UNDER THE SANITARY SEWER LINE



3. **Advantages:**
   - Do not have to dig a deep hole to install the water line
   - Keeps the water line above the sanitary sewer line
   - Shortens the length of storm sewer line to be temporarily supported during construction
   - Avoids having to temporarily support the sanitary sewer line to install the water line

4. **Disadvantages:**
   - None apparent

5. **Discussion:** It is preferrable that water lines not be placed below sanitary sewer lines. Installing the sleeve will protect the water line and avoids having to dig down approximately another 8 feet to install the water line under the sanitary sewer line.

6. **Discussion of Schedule Impacts:** No impacts

7. **Discussion of Risk Impacts:** Potential difficulty in jacking the sleeve

8. **Discussion of Operating Impacts:** N/A

VE PROPOSAL D-1

HIRE THE SOLAR PANEL VENDOR TO REMOVE AND REINSTALL PANELS IN LIEU OF THE CONTRACTOR

Alternative Summary	
Total Potential Cost Avoidance:	DESIGN SUGGESTION
Change in Schedule:	No impact to schedule

1. **Description of Baseline Concept:** The design documents indicate that the general contractor will remove, store, and reinstall the currently installed solar roof panels.

2. **Description of Alternative Concept:** Hire the solar panel company to remove, store, and reinstall the solar panels.

3. **Advantages:**
   - Reduces risk of damage to panels
   - General contractors may shy away from bidding on the project to avoid the risk

4. **Disadvantages:**
   - Requires coordination between the vendor and the general contractor

5. **Discussion:** There is a greater risk of damage to the solar panels if the general contractor removes, stores, and reinstalls them. The solar vendor will have the knowledge to prevent damage. There is a possibility that the solar warranty could be void if the panels are not handled by the solar vendor.

6. **Discussion of Schedule Impacts:** There should be no impact to the schedule.

7. **Discussion of Risk Impacts:** N/A

8. **Discussion of Operating Impacts:** N/A

9. **Assumptions driving Cost Calculations:** N/A

VE PROPOSAL E-3

USE A NORMAL LIGHTING SYSTEM IN LIEU OF DIGITAL LIGHTING

Alternative Summary	
Total Potential Cost Avoidance:	$7,000
Change in Schedule:	No Change

1. **Description of Baseline Concept:** The baseline concept has digital lighting and a plug load control system.
2. **Description of Alternative Concept:** Use standard high voltage lighting system without digital lighting and plug load control system.

3. **Advantages:**
   - Reduces construction cost

4. **Disadvantages:**
   - Lose the ability to digitally control all the lights
   - Lose the ability to dim lights
   - Switched receptacles removed which requires manual operation to unplug/turn off anything plugged into those receptacles
   - Removal of control relays would eliminate the potential of daylight harvesting resulting in loss of energy savings
5. **Discussion:** Changing digital lighting and plug load control system to a standard lighting system results in the relays and controllers being removed but retaining the occupancy sensors per code.
6. **Discussion of Schedule Impacts:** Would not delay the project schedule. If anything, it could shorten the work without the need to install plug room controllers, dimming controllers, and associated cables.
7. **Discussion of Risk Impacts:** There is no risk associated with this change.
8. **Discussion of Operating Impacts:** Change in operating costs would be negligible.

9. **Assumptions driving Cost Calculations:**
   - Removed controllers
   - Changed switched receptacles to standard receptacles
   - Changed dimming light switches to automatic (sensor) light switches
   - Changed normal light switches to automatic (sensor) light switches
   - Reduced the amount of LV lighting control cable needed by 25%

VE PROPOSAL E-3

USE A NORMAL LIGHTING SYSTEM IN LIEU OF DIGITAL LIGHTING

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Switched Duplex receptacle		EA	39	94.97	$3,703.83			
Switched Rec. Control module		EA	11	209.66	$2,306.26			
Switched quadplex rec.		EA	8	116.95	$935.60			
FB Switched control Duplex rec.		EA	1	500.47	$500.47			
Digital Dimming Switch		EA	27	160.90	$4,344.30			
SPST 1 gang switch		EA	12	87.15	$1,045.80			
LV lighting control cable		LF	2240	4.06	$9,094.40			
Duplex receptacle		EA				39	87.21	$3,401.19
Double Duplex receptacle		EA				8	93.69	$749.52
FB duplex receptacle		EA				1	500.47	$500.47
Automatic wall Switch		EA				39	123.00	$4,797.00
LV lighting control cable		LF				1680	4.06	$6,820.80
Subtotal					**$21,931**			**$16,269**
Markup Factor (%)	**25.10%**				**$5,505**			**$4,084**
Total					**$27,435**			**$20,352**
TOTAL (ROUNDED)					**$27,000**			**$20,000**
						Net Cost Avoidance*		**$7,000**

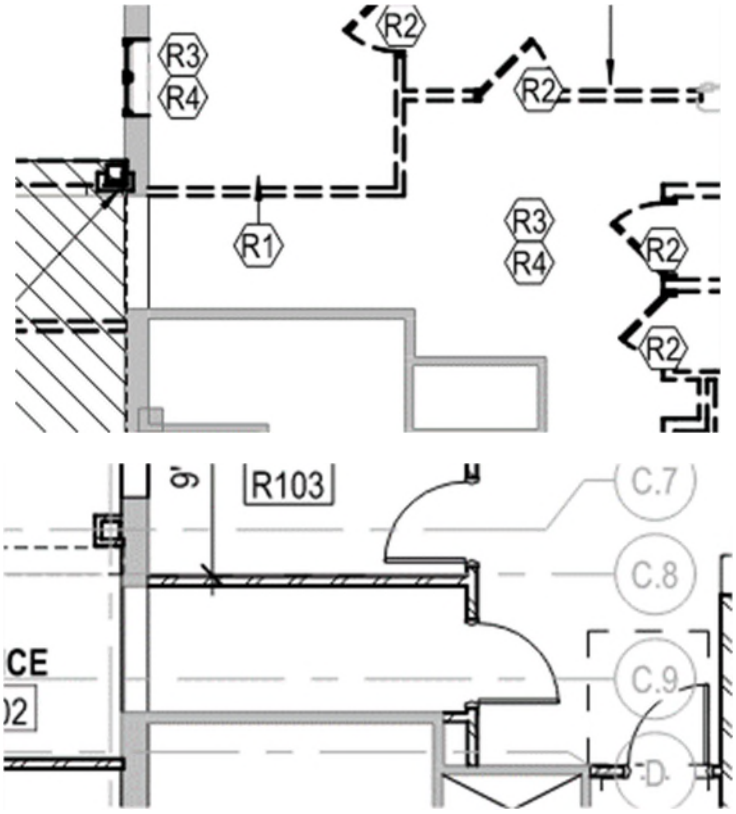
*: Negative number is a cost INCREASE

VE PROPOSAL PH-1

RETAIN THE RECREATION AREA AS IS AND MAKE IT A CONSTRUCTION CONTRACT ADD ALTERNATE

Alternative Summary	
Total Potential Cost Avoidance:	$1,198,000
Change in Schedule:	No Change

1. **Description of Baseline Concept:** The baseline concept renovates the Recreation Area to provide new restrooms and office area.



2. **Description of Alternative Concept:** Include the Recreation Area renovation as an add alternate in the construction contract. Build out the storage room only to prevent a dead-end corridor.

3. **Advantages:**
   - Cost savings – Adds back into project if budget allows
   - Prevent base bids from exceeding the budget

4. **Disadvantages:**
   - Budget may not allow renovation

5. **Discussion:** In order to prevent base bids from exceeding the budget, include the renovation of the Recreation Area as an add alternate to the construction contract. Build out the storage room in the office area to eliminate the dead-end corridor. If the bids received have a separate bid amount for the renovation that exceeds the budget, the scope of the renovation can be reevaluated to fit into the remaining budget.

VE PROPOSAL PH-1

RETAIN THE RECREATION AREA AS IS AND MAKE IT A CONSTRUCTION CONTRACT ADD ALTERNATE

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule. The renovation work would be performed concurrently with the longer duration new construction.

7. **Discussion of Risk Impacts:** None identified

8. **Discussion of Operating Impacts:** Continued maintenance of existing building systems if add alternate is not selected.

9. **Assumptions driving Cost Calculations:**
   - Except for addressing the dead-end corridor, remaining renovation is not necessary to permit the project

COST EVALUATION

See following cost evaluation sheet

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Existing Conditions/Demo								
Protection		LS	1.0	3,202.87	$3,202.87			
Interior Demo		SF	3709.0	11.72	$43,469.48			
Saw Cut SOG		LF	68.0	11.57	$786.76			
Demo SOG 4"		SF	132.0	5.47	$722.04			
Masonry Tooth-in/Repair		LF	28.0	70.73	$1,980.44			
Dumpster		EA	4.0	776.00	$3,104.00			
Hazmat Allowance		LS	1.0	54,000.00	$54,000.00			
Accessories Misc Allowance		LS	1.0	2,500.00	$2,500.00			
General Floor Patching Allowance		GSF	3709.0	1.05	$3,894.45			
Wood								
Blocking Toilet Accessories		EA	12.0	92.00	$1,104.00			
Blocking Total Building		GSF	3709.0	1.18	$4,376.62			
Wall Cap Short Wall - Restroom		LF	25.0	22.83	$570.75			
Construct Raised Dance Floor and Ramp		SF	292.0	7.35	$2,146.20			
Thermal & Moisture Protection								
Sealant Total Interior		SF	3709.0	1.30	$4,821.70			
Doors & Windows								
Single Type Frame, Slab		EA	15.0	596.72	$8,950.80	1.0	596.72	$596.72
Door		EA	15.0	539.01	$8,085.15	1.0	539.01	$539.01
Hardware		EA	15.0	710.46	$10,656.90	1.0	710.46	$710.46
Door Glazing Sheet Glass		SF	66.0	41.48	$2,737.68			
Transaction Window		SF	25.0	51.00	$1,275.00			
Plumbing Access Door		EA	4.0	228.66	$914.64			
Finishes								
GWB on 3-5/8 Studs 5/8" Abuse		SF	8453.0	13.45	$113,692.98	50.0	13.45	$672.50
GWB on 6" Studs 5/8" Abuse		SF	3202.0	16.71	$53,505.42			
GWB Ceiling Moisture		SF	736.0	9.92	$7,301.12			
Marble Thresholds		LF	15.0	24.24	$363.60			
Porcelain Wall Tile		SF	2022.5	17.24	$34,867.90			
Glass Tile Accent		SF	191.0	19.81	$3,783.71			
Porcelain Floor		SF	694.0	17.24	$11,964.56			
Porcelain Base		LF	216.0	17.23	$3,721.68			
Moisture Resistant Membrane 1/16"		SF	694.0	5.94	$4,122.36			
2x2 grid and tile		SF	1887.0	6.24	$11,774.88	50.0	6.24	$312.00
FRP Wall Panels and Trim		SF	32.0	15.71	$502.72			
VCT Flooring		SF	900.0	3.69	$3,321.00	50.0	3.64	$182.00
Wall Base 4"		LF	741.8	2.68	$1,988.02			
LVT Flooring		SF	129.0	7.38	$952.02			
Carpet Tile		SF	1576.8	6.26	$9,870.77			
Match Ex. Dance Floor Finish Allowance		SF	232.0	18.10	$4,199.20			
Interior Paint		GSF	3709.0	3.93	$14,576.37	50.0	3.93	$196.50
Exterior Paint		GSF	3709.0	3.93	$14,576.37			
Concrete Sealer		SF	44.0	2.34	$102.96			
Wall Patching Allowance		GSF	3709.0	0.45	$1,669.05			
Specialties								
Grab bars - Set		EA	5.0	241.92	$1,209.60			
Soap Dispenser Surface Mount		EA	11.0	91.69	$1,008.59			
TP Dispenser Recessed		EA	11.0	253.39	$2,787.29			
Disposal Feminine Napkin		EA	4.0	126.46	$505.84			
PT Dispenser Multi-Fold		EA	5.0	257.25	$1,286.25			
PT Dispenser w/ Waste		EA	5.0	711.29	$3,556.45			
Baby Changing Station		EA	1.0	448.37	$448.37			
Coat Hook		EA	11.0	35.00	$385.00			
Mirrors 24" x 36"		EA	3.0	170.22	$510.66			
Interior Door/Hall Signage		EA	15.0	180.00	$2,700.00			
Partitions		EA	6.0	1,489.27	$8,935.62			
Partitions ADA		EA	2.0	1,745.79	$3,491.58			
SUBTOTAL PAGE 1					**$482,981.43**			

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
SUBTOTAL FROM PREVIOUS PAGE					**$482,981.43**			
Furnishings								
Counter Top SS 4"		LF	9.5	89.32	$848.54			
Base Cabinet PLAM		LF	9.5	325.83	$3,095.39			
Vanities - SS Top w Lav Bowl		SF	74.9	99.12	$7,419.13			
Fire Protection								
FP inc Jockey Pump and Controller		SF	3709.0	5.00	$18,545.00			
Plumbing								
Demolition Crew		SF	3709.0	1.34	$4,970.06			
Water Closets AS Afwall		EA	11.0	1,713.70	$18,850.70			
Lavatory Counter Mounted		EA	8.0	956.74	$7,653.92			
Lavatory Wall Mounted		EA	3.0	1,040.84	$3,122.52			
Bottle Filler Elkay		EA	1.0	3,524.10	$3,524.10			
Floor Drain		EA	5.0	469.55	$2,347.75			
Clean-Out Cast Iron w Brass		EA	1.0	122.64	$122.64			
Loose Key Hose Bibb 3/4"		EA	2.0	143.92	$287.84			
Tempering Valve 1/2"		EA	11.0	169.32	$1,862.52			
Pipe, Copper 1/2"		LF	150.0	33.38	$5,007.00			
Pipe, Copper 3/4"		LF	15.0	37.26	$558.90			
Pipe, Copper 1"		LF	135.0	45.88	$6,193.80			
Pipe, Copper 1 1/2"		LF	80.0	63.99	$5,119.20			
Pipe, Copper 2"		LF	150.0	77.74	$11,661.00			
Domestic Water Tie in		EA	2.0	144.04	$288.08			
Sanitary Piping								
Pipe w/Fittings 2" x 10'		LF	20.0	71.42	$1,428.40			
Pipe w/Fittings 3" x 10'		LF	55.0	87.01	$4,785.55			
Pipe w/Fittings 4" x 10'		LF	160.0	98.65	$15,784.00			
Excavation		LF	208.8	30.00	$6,264.00			
Spoils Removal		LF	52.2	30.00	$1,566.00			
Select Fill		LF	52.2	30.00	$1,566.00			
Above Grade Piping								
Pipe w/Fittings no hub 1 1/2" - 2"		LF	300.0	67.48	$20,244.00			
Floor Mounted Water Closet Flanges and J Bolts		EA	11.0		$0.00			
Carrier Lav Josam 17100		EA	3.0	225.00	$675.00			
Tie Into Existing		EA	6.0	144.04	$864.24			
Plumbing Insulation								
1/2" Pipe 1" Thick		LF	187.5	9.20	$1,725.00			
3/4" Pipe 1" Thick		LF	18.0	9.66	$173.88			
1" Pipe 1" Thick		LF	162.0	10.89	$1,764.18			
1 1/2" Pipe 1" Thick		LF	92.0	11.95	$1,099.40			
2" Pipe 1" Thick		LF	172.5	14.35	$2,475.38			
Testing & Marking/Clean/Chlor		GSL	3709.0	1.50	$5,563.50			
GC/Cx/Warranties		GSF	3709.0	1.50	$5,563.50			
Mechanical								
Demolition Crew		GSF	3709.0	2.00	$7,418.00			
HVAC Equipment - RTU-2		EA	1.0	62,855.00	$62,855.00			
EF-6 Cabinet Fan		EA	1.0	2,170.39	$2,170.39			
EF-7,8,9 Ceiling Exhaust Fan		EA	3.0	556.12	$1,668.36			
Sheet Metal								
Ductwork Rec. L/M Pressure		LB	1075.0	12.00	$12,900.00			
Ductwork Round L/M Pressure		LB	1040.0	12.00	$12,480.00			
Ductwork Hangers Access		LB	126.9	12.00	$1,522.80			
Flex Duct Including Insulation		LF	45.0	5.72	$257.40			
Spin-in w/ Damper		EA	9.0	23.68	$213.12			
Equipment Flex Conn		LF	8.0	11.62	$92.96			
Supply Diffuser 24" x 24"		EA	9.0	199.78	$1,798.02			
Return Air 24"		EA	2.0	199.78	$399.56			
Return/Exhaust Register		EA	4.0	199.78	$799.12			
Louver, Greenheck Product		EA	4.0	784.34	$3,137.36			

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Backdraft Damper		EA	1.0	199.78	$199.78			
SUBTOTAL PAGE 2					**$763,913.41**			
SUBTOTAL FROM PREVIOUS PAGE					**$763,913.41**			
Drive Motor for Dampers		EA	1.0	419.00	$419.00			
T&B Fees / Cut / Patch / Fire		GSF	3709.0	4.50	$16,690.50			
Controls		GSF	3709.0	8.00	$29,672.00			
Electrical								
Electrical Demolition		LS	1.0	14,695.00	$14,695.00			
SPD Added to Existing Panels		EA	2.0	951.41	$1,902.82			
Receptacle GFI		EA	8.0	99.43	$795.44			
Receptacle Duplex		EA	2.0	87.21	$174.42			
Plug-Load Control Duplex Receptacle Outlet, Watt Stopper		EA	6.0	94.97	$569.82			
Junction Box w/ Power		EA	4.0	161.18	$644.72			
Modular Furn. Power Column inc. Outlets, TV/Data/ etc.		EA	2.0	391.42	$782.84			
Disconnect Toggle Motor Rated 20A @ EF's/ Light Equip		EA	4.0	251.11	$1,004.44			
Motor/Equip Connections w/ Flex Equip		EA	4.0	265.14	$1,060.56			
PVC Sch 40 Conduit 1" through 1-1/4" to Floor Boxes		LF	5.6	5.64	$31.81			
EMT Conduit 3/4"		LF	580.0	12.62	$7,319.60			
#12 Wire 600 V THWN/THHN		LF	2719.2	0.85	$2,311.32			
Junction Box 4" x 4"		EA	4.0	161.18	$644.72			
Utility Box w/ Mud Ring 4" x 4"		EA	11.0	28.56	$314.16			
Cast in Place w/ Floor Box		EA	2.0	236.36	$472.72			
Poke Thru Box for Modular Furn		EA	2.0	1,464.45	$2,928.90			
Light Type A		EA	6.0	334.05	$2,004.30			
Light Type B		EA	27.0	590.57	$15,945.39			
Light Type D		EA	4.0	475.42	$1,901.68			
Light Type H 2'		EA	6.0	398.18	$2,389.08			
Light Type H 4'		EA	14.0	590.57	$8,267.98			
Light Type H 6'		EA	7.0	879.15	$6,154.05			
Light Type I 4'		EA	2.0	349.44	$698.88			
Back Up Battery Iota I-42-EM-A Emergency Battery 90 min		EA	18.0	121.71	$2,190.78			
Emergency Exit Wall/Clng Mnt		EA	1.0	308.40	$308.40			
Ceiling Mount Occupancy Sensor		EA	15.0	226.37	$3,395.55			
Wattstopper Power Back BZ-150		EA	3.0	132.60	$397.80			
D Wattstopper, Dimming Sensor w Dual Detection Occupancy		EA	6.0	160.90	$965.40			
Wattstopper LMRC-102 Digital Lighting Mgmt Relay Room		EA	6.0	359.74	$2,158.44			
EMT Conduit 3/4"		LF	525.0	9.68	$5,082.00			
#12 Wire 600 V THWN/THHN		LF	2178.8	0.85	$1,851.94			
EMT Conduit 3/4"		LF	1114.0	9.68	$10,783.52			
#12 Wire 600 V THWN/THHN		LF	3843.3	0.85	$3,266.81			
Cat Cable		LF	2800.0	1.14	$3,192.00			
Cat Terminations		EA	70.0	6.61	$462.70			
Junction Box 4" x 4"		EA	4.0	161.18	$644.72			
Utility Box w/ Mud Ring 4" x 4"		EA	35.0	28.56	$999.60			
Communications								
Wire and Cable Management		SF	3709.0	2.23	$8,271.07			
EMT Conduit		LF	60.0	15.56	$933.60			

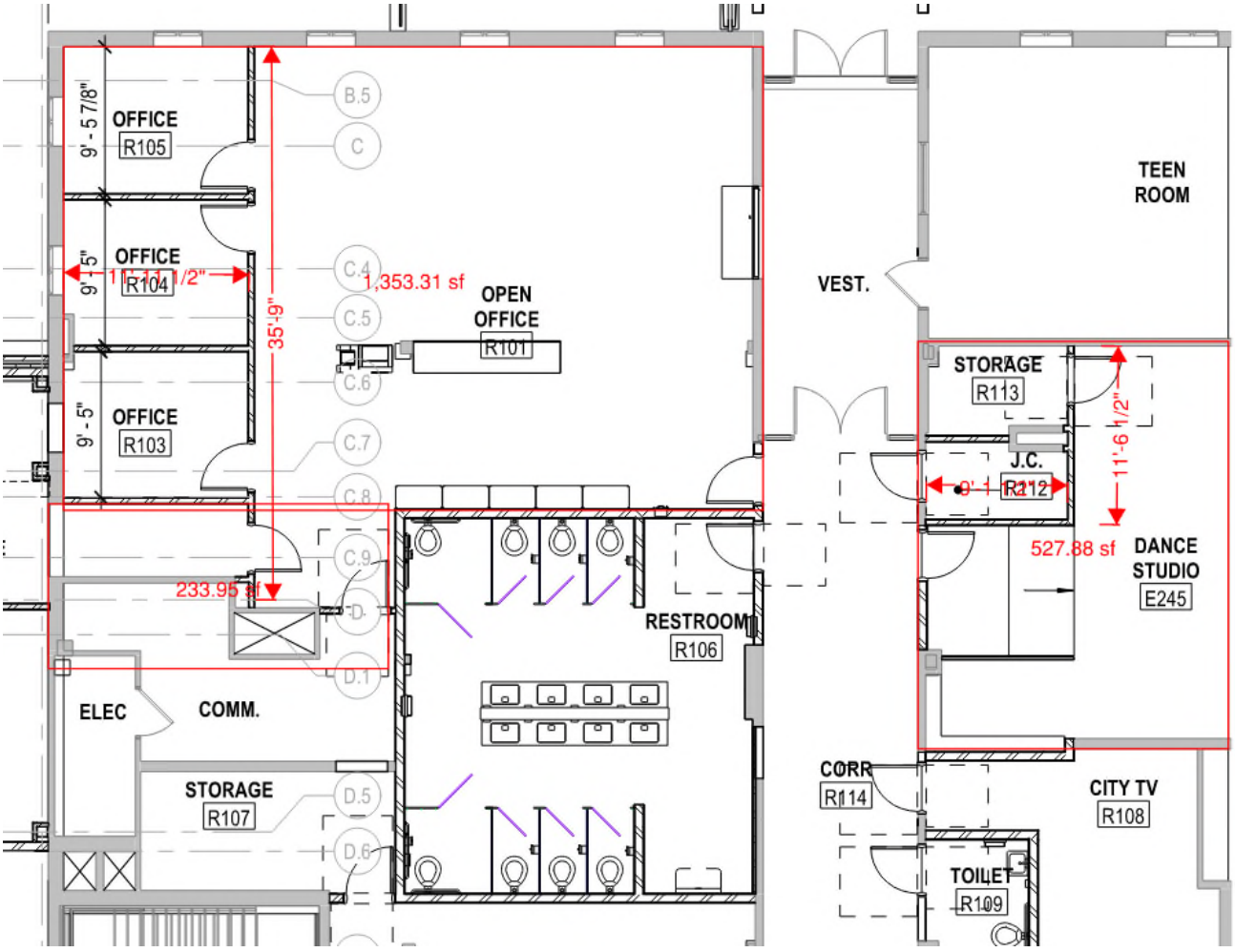
Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Utility Box w/ Mud Ring 4" x 4"		EA	6.0	51.64	$309.84			
Tele - Data Outlet		EA	6.0	89.13	$534.78			
CCTV - Allowance		SF	3709.0	1.75	$6,490.75			
Safety & Security								
Security System		SF	3709.0	4.18	$15,503.62			
Fire Alarm System		SF	3709.0	2.58	$9,569.22			
Subtotal					**$961,022**			**$3,209**
Markup Factor (%)	**25.10%**				**$241,217**			**$806**
Total					**$1,202,239**			**$4,015**
TOTAL (ROUNDED)					**$1,202,000**			**$4,000**
							Net Cost Avoidance	**$1,198,000**

VE PROPOSAL PH-2

RETAIN THE RECREATION AREA AS IS EXCEPT FOR THE OFFICE AREAS AND INCLUDE IN THE CONSTRUCTION CONTRACT AS AN ADD ALTERNATE

Alternative Summary	
Total Potential Cost Avoidance:	$ 676,000
Change in Schedule:	No Change

1. **Description of Baseline Concept:** The baseline concept includes the renovation of the Recreation Area to provide new restrooms and office area.



2. **Description of Alternative Concept:** Include the restroom renovation as an add alternate in the construction contract and build out the Recreation Area Office and Dance Studio Areas.

3. **Advantages:**
   - Cost savings – Add back into project if budget allows
   - Prevents base bids from exceeding the budget

4. **Disadvantages:**
   - Budget may not allow renovation
   - Added complexity if toilet renovations are performed under a separate project

VE PROPOSAL PH-2

RETAIN THE RECREATION AREA AS IS EXCEPT FOR THE OFFICE AREAS AND INCLUDE IN THE CONSTRUCTION CONTRACT AS AN ADD ALTERNATE

- Added cost if toilet renovations are performed under a separate project as renovated areas would be affected.

5. **Discussion:** To prevent base bids from exceeding the budget, include the renovation of the Recreation Area restrooms as an add alternate and build out the Office Area and Dance Studio. If the bids received have a separate bid amount for the renovation that exceeds the budget, the scope of the renovation can be reevaluated to fit into the remaining budget.

   The mechanical systems would be complicated. This option would include new HVAC system installation except for the actual restroom exhaust fans. Existing restroom exhaust fans will need to be coordinated with new systems.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule. The renovation work would be performed concurrently with the longer duration new construction.

7. **Discussion of Risk Impacts:** None identified

8. **Discussion of Operating Impacts:** None anticipated.

9. **Assumptions driving Cost Calculations:**
   - The toilet room renovations are not necessary for permits. Existing toilet room exhaust fans can be tied into the new exhaust ductwork

COST EVALUATION

See following cost evaluation sheet

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Existing Conditions/Demo								
Protection		LS	1.0	3,202.87	$3,202.87	0.5	3,202.87	$1,601.44
Interior Demo		SF	3709.0	11.72	$43,469.48	2114.0	11.72	$24,776.08
Saw Cut SOG		LF	68.0	11.57	$786.76			$0.00
Demo SOG 4"		SF	132.0	5.47	$722.04			$0.00
Masonry Tooth-in/Repair		LF	28.0	70.73	$1,980.44			$0.00
Dumpster		EA	4.0	776.00	$3,104.00	2.0	776.00	$1,552.00
Hazmat Allowance		LS	1.0	54,000.00	$54,000.00	0.5	54,000.00	$27,000.00
Accessories Misc Allowance		LS	1.0	2,500.00	$2,500.00	0.5	2,500.00	$1,250.00
General Floor Patching Allowance		GSF	3709.0	1.05	$3,894.45	2114.0	1.05	$2,219.70
Wood								
Blocking Toilet Accessories		EA	12.0	92.00	$1,104.00			
Blocking Total Building		GSF	3709.0	1.18	$4,376.62	2114.0	1.18	$2,494.52
Wall Cap Short Wall - Restroom		LF	25.0	22.83	$570.75			
Construct Raised Dance Floor and Ramp		SF	292.0	7.35	$2,146.20	292.0	7.35	$2,146.20
Thermal & Moisture Protection								
Sealant Total Interior		SF	3709.0	1.30	$4,821.70	2114.0	1.30	$2,748.20
Doors & Windows								
Single Type Frame, Slab		EA	15.0	596.72	$8,950.80	7.0	596.72	$4,177.04
Door		EA	15.0	539.01	$8,085.15	7.0	539.01	$3,773.07
Hardware		EA	15.0	710.46	$10,656.90	7.0	710.46	$4,973.22
Door Glazing Sheet Glass		SF	66.0	41.48	$2,737.68	66.0	41.48	$2,737.68
Transaction Window		SF	25.0	51.00	$1,275.00	25.0	51.00	$1,275.00
Plumbing Access Door		EA	4.0	228.66	$914.64			
Finishes								
GWB on 3-5/8 Studs 5/8" Abuse		SF	8453.0	13.45	$113,692.98	2040.0	13.45	$27,438.00
GWB on 6" Studs 5/8" Abuse		SF	3202.0	16.71	$53,505.42			
GWB Ceiling Moisture		SF	736.0	9.92	$7,301.12			
Marble Thresholds		LF	15.0	24.24	$363.60			
Porcelain Wall Tile		SF	2022.5	17.24	$34,867.90			
Glass Tile Accent		SF	191.0	19.81	$3,783.71			
Porcelain Floor		SF	694.0	17.24	$11,964.56			
Porcelain Base		LF	216.0	17.23	$3,721.68			
Moisture Resistant Membrane 1/16"		SF	694.0	5.94	$4,122.36			
2x2 grid and tile		SF	1887.0	6.24	$11,774.88	1887.0	6.24	$11,774.88
FRP Wall Panels and Trim		SF	32.0	15.71	$502.72			
VCT Flooring		SF	900.0	3.69	$3,321.00	900.0	3.64	$3,276.00
Wall Base 4"		LF	741.8	2.68	$1,988.02	741.8	2.68	$1,988.02
LVT Flooring		SF	129.0	7.38	$952.02	129.0	7.38	$952.02
Carpet Tile		SF	1576.8	6.26	$9,870.77	1576.0	6.26	$9,865.76
Match Ex. Dance Floor Finish Allowance		SF	232.0	18.10	$4,199.20	232.0	18.10	$4,199.20
Interior Paint		GSF	3709.0	3.93	$14,576.37	2114.0	3.93	$8,308.02
Exterior Paint		GSF	3709.0	3.93	$14,576.37			
Concrete Sealer		SF	44.0	2.34	$102.96	44.0	2.34	$102.96
Wall Patching Allowance		GSF	3709.0	0.45	$1,669.05	2114.0	0.45	$951.30
Specialties								
Grab bars - Set		EA	5.0	241.92	$1,209.60			
Soap Dispenser Surface Mount		EA	11.0	91.69	$1,008.59			
TP Dispenser Recessed		EA	11.0	253.39	$2,787.29			
Disposal Feminine Napkin		EA	4.0	126.46	$505.84			
PT Dispenser Multi-Fold		EA	5.0	257.25	$1,286.25			
PT Dispenser w/ Waste		EA	5.0	711.29	$3,556.45			
Baby Changing Station		EA	1.0	448.37	$448.37			
Coat Hook		EA	11.0	35.00	$385.00			
Mirrors 24" x 36"		EA	3.0	170.22	$510.66			
Interior Door/Hall Signage		EA	15.0	180.00	$2,700.00	15.0	180.00	$2,700.00
Partitions		EA	6.0	1,489.27	$8,935.62			
Partitions ADA		EA	2.0	1,745.79	$3,491.58			
Furnishings								
Counter Top SS 4"		LF	9.5	89.32	$848.54			
Base Cabinet PLAM		LF	9.5	325.83	$3,095.39	9.5	325.83	$3,095.39
Vanities - SS Top w Lav Bowl		SF	74.9	99.12	$7,419.13			

Fire Protection								
FP inc Jockey Pump and Controller		SF	3709.0	5.00	$18,545.00	2114.0	5.00	$10,570.00
Plumbing								
Demolition Crew		SF	3709.0	1.34	$4,970.06			
Water Closets AS Afwall		EA	11.0	1,713.70	$18,850.70			
Lavatory Counter Mounted		EA	8.0	956.74	$7,653.92			
Lavatory Wall Mounted		EA	3.0	1,040.84	$3,122.52			
Bottle Filler Elkay		EA	1.0	3,524.10	$3,524.10			
Floor Drain		EA	5.0	469.55	$2,347.75			
Clean-Out Cast Iron w Brass		EA	1.0	122.64	$122.64			
Loose Key Hose Bibb 3/4"		EA	2.0	143.92	$287.84			
Tempering Valve 1/2"		EA	11.0	169.32	$1,862.52			
Pipe, Copper 1/2"		LF	150.0	33.38	$5,007.00			
Pipe, Copper 3/4"		LF	15.0	37.26	$558.90			
Pipe, Copper 1"		LF	135.0	45.88	$6,193.80			
Pipe, Copper 1 1/2"		LF	80.0	63.99	$5,119.20			
Pipe, Copper 2"		LF	150.0	77.74	$11,661.00			
Domestic Water Tie in		EA	2.0	144.04	$288.08			
Sanitary Piping					$0.00			
Pipe w/Fittings 2" x 10'		LF	20.0	71.42	$1,428.40			
Pipe w/Fittings 3" x 10'		LF	55.0	87.01	$4,785.55			
Pipe w/Fittings 4" x 10'		LF	160.0	98.65	$15,784.00			
Excavation		LF	208.8	30.00	$6,264.00			
Spoils Removal		LF	52.2	30.00	$1,566.00			
Select Fill		LF	52.2	30.00	$1,566.00			
Above Grade Piping					$0.00			
Pipe w/Fittings no hub 1 1/2" - 2"		LF	300.0	67.48	$20,244.00			
Floor Mounted Water Closet Flanges and J Bolts		EA	11.0		$0.00			
Carrier Lav Josam 17100		EA	3.0	225.00	$675.00			
Tie Into Existing		EA	6.0	144.04	$864.24			
Plumbing Insulation					$0.00			
1/2" Pipe 1" Thick		LF	187.5	9.20	$1,725.00			
3/4" Pipe 1" Thick		LF	18.0	9.66	$173.88			
1" Pipe 1" Thick		LF	162.0	10.89	$1,764.18			
1 1/2" Pipe 1" Thick		LF	92.0	11.95	$1,099.40			
2" Pipe 1" Thick		LF	172.5	14.35	$2,475.38			
Testing & Marking/Clean/Chlor		GSL	3709.0	1.50	$5,563.50			
GC/Cx/Warranties		GSF	3709.0	1.50	$5,563.50			
Mechanical					$0.00			$0.00
Demolition Crew		GSF	3709.0	2.00	$7,418.00	3709.0	2.00	$7,418.00
HVAC Equipment RTU-2		EA	1.0	62,855.00	$62,855.00	1.0	62,855.00	$62,855.00
EF-6 Cabinet Fan		EA	1.0	2,170.39	$2,170.39			
EF-7,8,9 Ceiling Exhaust Fan		EA	3.0	556.12	$1,668.36			
Sheet Metal								
Ductwork Rec. L/M Pressure		LB	1075.0	12.00	$12,900.00	1075.0	12.00	$12,900.00
Ductwork Round L/M Pressure		LB	1040.0	12.00	$12,480.00	1040.0	12.00	$12,480.00
Ductwork Hangers Access		LB	126.9	12.00	$1,522.80	126.9	12.00	$1,522.80
Flex Duct Including Insulation		LF	45.0	5.72	$257.40	45.0	5.72	$257.40
Spin-in w/ Damper		EA	9.0	23.68	$213.12	9.0	23.68	$213.12
Equipment Flex Conn		LF	8.0	11.62	$92.96	8.0	11.62	$92.96
Supply Diffuser 24" x 24"		EA	9.0	199.78	$1,798.02	9.0	199.78	$1,798.02
Return Air 24"		EA	2.0	199.78	$399.56	2.0	199.78	$399.56
Return/Exhaust Register		EA	4.0	199.78	$799.12			
Louver, Greenheck Product		EA	4.0	784.34	$3,137.36	4.0	784.34	$3,137.36
Backdraft Damper		EA	1.0	199.78	$199.78	1.0	199.78	$199.78
Drive Motor for Dampers		EA	1.0	419.00	$419.00	1.0	419.00	$419.00
T&B Fees / Cut / Patch / Fire		GSF	3709.0	4.50	$16,690.50	2114.0	4.50	$9,513.00
Controls		GSF	3709.0	8.00	$29,672.00	2114.0	8.00	$16,912.00
Electrical								$0.00
Electrical Demolition		LS	1.0	14,695.00	$14,695.00	0.5	14,695.00	$7,347.50
SPD Added to Existing Panels		EA	2.0	951.41	$1,902.82	2.0	951.41	$1,902.82
Receptacle GFI		EA	8.0	99.43	$795.44			
Receptacle Duplex		EA	2.0	87.21	$174.42	2.0	87.21	$174.42

Plug-Load Control Duplex Receptacle Outlet, Watt Stopper		EA	6.0	94.97	$569.82	6.0	94.97	$569.82
Junction Box w/ Power		EA	4.0	161.18	$644.72	4.0	161.18	$644.72
Modular Furn. Power Column inc. Outlets, TV/Data/ etc.		EA	2.0	391.42	$782.84	2.0	391.42	$782.84
Disconnect Toggle Motor Rated 20A @ EF's/ Light Equip		EA	4.0	251.11	$1,004.44	4.0	251.11	$1,004.44
Motor/Equip Connections w/ Flex Equip		EA	4.0	265.14	$1,060.56	4.0	265.14	$1,060.56
PVC Sch 40 Conduit 1" through 1-1/4" to Floor Boxes		LF	5.6	5.64	$31.81	5.6	5.64	$31.58
EMT Conduit 3/4"		LF	580.0	12.62	$7,319.60	580.0	12.62	$7,319.60
#12 Wire 600 V THWN/THHN		LF	2719.2	0.85	$2,311.32	2719.2	0.85	$2,311.32
Junction Box 4" x 4"		EA	4.0	161.18	$644.72	4.0	161.18	$644.72
Utility Box w/ Mud Ring 4" x 4"		EA	11.0	28.56	$314.16	11.0	28.56	$314.16
Cast in Place w/ Floor Box		EA	2.0	236.36	$472.72	2.0	236.36	$472.72
Poke Thru Box for Modular Furn		EA	2.0	1,464.45	$2,928.90	2.0	1,464.45	$2,928.90
Light Type A		EA	6.0	334.05	$2,004.30	6.0	334.05	$2,004.30
Light Type B		EA	27.0	590.57	$15,945.39	27.0	590.57	$15,945.39
Light Type D		EA	4.0	475.42	$1,901.68	4.0	475.42	$1,901.68
Light Type H 2'		EA	6.0	398.18	$2,389.08			
Light Type H 4'		EA	14.0	590.57	$8,267.98			
Light Type H 6'		EA	7.0	879.15	$6,154.05			
Light Type I 4'		EA	2.0	349.44	$698.88			
Back Up Battery Iota I-42-EM-A Emergency Battery 90 min		EA	18.0	121.71	$2,190.78	9.0	121.71	$1,095.39
Emergency Exit Wall/Clng Mnt		EA	1.0	308.40	$308.40	1.0	308.40	$308.40
Ceiling Mount Occupancy Sensor		EA	15.0	226.37	$3,395.55	10.0	226.37	$2,263.70
Wattstopper Power Back BZ-150		EA	3.0	132.60	$397.80	3.0	132.60	$397.80
D Wattstopper, Dimming Sensor w Dual Detection Occupancy		EA	6.0	160.90	$965.40	6.0	160.90	$965.40
Wattstopper LMRC-102 Digital Lighting Mgmt Relay Room		EA	6.0	359.74	$2,158.44	6.0	359.74	$2,158.44
EMT Conduit 3/4"		LF	525.0	9.68	$5,082.00	525.0	9.68	$5,082.00
#12 Wire 600 V THWN/THHN		LF	2178.8	0.85	$1,851.94	2178.8	0.85	$1,851.98
EMT Conduit 3/4"		LF	1114.0	9.68	$10,783.52	1114.0	9.68	$10,783.52
#12 Wire 600 V THWN/THHN		LF	3843.3	0.85	$3,266.81	3843.0	0.85	$3,266.55
Cat Cable		LF	2800.0	1.14	$3,192.00	2800.0	1.14	$3,192.00
Cat Terminations		EA	70.0	6.61	$462.70	70.0	6.61	$462.70
Junction Box 4" x 4"		EA	4.0	161.18	$644.72	4.0	161.18	$644.72
Utility Box w/ Mud Ring 4" x 4"		EA	35.0	28.56	$999.60	35.0	28.56	$999.60
Communications								
Wire and Cable Management		SF	3709.0	2.23	$8,271.07	3709.0	2.23	$8,271.07
EMT Conduit		LF	60.0	15.56	$933.60	60.0	15.56	$933.60
Utility Box w/ Mud Ring 4" x 4"		EA	6.0	51.64	$309.84	6.0	51.64	$309.84
Tele - Data Outlet		EA	6.0	89.13	$534.78	6.0	89.13	$534.78
CCTV - Allowance		SF	3709.0	1.75	$6,490.75	3709.0	1.75	$6,490.75
Safety & Security								$0.00
Security System		SF	3709.0	4.18	$15,503.62	3709.0	4.18	$15,503.62
Fire Alarm System		SF	3709.0	2.58	$9,569.22	3709.0	2.58	$9,569.22
Subtotal					**$961,022**			**$420,510**
Markup Factor (%)	**25.10%**				**$241,217**			**$105,548**
Total					**$1,202,239**			**$526,058**
TOTAL (ROUNDED)					**$1,202,000**			**$526,000**
							Net Cost Avoidance*	**$676,000**

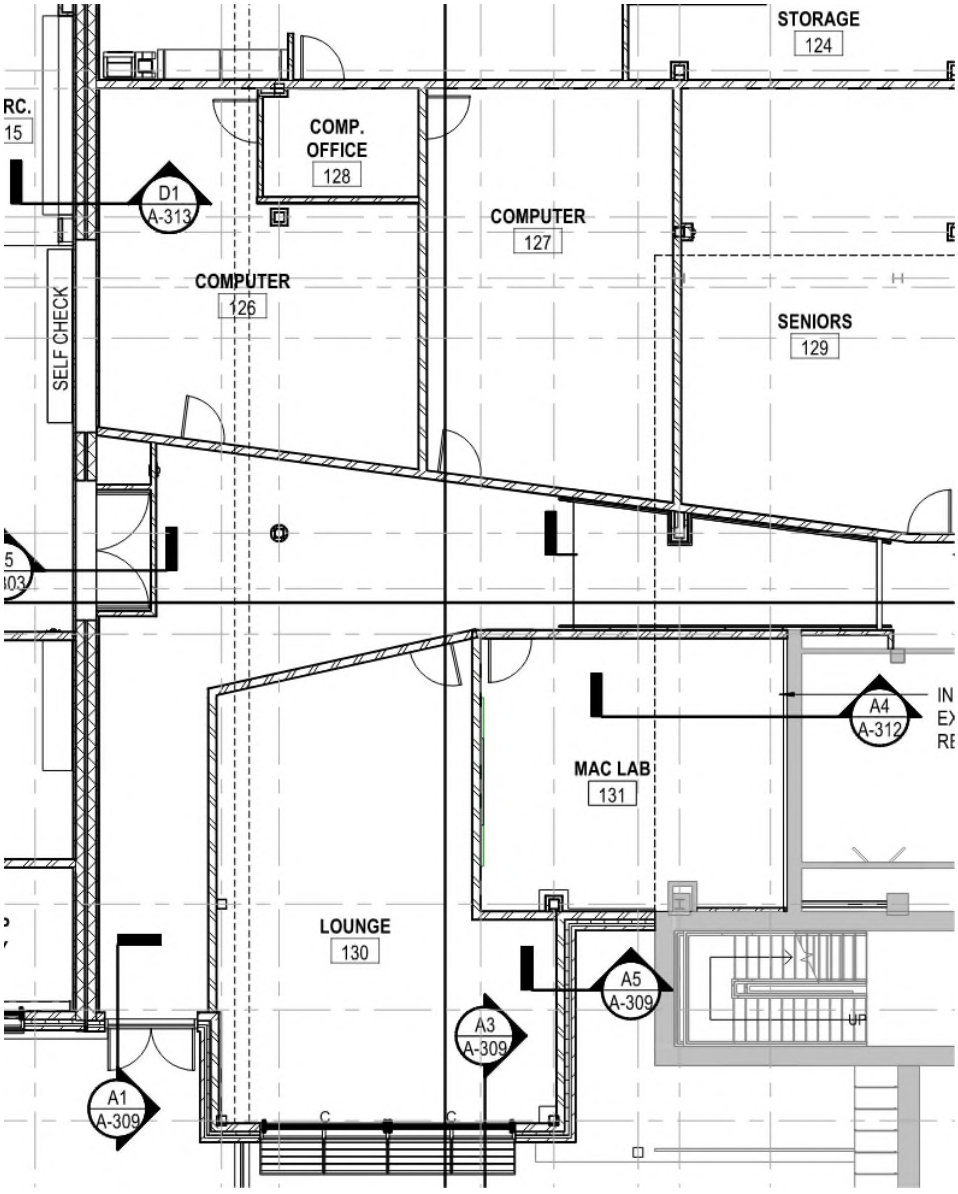
*: Negative number is a cost INCREASE

VE PROPOSAL PH-3

DO NOT BUILD OUT COMPUTER, SENIOR, LOUNGE, AND MAC ROOMS AND MAKE THESE AREAS A CONSTRUCTION CONTRACT ADD ALTERNATE

Alternative Summary	
Total Potential Cost Avoidance:	$ 141,000
Change in Schedule:	No Change

1. **Description of Baseline Concept:** The baseline concept provides new construction and build-out of Computer Rooms, Senior Room, Lounge and Mac Room (Rooms 126, 127, 128, 129, 130, 131).



2. **Description of Alternative Concept:** Leave the Computer Rooms, Senior Room, Lounge and Mac Room as shell space. Do not construct interior walls, finishes, electric, and data system. Make this work an Add Alternate in the construction contract.

3. **Advantages:**

VE PROPOSAL PH-3

DO NOT BUILD OUT COMPUTER, SENIOR, LOUNGE, AND MAC ROOMS AND MAKE THESE AREAS A CONSTRUCTION CONTRACT ADD ALTERNATE

- Cost savings – Add back into project if budget allows
- Prevent base bids from exceeding the budget

4. **Disadvantages:**
   - Budget may not allow finishes
   - Could add future costs to complete as temporary sprinkler heads, fire alarm, and light fixtures will be needed for permitting

5. **Discussion:** In order to prevent base bids from exceeding the budget, leave the Computer Rooms, Senior Room, Lounge, and Mach Room (Rooms 126, 127, 128, 129, 130, & 131) as shell space. Do not provide interior walls, finishes, electric and data systems. Continue to provide sprinkler, fire alarm, and HVAC systems. The corridor remains fully built-out. If this work is not chosen as an add alternate, temporary provisions for fire alarm, sprinkler heads, and lighting will be required for the permit. The cost of the temporary items will be lost when the space build-out is complete.

6. **Discussion of Schedule Impacts:** No negative impact on construction schedule. Schedule may be slightly reduced.
7. **Discussion of Risk Impacts:** None identified.

8. **Discussion of Operating Impacts:** None anticipated.

9. **Assumptions driving Cost Calculations:**
   - Shell space will be allowed for permits with minimal temporary systems.

VE PROPOSAL PH-3

DO NOT BUILD OUT COMPUTER, SENIOR, LOUNGE, AND MAC ROOMS AND MAKE THESE AREAS A CONSTRUCTION CONTRACT ADD ALTERNATE

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Doors & Windows								
Single Type Frame, Slab		EA	2.0	596.72	$1,193.44			
Door		EA	2.0	539.01	$1,078.02			
Hardware		EA	2.0	710.46	$1,420.92			
Door Glazing Sheet Glass		SF	12.0	41.48	$497.76			
Finishes								
GWB on 3-5/8 Studs 5/8" Abuse		SF	790.0	13.45	$10,625.50			
2x2 grid and tile		SF	2730.0	6.24	$17,035.20			
VCT Flooring		SF	1470.0	3.69	$5,424.30			
Wall Base 4"		LF	450.0	2.68	$1,206.00			
Carpet Tile		SF	1250.0	6.26	$7,825.00			
Interior Paint		GSF	2730.0	3.93	$10,728.90			
Electrical								
Receptacle Duplex		EA	34.0	87.21	$2,965.14			
Plug-Load Control Duplex Receptacle Outlet, Watt Stopper		EA	5.0	94.97	$474.85			
Junction Box w/ Power		EA	34.0	161.18	$5,480.12			
Junction Box 4" x 4"		EA	22.0	161.18	$3,545.96			
Light Type A		EA	25.0	334.05	$8,351.25			
Light Type B		EA	29.0	590.57	$17,126.53			
Ceiling Mount Occupancy Sensor		EA	15.0	226.37	$3,395.55			
Wattstopper Power Back BZ-150		EA	5.0	132.60	$663.00			
D Wattstopper, Dimming Sensor w Dual Detection Occupancy		EA	5.0	160.90	$804.50			
Wattstopper LMRC-102 Digital Lighting Mgmt Relay Room		EA	5.0	359.74	$1,798.70			
Communications								
Wire and Cable Management		SF	2730.0	2.23	$6,087.90			
CCTV - Allowance		SF	2730.0	1.75	$4,777.50			
Subtotal					**$112,506**			**$0**
Markup Factor (%)	**25.10%**				**$28,239**			**$0**
Total					**$140,745**			**$0**
TOTAL (ROUNDED)					**$141,000**			**$0**
							Net Cost Avoidance*	**$141,000**

*: Negative number is a cost INCREASE

VE PROPOSAL PH-4

DO NOT BUILD STAND-ALONE CANOPY

Alternative Summary	
Total Potential Cost Avoidance:	$48,000
Change in Schedule:	No impact to schedule

1. **Description of Baseline Concept:** The design documents indicate that a stand-alone canopy will be built at the north entrance.

2. **Description of Alternative Concept:** Do not build the stand-alone canopy.

3. **Advantages:**
   - Saves cost
   - Eliminates need to cut into existing façade
   - Eliminates need to cut into existing concrete

4. **Disadvantages:**
   - Reduces shelter area
   - Reduces aesthetics
   - Removes focal point at door

5. **Discussion:** Deleting the canopy reduces the project cost. However, it will reduce the amount of area for shelter. It also removes the focal point from the door.

6. **Discussion of Schedule Impacts:** No impact to the schedule.

7. **Discussion of Risk Impacts:** N/A

8. **Discussion of Operating Impacts:** N/A

9. **Assumptions driving Cost Calculations:** N/A

COST EVALUATION

Construction Item (Contract Costs)			Original Estimate			Alternative Estimate		
Project Item		**Units**	**Qty**	**Unit $**	**Total**	**Qty**	**Unit $**	**Total**
Canopy: Roofing, Soffit, Fascia, Insulation & Framing		SF	322	86.35	$27,834.92			
Column Footings		EA	2	4,877.29	$9,754.58			
Demo at Concrete & Building		LS	1	1,000.00	$1,000.00			
Subtotal					**$38,590**			
Markup Factor (%)	**25.10%**				**$9,686**			
Total					**$48,275**			
TOTAL (ROUNDED)					**$48,000**			
						Net Cost Avoidance*		**$48,000**

*: Negative number is a cost INCREASE

Exhibit B: Summary of Value Engineering Options

SUMMARY OF VALUE ENGINEERING PROPOSALS

PROJECT:	TAKOMA PARK MARYLAND LIBRARY REPLACEMENT									
	City of Takoma Park	PRESENT WORTH OF COST SAVINGS				IMPLEMENTATION				
ALT.		ORIGINAL	ALTERNATIVE	INITIAL COST	NET	A/E RECOMMEND?				
NO.	DESCRIPTION	COST	COST	SAVINGS	SAVINGS	DESIGN TEAM COMMENTS	YES OR NO	COST TO REDESIGN	PERMIT RESUBMITT	PERMIT TIME?
HVAC & CONTROLS										
HV-1	Use a variable refregerant flow system in lieu of variable air flow handling system for heating and cooling the building and reduce the building envelope insulation	$1,171,000	$1,095,000	$76,000	$46,000	If envelope is reduced the capacity of the HVAC system may go up and therefore energy usage as well. We didn't understand this suggestion. Cassette units would clutter up the ceiling plane. Ductwork savings may not be accurate. Maint. Cost of VRV is more complicated and would require a service contract.	NO	$ 30,000.00	Yes	1-2 Months
HV-2	Install a geothermal system utilizing a variable refrigerant flow system in lieu of a variable air handling system for heating and cooling the building	$1,171,000	$1,320,000	($149,000)	($209,000)	Parking lot would need to be repaved. This cost is not included. LOD is increasing so SWM requirements will increase. Unsure if there is enough space for the wells. Many other underground utilities to contend with. Can geothermal be located in the flood plane? Geothermal with VRF requires advanced controls - cost not included. Need floor area for pump room and water treatment. Cost of test well. Study says 20 wells at 500 feet deep.	NO	$ 60,000.00	Yes, Would return the project to SWM concept level	1-2 Months
HV-3/HV-4	Reduce the number of VAV/SFB boxes in the adult and children sections	$151,000	$104,000	$47,000	$42,000	Number of boxes provides greater # of zones which increases thermal comfort - LEED. Ductwork is not necessarily reduced. Boxes were kept at a small size for noise reasons. Larger boxes = more noise. No consideration of ductwork costs in the VE cost estimate.	NO	$ 5,000.00	Yes	1-2 Months
CREATE ENVIRONMENT										
CE-1	Use a skylight in lieu of a clerestory	$86,000	$36,000	$50,000	$35,000	Study proposes using 4 barrel vault skylights in lieu of the clerestory. We could also use a cluster of solatubes and get natural light into the space. Skylights more prone to leaks over time.	YES	$9,000 GPI $6,000 RRMM	Yes	1-2 Months
CE-4	Eliminate curtainwall sunshade	$114,000	$0	$114,000		Study says to eliminate the curtainwall sunshade but leave the large roof overhang. What affect does this have on heat gain and energy use? This wall faces south so needs treatment. What does this do to the energy model.	NO	$2000 run model with and without sunshade to determine effect	Yes	1 Month
CE-5	Eliminate motorized sunshades and tint windows	$83,000	$32,000	$51,000	$47,000	Suggests removing the sunshades and adding window tinting. Will this work? Souther sun can be uncomfortable even through a tinted window. Operation and aesthetics is an issue. Can the effect on energy be modeled? Tinting is always there. Shades don't always get put down. Loss of control.	MAYBE	$4000 Cost to examine via energy model	Yes	1 Month
CE-7	Revise exterior wall at office and conference room (Rooms 117/118/119)	$38,000	$9,000	$29,000	$12,500	Study suggests deleting the upper two rows of glass as well as deleting the sunshade. I would support this change as it would still get natural light into the areas and the sunshade is mostly decoration at this location because the windows are north facing	YES	$1,500 GPI $1,500 RRMM	Yes	1-2 Months
CE-8	Revise exterior wall at lounge area (Room 130)	$21,000	$5,000	$16,000	$13,000	Study suggests deleting the upper row of glass and the sunshade. Im fine with this as the upper row of glass is all spandrel anyway.	YES	$1,500 GPI $1,500 RRMM	Yes	1-2 Months

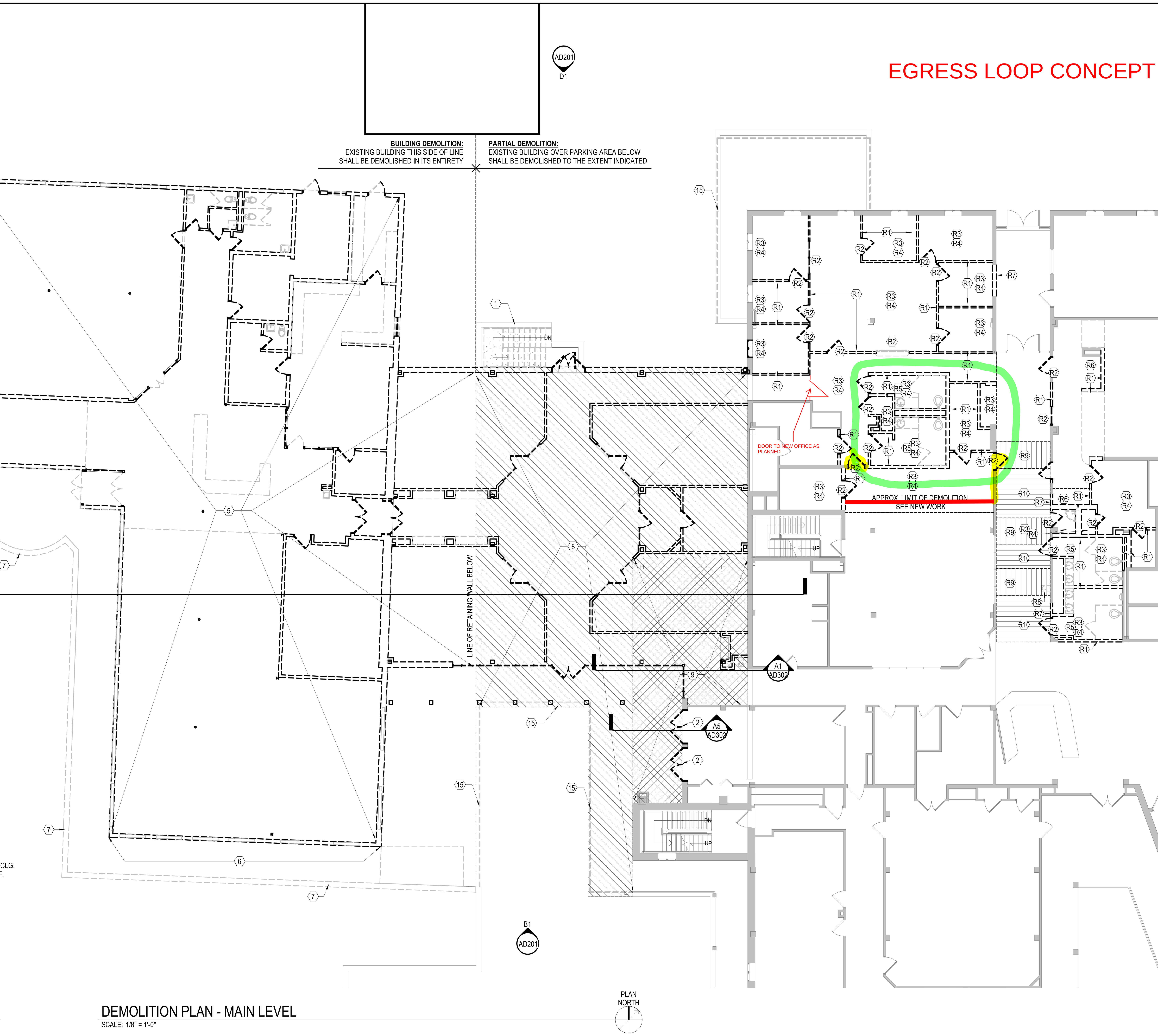
SUMMARY OF VALUE ENGINEERING PROPOSALS

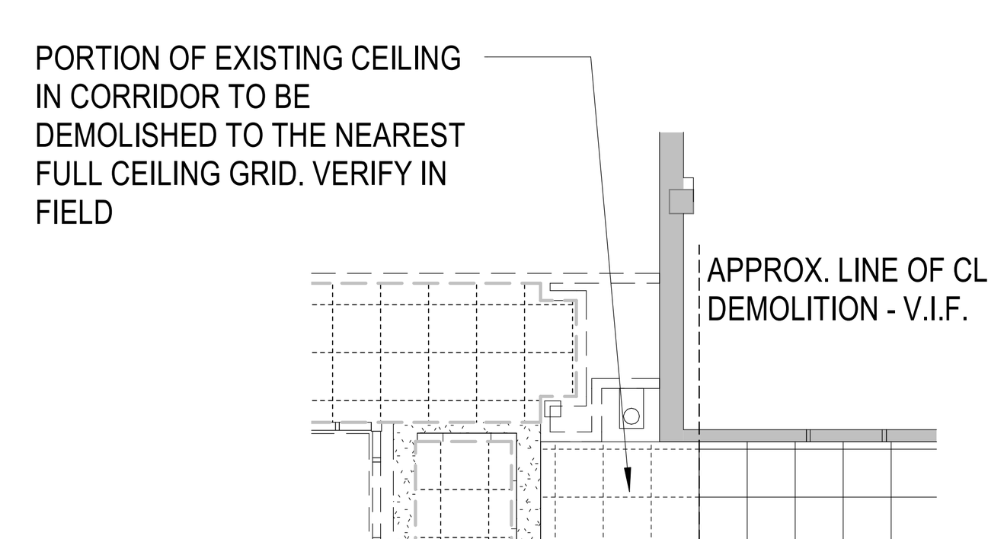
PROJECT:	**TAKOMA PARK MARYLAND LIBRARY REPLACEMENT**									
	City of Takoma Park	PRESENT WORTH OF COST SAVINGS				IMPLEMENTATION				
ALT.		ORIGINAL	ALTERNATIVE	INITIAL COST	NET	A/E RECOMMEND?				
NO.	DESCRIPTION	COST	COST	SAVINGS	SAVINGS	DESIGN TEAM COMMENTS	YES OR NO	COST TO REDESIGN	PERMIT RESUBMITT	PERMIT TIME?
CE-10	Attach a concrete corbel to the existing foundation wall to support the new firewall in lieu of extendting the masonry down to the existing low level footing	$44,000	$14,000	$30,000		The referenced section where the existing and new walls are adjacent and parallel is only 10 feet long. The wall is lightly reinforced as a basement wall and not a retaining wall. Installing a corbel as suggested will create moment and shear forces within the wall for which it was not designed. In particular, the location where the firewalls turn perpendicular to the existing basement wall would create particularly high point loading on the wall and its foundation. Savings in excavation is limited as the difference in height between the existing	NO	$ -	Yes	1-2 Months
CE-11	Use manually operated interior shades in lieu of motorized shades	$83,000	$32,000	$51,000	$50,000	Fine with me. This is a value judgement by the library. What affect does it have on energy use?	YES	$ 1,000.00	Yes	1 Month
Total Net Savings (Staff					**$110,500**					

SUMMARY OF VALUE ENGINEERING PROPOSALS

PROJECT:	**TAKOMA PARK MARYLAND LIBRARY REPLACEMENT**									
	City of Takoma Park	PRESENT WORTH OF COST SAVINGS				IMPLEMENTATION				
ALT.		ORIGINAL	ALTERNATIVE	INITIAL COST	NET	A/E RECOMMEND?				
NO.	DESCRIPTION	COST	COST	SAVINGS	SAVINGS	DESIGN TEAM COMMENTS	YES OR NO	COST TO REDESIGN	PERMIT RESUBMITT	PERMIT TIME?
UTILITIES										
U-2	Insert a sleeve between the 8-inch sanitary sewer and 24-inch storm sewer to accept the new water line in lieu of digging a deep hole to run the water line under the sanitary sewer line	DESIGN SUGGESTION				WSSC will not allow this. They require 18" for sewer and 12" for storm. Pipe between will not satisfy this	NO	$ -	Yes	6 Months
DEMOLITION										
D-1	Have solar panel vendor remove and reinstall panels in lieu of the contractor	DESIGN SUGGESTION				We should do this and change the notes to make it clear. Just moving money from one pot to another. May have a monthly storage fee.	YES	$ -	No	0 Months
Total Net Savings					**$0**					
ELECTRICAL										
E-3	Use a normal lighting system in lieu of digital lighting	$27,000	$20,000	$7,000		Digital lighting controller is required for LEED credit for Demand Response. Also affects Lighting Control LEED credit. Doesn't take into account life cycle cost for energy savings	NO	$ 1,700.00	Yes	1 Month
PHASING										
PH-1	Retain the Recreation Area as is and make it a construction contract Add Alternate	$1,202,000	$4,000	$1,198,000	$1,178,000	Value judgement by the Library / City. Dead end corridor issue can be solved by creating a loop as discussed with Brandon. Real $ is in bathrooms. Doesn't have any effect on energy. Eliminates gender neutral restrooms.	MAYBE - DECISION BY LIBRARY / CITY	$ 20,000.00	Yes	3-4 Months
PH-2	Retain the Recreation Area as is except for the office areas and include in the construction contract as an Add Alternate	$1,202,000	$526,000	$676,000	$666,000	This scheme the office area would be included in the base bid as designed but the restroom becomes an add alternate. In this case, we would have to determine if there is a way to maintain access the existing restrooms. Otherwise they may become inaccessible to the public which would affect fixture counts. Same comments as above.	MAYBE - DECISION BY LIBRARY / CITY	$ 10,000.00	Yes	3-4 Months
PH-3	Do not build out Computer, Senior, Lounge and MAC rooms and make these areas a construction contract Add Alternate	$141,000	$0	$141,000	$135,000	Shell space only. Value judgement by the library and the city. Can they live without these spaces	MAYBE - DECISION BY LIBRARY	$ 6,000.00	Yes	1-2 Months
PH-4	Do not build stand-alone canopy	$48,000	$0	$48,000	$46,000	Quite possible if they are OK with losing the shelter aspect of the canopy	MAYBE - DECISION BY LIBRARY / CITY	$ 2,000.00	Yes	1 Month

Exhibit C: Corridor Diagram





PARTIAL CEILING DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

DEMOLITION PLAN - MAIN LEVEL

SCALE: 1/8" = 1'-0"

DEMOLITION KEY NOTES (APPLIES TO ALL DEMOLITION SHEETS - NOT ALL TAGS ARE USED ON EVERY SHEET)

1. DEMOLISH AND LEGALLY DISPOSE OF EXISTING EXTERIOR STAIR, HANDRAILS, RETAINING WALL AND ALL ASSOCIATED ITEMS
2. DEMOLISH AND LEGALLY DISPOSE OF EXISTING HOLLOW METAL DOOR, FRAME AND ASSOCIATED HARDWARE
3. DEMOLISH AND LEGALLY DISPOSE OF PORTION OF EXISTING CONCRETE RETAINING WALL AS NECESSARY TO ALLOW FOR INSTALLATION OF NEW DOOR. REFER TO NEW WORK DRAWINGS FOR ADDITIONAL INFORMATION.
4. SAWCUT AND REMOVE PORTION OF EXISTING CONCRETE PARKING SURFACE TO THE EXTENT NECESSARY FOR INSTALLATION OF NEW COLUMN AND FOUNDATION. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
5. DEMOLISH AND DISPOSE OF EXISTING LIBRARY STRUCTURE IN ITS ENTIRETY INCLUDING ALL FINISHES, DOORS, WINDOWS, FOOTERS AND STRUCTURAL ITEMS ETC.
6. EXISTING MOSAIC MURAL TO BE CAREFULLY REMOVED, STORED AND PROTECTED FOR THE DURATION OF CONSTRUCTION. REFER TO NEW WORK DRAWINGS FOR LOCATION OF NEW INSTALLATION.
7. DEMOLISH AND LEGALLY DISPOSE OF EXISTING CONCRETE FLOOD WALL
8. EXISTING POST-TENSIONED CONCRETE FLOOR SLAB TO REMAIN THIS AREA. ALL OTHER ITEMS INCLUDING WALLS, DOORS, WINDOWS, RAILINGS, FINISHES ETC. SHALL BE DEMOLISHED AND LEGALLY DISPOSED OF. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION
9. ALL DEMOLITION WORK THIS AREA SHALL BE FROM TOP OF POST-TENSIONED CONCRETE FLOOR SLAB TO UNDERSIDE OF EXISTING STRUCTURE ABOVE TO REMAIN. ALL ITEMS TO BE DEMOLISHED PER KEY NOTE 8.
10. DEMOLISH AND DISPOSE OF EXISTING ROOF ASSEMBLY AND STRUCTURE TO THE EXTENTS INDICATED.
11. EXISTING SOLAR PANELS SHALL BE CAREFULLY REMOVED AND STORED FOR THE DURATION OF CONSTRUCTION. TO BE REINSTALLED AFTER COMPLETION OF NEW WORK. COORDINATE WITH EXISTING SOLAR VENDOR.
12. EXISTING EXTERIOR WINDOWS TO BE REMOVED AND LEGALLY DISPOSED OF. WORK SHALL BE COORDINATED TO MINIMIZE DISRUPTION IN THE ADJACENT OFFICES.
13. EXISTING ROOFTOP MECHANICAL EQUIPMENT TO BE REMOVED AND LEGALLY DISPOSED OF. REFERE TO MECHANICAL DRAWINGS FOR ADDITIONAL INFO.
14. EXISTING BIKE RACKS (QTY. 4) TO BE CAREFULLY REMOVED AND SALVAGED FOR REINSTALLATION. CONTRACTOR SHALL STORE AND PROTECT BIKE RACKS FOR DURATION OF CONSTRUCTION. SEE NEW WORK DRAWINGS FOR ADDITIONAL INFORMATION.
15. DEMOLISH AND LEGALLY DISPOSE OF EXISTING HANDRAIL.

- R1 DEMOLISH AND LEGALLY DISPOSE OF EXISTING WALLS AS INDICATED INCLUDING ASSOCIATED FINISHES
- R2 DEMOLISH AND DISPOSE OF EXISTING INTERIOR DOOR / WINDOW INCLUDING FRAME AND ASSOCIATED HARDWARE.
- R3 DEMOLISH AND LEGALLY DISPOSE OF EXISTING FLOOR FINISH THIS AREA. PREP SUBSTRATE TO RECEIVE NEW FLOOR MATERIAL.
- R4 DEMOLISH AND LEGALLY DISPOSE OF EXISTING CEILING TO THE EXTENTS INDICATED. MODIFY EXISTING CEILING / GRID ASSEMBLY AS NECESSARY FOR PORTIONS TO REMAIN.
- R5 DEMOLISH AND LEGALLY DISPOSE OF ALL EXISTING RESTROOM ITEMS INCLUDING FIXTURES, PARTITIONS, ETC. REFER TO M.E.P. DRAWINGS FOR ADDITIONAL INFORMATION.
- R6 LIMITED FLOOR / CEILING MODIFICATION REQUIRED IN THIS AREA AS REQUIRED FOR COMPLETION OF NEW WORK.
- R7 DEMOLISH AND LEGALLY DISPOSE OF PORTION OF EXISTING WALL AS REQUIRED FOR INSTALLATION OF NEW DOOR / WINDOW. SEE NEW WORK DRAWINGS.
- R8 DEMOLISH AND LEGALLY DISPOSE OF EXISTING DRINKING FOUNTAIN.
- R9 DEMOLISH PORTION OF EXISTING FLOOR SLAB TO ACCOMMODATE NEW PIPING BELOW.
- R10 DEMOLISH AND DISPOSE OF EXISTING FLOOR FINISH. PREP SUBSTRATE TO RECEIVE NEW FINISH.

MARK	DATE	BY	DESCRIPTION

REVISIONS

DATE	06/04/2021
PROJECT	13326-02
DESIGNED	GSL
DRAWN	BH/RK
CHECKED	KDL

RRMM ARCHITECTS, PC
2900 South Quincy Street, Suite 710
Arlington, Virginia 22206
(703)998-0101

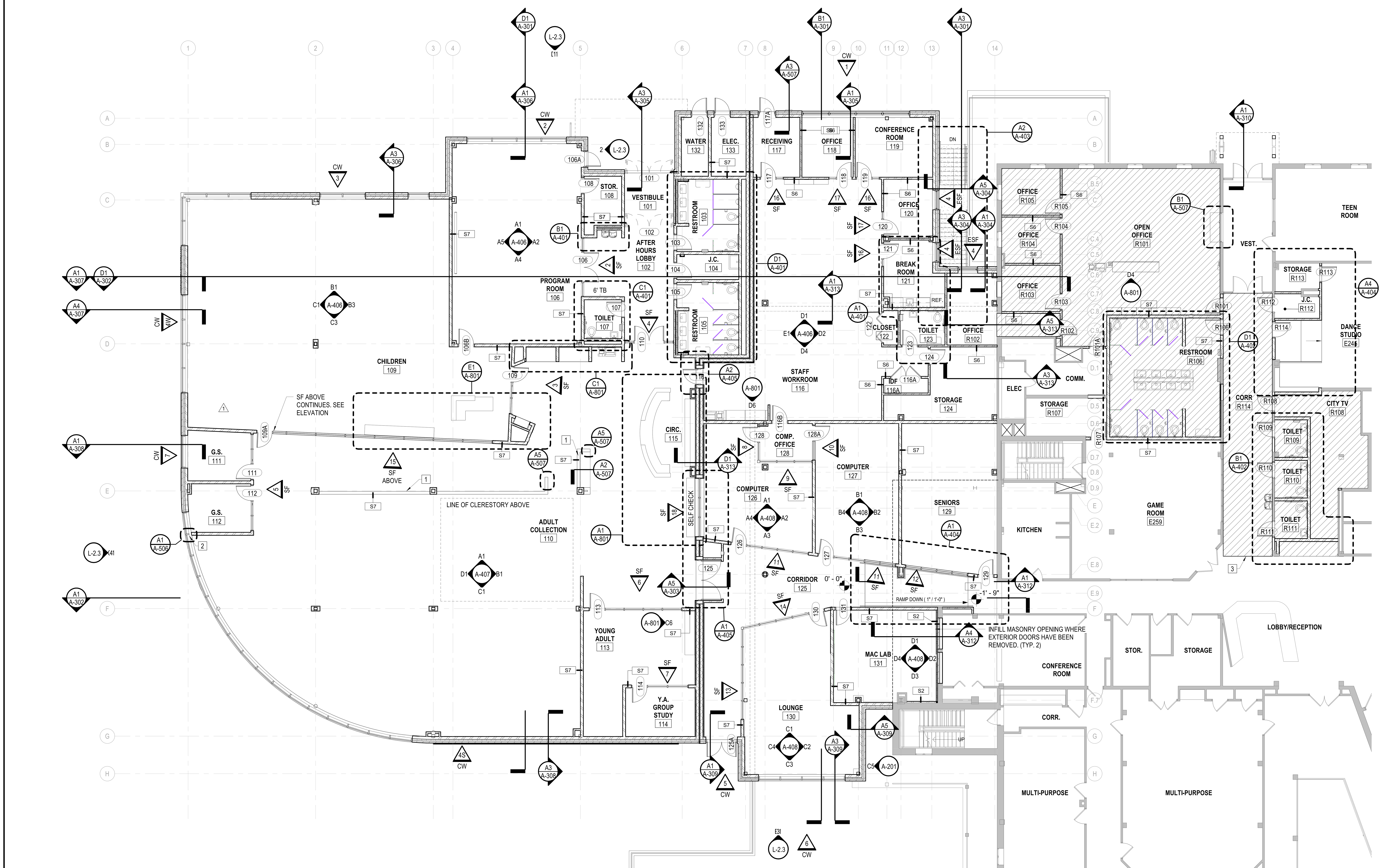
PROJECT: CITY OF TAKOMA PARK
TAKOMA PARK MARYLAND LIBRARY REPLACEMENT
101 PHILADELPHIA AVENUE, TAKOMA PARK, MD 20912

DRAWING: DEMOLITION PLAN - MAIN LEVEL

SHEET AD102

FLOOR PLAN KEYNOTES

1. PARTIAL HEIGHT WALL. REFER TO DETAIL A5 / A-507 FOR ADDITIONAL INFORMATION.
2. ALIGN FACE OF GWB WITH CW MULLION.
3. PATCH AND REPAIR CONCRETE SLAB AS REQUIRED. PREPARE SUBSTRATE TO RECEIVE NEW FLOORING AS RECOMMENDED BY FLOORING MANUFACTURER.



NEW WORK FLOOR PLAN - MAIN LEVEL

SCALE: 1/8" = 1'-0"

1	06/27/2021
	PERMIT COMMENTS 1
MARK	DATE
BY	DESCRIPTION

REVISIONS

DATE	06/04/2021
PROJECT	13326-02
DESIGNED	GSL
DRAWN	BH/RK
CHECKED	KDL

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PROJECT: CITY OF TAKOMA PARK
TAKOMA PARK MARYLAND LIBRARY REPLACEMENT
101 PHILADELPHIA AVENUE, TAKOMA PARK, MD 20912

DRAWING: FLOOR PLAN - MAIN LEVEL

SHEET: A-102

11/23/2021 6:38:12 PM BIM 360://13326-02 Takoma Park Replacement Library/13326-02 v20 TPL - ARCH.rvt

Exhibit D: Net Benefit Analysis

		3 Year Delay				5 Year Delay				7 year Delay			
Phasing Options	Original Cost Savings (Year 0)	Cost In Year 3	Cost Increase (from Year 0)	Year 0 Savings	Net Benefit	Cost In Year 5 (from Year 0)	Cost Increase	Year 0 Savings	Net Benefit	Cost in Year 7 (from Year 0)	Cost Increase	Year 0 Savings	Net Benefit
Phasing Option 1	$1,202,000	$ 1,431,601	$ 229,601	$ 1,178,000	$ (253,601)	$ 1,608,547	$ 406,547	$ 1,178,000	$ (430,547)	$ 1,807,364	$ 629,364	$ 1,178,000	$ (629,364)
Phasing Option 2	$676,000	$ 793,217	$ 127,217	$ 666,000	$ (127,217)	$ 891,258	$ 225,258	$ 666,000	$ (225,258)	$ 1,001,418	$ 335,418	$ 666,000	$ (335,418)
Phasing Option 3	$141,000	$ 167,933	$ 26,933	$ 135,000	$ (32,933)	$ 188,690	$ 47,690	$ 135,000	$ (53,690)	$ 212,012	$ 77,012	$ 135,000	$ (77,012)
Phasing Option 4	$48,000	$ 57,169	$ 9,169	$ 46,000	$ (11,169)	$ 64,235	$ 16,235	$ 46,000	$ (18,235)	$ 72,174	$ 26,174	$ 46,000	$ (26,174)