

Memo

To: Berlin City Council
From: Jim Wheeler, City Manager
Date: 6/14/2021
Re: Fire Department Upgrades

Attached is a report from ALBA Architects regarding contemplated work at the Fire Station. While you will be interested in the entire report, I'd like to spend some time specifically talking about the phasing and estimates on page 10 of 12 on Monday night.

PREFACE

In late 2020 and early 2021, the City of Berlin retained the services of HEB Engineers and Alba Architects to undertake a series of repairs and renovations to the existing Fire Department building, as well as a conceptual study of locating a new Vehicle Equipment Station adjacent to the existing Fire Department located at 263 Main Street, Berlin, New Hampshire.

The existing Fire Department is housed in the historic fire department building that is not well suited for the needs of modern fire department vehicles. Specifically, the structural floor system of the existing building is significantly undersized for the weight and forces applied of stationing equipment. In addition, roof replacement, window replacement, and boiler replacement are all needed.

With the partial demolition of the neighboring building consideration could be given to a new building located directly adjacent to the existing building, specifically designed for the stationing of vehicle equipment.

Conceptually this would assume the complete demolition of the remaining section of neighboring building to create a 'clean' site for development.

The new conceptual building is proposed to be a single story, slab on grade structure, specifically and solely used for the housing of fire department vehicles. All other fire department functions will remain in the existing neighboring facility. A new conditioned connection would be provided between the existing fire department and the new building to allow for ease of personnel movement between the two structures in inclement weather.

The intent of this feasibility report is to provide a conceptual building layout and associated estimate of probable construction costs to allow the City to make more informed decisions as to the continued functions maintained within the existing fire department.

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APPENDIX I Estimate of Probable Costs Breakdown

1.0 PROPOSED SCOPE OF WORKS TO EXISTING

1.1 PROPOSED SCOPE OF WORKS STRUCTURAL UPGRADES TO THE EXISTING FIRE DEPARTMENT

- Scope to include structural reinforcement of existing main level floor system that is inadequate for the fire department equipment stationed on it.
- Structural reinforcement will include a series of new dropped beams, posts, and footings below the existing floor system in the lower level / basement of the existing building.
- Proposed scope to include additional repairs to the existing floor finish.

1.2 PROPOSED SCOPE OF WORKS ROOF REPLACEMENT TO THE EXISTING FIRE DEPARTMENT

- Scope to include replacement of the bell tower roof, associated fascia and soffit, as well as the roof of the main fire department.
- Existing condition to bell tower is asphalt shingle with wood trims, replacement will be 'like for like'.
- Existing condition to main roof is a built-up flat roof with stone ballast, replacement will be new EPDM membrane, either full adhered or mechanically fastened, suitable for flat roof applications.
- Contractor will coordinate as necessary for any temporary removal of communication antennas.

1.3 PROPOSED SCOPE OF WORKS WINDOW REPLACEMENT TO THE EXISTING FIRE DEPARTMENT

- Scope to include replacement of all windows to existing fire department.
- Windows to be replaced with similar sized units based on existing masonry openings.
- The existing large openings to the single-story section of the building (to the left of the truck doors as viewed from Main Street) will be reconfigured to include a door opening.
- Bid documents will provide option for either replacement of windows to match current size (existing has some infill within the masonry opening), or to match dimensions of full masonry opening (more historically accurate).

1.4 PROPOSED SCOPE OF WORKS BOILER TO THE EXISTING FIRE DEPARTMENT

PROJECT UNDERSTANDING

- Scope to include replacement of existing steam heating system boiler that is antiquated.
- Replacement will be 'like for like' replacement.
- It is understood that a district heating system is under consideration by the City, however this is outside the scope of these works.

2.0 PROPOSED SCOPE OF WORKS FOR NEW VEHICLE EQUIPMENT STATION

2.1 ANTICIPATED BUILDING PROGRAM

Alba Architects, in consultation with the Berlin Fire Department, has established a building program that represents the current and future needs of fire department vehicle fleet.

Note, architectural programming is the research and decision-making process that identifies the scope of work to be designed into any given building. It does not represent any particular building style or configuration but does provide a benchmark from which conceptual design can be undertaken.

The estimated programmatic needs are based on the required and anticipated vehicle fleet, which are the minimum levels required to ensure successful operations, and the minimum space requirements to accommodate these vehicles.

space program

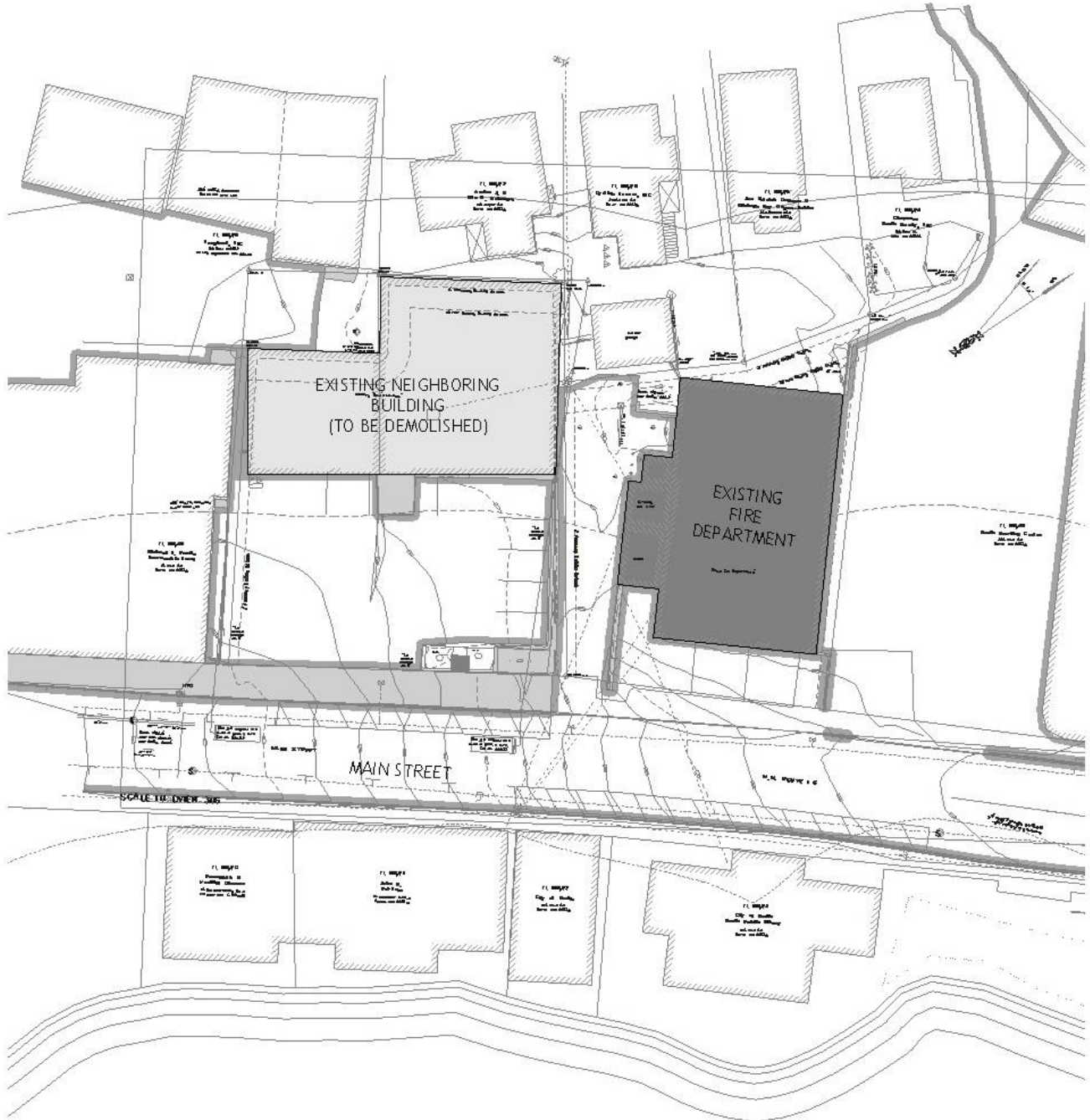
description	sq.ft. requirement
Vehicle Equipment Bays	
Engine 1 (12' x 39')	468
Tanker 1 (12' x 32')	384
Ladder 1 (12' x 52')	780
Engine 4 (12' x 39')	468
subtotal	2,100
Storage Functions	
Turnout Gear Storage	250
Hose Storage	200
Breathing Apparatus Storage	100
Vehicle Parts Storage	400
Miscellaneous Storage	200
subtotal	1,150
Ancillary Functions	
Connection to Existing	400
Maintenance / Custodial	200
Mechanical & Electrical	200
subtotal	800
sub-total program area	
	4,050
circulation and partitioning @ 30%	
	1,215
total building program	
	5,265
Exterior Amenities / Functions	
-	
subtotal	0

Add Alternate for 5th Vehicle Equipment Bay - add 900 sq.ft. to above totals

notes

1. Existing Equipment:
 - Engine 1 - GVRW: 48,500
 - Tanker 1 - GVRW: 35,000
 - Ladder 1 - GVRW: 64,000
 - Engine 4 - GVRW: 37,000
2. Future engines are likely to be replaced in similar size as Engine 1 and not Engine 4.
3. There is no anticipated large vehicles being added to the fleet in the future.

2.2 EXISTING SITE PLAN



Existing Survey by HEB Engineers

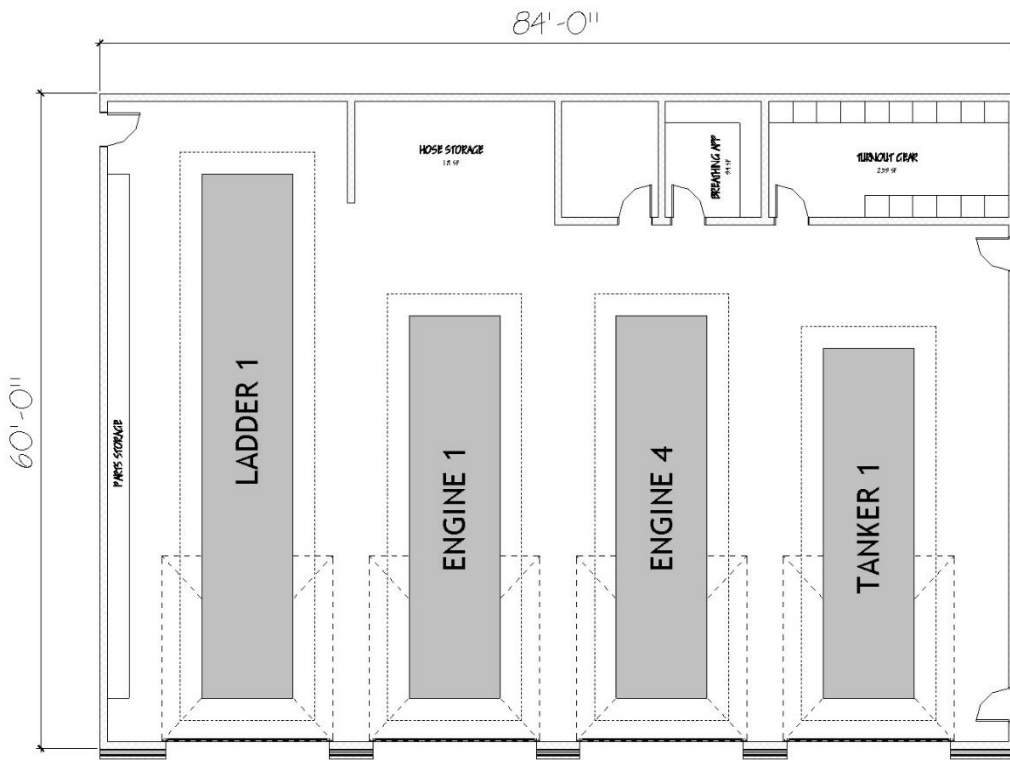
2.3 CONCEPTUAL SITE PLAN



2.4 CONCEPTUAL BUILDING



Conceptual Exterior Perspective



Conceptual Floor Plan

3.1 CONCEPT DEVELOPMENT OPTIONS

Based on preliminary assessment of the existing facilities, available land, and initial discussions with the City Manager and Fire Chief, the following options have been developed for consideration.

PHASE I EXISTING FIRE DEPARTMENT STRUCTURAL REINFORCEMENT & COMPONENT RENOVATIONS

- Structural Reinforcement of the existing Fire Department floor system to satisfy immediate short-term needs.
- Replacement of the Existing Fire Station Roof, Windows, and Boiler.

The following offers two options for further renovations / developments, only one would be selected.

PHASE IIA MINIMAL RENOVATION TO EXISTING NEIGHBORING BUILDING

- Minimal renovation of the existing neighboring building for equipment storage.

ADVANTAGES

- Lower initial capital costs.

DISADVANTAGES

- Heavy equipment will remain in existing building for feasible future.
- Limited flexibility in arrangement of equipment storage.
- No increased capacity for vehicle equipment.

PHASE IIB NEW ADJACENT VEHICLE EQUIPMENT STATION

- Demolition of Neighboring Equipment Storage Building
- Construction of a new Vehicle Equipment Station.

ADVANTAGES

- Opportunity to relocate heavy equipment to slab on grade structure.
- Opportunity for flexibility in arrangement of equipment storage.
- Increased capacity for vehicle equipment.

DISADVANTAGES

- Higher initial capital costs.

The following page summarizes the probable costs associated with each of the above.

3.2 CONCEPT DEVELOPMENT OPTIONS – ESTIMATE OF PROBABLE COSTS

The estimate of probable costs are based on the following parameters:

cost data source: RSMean Construction Cost Data
 data release: 2021 Quarter 2
 labor rates: Open (non-union)

Note, costs of construction materials are volatile and are subject to change. Estimates of probable costs are provided to establish order of magnitude to allow for informed decisions.

PHASE I	EXISTING FIRE DEPARTMENT STRUCTURAL REINFORCEMENT
Structural Reinforcement of Existing Floor System	\$300,000
Replacement of Existing Fire Station Roof (allowance)	\$75,000
Replacement of Existing Fire Station Windows (allowance)(60 units @ \$1,500)	\$90,000
Replacement of Existing Fire Station Boiler (allowance)	\$75,000
subtotal	\$540,000
contingency @ 10% of above subtotal	\$54,000
total estimate of probable costs	\$594,000

The following offers two options for further renovations / developments, only one would be selected.

PHASE IIA	MINIMAL RENOVATION TO EXISTING NEIGHBORING BUILDING
Renovations of Existing Neighboring Building (1,700 sq.ft. @ 100 per sq.ft.)	\$170,000
subtotal	\$170,000
contingency @ 10% of above subtotal	\$17,000
total estimate of probable costs	\$187,500

PHASE IIB	NEW ADJACENT VEHICLE EQUIPMENT STATION
Site Development (allowance)	\$50,000
Offsite Adaptations (allowance)	\$25,000
New Vehicle Equipment Station and Connection to Existing	\$737,100
subtotal	\$812,100
contingency @ 10% of above subtotal	\$81,210
total estimate of probable costs	\$893,310

Note 1: In consultation with the City the above assumes no General Contractor, add 15% to above totals if needed.

Note 2: Add \$126,000 to above Phase IIB total if 5th vehicle bay add alternate included.

Budgets and Opinions of Cost: Suggested budgets are based on available information and prior to any detailed research of the project. Budgets are not intended to be fixed prices, but are reasonable estimates of average costs to complete projects of similar size based on published historical data. Since Alba Architects has no control over the cost of labor, materials, equipment, market conditions or services furnished by others, or over the Contractor(s) methods of determining prices, Alba Architects opinion of probable costs represent best judgement as experienced and qualified professionals. Alba Architects cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from estimate of probable cost prepared.

Estimate Name:	Berlin Fire Department - New Vehicle Equipment Station	
Building Type:	Fire Station, 1 Story with Face Brick & Concrete Block / Steel Joists	
Location:	BERLIN, NH	
Story Count:	1	
Story Height (L.F.):	18.00	
Floor Area (S.F.):	5040	
Labor Type:	OPN	
Basement Included:	No	
Data Release:	Year 2021 Quarter 2	
Cost Per Square Foot:	\$143.13	
Building Cost:	\$721,350.61	

Costs are derived from a building model with basic components.
Scope differences and market conditions can cause costs to vary significantly.

		Quantity	% of Total	Cost Per S.F.	Cost
A	Substructure		12.79%	\$15.92	\$80,222.99
A1010	Standard Foundations			\$7.67	\$38,643.85
A10101051560	Foundation wall, CIP, 4' wall height, direct chute, .148 CY/LF, 7.2 PLF, 12" thick	288		\$4.65	\$23,440.75
A10101102500	Strip footing, concrete, reinforced, load 5.1 KLF, soil bearing capacity 3 KSF, 12" deep x 24" wide	316.8		\$2.64	\$13,294.04
A10102107200	Spread footings, 3000 PSI concrete, load 50K, soil bearing capacity 6 KSF, 3' - 0" square x 12" deep	10.08		\$0.38	\$1,909.06
A1030	Slab on Grade			\$7.70	\$38,789.50
A10301203400	Slab on grade, 5" thick, light industrial, reinforced	5040		\$7.70	\$38,789.50
A2010	Basement Excavation			\$0.55	\$2,789.64
A20101103380	Excavate and fill, 4000 SF, 4' deep, sand, gravel, or common earth, on site storage	5040		\$0.55	\$2,789.64
B	Shell		45.37%	\$56.46	\$284,567.68
B1020	Roof Construction			\$12.30	\$61,992.35
B10201124500	Roof, steel joists, beams, 1.5" 22 ga metal deck, on columns, 30'x30' bay, 28" deep, 40 PSF superimposed load, 62 PSF total load	5040		\$10.74	\$54,109.49
B10201124600	Roof, steel joists, beams, 1.5" 22 ga metal deck, on columns, 30'x30' bay, 28" deep, 40 PSF superimposed load, 62 PSF total load, add for column	5040		\$1.56	\$7,882.86
B2010	Exterior Walls			\$25.35	\$127,740.05
B20101321200	Brick wall, composite double wythe, standard face/CMU back-up, 8" thick, perlite core fill	3888		\$25.35	\$127,740.05
B2030	Exterior Doors			\$4.74	\$23,887.82
B20302203450	Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening	3		\$1.67	\$8,410.50
B20302204650	Door, steel 24 gauge, overhead, sectional, electric operator, 12'-0" x 12'-0" opening	4		\$3.07	\$15,477.32
B3010	Roof Coverings			\$14.08	\$70,947.46
B30101401850	Metal roofing, steel, colors, 3" min slope, 26 gauge, 1.0 PSF	5040		\$8.33	\$41,983.20
B30103201750	Insulation, rigid, roof deck, polyisocyanurate, 2#/CF, 3.5" thick	5040		\$2.87	\$14,464.80
B30104201400	Roof edges, aluminum, duranodic, .050" thick, 6" face	288		\$1.79	\$9,037.58
B30104300040	Flashing, aluminum, no backing sides, .019"	288		\$0.33	\$1,644.51
B30106305100	Gravel stop, aluminum, extruded, 4", mill finish, .050" thick	288		\$0.76	\$3,817.37
C	Interiors		8.32%	\$10.35	\$52,171.90
C1010	Partitions			\$0.19	\$935.00
C10101045500	Concrete block (CMU) partition, light weight, hollow, 6" thick, no finish	100		\$0.19	\$935.00
C1020	Interior Doors			\$2.42	\$12,195.92
C10201022600	Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8"	3		\$0.72	\$3,629.76
C10201022600	Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8"	7.08		\$1.70	\$8,566.16
C3010	Wall Finishes			\$3.46	\$17,427.37
C30102202050	Glazed coating	3888		\$0.48	\$2,399.64
C30102300200	Painting, woodwork including puttying, brushwork, primer & 3 coats	2520		\$1.01	\$5,102.67
C30102300320	Painting, masonry or concrete, latex, brushwork, primer & 2 coats	5929.41		\$1.97	\$9,925.06

C3020	Floor Finishes			\$0.84	\$4,218.15
C30204100930	Concrete topping, paint	2520		\$0.84	\$4,218.15
C3030	Ceiling Finishes			\$3.45	\$17,395.46
C30302107400	Acoustic ceilings, 3/4" mineral fiber, 12" x 12" tile, concealed 2" bar & channel grid, suspended support	2520		\$3.45	\$17,395.46
D	Services		33.53%	\$41.73	\$210,298.83
D2010	Plumbing Fixtures			\$1.27	\$6,380.38
D20104404340	Service sink w/trim, PE on CI, wall hung w/rim guard, 24" x 20"	1.43		\$1.27	\$6,380.38
D2020	Domestic Water Distribution			\$4.31	\$21,728.98
D20202501900	Gas fired water heater, commercial, 100< F rise, 115 MBH input, 110 GPH	1.7		\$4.31	\$21,728.98
D2040	Rain Water Drainage			\$1.70	\$8,571.51
D20402104200	Roof drain, CI, soil, single hub, 4" diam, 10' high	3.3		\$1.33	\$6,727.22
D20402104240	Roof drain, CI, soil, single hub, 4" diam, for each additional foot add	42		\$0.37	\$1,844.29
D3050	Terminal & Package Units			\$20.93	\$105,492.90
D30501553840	Rooftop, multizone, air conditioner, offices, 10,000 SF, 31.66 ton	5544		\$20.93	\$105,492.90
D4010	Sprinklers			\$4.25	\$21,443.79
D40104100600	Wet pipe sprinkler systems, steel, light hazard, 1 floor, 5000 SF	5040		\$4.25	\$21,443.79
D4020	Standpipes			\$1.65	\$8,315.29
D40203101540	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, 1 floor	0.84		\$1.65	\$8,315.29
D5010	Electrical Service/Distribution			\$1.77	\$8,916.50
D50101200280	Overhead service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 200 A	1		\$0.49	\$2,486.10
D50102300280	Feeder installation 600 V, including RGS conduit and XHHW wire, 200 A	20		\$0.14	\$718.04
D50102400200	Switchgear installation, incl switchboard, panels & circuit breaker, 120/208 V, 3 phase, 400 A	0.5		\$1.13	\$5,712.36
D5020	Lighting and Branch Wiring			\$4.54	\$22,895.50
D50201100200	Receptacles incl plate, box, conduit, wire, 2.5 per 1000 SF, .3 watts per SF	5040		\$1.50	\$7,540.09
D50201350280	Miscellaneous power, 1 watt	5040		\$0.24	\$1,189.99
D50201400280	Central air conditioning power, 4 watts	5040		\$0.55	\$2,769.73
D50202100500	Fluorescent fixtures recess mounted in ceiling, 0.8 watt per SF, 20 FC, 5 fixtures @32 watt per 1000 SF	5040		\$2.26	\$11,395.69
D5030	Communications and Security			\$1.30	\$6,553.98
D50309100452	Communication and alarm systems, fire detection, addressable, 25 detectors, includes outlets, boxes, conduit and wire	0.24		\$0.82	\$4,110.46
D50309100460	Fire alarm command center, addressable without voice, excl. wire & conduit	0.84		\$0.48	\$2,443.52
E	Equipment & Furnishings		0.00%	\$0.00	\$0.00
E1090	Other Equipment			\$0.00	\$0.00
F	Special Construction		0.00%	\$0.00	\$0.00
G	Building Sitework		0.00%	\$0.00	\$0.00
SubTotal			100%	\$124.46	\$627,261.40
Total Building Cost				\$124.46	\$627,261.40