

# City of Somerville

## Building Renovation & Department Relocation Master Plan

PREFERRED SCHEMATIC REPORT APPENDIX VOL. 1

NOVEMBER 24, 2021



**BEYER  
BLINDER  
BELLE**





# City of Somerville

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**BEYER  
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## **CITY OF SOMERVILLE LEADERSHIP**

Joseph A. Curtatone, *Mayor*

## **CITY OF SOMERVILLE BUILDING RENOVATION & DEPARTMENT RELOCATION MASTER PLAN INTERNAL TECHNICAL TEAM**

Cortni K. Desir, *Director, SomerStat*

Ralph Henry, *Deputy Director, Capital Projects & Planning*

Erik Larson, *Energy Manager, Office of Sustainability & Environment*

Fred Massaro, Jr., *Director, Capital Projects & Planning*

Debora Mitrano, *Project Assistant, Capital Projects & Planning*

Rich Raiche, *Director, Infrastructure & Asset Management*

Melissa Woods, *Senior Project Manager, Capital Projects & Planning*

## **OWNER'S PROJECT MANAGER**

PMA Consultants

## **DESIGN TEAM**

Beyer Blinder Belle Architects & Planners, *Planning, Architecture, and Historic Preservation*

Studio ENÉE, *Collaborating Architect, Programming & Planning Support*

Silman Engineers, *Structural*

Wiss, Janney, Elstner Associates, *Building Envelope Science*

Nitsch Engineering, *Civil*

BR+A Consulting Engineers, *Mechanical, Electrical, Plumbing, Fire Protection & Fire Alarm*

Haley & Aldrich, *Geotechnical & Hazardous Materials*

Atelier Ten, *Environmental Design & LEED Consulting*

Energysmiths, *Net-Zero Energy Strategy Consulting*

Jensen Hughes Associates, *Code*

Dharam, *Cost Estimating*

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<b>EXEC</b> Mayor & Executive Administration	<b>FIN-AD</b> Finance Auditing	<b>CCK</b> City Clerk	<b>COMM</b> Community Engagement	<b>OSPCD EX</b> Executive & Finance Administration	<b>IAM EX</b> Infrastructure & Asset Mgmt Exec / Admin	<b>HHS</b> Health and Human Services	<b>DPW AD</b> DPW Administration	<b>ISD</b> Inspectional Services Division	<b>SPS ADMIN</b> Schools Administration
<b>STAT</b> Somerset	<b>FIN-P</b> Finance Procurement & Contract Services	<b>ARCH</b> Archives	<b>COMM SOIA</b> Office of Immigrant Affairs	<b>OSPCD ED</b> Economic Development	<b>IAM CP</b> Capital Projects	<b>SOP</b> Somerset Promise	<b>DPW B&amp;G</b> DPW Buildings and Grounds	<b>FP</b> Fire Prevention	<b>SPS ECS</b> Early Childhood Services
<b>OSE</b> Office of Sustainability & Environment	<b>FIN-AS</b> Finance Assessing	<b>ELEC</b> Elections	<b>COMM 311</b> Constituent Services / 311	<b>OSPCD M</b> Mobility	<b>IAM ENG</b> Engineering	<b>VS</b> Veterans' Services	<b>DPW HWY</b> DPW Highway and Fleet	<b>W/S</b> Water & Sewer	<b>SPS EO</b> Enrollment Office (formerly PIC)
<b>ARTS</b> Arts Council	<b>FIN-T</b> Finance Treasury	<b>LAW</b> Law	<b>IT</b> Information Technology	<b>OSPCD PZ</b> Planning & Zoning		<b>COA</b> Council on Aging	<b>DPW L&amp;L</b> DPW Lights and Lines	<b>PKG</b> Parking	<b>SPS SFLC</b> Family Learning Center Collaborative
<b>RSJ</b> Racial and Social Justice	<b>FIN-G</b> Finance Grants			<b>OSPCD PSUF</b> Public Space & Urban Forestry			<b>DPW S</b> DPW Sanitation	<b>P&amp;R</b> Parks & Recreation	<b>SPS SCALE</b> Center for Adult Learning & Education
<b>CITY COUNCIL</b>	<b>HR</b> Human Resources			<b>OSPCD H</b> Housing					<b>SPS CS</b> Community Schools
	<b>RET</b> Retirement			<b>OSPCD OHS</b> Office of Housing Stability					<b>LIB</b> Libraries (Central, East & West Branches)

"PERIODIC TABLE" OF CITY DEPARTMENTS AND DIVISIONS ADDRESSED IN THE PROGRAM

# Detailed Space Needs Program

# DEPARTMENTAL SPACE NEEDS TABLES

## GENERAL NOTES

- The detailed department and division space needs program was generated from initial department and division programming interviews in spring of 2021. Interview meetings were conducted and minutes from those meetings were issued. Departments were given the opportunity to respond in order to clarify the documented program requests. The additional input was included and the overall program document was reviewed by the Internal Technical Team for accuracy, validity, and priority. Additionally, the program was updated to reflect FY2022 staff numbers confirmed with the Internal Technical Team over the summer of 2021 after the completion of the Preliminary Design Program (PDP) report. All City of Somerville feedback is now incorporated in the detailed space needs program.
- The Master Plan programming effort is focused specifically on administrative workspaces; however, program totals for departments or divisions that may move from their current spaces (e.g. SCALE) include line items for non-workspaces such as classrooms that a given department is using in their current location. These items are important to carry in order to consider the full space needs in proposed relocation concepts, unless the City provides direction that those functions will not be moved to the three buildings in the scope of the concept planning effort.
- The program needs of the Libraries were discussed at a very high visioning level. Projected administrative space needs beyond confirmation of FY2022 staff levels are not provided, as the intent is for the staff and programs to remain in their current buildings in the near term. A full renovation of the West Branch Library was recently completed and the East Branch Library building and site is being reimagined as part of the CSA Master Plan. The CSA programming discussions also underscored the importance of the library system's ability to provide community program space, and that the Central Library is an aging asset overdue for capital investment and potential renovation.
- The gray highlighted rows at the bottom of each summary indicate those departmental space needs that can potentially be shared with other departments. Those requests have been aggregated, analyzed, and proposed as a separate category called Shared Space Needs. This will assist in creating space efficiencies not typically realized today. Dedicated meeting, storage, or specialized space needs that are not grayed out, and are included as line items and in department totals, represent requests made in the programming interviews or gleaned from building tours, that are deemed necessary to be dedicated to a department and not considered a shared resource.
- In general, storage and filing needs will be analyzed further in subsequent design phases; some of these needs may be accommodated in shared space to further maximize efficiency. Storage and filing needs will also be vetted to reflect city policies on archiving and reducing paper and physical storage as possible.
- Full-time employee (FTE) designations indicate positions that are permanent and full-time. PTE designations (part-time employees) are carried in the totals as 0.5 FTEs. Positions described as interns are carried as requiring workspace but not as FTE positions (as was directed by the City of Somerville).
- Future staff projections by department and division for the next decade (2030) were provided by the City of Somerville. Projections for Schools were not provided, and therefore were estimated as an across-the-board projection based on rates found within other administrative groups.
- FY2022 confirmed staff counts do not include those without individual workspace needs (e.g., board members, commissioners, field/off-site staff). Staff counts for those "non-desk" employees are included in the notes column for each department or division.
- Additional department- and division-specific notes are carried in the "notes" column for reference and clarification of requests.



## DEPARTMENTAL SPACE NEEDS

Note: All spaces highlighted in grey are assumed to be shared across all departments and divisions as part of overall shared amenities program

City Council						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director		1	PO-3		100	100
Policy Analyst	1		WS-2		42	42
Staff		3	WS-2		42	126
Hoteling			WS-3	2	30	60
Councilor Lounge			C3	1	200	200
TV Control Booth				1	135	135
Council Chamber				1	2514	2,514
Committee Room			C1	1	500	500
Sub-Committee Room			C2	1	280	280
<b>Total</b>	<b>1</b>	<b>4</b>			<b>Staff</b>	<b>328</b>
					<b>Other</b>	<b>3,629</b>
					<b>ASF</b>	<b>3,957</b>

**Notes**

Staff totals do not include (1) elected City Council members, and (2) Clerks (Asst. and Clerk of Committees)

*Ideally adjacent to Staff workspace; part of suite*

*Need access to Council Chamber spaces; not necessarily attached*

*PT Staff present during Council meetings*

Mayor's Office / Executive Administration						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Mayor	1		PO		450	450
Chief of Staff	1		PO-1		165	165
Operating Officer/Deputy Chief of Staff		1	PO-1		165	165
Director of Intergovernmental Affairs	1		PO-3		100	100
Administrative Aide	1		WS-2		42	42
Executive Administrative Aide	1		WS-2		42	42
Legislative Liaison	1		WS-2		42	42
Hoteling; Flex workstation			WS-3	1	30	30
Hoteling; PD assigned to Mayor			WS-3	1	30	30
Storage			ST.5	1	50	50
Copy / Work Room			W1	1	100	100
Toilet			T1	1	50	50
Waiting / Reception			R1	1	100	100
Pantry / Kitchenette			K1	1	100	100
Meeting / Counseling Room: 3-4 p.			C4	0	120	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>6</b>	<b>1</b>			<b>Staff</b>	<b>1,066</b>
					<b>Other</b>	<b>400</b>
					<b>ASF</b>	<b>1,466</b>

**Notes**

*\*Meeting space for 10*

*Direct access Council Chamber spaces is ideal but not required*

*Not a position; requested flex workstation*

*Not a position; requires dedicated workstation*

*Dedicated*

*Dedicated*

*Dedicated*

*Dedicated*

## DEPARTMENTAL SPACE NEEDS

SomerStat						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Digital Innovation Officer	1		WS-1		64	64
Analyst	2	2	WS-2		42	168
Principal Analyst	1		WS-2		42	42
Hoteling			WS-3	1	30	30
Storage			ST.5	1	50	50
Large Meeting Room: 20-24 p.			C1	0	500	-
Open Meeting Space: 4-6 p.			C6	0	120	-
<b>Total</b>	<b>5</b>	<b>2</b>				<b>Staff 404</b>
						<b>Other 50</b>
						<b>ASF 454</b>

Notes

Not a position; requested flex workstation

Requested dedicated as space allows

Arts Council						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Cultural Director	1		WS-1		64	64
Arts Coordinator	1		WS-2		42	42
Special Events Manager	1		WS-2		42	42
Kitchen Manager	1		WS-3		30	30
Hoteling			WS-3	1	30	30
Storage			ST4	1	400	400
Open Meeting Space: 4-6 p.			C6	0	120	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>5</b>	<b>0</b>				<b>Staff 308</b>
						<b>Other 400</b>
						<b>ASF 708</b>

Notes

Staff totals do not include (3) off-site staff: ArtFarm Manager, Armory Manager, Cultural Culinary Coordinator (PTE)

May move to Armory

Not a position; requested flex workstation

Confirm storage needs (approx 700 SF)

Requested dedicated as space allows

## DEPARTMENTAL SPACE NEEDS

Office of Sustainability and Environment						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Manager		2	WS-1		64	128
Clerk		1	WS-2		42	42
Climate Change Program Manager	1		WS-2		42	42
Community Engagement Specialist	1		WS-2		42	42
Energy Manager	1		WS-2		42	42
Environmental Program Manager	1		WS-2		42	42
Sustainable Mobility		1	WS-2		42	42
Hoteling			WS-3	1	30	30
Storage			ST.5	1	50	50
Pantry / Kitchenette			K1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>5</b>	<b>4</b>				
					<b>Staff</b>	<b>510</b>
					<b>Other</b>	<b>50</b>
					<b>ASF</b>	<b>560</b>

*Notes*

*OSE uses DPW for oversized equipment and product storage needs*

*Request for departmental meetings*

*OSE hosts Comissions for up to 30*

Racial and Social Justice						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director	1		WS-1		64	64
ADA Coordinator	1		WS-2		42	42
Analyst	1		WS-2		42	42
Commissions Coordinator	1		WS-2		42	42
Community Engagement Specialist	1		WS-2		42	42
Coordinator	1		WS-2		42	42
Project Specialist	1		WS-2		42	42
Public Information Officer	1		WS-2		42	42
<b>Total</b>	<b>9</b>	<b>0</b>				
					<b>Staff</b>	<b>458</b>
					<b>Other</b>	
					<b>ASF</b>	<b>458</b>

*Notes*

## DEPARTMENTAL SPACE NEEDS

Finance - Procurement and Contract Services (formerly Purchasing)						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Assistant Director	1		WS-1		64	64
Admin. Asst. SMEA B	1		WS-2		42	42
Clerk		2	WS-2		42	84
Construction Procurement Manager	1		WS-2		42	42
Principal Clerk	1		WS-2		42	42
Procurement Analyst	1		WS-2		42	42
Senior Procurement Manager	1		WS-2		42	42
Waiting / Reception; no desk			R1	0	100	0
Files				1	100	100
Open Meeting Space: 4-6 p.			C6	1	120	120
Storage			ST.5	1	50	50
Pantry / Kitchenette			K1	0	100	-
One-on-One Meeting Room: 2 p.			C5	0	80	-
Meeting / Counseling Room: 3-4 p.			C4	0	120	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>7</b>	<b>2</b>				
					<b>Staff</b>	<b>458</b>
					<b>Other</b>	<b>270</b>
					<b>ASF</b>	<b>728</b>

### Notes

Finance requested dedicated Large Mtg space for their department

Requested area for bid openings; do not need a counter but deal with daily vendor visitors

Goal to reduce footprint of storage

Requested shared dedicated to Finance; confirm

## DEPARTMENTAL SPACE NEEDS

Finance - Treasury						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - Treasurer/Collector	1		PO-3		100	100
Deputy Treasurer	1		WS-1		64	64
Accountant	1		WS-2		42	42
Admin. Asst. SMEA A	1		WS-2		42	42
Asst. Tax Collector	1		WS-2		42	42
Head Cashier	1		WS-2		42	42
Head Clerk	1		WS-2		42	42
Principal Clerk	3		WS-2		42	126
PT Customer Service Rep.	0.5		WS-2	1	42	42
Tax Asst. / Paralegal	1		WS-2		42	42
Intern / Hoteling			WS-3	3	30	90
Storage			ST1	1	100	100
Transaction or Service Window			R4	3	30	90
Receiving Area			W1	1	100	100
Copy/Work Room			W2	1	150	150
Files				1	50	50
One-on-One Meeting Room: 2 p.			C5	1	80	80
Pantry / Kitchenette			K1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
<b>Total</b>	<b>11.5</b>	<b>0</b>			<b>Staff</b>	<b>674</b>
					<b>Other</b>	<b>570</b>
					<b>ASF</b>	<b>1,244</b>

*Notes*

*Not positions; intern workspaces*

*Storage for back-up machines and permanent documents; required to be kept on site*

*Requested bullet-proof glass and handwashing sink; 2 for typical and 1 additional for tax season*

*Receive secure deliveries daily, deposit drops; sort and process mail*

*For printing, sealing and shredding; requested safe; prefer secure and isolated room*

*Requested confidential space for meetings with taxpayers*

*Requested shared dedicated to Finance; confirm*

## DEPARTMENTAL SPACE NEEDS

Finance - Auditing (Accounts Payable)						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - City Auditor	1		PO-1		165	165
Budget Director	1		WS-1		64	64
Deputy Auditor	1		WS-1		64	64
Manager of Accts Payable	1		WS-1		64	64
Accounting Analyst	1		WS-2		42	-
Administrative Assistant SMEA B	1		WS-2		42	-
Budget Analyst	1	1	WS-2		42	42
CIP Manager		1	WS-2		42	42
Clerk		1	WS-2		42	42
Grant Accountant	1		WS-2		42	42
Internal Auditor	1		WS-2		42	42
Principal Clerk	3		WS-2		42	126
Systems Accountant	1		WS-2		42	42
Hoteling			WS-3	1	30	30
Storage			ST1.5	1	150	150
Files				1	80	80
Receiving Area			W1	1	100	100
One-on-One Meeting Room: 2 p.			C5	1	80	80
Copy/Work Room			W1	0	100	-
Pantry / Kitchenette			K1	0	100	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>13</b>	<b>3</b>			<b>Staff</b>	<b>765</b>
					<b>Other</b>	<b>410</b>
					<b>ASF</b>	<b>1,175</b>

### Notes

*Not a position; requested flex workstation*

*Space to receive paperwork, cash receipts and contracts*

*Requested confidential space for meetings with taxpayers*

*Department meetings and training; can be shared within Finance*



## DEPARTMENTAL SPACE NEEDS

Finance - Assessing						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Chief Assessor / Chairman Board of Assessors	1		PO-3		100	100
Admin. Asst. SMEA B	1		WS-2		42	42
Assessor Analyst	1		WS-2		42	42
Clerk		1	WS-2		42	42
Director of Commercial Assessments	1		WS-2		42	42
Manager of Residential Assessments	1		WS-2		42	42
Principal Clerk	1		WS-2		42	42
Sales/Personal Prop Analyst	1		WS-2		42	42
Senior Clerk	1		WS-2		42	42
Storage			ST1.5	1	150	150
Transaction or Service Window			R4	2	30	60
Reception			R2	1	220	220
Meeting / Counseling Room: 3-4 p.			C4	0	120	-
Small Meeting Room: 6-8 p.			C3	0	200	-
<b>Total</b>	<b>8</b>	<b>1</b>			<b>Staff</b>	<b>436</b>
					<b>Other</b>	<b>430</b>
					<b>ASF</b>	<b>866</b>

*Notes*

*Staff totals do not include (2) Board of Assessors Members*

*Expressed interest in reducing paper storage needs  
 Separation from constituents is important  
 Exg - 240 SF  
 Can be shared  
 Requested shared dedicated to Finance; confirm*

Finance - Grants						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director of Grants and External Funds	1		PO-3		100	100
Grant Writer	1	1	WS-2		42	84
Storage			ST.5	1	50	50
Meeting / Counseling Room: 3-4 p.			C4	0	120	-
<b>Total</b>	<b>2</b>	<b>1</b>			<b>Staff</b>	<b>184</b>
					<b>Other</b>	<b>50</b>
					<b>ASF</b>	<b>234</b>

*Notes*

*Requested dedicated; confirm*

## DEPARTMENTAL SPACE NEEDS

City Clerk						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Director - City Clerk	1		PO-3		100	100
Assistant City Clerk	1		WS-1		64	64
Admin. Asst. SMEA B	2		WS-2		42	84
Head Clerk	1		WS-2		42	42
Principal Clerk	3		WS-2		42	126
Intern / Hoteling			WS-3	1	30	30
Storage			ST4	1	400	400
Mail Office			ST2	1	200	200
Transaction or Service Window			R4	3	30	90
Files				1	100	100
Copy/Work Room			W1	1	100	100
Meeting / Counseling Room: 3-4 p.			C4	0	120	-
Small Meeting Room: 6-8 p.			C3	0	200	-
<b>Total</b>	<b>8</b>	<b>0</b>				
					<b>Staff</b>	<b>446</b>
					<b>Other</b>	<b>890</b>
					<b>ASF</b>	<b>1,336</b>

### Notes

Staff totals do not include Chairman or (2) Commissioners (Licensing)

Not a position; intern workspace

Prefer one space with a lockable door; storage of vital records

Confirm mail delivery should remain in space needs

Anticipate 1 upon return to work but having multiple is still necessary

Currently in open workspace

Space for printing, copy, scanning, timestamp and digital seal

Archives						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Archivist	1		WS-2		42	42
Assistant Archivist		1	WS-2		42	42
Intern / Hoteling			WS-3	2	30	60
Palette Shipment Storage				4	16	64
Receiving and Processing Area				1	300	300
Scanning / Digitizing Areas				1	100	100
Storage				1	760	760
Public Reading Room				1	200	200
<b>Total</b>	<b>1</b>	<b>1</b>				
					<b>Staff</b>	<b>144</b>
					<b>Other</b>	<b>1,424</b>
					<b>ASF</b>	<b>1,568</b>

### Notes

Not positions; intern workspace

Confirm SF

Confirm SF

Confirm SF

Confirm SF

Confirm SF

## DEPARTMENTAL SPACE NEEDS

### Communications - Community Engagement

Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
Director	1				PO-1		165	165
Deputy Director	1				WS-1		64	64
Cable	2				WS-2		42	84
Communications Professional		1			WS-2		42	42
Community Engagement Specialist	1				WS-2		42	42
Principal Clerk	1				WS-2		42	42
Public Information Officer	1				WS-2		42	42
Public Information Officer - Construction	1				WS-2		42	42
Web Developer & Multimedia Designer	1				WS-2		42	42
Storage					ST1	1	100	100
Welcome Desk					R2	1	220	220
Medium Meeting Room: 10-14 p.					C2	0	280	0
<b>Total</b>	<b>9</b>	<b>1</b>					<b>Staff</b>	<b>565</b>
							<b>Other</b>	<b>320</b>
							<b>ASF</b>	<b>885</b>

#### Notes

Idealize that all 3 groups would be located together (see note in SOIA)

Space for event materials and flyers  
Likely need per building; confirm

### Communications - Somerville Office of Immigrant Affairs

Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
Director	1				WS-2		42	42
Community Engagement Specialist	5	5			WS-2		42	420
Immigration Services Coordinator	0.5				WS-2	1	42	42
Intern / Hoteling					WS-3	3	30	90
Waiting / Reception; no desk					R1	1	100	100
Family Waiting / Children Play Area					R3	1	80	80
Storage					ST1	1	100	100
One-on-One Meeting Room: 2 p.					C6	0	120	0
Small Meeting Room: 6-8 p.					C3	0	200	0
Program / Workshop Space: 20 p.						0	500	0
Pantry / Kitchenette - Typ.					K1	0	100	0
<b>Total</b>	<b>6.5</b>	<b>5</b>					<b>Staff</b>	<b>594</b>
							<b>Other</b>	<b>280</b>
							<b>ASF</b>	<b>874</b>

#### Notes

SOIA access to community prioritized over co-location with Comm

Need access to counseling rooms  
Need access to counseling rooms  
Need access to counseling rooms  
Not positions; 3 flex workspaces

## DEPARTMENTAL SPACE NEEDS

### Communications - Constituent Services 311

Description	EXISTING		PROPOSED		Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty			
Director	1		PO-3			100	100
Call Center Manager	1		WS-1			64	64
Customer Experience Manager	1		WS-1			64	64
Quality Manager	1		WS-1			64	64
Service Operations Manager	1		WS-1			64	64
Customer Service & Support		1	WS-2			42	42
Customer Service Rep	2	3	WS-3			30	150
Customer Service Rep (P/T)	1.5	1.5	WS-3	3		30	90
Professional		2	WS-2			42	84
Senior Customer Service Rep	5		WS-3			30	150
Telephone Operator	2		WS-3	0		30	-
Storage Room			ST.5	1		50	50
Copy / Work Room - Typ.			W1	0		100	0
Break Room/ Kitchen (seating for 6)			K2	0		200	0
One-on-One Meeting Room: 2 p.			C5	0		80	0
Meeting / Counseling Room: 3-4 p.			C4	0		120	0
Medium Meeting Room: 10-14 p.			C2	0		280	0
<b>Total</b>	<b>15.5</b>	<b>7.5</b>					
							<b>Staff 872</b>
							<b>Other 50</b>
							<b>ASF 922</b>

### Notes

Confirm shared workstations and work from home policies

6 positions; 3 workstations VERIFY

Positions being absorbed into call center  
Includes request for Outreach and Computer Equipment Storage

## DEPARTMENTAL SPACE NEEDS

Elections						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - Chairman of Elections	1		PO-3		100	100
Asst. Election Commissioner	1		WS-2		42	42
Deputy Election Commissioner	1		WS-2		42	42
Senior Clerk	1		WS-2		42	42
Intern/Hoteling			WS-3	2	30	60
Storage - Voting Machines				1	100	100
Storage - Auto-marking devices				1	400	400
Storage Room			ST1	1	100	100
Transaction or Service Window			R4	2	30	60
Waiting / Reception; no desk			R3	1	80	80
Copy/Work Room			W1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Training - Poll Workers			N/A			
<b>Total</b>	<b>4</b>	<b>0</b>			<b>Staff</b>	<b>286</b>
					<b>Other</b>	<b>740</b>
					<b>ASF</b>	<b>1,026</b>

**Notes**

Confirm SF at 45 College Ave; confirm space for voting machine stg  
Staff totals do not include (3) Election Commissioners

Permanent temps; not FTEs

Need storage for 24 tabulators (must be secured and near them)

Need storage for 24 auto-marking devices (can be off-site)

Permanent on-site voting record cabinets (approx. 14)

Training for 150-200 Poll Workers; previously used Chamber or off-site

Law						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - City Solicitor	1		PO-1		165	165
Deputy City Solicitor	1		PO-3		100	100
Asst. City Solicitor	2	1	PO-3		100	300
Chief Labor Counsel	1		PO-3		100	100
Legal Admin. Assistant	1		WS-2		42	42
Paralegal / Legal Assistant	1		WS-2		42	42
Housing - Asst Director & Housing Counsel	1		PO-3	0	100	-
Housing Paralegal	1		WS-2	0	42	-
ISD Paralegal	1		WS-2	0	42	-
OSPCD Assistant City Solicitor	1		PO-3		100	100
Intern / Hoteling			WS-3	1	30	30
Storage Room			ST1	1	100	100
Waiting / Reception; no desk			R1	1	100	100
Small Meeting Room: 6-8 p.			C3	1	200	200
Pantry / Kitchenette - Typ.			K1	0	100	-
<b>Total</b>	<b>11</b>	<b>1</b>			<b>Staff</b>	<b>879</b>
					<b>Other</b>	<b>400</b>
					<b>ASF</b>	<b>1,279</b>

**Notes**

Staff total does not include (1) Municipal Hearing Officer

Currently in Housing; to remain there

Currently in Housing; to remain there

Currently in ISD; to remain there

Currently in OSPCD; ideally returns back with Law

Not a position; intern workstation

Lockable room

Requested dedicated meeting / library for book collection

## DEPARTMENTAL SPACE NEEDS

Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-1		165	165
Deputy Director	1		PO-3		100	100
Human Resources Manager (Future Payroll & Benefits Mgr)	1		PO-3		100	100
Payroll Director	1		PO-3		100	100
Benefits Manager (Future Senior Recruiter)	1		WS-1		64	64
Training Manager		1	WS-1		64	64
HR Assistant	1		WS-2		42	42
HR Benefits Coordinator	2		WS-2		42	84
HR Generalist	2		WS-2		42	84
HRIS Coordinator		1	WS-2		42	42
Manager - Employee Safety and Training	1		WS-2		42	42
Payroll Coordinator	3		WS-2		42	126
Recruiter	1		WS-2		42	42
Intern / Hoteling			WS-3	1	30	30
Transaction or Service Window			R4	2	30	60
Files				1	100	100
Admin Reception Area, no reception desk			R1	1	100	100
Work / Interview Room				1	150	150
Pantry / Kitchenette - Typ.			K1	0	100	-
Copy / Work Room - Typ.			W1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
<b>Total</b>	<b>15</b>	<b>2</b>			<b>Staff</b>	<b>1,085</b>
					<b>Other</b>	<b>410</b>
					<b>ASF</b>	<b>1,495</b>

### Notes

*Not a position*

*Confirm SF; High-density system?*

*Includes access via service window*

*Requested dedicated; confirm*

*Requested dedicated; confirm*



## DEPARTMENTAL SPACE NEEDS

Information Technology						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Chief Information Officer	1		PO-3		100	100
Deputy Director	1		WS-1		64	64
Application Support Specialist		1	WS-2		42	42
Admin. Asst. SMEA A	1		WS-2		42	42
Computer Technician / System Administrator	1		WS-2		42	42
IT Network Manager	1		WS-2		42	42
IT Project Manager	1		WS-2		42	42
IT Specialist	3	1	WS-2		42	168
IT Supervisor/Computer Info Systems	1		WS-2		42	42
Project Manager	1		WS-2		42	42
Senior Clerk & IT Help Desk Admin	1		WS-2		42	42
Storage Room			ST1.5	1	150	150
Receiving, Staging, Testing and Work Area			W2	1	150	150
Help Desk			R5	1	36	36
Server Room / MDF				1	200	200
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Copy / Work Room - Typ.			W1	0	100	-
Pantry / Kitchenette			K1	0	100	-
<b>Total</b>	<b>12</b>	<b>2</b>			<b>Staff</b>	<b>668</b>
					<b>Other</b>	<b>536</b>
					<b>ASF</b>	<b>1,204</b>

Notes

Adjacent to receiving; lockable  
 Receiving, staging and testing; multi-level work bench for 3p.; near entry  
 Help Desk Admin staff is included in above workspace needs  
 Confirmed in IT meeting

Double as Training Space; flexible tech. furniture, floor outlets, projector

## DEPARTMENTAL SPACE NEEDS

### OSPDC - Executive Administration & Finance

Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Executive Director	1		PO-1		165	165
Director of Finance and Community Development	1		PO-3		100	100
Strategic Planning and Equity Manager	1		WS-1		64	64
CPA Manager	1		WS-2		42	42
Executive Assistant	1		WS-2		42	42
Program Compliance Officer	1.5		WS-2	2	42	84
Senior Accountant	2		WS-2		42	84
OSPDC Assistant City Solicitor			PO-3	1	100	100
Waiting / Reception; no desk			R1	1	100	100
Storage			ST1	1	100	100
Break Room/ Kitchen (seating for 6)			K2	0	200	-
Small Meeting Room: 6-8 p.			C3	0	200	-
<b>Total</b>	<b>8.5</b>	<b>0</b>			<b>Staff</b>	<b>681</b>
					<b>Other</b>	<b>200</b>
					<b>ASF</b>	<b>881</b>

#### Notes

Includes shared amenities for all OSPDC in City Hall

Law position to move back with department; hold for space proofing  
Confirm needs for this space if OSPDC / PZ are not co-located

### OSPDC - Economic Development

Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Asst. Director of Economic Development		1	WS-1		64	64
Assistant Planner	2		WS-2		42	84
Senior Planner		1	WS-2		42	42
Workforce Development Coordinator	4		WS-2		42	168
Storage	1		WS-2		42	42
Storage			ST.5	1	50	50
One-on-One Meeting Room: 2 p.			C5	0	80	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>8</b>	<b>2</b>			<b>Staff</b>	<b>500</b>
					<b>Other</b>	<b>50</b>
					<b>ASF</b>	<b>550</b>

#### Notes

Staff totals do not include (6) Board Members

## DEPARTMENTAL SPACE NEEDS

OSPCD - Mobility						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director		1	WS-1		64	64
Planner		3	WS-2		42	126
Outreach Coordinator	1		WS-2		42	42
Senior Planner	3		WS-2		42	126
Transportation Planner	3		WS-2		42	126
Storage			ST1	1	100	100
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>8</b>	<b>4</b>				
					<b>Staff</b>	<b>584</b>
					<b>Other</b>	<b>100</b>
					<b>ASF</b>	<b>684</b>

Notes

OSPCD - Planning and Zoning						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director	1	1	WS-1		64	128
Admin. Asst. (Non-union)	1		WS-2		42	42
Director - Historic Preservation	0.75		WS-2	1	42	42
Outreach Coordinator	1		WS-2		42	42
Planner	4	2	WS-2		42	252
Senior Planner	3		WS-2		42	126
Senior Zoning Review Planner	1		WS-2	0	42	42
Zoning Review Planner	2	1	WS-2	0	42	126
Intern / Hoteling			WS-3	1	30	30
Storage			ST1.5	1	150	150
Waiting / Reception; no desk			R1	1	100	100
Print Room - Plotting			W1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>14.75</b>	<b>4</b>				
					<b>Staff</b>	<b>930</b>
					<b>Other</b>	<b>250</b>
					<b>ASF</b>	<b>1,180</b>

Notes

Staff totals do not include (15) Board Members, Representatives and Alternates

Position is part of ISD; workspace accounted for here

Position is part of ISD; workspace accounted for here

1 intern; 1 workstation

Existing 3Fl storage 114 SF+182

Final needs TBC pending location of PZ and EXEC

Need access to plotter; should be shared with IAM or OSPCD

## DEPARTMENTAL SPACE NEEDS

### OSPCD - Public Space and Urban Forestry

Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director		1	WS-1		64	64
Planner	2		WS-2		42	84
Project Manager / Director of Parks	1		WS-2		42	42
Senior Planner	2		WS-2		42	84
Storage			ST1	1	100	100
Phone Booth			PH1	0	50	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>6</b>	<b>1</b>				
					<b>Staff</b>	<b>374</b>
					<b>Other</b>	<b>100</b>
					<b>ASF</b>	<b>474</b>

### Notes

*For plans, project manuals and field tools*

## DEPARTMENTAL SPACE NEEDS

OSPCD - Housing						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Director	1		PO-3		100	100
Housing - Asst Director & Housing Counsel	0		PO-3	1	100	100
100 Homes Manager		1	WS-2		42	42
Affordable Housing Coordinator	1		WS-2		42	42
Housing Coordinator	1		WS-2		42	42
Housing Development Program Manager	1		WS-2		42	42
Housing Grants Manager	1		WS-2		42	42
Housing Policy Coordinator	1		WS-2		42	42
Housing Rehab Program Manager	1		WS-2		42	42
Inclusionary Housing Program Manager	1		WS-2		42	42
Inclusionary Housing Specialist	1	2	WS-2		42	126
Lead Program Coordinator	1		WS-2		42	42
Lead Program Manager	1		WS-2		42	42
Program Compliance Officer	1		WS-2		42	42
Program Specialist	2		WS-2		42	84
Housing Paralegal	0		WS-2	1	42	42
Intern / Hoteling			WS-3	1	30	30
Files				1	100	100
Transaction or Service Window			R4	2	30	60
Storage			ST1	1	100	100
Small Meeting Room: 6-8 p.			C3	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>14</b>	<b>3</b>				
					<b>Staff</b>	<b>944</b>
					<b>Other</b>	<b>260</b>
					<b>ASF</b>	<b>1,204</b>

**Notes**

Security is an issue; Need separate transparent meeting space

Space needs accounted for here; but position is in Law

Space needs accounted for here; but position is in Law

Not a position; flex workstation

Confirm SF; Survey noted filing in Annex workspaces; BsmT TBC

Security issue with developers; need buffer space

Office supplies and event materials

OSPCD - Housing Stability						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Director	1		PO-3		100	100
Deputy Director	1.5		WS-1	2	64	128
Case Manager	4		WS-2		42	168
Housing Intake Specialist	1		WS-2		42	42
Planner		2	WS-2		42	84
Storage Room			ST1.5	1	150	150
Meeting / Counseling Room: 3-4 p.			C4	2	120	240
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>7.5</b>	<b>2</b>				
					<b>Staff</b>	<b>522</b>
					<b>Other</b>	<b>390</b>
					<b>ASF</b>	<b>912</b>

**Notes**

Confirm SF; paper storage in Annex basement was unclear during survey

Direct access to counseling rooms required if staff is in WSs

## DEPARTMENTAL SPACE NEEDS

HHS - Health and Human Services						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director of HHS	1		PO-1		165	165
Director of Public Health		1	PO-3		100	100
Director of Human Services	1		PO-3		100	100
Shape Up Somerville Director	1		PO-3		100	100
Admin. Asst. SMEA A	1		WS-2		42	42
Case Manager	1		WS-2		42	42
Clinical Youth Specialist	2		WS-2		42	84
Community Services Manager	1		WS-2		42	42
Director of Prevention Services	1		WS-2		42	42
Director of Tobacco Control	1		WS-2		42	42
Environmental Health Coordinator	1		WS-2		42	42
Grants Analyst	1		WS-2		42	42
LGBTQ Liaison	1		WS-2		42	42
Mental Health Human Services		1	WS-2		42	42
Prevention Coordinator		1	WS-2		42	42
Program Director	1		WS-2		42	42
Public Health Nurse Manager	1		WS-2		42	42
Public Health Preparedness Nurse	1		WS-2		42	42
Shape Up Somerville Coordinator	1		WS-2		42	42
Social Worker	2		WS-2		42	84
Substance Use Prevention Coordinator	1		WS-2		42	42
Youth Coordinator		1	WS-2		42	42
Intern / Hoteling PT	1		WS-3		30	30
Meeting / Counseling Room: 3-4 p.			C4	3	120	360
Copy / Work Room - Typ.			W1	0	100	-
Break Room/ Kitchen (seating for 6)			K2	0	200	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>21</b>	<b>4</b>			<b>Staff</b>	<b>1,335</b>
					<b>Other</b>	<b>360</b>
					<b>ASF</b>	<b>1,695</b>

### Notes

Staff totals do not include (3) Board of Health Members

Requested a series of dedicated counseling rooms



## DEPARTMENTAL SPACE NEEDS

HHS - SomerPromise						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director SomerPromise	1		PO-3		100	100
Coordinator	1	2	WS-2		42	126
Home Visitor	2		WS-2		42	84
Out of Time Coordinator	1		WS-2		42	42
Youth and Family Resource Navigator	1		WS-2		42	42
Storage			ST1	1	100	100
Small Meeting Room: 6-8 p.			C3	0	200	0
<b>Total</b>	<b>6</b>	<b>2</b>				
					<b>Staff</b>	<b>394</b>
					<b>Other</b>	<b>100</b>
					<b>ASF</b>	<b>494</b>

Notes

HHS - Veterans Services						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Principal Clerk	1		WS-2		42	42
Intern -Hoteling			WS-3	2	30	60
Storage Room			ST2	1	200	200
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>2</b>	<b>0</b>				
					<b>Staff</b>	<b>202</b>
					<b>Other</b>	<b>200</b>
					<b>ASF</b>	<b>402</b>

Notes

2 interns; 2 workstations  
 Approx. 200 SF of files / storage in Annex basement

## DEPARTMENTAL SPACE NEEDS

### HHS - Council on Aging

Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Admin. Asst. (Non-union)	1		WS-2		42	42
Geriatric Social Worker	1		WS-2		42	42
Health and Wellness Coordinator	1		WS-2		42	42
Holland St. Director	1		WS-2		42	42
Nutritionist	1		WS-2		42	42
Outreach Coordinator	1		WS-2		42	42
Program Coordinator	1		WS-2		42	42
Receptionist (Grant)	1		WS-2	0	42	-
Social Worker	1		WS-2		42	42
Interns			WS-2	1	42	42
Waiting / Reception; with desk			R2	1	220	220
Program Space (TAB)				1	2,200	2,200
Kitchen / Pantry (TAB)			K2	1	200	200
Pantry (TAB)				1	225	225
Program Space (CSC)				1	1,200	1,200
Kitchen / Pantry (CSC)			K2	1	200	200
Computer Lab (CSC)			C4	1	120	120
Storage (CSC)			ST1.5	1	150	150
Small Meeting Room: 6-8 p.			C3	0	200	-
Pantry / Kitchenette - Typ.			K1	0	100	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
<b>Total</b>	<b>10</b>	<b>0</b>				
					<b>Staff</b>	<b>478</b>
					<b>Other</b>	<b>4,515</b>
					<b>ASF</b>	<b>4,993</b>

### Notes

Admin at TAB and 165 Cross (CSC); R&J Center is program space  
R&J program space not captured

Space needs included as part of Reception

1 social work intern; also 4 therapy interns but no space needs

Includes workspace for Admin.

Assumed moving to 45 College

Assumed moving to 45 College

Assumed moving to 45 College

Assumed moving to Community Services & Activities programming

Assumed moving to Community Services & Activities programming

Assumed moving to Community Services & Activities programming

Assumed moving to Community Services & Activities programming

## DEPARTMENTAL SPACE NEEDS

IAM (Infrastructure and Asset Management)						
Administration						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - IAM	1		PO-1		165	165
Director of Finance and Administration	1		PO-3		100	100
Construction Liaison and Compliance Manager	1		WS-2		42	42
GIS Coordinator	1		WS-2		42	42
Head Clerk	1		WS-2		42	42
Senior Project Manager	1		WS-2		42	42
Storage			ST.5	1	50	50
Storage (shared by IAM)			ST2	1	200	200
Waiting / Reception; with desk			R2	1	220	220
Pantry / Kitchenette - Typ.			K1	0	100	-
Print Room - Plotting			W1	0	100	-
Hoteling / Touchdown			WS-3	0	30	-
Conference Room 3p - 4p			C4	0	120	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>6</b>	<b>0</b>				
					<b>Staff</b>	<b>433</b>
					<b>Other</b>	<b>470</b>
					<b>ASF</b>	<b>903</b>

**Notes**

Confirm shared storage and reception needs if 3 groups are separated

Storage for cameras, tripods, etc

Plan files and misc storage; at least 100 SF must be on-site (shared)

To include plan layout space and computer

IAM Capital Projects						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director	1		WS-2		42	42
Building Improvements Manager	1		WS-2		42	42
Capital Projects Manager	1		WS-2		42	42
Green Facilities Manager	1		WS-2		42	42
Project Manager	2	2	WS-2		42	84
Project Assistant	1		WS-2		42	42
<b>Total</b>	<b>8</b>	<b>2</b>				
					<b>Staff</b>	<b>394</b>
					<b>Other</b>	<b>-</b>
					<b>ASF</b>	<b>394</b>

**Notes**

If separated from IAM, confirm storage needs

LISTED AS WS-2; VERIFY

## DEPARTMENTAL SPACE NEEDS

IAM Engineering						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Deputy Director - Engineering Projects	1		WS-1		64	64
Deputy Director - Engineering Services	1		WS-1		64	64
Engineering Project Manager	2		WS-2		42	84
Junior Civil Engineer	1		WS-2		42	42
Senior Civil Engineer	1		WS-2		42	42
Senior Project Manager - Streetscapes	1		WS-2		42	42
Stormwater Program Manager	1		WS-2		42	42
Traffic Engineer	1		WS-2		42	42
Trench Inspector	1		WS-2		42	42
Utilities Project Manager	1		WS-2		42	42
<b>Total</b>	<b>12</b>	<b>0</b>				
					<b>Staff</b>	<b>606</b>
					<b>Other</b>	<b>-</b>
					<b>ASF</b>	<b>606</b>

### Notes

*If separated from IAM, confirm storage needs*

## DEPARTMENTAL SPACE NEEDS

Inspectional Services	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Superintendent	1		PO-1		165	165
Deputy Director	1		PO-3		100	100
Director of Administration and Finance	1		PO-3		100	100
Admin. Asst. SMEA B	1		WS-2		42	42
Building Inspector	7	4	WS-2		42	462
Chief Code Enforcement Inspector	1		WS-2		42	42
Chief Plumbing and Gas Inspector	1		WS-2		42	42
Chief Wire and Electrical Inspector	1		WS-2		42	42
Clerk		2	WS-2		42	84
Code Enforcement Inspector	2		WS-2		42	84
Code Enforcement Officer		1	WS-2		42	42
Deputy Sealer	1		WS-2		42	42
Electrical Inspector		1	WS-2		42	42
Inspectional Coordinator	1		WS-2		42	42
ISD Admin. Assistant	1		WS-2		42	42
ISD Liaison		1	WS-2		42	42
Plumbing and Gas Fitting Inspector	1		WS-2		42	42
Plumbing Inspector		1	WS-2		42	42
Safety Inspector	2		WS-2		42	84
Safety Officer		2	WS-2		42	84
Sealer	1		WS-2		42	42
Senior Clerk	2		WS-2		42	84
Senior Building Inspector	1		WS-2		42	42
Senior Code Enforcement Inspector	2	1	WS-2		42	126
Wire Inspector	2		WS-2		42	84
Senior Zoning Review Planner	1		WS-2	0	42	-
Zoning Review Planner	2	1	WS-2	0	42	-
ISD Paralegal	0		WS-2	1	42	42
Permits storage			ST1	1	100	100
Plan Storage			ST2	1	200	200
Reception / Plan Review Area				1	250	250
High Density Filing			ST-HD	1	100	100
Work / File Room			ST1	1	100	100
Break Room/ Kitchen (seating for 6)			K2	0	200	-
Print Room - Plotting			W1	0	100	-
Copy / Work Room - Typ.			W1	0	100	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>33</b>	<b>14</b>			<b>Staff</b>	<b>2,087</b>
					<b>Other</b>	<b>750</b>
					<b>ASF</b>	<b>2,837</b>

**Notes**

Confirm shared workstations and work from home policies

Position is part of ISD; workspace accounted for in OSPCD

Position is part of ISD; workspace accounted for in OSPCD

Space needs accounted for here; but position is in Law

Currently in vault (1st Fl)

Currently in vault (Bsmt)

Currently in 1st Fl; Includes 2 computers

Currently in 1st Fl

Currently in Bsmt

Can be shared but need plotter access

Requested dedicated

Request for monthly departmental meetings

## DEPARTMENTAL SPACE NEEDS

Department of Public Works Department of Public Works Administration						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Commissioner of DPW	1		PO-1		165	165
Director of Finance and Administration	1		PO-3		100	100
Director of Operations	1		PO-3		100	100
Executive Admin. Asst. (Non-union)	1		WS-1		64	64
Admin. Asst. SMEA B	1		WS-2		42	42
Head Clerk	2		WS-2		42	84
Principal Clerk	1		WS-2		42	42
Senior Clerk	1		WS-2		42	42
Transaction or Service Window			R4	3	30	90
Storage			ST1	1	100	100
Open Meeting Space: 4-6 p.			C6	1	120	120
Pantry / Kitchenette			K1	0	200	-
Medium Meeting Room: 10-14 p.			C2	0	280	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>9</b>	<b>0</b>			<b>Staff</b>	<b>639</b>
					<b>Other</b>	<b>310</b>
					<b>ASF</b>	<b>949</b>

### Notes

Program incomplete for staff without space needs; confirm lockers, support spaces, etc.

Requested by Admin

Ideally shared by DPW groups

Ideally shared by DPW groups

Ideally shared by DPW groups; Doubles as training space

DPW Buildings						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Superintendent of Buildings and Custodians	1		PO-3		100	100
Preventative Maintenance Manager	1		WS-2		42	42
Break Room / Kitchen			K2	1	200	200
<b>Total</b>	<b>2</b>	<b>0</b>			<b>Staff</b>	<b>142</b>
					<b>Other</b>	<b>200</b>
					<b>ASF</b>	<b>342</b>

### Notes

Staff totals do not include (59) staff without space needs

Union requirement; could be shared with Grounds

DPW Grounds						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Superintendent of Grounds	1		PO-3		100	100
Break Room / Kitchen			K2	0	200	-
<b>Total</b>	<b>1</b>	<b>0</b>			<b>Staff</b>	<b>100</b>
					<b>Other</b>	<b>-</b>
					<b>ASF</b>	<b>100</b>

### Notes

Staff totals do not include (19) staff without space needs

Union requirement; could be shared with Buildings

New - separated buildings and grounds

## DEPARTMENTAL SPACE NEEDS

DPW Highway								
Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
Superintendent of Highway	0	1			PO-3		100	100
<b>Total</b>	<b>0</b>	<b>1</b>					Staff	100
							<b>Other</b>	-
							<b>ASF</b>	<b>100</b>

Notes

Staff totals do not include (34) staff without space needs

DPW Fleet								
Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
Superintendent of Fleet	0	1			PO-3		100	100
<b>Total</b>	<b>0</b>	<b>1</b>					Staff	100
							<b>Other</b>	-
							<b>ASF</b>	<b>100</b>

Notes

DPW Lights and Lines								
Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
N/A						0	0	-
<b>Total</b>	<b>0</b>	<b>0</b>					Staff	-
							<b>Other</b>	-
							<b>ASF</b>	-

Notes

Staff totals do not include (4) staff without space needs

DPW Sanitation								
Description	EXISTING		PROPOSED		Space Type	Space Qty	Unit Area	ASF
	FTE 2022	FTE 2030 Growth						
TBC	0							-
<b>Total</b>	<b>0</b>	<b>0</b>					Staff	-
							<b>Other</b>	-
							<b>ASF</b>	-

Notes

Confirm Staff; No information provided

## DEPARTMENTAL SPACE NEEDS

Water Sewer						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Director	1		PO-1		165	165
Director of Administration and Finance	1		PO-3		100	100
Superintendent of Sewer	1		PO-3		100	100
Superintendent of Water	1		PO-3		100	100
Water Sewer Systems Analyst	1	-1	WS-1		64	-
Water Sewer Systems Analyst	1	-1	WS-2		42	-
Administrative Assistant	1		WS-2		42	42
Clerk		1	WS-2		42	42
Head Water Meter Technician	1		WS-2		42	42
Principal Clerk	2		WS-2		42	84
Senior Engineer		1	WS-2		42	42
Sewer Primary Operator	1		WS-2		42	42
Water Engineer	1		WS-2		42	42
Water Primary Operator	1		WS-2		42	42
Water Systems Billing Manager	1		WS-2		42	42
Transaction or Service Window			R4	3	30	90
Storage			ST1.5	1	150	150
Plan Review Space				1	100	100
Pantry / Kitchenette			K1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>14</b>	<b>0</b>				
					<b>Staff</b>	<b>885</b>
					<b>Other</b>	<b>340</b>
					<b>ASF</b>	<b>1,225</b>

### Notes

Staff totals do not include (24) staff without space needs

Secure inventory

Fire Prevention						
Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Professional / Administrative Staff	6		WS-2		42	252
Intern or PT (Hoteling / Benching)			WS-3	1	30	30
Transaction or Service Window			R4	2	30	60
Files				1	50	50
Pantry / Kitchenette			K1	0	100	-
Copy / Work Room			W1	0	100	-
Small Meeting Room: 6-8 p.			C3	0	200	-
Large Meeting Room: 20-24 p.			C1	0	500	-
<b>Total</b>	<b>6</b>	<b>0</b>				
					<b>Staff</b>	<b>282</b>
					<b>Other</b>	<b>110</b>
					<b>ASF</b>	<b>392</b>

### Notes

Not a position; requested flex workstation

12+ cabinets; Interested in digitizing



## DEPARTMENTAL SPACE NEEDS

Parking						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Director of Operations and PCO Supervisor	1		WS-1		64	64
Accountant	1		WS-2		42	42
Admin. Asst. SMEA B	1		WS-2		42	42
Head Clerk	2		WS-2		42	84
Hearing Officer	1		WS-2	2	42	84
PCO Supervisor	2		WS-2		42	84
Principal Clerk	2		WS-2		42	84
Project Analyst	1		WS-2		42	42
Senior Clerk	6		WS-2		42	252
Work Room				1	200	200
Counting & Safe				1	120	120
Paper Sign Storage				1	120	120
Dead Records Storage				1	400	400
Sign Shop				1	1,200	1200
Meter Shop				1	320	320
Meter Storage				1	600	600
Permit Storage				1	100	100
Dedicated Public Restroom				1	0	-
Waiting Room				1	1,200	1200
Hearing Room				1	100	100
Medium Meeting Room: 10-14 p.			C2	1	280	280
Break Room/ Kitchen (seating for 12)			K3	1	360	360
<b>Total</b>	<b>18</b>	<b>0</b>			<b>Staff</b>	<b>878</b>
					<b>Other</b>	<b>5,000</b>
					<b>ASF</b>	<b>5,878</b>

**Notes**

PSB - Public Safety Bldg programming for reference  
 Staff totals do not include (33) staff without space needs  
 To stay at 133 Holland

2 PTE

PSB-200 SF  
 PSB-120 SF  
 PSB-120 SF  
 PSB-400 SF  
 PSB-1200 SF  
 PSB-320 SF  
 PSB-600 SF  
 Additional request to PSB  
 Interview request if Parking was to relocate (included for reference)  
 PSB-1200 SF; significantly larger than exg (500 SF approx.)  
 PSB-90 SF  
 Can double as Roll Call space; PSB-336 SF  
 PSB-360 SF

Retirement						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-1		165	165
Deputy Director	1		PO-3		100	100
Professional / Administrative Staff	1		WS-2		42	42
Waiting / Reception; with desk			R2	1	220	220
Storage			ST.5	1	50	50
Medium Meeting Room: 10-14 p.			C2	1	280	280
<b>Total</b>	<b>3</b>	<b>0</b>			<b>Staff</b>	<b>307</b>
					<b>Other</b>	<b>550</b>
					<b>ASF</b>	<b>857</b>

**Notes**

To stay in 315 Broadway

## DEPARTMENTAL SPACE NEEDS

Parks and Recreation						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-1		165	165
Director of Operations and Field Maintenance	1		PO-3		100	100
Admin. Asst. SMEA B	1		WS-2		42	42
Clerk		1	WS-2		42	42
Aquatics Director		1	WS-2		42	42
Outreach Coordinator		1	WS-2		42	42
Program Coordinator		1	WS-2		42	42
Recreation Program Developer	1		WS-2		42	42
Specialized Program Coordinator	5		WS-2		42	210
Storage				1	1,200	1200
Game Room (Distribution)				1	1,250	1250
Waiting / Reception; with desk			R2	1	220	220
Small Meeting Room: 6-8 p.			C3	0	200	0
Medium Meeting Room: 10-14 p.			C2	0	280	0
Break Room/ Kitchen (seating for 6)			K2	0	200	0
<b>Total</b>	<b>9</b>	<b>4</b>				
					<b>Staff</b>	<b>727</b>
					<b>Other</b>	<b>2,670</b>
					<b>ASF</b>	<b>3,397</b>

### Notes

Staff totals do not include (7) staff without space needs

Existing approx. 2300 SF but appears inefficiently used  
 Moves to Community Services & Activities programming?

## DEPARTMENTAL SPACE NEEDS

Somerville Public Schools Schools Administration						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
<b>Administration</b>						
Superintendent	1		PO-1		165	165
Chief Communications & Development Officer	1		PO-3		100	100
Chief of Staff	1		PO-3		100	100
Director of Equity & Excellence	1		PO-3		100	100
Director of Operations	1		PO-3		100	100
Director of Out of School Time	1		PO-3		100	100
Director of Human Resources	1		PO-3		100	100
Finance Director	1		PO-3		100	100
Operations & Ext. Learning Director	1		PO-3		100	100
Accounts Supervisor	1		WS-2		42	42
Administrative Assistant	1		WS-2		42	42
Administrative Assistant, Supt.	1		WS-2		42	42
Assistant Director of Human Resources	1		WS-2		42	42
Communications Specialist	1		WS-2		42	42
Courier & Facilities Aide	1		WS-2		42	42
Deputy Financial Officer	1		WS-2		42	42
HR Generalist	1		WS-2		42	42
Payroll Manager	1		WS-2		42	42
Principal Account Clerk 2	2		WS-2		42	84
Principal Account Clerk Payroll	2		WS-2		42	84
Principal Clerk 1 HR	1		WS-2		42	42
Principal Clerk 2	1		WS-2		42	42
Volunteer Coordinators and Support	1		WS-2		42	42
Wellness Coordinator	1		WS-2		42	42
Writing Communications Specialist	1		WS-2		42	42
HR Intern	1		WS-2		42	42
<b>Curriculum and Instruction</b>						
Asst. Superintendent of Schools	1		PO-3		100	100
Coordinator Elementary CI&A (1-8)	1		WS-2		42	42
Data & Evaluation Specialist	1		WS-2		42	42
Innovation Project Specialist	1		WS-2		42	42
Performance Data Specialist	1		WS-2		42	42
Admin Educator Dvelopment	1		WS-2		42	42

**Notes**

Estimated 2030 growth based on overall admin rates; no data provided

Request adjacent private call rooms if in workstations

Staff totals do not include (17) nurses and admin. positions without space needs (moving from HHS)

## DEPARTMENTAL SPACE NEEDS

<b>English Language Learners</b>						
District Administrator	1		WS-2		42	42
ELL Parent Educator	1		WS-2		42	42
ELL Parent ESL Eacher	1		WS-2		42	42
ELL Parent Leader	3		WS-2		42	126
MLE Assessment & Placement Liaison	1		WS-2		42	42
MLE Curriculum & Instruction Specialist	1		WS-2		42	42
Multilingual Learner Education Program Coordinator	1		WS-2		42	42
<b>Food Services</b>						
Director	1		PO-3		100	100
Assistant Director	1		WS-2		42	42
Nutrition & Sustainability Director	1		WS-2		42	42
Principal Account Clerk	1		WS-2		42	42
<b>Special Education</b>						
Director	1		PO-3		100	100
Asst. Director - Instruction & Programming	3		WS-2		42	126
BCBA	2		WS-2		42	84
Education Evaluator	1		WS-2		42	42
Head Clerk	1		WS-2		42	42
Home Trainer / BCBA	1		WS-2		42	42
Multilingual Services	5		WS-2		42	210
Paraprofessional	3		WS-2		42	126
Principle Account Clerk 2	1		WS-2		42	42
School Psychologist	3		WS-2		42	126
Senior Clerk - Full Year	2		WS-2		42	84
Team Facilitator	3		WS-2		42	126
<b>Student Services</b>						
Director	1		PO-3		100	100
Adjustment Counselor	1		WS-2		42	42
Crisis Case Manager	1		WS-2		42	42
Supervisor of Attendance	2		WS-2		42	84
Social Worker	1		WS-2		42	42
Social Worker Pre K-3	1		WS-2		42	42

## DEPARTMENTAL SPACE NEEDS

Somerville Public Schools Schools Administration (continued)						
<b>Other</b>						
<i>Estimated Growth 2030 - position TBD</i>		15	WS-2		42	630
Storage Room - XL			ST4	1	400	400
Small Meeting Room: 6-8 p.			C3	0	200	0
Large Meeting Room: 20-24 p.			C1	0	500	0
Community Meeting Room: 35-40 p.			C7	0	720	0
Copy / Work Room - Lg			W2	0	150	0
Break Room/ Kitchen (seating for 12)			K3	0	360	0
<b>Total</b>	<b>80</b>	<b>15</b>			<b>Staff</b>	<b>4,809</b>
					<b>Other</b>	<b>400</b>
					<b>ASF</b>	<b>5,209</b>

Confirm storage needs

Based on exg 1200 SF Conference Space (shared with below)

Based on exg 1200 SF Conference Space (shared with above)

Exg Staff Lounge - 573 SF

SPS Early Childhood Services						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director - Early Education & Care	1		PO-3		100	100
Academic Coach	1		WS-2		42	42
Early Childhood Intern	1		WS-2		42	42
Instructional Coach	2		WS-2		42	84
Itinerant Special Education Service	1		WS-2		42	42
PT Grant Project Assistant	1		WS-2		42	42
Coordinatory SPYC*	1		WS-2		42	42
Summer Program Stipends	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		2	WS-2		42	84
Storage				1	215	215
<b>Total</b>	<b>9</b>	<b>2</b>			<b>Staff</b>	<b>520</b>
					<b>Other</b>	<b>215</b>
					<b>ASF</b>	<b>735</b>

Notes

ECS is not slated to move from Capuano; all program carried as dedicated

Estimated 2030 growth based on overall admin rates; no data provided

## DEPARTMENTAL SPACE NEEDS

SPS Somerville Family Learning Collaborative						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	2		PO-3		100	200
Director Parent Child Home Program	1		PO-3		100	100
Early Beginnings Liaison	1		WS-2		42	42
Early Conn and Lit Playgroup Leader	1		WS-2		42	42
Home Visitors	5		WS-2		42	210
Multilingual Coordinator	1		WS-2		42	42
Program Liaison	1		WS-2		42	42
PT SFLC Program Specialist	0.5		WS-2	1	42	42
Volunteer Coordinator	1		WS-2		42	42
School Readiness Transition Specialist	1		WS-2		42	42
Multilingual Services	3		WS-2		42	126
Playgroup Facilitator	4		WS-2		42	168
SFLC Basic Needs Family & Community Liaison	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		3.5	WS-2	4	42	168
Waiting / Reception; with desk			R2	1	220	220
Family Waiting / Children Play Area			R3	1	80	80
Playgroup Space				1	1100	1,100
Clothing Closet				1	710	710
Storage				1	780	780
Small Meeting Room: 6-8 p.			C3	0	200	0
Medium Meeting Room: 10-14 p.			C2	0	280	0
Community Meeting Room: 35-40 p.			C7	0	720	0
<b>Total</b>	<b>22.5</b>	<b>3.5</b>			<b>Staff</b>	<b>1,308</b>
					<b>Other</b>	<b>2,890</b>
					<b>ASF</b>	<b>4,198</b>

### Notes

Holding program spaces based on exg for test fit purposes

Program paces shared with EO are carried in SFLC

Estimated 2030 growth based on overall admin rates; no data provided

Confirm position in Admin

Confirm SF

Confirm SF

Confirm SF

Confirm SF

Confirm SF

Confirm SF

SPS Enrollment Office (formerly Parent Information Center)						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Director	1		PO-3		100	100
Liaison	2		WS-2		42	84
Principle Clerk 1	1		WS-2		42	42
Student Enrollment and Registration Specialist	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		1	WS-2		42	42
Storage				1	480	480
<b>Total</b>	<b>5</b>	<b>1</b>			<b>Staff</b>	<b>310</b>
					<b>Other</b>	<b>480</b>
					<b>ASF</b>	<b>790</b>

### Notes

Staff and stg only; program spaces are carried with SFLC

Estimated 2030 growth based on overall admin rates; no data provided

EO is technically part of SFLC

Confirm SF

SPS Somerville Center for Adult Learning & Education

Description	EXISTING		PROPOSED		Unit Area	ASF
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty		
Director of Continuing Education	1		PO-3		100	100
Computer Operator	1		WS-2		42	42
FT Counselor	2		WS-2		42	84
FT Teacher	1		WS-2		42	42
FT Teacher (Goal Program Inst.)	1		WS-2		42	42
Head Clerk 1	1		WS-2		42	42
Principle Clerk 1	1		WS-2		42	42
Program Administrator	2		WS-2		42	84
PT ABE Counselor	0.5		WS-2	1	42	42
PT ADP	0.5		WS-2	1	42	42
PT ADP Assessor	0.5		WS-2	1	42	42
PT Chief Examiner	0.5		WS-2	1	42	42
PT Counselor	0.5		WS-2	1	42	42
PT ELL Counselor	0.5		WS-2	1	42	42
Senior Clerk - Full Year	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		3	WS-2		42	126
Storage			ST2	1	200	200
Reception / Lobby			R2	1	220	220
ELL Classrooms (18-23 seats)				8	750	6000
ABE Classrooms (15 seats)				4	450	1800
Instructional (Computer) Lab (25 seats)				1	750	750
HISSET Test Center (20 seats)				1	600	600
Teacher's Lounge			K3	1	360	360
Student Lounge (20 students)				1	500	500
Goal Lounge (12-16 students)			K3	1	360	360
Meeting / Counseling Room: 3-4 p.			C4	2	120	240
Medium Meeting Room: 10-14 p.			C2	0	280	0
Large Meeting Room: 20-24 p.			C1	0	500	0
<b>Total</b>	<b>14</b>	<b>3</b>			<b>Staff</b>	<b>898</b>
					<b>Other</b>	<b>11,030</b>
					<b>ASF</b>	<b>11,928</b>

Notes

Estimated 2030 growth based on overall admin rates; no data provided

Staff totals do not include staff without space needs

2 PTE

2 PTE

Laptops (125), textbooks and teacher storage cabinets

Confirm SF needs; assumes 30 SF/pp

Confirm SF needs; assumes 30 SF/pp

Exg 700 SF; assumes 30 SF/pp

Exg 625 SF; assumes 30 SF/pp

2 requested; 1 provided

Lunch Room; vending machines

Hang-out space between classes; smart boards and computers

Dedicated "rooms" for counseling and assessment

Requested for departmental meetings

Requested for vendor / speaker presentations

## DEPARTMENTAL SPACE NEEDS

SPS Community Schools						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Asst. Director	1		WS-2		42	42
Community Education Admin.	1		WS-2		42	42
Principle Account Clerk	1		WS-2		42	42
Principle Clerk 1	1		WS-2		42	42
PT Clerical Substitute	1		WS-2		42	42
Senior Clerk - Full Year	1		WS-2		42	42
Social Worker	1		WS-2		42	42
Student Services Coordinator	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		2	WS-2		42	84
Waiting / Reception; with desk			R2	1	220	220
Files				1	50	50
Small Meeting Room: 6-8 p.			C3	0	200	0
<b>Total</b>	<b>8</b>	<b>2</b>			<b>Staff</b>	<b>420</b>
					<b>Other</b>	<b>270</b>
					<b>ASF</b>	<b>690</b>

### Notes

Space not accessible at time of survey; Exg SFs based on pdf

Estimated 2030 growth based on overall admin rates; no data provided

Accounts for 1 Admin workspace above as part of Reception

Confirm SF; not accessible at time of survey

Libraries						
Description	EXISTING		PROPOSED			
	FTE 2022	FTE 2030 Growth	Space Type	Space Qty	Unit Area	ASF
Library Director	1		PO-1		165	165
Admin. Asst. SMEA B	1		WS-2		42	42
Branch Librarian - East	1		PO-3		100	100
Deputy Director	1		PO-3		100	100
Librarian I	9		WS-2		42	378
Librarian II	7		WS-2		42	294
Library First Assistant	3		WS-2		42	126
Library Senior Assistant	1		WS-2		42	42
Library Technician II	4		WS-2		42	168
Library Technician III	5		WS-2		42	210
Manager of Branch Services	1		WS-2		42	42
<i>Estimated Growth 2030 - position TBD</i>		7	WS-2		42	294
<b>Total</b>	<b>34</b>	<b>7</b>			<b>Staff</b>	<b>1,961</b>
					<b>ASF</b>	<b>1,961</b>

### Notes



SOMERVILLE MP - 1895 BUILDING  
1895 BUILDING  
October 28, 2021

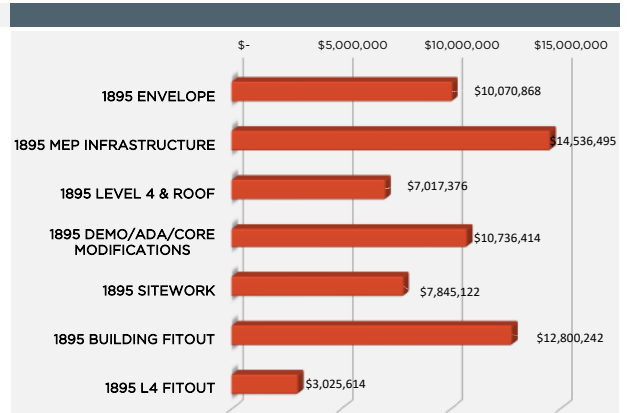


ONE BEACON ST  
FLOOR 15  
BOSTON, 02108

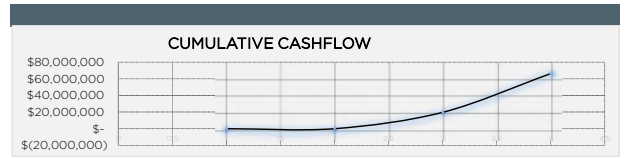
CONSTRUCTION COST  
& RISK CONSULTANTS

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE 1895 BUILDING RENOVATION. THE MODEL SHOWS ALL APPLICABLE RENOVATION CONSTRUCTION : EXISTING BUILDING MEP REPLACEMENT AND CORE RENOVATION WORK . THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN.

CONSTRUCTION COSTS \$ (ESCALATED)					
COST ELEMENT	GSF	\$/SF	CONST \$ (ESCALATED)	PROJECT \$ (ESCALATED)	
1895 ENVELOPE	75,240	\$ 134	\$ 10,070,868	\$ 10,070,868	
1895 MEP INFRASTRUCTURE	75,240	\$ 193	\$ 14,536,495	\$ 14,536,495	
1895 LEVEL 4 & ROOF	14,850	\$ 473	\$ 7,017,376	\$ 7,017,376	
1895 DEMO/ADA/CORE MODIFICATIONS	60,390	\$ 178	\$ 10,736,414	\$ 10,736,414	
1895 SITEWORK	71,570	\$ 110	\$ 7,845,122	\$ 7,845,122	
1895 BUILDING FITOUT	60,390	\$ 212	\$ 12,800,242	\$ 12,800,242	
1895 L4 FITOUT	14,850	\$ 204	\$ 3,025,614	\$ 3,025,614	
<b>TOTAL CONSTRUCTION COSTS</b>	<b>75,240</b>	<b>\$878</b>	<b>\$ 66,032,131</b>	<b>\$ 66,032,131</b>	
SOFT COSTS		0%	\$ -	EXCLUDED	
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED	
<b>TOTAL CAPITAL EXPENDITURE</b>			<b>\$ 66,032,131</b>	<b>\$ 66,032,131</b>	



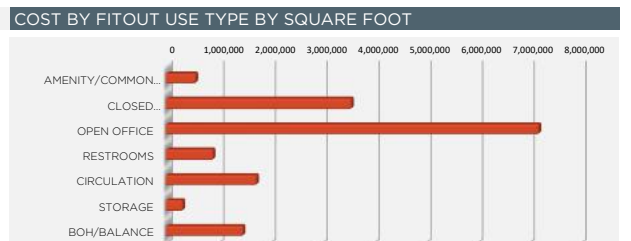
BUILDINGS CASHFLOW FORECAST			
SPEND TOTALS	ANNUAL	CUMULATIVE	
2021	\$ -	\$ -	
2022	\$ -	\$ -	
2023	\$ 19,788,296	\$ 19,788,296	
2024+	\$ 46,243,835	\$ 66,032,131	



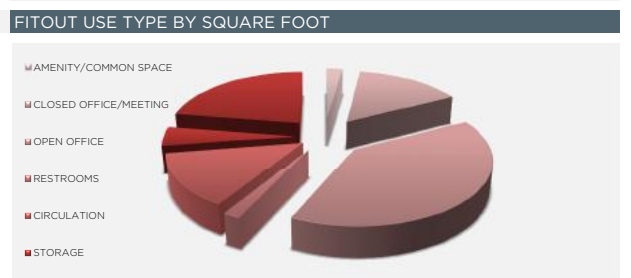
ALTS & BREAKOUTS	\$	\$/SF
<b>ALTERNATES (CONSTRUCTION COST VALUES)</b>		
ENV #1 - Deduct to maintain flat roof	(\$5,305,883)	(\$70.52)
ENV #2 - Slate Shingles ILO synthetic slate	\$483,814	\$6.43
ENV #3 - GFRG dentils/cornices ILO terracotta	(\$166,507)	(\$2.21)
ENV #4 - Full repointing to match mortar	\$1,303,057	\$17.32
MECH #1 - ASHP ILO GSHP	(\$2,960,028)	(\$39.34)
PLUMB #1 - Deduct rainwater flushing reuse	(\$211,040)	(\$2.80)
DEMO #1 - Early Abatement & Enabling Package	(\$2,736,900)	(\$36.38)
- Demo ALT #1: requires early abatement and demo package is accepted.		
<b>BREAKOUT COSTS (Included within construction costs)</b>		
Structural/Facade Repair Allowances	\$1,677,038	\$22.29
<b>** For scope related to unmitigated water ingress</b>		
Site Elevator Scope	\$727,185	\$9.66

CONTINGENCY & ESCALATION SUMMARY	
Design contingency	11.0%
Construction contingency	4.5%
Owners contingency	0.0%
Productivity loss factor	0.0%
GL Insurance & Subguard	2.6%
Bond	1.5%
Escalation carried to Midpoint	10.3%
Project labor assumptions	Union

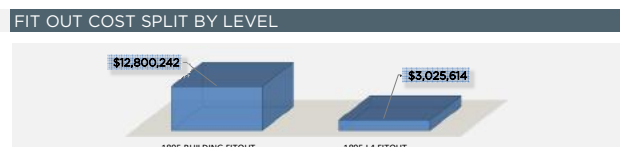
FITOUT USE TYPE BY COST	TOTAL \$	% MIX	CONST \$
AMENITY/Common Space		4%	575,903
Closed Office/Meeting		26%	3,583,889
Open Office		51%	7,206,981
Restrooms		6%	909,407
Circulation		12%	1,744,922
Storage		2%	322,558
BOH/Balance		11%	1,482,196



FITOUT USE TYPE BY SQUARE FOOT	% MIX OF TYPE	AREAS SF
AMENITY/Common Space	2%	1,740
Closed Office/Meeting	15%	11,394
Open Office	40%	29,720
Restrooms	2%	1,360
Circulation	14%	10,380
Storage	5%	3,690
BOH/Balance	23%	16,956



BUILDING FIT-OUT COST \$	% MIX	CONST \$
1895 BUILDING FITOUT	81%	\$ 12,800,242
1895 L4 FITOUT	19%	\$ 3,025,614



### EXCLUSIONS & ASSUMPTIONS

- 1 Escalation per annum is carried at 8% for 2021, 5% for 2022, and 4% for 2023 to an assumed midpoint of December 1, 2023. For the final 2 months of 2021, we anticipate 1.3% escalation to end of year.
- 2 We have included 11% design contingency on trade costs
- 3 We have included 4.5% construction contingency on trade costs + design contingency
- 4 We have included 2.6% for GL & Subguard Insurance on cost of work (trade + contingencies + general conditions)
- 5 We have included 1.5% for a bond on cost of work (trade + contingencies + general conditions)
- 6 We have included a 3% CM Fee
- 7 We have excluded permit costs, assumed covered by City
- 8 General project requirements are carried at 5% of trade costs
- 9 General conditions are costed per assumed project schedule durations, see GC staffing sheet at back of the report
- 10 Soft costs, FFE & owner's contingency have been excluded
- 11 All work is priced on regular hours, OT allowances are excluded presently

### BASIS OF ESTIMATE

- 1 1895 Bldg\_Demolition and C&S Plans\_A-1 to A-5\_20211004
- 2 1895 Bldg\_EX-4 Existing Elevations with Estimating Markups\_2021-10-07
- 3 1895 Bldg\_H&A Ground Source Heat Pump Concept Sketch and Memo\_20211005
- 4 1895 Bldg\_PSR\_Cost Estimating Roof & 4th Floor Massing\_20211004
- 5 1895 Bldg\_STRUCT\_19887 2021-10-07 1895 Building-Structural Overlays
- 6 1895 Bldg\_Test-Fit Diagram Proposed Plans with Updates
- 7 Central Hill\_BBB Site and Landscape Sketch Overlay\_20211007
- 8 Central Hill\_Nitsch Proposed Site & Utilities Concept Sketch\_20211006
- 9 HBM Survey Rpt 1985 HS 092921

### Systems Assumptions

#### General

Please see estimate backup for additional assumptions, qualifications & exclusions  
Construction of new L4 structure & sloped roof w/ program fitout is included in the base estimate  
All boring wells for the ground source heat pump system to serve both 1985 and City hall are included within this estimate.

#### Foundations/Basement Construction

Costs are included to replace 20% of the existing basement SOG  
Costs are included for 7'H of bentonite grout injection at the foundation perimeter  
Costs are included to create new areaways on the South elevation, assumed areaways will be 4' deep  
All other work to existing foundations is excluded

#### Superstructure

Rebuilding/support of existing structure has been assumed per the sketches provided on the structural overlay.  
An allowance of \$10/SF is included for misc. structural scope  
Per findings seen on site and noted within the report, much of the historic joists support L4 are in place below the open web steel truss system supporting the existing flat roof. Per the structural overlay we have assumed these joists to remain with select replacement and repairs.  
Select steel reinforcement and LVL joists with plywood subfloor are included for L4 floor infill where required per the structural drawings.  
An allowance of \$24/SF has been included for seismic upgrades to the existing building structure

#### Exterior Enclosure

Estimate assumes full scaffolding of building in order to complete façade restoration scope  
Full window replacement is included, including enlarging openings/reinstating arches as indicated in the narratives  
Allowance are included per LF to recreate the TC dentils & foliate units and feature façade bands as called for by the narrative and indicated on the elevation sketch.  
An allowance of \$12/SF has been included on the surface area of the façade for misc. repointing/repairs & sealants as required

An allowance of \$30,000 has been included for a new entrance canopy  
Curtainwall is assumed at the contemporary addition and included within the L4 & Roof rebuild section. A premium is included for the 3D treatment at the north elevation extending down to L2 and L3.

#### Roofing

Costs are included for building a new sloped roof per the narrative. This includes an allowance of 10PSF for structural steel, roof deck, copper gutters/downspouts and allowances for misc. requirements

Per the narrative, a traditional slate shingle roof is included at the historic roof areas. The contemporary sloped roof is carried as standing metal seam.

Allowances have been included for two skylights and dormer construction

An allowance is include for rebuilding the historcial chimney's to align with the MEP strategy.

#### Interior Construction/Finishes

An allowance of \$10/SF has been carried for C&S interior construction requirements, including constructing new shafts, rebuilding masonry walls, etc.

An additional allowance of \$9.50/SF has been carried for C&S interior construction to account for the required rated GWB ceiling at the underside of all floor joist assemblies to meet required code upgrades to achieve Type IIIA construction. This is an add from the previous iteration of this study.

Fitout costs are modeled to reflect the level of finish provided within the updated narrative and the new program test fits.

#### Stairways/Conveying

(2) new (5) stop elevators have been included

A new lift has been carried per the narrative

Existing stairwells are assumed to remain with repainted guardrails, all new handrails and new 521 CMR compliant walking surfaces

#### Services

Estimate assumes full replacement of all MEP systems per narrative

Fitout MEPPF costs are modeled

An allowance is INCLUDED for rainwater reuse for flushing. Greywater harvesting from sinks is EXCLUDED.

#### Furnishings/Equipment

The furnishing and equipment costs carried in this model represent a full gut renovation of interior spaces.

Fixed furnishes included only. Workstations are excluded and assumed part of FFE, power/data to locations is included as required

#### Demolition & Abatement

Abatement scope identified within the report is presently included within the estimate and assumed to be bought out as part of this project scope.

A \$3/SF allowance for general demo is included.

DEMO ALT#1 is included to show the savings on this project cost if the early release package for demo and abatement proceeds as a separate project. See Separate 1895 Demo & Abatement Concept Estimate dated October 28, 2021 for the cost of the standalone project.

Abatement beyond the scope and budget of the Axiom report is EXCLUDED at this time.

#### Site Improvements

Contaminated soil disposal is EXCLUDED from this estimate.

#### Site Mechanical Utilities

Storm sewer mitigation is excluded

New storm sewer lines and sanitary sewer lines are included per the site sketch provided. This scope is a notable add from the previous iteration of the study.

New water service is included per the sketch provided.

#### Site Electrical Utilities

Utilities are carried in the sitework section

DIVISION SUMMARY		75,240 GFA	28-Oct-21
		\$/SF	\$ TOTAL
Project Requirements		28.99	2,181,255
<b>PROJECT REQUIREMENTS</b>		28.99	2,181,255
A10. Foundations		5.63	423,617
A20. Basement Construction			0
<b>A. SUBSTRUCTURE</b>		5.63	423,617
B10. Superstructure		45.73	3,440,744
B20. Exterior Enclosure		99.22	7,465,118
B30. Roofing		21.72	1,634,185
<b>B. SHELL</b>		166.67	12,540,046
C10. Interior Construction		35.35	2,659,763
C30. Interior Finishes		27.77	2,089,110
<b>C. INTERIORS</b>		63.12	4,748,873
C20. Stairways		1.75	132,000
D10. Conveying Systems		8.17	615,000
<b>VERTICAL TRANSPORTATION</b>		9.93	747,000
D20. Plumbing Systems		20.24	1,523,102
D30. Heating, Ventilating & Air Conditioning		112.61	8,472,833
D40. Fire Protection Systems		6.85	515,556
D50. Electric Lighting, Power & Communications		66.75	5,022,528
<b>D. SERVICES</b>		206.46	15,534,019
E10. Equipment		3.28	246,500
E20. Furnishings		9.72	731,575
<b>E. EQUIPMENT AND FURNISHINGS</b>		13.00	978,075
F10. Special Construction (Sustainability allowance)		0.00	0
F20. Selective Demolition		40.23	3,027,269
<b>F. SPECIAL CONSTRUCTION AND DEMOLITION</b>		40.23	3,027,269
<b>TOTAL BUILDING CONSTRUCTION</b>		534.03	40,180,154
G10. Site Preparation		2.50	188,442
G20. Site Improvements		51.10	3,844,865
G30. Site Civil/Mechanical Utilities		12.21	918,856
G40. Site Electrical Utilities		2.90	218,033
G90. Other Site Construction		0.00	0
<b>TOTAL SITE CONSTRUCTION</b>		68.72	5,170,196
<b>TOTAL TRADE COSTS</b>		602.74	45,350,350
a. Design Contingency	11.0%	66.30	4,988,538
b. Logistics & Loss Productivity	0.0%	0.00	0
c. Construction Contingency	4.5%	30.11	2,265,250
d. General Conditions	6.14%	42.91	3,228,300
<b>SUBTOTAL</b>		742.06	55,832,438
e. Permits	0.0%	0.00	0
f. Insurances	2.6%	19.29	1,451,643
g. Bond	1.5%	11.13	837,487
h. Fee	3.0%	23.17	1,743,647
<b>TOTAL COST TODAY</b>		795.66	59,865,215
i. Escalation	10.3%	81.96	6,166,915
<b>TOTAL ANTICIPATED CONSTRUCTION COST</b>		<b>\$878</b>	<b>66,032,131</b>

SUMMARY BY PROGRAM

75,240 GFA



TRADE		CORE & SHELL	/ SF	COMBINED FIT-OUT PROJECTS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING		\$ 2,521,913	\$ 33.52	\$ 505,356	\$ 6.72	\$ 3,027,269	\$ 40.23
FOUNDATIONS		\$ 423,617	\$ 5.63	\$ -	\$ -	\$ 423,617	\$ 5.63
BASEMENT CONSTRUCTION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE		\$ 3,440,744	\$ 45.73	\$ -	\$ -	\$ 3,440,744	\$ 45.73
EXTERIOR ENCLOSURE		\$ 7,465,118	\$ 99.22	\$ -	\$ -	\$ 7,465,118	\$ 99.22
ROOFING		\$ 1,634,185	\$ 21.72	\$ -	\$ -	\$ 1,634,185	\$ 21.72
INTERIOR CONSTRUCTION		\$ 1,215,605	\$ 16.16	\$ 1,444,158	\$ 19.19	\$ 2,659,763	\$ 35.35
INTERIOR FINISHES		\$ -	\$ -	\$ 2,089,110	\$ 27.77	\$ 2,089,110	\$ 27.77
STAIRWAYS		\$ 132,000	\$ 1.75	\$ -	\$ -	\$ 132,000	\$ 1.75
CONVEYING SYSTEMS		\$ 615,000	\$ 8.17	\$ -	\$ -	\$ 615,000	\$ 8.17
PLUMBING		\$ 1,177,624	\$ 15.65	\$ 345,478	\$ 4.59	\$ 1,523,102	\$ 20.24
HVAC		\$ 5,444,373	\$ 72.36	\$ 3,028,460	\$ 40.25	\$ 8,472,833	\$ 112.61
FIRE PROTECTION		\$ 327,456	\$ 4.35	\$ 188,100	\$ 2.50	\$ 515,556	\$ 6.85
ELECTRICAL		\$ 2,919,582	\$ 38.80	\$ 2,102,946	\$ 27.95	\$ 5,022,528	\$ 66.75
EQUIPMENT		\$ -	\$ -	\$ 246,500	\$ 3.28	\$ 246,500	\$ 3.28
FURNISHINGS		\$ 90,585	\$ 1.20	\$ 640,990	\$ 8.52	\$ 731,575	\$ 9.72
SUSTAINABILITY ALLOWANCE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP		\$ 188,442	\$ 2.50	\$ -	\$ -	\$ 188,442	\$ 2.50
SITE IMPROVEMENTS		\$ 3,844,865	\$ 51.10	\$ -	\$ -	\$ 3,844,865	\$ 51.10
SITE CIVIL / MECHANICAL		\$ 918,856	\$ 12.21	\$ -	\$ -	\$ 918,856	\$ 12.21
SITE ELECTRICAL		\$ 218,033	\$ 2.90	\$ -	\$ -	\$ 218,033	\$ 2.90
OTHER SITE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL DIRECT COSTS</b>		<b>\$ 32,577,997</b>	<b>\$ 432.99</b>	<b>\$ 10,591,098</b>	<b>\$ 140.76</b>	<b>\$ 43,169,095</b>	<b>\$ 573.75</b>
Design Contingency	11.00%	\$ 3,765,267	\$ 50.04	\$ 1,223,272	\$ 16.26	\$ 4,988,538	\$ 66.30
Logistics & Loss Productivity	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	4.50%	\$ 1,709,773	\$ 22.72	\$ 555,477	\$ 7.38	\$ 2,265,250	\$ 30.11
General Conditions	6.14%	\$ 2,746,396	\$ 36.50	\$ 481,904	\$ 6.40	\$ 3,228,300	\$ 42.91
Project Requirements	5.05%	\$ 1,651,700	\$ 21.95	\$ 529,555	\$ 7.04	\$ 2,181,255	\$ 28.99
<b>SUBTOTAL</b>		<b>\$ 42,451,133</b>	<b>\$ 564.21</b>	<b>\$ 13,381,306</b>	<b>\$ 177.85</b>	<b>\$ 55,832,438</b>	<b>\$ 742.06</b>
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	2.60%	\$ 1,103,729	\$ 14.67	\$ 347,914	\$ 4.62	\$ 1,451,643	\$ 19.29
Bond	1.50%	\$ 636,767	\$ 8.46	\$ 200,720	\$ 2.67	\$ 837,487	\$ 11.13
CM Fee	3.00%	\$ 1,325,749	\$ 17.62	\$ 417,898	\$ 5.55	\$ 1,743,647	\$ 23.17
<b>SUBTOTAL</b>		<b>\$ 45,517,378</b>	<b>\$ 604.96</b>	<b>\$ 14,347,837</b>	<b>\$ 190.69</b>	<b>\$ 59,865,215</b>	<b>\$ 795.66</b>
Escalation	10.30%	\$ 4,688,897	\$ 62.32	\$ 1,478,019	\$ 19.64	\$ 6,166,915	\$ 81.96
<b>TOTAL</b>		<b>\$ 50,206,275</b>	<b>\$ 667.28</b>	<b>\$ 15,825,856</b>	<b>\$ 210.34</b>	<b>\$ 66,032,131</b>	<b>\$ 877.62</b>

SUMMARY BY PROGRAM

TRADE	75,240		75,240		14,850		60,390		71,570	
	RENOVATION CORE & SHELL									
	1895 ENVELOPE		1895 MEP INFRASTRUCTURE		1895 LEVEL 4 & ROOF		1895 DEMO/ADA/CORE MODIFICATIONS		1895 SITEWORK	
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,521,913	\$ 41.76	\$ -	\$ -
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 423,617	\$ 7.01	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ 1,981,526	\$ 133.4	\$ 1,459,218	\$ 24.16	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ 6,485,278	\$ 86.19	\$ -	\$ -	\$ 979,840	\$ 65.98	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ 1,634,185	\$ 110.0	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,215,605	\$ 20.13	\$ -	\$ -
INTERIOR FINISHES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 132,000	\$ 2.19	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 615,000	\$ 10.18	\$ -	\$ -
PLUMBING	\$ -	\$ -	\$ 1,137,880	\$ 15.12	\$ -	\$ -	\$ 39,744	\$ 0.66	\$ -	\$ -
HVAC	\$ -	\$ -	\$ 5,391,381	\$ 71.66	\$ -	\$ -	\$ 52,992	\$ 0.88	\$ -	\$ -
FIRE PROTECTION	\$ -	\$ -	\$ 300,960	\$ 4.00	\$ -	\$ -	\$ 26,496	\$ 0.44	\$ -	\$ -
ELECTRICAL	\$ -	\$ -	\$ 2,755,224	\$ 36.62	\$ -	\$ -	\$ 164,358	\$ 2.72	\$ -	\$ -
EQUIPMENT	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FURNISHINGS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 90,585	\$ 1.50	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 188,442	\$ 2.63
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,844,865	\$ 53.72
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 918,856	\$ 12.84
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 218,033	\$ 3.05
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL DIRECT COSTS</b>	<b>\$ 6,485,278</b>	<b>\$ 86.19</b>	<b>\$ 9,585,445</b>	<b>\$ 127.40</b>	<b>\$ 4,595,551</b>	<b>\$ 309.46</b>	<b>\$ 6,741,528</b>	<b>\$ 111.63</b>	<b>\$ 5,170,196</b>	<b>\$ 72.24</b>
Design Contingency	\$ 749,050	\$ 9.96	\$ 1,107,119	\$ 14.71	\$ 530,786	\$ 35.74	\$ 781,154	\$ 12.94	\$ 597,158	\$ 8.34
Logistics & Loss Productivity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 340,137	\$ 4.52	\$ 502,733	\$ 6.68	\$ 241,025	\$ 16.23	\$ 354,715	\$ 5.87	\$ 271,164	\$ 3.79
General Conditions	\$ 616,538	\$ 8.19	\$ 616,538	\$ 8.19	\$ 336,293	\$ 22.65	\$ 840,733	\$ 13.92	\$ 336,293	\$ 4.70
Project Requirements	\$ 324,264	\$ 4.31	\$ 479,272	\$ 6.37	\$ 229,778	\$ 15.47	\$ 359,876	\$ 5.96	\$ 258,510	\$ 3.61
<b>SUBTOTAL</b>	<b>\$ 8,515,265</b>	<b>\$ 113.17</b>	<b>\$ 12,291,107</b>	<b>\$ 163.36</b>	<b>\$ 5,933,433</b>	<b>\$ 399.56</b>	<b>\$ 9,078,007</b>	<b>\$ 150.32</b>	<b>\$ 6,633,320</b>	<b>\$ 92.68</b>
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 221,397	\$ 2.94	\$ 319,569	\$ 4.25	\$ 154,269	\$ 10.39	\$ 236,028	\$ 3.91	\$ 172,466	\$ 2.41
Bond	\$ 127,729	\$ 1.70	\$ 184,367	\$ 2.45	\$ 89,001	\$ 5.99	\$ 136,170	\$ 2.25	\$ 99,500	\$ 1.39
CM Fee	\$ 265,932	\$ 3.53	\$ 383,851	\$ 5.10	\$ 185,301	\$ 12.48	\$ 283,506	\$ 4.69	\$ 207,159	\$ 2.89
<b>SUBTOTAL</b>	<b>\$ 9,130,323</b>	<b>\$ 121.35</b>	<b>\$ 13,178,894</b>	<b>\$ 175.16</b>	<b>\$ 6,362,004</b>	<b>\$ 428.42</b>	<b>\$ 9,733,712</b>	<b>\$ 161.18</b>	<b>\$ 7,112,445</b>	<b>\$ 99.38</b>
Escalation	\$ 940,545	\$ -	\$ 1,357,602	\$ 18.04	\$ 655,371	\$ 44.13	\$ 1,002,702	\$ 16.60	\$ 732,677	\$ 10.24
<b>TOTAL</b>	<b>\$ 10,070,868</b>	<b>\$ 121.35</b>	<b>\$ 14,536,495</b>	<b>\$ 193.20</b>	<b>\$ 7,017,376</b>	<b>\$ 472.55</b>	<b>\$ 10,736,414</b>	<b>\$ 177.78</b>	<b>\$ 7,845,122</b>	<b>\$ 109.61</b>

SUMMARY BY PROGRAM

	1,740		11,394		29,720		1,360		10,380		3,690		16,956	
	RENOVATION FIT-OUT MODEL													
	AMENITY/Common Space		CLOSED OFFICE/MEETING		OPEN OFFICE		RESTROOMS		CIRCULATION		STORAGE		BOH/BALANCE	
TRADE	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 10,440	\$ 6.00	\$ 68,364	\$ 6.00	\$ 199,850	\$ 6.72	\$ 9,520	\$ 7.00	\$ 72,660	\$ 7.00	\$ 25,830	\$ 7.00	\$ 118,692	\$ 7.00
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 34,800	\$ 20.00	\$ 478,548	\$ 42.00	\$ 583,480	\$ 19.63	\$ 88,400	\$ 65.00	\$ 155,700	\$ 15.00	\$ 18,450	\$ 5.00	\$ 84,780	\$ 5.00
INTERIOR FINISHES	\$ 78,300	\$ 45.00	\$ 512,730	\$ 45.00	\$ 1,026,550	\$ 34.54	\$ 108,800	\$ 80.00	\$ 259,500	\$ 25.00	\$ 18,450	\$ 5.00	\$ 84,780	\$ 5.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 34,800	\$ 20.00	\$ -	\$ -	\$ -	\$ -	\$ 217,600	\$ 160.00	\$ 31,140	\$ 3.00	\$ 11,070	\$ 3.00	\$ 50,868	\$ 3.00
HVAC	\$ 87,000	\$ 50.00	\$ 683,640	\$ 60.00	\$ 1,458,700	\$ 49.08	\$ 74,800	\$ 55.00	\$ 311,400	\$ 30.00	\$ 73,800	\$ 20.00	\$ 339,120	\$ 20.00
FIRE PROTECTION	\$ 4,350	\$ 2.50	\$ 28,485	\$ 2.50	\$ 74,300	\$ 2.50	\$ 3,400	\$ 2.50	\$ 25,950	\$ 2.50	\$ 9,225	\$ 2.50	\$ 42,390	\$ 2.50
ELECTRICAL	\$ 87,000	\$ 50.00	\$ 455,760	\$ 40.00	\$ 1,026,550	\$ 34.54	\$ 47,600	\$ 35.00	\$ 155,700	\$ 15.00	\$ 59,040	\$ 16.00	\$ 271,296	\$ 16.00
EQUIPMENT	\$ 17,400	\$ 10.00	\$ 56,970	\$ 5.00	\$ 116,150	\$ 3.91	\$ 4,080	\$ 3.00	\$ 51,900	\$ 5.00	\$ -	\$ -	\$ -	\$ -
FURNISHINGS	\$ 31,320	\$ 18.00	\$ 113,940	\$ 10.00	\$ 337,530	\$ 11.36	\$ 54,400	\$ 40.00	\$ 103,800	\$ 10.00	\$ -	\$ -	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL DIRECT COSTS</b>	<b>\$ 385,410</b>	<b>\$ 221.50</b>	<b>\$ 2,398,437</b>	<b>\$ 210.50</b>	<b>\$ 4,823,110</b>	<b>\$ 162.28</b>	<b>\$ 608,600</b>	<b>\$ 447.50</b>	<b>\$ 1,167,750</b>	<b>\$ 112.50</b>	<b>\$ 215,865</b>	<b>\$ 58.50</b>	<b>\$ 991,926</b>	<b>\$ 58.50</b>
Design Contingency	\$ 44,515	\$ 25.58	\$ 277,019	\$ 24.31	\$ 557,069	\$ 18.74	\$ 70,293	\$ 51.69	\$ 134,875	\$ 12.99	\$ 24,932	\$ 6.76	\$ 114,567	\$ 6.76
Logistics & Loss Productivity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 20,214	\$ 11.62	\$ 125,792	\$ 11.04	\$ 252,960	\$ 8.51	\$ 31,920	\$ 23.47	\$ 61,246	\$ 5.90	\$ 11,322	\$ 3.07	\$ 52,024	\$ 3.07
General Conditions	\$ 26,049	\$ 14.97	\$ 130,244	\$ 11.43	\$ 208,391	\$ 7.01	\$ 26,049	\$ 19.15	\$ 52,098	\$ 5.02	\$ 13,024	\$ 3.53	\$ 26,049	\$ 1.54
Project Requirements	\$ 19,271	\$ 11.08	\$ 119,922	\$ 10.53	\$ 241,156	\$ 8.11	\$ 30,430	\$ 22.38	\$ 58,388	\$ 5.63	\$ 10,793	\$ 2.93	\$ 49,596	\$ 2.93
<b>SUBTOTAL</b>	<b>\$ 495,458</b>	<b>\$ 284.75</b>	<b>\$ 3,051,415</b>	<b>\$ 267.81</b>	<b>\$ 6,082,686</b>	<b>\$ 204.67</b>	<b>\$ 767,292</b>	<b>\$ 564.19</b>	<b>\$ 1,474,356</b>	<b>\$ 142.04</b>	<b>\$ 275,937</b>	<b>\$ 74.78</b>	<b>\$ 1,234,163</b>	<b>\$ 72.79</b>
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 12,882	\$ 7.40	\$ 79,337	\$ 6.96	\$ 158,150	\$ 5.32	\$ 19,950	\$ 14.67	\$ 38,333	\$ 3.69	\$ 7,174	\$ 1.94	\$ 32,088	\$ 1.89
Bond	\$ 7,432	\$ 4.27	\$ 45,771	\$ 4.02	\$ 91,240	\$ 3.07	\$ 11,509	\$ 8.46	\$ 22,115	\$ 2.13	\$ 4,139	\$ 1.12	\$ 18,512	\$ 1.09
CM Fee	\$ 15,473	\$ 8.89	\$ 95,296	\$ 8.36	\$ 189,962	\$ 6.39	\$ 23,963	\$ 17.62	\$ 46,044	\$ 4.44	\$ 8,618	\$ 2.34	\$ 38,543	\$ 2.27
<b>SUBTOTAL</b>	<b>\$ 531,245</b>	<b>\$ 305.31</b>	<b>\$ 3,271,818</b>	<b>\$ 287.15</b>	<b>\$ 6,522,038</b>	<b>\$ 219.45</b>	<b>\$ 822,713</b>	<b>\$ 604.94</b>	<b>\$ 1,580,849</b>	<b>\$ 152.30</b>	<b>\$ 295,868</b>	<b>\$ 80.18</b>	<b>\$ 1,323,306</b>	<b>\$ 78.04</b>
Escalation	\$ 54,725	\$ 31.45	\$ 337,041	\$ 29.58	\$ 671,857	\$ 22.61	\$ 84,750	\$ 62.32	\$ 162,848	\$ 15.69	\$ 30,478	\$ 8.26	\$ 136,318	\$ 8.04
<b>TOTAL</b>	<b>\$ 585,970</b>	<b>\$ 336.76</b>	<b>\$ 3,608,859</b>	<b>\$ 316.73</b>	<b>\$ 7,193,895</b>	<b>\$ 242.06</b>	<b>\$ 907,464</b>	<b>\$ 667.25</b>	<b>\$ 1,743,697</b>	<b>\$ 167.99</b>	<b>\$ 326,346</b>	<b>\$ 88.44</b>	<b>\$ 1,459,624</b>	<b>\$ 86.08</b>



TRADE	QTY	UNIT	RATE	TOTAL
<b>EXTERIOR ENCLOSURE</b>	<b>75,240</b>			<b>6,485,278</b>
<b><u>Scaffolding - assume scaffolding @ entire enclosure</u></b>	34,275	SF		<i>For reference only</i>
Scaffolding	34,275	SF	18.00	616,950
Scrim	34,275	SF	5.00	171,375
Misc. setup/tear down	100	MD	800.00	80,000
<b><u>New 4th Floor Glass Massing at North Side</u></b>				See L4 & Roof
<b><u>Façade Demo</u></b>				-
Clear vegetation from windows and sills per report - allowance	1	LS	5,000.00	5,000
Remove plywood infills - 19 Loc	1,770	SF	6.50	11,505
Remove CMU infills - 5 Loc	390	SF	25.00	9,750
Demo Existing Parapet	3,470	SF	20.00	69,400
Demo remnant foundation walls	280	SF	25.00	7,000
Reconstitute Historic Brick Openings where infilled - assumes structural header/lintel still remains and no shoring required - 18 Loc	325	SF	30.00	9,750
Remove brick infill to be replaced to match historic detailing	50	SF	35.00	1,750
- Shoring for above	1	LS	4,000.00	4,000
Demo brick masonry wall at new window locations	1,160	SF	35.00	40,600
- Shoring for above	46	LOC	2,500.00	115,000
<b><u>Façade Masonry Restoration and Rebuild</u></b>				-
100% Masonry Cleaning	34,275	SF	5.00	171,375
100% Repoint North Face at highlighted section	1,400	SF	35.00	49,000
Allowance - 20% of remaining brick to require repoint	3,200	SF	35.00	112,000
Rebuild of arches due to steel rust-jacking - allow 10 Arch locations	10	LOC	7,500.00	75,000
Brick stitching @ 15% of window openings	25	LOC	1,500.00	37,800
Remove/replace 1 wythe brick	1,650	SF	80.00	132,000
Allow for 5% replacement of backup wythe - assume single bricks	800	BRICKS	70.00	56,000
Full Depth Masonry rebuild at openings and infill, inclusive of brick stitching at perimeter	1,265	SF	200.00	253,000
<b><u>New Windows</u></b>				-
New Windows at Existing Openings	150	EA		Ref only
- new window - triple glazed Pella Reserve BOD	4,050	SF	200.00	810,000
- grouting/insulation				Incl. above
- masonry touchup at window surrounds	2,834	LF	75.00	212,550
- waterproofing	150	LOC	600.00	90,000
New Windows at Reconstituted Openings	12	EA		Ref only
- new window - triple glazed Pella Reserve BOD	265	SF	200.00	53,000
- plate frame	222	LF	400.00	88,800
- grouting/insulation				Incl. above
- masonry touchup at window surrounds	222	LF	90.00	19,980

TRADE	QTY	UNIT	RATE	TOTAL
- repairs to historic arches and header details where applicable	3	LOC	4,500.00	13,500
- waterproofing	12	LOC	600.00	7,200
New Windows at Expanded Openings at Areaways	24	EA		Ref only
- new window - triple glazed Pella Reserve BOD	506	SF	200.00	101,200
- plate frame	450	LF	400.00	180,000
- grouting/insulation				Incl. above
- masonry touchup at window surrounds	450	LF	90.00	40,500
- waterproofing	24	LOC	600.00	14,400
- Demo brick for larger opening	253	SF	35.00	8,855
New Windows at New Openings	46	EA		Ref only
- new window - triple glazed Pella Reserve BOD	1,160	SF	200.00	232,000
- plate frame	960	LF	400.00	384,000
- grouting/insulation				Incl. above
- masonry touchup at window surrounds	960	LF	90.00	86,400
- waterproofing	46	LOC	600.00	27,600
- rebuild historic corbel window header detail	12	LOC	4,000.00	48,000
- rebuild/repair historic arch window header details	6	LOC	5,000.00	30,000
New Windows at Full Depth Rebuilds	10	EA		Ref only
- new window - triple glazed Pella Reserve BOD	300	SF	200.00	60,000
- plate frame	230	LF	400.00	92,000
- grouting/insulation				incl. above
- masonry touchup at window surrounds	230	LF	90.00	20,700
- waterproofing	10	LOC	600.00	6,000
- rebuild historic corbel window header detail	7	LOC	5,000.00	35,000
- rebuild/repair historic arch window header details	2	LOC	7,500.00	15,000
<b>Misc. Façade Scope</b>				-
Replace Terracotta Window Sills at existing windows where indicated on report - 4 Loc	18	LF	325.00	5,850
Replace Terracotta dentils & foliate units along roof line, recreate historic detail - per report	175	LF	375.00	65,625
Replace Terracotta Band Detail at L3 Window header height per markup - ( -EI 150) 1'8" H with articulated profile	50	LF	550.00	27,500
Replace Terracotta Band Detail at L2 - ( -EI 128) 1'8" H with articulated profile	58	LF	500.00	29,000
Replace Terracotta Band Detail at L1 - ( -EI 116) 12" H	58	LF	300.00	17,400
Replace Terracotta Band Detail at LO Header band - ( -EI 113) 1'8" H	90	LF	290.00	26,100
New Terracotta sills at reinstated & new windows	110	LF	325.00	35,750
Repainting of extg terracotta- qty allowance	2,500	LF	15.00	37,500
Remove metal louvers and replace TC units at 8 locations (32 TC units)	32	EA	1,000.00	32,000
TC spall repairs	20	LOC	800.00	16,000
Coursed granite facing at exposed rubble foundations at rear and at new areaways (inclusive of waterproofing & grouting)	1,550	SF	190.00	294,500

TRADE	QTY	UNIT	RATE	TOTAL
Clean/repoint extg granite foundation	611	LF	50.00	30,550
Misc. repointing/repairs/sealants	34,275	SF	15.00	514,125
<b><u>New Façade/Entrances</u></b>				-
Entrance canopy - allowance	120	SF	250.00	30,000
Single fire stair egress doors in new opening - flush metal doors	2	EA	3,000.00	6,000
New entrance at ramp	1	EA	10,000.00	10,000
New entrance storefront	120	SF	150.00	18,000
New entrance glass doors	2	LOC	10,000.00	20,000
Automatic door openers	6	LOC	3,500.00	21,000
<b><u>Interior Side - Below Grade</u></b>				
Furring - 1 layer paperless gypsum on 2.5" studs set 5" from wall. AVB not required per narrative note.	2,250	SF	8.25	18,563
3" closed cell spray foam	2,250	SF	7.50	16,875
<b><u>Interior Side - Above Grade</u></b>				-
Furring - 2.5" stud, 1 layer drywall. Smart Vapor Retarder, MemBrain BOD	31,750	SF	11.00	349,250
5" open cell spray foam	31,750	SF	5.00	158,750
<b>PROJECT REQUIREMENTS</b>	<b>75,240</b>			<b>324,264</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	6,485,277.50	324,264
<b>TOTAL DIRECT COSTS</b>				<b>6,809,541</b>
<b>ALLOCATIONS</b>				<b>3,261,327</b>
General Conditions	22.0	28,024	wks	616,538
Permits	0.0 %			-
Insurances	2.6 %			221,397
Design Contingency	11.0 %			749,050
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			340,137
Bond	1.5 %			127,729
Fee	3.0 %			265,932
Escalation	10.3 %		12/1/2023	940,545
<b>TOTAL CONSTRUCTION COST</b>				<b>10,070,868</b>

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	75,240			-
Demolition of extg MEP systems			See Abatement & Enabling Section	
PLUMBING	75,240			1,137,880
Plumbing infrastructure replacement	75,240	SF	12.00	902,880
Rainwater storage & reuse - allow				-
Rainwater treatment skid: filters, UV, day tank, booster pump, recirc pump to exterior tank, dye infusion	1	LS	100,000	100,000
Exterior storage tank - 30,000 gal				With Site Section
Makeup water connection w/ backflow preventer	1	LS	10,000	10,000
Exterior storage tank - 5000Gal day tank for flushing	1	LS	15,000.00	15,000
Piping and connections for fixture flushing- allow	1	LS	75,000	75,000
Misc. rainwater harvesting scope required	1	LS	35,000	35,000
HVAC	75,240			5,391,381
<u>Geothermal wells, allow (60 each @ 500LF deep) for 1895 &amp; City Hall</u>				-
Inclusive of wells & closed system piping	60	EA	25,000.00	1,500,000
- spoils control from drilling process - allowance	1	LS	50,000.00	50,000
Glycol piping, 3" (ALL-IN) - allow	600	LF	80.00	48,000
Geothermal manifold/pipe header vault	1	EA	25,000.00	25,000
Geothermal pumps - 30 hp primary pumps	2	EA	25,000.00	50,000
Secondary Geothermal pumps			See GTWP pumps below	
Storage tanks - 600 gal	2	EA	7,500.00	15,000
Glycol water piping between wells - per schematic, 3" assumed per H&A input	3,100	LF	80.00	248,000
<u>Heating/cooling equipment</u>				-
6-pipe modular GSHP chiller consisting of (4) 50 ton (nominal) VFD scroll heat recovery chiller modules, similar to Multistack VME-2	200	TON	2,250.00	450,000
- 10 hp GTWP (vertical in-line close coupled)	2	EA	22,000.00	44,000
- 7.5 hp HWP (vertical in-line close coupled)	2	EA	15,000.00	30,000
- 7.5 hp CHWP (vertical in-line close coupled)	2	EA	15,000.00	30,000
125 ton split adiabatic remote condenser air-cooled chiller with maglev centrifugal compressor	125	TON	1,600.00	200,000
- 5 hp CHWP pumps for chiller	2	EA	10,000.00	20,000
Heat exchanger	1	LS	30,000.00	30,000
- HX GTW to CHW, 300 gpm	1	EA	45,000.00	45,000
- HX GTW to CHW, 240 gpm	1	EA	36,000.00	36,000
New glycol system/ feed	1	LS	20,000.00	20,000
Chemical shot feeder, air separation, expansion	1	LS	25,000.00	25,000
<u>Air Distribution</u>				-
AHU-1 - with ECM fans	15,000	CFM	17.00	255,000
<u>Exhaust</u>				-
General exhaust - allow	1	LS	3,500.00	3,500
<u>Smoke extract</u>				-
			Excluded, assume not required	
<u>Energy Performance</u>				-
Variable Frequency Drives				-
AHUs - ECM fans				No VFD Req.
GTHP Primary Pumps	2	EA	20,000.00	40,000
GTHP Secondary Pumps - allowance	2	EA	3,500.00	7,000
HW/CHW Pumps	6	EA	3,500.00	21,000
VFD's for exhaust fans, allow	1	EA	1,500.00	1,500
Energy Metering Allowance	1	LS	30,000.00	30,000

TRADE	QTY	UNIT	RATE	TOTAL
Terminal Units				w/ Fitout
Pipe, Valves & Connections				-
Steam Piping			Excluded, assume not required	
Heating/Cooling piping				-
- CHW/HW mains & risers, runouts to equipment	1,358	LF	80.00	108,664
- Piping on floor loops	8,466	LF	40.00	338,656
Control valves on main equipment	13	EA	3,500.00	45,500
Sheetmetal & Accessories				-
Primary ductwork galvanized sheetmetal tying AHU's	13,050	LBS	15.50	202,275
General bathroom & exhaust ductwork	1,400	LBS	15.50	21,700
Accessories				-
Fire dampers for main supply extract risers (Assume)	4	EA	2,250.00	9,000
Volume dampers, control dampers & access Panels	1	LS	34,946.25	34,946
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
Insulation				-
Piping insulation	9,825	LF	11.00	108,072
Ductwork insulation	10,038	SF	6.00	60,231
Fuel Systems			Excluded, assume not required	
Data room cooling	1	LS	15,000.00	15,000
Building Management System				-
Head end allowance	1	LS	35,000.00	35,000
GSHP	150	PTS	1,200.00	180,000
Pumps	40	PTS	1,200.00	48,000
AHUs - assume 40pts ea average	40	PTS	1,200.00	48,000
Fans	4	PTS	1,200.00	4,800
Misc.	20	PTS	1,200.00	24,000
Testing, balancing & commissioning support	1	LS	180,313.76	180,314
Co-ordination, rigging, CAD, Sub-trade temp	1	LS	703,223.66	703,224
<b>FIRE PROTECTION</b>	<b>75,240</b>			<b>300,960</b>
Fire protection infrastructure	75,240	SF	4.00	300,960
<b>ELECTRICAL</b>	<b>75,240</b>			<b>2,755,224</b>
Normal Service Distribution				-
1500KVA pad mounted xfmr	1	LS	187,500	187,500
2000A swbd, CT cab	1	LS	90,000	90,000
45kva step down xfmr	2	EA	5,000.00	10,000
- Labor for equipment install	768	MH	125.00	96,000
150A power panel - 84 ckts	5	EA	7,650.00	38,250
100A lighting panels	5	EA	3,000.00	15,000
Mechanical panel - 400A	1	EA	8,000.00	8,000
Mechanical panel - 150A	1	EA	4,500.00	4,500
ATS Switches				-
ATS-LS, OP	2	EA	25,000.00	50,000
Energy Metering				-
Energy meters	15	EA	3,500.00	52,500
Normal Feeders	75,240	SF	3.00	225,720
Emergency Power Distribution				-
Generator - Diesel Generator (serves 1895 & city hall)	300	KW	400	120,000
Acoustic enclosure allowance	1	LS	60,000	With Site
Panel/connections	1	LS	15,000	15,000
Emergency Distribution Panels - allow	5	EA	4,500	22,500
Emergency Feeders	75,240	SF	1.50	112,860
Mechanical / Equipment Power	75,240	SF	2.50	188,100
Lighting, inclusive of conduit, fitting and wiring				w/ fitout

TRADE	QTY	UNIT	RATE	TOTAL
Lighting controls				w/ fitout
Receptacle power				w/ fitout
Fire Alarm				-
Fire Alarm - complete system	75,240	SF	7.00	526,680
Temp fire alarm	75,240	SF	1.50	112,860
BDA			Excluded, assume not required	
Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)	75,240	SF	3.00	225,720
Audio visual				w/ fitout
Security systems allowance (head-end and backbone)	75,240	SF	2.00	150,480
Lightning protection	75,240	SF	0.85	63,954
PV infrastructure allowance	1	LS	100,000	100,000
Testing & bonding	1	LS	89,124.96	89,125
Sub-trade temps/ gcs	1	LS	250,475	250,475
<b>PROJECT REQUIREMENTS</b>	<b>75,240</b>			<b>479,272</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	9,585,445	479,272
<b>TOTAL DIRECT COSTS</b>				<b>10,064,718</b>
<b>ALLOCATIONS</b>				<b>4,471,778</b>
General Conditions	22.0	28,024	wks	616,538
Permits	0.0 %			-
Insurances	2.6 %			319,569
Design Contingency	11.0 %			1,107,119
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			502,733
Bond	1.5 %			184,367
Fee	3.0 %			383,851
Escalation	10.3 %		12/1/2023	1,357,602
<b>TOTAL CONSTRUCTION COST</b>				<b>14,536,495</b>

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	60,390			2,521,913
<b>HAZMAT Abatement - Per Axiom Report</b>				-
Transite Lab Hood	150	SF	13.33	2,000
12" x 12" Dark Gray Floor Tile Mastic	10,900	SF	4.00	43,600
12" x 12" Light Gray Floor Tile Mastic	15,500	SF	4.00	62,000
9" x 9" Gray/Brown Floor Tile	48,000	SF	6.00	288,000
9" x 9" Gray/Brown Floor Tile Mastic	48,000	SF		incl. above
6" Pipe Insulation	250	LF	20.00	5,000
6" Pipe Elbow Insulation	35	EA	15.00	525
Green Floor Tile	16,000	SF	6.00	96,000
White Floor Tile	16,000	SF	6.00	96,000
12" x 12" and 9' x 9" floor tiles and black mastic (various types)	64,000	SF		incl. above
Interior joint compound			Excluded, assume not ACM	
White pipe fitting and elbow insulation	18,000	LF	5.00	90,000
Black Sink Coating	150	EA	10.00	1,500
Multicolored Sheet Flooring	150	SF	5.00	750
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	1	ALLOW	5,000.00	5,000
Interior Components w/ Boiler Unit	1	ALLOW	3,000.00	3,000
Misc. hazardous building materials	1	LS	10,000.00	10,000
- 5.5% Contingency for above ( 4.5% carried below line)	1	LS	38,685.63	38,686
- Estimated Abatement Design/Bid & Monitoring Fee - for above	1	LS	22,416.23	22,416
<b>HAZMAT Abatement based on report - (items to remain if Demo Alt #1 Taken)</b>				-
Exterior Door Caulking	4	EA	125.00	500
Interior joint compound			Excluded, assume not ACM	
Window Caulking old under new	20,000	LF	1.10	22,000
Black Vapor Barrier on CMU Block Wall	1	LS	600,000.00	600,000
Exterior Door Caulking	500	LF	5.00	2,500
Exterior black tar on coping	5,000	SF	5.00	25,000
Exterior caulk at roof penthouse - N/A TBD - Allowance held	1	LS	4,000.00	4,000
Coating on Roof Curbing	NA			TBD
Asphaltic Damp Proofing	5,000	SF	20.00	100,000
Buried Pipes - allowance (TBD in report)	1	LS	20,000.00	20,000
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	168	EA	125.00	21,000
Roofing Materials Assoc. w/ Flat Roof System	16,000	SF	5.00	80,000
- 5.5% Contingency for above ( 4.5% carried below line)	1	LS	48,125.00	48,125
- Estimated Abatement Design/Bid & Monitoring Fee - for above	1	LS	27,583.77	27,584
<b>Selective Demolition</b>				-
<b>Flooring</b>				-
Remove Carpet & Base (Carpet + wood flooring below to subfloor)	2,767	SF	3.50	9,685
Remove VCT & Base (VCT + wood flooring below to subfloor) - assume VCT removed w/ abatement	31,224	SF	2.50	78,060

TRADE	QTY	UNIT	RATE	TOTAL
Remove Terrazzo & Base (removed to subfloor)	560	SF	10.00	5,600
Remove Wood & Base (removed to subfloor)	7,762	SF	2.50	19,405
<u>Ceilings</u>				-
Remove extg ceilings throughout	60,000	SF	2.75	165,000
<u>Interior Partitions</u>				-
Remove furring down to structure @ exterior walls	34,271	SF	2.25	77,110
Remove furring down to structure @ interior load bearing walls	72,185	SF	2.25	162,416
Remove typical interior partitions	33,461	SF	3.00	100,382
Remove doors & frames	152	LVS	100.00	15,200
Remove bathroom partitions	21	EA	350.00	7,350
Cart/dispose of plumbing fixtures	48	EA	150.00	7,200
<u>Misc. Interior</u>				-
Remove trash, millwork/cabinetry, tackboards, etc.	256	MH	95.00	24,320
<u>MEPFP</u>				-
Removal/disposal of dropped MEPFP piping, duct, equipment, etc.	60,000	SF	1.00	60,000
See MEP Sections below for demo by trade				-
Allowance - General demo	60,000	SF	1.25	75,000
<b>FOUNDATIONS</b>	<b>60,390</b>			<b>423,617</b>
<u>Existing Foundations</u>				-
Removal/replacement of extg basement slab on grade - assume 6" (20%)	3,100	SF		<i>For reference only</i>
Chop/remove extg slab	3,100	SF	12.00	37,200
Pour new reinforced 6" slab	3,100	SF	15.00	46,500
Bentonite grout injection	4,277	SF	40.00	171,080
<u>New Areaways</u>				-
Excavate for new areaways	100	CY	100.00	9,956
Footings for areaway walls	22	CY	850.00	18,889
Areaway walls	30	CY	1,100.00	32,593
Areaway slab	672	SF	15.00	10,080
Metal Grate at areaway tops	672	SF	35.00	23,520
Granite cladding @ extg rubble foundation				See Envelope
<u>Elevator Pits</u>				-
Remove slab	130	SF	50.00	6,500
Excavate for elevator pits	29	CY	150.00	4,333
Underpin Full perimeter of Slab	60	LF	550.00	33,000
Elevator Slab 12" Reinforced concrete	5	CY	750.00	3,611
Elevator Pit Walls * 12" Reinforced concrete	13	CY	850.00	11,333
New 30x30x12 footings for lift	2	EA	5,000.00	10,000
Dispose of excavated materials - excludes contaminates	51	TONS	40.00	2,022
Patch slab @ perimeter	1	LS	3,000.00	3,000
<b>SUPERSTRUCTURE</b>	<b>60,390</b>			<b>1,459,218</b>
<u>New Walls</u>				-
CMU bearing at shafts - assume 60'H total (Inclusive of resupporting floor joists on masonry wall)	2,880	SF	50.00	144,000



TRADE	QTY	UNIT	RATE	TOTAL
Infill wall openings where shown on plan	1,121	SF	50.00	56,025
<b>Superstructure L1-L3</b>				-
Demo existing floor structure to be replaced	1,825	SF	20.00	36,500
Rebuild flooring - steel decking and concrete fill	1,825	SF	21.00	38,325
HSS steel column up from existing masonry pier	12	EA	4,000.00	48,000
HSS steel to new foundations at lift	2	EA	3,500.00	7,000
New Steel Beams at floor replacements - unsized beams, assume 8lbs/sf on area of floor to be replaced	7	TONS	6,000.00	43,800
- inclusive of connections of existing joists	130	LF	300.00	39,000
Shoring - allowance	260	LF	80.00	20,800
<b>Superstructure L4 and Roof Rebuild</b>			See L4 & Roof section of estimate	
<b>New Wall Openings</b>				-
Demo existing masonry walls for new openings, 74 LOC	5,581	CF	30.00	167,430
Steel lentils at openings	480	LFR	180.00	86,400
Repair and refinish edges of frames cuts	74	EA	1,000.00	74,000
Remove extg slab for new lift	270	SF	15.00	4,050
Remove slab for elevator shaft	250	SF	20.00	5,000
Remove slab for mechanical shaft	250	SF	20.00	5,000
Frame shaft openings	4	LOC	5,000.00	20,000
Rebuild entry level slab	156	SF	30.00	4,680
<b>Infill Floor for additional Space</b>	444	SF		Ref Only
Support steel - 10 lbs./sf assumed	2	TON	6,000.00	13,320
Steel decking & concrete fill	444	SF	27.00	11,988
<b>Stairs, Ramps, &amp; misc.</b>				-
Rebuild entry stairs - incl rails	102	LFR	250.00	25,500
New accessible ramp	90	SF	50.00	4,500
Misc. structural allowance for repairs	60,390	SF	10.00	603,900
<b>ROOFING</b>	60,390			-
<b>New Sloped Roof - Lower Roof</b>			Excluded, not required with infill scope	
<b>INTERIOR CONSTRUCTION</b>	60,390			<b>1,215,605</b>
Core & Shell Interior Construction - Allowance	60,390	SF	10.00	603,900
Code required rated GWB ceiling at all floor joists - Allowance	60,390	SF	9.50	573,705
Fire-rated internal glazing at stairwell area abutting new infill rooms - 6 windows	120	SF	250.00	30,000
- allowance, fire rated floor plate transition detailing	1	LS	8,000.00	8,000
<b>STAIRWAYS</b>	60,390			<b>132,000</b>
Refinish existing stair treads, paint existing guardrails	8	FLT	6,500.00	52,000
Add handrails to extg to remain guardrails	8	FLT	5,000.00	40,000
Extend stairs to L4	2	FLTS	20,000.00	40,000
<b>CONVEYING SYSTEMS</b>	60,390			<b>615,000</b>
Passenger elevator	10	STPS	55,000.00	550,000
Wheelchair lift - allowance	1	LS	65,000.00	65,000
<b>PLUMBING</b>	60,390			<b>\$ 39,744</b>
<b>Demolition</b>				
Cut/drop/make safe	36	MD	960.00	34,560
Disinfecting, testing of pipe, sign-off				Excluded
Subcontractor's GCs/GRs	1	LS	5,184.00	5,184
<b>HVAC</b>	60,390			<b>\$ 52,992</b>
<b>Demolition</b>				

TRADE	QTY	UNIT	RATE	TOTAL
Cut/drop/make safe	48	MD	960.00	46,080
Testing, balancing & commissioning				Excluded
Subcontractor's GCs/GRs	1	LS	6,912.00	6,912
<b>FIRE PROTECTION</b>	<b>60,390</b>			<b>\$ 26,496</b>
<u>Demolition</u>				
Cut/drop/make safe	24	MD	960.00	23,040
Hydraulic calculations, testing, etc.				Excluded
Subcontractor's GCs/GRs	1	LS	3,456.00	3,456
<b>ELECTRICAL</b>	<b>60,390</b>			<b>\$ 164,358</b>
Demo/make-safe	48	MD	1,040.00	49,920
Temp light & power	60,000	SF	0.75	45,000
Protect & maintain ETR fire alarm system	60,000	SF	0.80	48,000
<u>Testing, grounding &amp; bonding</u>				Excluded
Subcontractor's GCs/GRs	1	LS	21,438.00	21,438
<b>FURNISHINGS</b>	<b>60,390</b>			<b>90,585</b>
Accessibility Signage - allowance	60,390	SF	1.00	60,390
Wayfinding Signage & Departmental Graphics	60,390	SF	0.50	30,195
<b>PROJECT REQUIREMENTS</b>	<b>60,390</b>			<b>359,876</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	6,741,528	337,076
Equipment rental, Hepa/environmental control etc.	24.0	WK	400.00	9,600
Temp electric usage	6.0	MO	500.00	3,000
Temp water usage	6.0	MO	500.00	3,000
Temp sanitary facilities	6.0	MO	1,200.00	7,200
<b>TOTAL DIRECT COSTS</b>				<b>7,101,404</b>
<b>ALLOCATIONS</b>				<b>3,635,010</b>
General Conditions	30.0	28,024	wks	840,733
Permits	0.0 %			-
Insurances	2.6 %			236,028
Design Contingency	11.0 %			781,154
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			354,715
Bond	1.5 %			136,170
Fee	3.0 %			283,506
Escalation	10.3 %		12/1/2023	1,002,702
<b>TOTAL CONSTRUCTION COST</b>				<b>10,736,414</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>SUPERSTRUCTURE</b>	<b>14,850</b>			<b>1,981,526</b>
<b><u>New L4 Structure</u></b>				-
Remove extg roof structure inclusive of open web steel joists	13,886	SF	12.00	166,632
- Protect existing wood subfloor & wood framing at former L4 floor (protection membrane at full surface, plywood subfloor carried below for final condition)	13,886	SF	8.50	118,031
L4 Structure - Repair	8,200	SF		Ref Only
- Assume select replacement for existing wood floor joists (assumes 10% of existing)	820	SF	60.00	49,200
L4 Structure - New Steel per structural sketch and input	7	TON	6,500.00	45,500
- W10 - Weight not specified	65	LF		incl. above
- W12 - Weight not specified	50	LF		-
- W24 - Weight not specified	72	LF		-
L4 Structure - New TIJ wood joists per sketch				Ref Only
- 9-1/2" TJI 360 @ 16" OC joists	925	SF	58.00	53,650
- 11-7/8" TJI 360 @ 16" OC joists	1,120	SF	65.00	72,800
- 16" TJI 360 @ 16" OC joists	3,530	SF	73.00	257,690
Plywood Subfloor	5,575	SF	4.50	25,088
Misc. metals. requirements	14,850	SF	1.50	22,275
<u>Seismic upgrade allowance</u>	45,540	SF	24.00	1,092,960
Chimney Rebuild - CMU Backup, select reinf., 2 LOC	2,220	SF	35.00	77,700
<b>EXTERIOR ENCLOSURE</b>	<b>14,850</b>			<b>979,840</b>
<b><u>New 4th Floor Massing at North Side</u></b>				-
Glass curtain wall - standard aluminum framing	3,225	SF	200.00	645,000
- Premium, custom shape at infill	900	SF	275.00	247,500
Allowance - misc. metal and sealants connections to existing envelope below	220	LF	175.00	38,500
Brick Facing, single wythe at chimney	2,220	SF	22.00	48,840
<b>ROOFING</b>	<b>14,850</b>			<b>1,634,185</b>
<b><u>New Sloped Roof</u></b>	19,700	SF		Ref Only
Roof structure - structural steel, allow 10PSF	99	TONS	6,000.00	591,000
Roof deck	19,700	SF	6.00	118,200
Standing Seam Metal Roof - Contemporary Roof	5,805	SF	45.00	261,225
Synthetic Slate roofing System	13,895	SF	30.00	416,850
Concealed copper gutters	700	LF	75.00	52,500
Copper downspouts	750	LF	75.00	56,250
Allowance for snow guards, misc. roof requirements	13,895	SF	8.00	111,160
Allowance - chimney vents & weather protection	2	EA	8,500.00	17,000
Allowance for skylights	2	EA	5,000.00	10,000

TRADE	QTY	UNIT	RATE	TOTAL
PROJECT REQUIREMENTS	14,850			<b>229,778</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	4,595,551	229,778
<b>TOTAL DIRECT COSTS</b>				<b>4,825,328</b>
ALLOCATIONS				<b>2,192,048</b>
General Conditions	12.0	28,024	wks.	336,293
Permits	0.0 %			-
Insurances	2.6 %			154,269
Design Contingency	11.0 %			530,786
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			241,025
Bond	1.5 %			89,001
Fee	3.0 %			185,301
Escalation	10.3 %		12/1/2023	655,371
<b>TOTAL CONSTRUCTION COST</b>				<b>7,017,376</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>SITE PREP</b>	<b>71,570</b>			<b>188,442</b>
Hazardous Soil Disposal				Excluded
Site Perimeter Fence	1,300	LF	75.00	97,500
Silt Barrier and Erosion protection - allowance	71,570	SF	0.25	17,893
Allowance - existing tree protection, 10 assumed	10	EA	800.00	8,000
Clearing and grubbing of existing	71,570	SF	0.35	25,050
Construction Vehicle access/wheel wash - two locations assumed	2	EA	20,000.00	40,000
<b>SITE IMPROVEMENTS</b>	<b>71,570</b>			<b>3,844,865</b>
<u>Grading</u>				-
Fine grading across full site	71,570	SF	1.25	89,463
Excavation for site features - allowance	200	CY	75.00	15,000
<u>Stairs &amp; Walls</u>				-
Stairs to central entrance	1	LS	30,000.00	30,000
Stairs from Highland Ave - assumed	1	LS	45,000.00	45,000
Concrete planters - allowance	5	LOC	12,000.00	60,000
Seat Walls - allowance	50	LF	500.00	25,000
<u>Hardscape</u>				-
Vehicular Pavers - non permeable pavers per narrative	11,365	SF	40.00	454,600
Pedestrian Sidewalks - Brushed concrete CIP assumed	30,000	SF	30.00	900,000
Bermed entry ramps to front entry	1,030	SF	30.00	30,900
ADA ramp access concrete ramps at side and back of building	60	LF	1,200.00	72,000
Permeable plaza pavers - type 1	17,500	SF	55.00	962,500
<u>Landscaping &amp; Plantings</u>				-
Trees, counts based roughly on current site conceptual plan - allowance	43	EA	900.00	38,700
Native Shrubs & Perennials at feature planting areas that are drought resistant - allowance	7,600	SF	20.00	152,000
Raingarden & bioretention plantings - allowance per sketch	3,300	SF	40.00	132,000
Sod at highland lawn - assumed	17,500	SF	2.50	43,750
Irrigation - reuse of storm water per Nitsch narrative	17,500	SF	3.00	52,500
<u>Misc. Site Furnishings</u>				-
ADA railings at ramps and stairs	290	LF	500.00	145,000
Bike racks	3	EA	3,000.00	9,000
Trash Receptacles	6	EA	600.00	3,600
Bollards - impact resistant	40	EA	2,500.00	99,063
<u>Glass Enclosed Hydraulic Elevator</u>				-
Excavate for elevator pits	32	CY	150.00	4,800
Form/pour elevator pit walls, slab & sump	1	EA	30,000.00	30,000
Dispose of excavated materials - excludes	56	TONS	40.00	2,240

TRADE	QTY	UNIT	RATE	TOTAL
Foundation allowance for exterior shaft	150	SF	75.00	11,250
Allowance to create loading platforms	1	LOC	25,000.00	25,000
Structure for exterior shaft - allowance	5	TONS	5,500.00	27,500
Glass Enclosure	1,440	SF	175.00	252,000
Roof structure/covering	150	SF	80.00	12,000
(2) stop, front & back opening hydraulic elevator	2	STOPS	60,000.00	120,000
<b>SITE CIVIL / MECHANICAL</b>	<b>71,570</b>			<b>918,856</b>
<u>Storm Water Management</u>				-
Bioretention areas and building runoff storm water management pipes/structures - per sketch	630	LF	125.00	78,750
- Excavation and backfill	350	CY	120.00	42,000
North half of site - new stormwater pipe	660	LF	125.00	82,500
South half of site - stormwater main pipe replacement	630	LF	125.00	78,750
- Excavation and backfill	1,194	CY	120.00	143,333
30,000 gallon rainwater reuse tank (shared between 1895 and city hall buildings, allocated to 1895 project)	1	LS	75,000.00	75,000
25,000 cf subgrade retention chambers additional (~2000 Sf footprint)	25,000	CF	10.00	250,000
- excavation for detention structure	225	CY	75.00	16,875
Storm water reuse system - to plumbing fixtures				w/ Plumbing
<u>Incoming utility services</u>				-
Replace Sewer Line	215	LF	125.00	26,875
- Excavation and backfill	199	CY	120.00	23,889
8" Fire Service - length assumed as branch off new water line	30	LF	175.00	5,250
- Excavation and backfill	17	CY	120.00	2,000
3" Water Service - length per concept sketch	530	LF	110.00	58,300
- Excavation and backfill	294	CY	120.00	35,333
<b>SITE ELECTRICAL</b>	<b>71,570</b>			<b>218,033</b>
Site Electrical - allowance	1	LS	100,000	100,000
<u>Electrical Service</u>				-
Incoming electrical ductbank - assumed required	215	LF	180.00	38,700
- excavation and backfill	119	LF	120.00	14,333
Concrete pad for transformer				Use Existing Vault
Concrete pad for generator to serve both 1895 and City Hall	1	LS	5,000.00	5,000
Acoustic enclosure allowance	1	LS	60,000	60,000
<b>PROJECT REQUIREMENTS</b>	<b>71,570</b>			<b>258,510</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	5,170,196	258,510
<b>TOTAL DIRECT COSTS</b>				<b>5,428,706</b>
<b>ALLOCATIONS</b>				<b>2,416,416</b>

TRADE	QTY	UNIT	RATE	TOTAL
General Conditions	12.0	28,024	wks	336,293
Permits	0.0 %			-
Insurances	2.6 %			172,466
Design Contingency	11.0 %			597,158
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			271,164
Bond	1.5 %			99,500
Fee	3.0 %			207,159
Escalation	10.3 %			732,677
<b>TOTAL CONSTRUCTION COST</b>				<b>7,845,122</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION/ENABLING</b>	<b>57,660</b>			<b>393,923</b>
AMENITY/Common Space	670	SF	6.00	4,020
Closed Office/Meeting	9,027	SF	6.00	54,162
Open Office	26,770	SF	7.00	187,390
Restrooms	1,000	SF	7.00	7,000
Circulation	8,490	SF	7.00	59,430
Storage	2,575	SF	7.00	18,025
BOH/Balance	9,128	SF	7.00	63,896
<b>INTERIOR CONSTRUCTION</b>	<b>57,660</b>			<b>1,178,799</b>
AMENITY/Common Space	670	SF	20.00	13,400
Closed Office/Meeting	9,027	SF	42.00	379,134
Open Office	26,770	SF	20.00	535,400
Restrooms	1,000	SF	65.00	65,000
Circulation	8,490	SF	15.00	127,350
Storage	2,575	SF	5.00	12,875
BOH/Balance	9,128	SF	5.00	45,640
<b>INTERIOR FINISHES</b>	<b>57,660</b>			<b>1,724,080</b>
AMENITY/Common Space	670	SF	45.00	30,150
Closed Office/Meeting	9,027	SF	45.00	406,215
Open Office	26,770	SF	35.00	936,950
Restrooms	1,000	SF	80.00	80,000
Circulation	8,490	SF	25.00	212,250
Storage	2,575	SF	5.00	12,875
BOH/Balance	9,128	SF	5.00	45,640
<b>PLUMBING</b>	<b>57,660</b>			<b>233,979</b>
AMENITY/Common Space	670	SF	20.00	13,400
Restrooms	1,000	SF	160.00	160,000
Circulation	8,490	SF	3.00	25,470
Storage	2,575	SF	3.00	7,725
BOH/Balance	9,128	SF	3.00	27,384
<b>HVAC</b>	<b>57,660</b>			<b>2,457,380</b>
AMENITY/Common Space	670	SF	50.00	33,500
Closed Office/Meeting	9,027	SF	60.00	541,620
Open Office	26,770	SF	50.00	1,338,500
Restrooms	1,000	SF	55.00	55,000
Circulation	8,490	SF	30.00	254,700
Storage	2,575	SF	20.00	51,500
BOH/Balance	9,128	SF	20.00	182,560
<b>FIRE PROTECTION</b>	<b>57,660</b>			<b>144,150</b>
Closed Office/Meeting	670	SF	2.50	1,675
Closed Office/Meeting	9,027	SF	2.50	22,568
Open Office	26,770	SF	2.50	66,925
Restrooms	1,000	SF	2.50	2,500
Circulation	8,490	SF	2.50	21,225
Storage	2,575	SF	2.50	6,438
BOH/Balance	9,128	SF	2.50	22,820
<b>ELECTRICAL</b>	<b>57,660</b>			<b>1,681,128</b>
AMENITY/Common Space	670	SF	50.00	33,500
Closed Office/Meeting	9,027	SF	40.00	361,080
Open Office	26,770	SF	35.00	936,950
Restrooms	1,000	SF	35.00	35,000



TRADE	QTY	UNIT	RATE	TOTAL
CIRCULATION	8,490	SF	15.00	127,350
STORAGE	2,575	SF	16.00	41,200
BOH/BALANCE	9,128	SF	16.00	146,048
<b>EQUIPMENT</b>	<b>57,660</b>			<b>204,365</b>
AMENITY/Common Space	670	SF	10.00	6,700
Closed Office/Meeting	9,027	SF	5.00	45,135
Open Office	26,770	SF	4.00	107,080
Restrooms	1,000	SF	3.00	3,000
CIRCULATION	8,490	SF	5.00	42,450
<b>FURNISHINGS</b>	<b>57,660</b>			<b>548,470</b>
AMENITY/Common Space	670	SF	18.00	12,060
Closed Office/Meeting	9,027	SF	10.00	90,270
Open Office	26,770	SF	12.00	321,240
Restrooms	1,000	SF	40.00	40,000
CIRCULATION	8,490	SF	10.00	84,900
<b>PROJECT REQUIREMENTS</b>	<b>57,660</b>			<b>428,314</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	8,566,274	428,314
<b>TOTAL DIRECT COSTS</b>				<b>8,994,588</b>
<b>ALLOCATIONS</b>				<b>3,805,654</b>
General Conditions	29.9	wks	13,024	389,773
Permits	0.0 %			-
Insurances	2.6 %			281,399
Design Contingency	11.0 %			989,405
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			449,280
Bond	1.5 %			162,346
Fee	3.0 %			338,004
Escalation	10.3 %		12/1/2023	1,195,448
<b>TOTAL CONSTRUCTION COST</b>				<b>12,800,242</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION/ENABLING</b>	<b>17,580</b>			<b>111,433</b>
AMENITY/Common Space	1,070	SF	6.00	6,420
Closed Office/Meeting	2,367	SF	6.00	14,202
Open Office	220	SF	7.00	1,540
Restrooms	360	SF	7.00	2,520
Circulation	1,890	SF	7.00	13,230
Storage	1,115	SF	7.00	7,805
BOH/Balance	7,828	SF	7.00	54,796
Open Office	2,730	SF	4.00	10,920
<b>INTERIOR CONSTRUCTION</b>	<b>17,580</b>			<b>265,359</b>
AMENITY/Common Space	1,070	SF	20.00	21,400
Closed Office/Meeting	2,367	SF	42.00	99,414
Open Office	220	SF	20.00	4,400
Restrooms	360	SF	65.00	23,400
Circulation	1,890	SF	15.00	28,350
Storage	1,115	SF	5.00	5,575
BOH/Balance	7,828	SF	5.00	39,140
Open Office	2,730	SF	16.00	43,680
<b>INTERIOR FINISHES</b>	<b>17,580</b>			<b>365,030</b>
AMENITY/Common Space	1,070	SF	45.00	48,150
Closed Office/Meeting	2,367	SF	45.00	106,515
Open Office	220	SF	35.00	7,700
Restrooms	360	SF	80.00	28,800
Circulation	1,890	SF	25.00	47,250
Storage	1,115	SF	5.00	5,575
BOH/Balance	7,828	SF	5.00	39,140
Open Office	2,730	SF	30.00	81,900
<b>PLUMBING</b>	<b>17,580</b>			<b>111,499</b>
AMENITY/Common Space	1,070	SF	20.00	21,400
Restrooms	360	SF	160.00	57,600
Circulation	1,890	SF	3.00	5,670
Storage	1,115	SF	3.00	3,345
BOH/Balance	7,828	SF	3.00	23,484
<b>HVAC</b>	<b>17,580</b>			<b>571,080</b>
AMENITY/Common Space	1,070	SF	50.00	53,500
Closed Office/Meeting	2,367	SF	60.00	142,020
Open Office	220	SF	50.00	11,000
Restrooms	360	SF	55.00	19,800
Circulation	1,890	SF	30.00	56,700
Storage	1,115	SF	20.00	22,300
BOH/Balance	7,828	SF	20.00	156,560
Open Office	2,730	SF	40.00	109,200
<b>FIRE PROTECTION</b>	<b>17,580</b>			<b>43,950</b>
AMENITY/Common Space	1,070	SF	2.50	2,675
Closed Office/Meeting	2,367	SF	2.50	5,918
Open Office	220	SF	2.50	550
Restrooms	360	SF	2.50	900
Circulation	1,890	SF	2.50	4,725
Storage	1,115	SF	2.50	2,788
BOH/Balance	7,828	SF	2.50	19,570
Open Office	2,730	SF	2.50	6,825

TRADE	QTY	UNIT	RATE	TOTAL
<b>ELECTRICAL</b>	<b>17,580</b>			<b>421,818</b>
AMENITY/Common Space	1,070	SF	50.00	53,500
Closed Office/Meeting	2,367	SF	40.00	94,680
Open Office	220	SF	35.00	7,700
Restrooms	360	SF	35.00	12,600
Circulation	1,890	SF	15.00	28,350
Storage	1,115	SF	16.00	17,840
BOH/Balance	7,828	SF	16.00	125,248
Open Office	2,730	SF	30.00	81,900
<b>EQUIPMENT</b>	<b>17,580</b>			<b>42,135</b>
AMENITY/Common Space	1,070	SF	10.00	10,700
Closed Office/Meeting	2,367	SF	5.00	11,835
Open Office	220	SF	4.00	880
Restrooms	360	SF	3.00	1,080
Circulation	1,890	SF	5.00	9,450
Open Office	2,730	SF	3.00	8,190
<b>FURNISHINGS</b>	<b>17,580</b>			<b>92,520</b>
AMENITY/Common Space	1,070	SF	18.00	19,260
Closed Office/Meeting	2,367	SF	10.00	23,670
Open Office	220	SF	12.00	2,640
Restrooms	360	SF	40.00	14,400
Circulation	1,890	SF	10.00	18,900
Open Office	2,730	SF	5.00	13,650
<b>PROJECT REQUIREMENTS</b>	<b>17,580</b>			<b>101,241</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	2,024,824	101,241
<b>TOTAL DIRECT COSTS</b>				<b>2,126,065</b>
<b>ALLOCATIONS</b>				<b>899,549</b>
General Conditions	7.1	wks	13,024	92,131
Permits	0.0 %			-
Insurances	2.6 %			66,515
Design Contingency	11.0 %			233,867
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			106,197
Bond	1.5 %			38,374
Fee	3.0 %			79,894
Escalation	10.3 %		12/1/2023	282,570
<b>TOTAL CONSTRUCTION COST</b>				<b>3,025,614</b>

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	<b>ENV Alternate #1</b> <i>Alt- Deduct to maintain flat roof</i>				<b>(5,305,882.94)</b>
	Deduct L4 & Roof C&S work (includes seismic upgrades)	(1)	LS	3,615,710.5	(3,615,710.50)
	Deduct (2) elevator stops	(2)	LS	55,000.00	(110,000.00)
	Deduct L4 program fitout	(17,580)	SF	120.94	(2,126,065.20)
	Add new complete membrane roofing system w/ tapered insulation	13,886	SF	35.00	486,010.00
	Add repairs to extg roof deck and open web steel joist work as necessary	13,886	SF	15.00	208,290.00
	Add upcharge for exterior mechanical systems (allowance)	1	LS	75,000.00	75,000.00
	Allowance - structural improvements and dunnage for mechanical equipment	1	LS	80,000.00	80,000.00
	Equipment screening	2,000	SF	85.00	170,000.00
	Stair Bulkhead	1	EA	30,000.00	30,000.00
	Stair extension	1	EA	15,000.00	15,000.00
	Remove/replace roof drains, new interior rainwater leaders	10	LOC	5,300.00	53,000.00
	<u>Total Direct Costs</u>				(4,734,475.70)
	<u>Allocations</u>				(571,407.24)
	General Conditions	(8.0)	wks	28,024	(224,195.56)
	Permits	0.0 %			-
	Insurances	2.6 %			(148,614.72)
	Design Contingency	11.0 %			(520,792.33)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(236,487.06)
	Bond	1.5 %			(85,739.26)
	Fee	3.0 %			(175,936.96)
	Escalation	10.3 %			(631,084.57)
2	<b>ENV Alternate #2</b> <i>Alt- Slate Shingle ILO synthetic slate shingles.</i>				<b>483,814.40</b>
	Add - Slate premium over synthetic slate	13,895	SF	28.00	389,060.00
	<u>Total Direct Costs</u>				389,060.00
	<u>Allocations</u>				94,754.40
	General Conditions	(1.5)	wks	28,024	(42,036.67)
	Permits	0.0 %			-
	Insurances	2.6 %			10,640.59
	Design Contingency	11.0 %			42,796.60
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			19,433.55
	Bond	1.5 %			6,138.80
	Fee	3.0 %			12,596.82
	Escalation	10.3 %			45,184.71

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
3	<b>ENV Alternate #3</b> <i>Alternate Deduct for GFRC dentils/cornice in lieu of Terra Cota</i>				<b>(166,507.50)</b>
	Deduct Terracota dentil/cornice/foolate	(1)	LS	239,225	(239,225.00)
	Add GFRC reproduction window sills at existing windows	18	LF	350.00	6,300.00
	Add GFRC reproduction dentils & foliate units to recreate historical detail	175	LF	280.00	49,000.00
	Add GFRC reproduction sills at reinstate & new window openings	110	LF	350.00	38,500.00
	Add GFRC units at metal louver replacement areas	32	EA	750.00	24,000.00
	<u>Total Direct Costs</u>				(121,425.00)
	<u>Allocations</u>				(45,082.50)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(3,662.02)
	Design Contingency	11.0 %			(13,356.75)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(6,065.18)
	Bond	1.5 %			(2,112.70)
	Fee	3.0 %			(4,335.27)
	Escalation	10.3 %			(15,550.58)
4	<b>ENV Alternate #4</b> <i>Add-alternate for full repointing</i>				<b>1,303,057.43</b>
	Deduct baseline repointing scope	(1)	LS	161,000.00	(161,000.00)
	Add full repointing	31,750	SF	35.00	1,111,250.00
	<u>Total Direct Costs</u>				950,250.00
	<u>Allocations</u>				352,807.43
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			28,658.30
	Design Contingency	11.0 %			104,527.50
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			47,464.99
	Bond	1.5 %			16,533.64
	Fee	3.0 %			33,927.02
	Escalation	10.3 %			121,695.98

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
5	<b>MECH Alternate #1</b>				<b>(2,960,028.15)</b>
	<i>Air Source Heat Pump in lieu of Ground Source Heat Pump</i>				
	Deduct ground source infrastructure	(1)	LS	2,866,000	(2,866,000.00)
	<u>Heating/cooling equipment</u>				-
	ASHP - 30 TON 2 pipe system	7	EA	80,000.00	560,000.00
	HX -300 gpm plate	2	EA	45,000.00	90,000.00
	- 7.5 hp GWP (vertical in-line close coupled)	2	EA	15,000.00	30,000.00
	- 7.5 hp HWP (vertical in-line close coupled)	2	EA	15,000.00	30,000.00
	-7.5 hp CHWP (vertical in-line close coupled)	2	EA	15,000.00	30,000.00
	600 Gal Buffer Tank	1	EA	7,500.00	7,500.00
	Chiller 50 Ton Recovery Chiller	50	TON	2,500.00	125,000.00
	HWP 2hp	2	EA	4,500.00	9,000.00
	CHWP 2hp	2	EA	4,500.00	9,000.00
	500 Gal Buffer Tank	2	EA	6,000.00	12,000.00
	Expansion, air separation , shot feed, pressurization, filtration (assumed)	1	EA	25,000.00	25,000.00
	<u>Heat Recovery Systems</u>				-
	New glycol system/ feed	1	LS	20,000.00	20,000.00
	Plant Controller	1	EA	25,000.00	25,000.00
	<b>Testing, balancing &amp; commissioning support</b>	1	LS	<b>(75,740.00)</b>	<b>(75,740.00)</b>
	<b>Co-ordination, rigging, CAD, Sub-trade temp requirements</b>	1	LS	<b>(189,350.00)</b>	<b>(189,350.00)</b>
	<u>Total Direct Costs</u>				(2,158,590.00)
	<u>Allocations</u>				(801,438.15)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(65,100.27)
	Design Contingency	11.0 %			(237,444.90)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(107,821.57)
	Bond	1.5 %			(37,557.85)
	Fee	3.0 %			(77,068.70)
	Escalation	10.3 %			(276,444.86)
6	<b>PLUMB Alternate #1</b>				<b>(211,039.77)</b>
	Deduct Alternate for irrigation use only of rainwater vs fixture flushing				
	Deduct rainwater piping and connections to fixtures for flushing	(1)	LS	135,000.00	(135,000.00)
	<b>Testing, balancing &amp; commissioning support</b>	1	LS	<b>(5,400.00)</b>	<b>(5,400.00)</b>
	<b>Co-ordination, rigging, CAD, Sub-trade temp requirements</b>	1	LS	<b>(13,500.00)</b>	<b>(13,500.00)</b>
	<u>Total Direct Costs</u>				(153,900.00)
	<u>Allocations</u>				(57,139.77)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(4,641.42)
	Design Contingency	11.0 %			(16,929.00)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(7,687.31)
	Bond	1.5 %			(2,677.74)
	Fee	3.0 %			(5,494.73)
	Escalation	10.3 %			(19,709.56)
6	<b>DEMO ALT #1 - ABATEMENT &amp; ENABLING PACKAGE</b>				<b>(2,736,900.01)</b>
	<i>Early Demo and Abatement enabling packate as an earlier and separate project</i>				

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
<p>Note: Alternate can only be taken if separate Early Demo &amp; Abatement Package is also accepted. See report: 1895 Building - Early Demo &amp; Abatement Concept Estimate dated October 28, 2021.</p>					
<u>Deduct Early Abatement &amp; Demo Scope</u>					-
	Transite Lab Hood	(150)	SF	13.33	(2,000.00)
	12" x 12" Dark Gray Floor Tile Mastic	(10,900)	SF	4.00	(43,600.00)
	12" x 12" Light Gray Floor Tile Mastic	(15,500)	SF	4.00	(62,000.00)
	9" x 9" Gray/Brown Floor Tile	(48,000)	SF	6.00	(288,000.00)
	9" x 9" Gray/Brown Floor Tile Mastic	(48,000)	SF	0.00	-
	6" Pipe Insulation	(250)	LF	20.00	(5,000.00)
	6" Pipe Elbow Insulation	(35)	EA	15.00	(525.00)
	Green Floor Tile	(16,000)	SF	6.00	(96,000.00)
	White Floor Tile	(16,000)	SF	6.00	(96,000.00)
	12" x 12" and 9' x 9" floor tiles and black mastic (various types)	(64,000)	SF	0.00	-
	Interior joint compound	0	0	0.00	-
	White pipe fitting and elbow insulation	(18,000)	LF	5.00	(90,000.00)
	Black Sink Coating	(150)	EA	10.00	(1,500.00)
	Multicolored Sheet Flooring	(150)	SF	5.00	(750.00)
	Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	(1)	ALLOW	5,000.00	(5,000.00)
	Interior Components w/ Boiler Unit	(1)	ALLOW	3,000.00	(3,000.00)
	Misc. hazardous building materials	(1)	LS	10,000.00	(10,000.00)
	- 5.5% Contingency for above ( 4.5% carried below line)	(1)	LS	38,685.63	(38,685.63)
	- Estimated Abatement Design/Bid & Monitoring Fee for above	(1)	LS	22,416.23	(22,416.23)
	Deduct A&S Demo	(1)	LS	671,727.38	(671,727.38)
	Deduct MEP removal and disposal of dropped	(1)	LS	60,000.00	(60,000.00)
	Deduct Plumbing demo	(1)	LS	39,744.00	(39,744.00)
	Deduct HVAC demo	(1)	LS	52,992.00	(52,992.00)
	Deduct FP demo	(1)	LS	26,496.00	(26,496.00)
	Deduct Elec demo	(1)	LS	164,358.00	(164,358.00)
	Savings on PR%	(1)	LS	22,800	(22,800.00)
<u>Total Direct Costs</u>					(1,802,594.24)
<u>Allocations</u>					(934,305.77)
	General Conditions	-8	wks	28,024.44	(224,195.56)
	Permits	0.0 %			-
	Insurances	2.6 %			(60,192.98)
	Design Contingency	11.0 %			(198,285.37)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(90,039.58)
	Bond	1.5 %			(34,726.72)
	Fee	3.0 %			(71,259.23)
	Escalation	10.3 %			(255,606.33)

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 24.5	DAYS - X 20 490	WEEKLY RATE \$28,024.44
----------------------------------	----------------	--------------------	----------------------------

STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	TOTALS
General Superintendent	0%	0	0	\$ 2,400	\$ -
Project Executive	0%	0	0	\$ 2,400	\$ -
Project Superintendent	100%	490	25	\$ 1,500	\$ 735,000
Sr. Project Manager	100%	490	25	\$ 1,500	\$ 735,000
Project Manager	100%	490	25	\$ 1,200	\$ 588,000
Assistant Project Manager	50%	245	12	\$ 900	\$ 220,500
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	147	7	\$ 1,500	\$ 220,500
Purchasing	5%	25	1	\$ 1,500	\$ 36,750
MEP Coordinator	15%	74	4	\$ 1,300	\$ 95,550
Safety	10%	51	3	\$ 1,800	\$ 92,556
Project Accountant	2%	10	0	\$ 700	\$ 6,860
Project Administration	2%	10	0	\$ 500	\$ 4,900
Project Expeditor	2%	10	0	\$ 1,100	\$ 10,780
<b>TOTALS</b>					\$ 2,746,396



CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 9.25	DAYS - X 20 185	WEEKLY RATE \$13,024.44			
STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	TOTALS	
General Superintendent	0%	0	0	\$ 2,400	\$	-
Project Executive	0%	0	0	\$ 2,400	\$	-
Project Superintendent	0%	0	0	\$ 1,500	\$	-
Sr. Project Manager	25%	46	2	\$ 1,500	\$	69,375
Project Manager	100%	185	9	\$ 1,200	\$	222,000
Assistant Project Manager	50%	93	5	\$ 900	\$	83,250
Assistant Superintendent	0%	0	0	\$ 1,100	\$	-
Senior Estimator	5%	9	0	\$ 1,500	\$	13,875
Purchasing	5%	9	0	\$ 1,500	\$	13,875
MEP Coordinator	15%	28	1	\$ 1,300	\$	36,075
Safety	10%	19	1	\$ 1,800	\$	34,944
Project Accountant	2%	4	0	\$ 700	\$	2,590
Project Administration	2%	4	0	\$ 500	\$	1,850
Project Expeditor	2%	4	0	\$ 1,100	\$	4,070
<b>TOTALS</b>					\$	<b>481,904</b>



SOMERVILLE MP - CITY HALL RENO  
CITY HALL  
October 28, 2021



ONE BEACON STREET  
FLOOR 15  
BOSTON, 02108

CONSTRUCTION COST  
& RISK CONSULTANTS

# EXECUTIVE SUMMARY

# SOMERVILLE MP - CITY HALL RENO

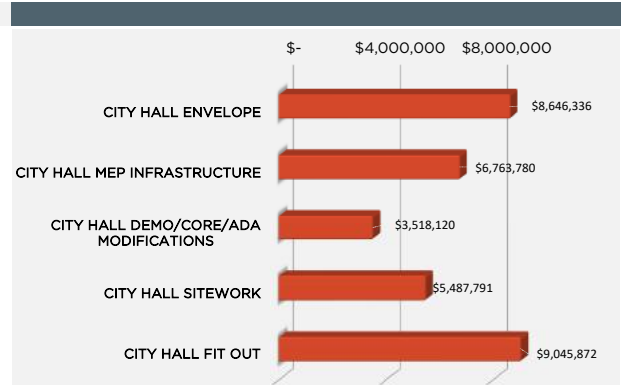
BUDGET MODEL - CITY HALL RENOVATION

28-Oct-21

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE SOMERVILLE CITY HALL RENOVATION. THE MODEL SHOWS ALL APPLICABLE RENOVATION CONSTRUCTION : EXISTING BUILDING MEP REPLACEMENT AND CORE RENOVATION WORK . THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN. ESCALATION IS PRESENTLY CARRIED TO AN ASSUMED MIDPOINT OF CONSTRUCTION OF 3/15/2025.

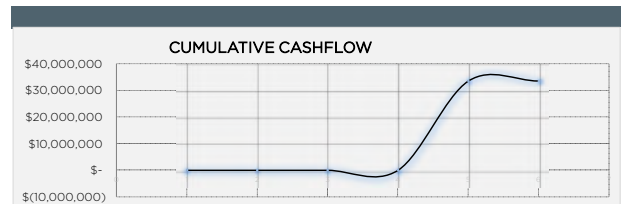
## CONSTRUCTION COSTS \$ (ESCALATED)

COST ELEMENT	GSF	\$/SF	CONST \$ (ESCALATED)	PROJECT \$ (ESCALATED)
CITY HALL ENVELOPE	40,000	\$ 216	\$ 8,646,336	\$ 8,646,336
CITY HALL MEP INFRASTRUCTURE	40,000	\$ 169	\$ 6,763,780	\$ 6,763,780
CITY HALL DEMO/CORE/ADA MODIFICATIONS	40,000	\$ 88	\$ 3,518,120	\$ 3,518,120
CITY HALL SITework	48,828	\$ 112	\$ 5,487,791	\$ 5,487,791
CITY HALL FIT OUT	40,000	\$ 226	\$ 9,045,872	\$ 9,045,872
<b>TOTAL COSTS</b>	<b>40,000</b>	<b>\$837</b>	<b>\$ 33,461,899</b>	<b>\$ 33,461,899</b>
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
<b>TOTAL CAPITAL EXPENDITURE</b>			<b>\$ 33,461,899</b>	<b>\$ 33,461,899</b>



## BUILDINGS CASHFLOW FORECAST

SPEND TOTALS	ANNUAL	CUMULATIVE
2021	\$ -	\$ -
2022	\$ -	\$ -
2023	\$ -	\$ -
2024	\$ -	\$ -
2025	\$ 33,461,899	\$ 33,461,899
2026+	\$ -	\$ 33,461,899



## ALTS & BREAKOUTS

	\$	\$/SF
<b>ALTERNATES</b>		
ENV ALT#1 Vented roof assembly ILO R-38 spray closed cell insulation	\$186,843	\$4.67
ENV ALT#2: Additional Reoport	\$293,184	\$7.33
MECH ALT #1: Air Source Heat Pump ILO Ground Source Heat Pump	\$361,864	\$9.05
PLUM ALT #1: Deduct rainwater reuse for flushing	(\$104,188)	(\$2.60)

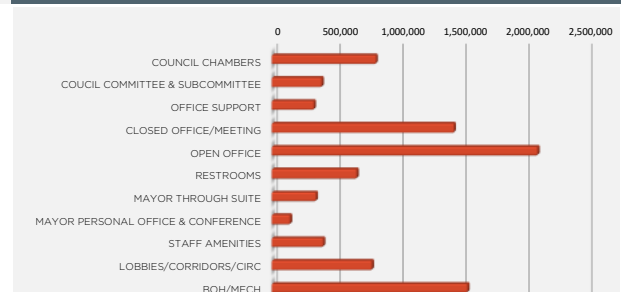
## CONTINGENCY & ESCALATION SUMMARY

Design contingency	11.0%
Construction contingency	4.5%
Owners contingency	Excluded
Productivity loss factor	0.0%
GL Insurance & Subguard	2.6%
Bond	1.5%
Escalation carried to Midpoint	11.7%
Project labor assumptions	Union

## FITOUT USE TYPE BY COST TOTAL \$

	% MIX	CONST \$
COUNCIL CHAMBERS	9%	827,869
COUCIL COMMITTEE & SUBCOMMITTEE	6%	395,467
OFFICE SUPPORT	5%	335,343
CLOSED OFFICE/MEETING	23%	1,448,771
OPEN OFFICE	34%	2,114,270
RESTROOMS	11%	672,817
MAYOR THROUGH SUITE	6%	351,897
MAYOR PERSONAL OFFICE & CONFERENCE	2%	144,269
STAFF AMENITIES	6%	407,196
LOBBIES/CORRIDORS/CIRC	13%	793,643
BOH/MECH	25%	1,554,330

## COST BY FITOUT USE TYPE BY SQUARE FOOT



## FITOUT USE TYPE BY SQUARE FOOT

	% MIX OF TYPE	AREAS SF
COUNCIL CHAMBERS	6%	2,500
COUCIL COMMITTEE & SUBCOMMITTEE	4%	1,725
OFFICE SUPPORT	4%	1,615
CLOSED OFFICE/MEETING	12%	4,875
OPEN OFFICE	21%	8,275
RESTROOMS	3%	1,010
MAYOR THROUGH SUITE	3%	1,310
MAYOR PERSONAL OFFICE & CONFERENCE	1%	445
STAFF AMENITIES	4%	1,680
LOBBIES/CORRIDORS/CIRC	14%	5,440
BOH/MECH	28%	11,125

## FITOUT USE TYPE BY SQUARE FOOT



### EXCLUSIONS & ASSUMPTIONS

- 1 Escalation is presently carried to the assumed midpoint of 3/15/2025. We have carried 8% per annum for 2021, 5% per annum for 2022, 4% per annum for 2023, and 4.5% per annum 2024 and beyond.
- 2 We have included 11% design contingency on trade costs
- 3 We have included 4.5% construction contingency on trade costs + design contingency
- 4 We have included 2.6% for GL & Subguard Insurance on cost of work (trade + contingencies + general conditions)
- 5 We have included 1.5% for a bond on cost of work (trade + contingencies + general conditions)
- 6 We have included a 3% CM Fee
- 7 We have excluded permit costs, assumed covered by City
- 8 General project requirements are carried at 5% of trade costs
- 9 General Conditions are included, refer to the total division summary.
- 10 Soft costs, FFE & owner's contingency have been excluded
- 11 All work is priced on regular hours, OT allowances are excluded presently

### BASIS OF ESTIMATE

- 1 City Hall\_Demolition and C&S Plans\_A-1 to A-4\_20211004
- 2 City Hall\_EX-3 Existing Roof Plan and Axons\_2021-10-07
- 3 City Hall\_EX-4 Existing Elevations with Estimating Markups\_2021-10-04
- 4 City Hall\_STRUCT\_19887 2021-10-04 City Hall Structural Overlays
- 5 City Hall\_Test-Fit Diagram Proposed Plans\_A-6 to A-7\_20210930
- 6 HBM Survey Rpt City Hall Somerville 092921
- 7 Central Hill\_BBB Site and Landscape Sketch Overlay\_20211007
- 8 Central Hill\_Nitsch Proposed Site & Utilities Concept Sketch\_20211006
- 9 03\_2875 CoS BMP - PSR Cost Estimating Narrative

### Systems Assumptions

#### General

Please see estimate backup for additional assumptions, qualifications & exclusions

#### Foundations/Basement Construction

Costs for select trenching and repairs of SOG of underslab plumbing are included.

Costs are included for an avg 6'H of bentonite grout injection at the foundation perimeter on 2' spacing

All other work to existing foundations is excluded

#### Superstructure

Rebuilding/resupport of existing structure to remain is EXCLUDED when not specified on the drawings.

Costs for restructuring floor plates including concrete, metal deck, & structural steel support are included where called out on the plans

Reinforcement of the existing wood trusses at the south wing is included per the updated structural sketches.

A 50k Allowance is included for scanning, coordination, and reinforcement of new MEP risers through pan joist systems.

10 PSF has been assumed to support infill at the removed vaults.

#### Exterior Enclosure

Estimate assumes full scaffolding of building in order to complete façade restoration scope.

Window replacement is included per sashes, sills, and frames.

Allowances have been included to replace, refurbish, and paint & prime feature exterior woodwork per the narrative

Allowances are included for select repointing and repairs of masonry.

#### Roofing

A full depth flat roof is assumed at the central mass to replace the existing EPDM roof in kind.

Full replacement of slate shingles at the pitched roof and select repairs to the roof substructure and membrane are included.

#### Interior Construction/Finishes

An allowance of \$10/SF has been carried for C&S interior construction requirements, including constructing new shafts, rebuilding masonry walls, etc.

Fitout costs are modeled by fit out type to align with the updated test fit areas.

Stairways/Conveying

Costs associated with refurbishing and modernizing the existing elevator are included.  
A new wheel chair lift is EXCLUDED in this update per the updated narrative report  
Existing monumental interior stair assumed to existing to remain.  
Existing egress stair within the south wing is assumed existing to remain.  
1 Hour Fire rated stair enclosures carried within interior construction scope.

Services

Estimate assumes full replacement of all MEP systems per narrative  
Fitout MEPFP costs are modeled.

Furnishings/Equipment

The furnishing and equipment costs carried in this model represent a full gut renovation of interior spaces.  
Fixed furnishes included only. Workstations are excluded and assumed part of FFE, power/data to locations  
is included as required

Demolition & Abatement

Abatement allowance is included per report provided.  
Allowances for additional abatement not identified within the Axiom report is EXCLUDED at this time.

Site Improvements

Contaminated Soil considerations are EXCLUDED at this time.  
Site improvements are carried in the site file

Site Mechanical Utilities

Utilities are carried in the site file

Site Electrical Utilities

Utilities are carried in the site file

DIVISION SUMMARY	40,000 GFA		28-Oct-21
		\$/SF	\$ TOTAL
Project Requirements		26.86	1,074,226
<b>PROJECT REQUIREMENTS</b>		<b>26.86</b>	<b>1,074,226</b>
A10. Foundations		3.43	137,000
A20. Basement Construction			0
<b>A. SUBSTRUCTURE</b>		<b>3.43</b>	<b>137,000</b>
B10. Superstructure		11.60	463,960
B20. Exterior Enclosure		110.78	4,431,372
B30. Roofing		29.36	1,174,220
<b>B. SHELL</b>		<b>151.74</b>	<b>6,069,552</b>
C10. Interior Construction		34.76	1,390,450
C30. Interior Finishes		31.60	1,263,805
<b>C. INTERIORS</b>		<b>66.36</b>	<b>2,654,255</b>
C20. Stairways		2.92	116,700
D10. Conveying Systems		4.75	190,000
<b>VERTICAL TRANSPORTATION</b>		<b>7.67</b>	<b>306,700</b>
D20. Plumbing Systems		24.13	965,105
D30. Heating, Ventilating & Air Conditioning		82.70	3,307,962
D40. Fire Protection Systems		6.71	268,588
D50. Electric Lighting, Power & Communications		70.62	2,824,618
<b>D. SERVICES</b>		<b>184.16</b>	<b>7,366,273</b>
E10. Equipment		2.04	81,770
E20. Furnishings		7.89	315,490
<b>E. EQUIPMENT AND FURNISHINGS</b>		<b>9.93</b>	<b>397,260</b>
F10. Special Construction (Sustainability allowance)		0.00	0
F20. Selective Demolition		26.93	1,077,285
<b>F. SPECIAL CONSTRUCTION AND DEMOLITION</b>		<b>26.93</b>	<b>1,077,285</b>
<b>TOTAL BUILDING CONSTRUCTION</b>		<b>477.06</b>	<b>19,082,550</b>
G10. Site Preparation		4.52	180,697
G20. Site Improvements		75.79	3,031,539
G30. Site Civil/Mechanical Utilities		2.90	115,917
G40. Site Electrical Utilities		3.95	158,033
G90. Other Site Construction		0.00	0
<b>TOTAL SITE CONSTRUCTION</b>		<b>87.15</b>	<b>3,486,186</b>
<b>TOTAL TRADE COSTS</b>		<b>564.22</b>	<b>22,568,736</b>
a. Design Contingency	11.00%	62.06	2,482,561
b. Logistics & Loss Productivity	0.00%	0.00	0
c. Construction Contingency	4.50%	28.18	1,127,308
d. General Conditions	6.73%	44.05	1,761,956
<b>SUBTOTAL</b>		<b>698.51</b>	<b>27,940,561</b>
e. Permits	0.00%	0.00	0
f. Insurances	2.60%	18.16	726,455
g. Bond	1.50%	10.48	419,108
h. Fee	3.00%	21.81	872,584
<b>SUBTOTAL</b>		<b>748.97</b>	<b>29,958,707</b>
i. Escalation	11.69%	87.58	3,503,191
<b>TOTAL ANTICIPATED CONSTRUCTION COST</b>		<b>\$837</b>	<b>33,461,899</b>

ESTIMATE SUMMARY  
CITY HALL

SOMERVILLE MP - CITY HALL RENO  
10/28/2021

SUMMARY BY PROGRAM

TRADE	40,000		GFA		40,000		40,000		40,000		48,828				
	CORE & SHELL		FIT-OUT PROJECTS		TOTALS		CITY HALL ENVELOPE		CITY HALL MEP INFRASTRUCTURE		CITY HALL DEMO/CORE/ADA MODIFICATIONS		CITY HALL SITework		
		/ SF		/ SF		/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	
DEMOLITION/ENABLING	\$ 844,405	\$ 21.11	\$ 232,880	\$ 5.82	\$ 1,077,285	\$ 26.93	\$ -	\$ -	\$ 120,000	\$ 3.00	\$ 724,405	\$ 18.11	\$ -	\$ -	
FOUNDATIONS	\$ 137,000	\$ 3.43	\$ -	\$ -	\$ 137,000	\$ 3.43	\$ -	\$ -	\$ -	\$ -	\$ 137,000	\$ 3.43	\$ -	\$ -	
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUPERSTRUCTURE	\$ 463,960	\$ 11.60	\$ -	\$ -	\$ 463,960	\$ 11.60	\$ -	\$ -	\$ -	\$ -	\$ 463,960	\$ 11.60	\$ -	\$ -	
EXTERIOR ENCLOSURE	\$ 4,431,372	\$ 110.78	\$ -	\$ -	\$ 4,431,372	\$ 110.78	\$ 4,431,372	\$ 110.78	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
ROOFING	\$ 1,174,220	\$ 29.36	\$ -	\$ -	\$ 1,174,220	\$ 29.36	\$ 1,174,220	\$ 29.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
INTERIOR CONSTRUCTION	\$ 536,275	\$ 13.41	\$ 854,175	\$ 21.35	\$ 1,390,450	\$ 34.76	\$ -	\$ -	\$ -	\$ -	\$ 536,275	\$ 13.41	\$ -	\$ -	
INTERIOR FINISHES	\$ -	\$ -	\$ 1,263,805	\$ 31.60	\$ 1,263,805	\$ 31.60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
STAIRWAYS	\$ 116,700	\$ 2.92	\$ -	\$ -	\$ 116,700	\$ 2.92	\$ -	\$ -	\$ -	\$ -	\$ 116,700	\$ 2.92	\$ -	\$ -	
CONVEYING SYSTEMS	\$ 190,000	\$ 4.75	\$ -	\$ -	\$ 190,000	\$ 4.75	\$ -	\$ -	\$ -	\$ -	\$ 190,000	\$ 4.75	\$ -	\$ -	
PLUMBING	\$ 690,000	\$ 17.25	\$ 275,105	\$ 6.88	\$ 965,105	\$ 24.13	\$ -	\$ -	\$ 690,000	\$ 17.25	\$ -	\$ -	\$ -	\$ -	
HVAC	\$ 1,801,937	\$ 45.05	\$ 1,506,025	\$ 37.65	\$ 3,307,962	\$ 82.70	\$ -	\$ -	\$ 1,801,937	\$ 45.05	\$ -	\$ -	\$ -	\$ -	
FIRE PROTECTION	\$ 160,000	\$ 4.00	\$ 108,588	\$ 2.71	\$ 268,588	\$ 6.71	\$ -	\$ -	\$ 160,000	\$ 4.00	\$ -	\$ -	\$ -	\$ -	
ELECTRICAL	\$ 1,543,018	\$ 38.58	\$ 1,281,600	\$ 32.04	\$ 2,824,618	\$ 70.62	\$ -	\$ -	\$ 1,543,018	\$ 38.58	\$ -	\$ -	\$ -	\$ -	
EQUIPMENT	\$ -	\$ -	\$ 81,770	\$ 2.04	\$ 81,770	\$ 2.04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
FURNISHINGS	\$ 60,000	\$ 1.50	\$ 255,490	\$ 6.39	\$ 315,490	\$ 7.89	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ 1.50	\$ -	\$ -	
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE PREP	\$ 180,697	\$ 4.52	\$ -	\$ -	\$ 180,697	\$ 4.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 180,697	\$ 3.70	
SITE IMPROVEMENTS	\$ 3,031,539	\$ 75.79	\$ -	\$ -	\$ 3,031,539	\$ 75.79	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,031,539	\$ 62.09	
SITE CIVIL / MECHANICAL	\$ 115,917	\$ 2.90	\$ -	\$ -	\$ 115,917	\$ 2.90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 115,917	\$ 2.37	
SITE ELECTRICAL	\$ 158,033	\$ 3.95	\$ -	\$ -	\$ 158,033	\$ 3.95	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 158,033	\$ 3.24	
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL DIRECT COSTS</b>	<b>\$ 15,635,073</b>	<b>\$ 390.88</b>	<b>\$ 5,859,438</b>	<b>\$ 146.49</b>	<b>\$ 21,494,510</b>	<b>\$ 537.36</b>	<b>\$ 5,605,592</b>	<b>\$ 140.14</b>	<b>\$ 4,314,955</b>	<b>\$ 107.87</b>	<b>\$ 2,228,340</b>	<b>\$ 55.71</b>	<b>\$ 3,486,186</b>	<b>\$ 71.40</b>	
Design Contingency	11.00%	\$ 1,805,796	\$ 45.14	\$ 676,765	\$ 16.92	\$ 2,482,561	\$ 62.06	\$ 647,446	\$ 16.19	\$ 498,377	\$ 12.46	\$ 257,318	\$ 6.43	\$ 402,654	\$ 8.25
Logistics & Loss Productivity	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Construction Contingency	4.50%	\$ 819,996	\$ 20.50	\$ 307,313	\$ 7.68	\$ 1,127,308	\$ 28.18	\$ 293,999	\$ 7.35	\$ 226,309	\$ 5.66	\$ 116,846	\$ 2.92	\$ 182,842	\$ 3.74
General Conditions	6.73%	\$ 1,345,173	\$ 33.63	\$ 416,782	\$ 10.42	\$ 1,761,956	\$ 44.05	\$ 392,342	\$ 9.81	\$ 392,342	\$ 9.81	\$ 224,196	\$ 5.60	\$ 336,293	\$ 6.89
Project Requirements	5.00%	\$ 781,254	\$ 19.53	\$ 292,972	\$ 7.32	\$ 1,074,226	\$ 26.86	\$ 280,280	\$ 7.01	\$ 215,748	\$ 5.39	\$ 110,917	\$ 2.77	\$ 174,309	\$ 3.57
<b>SUBTOTAL</b>	<b>\$ 20,387,291</b>	<b>\$ 509.68</b>	<b>\$ 7,553,269</b>	<b>\$ 188.83</b>	<b>\$ 27,940,561</b>	<b>\$ 698.51</b>	<b>\$ 7,219,658</b>	<b>\$ 180.49</b>	<b>\$ 5,647,731</b>	<b>\$ 141.19</b>	<b>\$ 2,937,617</b>	<b>\$ 73.44</b>	<b>\$ 4,582,285</b>	<b>\$ 93.85</b>	
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
GL Insurance & Subguard	2.60%	\$ 530,070	\$ 13.25	\$ 196,385	\$ 4.91	\$ 726,455	\$ 18.16	\$ 187,711	\$ 4.69	\$ 146,841	\$ 3.67	\$ 76,378	\$ 1.91	\$ 119,139	\$ 2.44
Bond	1.50%	\$ 305,809	\$ 7.65	\$ 113,299	\$ 2.83	\$ 419,108	\$ 10.48	\$ 108,295	\$ 2.71	\$ 84,716	\$ 2.12	\$ 44,064	\$ 1.10	\$ 68,734	\$ 1.41
CM Fee	3.00%	\$ 636,695	\$ 15.92	\$ 235,889	\$ 5.90	\$ 872,584	\$ 21.81	\$ 225,470	\$ 5.64	\$ 176,379	\$ 4.41	\$ 91,742	\$ 2.29	\$ 143,105	\$ 2.93
<b>SUBTOTAL</b>	<b>\$ 21,859,865</b>	<b>\$ 546.50</b>	<b>\$ 8,098,842</b>	<b>\$ 202.47</b>	<b>\$ 29,958,707</b>	<b>\$ 748.97</b>	<b>\$ 7,741,134</b>	<b>\$ 193.53</b>	<b>\$ 6,055,667</b>	<b>\$ 151.39</b>	<b>\$ 3,149,801</b>	<b>\$ 78.75</b>	<b>\$ 4,913,263</b>	<b>\$ 100.62</b>	
Escalation	11.69%	\$ 2,556,161	\$ 63.90	\$ 947,030	\$ 23.68	\$ 3,503,191	\$ 87.58	\$ 905,202	\$ -	\$ 708,113	\$ 17.70	\$ 368,319	\$ 9.21	\$ 574,527	\$ 11.77
<b>TOTAL</b>	<b>\$ 24,416,027</b>	<b>\$ 610.40</b>	<b>\$ 9,045,872</b>	<b>\$ 226.15</b>	<b>\$ 33,461,899</b>	<b>\$ 836.55</b>	<b>\$ 8,646,336</b>	<b>\$ 193.53</b>	<b>\$ 6,763,780</b>	<b>\$ 169.09</b>	<b>\$ 3,518,120</b>	<b>\$ 87.95</b>	<b>\$ 5,487,791</b>	<b>\$ 112.39</b>	

SUMMARY BY PROGRAM

	2,500		1,725		1,615		4,875		8,275		1,010	
	RENOVATION FIT-OUT MODEL											
	COUNCIL CHAMBERS		COUCIL & SUBCOMMITTEE		OFFICE SUPPORT		CLOSED OFFICE/MEETING		OPEN OFFICE		RESTROOMS	
TRADE	TOTALS	/SF	TOTALS	/SF	TOTALS	/SF	TOTALS	/SF	TOTALS	/SF	TOTALS	/SF
DEMOLITION/ENABLING	\$ 17,500	\$ 7.00	\$ 12,075	\$ 7.00	\$ 11,305	\$ 7.00	\$ 34,125	\$ 7.00	\$ 57,925	\$ 7.00	\$ 7,070	\$ 7.00
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 62,500	\$ 25.00	\$ 25,875	\$ 15.00	\$ 16,150	\$ 10.00	\$ 195,000	\$ 40.00	\$ 165,500	\$ 20.00	\$ 60,600	\$ 60.00
INTERIOR FINISHES	\$ 150,000	\$ 60.00	\$ 51,750	\$ 30.00	\$ 32,300	\$ 20.00	\$ 170,625	\$ 35.00	\$ 248,250	\$ 30.00	\$ 90,900	\$ 90.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 7,500	\$ 3.00	\$ 5,175	\$ 3.00	\$ 32,300	\$ 20.00	\$ -	\$ -	\$ -	\$ -	\$ 151,500	\$ 150.00
HVAC	\$ 112,500	\$ 45.00	\$ 69,000	\$ 40.00	\$ 64,600	\$ 40.00	\$ 292,500	\$ 60.00	\$ 413,750	\$ 50.00	\$ 55,550	\$ 55.00
FIRE PROTECTION	\$ 6,250	\$ 2.50	\$ 4,313	\$ 2.50	\$ 4,038	\$ 2.50	\$ 12,188	\$ 2.50	\$ 20,688	\$ 2.50	\$ 2,525	\$ 2.50
ELECTRICAL	\$ 137,500	\$ 55.00	\$ 69,000	\$ 40.00	\$ 48,450	\$ 30.00	\$ 195,000	\$ 40.00	\$ 314,450	\$ 38.00	\$ 32,320	\$ 32.00
EQUIPMENT	\$ 12,500	\$ 5.00	\$ 5,175	\$ 3.00	\$ -	\$ -	\$ 14,625	\$ 3.00	\$ 24,825	\$ 3.00	\$ 5,050	\$ 5.00
FURNISHINGS	\$ 30,000	\$ 12.00	\$ 13,800	\$ 8.00	\$ 8,075	\$ 5.00	\$ 24,375	\$ 5.00	\$ 124,125	\$ 15.00	\$ 30,300	\$ 30.00
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL DIRECT COSTS</b>	<b>\$ 536,250</b>	<b>\$ 214.50</b>	<b>\$ 256,163</b>	<b>\$ 148.50</b>	<b>\$ 217,218</b>	<b>\$ 134.50</b>	<b>\$ 938,438</b>	<b>\$ 192.50</b>	<b>\$ 1,369,513</b>	<b>\$ 165.50</b>	<b>\$ 435,815</b>	<b>\$ 431.50</b>
Design Contingency	\$ 61,937	\$ 24.77	\$ 29,587	\$ 17.15	\$ 25,089	\$ 15.53	\$ 108,390	\$ 22.23	\$ 158,179	\$ 19.12	\$ 50,337	\$ 49.84
Logistics & Loss Productivity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 28,125	\$ 11.25	\$ 13,435	\$ 7.79	\$ 11,393	\$ 7.05	\$ 49,219	\$ 10.10	\$ 71,828	\$ 8.68	\$ 22,857	\$ 22.63
General Conditions	\$ 52,098	\$ 20.84	\$ 13,024	\$ 7.55	\$ 39,073	\$ 24.19	\$ 65,122	\$ 13.36	\$ 91,171	\$ 11.02	\$ 26,049	\$ 25.79
Project Requirements	\$ 26,813	\$ 10.73	\$ 12,808	\$ 7.43	\$ 10,861	\$ 6.73	\$ 46,922	\$ 9.63	\$ 68,476	\$ 8.28	\$ 21,791	\$ 21.58
<b>SUBTOTAL</b>	<b>\$ 705,222</b>	<b>\$ 282.09</b>	<b>\$ 325,017</b>	<b>\$ 188.42</b>	<b>\$ 303,633</b>	<b>\$ 188.01</b>	<b>\$ 1,208,090</b>	<b>\$ 247.81</b>	<b>\$ 1,759,165</b>	<b>\$ 212.59</b>	<b>\$ 556,849</b>	<b>\$ 551.34</b>
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 18,336	\$ 7.33	\$ 8,450	\$ 4.90	\$ 7,894	\$ 4.89	\$ 31,410	\$ 6.44	\$ 45,738	\$ 5.53	\$ 14,478	\$ 14.33
Bond	\$ 10,578	\$ 4.23	\$ 4,875	\$ 2.83	\$ 4,554	\$ 2.82	\$ 18,121	\$ 3.72	\$ 26,387	\$ 3.19	\$ 8,353	\$ 8.27
CM Fee	\$ 22,024	\$ 8.81	\$ 10,150	\$ 5.88	\$ 9,482	\$ 5.87	\$ 37,729	\$ 7.74	\$ 54,939	\$ 6.64	\$ 17,390	\$ 17.22
<b>SUBTOTAL</b>	<b>\$ 756,160</b>	<b>\$ 302.46</b>	<b>\$ 348,493</b>	<b>\$ 202.02</b>	<b>\$ 325,564</b>	<b>\$ 201.59</b>	<b>\$ 1,295,350</b>	<b>\$ 265.71</b>	<b>\$ 1,886,230</b>	<b>\$ 227.94</b>	<b>\$ 597,070</b>	<b>\$ 591.16</b>
Escalation	\$ 88,421	\$ 35.37	\$ 40,751	\$ 23.62	\$ 38,070	\$ 23.57	\$ 151,470	\$ 31.07	\$ 220,564	\$ 26.65	\$ 69,818	\$ 69.13
<b>TOTAL</b>	<b>\$ 844,581</b>	<b>\$ 337.83</b>	<b>\$ 389,244</b>	<b>\$ 225.65</b>	<b>\$ 363,634</b>	<b>\$ 225.16</b>	<b>\$ 1,446,821</b>	<b>\$ 296.78</b>	<b>\$ 2,106,794</b>	<b>\$ 254.60</b>	<b>\$ 666,888</b>	<b>\$ 660.28</b>



SUMMARY BY PROGRAM

	1,310		445		1,680		5,440		11,125	
	RENOVATION FIT-OUT MODEL									
	MAYOR THROUGH SUITE		MAYOR OFFICE & CONFERENCE		STAFF AMENITIES		LOBBY / CORRIDORS		BOH/MECH	
TRADE	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 6,550	\$ 5.00	\$ 2,225	\$ 5.00	\$ 6,720	\$ 4.00	\$ 21,760	\$ 4.00	\$ 55,625	\$ 5.00
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 39,300	\$ 30.00	\$ 15,575	\$ 35.00	\$ 25,200	\$ 15.00	\$ 81,600	\$ 15.00	\$ 166,875	\$ 15.00
INTERIOR FINISHES	\$ 49,780	\$ 38.00	\$ 24,475	\$ 55.00	\$ 58,800	\$ 35.00	\$ 108,800	\$ 20.00	\$ 278,125	\$ 25.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 6,550	\$ 5.00	\$ 2,225	\$ 5.00	\$ 20,160	\$ 12.00	\$ 16,320	\$ 3.00	\$ 33,375	\$ 3.00
HVAC	\$ 52,400	\$ 40.00	\$ 20,025	\$ 45.00	\$ 67,200	\$ 40.00	\$ 136,000	\$ 25.00	\$ 222,500	\$ 20.00
FIRE PROTECTION	\$ 6,550	\$ 5.00	\$ 2,225	\$ 5.00	\$ 8,400	\$ 5.00	\$ 13,600	\$ 2.50	\$ 27,813	\$ 2.50
ELECTRICAL	\$ 49,780	\$ 38.00	\$ 17,800	\$ 40.00	\$ 58,800	\$ 35.00	\$ 136,000	\$ 25.00	\$ 222,500	\$ 20.00
EQUIPMENT	\$ 3,930	\$ 3.00	\$ 2,225	\$ 5.00	\$ 13,440	\$ 8.00	\$ -	\$ -	\$ -	\$ -
FURNISHINGS	\$ 13,100	\$ 10.00	\$ 6,675	\$ 15.00	\$ 5,040	\$ 3.00	\$ -	\$ -	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL DIRECT COSTS</b>	<b>\$ 227,940</b>	<b>\$ 174.00</b>	<b>\$ 93,450</b>	<b>\$ 210.00</b>	<b>\$ 263,760</b>	<b>\$ 157.00</b>	<b>\$ 514,080</b>	<b>\$ 94.50</b>	<b>\$ 1,006,813</b>	<b>\$ 90.50</b>
Design Contingency	\$ 26,327	\$ 20.10	\$ 10,793	\$ 24.26	\$ 30,464	\$ 18.13	\$ 59,376	\$ 10.91	\$ 116,287	\$ 10.45
Logistics & Loss Productivity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 11,955	\$ 9.13	\$ 4,901	\$ 11.01	\$ 13,834	\$ 8.23	\$ 26,962	\$ 4.96	\$ 52,805	\$ 4.75
General Conditions	\$ 13,024	\$ 9.94	\$ 13,024	\$ 29.27	\$ 26,049	\$ 15.51	\$ 26,049	\$ 4.79	\$ 52,098	\$ 4.68
Project Requirements	\$ 11,397	\$ 8.70	\$ 4,673	\$ 10.50	\$ 13,188	\$ 7.85	\$ 25,704	\$ 4.73	\$ 50,341	\$ 4.53
<b>SUBTOTAL</b>	<b>\$ 290,643</b>	<b>\$ 221.87</b>	<b>\$ 126,842</b>	<b>\$ 285.04</b>	<b>\$ 347,295</b>	<b>\$ 206.72</b>	<b>\$ 652,171</b>	<b>\$ 119.88</b>	<b>\$ 1,278,343</b>	<b>\$ 114.91</b>
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 7,557	\$ 5.77	\$ 3,298	\$ 7.41	\$ 9,030	\$ 5.37	\$ 16,956	\$ 3.12	\$ 33,237	\$ 2.99
Bond	\$ 4,360	\$ 3.33	\$ 1,903	\$ 4.28	\$ 5,209	\$ 3.10	\$ 9,783	\$ 1.80	\$ 19,175	\$ 1.72
CM Fee	\$ 9,077	\$ 6.93	\$ 3,961	\$ 8.90	\$ 10,846	\$ 6.46	\$ 20,367	\$ 3.74	\$ 39,923	\$ 3.59
<b>SUBTOTAL</b>	<b>\$ 311,637</b>	<b>\$ 237.89</b>	<b>\$ 136,003</b>	<b>\$ 305.63</b>	<b>\$ 372,380</b>	<b>\$ 221.65</b>	<b>\$ 699,278</b>	<b>\$ 128.54</b>	<b>\$ 1,370,677</b>	<b>\$ 123.21</b>
Escalation	\$ 36,441	\$ 27.82	\$ 15,903	\$ 35.74	\$ 43,544	\$ 25.92	\$ 81,769	\$ 15.03	\$ 160,279	\$ 14.41
<b>TOTAL</b>	<b>\$ 348,077</b>	<b>\$ 265.71</b>	<b>\$ 151,907</b>	<b>\$ 341.36</b>	<b>\$ 415,924</b>	<b>\$ 247.57</b>	<b>\$ 781,047</b>	<b>\$ 143.57</b>	<b>\$ 1,530,956</b>	<b>\$ 137.61</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION</b>	<b>40,000</b>			<b>724,405</b>
HAZMAT Abatement - allowance per report	1	LS	636,300.00	-
Exterior Door Caulking (man door)	5	EA	300.00	1,500
Exterior Window Caulking ( w/ wood dbl. hung window)	80	EA	150.00	12,000
White/Gray Sink Undercoating	10	EA	100.00	1,000
Pebble Patterned Vinyl Sheet Flooring (under carpet under other non ACM flooring & on concrete)	2,000	SF	8.00	16,000
9x9 Green Black Checkered Vinyl Floor Tile	800	SF	8.13	6,500
Remnant Black Tile Mastic	300	SF	4.00	1,200
Pipe insulation & Fittings (35)	450	LF	20.00	9,000
Pipe insulation & fittings (15)	60	LF	20.00	1,200
Plaster Walls and Ceilings	1,200	SF	9.00	10,800
Asphaltic Damp Proofing	1	LS	150,000.00	150,000
Buried Pipes & Steam Tunnels	1	LS	250,000.00	250,000
Concealed caulking & Sealants				TBD
Concealed pipe fitting insulation behind hard wall and ceiling surfaces				TBD
Grout/Thin Sets w/ Terrazzo Floors				TBD
Decorative Plaster	7,500	SF	8.00	60,000
Mirror Mastic				TBD
Misc. Hazardous building materials	1	LS	15,000	15,000
- 5.5 % Contingency (4.5 carried below line in markups)	1	LS	27,005	27,005
Bid Monitoring fee	1	LS	25,000	25,000
<u>Demo</u>				-
Demo painted metal ramp at front entry	75	LF	100.00	7,500
Demo painted metal ramp at rear entry	25	LF	100.00	2,500
Demo stairs for lift	1	LS	5,000.00	5,000
Demo existing vaults per demo drawings	1,000	SF	50.00	-
- Demo Vault Walls	3,810	SF	20.00	76,200
- Demo flooring associated with vault removal	1,880	SF	25.00	47,000
- Shoring of flooring slabs to remain				See Superstructure
<b>FOUNDATIONS</b>	<b>40,000</b>			<b>137,000</b>
<b>Existing Foundations</b>				-
Allowance - trenching for bathrooms and underslab plumbing	2,000	SF		For reference only
Trench existing slab for access	2,000	SF	12.00	24,000
Pour new reinforced 6" slab	2,000	SF	15.00	30,000
Bentonite Grout Injections with vertical ports - moisture remediation	2,075	SF	40.00	83,000
<b>Elevator Pits</b>				Excluded, no new pits required
<b>SUPERSTRUCTURE</b>	<b>40,000</b>			<b>463,960</b>
<b>Core &amp; Shell</b>				-
Allowance - 3 openings in load bearing masonry walls per demo drawings	3	EA	3,500.00	10,500
Create new 3-6 linteled openings (x5 allowance)	5	EA	2,600.00	13,000
Allowance - scan, coordinate, and reinforce new MEP riser openings	1	LS	50,000.00	50,000
Misc. structural allowance for repairs	40,000	SF	5.00	200,000
<b>Truss Reinforcement - Allowances</b>				-

TRADE	QTY	UNIT	RATE	TOTAL
Attic trusses - steel plate reinforcement, 20lf of truss to be reinforced at each truss. 9"x1/2"x 10' Plates	160	LF	125.00	20,000
<b><u>Vault Removal - Infill of structure</u></b>				-
Temp shoring/structure support at floor restructuring	400	LF	70.00	28,000
New Steel Columns per Structural Sketch - 4 floor to floor spans	60	LF	500.00	30,000
Transfer Beam - allowance	10	LF	1,000.00	10,000
<b><u>Floor restructuring</u></b>	1,880	SF		Ref only
- 3.25" Concrete	1,880	SF	7.00	13,160
- 2" Metal Deck	1,880	SF	10.00	18,800
- Steel Framing - 10 lbs./SF, premium rate per ton for small amount	9	TONS	7,500.00	70,500
<b>INTERIOR CONSTRUCTION</b>	<b>40,000</b>			<b>536,275</b>
Core & shell interior construction allowance	40,000	SF	10.00	400,000
Rated - GWB furring at wood joists, south wing 3rd floor only	2,650	SF	9.50	25,175
<b><u>Stair Enclosure Code Improvements</u></b>				
Glass & Metal Storefront with wood veneer at east entry wall to monumental stair case at each floor - 1 HR fire rated	384	SF	150.00	57,600
1 Hour Rated Double doors within storefront	4	EA	8,000.00	32,000
50% Partition replacement at second egress stair - 1 hr. rating	1,000	SF	21.50	21,500
<b>STAIRWAYS</b>	<b>40,000</b>			<b>116,700</b>
Main Monumental Circulation Stairs	8	FLT		Existing to Remain
Monumental Stairs - Wall mounted handrails	120	LF	375.00	45,000
Egress Stair in south wing	6	FLT		Existing to Remain
Egress Stairs - Wall mounted handrails	180	LF	375.00	67,500
Enclosure code upgrades				See Interior Construction
Selective cleaning of concrete/existing finishes	14	FLT	300.00	4,200
<b>CONVEYING SYSTEMS</b>	<b>40,000</b>			<b>190,000</b>
<b><u>Modernize Existing Elevator</u></b>				-
Rehab/Modernization/Full maintenance/testing of existing elevator: Beckwith Hydraulic, 80" x 50" cab, 2,500# capacity at 125 FPM, 4 steps	1	LS	150,000.00	150,000
-allowance - replace hydraulic pump	1	LS	15,000.00	15,000
-allowance - cab finishes	1	LS	25,000.00	25,000
<b><u>New Chairlift</u></b>				Excluded per narrative, previously included
<b>FURNISHINGS</b>	<b>40,000</b>			<b>60,000</b>
Accessibility Signage - Allowance	40,000	SF	1.00	40,000
Wayfinding signage & departmental graphics	40,000	SF	0.50	20,000

TRADE	QTY	UNIT	RATE	TOTAL
<b>PROJECT REQUIREMENTS</b>	40,000			<b>110,917</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	2,218,340	110,917
<b>TOTAL DIRECT COSTS</b>				<b>2,339,257</b>
<b>ALLOCATIONS</b>				<b>1,178,863</b>
General Conditions	8.0	28,024	wks	224,196
Permits	0.0 %			-
Insurances	2.6 %			76,378
Design Contingency	11.0 %			257,318
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			116,846
Bond	1.5 %			44,064
Fee	3.0 %			91,742
Escalation	11.7 %			368,319
<b>TOTAL CONSTRUCTION COST</b>				<b>3,518,120</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>EXTERIOR ENCLOSURE</b>	<b>40,000</b>			<b>4,431,372</b>
<b><u>General Allowances</u></b>				-
Scaffolding - Assumed@ entire enclosure and clock tower	28,450	SF	18.00	512,100
Scrim	28,450	SF	5.00	142,250
Misc. setup/tear down	60	MD	800.00	48,000
Misc. repointing/repairs/sealants	28,450	SF	5.50	156,475
<b><u>Window Scope - Exterior</u></b>				-
New mahogany sashes w/ custom geometry and true divided lites to fit existing frames, match historic - 168 Double Hung Windows	2,333	SF	350.00	816,550
Replace weather stripping, rails, and other hardware - bronze finishes	168	EA	1,200.00	201,600
Replace 5% of frames with mahogany to match	3	EA	15,000.00	45,000
Replace 15% of sills with mahogany to match	277	LF	300.00	83,160
Epoxy repairs at 40% of sills	554	LF	40.00	22,176
Remaining wood frames stripped, primed, painted	165	EA	1,600.00	264,000
<b><u>Window Scope - Interior</u></b>				-
Interior stain grade wood casing, salvage and reuse with jamb extensions required for furring	95	EA	1,800.00	171,000
<b><u>Clock Tower</u></b>				-
Replace 20% of T&G Flush Plank Cladding	264	SF	60.00	15,840
Replace 40% of projecting wood elements	1	LS	50,000.00	50,000
100% strip of existing paint	1,320	SF	8.00	10,560
Paint and prime all wood	1,320	SF	5.00	6,600
Allowance - repair and maintain copper flashing	1	LS	5,000.00	5,000
Allowance - repair clock (assumed specialist)	1	LS	35,000.00	35,000
<b><u>Brick Masonry Restoration</u></b>	10,050	SF		Ref Only
Precast medallions - consolidating/repairs	3	EA	1,800.00	5,400
Allowance - general masonry cleaning	10,050	SF	5.00	50,250
Allowance - 10% heavy duty cleaning/poultice treatment	1,005	SF	25.00	25,125
Allowance - 20% Efflorescence removal on exterior brick at central 3 story mass	500	SF	28.00	14,000
Allowance - face brick replacement	210	BRICKS	70.00	14,700
Allowance - clear vegetation/vines	100	SF	8.00	800
Allowance -20% masonry repoint	2,010	SF	35.00	70,350
Allowance - repoint at all window heads	95	EA	500.00	47,500
<b><u>Rusticated Base Story</u></b>	4,120	SF		Ref. Only
Allowance - General masonry cleaning	4,120	SF	5.00	20,600
Allowance - 10% heavy duty cleaning/poultice treatment	412	SF	25.00	10,300
Allowance - cleaning product test for above	1	LS	2,500.00	2,500
Allowance - 30% Repoint, rope style half round mortar	1,236	SF	38.00	46,968
Allowance - patch at spalling	20	LOC	500.00	10,000
Allowance - Repair & Patch cracks typically	200	LOC	320.00	64,000
Allowance - Replace cast masonry headers with precast units, custom color and aggregate	6	LOC	2,800.00	16,800
<b><u>Exterior Wood - Top of Pilasters and Up</u></b>	10,050	SF		Ref Only
100% Chemical strip down to bare wood	10,050	SF	8.00	80,400
40% wood replacement, element details to match existing	4,020	SF	135.00	542,700

TRADE	QTY	UNIT	RATE	TOTAL
Prime and paint all wood	10,050	SF	5.00	50,250
Repair and refinish pilaster capital details	34	EA	800.00	27,200
<b>Exterior Wood - Top of Pilasters and Below</b>	2,810	SF		Ref Only
Full wood Panel replacement at masonry openings as indicated on elevations	560	SF	115.00	64,400
Allowance - epoxy repairs at wood elements with exposed horizontal surfaces	1	LS	10,000.00	10,000
Replace 100% miniature cornice profile below window sills	576	LF	90.00	51,840
Allowance - prime and paint assumed	2,810	SF	5.00	14,050
<b>South Terrace</b>				Ref. Only
Allowance - General masonry cleaning	585	SF	5.00	2,925
Allowance - (1) Drain replacement	1	EA	1,200.00	1,200
Allowance - 10% heavy duty cleaning/poultice treatment	60	SF	25.00	1,500
Full replacement of balustrade with precast units, custom geometry and color.	65	LF	2,600.00	169,000
18" x 18" precast pavers to match existing on pedestal system	550	SF	40.00	22,000
- replace tapered insulation	550	SF	12.00	6,600
- replace waterproofing	550	SF	8.00	4,400
Metal Handrail with bronze handrail profile on metal posts	40	LF	450.00	18,000
Allowance - Repoint 100%	585	SF	25.00	14,625
Allowance - Reset ashlar units (15 units)	40	SF	100.00	4,000
Allowance - Replace ashlar units	4	EA	550.00	2,200
<b>Exterior Metal Works</b>				-
Steel wrought iron balconette on west façade - salvage, strip, patch, repair, shop paint, reinstall	15	LF	1,050.00	15,750
Fire escape - scrape/prime/paint	1	LS	9,000.00	9,000
<b>Doors and Entrances</b>				-
Strip & refinish wood leaves with exterior grade acrylic urethane at Main East & West Entries	4	LVS	2,000.00	8,000
- New Hardware at main entries: satin bronze finishes	4	LVS	1,600.00	6,400
Replace exterior door at west elevation of south wing	1	LVS	3,000.00	3,000
Full Replacement of north door and (2) south doors to terrace, wood door with window	3	LVS	3,500.00	10,500
Window Wall door surrounds at north and south with lites	100	SF	200.00	20,000
ADO (auto door operators) at all exits	6	LVS	3,500.00	21,000
<b>Interior Side - Below Grade Walls</b>				-
Furring - 2.5" stud, 1 layer mold-resistant drywall, Smart AVB assumed	2,145	SF	12.00	25,740
3" closed cell spray foam	2,145	SF	7.50	16,088
<b>Interior Side - Above Grade Walls</b>				-
Furring - 2.5" stud, 1 layer drywall - smart AVB	14,000	SF	11.00	154,000
5" open cell spray foam	14,000	SF	5.00	70,000
<b>ROOFING</b>	40,000			<b>1,174,220</b>
Demo existing EPDM flat roof	3,640	SF	6.00	21,840
Demo slate shingles and select substrate, insulation, membrane and pitched roof	10,760	SF	4.50	48,420

TRADE	QTY	UNIT	RATE	TOTAL
<b>Replace Flat Roof</b>	3,640	SF		For reference only
EPDM with rigid tapered insulation to R-38 min	3,640	SF	32.00	116,480
- Allowance for select repairs to concrete deck to remain per narrative	150	SF	80.00	12,000
<b>Pitched Roof</b>	10,760	SF		For reference only
Allowance - replace 20% of wood plank sheathing	2,152	SF	40.00	86,080
R-38 closed cell spray foam insulation at underside of roof deck	10,760	SF	7.50	80,700
New slate roof to match existing	10,760	SF	58.00	624,080
Copper step and cap flashings - allowance per narrative select replacement	60	LF	75.00	4,500
Allowance - replacement of membrane at lower 4' of pitched roof, fluid applied, three coats, on glass fiber mesh reinf	1,120	SF	26.00	29,120
Allowance - replacement of 40% of plywood substrate at lower pitched room	448	SF	20.00	8,960
<b>Internal Gutters &amp; misc. roof</b>	14,400	SF		For reference only
Replace 4 exposed leader boxes and rain water leaders - copper assumed	280	LF	75.00	21,000
Add 4 additional exposed rain leader boxes and downspouts	280	LF	75.00	21,000
Salvage and reinstall snow fences - 80% reuse	224	LF	60.00	13,440
New Snow fence - 20% replacement assumed	56	LF	150.00	8,400
Wood gutters, fascia, soffit repairs - allowance	14,400	SF	3.00	43,200
Allowance - fall arrest anchors for sloped roof	1	LS	30,000.00	30,000
Allowance - replace maintenance steps of the short roof ridge	1	LS	5,000.00	5,000
<b>PROJECT REQUIREMENTS</b>	40,000			<b>280,280</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	5,605,591.50	280,280
<b>TOTAL DIRECT COSTS</b>				<b>5,885,871</b>
<b>ALLOCATIONS</b>				<b>2,760,465</b>
General Conditions	14.0	28,024	wks	392,342
Permits	0.0 %			-
Insurances	2.6 %			187,711
Design Contingency	11.0 %			647,446
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			293,999
Bond	1.5 %			108,295
Fee	3.0 %			225,470
Escalation	11.7 %		3/15/2025	905,202
<b>TOTAL CONSTRUCTION COST</b>				<b>8,646,336</b>

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	40,000			120,000
Demolition of extg MEP systems	40,000	SF	3.00	120,000
PLUMBING	40,000			690,000
Plumbing infrastructure replacement	40,000	SF	12.00	480,000
Rainwater storage & reuse - allow				-
Rainwater treatment skid: filters, UV, day tank, booster pump, recirc pump to exterior tank, dye infusion	1	LS	100,000.00	100,000
Makeup water connection w/ backflow preventer	1	LS	10,000.00	10,000
Exterior storage tank - 5000Gal day tank for flushing	1	LS	15,000.00	15,000
Piping and connections for fixture flushing- allow	1	LS	50,000.00	50,000
Misc. harvesting scope required	1	LS	35,000.00	35,000
Greywater system - allowance, hand sink waste recycled for irrigation				Excluded
HVAC	40,000			1,801,937
<u>HVAC Infrastructure</u>				
<u>Geothermal Wells</u>				
<u>Heating/cooling equipment</u>				
6-pipe modular GSHP chiller consisting of (3) 30 ton (nominal) VFD scroll heat recovery chiller modules, similar to Multistack VME-2	90	TON	2,250.00	202,500
- 5 hp GTWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
- 5 hp HWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
- 5 hp CHWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
Heat exchangers				-
- HX GTW to CHW, 200 gpm	1	EA	30,000.00	30,000
- HX GTW to CHW, 150 gpm	1	EA	22,500.00	22,500
Smart Plant Controller by Equip Manufacturer	1	LS	35,000.00	35,000
400 Gallon buffer tanks	2	EA	4,500.00	9,000
Connection to bore well field installed with 1895	1	LS	30,000.00	30,000
<u>Heat Recovery Systems</u>				
New glycol system/ feed				With 1895
Chemical shot feeder, air separation, expansion				With 1895
<u>Air Distribution</u>				
AHU-1 - with ECM fans	10,000	CFM	17.00	170,000
Packaged ERV - 1500 CFM, (1) each	1,500	CFM	10.00	15,000
<u>Exhaust</u>				
General exhaust - allow	1	LS	3,500.00	3,500
<u>Smoke extract</u>				Excluded, assume not required
<u>Energy Performance</u>				
Variable Frequency Drives				-
AHUs - ECM fans,				No VFDs Req.
Pumps - 5hp	6	EA	3,500.00	21,000
VFD's for exhaust fans, allow	1	EA	1,500.00	1,500
Energy Metering Allowance	1	LS	30,000.00	30,000



TRADE	QTY	UNIT	RATE	TOTAL
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves &amp; Connections</u>				-
<u>Steam Piping</u>			Excluded, assume not required	
<u>Heating/Cooling piping</u>				-
- CHW/HW mains & risers, runouts to equipment	1,100	LF	80.00	88,000
- Piping on floor loops	6,400	LF	40.00	256,000
Control valves on main equipment	8	EA	3,500.00	28,000
<u>Sheetmetal &amp; Accessories</u>				-
Primary ductwork galvanized sheetmetal tying	8,700	LBS	15.50	134,850
General bathroom & exhaust ductwork	1,400	LBS	15.50	21,700
<u>Accessories</u>				-
Fire dampers for main supply extract risers	4	EA	2,250.00	9,000
Volume dampers, control dampers & access Panels	1	LS	24,832.50	24,833
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	7,500	LF	11.00	82,500
Ductwork insulation	6,692	SF	6.00	40,154
<u>Fuel Systems</u>				Excluded, assume not required
<u>Data room cooling</u>	1	LS	15,000.00	15,000
<u>Building Management System</u>				-
Head end allowance	1	LS	35,000.00	35,000
GSHP	30	PTS	1,200.00	36,000
Pumps	24	PTS	1,200.00	28,800
AHUs - assume 40pts ea average	40	PTS	1,200.00	48,000
Fans	4	PTS	1,200.00	4,800
Misc.	20	PTS	1,200.00	24,000
<b>Testing, balancing &amp; commissioning support</b>	1	LS	60,265.45	60,265
<b>Co-ordination, rigging, CAD, Sub-trade temp</b>	1	LS	235,035.27	235,035
<b>FIRE PROTECTION</b>	<b>40,000</b>			<b>160,000</b>
Fire protection infrastructure	40,000	SF	4.00	160,000
<b>ELECTRICAL</b>	<b>40,000</b>			<b>1,543,018</b>
<u>Normal Service Distribution</u>				-
1000KVA pad mounted xfmr	1	LS	125,000.00	125,000
1600A swbd, CT cab	1	LS	100,000	100,000
45kva step down xfmr	2	EA	5,000.00	10,000
- Labor for equipment install	640	MH	125.00	80,000
150A power panel - 84 ckts	4	EA	7,650.00	30,600
100A lighting panels	4	EA	3,000.00	12,000
Mechanical panel - 400A	1	EA	8,000.00	8,000
Mechanical panel - 150A	1	EA	4,500.00	4,500
<u>ATS Switches</u>				-
ATS-LS, OP	2	EA	25,000.00	50,000
<u>Energy Metering</u>				-
Energy meters - allowance	12	EA	3,500.00	42,000
<u>Normal Feeders</u>	40,000	SF	3.00	120,000
<u>Emergency Power Distribution</u>				-
Generator	300	KW		Carried with 1895
Acoustic enclosure allowance	1	LS		Carried with 1895
Panel/connections	1	LS	15,000.00	15,000
<u>Emergency Distribution Panels - allow</u>	5	EA	4,500.00	22,500

TRADE	QTY	UNIT	RATE	TOTAL
Emergency Feeders	40,000	SF	1.50	60,000
Mechanical / Equipment Power	40,000	SF	2.50	100,000
Lighting, inclusive of conduit, fitting and wiring				w/ fitout
Lighting controls				w/ fitout
Receptacle power				w/ fitout
Fire Alarm				-
Fire Alarm - complete system	40,000	SF	7.00	280,000
Temp fire alarm	40,000	SF	1.50	60,000
BDA				Excluded, assume not required
Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)	40,000	SF	3.00	120,000
Audio visual				w/ fitout
Security systems allowance (head-end and backbone)	40,000	SF	2.00	80,000
Lightning protection	40,000	SF	0.85	34,000
PV infrastructure allowance	1	LS		Excluded for City Hall
Testing & bonding	1	LS	49,144.00	49,144
Sub-trade temps/ gcs	1	LS	140,274.40	140,274
<b>PROJECT REQUIREMENTS</b>	<b>40,000</b>			<b>215,748</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	4,314,955	215,748
<b>TOTAL DIRECT COSTS</b>				<b>4,530,703</b>
<b>ALLOCATIONS</b>				<b>2,233,077</b>
General Conditions	14.0	28,024	wks	392,342
Permits	0.0 %			-
Insurances	2.6 %			146,841
Design Contingency	11.0 %			498,377
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			226,309
Bond	1.5 %			84,716
Fee	3.0 %			176,379
Escalation	11.7 %		3/15/2025	708,113
<b>TOTAL CONSTRUCTION COST</b>				<b>6,763,780</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>SITE PREP</b>	<b>48,828</b>			<b>180,697</b>
Contaminated Soil Considerations				Excluded
Site Perimeter Fence	1,000	LF	75.00	75,000
Silt Barrier and Erosion protection - allowance	48,828	SF	0.25	12,207
Allowance - existing tree protection, 10 assumed	8	EA	800.00	6,400
Clearing and grubbing of existing	48,828	SF	0.35	17,090
Stair path combination to be demolished north of building per site sketch	1	LS	30,000.00	30,000
Construction Vehicle access/wheel wash - two locations assumed	2	EA	20,000.00	40,000
<b>SITE IMPROVEMENTS</b>	<b>48,828</b>			<b>3,031,539</b>
<u>Grading</u>				-
Fine grading	48,828	SF	1.25	61,035
Excavation for site features - allowance	300	CY	75.00	22,500
Bermed Slope to accommodate new ramp	10,000	SF	20.00	200,000
Retaining Walls to accommodate ADA ramp - Assume spread footing extending back, max height 5'	430	LF	1,000.00	430,000
- Railing at ramp, both sides	1,120	LF	300.00	336,000
ADA Ramp	3,360	SF	50.00	168,000
Interconnecting stairs - CIP concrete assumed	5	EA	20,000.00	100,000
<u>Feature stairs at city hall plaza - east</u>				-
ADA accessible ramp to main entrance	500	SF	75.00	37,500
Stairs to main entrance, granite facing assumed for premium finish to city hall	1	LS	60,000.00	60,000
Concrete planters - allowance	2	LOC	12,000.00	24,000
Seat Walls - allowance	60	LF	500.00	30,000
Ramp to west entrance - adjust geometry to be ADA code compliant	250	SF	75.00	18,750
Stairs to school entrance, granite facing assumed	1	LS	18,500.00	18,500
Knee walls - allowance	35	LF	800.00	28,000
<u>Hardscape</u>				-
Pedestrian Sidewalks - Brushed concrete CIP assumed	16,000	SF	35.00	560,000
Permeable plaza pavers - type 1	7,500	SF	55.00	412,500
<u>Landscaping &amp; Plantings</u>				-
Trees, counts based roughly on current site conceptual plan - allowance	28	EA	900.00	25,200
Native Shrubs & Perennials at feature planting areas that are drought resistant - allowance	6,640	SF	20.00	132,800
Bioretention plantings - per sketch provided	6,000	SF	12.00	72,000
Sod at lawn - assumed	36,188	SF	2.50	90,470
Irrigation - reuse of storm water per Nitsch narrative	48,828	SF	3.00	146,484
<u>Misc. Site Furnishings</u>				-
Bike racks	2	EA	3,000.00	6,000
Trash Receptacles	3	EA	600.00	1,800
Bollards - impact resistant	20	EA	2,500.00	50,000
<b>SITE CIVIL / MECHANICAL</b>	<b>48,828</b>			<b>115,917</b>
<u>Storm Water Management</u>				-

TRADE	QTY	UNIT	RATE	TOTAL
Bioretention areas for storm water management - allowance for under drains and piping	6,000	SF	8.50	51,000
30,000 gallon detention tank (shared between 1895 and city hall buildings, allocated to 1895 project) - inclusive of piping routing				See 1895 Building
25,000 cf subgrade retention chambers additional				See 1895 Building
- excavation for detention structure				See 1895 Building
Storm water reuse system - to plumbing fixtures				w/ Plumbing
<u>Incoming utility services</u>				-
12" Sanitary Sewer line - length assumed	75	LF	125.00	9,375
- Excavation and backfill	42	CY	120.00	5,000
Storm Sanitary Sewer line - at sloped ramp switchback	100	LF	125.00	12,500
- Excavation and backfill	56	CY	120.00	6,667
6" Fire Service - length assumed	75	LF	175.00	13,125
- Excavation and backfill	42	CY	120.00	5,000
3" Water Service - length assumed	75	LF	110.00	8,250
- Excavation and backfill	42	CY	120.00	5,000
<b>SITE ELECTRICAL</b>	<b>48,828</b>			<b>158,033</b>
Site Electrical - allowance	1	LS	100,000.00	100,000
<u>Electrical Service</u>				-
Incoming electrical duct bank - assumed required	215	LF	180.00	38,700
- excavation and backfill	119	LF	120.00	14,333
Concrete pad for transformer	1	LS	5,000.00	5,000
Concrete pad for generator to serve both 1895 and City Hall				w/ 1895
<b>PROJECT REQUIREMENTS</b>	<b>48,828</b>			<b>174,309</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	3,486,186	174,309
<b>TOTAL DIRECT COSTS</b>				<b>3,660,495</b>
<b>ALLOCATIONS</b>				<b>1,827,295</b>
General Conditions	12.0	28,024	wks	336,293
Permits	0.0 %			-
Insurances	2.6 %			119,139
Design Contingency	11.0 %			402,654
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			182,842
Bond	1.5 %			68,734
Fee	3.0 %			143,105
Escalation	11.7 %			574,527
<b>TOTAL CONSTRUCTION COST</b>				<b>5,487,791</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION/ENABLING</b>	<b>40,000</b>			<b>232,880</b>
COUNCIL CHAMBERS	2,500	SF	7.00	17,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	7.00	12,075
OFFICE SUPPORT	1,615	SF	7.00	11,305
CLOSED OFFICE/MEETING	4,875	SF	7.00	34,125
OPEN OFFICE	8,275	SF	7.00	57,925
RESTROOMS	1,010	SF	7.00	7,070
MAYOR THROUGH SUITE	1,310	SF	5.00	6,550
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	5.00	2,225
STAFF AMENITIES	1,680	SF	4.00	6,720
LOBBIES/CORRIDORS/CIRC	5,440	SF	4.00	21,760
BOH/MECH	11,125	SF	5.00	55,625
<b>INTERIOR CONSTRUCTION</b>	<b>40,000</b>			<b>854,175</b>
COUNCIL CHAMBERS	2,500	SF	25.00	62,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	15.00	25,875
OFFICE SUPPORT	1,615	SF	10.00	16,150
CLOSED OFFICE/MEETING	4,875	SF	40.00	195,000
OPEN OFFICE	8,275	SF	20.00	165,500
RESTROOMS	1,010	SF	60.00	60,600
MAYOR THROUGH SUITE	1,310	SF	30.00	39,300
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	35.00	15,575
STAFF AMENITIES	1,680	SF	15.00	25,200
LOBBIES/CORRIDORS/CIRC	5,440	SF	15.00	81,600
BOH/MECH	11,125	SF	15.00	166,875
<b>INTERIOR FINISHES</b>	<b>40,000</b>			<b>1,263,805</b>
COUNCIL CHAMBERS	2,500	SF	60.00	150,000
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	30.00	51,750
OFFICE SUPPORT	1,615	SF	20.00	32,300
CLOSED OFFICE/MEETING	4,875	SF	35.00	170,625
OPEN OFFICE	8,275	SF	30.00	248,250
RESTROOMS	1,010	SF	90.00	90,900
MAYOR THROUGH SUITE	1,310	SF	38.00	49,780
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	55.00	24,475
STAFF AMENITIES	1,680	SF	35.00	58,800
LOBBIES/CORRIDORS/CIRC	5,440	SF	20.00	108,800
BOH/MECH	11,125	SF	25.00	278,125
<b>PLUMBING</b>	<b>40,000</b>			<b>275,105</b>
COUNCIL CHAMBERS	2,500	SF	3.00	7,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	3.00	5,175
OFFICE SUPPORT	1,615	SF	20.00	32,300
RESTROOMS	1,010	SF	150.00	151,500
MAYOR THROUGH SUITE	1,310	SF	5.00	6,550
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	5.00	2,225
STAFF AMENITIES	1,680	SF	12.00	20,160
LOBBIES/CORRIDORS/CIRC	5,440	SF	3.00	16,320
BOH/MECH	11,125	SF	3.00	33,375
<b>HVAC</b>	<b>40,000</b>			<b>1,506,025</b>
COUNCIL CHAMBERS	2,500	SF	45.00	112,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	40.00	69,000
OFFICE SUPPORT	1,615	SF	40.00	64,600
CLOSED OFFICE/MEETING	4,875	SF	60.00	292,500

TRADE	QTY	UNIT	RATE	TOTAL
OPEN OFFICE	8,275	SF	50.00	413,750
RESTROOMS	1,010	SF	55.00	55,550
MAYOR THROUGH SUITE	1,310	SF	40.00	52,400
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	45.00	20,025
STAFF AMENITIES	1,680	SF	40.00	67,200
LOBBIES/CORRIDORS/CIRC	5,440	SF	25.00	136,000
BOH/MECH	11,125	SF	20.00	222,500
<b>FIRE PROTECTION</b>	<b>40,000</b>			<b>108,588</b>
CLOSED OFFICE/MEETING	2,500	SF	2.50	6,250
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	2.50	4,313
OFFICE SUPPORT	1,615	SF	2.50	4,038
CLOSED OFFICE/MEETING	4,875	SF	2.50	12,188
OPEN OFFICE	8,275	SF	2.50	20,688
RESTROOMS	1,010	SF	2.50	2,525
MAYOR THROUGH SUITE	1,310	SF	5.00	6,550
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	5.00	2,225
STAFF AMENITIES	1,680	SF	5.00	8,400
LOBBIES/CORRIDORS/CIRC	5,440	SF	2.50	13,600
BOH/MECH	11,125	SF	2.50	27,813
<b>ELECTRICAL</b>	<b>40,000</b>			<b>1,281,600</b>
COUNCIL CHAMBERS	2,500	SF	55.00	137,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	40.00	69,000
OFFICE SUPPORT	1,615	SF	30.00	48,450
CLOSED OFFICE/MEETING	4,875	SF	40.00	195,000
OPEN OFFICE	8,275	SF	38.00	314,450
RESTROOMS	1,010	SF	32.00	32,320
MAYOR THROUGH SUITE	1,310	SF	38.00	49,780
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	40.00	17,800
STAFF AMENITIES	1,680	SF	35.00	58,800
LOBBIES/CORRIDORS/CIRC	5,440	SF	25.00	136,000
BOH/MECH	11,125	SF	20.00	222,500
<b>EQUIPMENT</b>	<b>40,000</b>			<b>81,770</b>
COUNCIL CHAMBERS	2,500	SF	5.00	12,500
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	3.00	5,175
CLOSED OFFICE/MEETING	4,875	SF	3.00	14,625
OPEN OFFICE	8,275	SF	3.00	24,825
RESTROOMS	1,010	SF	5.00	5,050
MAYOR THROUGH SUITE	1,310	SF	3.00	3,930
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	5.00	2,225
STAFF AMENITIES	1,680	SF	8.00	13,440
<b>FURNISHINGS</b>	<b>40,000</b>			<b>255,490</b>
COUNCIL CHAMBERS	2,500	SF	12.00	30,000
COUCIL COMMITTEE & SUBCOMMITTEE	1,725	SF	8.00	13,800
OFFICE SUPPORT	1,615	SF	5.00	8,075
CLOSED OFFICE/MEETING	4,875	SF	5.00	24,375
OPEN OFFICE	8,275	SF	15.00	124,125
RESTROOMS	1,010	SF	30.00	30,300
MAYOR THROUGH SUITE	1,310	SF	10.00	13,100
MAYOR PERSONAL OFFICE & CONFERENCE	445	SF	15.00	6,675
STAFF AMENITIES	1,680	SF	3.00	5,040
<b>PROJECT REQUIREMENTS</b>	<b>40,000</b>			<b>292,972</b>

TRADE	QTY	UNIT	RATE	TOTAL
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	5,859,438	292,972
<b>TOTAL DIRECT COSTS</b>				<b>6,152,409</b>
<b>ALLOCATIONS</b>				<b>2,893,463</b>
General Conditions	32.0	wks	13,024	416,782
Permits	0.0 %			-
Insurances	2.6 %			196,385
Design Contingency	11.0 %			676,765
Design Build Fee	0.0 %			-
Construction Contingency	4.5 %			307,313
Bond	1.5 %			113,299
Fee	3.0 %			235,889
Escalation	11.7 %		3/15/2025	947,030
<b>TOTAL CONSTRUCTION COST</b>				<b>9,045,872</b>

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	<b>ENV Alternate #1</b> <i>ILO R-38 achieved by closed-cell spray at underside of rafters, install ventilated roofing system</i>				<b>186,843</b>
	Deduct Closed Cell Spray at underside of rafters	(1)	LS	80,700.00	(80,700)
	Add ventilated roofing system at roof deck [ BOD Hunter polyiso panels and "Cool Vent" system]	10,760	SF	20.00	215,200
	<u>Total Direct Costs</u>				134,500
	<u>Allocations</u>				52,343
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			4,056
	Design Contingency	11.0 %			14,795
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			6,718
	Bond	1.5 %			2,340
	Fee	3.0 %			4,872
	Escalation	11.7 %			19,561
2	<b>ENV Alternate #2</b> <i>100% Brick Repoint @ non-original mortar (+60% repoint)</i>				<b>293,184</b>
	Repoint brick - additional 60%	6,030	SF	35.00	211,050
	<u>Total Direct Costs</u>				211,050
	<u>Allocations</u>				82,134
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			6,365
	Design Contingency	11.0 %			23,216
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			10,542
	Bond	1.5 %			3,672
	Fee	3.0 %			7,645
	Escalation	11.7 %			30,694



#	ALTERNATE	QTY	UNIT	RATE	TOTAL
3	<b>MECH Alternate #1</b> <i>Air Source Heat Pump ILO Ground Source Heat Pump</i>				<b>361,864</b>
	Deduct GSHP heating/cooling plant	(1)	LS	389,000	(389,000)
	Heating/cooling equipment				-
	ASHP - 30 TON (5)	5	EA	80,000.00	400,000
	HX 200 gpm plate and frame	1	LS	30,000.00	30,000
	- 5 hp GWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
	- 5 hp HWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
	- 5 hp CHWP (vertical in-line close coupled)	2	EA	10,000.00	20,000
	600 Gal Buffer Tank	1	EA	7,500.00	7,500
	Chiller 30 Ton Recovery Chiller	30	TON	2,500.00	75,000
	Primary/secondary HW/CHW pumps - allow Expansion, air separation , shot feed, pressurization, filtration (assumed)	4	EA	5,000.00	20,000
		1	EA	25,000.00	25,000
	<b>Testing, balancing &amp; commissioning support</b>	1	LS	9,140.00	9,140
	<b>Co-ordination, rigging, CAD, Sub-trade temp requirements</b>	1	LS	22,850.00	22,850
	<u>Total Direct Costs</u>				260,490
	<u>Allocations</u>				101,374
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			7,856
	Design Contingency	11.0 %			28,654
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			13,011
	Bond	1.5 %			4,532
	Fee	3.0 %			9,436
	Escalation	11.7 %			37,884
4	<b>PLUMB Alternate #4</b> <i>Deduct rainwater reuse for flushing</i>				<b>(104,188)</b>
	Deduct rainwater reuse for flushing considerations	(1)	LS	75,000.00	(75,000)
	<u>Total Direct Costs</u>				(75,000)
	<u>Allocations</u>				(29,188)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(2,262)
	Design Contingency	11.0 %			(8,250)
	Design Build Fee	0.0 %			-
	Construction Contingency	4.5 %			(3,746)
	Bond	1.5 %			(1,305)
	Fee	3.0 %			(2,717)
	Escalation	11.7 %			(10,908)

GENERAL CONDITIONS CORE & SHELL  
CITY HALL

SOMERVILLE MP - CITY HALL RENO

28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 12	DAYS - X 20 240	WEEKLY RATE \$28,024.44						
STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	MONTHLY RATE	TOTALS			
General Superintendent	0%	0	0	\$ 2,400	\$ 48,000	\$			-
Project Executive	0%	0	0	\$ 2,400	\$ 48,000	\$			-
Project Superintendent	100%	240	12	\$ 1,500	\$ 30,000	\$			360,000
Sr. Project Manager	100%	240	12	\$ 1,500	\$ 30,000	\$			360,000
Project Manager	100%	240	12	\$ 1,200	\$ 24,000	\$			288,000
Assistant Project Manager	50%	120	6	\$ 900	\$ 18,000	\$			108,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ 22,000	\$			-
Senior Estimator	30%	72	4	\$ 1,500	\$ 30,000	\$			108,000
Purchasing	5%	12	1	\$ 1,500	\$ 30,000	\$			18,000
MEP Coordinator	15%	36	2	\$ 1,300	\$ 26,000	\$			46,800
Safety	10%	25	1	\$ 1,800	\$ 36,000	\$			45,333
Project Accountant	2%	5	0	\$ 700	\$ 14,000	\$			3,360
Project Administration	2%	5	0	\$ 500	\$ 10,000	\$			2,400
Project Expeditor	2%	5	0	\$ 1,100	\$ 22,000	\$			5,280
<b>TOTALS</b>					\$ 388,000	\$			1,345,173

GENERAL CONDITIONS FIT-OUT  
CITY HALL

SOMERVILLE MP - CITY HALL RENO  
28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 8	DAYS - X 20 160	WEEKLY RATE \$13,024.44			
STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	MONTHLY RATE	TOTALS - MONTHLY
General Superintendent	0%	0	0	\$ 2,400	\$ 48,000	\$ -
Project Executive	0%	0	0	\$ 2,400	\$ 48,000	\$ -
Project Superintendent	0%	0	0	\$ 1,500	\$ 30,000	\$ -
Sr. Project Manager	25%	40	2	\$ 1,500	\$ 30,000	\$ 60,000
Project Manager	100%	160	8	\$ 1,200	\$ 24,000	\$ 192,000
Assistant Project Manager	50%	80	4	\$ 900	\$ 18,000	\$ 72,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ 22,000	\$ -
Senior Estimator	5%	8	0	\$ 1,500	\$ 30,000	\$ 12,000
Purchasing	5%	8	0	\$ 1,500	\$ 30,000	\$ 12,000
MEP Coordinator	15%	24	1	\$ 1,300	\$ 26,000	\$ 31,200
Safety	10%	17	1	\$ 1,800	\$ 36,000	\$ 30,222
Project Accountant	2%	3	0	\$ 700	\$ 14,000	\$ 2,240
Project Administration	2%	3	0	\$ 500	\$ 10,000	\$ 1,600
Project Expeditor	2%	3	0	\$ 1,100	\$ 22,000	\$ 3,520
<b>TOTALS</b>					\$ 388,000	\$ 416,782



SOMERVILLE MP - EDGERLY BUILDING RENOVATION  
EDGERLY RENO  
October 28, 2021



ONE BEACON ST  
FLOOR 15  
BOSTON, 02108

CONSTRUCTION COST  
& RISK CONSULTANTS

# EXECUTIVE SUMMARY

# SOMERVILLE MP - EDGERLY BUILDING RENOVATION

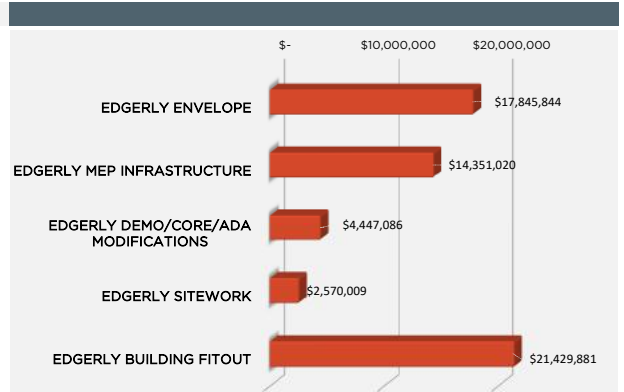
BUDGET MODEL - EDGERLY BUILDING RENOVATION

28-Oct-21

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE EDGERLY BUILDING RENOVATION. THE MODEL SHOWS ALL APPLICABLE RENOVATION CONSTRUCTION : EXISTING BUILDING MEP REPLACEMENT AND CORE RENOVATION WORK . THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN.

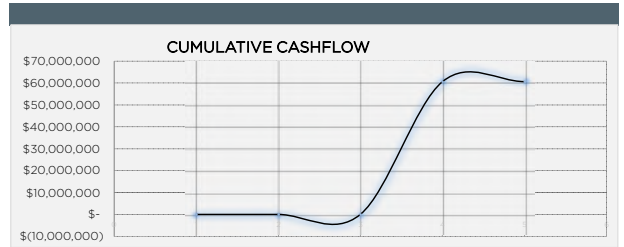
## CONSTRUCTION COSTS \$ (ESCALATED)

COST ELEMENT	GSF	\$/SF	CONST \$ (ESCALATED)	PROJECT \$ (ESCALATED)
EDGERLY ENVELOPE	80,000	\$ 223	\$ 17,845,844	\$ 17,845,844
EDGERLY MEP INFRASTRUCTURE	80,000	\$ 179	\$ 14,351,020	\$ 14,351,020
EDGERLY DEMO/CORE/ADA MODIFICATIONS	80,000	\$ 56	\$ 4,447,086	\$ 4,447,086
EDGERLY SITEWORK	20,710	\$ 124	\$ 2,570,009	\$ 2,570,009
EDGERLY BUILDING FITOUT	80,000	\$ 268	\$ 21,429,880	\$ 21,429,881
<b>TOTAL CONSTRUCTION COSTS</b>	<b>80,000</b>	<b>\$758</b>	<b>\$ 60,643,840</b>	<b>\$ 60,643,840</b>
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
<b>TOTAL CAPITAL EXPENDITURE</b>			<b>\$ 60,643,840</b>	<b>\$ 60,643,840</b>



## BUILDINGS CASHFLOW FORECAST

SPEND TOTALS	ANNUAL	CUMULATIVE
2023	\$ -	\$ -
2024	\$ -	\$ -
2025	\$ -	\$ -
2026	\$ 60,643,840	\$ 60,643,840
2027+	\$ -	\$ 60,643,840



## ALTS & BREAKOUTS

ALTERNATES (CONSTRUCTION COST VALUES)	\$	\$/SF
ENV ALT 1 - REDUCTION IN REPOINTING	(\$1,207,741)	(\$15.10)
MECH ALT 1 - GROUND SOURCE AND AIR SOURCE	\$1,020,875	\$12.76
IF A AIR SOURCE ONLY	\$58,346	\$0.73
STRUCTURAL ALT 1 - ALTERNATE COAL PIT INFILL		
PLUMBING ALT 1 - DEDUCT RAINWATER REUSE FOR TOILET FLUSHING	(\$126,364)	(\$1.58)

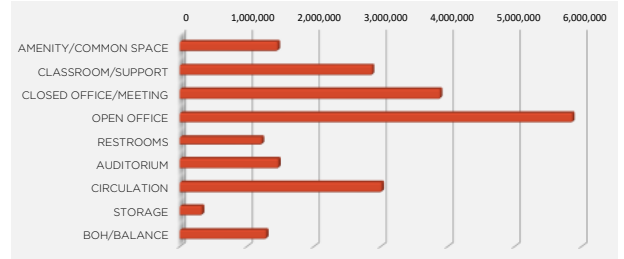
## CONTINGENCY & ESCALATION SUMMARY

Design contingency	11.0%
Construction contingency	4.5%
Owners contingency	0.0%
Productivity loss factor	3.0%
GL Insurance & Subguard	2.6%
Bond	1.5%
Escalation carried to Midpoint	23.8%
Project labor assumptions	Union

## FITOUT USE TYPE BY COST TOTAL \$

USE TYPE	% MIX	CONST \$
AMENITY/Common Space	7%	1,464,991
CLASSROOM/SUPPORT	14%	2,872,091
CLOSED OFFICE/MEETING	20%	3,891,048
OPEN OFFICE	30%	5,868,311
RESTROOMS	6%	1,227,281
AUDITORIUM	7%	1,473,003
CIRCULATION	15%	3,015,458
STORAGE	2%	328,839
BOH/BALANCE	7%	1,288,857

## COST BY FITOUT USE TYPE BY SQUARE FOOT



## FITOUT USE TYPE BY SQUARE FOOT

USE TYPE	% MIX OF TYPE	AREAS SF
AMENITY/Common Space	5%	4,096
CLASSROOM/SUPPORT	11%	8,443
CLOSED OFFICE/MEETING	13%	10,519
OPEN OFFICE	26%	20,648
RESTROOMS	2%	1,615
AUDITORIUM	5%	3,744
CIRCULATION	19%	15,124
STORAGE	4%	3,214
BOH/BALANCE	16%	12,597

## FITOUT USE TYPE BY SQUARE FOOT



### EXCLUSIONS & ASSUMPTIONS

- 1 Escalation has been included at 8% per annum for 2021, 5% for 2022 and 4% for 2023 & 4.5% from 2024 and beyond to an assumed midpoint of June 15 2026.
- 2 We have included 3% phasing allowance on trade costs + design contingency
- 3 We have included 11% design contingency on trade costs
- 4 We have included 4.5% construction contingency on trade costs + design contingency
- 5 We have included 2.6% for GL & Subguard Insurance on cost of work (trade + contingencies + general conditions)
- 6 We have included 1.5% for a bond on cost of work (trade + contingencies + general conditions)
- 7 We have included a 3% CM Fee
- 8 We have excluded permit costs, assumed covered by City
- 9 General project requirements are carried at 5% of trade costs
- 10 General conditions are costed per assumed project schedule durations, see GC staffing sheet at back of the report
- 11 Soft costs, FFE & owner's contingency have been excluded
- 12 All work is priced on regular hours, OT allowances are excluded presently

### BASIS OF ESTIMATE

- 1 Nitsch Conceptual Site Plan Sketch, Dated October 8 2021
- 2 Edgerly Test Fit Plans A5-A7, Dated October 13 2021
- 3 Edgerly Demo/CS Plans A1-A3, Dated October 4 2022
- 4 Edgerly A-4 Extg Elevations w/ Markups, Dated October 11 2021

### Systems Assumptions

#### General

Please see estimate backup for additional assumptions, qualifications & exclusions

#### Foundations/Basement Construction

Costs are included to replace 20% of the existing basement SOG  
Slab on foam glass aggregate infill is assumed in the base option for the coal pit infill  
All other work to existing foundations is excluded

#### Superstructure

Rebuilding/resupport of existing structure to remain is excluded  
An allowance of \$2/SF has been included for structural repairs

#### Exterior Enclosure

Estimate assumes full scaffolding of building in order to complete façade restoration scope  
Full window replacement is included, including reinstating infilled openings as indicated in the narratives  
An allowance of \$5/SF has been included on the surface area of the façade for misc. repointing/repairs & sealants as required

#### Roofing

Costs are included for to replace the existing roofing system, including extensive green roof as called for by the narrative. PV infrastructure costs are included. PV arrays are EXCLUDED and assumed by others.  
Allowances have been included to reconstruct extg skylights

#### Interior Construction/Finishes

An allowance of \$10/SF has been carried for C&S interior construction requirements, including constructing new shafts, rebuilding masonry walls, etc.  
Fitout costs are modeled

#### Stairways/Conveying

An allowance for existing elevator modernization & cab finish upgrades is included

Services

Estimate assumes full replacement of all MEP systems per narrative  
Fitout MEPPF costs are modeled

Furnishings/Equipment

The furnishing and equipment costs carried in this model represent a full gut renovation of interior spaces.  
Fixed furnishes included only. Workstations are excluded and assumed part of FFE, power/data to locations  
is included as required

Demolition & Abatement

Allowance has been included for HAZMAT abatement per the Axiom Report.  
Allowances for abatement beyond the scope within Axiom's report is EXCLUDED at this time.

Site Improvements

Contaminated soil disposal is excluded

Site Mechanical Utilities

Storm sewer mitigation is excluded

Site Electrical Utilities

Existing incoming service is assumed ETR, an allowance for site electrical/lighting is included

DIVISION SUMMARY	80,000 GFA	\$/SF	28-Oct-21 \$ TOTAL
Project Requirements		21.29	1,703,100
<b>PROJECT REQUIREMENTS</b>		<b>21.29</b>	<b>1,703,100</b>
A10. Foundations		1.97	157,959
A20. Basement Construction			0
<b>A. SUBSTRUCTURE</b>		<b>1.97</b>	<b>157,959</b>
B10. Superstructure		2.94	235,000
B20. Exterior Enclosure		106.06	8,484,931
B30. Roofing		21.21	1,697,000
<b>B. SHELL</b>		<b>130.21</b>	<b>10,416,931</b>
C10. Interior Construction		30.68	2,454,035
C30. Interior Finishes		25.99	2,079,471
<b>C. INTERIORS</b>		<b>56.67</b>	<b>4,533,506</b>
C20. Stairways		1.58	126,200
D10. Conveying Systems		2.25	180,000
<b>VERTICAL TRANSPORTATION</b>		<b>3.83</b>	<b>306,200</b>
D20. Plumbing Systems		21.82	1,745,835
D30. Heating, Ventilating & Air Conditioning		90.18	7,214,138
D40. Fire Protection Systems		9.09	727,170
D50. Electric Lighting, Power & Communications		66.17	5,293,699
<b>D. SERVICES</b>		<b>187.26</b>	<b>14,980,842</b>
E10. Equipment		3.18	254,684
E20. Furnishings		8.59	686,808
<b>E. EQUIPMENT AND FURNISHINGS</b>		<b>11.77</b>	<b>941,492</b>
F10. Special Construction (Sustainability allowance)		0.00	0
F20. Selective Demolition		16.44	1,315,581
<b>F. SPECIAL CONSTRUCTION AND DEMOLITION</b>		<b>16.44</b>	<b>1,315,581</b>
<b>TOTAL BUILDING CONSTRUCTION</b>		<b>429.45</b>	<b>34,355,611</b>
G10. Site Preparation		1.65	132,189
G20. Site Improvements		11.36	908,702
G30. Site Civil/Mechanical Utilities		3.92	313,600
G40. Site Electrical Utilities		0.69	55,000
G90. Other Site Construction		0.00	0
<b>TOTAL SITE CONSTRUCTION</b>		<b>17.62</b>	<b>1,409,491</b>
<b>TOTAL TRADE COSTS</b>		<b>447.06</b>	<b>35,765,102</b>
a. Design Contingency	11.0%	49.18	3,934,161
b. Phasing Allowance	3.0%	14.89	1,190,978
c. Construction Contingency	4.5%	23.00	1,840,061
d. General Conditions	6.93%	37.01	2,960,861
<b>SUBTOTAL</b>		<b>571.14</b>	<b>45,691,163</b>
e. Permits	0.0%	0.00	0
f. Insurances	2.6%	14.85	1,187,970
g. Bond	1.5%	8.57	685,367
h. Fee	3.0%	17.84	1,426,935
<b>TOTAL COST TODAY</b>		<b>612.39</b>	<b>48,991,436</b>
i. Escalation	23.8%	145.66	11,652,403
<b>TOTAL ANTICIPATED CONSTRUCTION COST</b>		<b>\$758</b>	<b>60,643,840</b>



SUMMARY BY PROGRAM

TRADE	80,000		GFA		80,000		80,000		80,000		20,710				
	CORE & SHELL		COMBINED FIT-OUT PROJECTS		TOTALS		EDGERLY ENVELOPE		EDGERLY MEP INFRASTRUCTURE		EDGERLY DEMO/CORE/ADA MODIFICATIONS		EDGERLY SITWORK		
	\$/SF	\$/SF	\$/SF	\$/SF	TOTALS	\$/SF	TOTALS	\$/SF	TOTALS	\$/SF	TOTALS	\$/SF	TOTALS	\$/SF	
DEMOLITION/ENABLING	\$ 755,581	\$ 9.44	\$ 560,000	\$ 7.00	\$ 1,315,581	\$ 16.44	\$ -	\$ -	\$ 240,000	\$ 3.00	\$ 515,581	\$ 6.44	\$ -	\$ -	
FOUNDATIONS	\$ 157,959	\$ 1.97	\$ -	\$ -	\$ 157,959	\$ 1.97	\$ -	\$ -	\$ -	\$ -	\$ 157,959	\$ 1.97	\$ -	\$ -	
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUPERSTRUCTURE	\$ 235,000	\$ 2.94	\$ -	\$ -	\$ 235,000	\$ 2.94	\$ -	\$ -	\$ -	\$ -	\$ 235,000	\$ 2.94	\$ -	\$ -	
EXTERIOR ENCLOSURE	\$ 8,484,931	\$ 106.06	\$ -	\$ -	\$ 8,484,931	\$ 106.06	\$ 8,484,931	\$ 106.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
ROOFING	\$ 1,697,000	\$ 21.21	\$ -	\$ -	\$ 1,697,000	\$ 21.21	\$ 1,697,000	\$ 21.21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
INTERIOR CONSTRUCTION	\$ 800,000	\$ 10.00	\$ 1,654,035	\$ 20.68	\$ 2,454,035	\$ 30.68	\$ -	\$ -	\$ -	\$ -	\$ 800,000	\$ 10.00	\$ -	\$ -	
INTERIOR FINISHES	\$ -	\$ -	\$ 2,079,471	\$ 25.99	\$ 2,079,471	\$ 25.99	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
STAIRWAYS	\$ 126,200	\$ 1.58	\$ -	\$ -	\$ 126,200	\$ 1.58	\$ -	\$ -	\$ -	\$ -	\$ 126,200	\$ 1.58	\$ -	\$ -	
CONVEYING SYSTEMS	\$ 180,000	\$ 2.25	\$ -	\$ -	\$ 180,000	\$ 2.25	\$ -	\$ -	\$ -	\$ -	\$ 180,000	\$ 2.25	\$ -	\$ -	
PLUMBING	\$ 1,160,000	\$ 14.50	\$ 585,835	\$ 7.32	\$ 1,745,835	\$ 21.82	\$ -	\$ -	\$ 1,160,000	\$ 14.50	\$ -	\$ -	\$ -	\$ -	
HVAC	\$ 3,519,653	\$ 44.00	\$ 3,694,485	\$ 46.18	\$ 7,214,138	\$ 90.18	\$ -	\$ -	\$ 3,519,653	\$ 44.00	\$ -	\$ -	\$ -	\$ -	
FIRE PROTECTION	\$ 480,000	\$ 6.00	\$ 247,170	\$ 3.09	\$ 727,170	\$ 9.09	\$ -	\$ -	\$ 480,000	\$ 6.00	\$ -	\$ -	\$ -	\$ -	
ELECTRICAL	\$ 2,683,314	\$ 33.54	\$ 2,610,386	\$ 32.63	\$ 5,293,699	\$ 66.17	\$ -	\$ -	\$ 2,683,314	\$ 33.54	\$ -	\$ -	\$ -	\$ -	
EQUIPMENT	\$ -	\$ -	\$ 254,684	\$ 3.18	\$ 254,684	\$ 3.18	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
FURNISHINGS	\$ 120,000	\$ 1.50	\$ 566,808	\$ 7.09	\$ 686,808	\$ 8.59	\$ -	\$ -	\$ -	\$ -	\$ 120,000	\$ 1.50	\$ -	\$ -	
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE PREP	\$ 132,189	\$ 1.65	\$ -	\$ -	\$ 132,189	\$ 1.65	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 132,189	\$ 6.38	
SITE IMPROVEMENTS	\$ 908,702	\$ 11.36	\$ -	\$ -	\$ 908,702	\$ 11.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 908,702	\$ 43.88	
SITE CIVIL / MECHANICAL	\$ 313,600	\$ 3.92	\$ -	\$ -	\$ 313,600	\$ 3.92	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 313,600	\$ 15.14	
SITE ELECTRICAL	\$ 55,000	\$ 0.69	\$ -	\$ -	\$ 55,000	\$ 0.69	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 55,000	\$ 2.66	
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL DIRECT COSTS</b>	<b>\$ 21,809,128</b>	<b>\$ 272.61</b>	<b>\$ 12,252,874</b>	<b>\$ 153.16</b>	<b>\$ 34,062,002</b>	<b>\$ 425.78</b>	<b>\$ 10,181,931</b>	<b>\$ 127.27</b>	<b>\$ 8,082,967</b>	<b>\$ 101.04</b>	<b>\$ 2,134,740</b>	<b>\$ 26.68</b>	<b>\$ 1,409,491</b>	<b>\$ 68.06</b>	
Design Contingency	11.00%	\$ 2,518,954	\$ 31.49	\$ 1,415,207	\$ 17.69	\$ 3,934,161	\$ 49.18	\$ 1,176,013	\$ 14.70	\$ 933,583	\$ 11.67	\$ 246,563	\$ 3.08	\$ 162,796	\$ 7.86
Phasing Allowance	3.00%	\$ 762,556	\$ 9.53	\$ 428,422	\$ 5.36	\$ 1,190,978	\$ 14.89	\$ 356,011	\$ 4.45	\$ 282,621	\$ 3.53	\$ 74,641	\$ 0.93	\$ 49,253	\$ 2.38
Construction Contingency	4.50%	\$ 1,178,149	\$ 14.73	\$ 661,912	\$ 8.27	\$ 1,840,061	\$ 23.00	\$ 550,037	\$ 6.88	\$ 436,649	\$ 5.46	\$ 115,321	\$ 1.44	\$ 76,142	\$ 3.68
General Conditions	6.93%	\$ 2,185,907	\$ 27.32	\$ 774,954	\$ 9.69	\$ 2,960,861	\$ 37.01	\$ 672,587	\$ 8.41	\$ 672,587	\$ 8.41	\$ 672,587	\$ 8.41	\$ 168,147	\$ 8.12
Project Requirements	5.00%	\$ 1,090,456	\$ 13.63	\$ 612,644	\$ 7.66	\$ 1,703,100	\$ 21.29	\$ 509,097	\$ 6.36	\$ 404,148	\$ 5.05	\$ 106,737	\$ 1.33	\$ 70,475	\$ 3.40
<b>SUBTOTAL</b>	<b>\$ 29,545,151</b>	<b>\$ 369.31</b>	<b>\$ 16,146,012</b>	<b>\$ 201.83</b>	<b>\$ 45,691,163</b>	<b>\$ 571.14</b>	<b>\$ 13,445,675</b>	<b>\$ 168.07</b>	<b>\$ 10,812,555</b>	<b>\$ 135.16</b>	<b>\$ 3,350,588</b>	<b>\$ 41.88</b>	<b>\$ 1,936,333</b>	<b>\$ 93.50</b>	
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
GL Insurance & Subguard	2.60%	\$ 768,174	\$ 9.60	\$ 419,796	\$ 5.25	\$ 1,187,970	\$ 14.85	\$ 349,588	\$ 4.37	\$ 281,126	\$ 3.51	\$ 87,115	\$ 1.09	\$ 50,345	\$ 2.43
Bond	1.50%	\$ 443,177	\$ 5.54	\$ 242,190	\$ 3.03	\$ 685,367	\$ 8.57	\$ 201,685	\$ 2.52	\$ 162,188	\$ 2.03	\$ 50,259	\$ 0.63	\$ 29,045	\$ 1.40
CM Fee	3.00%	\$ 922,695	\$ 11.53	\$ 504,240	\$ 6.30	\$ 1,426,935	\$ 17.84	\$ 419,908	\$ 5.25	\$ 337,676	\$ 4.22	\$ 104,639	\$ 1.31	\$ 60,472	\$ 2.92
<b>SUBTOTAL</b>	<b>\$ 31,679,198</b>	<b>\$ 395.99</b>	<b>\$ 17,312,239</b>	<b>\$ 216.40</b>	<b>\$ 48,991,436</b>	<b>\$ 612.39</b>	<b>\$ 14,416,856</b>	<b>\$ 180.21</b>	<b>\$ 11,593,545</b>	<b>\$ 144.92</b>	<b>\$ 3,592,601</b>	<b>\$ 44.91</b>	<b>\$ 2,076,195</b>	<b>\$ 100.25</b>	
Escalation	23.78%	\$ 7,534,762	\$ 94.18	\$ 4,117,642	\$ 51.47	\$ 11,652,403	\$ 145.66	\$ 3,428,988	\$ 42.86	\$ 2,757,475	\$ 34.47	\$ 854,485	\$ 10.68	\$ 493,814	\$ 23.84
<b>TOTAL</b>	<b>\$ 39,213,959</b>	<b>\$ 490.17</b>	<b>\$ 21,429,880</b>	<b>\$ 267.87</b>	<b>\$ 60,643,840</b>	<b>\$ 758.05</b>	<b>\$ 17,845,844</b>	<b>\$ 223.07</b>	<b>\$ 14,351,020</b>	<b>\$ 179.39</b>	<b>\$ 4,447,086</b>	<b>\$ 55.59</b>	<b>\$ 2,570,009</b>	<b>\$ 124.10</b>	

SUMMARY BY PROGRAM

TRADE	4,096		8,443		10,519		20,648		1,615		3,744		15,124		3,214		12,597		
	RENOVATION FIT-OUT MODEL																		
	AMENITY/Common Space		CLASSROOM/SUPPORT		CLOSED OFFICE/MEETING		OPEN OFFICE		RESTROOMS		AUDITORIUM		CIRCULATION		STORAGE		BOH/BALANCE		
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	
DEMOLITION/ENABLING	\$ 28,672	\$ 7.00	\$ 59,101	\$ 7.00	\$ 73,633	\$ 7.00	\$ 144,536	\$ 7.00	\$ 11,305	\$ 7.00	\$ 26,208	\$ 7.00	\$ 105,868	\$ 7.00	\$ 22,498	\$ 7.00	\$ 88,179	\$ 7.00	
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
INTERIOR CONSTRUCTION	\$ 61,440	\$ 15.00	\$ 168,860	\$ 20.00	\$ 420,760	\$ 40.00	\$ 412,960	\$ 20.00	\$ 96,900	\$ 60.00	\$ 187,200	\$ 50.00	\$ 226,860	\$ 15.00	\$ 16,070	\$ 5.00	\$ 62,985	\$ 5.00	
INTERIOR FINISHES	\$ 163,840	\$ 40.00	\$ 253,290	\$ 30.00	\$ 368,165	\$ 35.00	\$ 619,440	\$ 30.00	\$ 121,125	\$ 75.00	\$ 187,200	\$ 50.00	\$ 287,356	\$ 19.00	\$ 16,070	\$ 5.00	\$ 62,985	\$ 5.00	
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
PLUMBING	\$ 81,920	\$ 20.00	\$ 168,860	\$ 20.00	\$ -	\$ -	\$ -	\$ -	\$ 242,250	\$ 150.00	\$ -	\$ -	\$ 45,372	\$ 3.00	\$ 9,642	\$ 3.00	\$ 37,791	\$ 3.00	
HVAC	\$ 225,280	\$ 55.00	\$ 506,580	\$ 60.00	\$ 736,330	\$ 70.00	\$ 1,032,400	\$ 50.00	\$ 104,975	\$ 65.00	\$ 243,360	\$ 65.00	\$ 529,340	\$ 35.00	\$ 64,280	\$ 20.00	\$ 251,940	\$ 20.00	
FIRE PROTECTION	\$ 10,240	\$ 2.50	\$ 21,108	\$ 2.50	\$ 26,298	\$ 2.50	\$ 51,620	\$ 2.50	\$ 4,038	\$ 2.50	\$ 18,720	\$ 5.00	\$ 75,620	\$ 5.00	\$ 8,035	\$ 2.50	\$ 31,493	\$ 2.50	
ELECTRICAL	\$ 204,800	\$ 50.00	\$ 422,150	\$ 50.00	\$ 473,355	\$ 45.00	\$ 722,680	\$ 35.00	\$ 51,680	\$ 32.00	\$ 104,645	\$ 27.95	\$ 378,100	\$ 25.00	\$ 51,424	\$ 16.00	\$ 201,552	\$ 16.00	
EQUIPMENT	\$ 40,960	\$ 10.00	\$ -	\$ -	\$ 52,595	\$ 5.00	\$ 61,944	\$ 3.00	\$ 4,845	\$ 3.00	\$ 18,720	\$ 5.00	\$ 75,620	\$ 5.00	\$ -	\$ -	\$ -	\$ -	
FURNISHINGS	\$ 20,480	\$ 5.00	\$ 42,215	\$ 5.00	\$ 73,633	\$ 7.00	\$ 309,720	\$ 15.00	\$ 64,600	\$ 40.00	\$ 56,160	\$ 15.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL DIRECT COSTS</b>	<b>\$ 837,632</b>	<b>\$ 204.50</b>	<b>\$ 1,642,164</b>	<b>\$ 194.50</b>	<b>\$ 2,224,769</b>	<b>\$ 211.50</b>	<b>\$ 3,355,300</b>	<b>\$ 162.50</b>	<b>\$ 701,718</b>	<b>\$ 434.50</b>	<b>\$ 842,213</b>	<b>\$ 224.95</b>	<b>\$ 1,724,136</b>	<b>\$ 114.00</b>	<b>\$ 188,019</b>	<b>\$ 58.50</b>	<b>\$ 736,925</b>	<b>\$ 58.50</b>	
Design Contingency	\$ 96,746	\$ 23.62	\$ 189,670	\$ 22.46	\$ 256,961	\$ 24.43	\$ 387,537	\$ 18.77	\$ 81,048	\$ 50.18	\$ 97,276	\$ 25.98	\$ 199,138	\$ 13.17	\$ 21,716	\$ 6.76	\$ 85,115	\$ 6.76	
Phasing Allowance	\$ 29,288	\$ 7.15	\$ 57,418	\$ 6.80	\$ 77,789	\$ 7.40	\$ 117,318	\$ 5.68	\$ 24,536	\$ 15.19	\$ 29,448	\$ 7.87	\$ 60,264	\$ 3.99	\$ 6,574	\$ 2.05	\$ 25,767	\$ 2.05	
Construction Contingency	\$ 45,250	\$ 11.05	\$ 89,711	\$ 10.51	\$ 120,184	\$ 11.43	\$ 181,256	\$ 8.78	\$ 37,907	\$ 23.47	\$ 45,497	\$ 12.15	\$ 93,159	\$ 6.16	\$ 10,157	\$ 3.16	\$ 39,809	\$ 3.16	
General Conditions	\$ 26,049	\$ 6.36	\$ 104,196	\$ 12.34	\$ 78,147	\$ 7.43	\$ 312,587	\$ 15.14	\$ 39,073	\$ 24.19	\$ 78,147	\$ 20.87	\$ 78,147	\$ 5.17	\$ 6,512	\$ 2.03	\$ 52,098	\$ 4.14	
Project Requirements	\$ 41,882	\$ 10.23	\$ 82,108	\$ 9.73	\$ 111,238	\$ 10.58	\$ 167,765	\$ 8.13	\$ 35,086	\$ 21.73	\$ 42,111	\$ 11.25	\$ 86,207	\$ 5.70	\$ 9,401	\$ 2.93	\$ 36,846	\$ 2.93	
<b>SUBTOTAL</b>	<b>\$ 1,076,846</b>	<b>\$ 262.90</b>	<b>\$ 2,164,267</b>	<b>\$ 256.34</b>	<b>\$ 2,869,087</b>	<b>\$ 272.75</b>	<b>\$ 4,521,763</b>	<b>\$ 218.99</b>	<b>\$ 919,368</b>	<b>\$ 569.27</b>	<b>\$ 1,134,691</b>	<b>\$ 303.07</b>	<b>\$ 2,241,051</b>	<b>\$ 148.18</b>	<b>\$ 242,379</b>	<b>\$ 75.41</b>	<b>\$ 976,559</b>	<b>\$ 77.52</b>	
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
GL Insurance & Subguard	\$ 27,998	\$ 6.84	\$ 56,271	\$ 6.66	\$ 74,596	\$ 7.09	\$ 117,566	\$ 5.69	\$ 23,904	\$ 14.80	\$ 29,502	\$ 7.88	\$ 58,267	\$ 3.85	\$ 6,302	\$ 1.96	\$ 25,391	\$ 2.02	
Bond	\$ 16,153	\$ 3.94	\$ 32,464	\$ 3.85	\$ 43,036	\$ 4.09	\$ 67,826	\$ 3.28	\$ 13,791	\$ 8.54	\$ 17,020	\$ 4.55	\$ 33,616	\$ 2.22	\$ 3,636	\$ 1.13	\$ 14,648	\$ 1.16	
CM Fee	\$ 33,630	\$ 8.21	\$ 67,590	\$ 8.01	\$ 89,602	\$ 8.52	\$ 141,215	\$ 6.84	\$ 28,712	\$ 17.78	\$ 35,436	\$ 9.46	\$ 69,988	\$ 4.63	\$ 7,570	\$ 2.36	\$ 30,498	\$ 2.42	
<b>SUBTOTAL</b>	<b>\$ 1,154,627</b>	<b>\$ 281.89</b>	<b>\$ 2,320,592</b>	<b>\$ 274.85</b>	<b>\$ 3,076,322</b>	<b>\$ 292.45</b>	<b>\$ 4,848,370</b>	<b>\$ 234.81</b>	<b>\$ 985,774</b>	<b>\$ 610.39</b>	<b>\$ 1,216,649</b>	<b>\$ 324.96</b>	<b>\$ 2,402,922</b>	<b>\$ 158.88</b>	<b>\$ 259,886</b>	<b>\$ 80.86</b>	<b>\$ 1,047,096</b>	<b>\$ 83.12</b>	
Escalation	\$ 274,623	\$ 67.05	\$ 551,943	\$ 65.37	\$ 731,690	\$ 69.56	\$ 1,153,164	\$ 55.85	\$ 234,462	\$ 145.18	\$ 289,375	\$ 77.29	\$ 571,525	\$ 37.79	\$ 61,813	\$ 19.23	\$ 249,047	\$ 19.77	
<b>TOTAL</b>	<b>\$ 1,429,250</b>	<b>\$ 348.94</b>	<b>\$ 2,872,534</b>	<b>\$ 340.23</b>	<b>\$ 3,808,012</b>	<b>\$ 362.01</b>	<b>\$ 6,001,534</b>	<b>\$ 290.66</b>	<b>\$ 1,220,236</b>	<b>\$ 755.56</b>	<b>\$ 1,506,024</b>	<b>\$ 402.25</b>	<b>\$ 2,974,447</b>	<b>\$ 196.67</b>	<b>\$ 321,699</b>	<b>\$ 100.09</b>	<b>\$ 1,296,143</b>	<b>\$ 102.89</b>	

TRADE	QTY	UNIT	RATE	TOTAL
EXTERIOR ENCLOSURE	80,000			8,484,931
<b><u>Scaffolding - assume scaffolding @ entire enclosure</u></b>	42,000	SF		<i>For reference only</i>
Scaffolding	42,000	SF	18.00	756,000
Scrim	42,000	SF	5.00	210,000
Misc. setup/tear down	100	MD	800.00	80,000
<b><u>Window Replacement</u></b>				-
Remove extg windows/temp weatherproofing @ openings	186	LOC	2,000.00	372,000
Masonry repairs	186	LOC	1,500.00	279,000
Waterproofing	186	LOC	2,000.00	372,000
Grouting/insulation	186	LOC	2,000.00	372,000
New windows - thermally broken aluminum	11,135	SF	170.00	1,892,950
Aluminum sunshades @ S & E Facades	700	LF	350.00	245,000
<b><u>Re-open extg infilled masonry window openings</u></b>				-
Shoring for opening creation	4	LOC	1,500.00	6,000
Create new openings	21	LOC	5,000.00	105,000
Lintels @ new openings	40	LF	400.00	16,000
Grouting/insulation	21	LOC	1,000.00	21,000
New window	1,667	SF	250.00	416,750
Masonry repairs	21	LOC	1,500.00	31,500
Waterproofing	21	LOC	1,500.00	31,500
<b><u>Masonry Restoration</u></b>				-
100% masonry cleaning - brick	40,000	SF	5.00	200,000
100% masonry cleaning - 18" concrete water table	1,416	SF	8.00	11,328
100% repoint	36,268	SF	35.00	1,269,380
Rebuild 20% of masonry parapets	500	SF	250.00	125,000
Masonry cleaning - L2 cast stone band to parapet	1,755	SF	8.00	14,040
Full repoint - L2 cast stone band to parapet	1,755	SF	35.00	61,425
Brick Soldier Course Lintels @ L1 Windows	477	LF		<i>For reference only</i>
Remove soldier course - salvage brick	477	LF	70.00	33,390
Replace lintel - 30%	143	LF	400.00	57,240
Reinforce lintel - 30%	143	LF	250.00	35,775
Rust inhibiting coating - 100%	477	LF	60.00	28,620
Reinstall solder course	477	LF	160.00	76,320
Remove sign/repair	1	LS	20,000.00	20,000
Single brick replacement	1,055	BRICKS	70.00	73,850
Rebuild masonry chimney	277	SF	250.00	69,250
Stich in face brick @ 1x5 louvered openings below windows	145	SF	100.00	14,500
Allowance for areas of more intensive façade cleaning	1	LS	20,000.00	20,000
Remove vines/bio growth	1	LS	14,400.00	14,400
CS Lintels @ L2 Windows	585	LF		<i>For reference only</i>
Remove/reset CS string band	585	LF	150.00	87,750
Replace lintel - 30%	176	LF	400.00	70,200
Reinforce lintel - 30%	176	LF	250.00	43,875
Rust inhibiting coating - 100%	585	LF	60.00	35,100
Reinstall string course	302	LF	160.00	48,240
Replace CS string course/water table - 30%	176	LF	400.00	70,200
Patch/repair CS string course/water table - 30%	176	LF	125.00	21,938
Replace decorative cast stone figural relief units	2	EA	3,500.00	7,000
Spall repairs	11	LOC	800.00	8,800

TRADE	QTY	UNIT	RATE	TOTAL
<b>New Façade/Entrances</b>				-
Entrance canopy - allowance	150	SF	250.00	37,500
Single fire stair egress doors in new opening	3	EA	3,500.00	10,500
New entrance storefront	283	SF	150.00	42,450
New entrance glass doors - single	6	LOC	7,500.00	45,000
Automatic door openers	6	LOC	3,500.00	21,000
<b>Interior Side</b>				-
Furring - 2.5" stud, 1 layer drywall, smart vapor permeable retarder	37,760	SF	11.00	415,360
5" open cell spray foam	37,760	SF	5.00	188,800
<b>ROOFING</b>	<b>80,000</b>			<b>\$ 1,697,000</b>
Remove/replace extg roofing system	26,000	SF	30.00	\$ 780,000
Premium for extensive green roof	11,000	SF	40.00	\$ 440,000
Walking paths - assume pedestal pavers	3,500	SF	50.00	\$ 175,000
Reconstruct extg skylights (2) each	192	SF	250.00	\$ 48,000
Rem/replace roof drains	16	EA	1,500.00	\$ 24,000
Creation of stair bulkheads	2	EA	30,000.00	\$ 60,000
Equipment screening - allow 200LF x 10'H	2,000	SF	85.00	\$ 170,000
<b>PROJECT REQUIREMENTS</b>	<b>80,000</b>			<b>509,097</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	10,181,930.50	509,097
<b>TOTAL DIRECT COSTS</b>				<b>10,691,027</b>
<b>ALLOCATIONS</b>				<b>7,154,817</b>
General Conditions	24.0	28,024	wks	672,587
Permits	0.0 %			-
Insurances	2.6 %			349,588
Design Contingency	11.0 %			1,176,013
Phasing Allowance	3.0 %			356,011
Construction Contingency	4.5 %			550,037
Bond	1.5 %			201,685
Fee	3.0 %			419,908
Escalation	23.8 %			3,428,988
<b>TOTAL CONSTRUCTION COST</b>				<b>17,845,844</b>

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	80,000			<b>240,000</b>
Demolition of extg MEP systems	80,000	SF	3.00	240,000
PLUMBING	80,000			<b>1,160,000</b>
Plumbing infrastructure replacement	80,000	SF	12.00	960,000
Rainwater storage & reuse - allow				-
Rainwater treatment skid - incl cover filters, UC, booster pump, recirc pump, dye infusion	1	LS	100,000	100,000
Day tank - 5000 Gal Assumed	1	LS	15,000	15,000
Exterior storage tank - 30000Gal				With Site
Makeup water connection w/ backflow preventer	1	LS	10,000.00	10,000
Piping and connections - allowance for flushing reuse	1	LS	50,000.00	50,000
Misc. harvesting scope required	1	LS	25,000.00	25,000
HVAC	80,000			<b>3,519,653</b>
<u>HVAC Infrastructure</u>				-
<u>Heating/cooling equipment</u>				-
ASHP - 30 TON	9	EA	80,000.00	720,000
HX - (2) 300 GPM	600	GPM	125.00	75,000
<u>Pumps</u>				-
7.5 hp GWP	2	EA	15,000.00	30,000
7.5 hp HWP	2	EA	15,000.00	30,000
7.5 hp CHWP	2	EA	15,000.00	30,000
600 Gal buffer tank	1	EA	6,000.00	6,000
Expansion, air separation , shot feed, pressurization, filtration (assumed)	1	EA	35,000.00	35,000
<u>Heat Recovery Systems</u>				-
Heat recovery chillers - DHRC units	60	TONS	2,500.00	150,000
2 hp HWP	2	EA	5,000.00	10,000
2 hp CHWP	2	EA	5,000.00	10,000
400 Gal buffer tank	1	EA	5,000.00	5,000
New glycol system/ feed	1	LS	30,000.00	30,000
<u>Air Distribution</u>				-
AHU-1,2,	18,000	CFM	17.00	306,000
<u>Exhaust</u>				-
General exhaust - allow	1	LS	3,500.00	3,500
<u>Smoke extract</u>				Excluded, assume not required
<u>Energy Performance</u>				-
Variable Frequency Drives				-
AHUs				Excluded, ECM fans
ASHP				Not required
HRC				w/ HRC
Pumps	10	EA	3,500.00	35,000
VFD's for exhaust fans, allow	1	EA	1,500.00	1,500
Energy Metering Allowance	1	LS	30,000.00	30,000
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves &amp; Connections</u>				-
<u>Steam Piping</u>				Excluded, assume not required
<u>Heating/Cooling piping</u>				-
- CHW/HW mains & risers, runouts to equipment	1,513	LF	80.00	121,061
- Piping on floor loops	9,706	LF	40.00	388,243
Control valves on main equipment	23	EA	3,500.00	80,500
<u>Sheetmetal &amp; Accessories</u>				-

TRADE	QTY	UNIT	RATE	TOTAL
Primary ductwork galvanized Sheetmetal tying	15,660	LBS	14.50	227,070
General bathroom & exhaust ductwork	1,400	LBS	14.50	20,300
<u>Accessories</u>				-
Fire dampers for main supply extract risers	4	EA	2,250.00	9,000
Volume dampers, control dampers & access Panels	1	LS	38,455.50	38,456
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	11,219	LF	10.00	112,193
Ductwork insulation	12,046	SF	5.00	60,231
<u>Fuel Systems</u>				Excluded, assume not required
<u>Data room cooling</u>	1	LS	15,000.00	15,000
<u>Building Management System</u>				-
Head end allowance	1	LS	35,000.00	35,000
ASHP - allow 8pts per module	80	PTS	1,200.00	96,000
HRCs	50	PTS	1,200.00	60,000
Pumps	40	PTS	1,200.00	48,000
AHUs - assume 40pts ea average	80	PTS	1,200.00	96,000
Fans	4	PTS	1,200.00	4,800
Misc.	20	PTS	1,200.00	24,000
<b>Testing, balancing &amp; commissioning support</b>	1	LS	117,714.15	117,714
<b>Co-ordination, rigging, CAD, Sub-trade temp</b>	1	LS	459,085.18	459,085
<b>FIRE PROTECTION</b>	<b>80,000</b>			<b>480,000</b>
Fire protection infrastructure	80,000	SF	6.00	480,000
<b>ELECTRICAL</b>	<b>80,000</b>			<b>2,683,314</b>
<u>Normal Service Distribution</u>				-
1500KVA pad mounted xfmr	1	LS	165,000	165,000
2000A swbd, CT cab	1	LS	70,000	70,000
45kva step down xfmr	2	EA	5,000	10,000
150A power panel - 84 ckts	6	EA	7,650	45,900
100A lighting panels	6	EA	3,000	18,000
Mechanical panel - 400A	1	EA	8,000	8,000
Mechanical panel - 150A	1	EA	4,500	4,500
<u>ATS Switches</u>				-
ATS-LS, OP	2	EA	25,000	50,000
<u>Energy Metering</u>				-
Energy meters	15	EA	3,500	52,500
<u>Normal Feeders</u>	80,000	SF	3.00	240,000
<u>Emergency Power Distribution</u>				-
Generator				Excluded
Acoustic enclosure allowance				Excluded
Panel/connections				Excluded
<u>Emergency Distribution Panels - allow</u>				Excluded
<u>Emergency Feeders</u>				Excluded
<u>Mechanical / Equipment Power</u>	80,000	SF	2.50	200,000
<u>Lighting, inclusive of conduit, fitting and wiring</u>				w/ fitout
<u>Lighting controls</u>				w/ fitout
<u>Receptacle power</u>				w/ fitout
<u>Fire Alarm</u>				-
Fire Alarm - complete system	80,000	SF	10.00	800,000
Temp fire alarm	80,000	SF	1.50	120,000
<u>BDA</u>				Excluded, assume not required

TRADE	QTY	UNIT	RATE	TOTAL
Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)	80,000	SF	3.00	240,000
Audio visual				w/ fitout
Security systems allowance (head-end and backbone)	80,000	SF	2.00	160,000
Lightning protection	80,000	SF	0.85	68,000
Rooftop PV (11,000 SF per narrative) - including mounting system, etc.				Excluded, by others
PV infrastructure allowance	1	LS	100,000	100,000
Testing & bonding	1	LS	87,476.00	87,476
Sub-trade temps/ gcs	1	LS	243,937.60	243,938
<b>PROJECT REQUIREMENTS</b>	<b>80,000</b>			<b>404,148</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	8,082,967	404,148
<b>TOTAL DIRECT COSTS</b>				<b>8,487,115</b>
<b>ALLOCATIONS</b>				<b>5,863,906</b>
General Conditions	24.0	28,024	wks	672,587
Permits	0.0 %			-
Insurances	2.6 %			281,126
Design Contingency	11.0 %			933,583
Phasing Allowance	3.0 %			282,621
Construction Contingency	4.5 %			436,649
Bond	1.5 %			162,188
Fee	3.0 %			337,676
Escalation	23.8 %			2,757,475
<b>TOTAL CONSTRUCTION COST</b>				<b>14,351,020</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION</b>	<b>80,000</b>			<b>515,581</b>
HAZMAT Abatement - allowance per Axiom report dated 10.12.21				-
Black Exterior Window Caulking	155	EA	352.27	54,602
12"X12" Pink Floor Tile Mastic	2,500	SF	5.00	12,500
3" Pipe Insulation	6	LF	33.33	200
3" Pipe Elbow Insulation	2	EA	50.00	100
Chimney Cap waterproofing	15	SF	160.00	2,400
Asphaltic Coating on hardwood planking	27,400	SF	10.00	274,000
Pipe Insulation	150	LF	20.00	3,000
Boiler breeching	600	SF	20.00	12,000
Tank insulation	400	SF	20.00	8,000
Asphaltic damp proofing	5,000	SF	20.00	100,000
Buried Pipes				TBD
Concealed pipe and fitting insulation behind hard surface wall and ceilings				TBD
Interior components w/ boiler unit	1	LS	3,000.00	3,000
Misc. Hazardous building materials	1	LS	6,000.00	6,000
-5.5% Contingency (4.5 carried below the line)	1	LS	23,778.70	23,779
Design and bid monitoring fee	1	LS	16,000.00	16,000
<b>FOUNDATIONS</b>	<b>80,000</b>			<b>157,959</b>
<b>Existing Foundations</b>				-
Removal/replacement of extg basement slab on grade - assume 6" (20%)	3,065	SF		<i>For reference only</i>
Chop/remove extg slab	3,065	SF	12.00	36,785
Pour new reinforced 6" slab	3,065	SF	15.00	45,981
New slab @ coal pocket	1,445	SF	15.00	21,675
Foam glass aggregate backfill - 5' depth avg. allowed	268	CY	200.00	53,519
Below grade foundation walls				Excluded, no scope
<b>SUPERSTRUCTURE</b>	<b>80,000</b>			<b>235,000</b>
Allowance for creation of shaft/floor openings as required	15	LOC	5,000.00	75,000
Misc. structural allowance for repairs	80,000	SF	2.00	160,000
<b>INTERIOR CONSTRUCTION</b>	<b>80,000</b>			<b>800,000</b>
Core & shell interior construction allowance	80,000	SF	10.00	800,000
<b>STAIRWAYS</b>	<b>80,000</b>			<b>126,200</b>
Scrape/prime/paint guardrails	144	LF	50.00	7,200
New handrails	400	LF	125.00	50,000
Remove/replace interior stair	1	FLT	15,000.00	15,000
New half stairs	2	FLTS	7,000.00	14,000
Stairwell extension to roof	2	FLTS	15,000.00	30,000
Misc. handrail/guardrail scope throughout	1	LS	10,000.00	10,000
<b>CONVEYING SYSTEMS</b>	<b>80,000</b>			<b>180,000</b>
Modernize/Rehab/full maintenance/testing of existing elevator: Dover Hydraulic, 56" x 77", #2,600 and 100 FPM	1	ls	150,000.00	150,000
Cab finish upgrade allowance	1	LS	30,000.00	30,000
<b>FURNISHINGS</b>	<b>80,000</b>			<b>120,000</b>
Accessibility Signage - allowance	80,000	SF	1.00	80,000
Wayfinding Signage & Departmental Graphics	80,000	SF	0.50	40,000



TRADE	QTY	UNIT	RATE	TOTAL
<b>PROJECT REQUIREMENTS</b>	<b>80,000</b>			<b>106,737</b>
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	2,134,740	106,737
<b>TOTAL DIRECT COSTS</b>				<b>2,241,477</b>
<b>ALLOCATIONS</b>				<b>2,205,609</b>
General Conditions	24.0	28,024	wks	672,587
Permits	0.0 %			-
Insurances	2.6 %			87,115
Design Contingency	11.0 %			246,563
Phasing Allowance	3.0 %			74,641
Construction Contingency	4.5 %			115,321
Bond	1.5 %			50,259
Fee	3.0 %			104,639
Escalation	23.8 %			854,485
<b>TOTAL CONSTRUCTION COST</b>				<b>4,447,086</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>SITE PREP</b>	<b>20,710</b>			<b>132,189</b>
Contaminated soil considerations				Excluded
Site Perimeter Fence	900	LF	75.00	67,500
Silt Barrier and Erosion protection - allowance	20,965	SF	0.25	5,241
Allowance - existing tree protection, 10 assumed	10	EA	800.00	8,000
Site demolition	20,965	SF	1.50	31,448
Construction Vehicle access/wheel wash - two locations assumed	1	EA	20,000.00	20,000
<b>SITE IMPROVEMENTS</b>	<b>20,710</b>			<b>908,702</b>
<u>Grading</u>				-
Fine grading	20,965	SF	1.25	26,206
Excavation for site features - allowance	200	CY	75.00	15,000
<u>Stairs &amp; Walls</u>				-
Site stairs	185	LFR	250.00	46,250
Stair walls/platforms	200	SF	100.00	20,000
<u>Hardscape</u>				-
Pedestrian Sidewalks/Curbs - Brushed concrete CIP assumed	4,626	SF	30.00	138,792
Permeable paving strip	1,157	SF	40.00	46,264
ADA ramp access per narrative	236	SF	100.00	23,600
Plaza pavers	5,712	SF	40.00	228,480
<u>Landscaping &amp; Plantings</u>				-
Trees, allowance	10	EA	1,200.00	12,000
Native Shrubs & Perennials at feature planting areas that are drought resistant - allowance	6,305	SF	20.00	126,100
Bioretention Areas	3,165	SF	40.00	126,600
Irrigation - reuse of storm water per Nitsch narrative	9,470	SF	3.00	28,410
<u>Misc. Site Furnishings</u>				-
ADA railings at ramps and stairs	120	LF	400.00	48,000
Bike racks	5	EA	3,000.00	15,000
Trash Receptacles	5	EA	600.00	3,000
2 Step concrete stair w/ handrails	1	LS	5,000.00	5,000
<b>SITE CIVIL / MECHANICAL</b>	<b>20,710</b>			<b>313,600</b>
<u>Storm Water Management</u>				-
Exterior storage tank - 30000Gal	1	LS	75,000.00	75,000
Storm Pipe per sketch - rate inclusive of drawings, structures & connections	840	LF	125.00	105,000
- Excavation and backfill	467	CY	120.00	56,000
<u>Incoming utility services</u>				-
Replace sewer line - allowance	36	LF	750.00	27,000
8" Fire Service	36	LF	175.00	6,300
Valves, CTE	1	LS	20,000.00	20,000
- Excavation and backfill	20	CY	120.00	2,400
4" Water Service	36	LF	125.00	4,500
Valves, CTE	1	LS	15,000.00	15,000
- Excavation and backfill	20	CY	120.00	2,400
<b>SITE ELECTRICAL</b>	<b>20,710</b>			<b>55,000</b>
Site Electrical - allowance	1	LS	50,000.00	50,000
<u>Electrical Service</u>				-
Incoming electrical ductbank			Excluded, assume ETR	
Concrete pad for transformer	1	LS	5,000.00	5,000

TRADE	QTY	UNIT	RATE	TOTAL
<b>PROJECT REQUIREMENTS</b>	<b>20,710</b>			<b>70,475</b>
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,409,491	70,475
<b>TOTAL DIRECT COSTS</b>				<b>1,479,966</b>
<b>ALLOCATIONS</b>				<b>1,090,043</b>
General Conditions	6.0	28,024	wks	168,147
Permits	0.0 %			-
Insurances	2.6 %			50,345
Design Contingency	11.0 %			162,796
Phasing Allowance	3.0 %			49,283
Construction Contingency	4.5 %			76,142
Bond	1.5 %			29,045
Fee	3.0 %			60,472
Escalation	23.8 %			493,814
<b>TOTAL CONSTRUCTION COST</b>				<b>2,570,009</b>

TRADE	QTY	UNIT	RATE	TOTAL
<b>DEMOLITION/ENABLING</b>	<b>80,000</b>			<b>560,000</b>
AMENITY/Common Space	4,096	SF	7.00	28,672
CLASSROOM/SUPPORT	8,443	SF	7.00	59,101
CLOSED OFFICE/MEETING	10,519	SF	7.00	73,633
OPEN OFFICE	20,648	SF	7.00	144,536
RESTROOMS	1,615	SF	7.00	11,305
AUDITORIUM	3,744	SF	7.00	26,208
CIRCULATION	15,124	SF	7.00	105,868
STORAGE	3,214	SF	7.00	22,498
BOH/BALANCE	12,597	SF	7.00	88,179
<b>INTERIOR CONSTRUCTION</b>	<b>80,000</b>			<b>1,654,035</b>
AMENITY/Common Space	4,096	SF	15.00	61,440
CLASSROOM/SUPPORT	8,443	SF	20.00	168,860
CLOSED OFFICE/MEETING	10,519	SF	40.00	420,760
OPEN OFFICE	20,648	SF	20.00	412,960
RESTROOMS	1,615	SF	60.00	96,900
AUDITORIUM	3,744	SF	50.00	187,200
CIRCULATION	15,124	SF	15.00	226,860
STORAGE	3,214	SF	5.00	16,070
BOH/BALANCE	12,597	SF	5.00	62,985
<b>INTERIOR FINISHES</b>	<b>80,000</b>			<b>2,079,471</b>
AMENITY/Common Space	4,096	SF	40.00	163,840
CLASSROOM/SUPPORT	8,443	SF	30.00	253,290
CLOSED OFFICE/MEETING	10,519	SF	35.00	368,165
OPEN OFFICE	20,648	SF	30.00	619,440
RESTROOMS	1,615	SF	75.00	121,125
AUDITORIUM	3,744	SF	50.00	187,200
CIRCULATION	15,124	SF	19.00	287,356
STORAGE	3,214	SF	5.00	16,070
BOH/BALANCE	12,597	SF	5.00	62,985
<b>PLUMBING</b>	<b>80,000</b>			<b>585,835</b>
AMENITY/Common Space	4,096	SF	20.00	81,920
CLASSROOM/SUPPORT	8,443	SF	20.00	168,860
RESTROOMS	1,615	SF	150.00	242,250
CIRCULATION	15,124	SF	3.00	45,372
STORAGE	3,214	SF	3.00	9,642
BOH/BALANCE	12,597	SF	3.00	37,791
<b>HVAC</b>	<b>80,000</b>			<b>3,694,485</b>
AMENITY/Common Space	4,096	SF	55.00	225,280
CLASSROOM/SUPPORT	8,443	SF	60.00	506,580
CLOSED OFFICE/MEETING	10,519	SF	70.00	736,330
OPEN OFFICE	20,648	SF	50.00	1,032,400
RESTROOMS	1,615	SF	65.00	104,975
AUDITORIUM	3,744	SF	65.00	243,360
CIRCULATION	15,124	SF	35.00	529,340
STORAGE	3,214	SF	20.00	64,280
BOH/BALANCE	12,597	SF	20.00	251,940

TRADE	QTY	UNIT	RATE	TOTAL
<b>FIRE PROTECTION</b>	<b>80,000</b>			<b>247,170</b>
AMENITY/Common Space	4,096	SF	2.50	10,240
CLASSROOM/SUPPORT	8,443	SF	2.50	21,108
CLOSED OFFICE/MEETING	10,519	SF	2.50	26,298
OPEN OFFICE	20,648	SF	2.50	51,620
RESTROOMS	1,615	SF	2.50	4,038
AUDITORIUM	3,744	SF	5.00	18,720
CIRCULATION	15,124	SF	5.00	75,620
STORAGE	3,214	SF	2.50	8,035
BOH/BALANCE	12,597	SF	2.50	31,493
<b>ELECTRICAL</b>	<b>80,000</b>			<b>2,610,386</b>
AMENITY/Common Space	4,096	SF	50.00	204,800
CLASSROOM/SUPPORT	8,443	SF	50.00	422,150
CLOSED OFFICE/MEETING	10,519	SF	45.00	473,355
OPEN OFFICE	20,648	SF	35.00	722,680
RESTROOMS	1,615	SF	32.00	51,680
AUDITORIUM	3,744	SF	27.95	104,645
CIRCULATION	15,124	SF	25.00	378,100
STORAGE	3,214	SF	16.00	51,424
BOH/BALANCE	12,597	SF	16.00	201,552
<b>EQUIPMENT</b>	<b>80,000</b>			<b>254,684</b>
AMENITY/Common Space	4,096	SF	10.00	40,960
CLOSED OFFICE/MEETING	10,519	SF	5.00	52,595
OPEN OFFICE	20,648	SF	3.00	61,944
RESTROOMS	1,615	SF	3.00	4,845
AUDITORIUM	3,744	SF	5.00	18,720
CIRCULATION	15,124	SF	5.00	75,620
<b>FURNISHINGS</b>	<b>80,000</b>			<b>566,808</b>
AMENITY/Common Space	4,096	SF	5.00	20,480
CLASSROOM/SUPPORT	8,443	SF	5.00	42,215
CLOSED OFFICE/MEETING	10,519	SF	7.00	73,633
OPEN OFFICE	20,648	SF	15.00	309,720
RESTROOMS	1,615	SF	40.00	64,600
AUDITORIUM	3,744	SF	15.00	56,160

TRADE	QTY	UNIT	RATE	TOTAL
PROJECT REQUIREMENTS	80,000			612,644
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	12,252,874	612,644
<b>TOTAL DIRECT COSTS</b>				<b>12,865,517</b>
ALLOCATIONS				<b>8,564,363</b>
General Conditions	59.5	wks	13,024	774,954
Permits	0.0 %			-
Insurances	2.6 %			419,796
Design Contingency	11.0 %			1,415,207
Phasing Allowance	3.0 %			428,422
Construction Contingency	4.5 %			661,912
Bond	1.5 %			242,190
Fee	3.0 %			504,240
Escalation	23.8 %			4,117,642
<b>TOTAL CONSTRUCTION COST</b>				<b>21,429,880</b>

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	<b>Alternate #1</b> <i>ENV ALT 1 - REDUCTION IN REPOINTING</i>				<b>(1,207,741)</b>
	Deduct 60% repointing from base	(21,761)	SF	35.00	(761,628)
	<u>Total Direct Costs</u>				(761,628)
	<u>Allocations</u>				(446,113)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(23,659)
	Design Contingency	11.0 %			(83,779)
	Phasing Allowance	3.0 %			(25,362)
	Construction Contingency	4.5 %			(39,185)
	Bond	1.5 %			(13,649)
	Fee	3.0 %			(28,418)
	Escalation	23.8 %			(232,061)
2	<b>Alternate #2</b> <i>MECH ALT 1 - GROUND SOURCE AND AIR SOURCE ILO AIR SOURCE ONLY</i>				<b>1,020,875</b>
	Deduct baseline heating/cooling plant	(1)	LS	1,131,000	(1,131,000)
	<u>Geothermal wells, allow (20 each @ 500LF deep)</u>				
	Inclusive of wells, piping	20	EA	25,000.00	500,000
	Glycol piping, 3" (ALL-IN) - allow	500	LF	80.00	40,000
	Geothermal manifold/pipe header vault	1	EA	25,000.00	25,000
	Geothermal pumps (P1 & P2)	2	EA	15,000.00	30,000
	Storage tanks	2	EA	7,500.00	15,000
	Glycol water piping - allow	1,500	LF	70.00	105,000

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
	<u>Heating/cooling equipment</u>				
	GSHP Chiller	90	TON	2,250.00	202,500
	Air to water heat pump	6	EA	80,000.00	480,000
	Pumps	12	EA	15,000.00	180,000
	Heat exchangers	450	GPM	125.00	56,250
	New glycol system/ feed	1	LS	20,000.00	20,000
	Chemical shot feeder, air separation, expansion	1	LS	25,000.00	25,000
	<u>Chiller plant controller optimization</u>	1	LS	15,000.00	15,000
	<u>Testing, balancing &amp; commissioning support</u>	1	LS	22,510.00	22,510
	<u>Co-ordination, rigging, CAD, Sub-trade temp requirements</u>	1	LS	58,526.00	58,526
	<u>Total Direct Costs</u>				643,786
	<u>Allocations</u>				377,089
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			19,998
	Design Contingency	11.0 %			70,816
	Phasing Allowance	3.0 %			21,438
	Construction Contingency	4.5 %			33,122
	Bond	1.5 %			11,537
	Fee	3.0 %			24,021
	Escalation	23.8 %			196,156
<b>3</b>	<b>Alternate #3</b>				<b>58,346</b>
	STRUCTURAL ALT 1 - ALTERNATE COAL PIT INFILL				
	Deduct baseline coal pit infill	(1)	LS	75,193.52	(75,194)
	Structural steel - allow 10PSF - pocket into extg masonry - includes 15% for connections, misc.	8	TONS	10,000.00	83,088
	Slab on metal deck	1,445	SF	20.00	28,900
	<u>Total Direct Costs</u>				36,794
	<u>Allocations</u>				21,552
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			1,143
	Design Contingency	11.0 %			4,047
	Phasing Allowance	3.0 %			1,225
	Construction Contingency	4.5 %			1,893
	Bond	1.5 %			659
	Fee	3.0 %			1,373
	Escalation	23.8 %			11,211



#	ALTERNATE	QTY	UNIT	RATE	TOTAL
4	<b>Alternate #4</b> <i>PLUMBING ALT 1 - DEDUCT RAINWATER REUSE FOR TOILET FLUSHING</i>				<b>(126,364)</b>
	Assume reduction in skid cost, tank size, piping connections, etc of 25%, removal of day tank and flushing risers and connections	(1)	LS	83,750.00	(83,750)
	<u>Total Direct Costs</u>				(83,750)
	<u>Allocations</u>				(42,614)
	General Conditions				Included in base
	Permits	0%			-
	GL Insurance	3%			(2,178)
	Design Contingency	11%			(9,213)
	Construction Contingency	5%			(3,769)
	Fee	3%			(2,967)
	Escalation	24.0 %			(24,488)

GENERAL CONDITIONS CORE & SHELL  
EDGERLY RENO

SOMERVILLE MP - EDGERLY BUILDING RENOVATION  
28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 19.5	DAYS - X 20 390	WEEKLY RATE \$28,024.44
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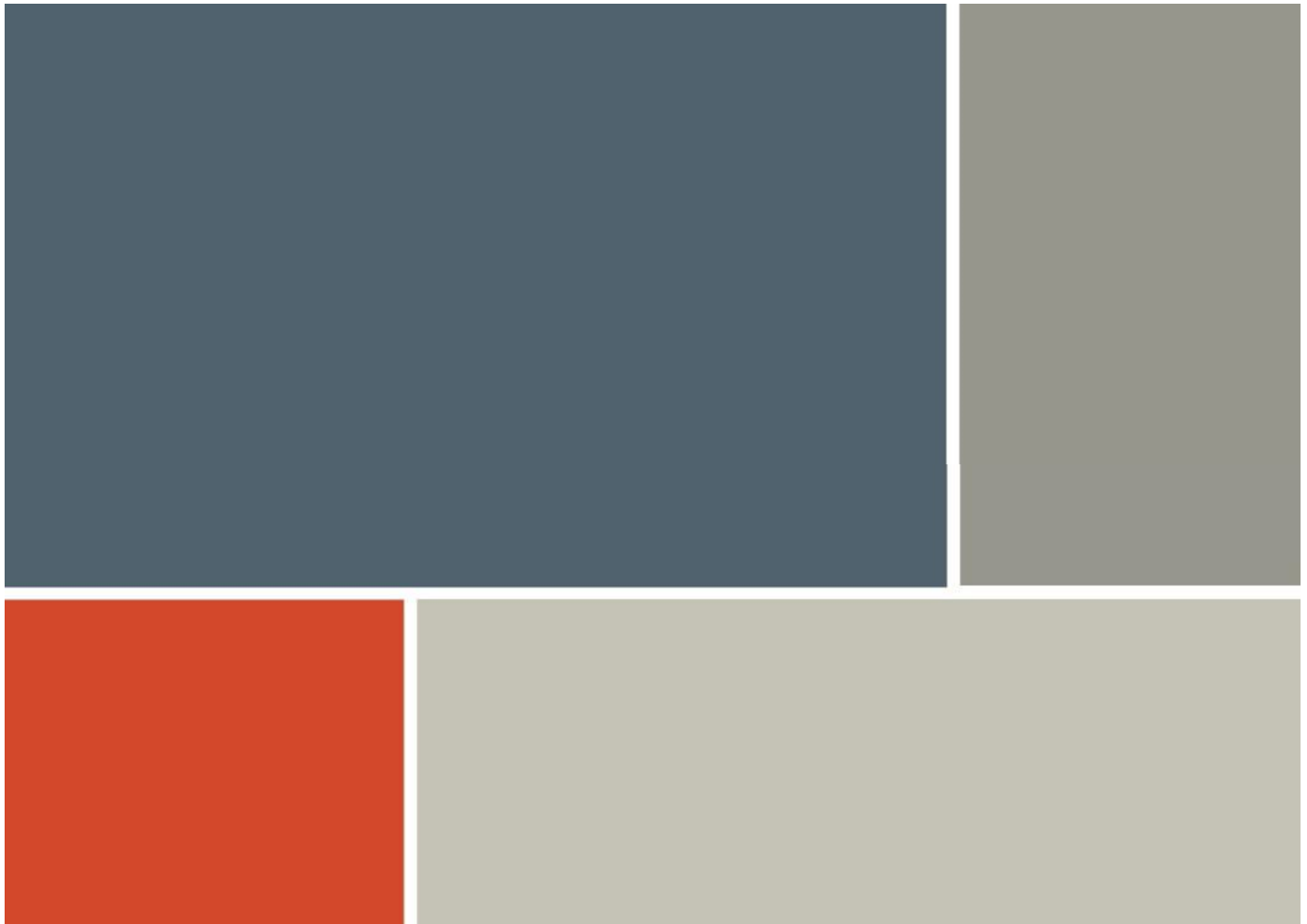
STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	TOTALS
General Superintendent	0%	0	0	\$ 2,400	\$ -
Project Executive	0%	0	0	\$ 2,400	\$ -
Project Superintendent	100%	390	20	\$ 1,500	\$ 585,000
Sr. Project Manager	100%	390	20	\$ 1,500	\$ 585,000
Project Manager	100%	390	20	\$ 1,200	\$ 468,000
Assistant Project Manager	50%	195	10	\$ 900	\$ 175,500
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	117	6	\$ 1,500	\$ 175,500
Purchasing	5%	20	1	\$ 1,500	\$ 29,250
MEP Coordinator	15%	59	3	\$ 1,300	\$ 76,050
Safety	10%	41	2	\$ 1,800	\$ 73,667
Project Accountant	2%	8	0	\$ 700	\$ 5,460
Project Administration	2%	8	0	\$ 500	\$ 3,900
Project Expeditor	2%	8	0	\$ 1,100	\$ 8,580
<b>TOTALS</b>					\$ 2,185,907

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 14.875	DAYS - X 20 297.5	WEEKLY RATE \$13,024.44
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STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	TOTALS
General Superintendent	0%	0	0	\$ 2,400	\$ -
Project Executive	0%	0	0	\$ 2,400	\$ -
Project Superintendent	0%	0	0	\$ 1,500	\$ -
Sr. Project Manager	25%	74	4	\$ 1,500	\$ 111,563
Project Manager	100%	298	15	\$ 1,200	\$ 357,000
Assistant Project Manager	50%	149	7	\$ 900	\$ 133,875
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	5%	15	1	\$ 1,500	\$ 22,313
Purchasing	5%	15	1	\$ 1,500	\$ 22,313
MEP Coordinator	15%	45	2	\$ 1,300	\$ 58,013
Safety	10%	31	2	\$ 1,800	\$ 56,194
Project Accountant	2%	6	0	\$ 700	\$ 4,165
Project Administration	2%	6	0	\$ 500	\$ 2,975
Project Expeditor	2%	6	0	\$ 1,100	\$ 6,545
<b>TOTALS</b>					<b>\$ 774,954</b>



1895 BUILDING - EARLY DEMO & ABATEMENT  
CONCEPT ESTIMATE  
October 28, 2021



CONSTRUCTION COST  
& RISK CONSULTANTS

# 1895 BUILDING - EARLY DEMO & ABATEMENT

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28-Oct-21

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BBB		

DHARAM CONSULTING  
COST & RISK CONSULTANT  
1 BEACON ST, FLOOR 15, BOSTON, MA 02108  
Email: [ojones@dharamconsulting.com](mailto:ojones@dharamconsulting.com)

Basis of Estimate

BBB Early Demo Drawings EX1,2,5,6	10/8/2021
Axiom HAZMAT Survey Report	9/29/2021

Exclusions and Assumptions

We have carried the following below line percentage markups;

SDI	Excluded	
General Conditions	LS	(5) Months Assumed
Construction Contingency (On Trade)	4.5%	
Design Contingency (On Trade)	4.5%	
Bond	1.5%	
Insurances	2.0%	
Permits	Excluded	
Fee	3.0%	
Escalation	2.5%	

- 1 The following estimate is priced as a union labor project
- 2 Escalation is included to an assumed buyout date of 4/1/2022
- 3 We have assumed normal daytime shifts - OT/off hours working is excluded
- 4 An allowance for HAZMAT abatement has been included per the given report
- 5 All work to existing roof and enclosure is excluded from this project
- 6 All structural demolition is excluded from this project
- 7 Cut/drop & makesafe is carried with the MEPFP trades, removal of dropped systems is carried within demolition
- 8 An allowance is carried within the electrical trade to maintain the extg temp. FA system, as well as provide temp light & power to circulation spaces
- 9 Please see detailed backup for additional exclusions, assumptions and clarifications

THIS ESTIMATE REPRESENTS THE EARLY DEMO & ABATEMENT PACKAGE FOR THE CITY OF SOMERVILLE MASTER PLAN - 1895 BUILDING. COSTS HAVE BEEN GIVEN IN CSI BREAKDOWN, A UNIFORMAT SUMMARY IS PROVIDED AS WELL

TOTAL CONSTRUCTION COST

	\$Total	\$/SF
1895 BUILDING ABATEMENT	\$1,155,994	\$19
1895 BUILDING DEMO	\$1,415,736	\$24
<b>TOTAL CONSTRUCTION COST \$</b>	<b>\$2,571,730</b>	<b>\$43</b>

ESCALATION OUTLOOK

Escalation has been included to an assumed buyout date of 4/1/2022. Escalation has been carried at 8% p.a. for the remainder of 2021 and 5% p.a for 2022.

CONTINGENCY & ESCALATION

Design Contingency	4.5%
Construction Contingency	4.5%
General Conditions	LS
Insurances	2%
Bond	1.5%
Fee	3.0%
Escalation carried	2.5%

TOTAL CONSTRUCTION COST - BREAKOUTS

COST ELEMENT CSI

	\$ TOTALS	\$/SF
PROJECT REQUIREMENTS	\$ 123,900	\$ 2.06
DEMOLITION & ABATEMENT	\$ 1,523,788	\$ 25.40
CONCRETE	\$ -	\$ -
MASONRY	\$ -	\$ -
METALS	\$ -	\$ -
WOODS & PLASTICS	\$ -	\$ -
THERMAL & MOISTURE PROTECTION	\$ -	\$ -
OPENINGS	\$ -	\$ -
FINISHES	\$ -	\$ -
SPECIALTIES	\$ -	\$ -
EQUIPMENT	\$ -	\$ -
FURNISHINGS	\$ -	\$ -
SPECIAL CONSTRUCTION	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -
FIRE PROTECTION	\$ 26,496	\$ 0.44
PLUMBING	\$ 39,744	\$ 0.66
HVAC	\$ 52,992	\$ 0.88
ELECTRICAL	\$ 164,358	\$ 2.74
SITWORK	\$ -	\$ -

TOTAL TRADE COST

	\$ 1,931,278	\$ 32
Design Contingency	\$ 86,907	\$ 1.45
Construction Contingency	\$ 90,818	\$ 1.51
General Conditions	\$ 244,000	\$ 4.07
Permit		Excluded
Insurance	\$ 47,060	\$ 0.78
Bond	\$ 35,295	\$ 0.59
Fee	\$ 73,061	\$ 1.22

TOTAL COST (TODAY'S \$)

	\$ 2,508,419	\$ 42
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Escalation

	\$ 63,311	\$ 1.06
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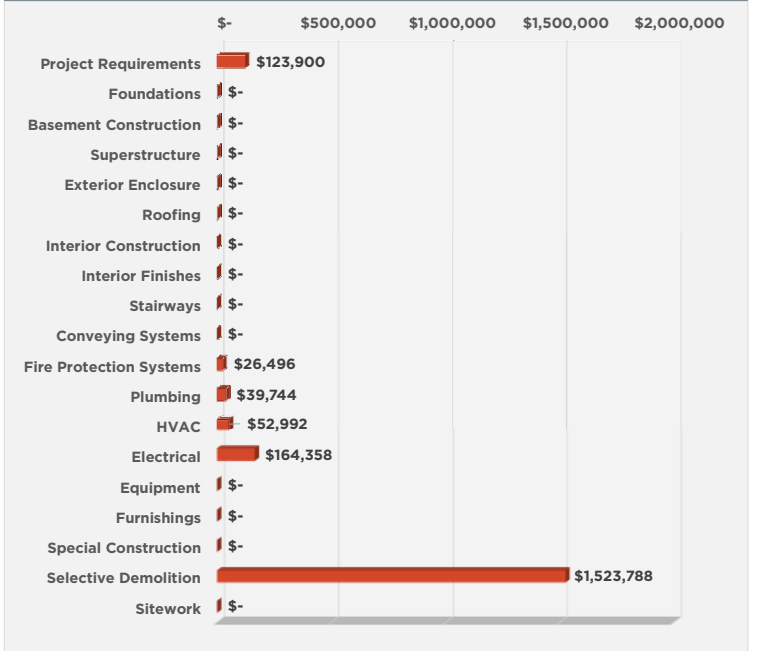
TOTAL ECC

	\$ 2,571,730	\$ 43
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COST ELEMENT BY UNIFORMAT

	\$ TOTALS	\$/SF
Project Requirements	\$ 123,900	\$ 2.06
Foundations	\$ -	\$ -
Basement Construction	\$ -	\$ -
Superstructure	\$ -	\$ -
Exterior Enclosure	\$ -	\$ -
Roofing	\$ -	\$ -
Interior Construction	\$ -	\$ -
Interior Finishes	\$ -	\$ -
Stairways	\$ -	\$ -
Conveying Systems	\$ -	\$ -
Fire Protection Systems	\$ 26,496	\$ 0.44
Plumbing	\$ 39,744	\$ 0.66
HVAC	\$ 52,992	\$ 0.88
Electrical	\$ 164,358	\$ 2.74
Equipment	\$ -	\$ -
Furnishings	\$ -	\$ -
Special Construction	\$ -	\$ -
Selective Demolition	\$ 1,523,788	\$ 25.40
Sitework	\$ -	\$ -

TOTAL TRADE COST



DIVISION SUMMARY		60,000 GFA	28-Oct-21
		\$/SF	\$ TOTAL
PR	Project Requirements	2.06	123,900
	<b>PROJECT REQUIREMENTS</b>	<b>2.06</b>	<b>123,900</b>
A10.	Foundations	0.00	0
A20.	Basement Construction	0.00	0
A.	<b>SUBSTRUCTURE</b>	<b>0.00</b>	<b>0</b>
B10.	Superstructure	0.00	0
B20.	Exterior Enclosure	0.00	0
B30.	Roofing	0.00	0
B.	<b>SHELL</b>	<b>0.00</b>	<b>0</b>
C10.	Interior Construction	0.00	0
C30.	Interior Finishes	0.00	0
C.	<b>INTERIORS</b>	<b>0.00</b>	<b>0</b>
C20.	Stairways	0.00	0
D10.	Conveying Systems	0.00	0
	<b>VERTICAL TRANSPORTATION</b>	<b>0.00</b>	<b>0</b>
D20	Fire Protection Systems	0.44	26,496
D30	Plumbing	0.66	39,744
D40	Heating, Ventilating & Air Conditioning	0.88	52,992
D50.	Electric Lighting, Power & Communications	2.74	164,358
D.	<b>SERVICES</b>	<b>4.73</b>	<b>283,590</b>
E10.	Equipment	0.00	0
E20.	Furnishings	0.00	0
E.	<b>EQUIPMENT AND FURNISHINGS</b>	<b>0.00</b>	<b>0</b>
F10.	Special Construction	0.00	0
F20.	Selective Demolition	25.40	1,523,788
F.	<b>SPECIAL CONSTRUCTION AND DEMOLITION</b>	<b>25.40</b>	<b>1,523,788</b>
	<b>TOTAL BUILDING CONSTRUCTION</b>	<b>32.19</b>	<b>1,931,278</b>
G10.	Site Preparation	0.00	0
G20.	Site Improvements	0.00	0
G30.	Site Civil/Mechanical Utilities	0.00	0
G40.	Site Electrical Utilities	0.00	0
G90.	Other Site Construction	0.00	0
	<b>TOTAL SITE CONSTRUCTION</b>	<b>0.00</b>	<b>0</b>
	<b>TOTAL TRADE COSTS</b>	<b>32.19</b>	<b>1,931,278</b>
	a. Design Contingency	1.45	86,907
	b. Logistics & Loss Productivity	0.00	
	c. Construction Contingency	1.51	90,818
	d. General Conditions	4.07	244,000
	<b>SUBTOTAL</b>	<b>39.22</b>	<b>2,353,003</b>
	e. Permit		Excluded
	f. Insurance	0.78	47,060
	g. Bond	0.59	35,295
	h. Fee	1.22	73,061
	<b>TOTAL TODAY'S DOLLARS</b>	<b>\$42</b>	<b>2,508,419</b>
	i. Escalation - 4/1/2022	1.06	63,311
	<b>TOTAL ANTICIPATED CONSTRUCTION COST</b>	<b>\$43</b>	<b>2,571,730</b>



DIVISION SUMMARY - TOTAL		60,000 GFA	\$/SF	27-Oct-21
	Project Requirements		2.06	\$ TOTAL: 123,900
1	PROJECT REQUIREMENTS		2.06	123,900
	Demolition/Abatement		25.40	1,523,788
2	DEMOLITION & ABATEMENT		25.40	1,523,788
	Cast in place concrete		0.00	0
	Pre-cast concrete		0.00	0
3	CONCRETE		0.00	0
4	MASONRY		0.00	0
	Structural Steel		0.00	0
	Miscellaneous Metals		0.00	0
5	METALS		0.00	0
	Finish Carpentry/Millwork / Casework		0.00	0
6	WOODS & PLASTICS		0.00	0
	Waterproofing/Dampproofing/Fireproofing		0.00	0
	Roofing		0.00	0
	Caulking/Joint Sealants		0.00	0
	Composite panels		0.00	0
7	THERMAL & MOISTURE PROTECTION		0.00	0
	Doors, Frames & Hardware		0.00	0
	Entrances/Storefronts		0.00	0
	Glass & Glazing		0.00	0
8	OPENINGS		0.00	0
	Drywall		0.00	0
	Tile & Stone		0.00	0
	Acoustical Ceilings		0.00	0
	Carpet & Resilient Flooring		0.00	0
	Painting & Wallcovering		0.00	0
9	FINISHES		0.00	0
	Miscellaneous Specialties		0.00	0
10	SPECIALTIES		0.00	0
	Equipment		0.00	0
11	EQUIPMENT		0.00	0
	Window Treatment		0.00	0
	Laboratory Casework		0.00	0
12	FURNISHINGS		0.00	0
	Special Construction		0.00	0
13	SPECIAL CONSTRUCTION		0.00	0
	Elevators		0.00	0
14	CONVEYING SYSTEMS		0.00	0
21	FIRE PROTECTION		0.44	26,496
22	PLUMBING		0.66	39,744
23	HVAC		0.88	52,992
26	ELECTRICAL		2.74	164,358
	Site Prep		0.00	0
	Earthwork		0.00	0
	Site Utilities		0.00	0
	Site Improvements		0.00	0
	Landscaping		0.00	0
32	SITE IMPROVEMENTS		0.00	0
<b>TOTAL TRADE COSTS</b>			<b>39.22</b>	<b>1,931,278</b>
	Design Contingency	4.50%	1.45	86,907
	Construction Contingency	4.70%	1.51	90,818
	General Conditions	12.63%	4.07	244,000
<b>SUBTOTAL</b>			<b>39.22</b>	<b>2,353,003</b>
	Permit	0.00%	0.00	0
	Insurance	2.00%	0.78	47,060
	Bond	1.50%	0.59	35,295
	Fee	3.00%	1.22	73,061
<b>TOTAL TODAY'S DOLLARS</b>			<b>\$42</b>	<b>\$2,508,419</b>
	Escalation	2.52%	1.06	63,311
<b>TOTAL ANTICIPATED CONSTRUCTION COST</b>			<b>\$43</b>	<b>\$2,571,730</b>

# 1895 BUILDING - EARLY DEMO & ABATEMENT

CONCEPT ESTIMATE		60,000 GFA			
		QTY	UNIT	RATE	\$TOTAL
<b>1</b>	<b>DEMOLITION &amp; ABATEMENT</b>				1,523,788
<b>2</b>					
<b>3</b>	<b>HAZMAT Abatement - Per Axiom Report</b>				
<b>4</b>	Transite Lab Hood	150	SF	13.33	2,000
<b>5</b>	12" x 12" Dark Gray Floor Tile Mastic	10,900	SF	4.00	43,600
<b>6</b>	12" x 12" Light Gray Floor Tile Mastic	15,500	SF	4.00	62,000
<b>7</b>	9" x 9" Gray/Brown Floor Tile	48,000	SF	6.00	288,000
<b>8</b>	9" x 9" Gray/Brown Floor Tile Mastic	48,000	SF		Incl above
<b>9</b>	6" Pipe Insulation	250	LF	20.00	5,000
<b>10</b>	6" Pipe Elbow Insulation	35	EA	15.00	525
<b>11</b>	Exterior Door Caulking	4	EA		Excluded, from this project
<b>12</b>	Black Waterproofing Mastic - Exterior Brick Façade	25,500	SF		Excluded, from this project
<b>13</b>	Green Floor Tile	16,000	SF	6.00	96,000
<b>14</b>	White Floor Tile	16,000	SF	6.00	96,000
<b>15</b>	Interior joint compound				Excluded, assume not ACM
<b>16</b>	Window Caulking old under new	20,000	LF		Excluded, from this project
<b>17</b>	12" x 12" and 9' x 9" floor tiles and black mastic (various types)	64,000	SF		Incl above
<b>18</b>	Black Vapor Barrier on CMU Block Wall	75,000	SF		Excluded, from this project
<b>19</b>	Exterior Door Caulking	500	LF		Excluded, from this project
<b>20</b>	Exterior black tar on coping	5,000	SF		Excluded, from this project
<b>21</b>	Exterior caulk at roof penthouse	NA			Excluded, from this project
<b>22</b>	White pipe fitting and elbow insulation	18,000	LF	5.00	90,000
<b>23</b>	Black Sink Coating	150	EA	10.00	1,500
<b>24</b>	Multicolored Sheet Flooring	150	SF	5.00	750
<b>25</b>	Coating on Roof Curbing	NA			Excluded, from this project
<b>26</b>	Asphaltic Damp Proofing	5,000	SF		Excluded, from this project
<b>27</b>	Buried Pipes	TBD			Excluded, from this project
<b>28</b>	Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	168	EA		Excluded, from this project
<b>29</b>	Roofing Materials Assoc. w/ Flat Roof System	16,000	SF		Excluded, from this project
<b>30</b>	Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	1	ALLOW	5,000.00	5,000
<b>31</b>	Interior Components w/ Boiler Unit	1	ALLOW	3,000.00	3,000
<b>32</b>	Misc. hazardous building materials	1	LS	10,000.00	10,000
<b>33</b>	5.5% Contingency - 4.5% carried below line	1	LS	38,685.63	38,686
<b>34</b>	Estimated Abatement Design/Bid & Monitoring Fee	1	LS	50,000.00	50,000
<b>35</b>					
<b>36</b>	<b>Selective Demolition</b>				
<b>37</b>	<u>Flooring</u>				
<b>38</b>	Remove Carpet & Base (Carpet + wood flooring below to subfloor)	2,767	SF	3.50	9,685
<b>39</b>	Remove VCT & Base (VCT + wood flooring below to subfloor) - assume VCT removed w/ abatement	31,224	SF	2.50	78,060
<b>40</b>	Remove Terrazzo & Base (removed to subfloor)	560	SF	10.00	5,600
<b>41</b>	Remove Wood & Base (removed to subfloor)	7,762	SF	2.50	19,405
<b>42</b>					
<b>43</b>	<u>Ceilings</u>				
<b>44</b>	Remove extg ceilings throughout	60,000	SF	2.75	165,000
<b>45</b>					
<b>46</b>	<u>Interior Partitions</u>				
<b>47</b>	Remove furring down to structure @ exterior walls	34,271	SF	2.25	77,110
<b>48</b>	Remove furring down to structure @ interior load bearing walls	72,185	SF	2.25	162,416
<b>49</b>	Remove typical interior partitions	33,461	SF	3.00	100,382
<b>50</b>	Remove doors & frames	152	LVS	100.00	15,200
<b>51</b>	Remove bathroom partitions	21	EA	350.00	7,350
<b>52</b>	Cart/dispose of plumbing fixtures	48	EA	150.00	7,200
<b>53</b>					
<b>54</b>	<u>Misc. Interior</u>				
<b>55</b>	Remove trash, millwork/cabinetry, tackboards, etc.	256	MH	95.00	24,320
<b>56</b>					
<b>57</b>	<u>Structural Demolition</u>				Excluded, assume ETR
<b>58</b>					

# 1895 BUILDING - EARLY DEMO & ABATEMENT

CONCEPT ESTIMATE		60,000 GFA			
		QTY	UNIT	RATE	\$TOTAL
59	<u>Existing Stairwells/Elevators</u>				Excluded, assume ETR
60					
61	<u>Roof/Enclosure</u>				Excluded, assume ETR
62					
63	<u>MEPFP</u>				
64	Removal/disposal of dropped MEPFP piping, duct, equipment, etc.	60,000	SF	1.00	60,000
65					
181	<b>PLUMBING</b>				39,744
182					
183	<u>Demolition</u>				
184	Cut/drop/make safe	36	MD	960.00	34,560
185					
186	<u>Disinfecting, testing of pipe, sign-off</u>				Excluded
187					
188	<u>Subcontractor's GCs/GRs</u>	1	LS	5,184.00	5,184
189					
190	<b>HVAC</b>				52,992
191					
192	<u>Demolition</u>				
193	Cut/drop/make safe	48	MD	960.00	46,080
194					
195	<u>Testing, balancing &amp; commissioning</u>				Excluded
196					
197	<u>Subcontractor's GCs/GRs</u>	1	LS	6,912.00	6,912
198					
199					
200	<b>FIRE PROTECTION</b>				26,496
201					
202	<u>Demolition</u>				
203	Cut/drop/make safe	24	MD	960.00	23,040
204					
205	<u>Hydraulic calculations, testing, etc.</u>				Excluded
206					
207	<u>Subcontractor's GCs/GRs</u>	1	LS	3,456.00	3,456
208					
209	<b>ELECTRICAL</b>				164,358
210					
211	Demo/make-safe	48	MD	1,040.00	49,920
212	Temp light & power	60,000	SF	0.75	45,000
213	Protect & maintain ETR fire alarm system	60,000	SF	0.80	48,000
214					
215	<u>Testing, grounding &amp; bonding</u>				Excluded
216					
217	<u>Subcontractor's GCs/GRs</u>	1	LS	21,438.00	21,438
218					

# 1895 BUILDING - EARLY DEMO & ABATEMENT

CONCEPT ESTIMATE		60,000 GFA			
		QTY	UNIT	RATE	\$TOTAL
<b>242</b>	<b>PROJECT REQUIREMENTS</b>				123,900
<b>243</b>					
<b>244</b>	<b>General Project Requirements</b>				
<b>245</b>	Sidewalk closure fees				Excluded
<b>246</b>	Street closure fees				Excluded
<b>247</b>	Sidewalk bridge/OH protection				Excluded
<b>248</b>	Temp sitework				Excluded
<b>249</b>	Temporary Protection of ETR items	60,000	SF	0.35	21,000
<b>250</b>	Trade overtime allowance			In trades where required	
<b>251</b>	Equipment rental, Hepa/environmental control etc.	18.0	WK	400.00	7,200
<b>252</b>	Temp construction, labor	18.0	MD	720.00	12,960
<b>253</b>	General labor / safety carpentry / misc. materials	18.0	MD	920.00	16,560
<b>254</b>	Temp site office setup	5.0	MO	2,500.00	12,500
<b>255</b>	Temp hoisting & operator	10.0	MD	800.00	8,000
<b>256</b>	Daily travel	100.0	D	80.00	8,000
<b>257</b>	Site parking	20.0	WKS	750.00	15,000
<b>258</b>	Police details and OT deliveries	5.0	D	1,200.00	6,000
<b>259</b>	Skips / collection				w/ Demo above
<b>260</b>	Winter conditions allowance				Excluded
<b>261</b>	Temp power				Excluded, assume ETR
<b>262</b>	Temp electric usage	4.5	MO	500.00	2,250
<b>263</b>	Temp water usage	4.5	MO	500.00	2,250
<b>264</b>	Temp sanitary facilities	4.5	MO	1,200.00	5,400
<b>265</b>	Workforce compliance	5.0	MO	250.00	1,250
<b>266</b>	Final cleaning	7.2	MD	768.00	5,530
<b>267</b>					
<b>268</b>	<b>TOTAL DIRECT COSTS</b>				<b>1,931,278</b>
<b>269</b>					
<b>270</b>	<b>ALLOCATIONS</b>				640,453
<b>271</b>					
<b>272</b>	General Conditions	20	wks.	12,200.00	\$ 244,000
<b>274</b>	Permits	0.0%			\$ -
<b>273</b>	Insurances	2.0%			\$ 47,060
<b>275</b>	Design Contingency	4.5%			\$ 86,907
<b>276</b>	Design Build Fee	0.0%			\$ -
<b>277</b>	Construction Contingency	4.5%			\$ 90,818
<b>278</b>	Bond	1.5%			\$ 35,295
<b>279</b>	Fee	3.0%			\$ 73,061
<b>280</b>	Escalation	2.5%			\$ 63,311
<b>281</b>					
<b>282</b>	<b>TOTAL CONSTRUCTION COST</b>				<b>2,571,730</b>

GENERAL CONDITIONS

1895 BUILDING - EARLY DEMO & ABATEMENT

CONSTRUCTION SCHEDULE DURATIONS:		MONTHS	DAYS - X 20								
		1	20								
STAFF	PROJECT % ALLOCATION	NUMBER OF DAYS	NUMBER OF MONTHS	DAY RATE	MONTHLY RATE	TOTALS - MONTHLY					
General Superintendent	0%	0	0	\$ 2,400	\$ 48,000	\$				-	
Project Executive	0%	0	0	\$ 2,400	\$ 48,000	\$				-	
Project Superintendent	100%	20	1	\$ 1,500	\$ 30,000	\$				30,000	
Sr. Project Manager	0%	0	0	\$ 1,500	\$ 30,000	\$				-	
Project Manager	50%	10	1	\$ 1,200	\$ 24,000	\$				12,000	
Assistant Project Manager	25%	5	0	\$ 900	\$ 18,000	\$				4,500	
Assistant Superintendent	0%	0	0	\$ 1,100	\$ 22,000	\$				-	
Senior Estimator	1%	0	0	\$ 1,500	\$ 30,000	\$				300	
Purchasing	1%	0	0	\$ 1,500	\$ 30,000	\$				300	
MEP Coordinator	2%	0	0	\$ 1,300	\$ 26,000	\$				520	
Safety	2%	0	0	\$ 1,800	\$ 36,000	\$				720	
Project Accountant	1%	0	0	\$ 700	\$ 14,000	\$				140	
Project Administration	1%	0	0	\$ 500	\$ 10,000	\$				100	
Project Expeditor	1%	0	0	\$ 1,100	\$ 22,000	\$				220	
<b>TOTALS</b>					<b>WEEKLY COST</b>		\$	<b>12,200</b>			

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PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	2875
DATE:	Oct 2021
SUBJECT:	<b>Preferred Schematic Report – Cost Estimate Narrative</b>

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## List of Alternates by Building

### 1895 Building

- **DEMO Alternate 1: Alt Deduct if Early Phase Demolition Package is Executed**  
Base project to assume full abatement and full demo; the alt-deduct should deduct the demo scope and abatement scope already included in the early-phase demo package
- **ENV Alternate 1: Alt-Deduct to maintain flat roof.** *NOTE: The building cannot meet program without 4<sup>th</sup> floor but incremental pricing needed for file; put this alternate in a stand-alone memo*  
In lieu of building a new pitched roof and occupiable fourth floor with stairs and elevators (base), alternate (alt-deduct) is to maintain existing flat roof configuration and install weatherized rooftop equipment outdoors; allow for new stair bulkhead as well as complete existing roof removal down to deck, new tapered insulation and roof assembly and all new RWL plumbing; **assume portions of roof structure will have to be replaced with new open web steel joists or wide-flange steel to support rooftop equipment; equipment will need architectural enclosures.**
- **ENV Alternate 2: Alt-Add for real slate shingles vs. synthetic slate**  
Provide stone slate (alt-add) ILO of synthetic slate shingle (base)
- **ENV Alternate 3: Alt-Deduct for GFRC vs. Terra Cotta**  
Where new terra cotta elements called for, provide pigmented GFRC (alt-deduct) ILO traditional terra cotta (base)
- **ENV Alternate 4: Add-Alt for Additional brick repointing**  
Include greater extent of repoint to remove uniform mortar color/appearance (alt-add)
- **MECH Alternate 1: Alt-Deduct for ASHP vs. GSHP**  
ILO combined ground-source system for City Hall/1895 (base), provide dedicated air-source heat pump system for 1895 (alt-deduct).
- **PLUM Alternate 1: Alt-Deduct for irrigation use only of rainwater vs. fixture flushing**  
ILO rainwater reclamation system for both irrigation and plumbing fixture flushing (base), utilize rainwater reclamation system for irrigation only; no toilet flushing or associated infrastructure (alt-deduct)

### City Hall

- **ENV Alternate 1: Ventilated roof system (addition?)**  
ILO of R-38 achieved by closed-cell spray foam at underside of wood deck and rafters, install

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ventilated roofing system above roof deck utilizing rigid insulation, e.g. Hunter polyiso panels and “Cool Vent” system *Why would polyiso roof need to be vented?*

- **ENV Alternate 2: Additional repointing**  
Include full balance of repoint to remove uniform mortar color/appearance (alt-add)
- **MECH Alternate 1: GSHP vs ASHP**  
ILO a combined ground-source system for City Hall/1895 (base scope; divide scope between buildings per MECH narrative), provide dedicated air-source heat pump system dedicated to City Hall (alt-deduct).
- **PLUM Alternate 1: Deduct Alt - rainwater for flushing vs. irrigation only**  
ILO rainwater reclamation for irrigation and plumbing fixture flushing (base), utilize rainwater reclamation system for irrigation only; no toilet flushing (alt-deduct)

## Edgerly Education Center

- **ENV Alternate 1: Deduct Alt - Reduction in repointing**  
Only repoint 40% of brick masonry rather than 100%
- **STRUCT Alternate 1: Infill floor – SOG (base) vs. structured beams/slab (alt)**  
Refer to narrative
- **PLUM Alternate 1: Deduct Alt - rainwater for flushing vs. irrigation only**  
ILO rainwater reclamation for irrigation and plumbing fixture flushing (base), utilize rainwater reclamation system for irrigation only; no toilet flushing (alt-deduct)

## 1895 Building

### Existing Conditions, Demolition, & Logistics (BBB/H&A)

#### *Hazardous Materials Removal*

- **Axiom report sent to Dharam by email, 10/13**

#### *Geotechnical Considerations (H&A)*

- It is understood that the proposed renovation will result in increased column and exterior wall loads. Consideration is given to supporting the new loads on the existing footings. A test pit exploration program is scheduled to observe conditions of the existing footings and shallow soil conditions and assess the feasibility of transferring new loads to the existing foundations. Further evaluation of the existing and additional loads will be required and is to be provided by the Structural Engineer.

#### *Other Construction Considerations*

- **DEMO ALTERNATE 1:** See alternates overview for description
- Continue to carry allowance for mitigation and repair of envelope and superstructure due to water intrusion during status of abandonment beginning with Somerville High School Project. **(At this stage, 10% of façade has poor-quality stabilization/enclosure).**

### Sustainability & Net Zero Energy (A10/Energysmiths)

#### *Overview*

- The 1895 Building will be renovated in compliance with the City of Somerville’s Zoning Ordinance which represents the minimum expectations for aligning with City-wide goals. As such, the project will be designed to achieve **Leadership in Energy and Environmental Design (LEED) Platinum** certification under LEED v4 Building Design and Construction (BD+C): New Construction (NC) and Major Renovation Program.
- The project strives to be an exemplar of high-performance, sustainable design by reducing energy use, greenhouse gas emissions, and potable water use to the greatest extent possible. To align with these goals, the building will be designed to be an **all-electric Net Zero Emissions building** in which all emissions from energy used in the building will be offset by a combination of on-site and off-site renewable energy on an annual basis. (See Energy Efficiency sub-section).

#### *Site and Landscape*

- The targets for site design are to provide a visual connection to nature from within the building, enhance the ecological function of the site, filter water on-site, minimize the urban heat island effect, minimize light pollution, and create comfortable outdoor microclimates. Site landscaping that promotes sustainable land development and management practices will also be considered.
  - Reduce impervious hardscape surfaces and use light-colored, high-albedo paving materials. Permeable pavers will be utilized in pedestrian areas where possible to increase the permeability of the site



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- Use native and drought-resistant vegetation to preserve natural habitat, promote biodiversity, and mitigate the need for irrigation water
- Specify and locate trees to shade paved areas and reduce urban heat island effect as well as reduce energy consumption associated with indoor climate control of surrounding buildings
- Specify locally sourced pavers and hardscape materials
- Design exterior lighting to minimize light trespass from the site boundary while providing sufficient lighting for security

## *Stormwater Management / Water Efficiency*

- The site design will strive to reduce, harvest, slow, and enhance stormwater management through strategies such as reduced impervious areas, permeable pavement, stormwater bio-retention or subsurface detention, and water conservation and reuse.
- The project will include a combination of engineered bioretention basins, permeable pavements, subsurface detention, and on-site stormwater collection cistern sized to manage 100% of the stormwater runoff for the 90<sup>th</sup> percentile storm event.
- In addition, costing to assume a separate supply pipe to all flush fixtures that will be connected to an on-site stormwater cistern which will filter and reuse collected stormwater for toilet and urinal flushing as well as all on-site irrigation. (See **Alternates**).
- Conservation of potable water is an important criterion that will be prioritized by selecting low flow plumbing fixtures and through the reuse of stormwater.

## *High Performance Envelope*

- A high-performance envelope is critical to meeting the project's energy efficiency and Net Zero Emissions goals. As such, the project will insulate existing exterior walls to reduce infiltration of outside air, air exfiltration, and provide a well-insulated envelope. In addition, the existing glazing will be replaced with triple-pane glazing and the roof will be insulated to reduce heat gains and losses to the building. Please see the *Shell Improvements* section for additional detail about proposed envelope improvements.

## *Energy Efficiency*

- The 1895 Building aims to use the least amount of energy feasible by designing efficient HVAC systems. By implementing a mix of both passive and active conditioning strategies, including system selection and advanced control mechanisms, the project will dramatically reduce the amount of energy spent on heating, cooling, fans, and pumping. The building will include decoupled mechanical systems served by dedicated outdoor air systems with enthalpy heat recovery. Chilled water and heating hot water for City Hall and the 1895 Building will be generated by a central **all-electric ground-source heat pump system as the base scope**. Please refer to the *Mechanical Infrastructure/Systems* section for additional detail about the proposed mechanical systems.

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- Renewable energy will be generated through a combination of **on-site PV and the purchase of off-site renewable energy credits** due to site limitations. Please refer to the *Electrical Infrastructure* section for additional information.
- To guarantee that the design intent of the project is being met, the 1895 Building performance will be measured and verified both during construction and occupancy through Enhanced Commissioning and Measurement and Verification. These programs, whose scope will be further defined later in the project, will require the use of submeters to break down the building energy and water consumption into different end-uses. To facilitate these programs, the 1895 Building will include, at a minimum, the following **submeters for energy and water use**. These submeters should be combined with a digital dashboard or online interface to simplify the review of energy and water measurements:
  - Energy submeters that record both energy consumption and demand for each energy end-use accounting for 10% or more of the total energy consumption of the building
  - Water submeters for irrigation, indoor plumbing fixtures and fittings, domestic hot water, and reclaimed stormwater
  - Note additional submeters will likely be required depending on the scope of Enhanced Commissioning and Measurement and Verification.

## *Lighting*

- The design will enhance lighting with a focus on visual quality, energy efficiency, and sustainability. By providing **LED lighting fixtures and advanced lighting controls**, this project intends to create high quality, energy efficient spaces that will improve the health satisfaction and productivity of the building occupants. Targets and strategies for lighting sustainability have been listed below
  - High efficiency lighting: 20% reduction from ASHRAE 90.1-2016
    - Lighting to be a combination of high-efficiency LED downlights, recessed slot lights, and linear pendants to achieve lighting target
  - Vacancy sensors in offices, break rooms, and meeting rooms
  - Occupancy sensors in corridors, lobbies, restrooms and storage rooms
  - Daylight dimming sensors with continuous control in all daylight/perimeter spaces
  - All site and exterior architectural lighting to be on a separate control circuit and controlled by astronomical schedule or by a photocell

## *Indoor Environmental Quality*

- The project's materials selection and installation methodology strategy will contribute to a high indoor environmental quality. Interior product selection criteria will focus on low toxicity, low emitting products to safeguard the health not only of building occupants, but also of anyone associated with the building throughout its life cycle from product manufacturing through on-site construction and ultimately demolition and disposal.

## *Carbon Emissions*

- The project will source materials from appropriate distances for each specific material type to minimize carbon emissions from material transport and to contribute to the local materials

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economy. Wood products will come from forests where responsible forestry is practiced, and whenever possible, from local or regional forests. At least 75% of construction waste will be diverted from landfills towards recycling or re-use. This criterion is aligned with LEED NC-v4 credit requirements.

- The reuse of buildings is the foremost strategy to reduce the overall embodied carbon of a project. When specifying new materials for the project, selection of products which disclose embodied carbon through product-specific Environmental Product Declarations (EPDs) and minimize embodied carbon will be prioritized. The embodied carbon associated with the construction and materials installed in the project will not exceed 500 kg CO<sub>2</sub>e/m<sup>2</sup>. This criterion is aligned with the ILFI Zero Carbon certification requirements.

## Site Improvements (Nitsch & BBB)

### *Utilities / Civil Infrastructure*

- Stormwater management system to be shared with City Hall; prorate cost
  - 30,000 gallon rainwater harvesting tank for rainwater reuse system for toilet flushing and irrigation (See Sustainability and Plumbing Sections) including new irrigation lines for establishing landscape plants
  - All new subgrade drainage infrastructure (pipes, structures, grates)
  - 25% of landscape areas bioretention with underdrains, including demonstration gardens and educational signage; bioretention basins shall include 24" soil media and 12" crushed stone reservoir.
  - Non-vehicular pavement to be permeable pavers with underdrains, where shown on plan. Permeable paving section shall include 18" bank-run gravel filter course and 12" crushed stone reservoir.
- New building laterals for water and sewer as indicated on plan.

### *Accessibility Compliance (BBB)*

- Refer to Central Hill Master Plan illustrative plan. Per plan, for front entrance, provide 70 feet landscaped sloped path at 5% grade with berms, planting, and masonry site walls.
- For access to side/ rear areas of building, provide two 30-foot long hardscape ramps 8.3% grade with required stacked 521-CMR compliant handrails

### *Landscape & Hardscape (BBB)*

- Refer to Central Hill Master Plan vision illustrative plan diagram overlay on High School civil/landscape drawing. Divide scope into 1895 vs. City Hall Scope as indicated.

## Shell Improvements (BBB)

### *Envelope & Roof Upgrades – NOTE: See drawings for indication of new entries, windows*

- Foundation slab
  - Allow for 20% replacement of existing basement slab-on-grade
  - Coordinate trenching with bathroom and any mech room drain requirements
  - Reuse existing trenches or abandon in place

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- Below-Grade rubble foundation walls up to grade. Basement is partially above grade, with ashlar cladding from grade up to terra cotta water table.
  - Closed cell insulation – Below-grade:
    - Provide 3” low-GWP closed-cell spray-foam insulation; exterior furring to be single 5/8” layer mold-resistant greenboard GWB on 16” OC, 20-ga, 2.5” studs. Set face of drywall 5” from interior face of masonry.
  - Excavate additional 3’ feet at each south façade window location for new window ganged areaways per elevation drawings; lower existing sills. Provide areaway drainage, new granite cladding over existing rubble foundation where exposed.
  - Moisture remediation scope – Exterior bentonite grout injection with vertical ports 2’ on-center -- 7’ of vertical wall height below grade on south façade; refer to elevations for proposed below-grade wall extent on the other elevations.
- Above-Grade Walls (Floors 1-3)
  - Existing multi-wythe load-bearing brick masonry, appears to be five wythes in most locations
  - Provide 5” of low-GWP open-cell spray-foam insulation; exterior furring to be single 5/8” layer GWB on 16” OC, 20-ga, 2.5” studs with a continuous “smart” vapor barrier. Set interior face of drywall 8” from interior face of masonry.
  - Allowance for detailing around wood joists/beams to make insulation more continuous and prevent wood decay from insulation
- Exterior Entry Systems
  - Where indicated on drawings, assume nicer-than-average new metal and glass storefront entry systems
  - For exterior fire stair exits, assume flush metal door only
  - Provide Automatic Door Openers (ADOs) at all exterior entry doors
- Windows
  - BBB assumes existing windows are aluminum frame-within-frame with some concealed wood still extant beneath from original wood windows
  - Assume complete removal of all extant window elements (wood, aluminum, etc.) leaving only masonry opening to remain
  - Provide full window replacement (not inserts):
    - Assume aluminum-clad wood window unit, double-hung sash style (e.g. Architect or Reserve-series), triple-glazed IGUs with modified low-e coating, half-height screens, and Pella ILT (Integral Light Technology) simulated divided-lite grilles per historic lite divisions.
    - See building elevation photos for mix of arched and rectilinear window openings;
    - Provide arch-headed windows as well as rectilinear windows (two types of arch-headed windows)
    - Provide full perimeter AVB at each window masonry opening; fill void between window frame and M.O. with spray-foam insulation

- Provide continuous sealant at exterior and interior perimeter in joint between window frame and rough opening
- Roof – Base scope to fully replace existing flat roofs and parapets with hybrid design of historic roof reconstruction at front and contemporary expression at rear; refer to drawings
  - **[1895 ENV ALTERNATE 1: Maintain/rehab flat roof – see description in Alternates]**
    - Remove existing flat roof assembly, long-span steel joists, and non-original brick parapet walls as indicated in elevations; retain original 4<sup>th</sup> floor wood joists and wood deck for reuse; see structural
    - New Roof structure and envelope; refer to provided BBB sketches and structural narrative and markups
      - TRADITIONAL ROOF SLOPES: Base assembly to be slate shingle on two layers of roofing felt; continuous ice and water shield, cementitious sheathing, rigid insulation R-38 MIN, Dens-Deck with self-adhered air-vapor membrane, metal deck; snow guards
        - Assembly to permit install of onsite photovoltaic system (system to be included in soft costs)
        - **1895 ENV ALTERNATE 2:** ILO synthetic slate, provide real slate shingles
      - ‘CONTEMPORARY ROOF SLOPES’: Allow for sloped metal roof with typical assembly and R-38 MIN insulation, and integrated pocket gutters
    - New Eaves – at intersection of wall/soffits for TRADITIONAL ROOF, recreate dentils and foliate units to match existing, using extant elements as template. Refer to drawings for LF takeoff
      - **1895 ENV ALTERNATE 3:** Provide GFRC in lieu of true terra cotta replacement units; note that relative to ENV ALTERNATE 1: No new TC eaves if building maintaining existing roof
    - New Gutter System, TRADITIONAL ROOF AREAS -- provide new concealed gutters within reconstructed cornice (see reference); provide copper leader boxes and 4” copper leaders at 12 locations around building (4 leaders on the south, 2 on each end (e/w), 4 leaders on the north). [Omit in ENV ALTERNATE 1 and provide flat roof RWLs, see Alternates.]

### *Envelope Restoration / Rehabilitation of Existing*

- **\*\* These notes are based on observation of the South Façade; percentages should also be applied to East and West elevations but only up to the “demolition” zone. Refer to photos and measured elevations in Bluebeam session. The north façades can use the same percentages unless otherwise noted on drawings except in demolition zones, which are also noted.**
  - Brick Masonry Repointing:
    - Base Scope: 20% of entire building requires repoint except at all window masonry openings, where the complete masonry header (both vertical face and soffit underside) require full repoint

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- **1895 ENV ALTERNATE 4 (add-alt):** Full building repoint to achieve uniform mortar color and mitigate water absorption into exterior wall assemblies
- Brick Masonry Restoration:
  - Lightly clean 100% of all brick masonry
  - Assume 3 LF of brick stitching with new face brick for each window head where diagonal cracking or displacement; assume 15% of window openings are affected
  - 10% of window openings require rebuilding of masonry arch due to rust-jacking of steel beyond
  - North façade in demolition ones has significant brick masonry in poor condition, refer to elevations and photos
- Granite foundation:
  - Has 1 ft high exposure only; clean and 100% repoint
- Terra Cotta Elements (New and Existing)
  - Refer to elevations for areas of new terra cotta to match existing profiles
    - See ENV ALTERNATE 3: Deduct; provide GFRC ILO terra cotta
  - 100% of the existing perimeter joint (material transition) needs repoint
  - Install silicone sealant in skyward-facing joints
  - Base scope: full repoint of all remaining horizontal TC joints;
  - Repoint 100% of vertical joints and at all window sill joints (also T.C., typically 3 T.C. units per sill)
  - 5% of the window sills require T.C. unit replacement
  - At TC string course above first floor: in 8 locations, remove metal louvers, infill duct opening with brick backup masonry, and replace 32 TC units total at the 8 locations
    - Where louvers are no longer present but former opening currently infilled with bad brick (two locations), assume partial demolition of existing infill to enable installation of terra cotta replacement units
  - For T.C. spalled areas: patch areas, assuming under 1 SF of area per, at 20 locations
  - North façade: remove plants from four window sills, and provide all new TC sills at each location
  - Lightly clean 100% of all terra cotta masonry

## Core Improvements (Multiple)

### *Structure Upgrades or Modifications (BBB, with Silman)*

- Existing structure is masonry bearing wall and masonry pier, with indeterminate system of steel girders or beams for longer spans supporting wood joist and wood subfloor
  - Structure for two new elevators and one platform lift (see plans, elevations for notes)
  - Assume new risers and reuse of existing two riser shafts for MEP

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- Refer to markup plans for typical scope of new structured openings in masonry bearing walls, as well as infill of openings to be abandoned (to be infilled with CMU masonry for lateral stiffness)
- New Fourth Floor:
  - Provide allowance for seismic retrofit to building, triggered by Level III Structural alteration with the addition of 4<sup>th</sup> floor and new roof massing
  - Fourth floor assembly will be mix of existing wood assembly to remain and new, with new steel framing at longer span conditions or where required for roof post transfers; refer to structural markups.
  - Provide structural steel superstructure for roof structure per structural markup notes/allowances, and refer to BBB sketches for massing; see envelope section for roof assembly.
    - [1895 ENV ALTERNATE 1: No new fourth floor/roof omits all associated structural work, but allowance to be made for new open-web steel joist work to support mech equipment]

## *Life Safety & Accessibility Improvements (BBB)*

- Existing pair of metal pan stairwells with metal guardrails to remain. Assume full repainting.
  - Assume full over-surfacing of treads, risers, landings with resilient tread/riser material (e.g. Tarkett stairwell management)
  - Assume new inside offset painted metal pipe handrails mounted to guardrail; assume new outside painted metal pipe handrails mounted to walls; extensions to comply with 521 CMR.
  - New lighting, graphics, signage, etc.
- For each stairwell, assume replacement of south wall on each floor, with new painted metal flush panel hold-open fire door with vision lite
- Assume all accessibility signage for public buildings per 521 CMR.
- Provide a new exit passageway at basement level for east stair to exit at north facade, with 1HR rated construction; refer to plan.
- Ceilings
  - 1895: Because building is Construction Type IIIB to be upgraded to Type IIIA, provide rated GWB ceiling at underside of all floor joist assemblies; all systems go below this layer and are either exposed (and painted out) or concealed behind ACT, ceiling clouds, or second GWB ceiling
- 

## *Vertical Conveyance Systems*

- See plans for structuring notes and vertical extent on two new elevators and note new wheelchair lift at entry:
  - Elevators: New pair of banked MRL elevators, e.g. Otis Gen2 MRL or equal; 3500# each, 200 feet per minute (FPM), center bi-parting doors with landings at all floors. Cab and landing finishes to be typical office/public building, selected from manufacturer's standard finishes.

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- **ENV ALTERNATE 1** – omit fourth floor landings
- Wheelchair lift: 750 lb. lift at 20 FPM, with front-and-back-opening doors. Lift will have a dedicated 6' x 6' vestibule at both the upper and lower landings. Manufacturer's standard finishes.

## *Mechanical Infrastructure/Systems (BR+A)*

- Mechanical system shall prioritize load reduction strategies, such as advanced ventilation energy recovery, and use a decoupled hydronic heating and cooling system. There will be no on-site fossil fuel combustion for heating. The air-side and water-side systems are described below.  
**MECH ALTERNATE 1** - Note that two water-side systems are to be evaluated. The base option is a ground-source heat pump (geothermal) with a borefield shared between 1895 and City Hall. The alternate is to use air-source (air-to-water) heat pumps, with separate systems for each building. – one using air-source heat pumps and the other using ground-source heat pump
- Air-side systems – (identical for waterside options 1 and 2)
  - Base option -- (1) 15,000 cfm semi-custom 100% outside air AHU, including dual core regenerative heat recovery, similar to Tempeff or Bousquet. Unit shall include the following components: MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan arrays, electric resistance heating coil (backup use only), chilled water cooling coil with wraparound heat pipe, supply and exhaust sound attenuators (pending acoustical analysis). Provide bypass dampers for cooling coil. Unit shall be located in rooftop mechanical room. All zones to have decoupled hydronic terminal units:
    - Open office areas: 4-pipe ducted fan coil units
    - Enclosed offices: if individual occupant control is desired, use cassette-style fan coil unit with 6-way changeover valve.
    - Conference rooms: 4-pipe fan coil units
    - Ventilation shall be ducted to terminal units with VAV inlet damper integral to terminal unit.
    - Provide desk fans for all multi-occupant work areas
    - Provide CO2-based demand control ventilation in all multi-occupant spaces
    - Provide occupancy-based ventilation in single-occupant spaces
    - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
  - For base option only: (2) Medium pressure supply and exhaust duct risers. Plenum return via (4) VAV return boxes or air flow control stations per floor.
  - Assumes no dedicated perimeter heating system
- Water-side systems – hot water (110F) and chilled water (44F) distribution
  - Base option: Ground-source heat pump. Note: well field is shared between 1895 and City Hall. Bore field and associated infrastructure is allocated to 1895 project, serving both buildings. Heat pump equipment is located in each building. Base is 60 wells. **Also provide unit price per additional well.**
    - 60 closed-loop U-bend geothermal wells



- 500' depth
- Wells circuited in groups of 5-7, with manifold in basement
- Utilize HDPE quad loop
- Well field to be piped in primary/secondary arrangement to serve both buildings. Provide (2) 30 hp primary pumps (vertical in-line split coupled with integral VFD)
- Ground loop to utilize 25% propylene glycol (PG). Provide glycol tank and pump. During design, optimize to minimize glycol % and pump power
- Geothermal manifold and well pumps shall be located in basement mechanical room.
- *Note: well field quantity depends on site conditions (well layout, including utility conflicts) and building heating loads, which are preliminary and subject to enclosure restoration and insulation.*
- 6-pipe modular GSHP chiller consisting of (4) 50 ton (nominal) VFD scroll heat recovery chiller modules, similar to Multistack VME-2, Note – this equipment serves 1895 building only. Refer to City Hall for additional heat pumps.
  - Provide (2) 10 hp GTWP (vertical in-line close-coupled ECM)
  - Provide (2) 7.5 hp HWP (vertical in-line close-coupled ECM)
  - Provide (2) 7.5 hp CHWP (vertical in-line close-coupled ECM)
  - Provide (2) 600 gallon buffer tanks
- Chiller shall contain glycol and be separated from hot water and chilled water loops with HX. Geothermal loop and wells shall contain glycol (20% PG).
  - Provide (1) plate and frame HX, 300 gpm (GTW to CHW)
  - Provide (1) plate and frame HX, 240 gpm (GTW to HW)
- (1) 125 ton split air cooled chiller with maglev centrifugal compressor and remote adiabatic condenser located on roof. For 1895 only.
  - Provide (2) 5 hp CHWP (vertical in-line close coupled ECM)
- Provide smart plant controller by equipment manufacturer, similar to MultiPro
- **MECH ALTERNATE 1:** Air-source heat pumps dedicated to 1895, [ILO GSHP shared borefield and GS Heat pumps in each building]
  - (1) 2-pipe ASHP consisting of (7) 30 ton (nominal) modules, similar to Multistack ARP-30. Actual heating output is 215 MBH per module at 12°F.
    - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX. Provide glycol tank and feed pump.
    - Provide (2) 300 gpm plate and frame HX
    - Provide (2) 7.5 hp GWP (vertical in-line close-coupled ECM)
    - Provide (2) 7.5 hp HWP (vertical in-line close-coupled ECM)
    - Provide (2) 7.5 hp CHWP (vertical in-line close-coupled ECM)
    - Provide (1) 600 gpm buffer tank
    - Heat pump shall be located on roof

- (1) 50 ton heat recovery chiller with dual refrigeration circuits and VFD compressors. Similar to Multistack DHRC.
  - Provide (2) 2 hp HWP (vertical in-line close-coupled ECM)
  - Provide (2) 2 hp CHWP (vertical in-line close-coupled ECM)
  - Provide (2) 500 gallon buffer tanks
  - Heat recovery chiller shall be located in mechanical room.
- Provide smart plant controller by equipment manufacturer, similar to MultiPro

*Electrical & Fire Alarm Infrastructure/Systems (BR+A, A10)*

- Electrical:
  - Provide 1500 KVA pad mounted utility transformer located on the site. Transformer shall feed 2000A main switchboard (480/277V, 3PH, 4W) located within an electrical room. The switchboard shall have a utility metering CT cabinet. Switchboard breakers shall have built in metering capabilities.
  - Provide a lighting panel (100A, 480/277V, 3PH, 4W) on each floor.
  - Provide a panel for site lighting
  - Provide a 84 pole panelboard (150A, 480/277V, 3PH, 4W), fed from a 45KVA step down transformer on each floor to serve receptacle loads.
  - Provide a panelboard (400A, 480/277V, 3PH, 4W) to serve mechanical loads, and a 45 KVA step down transformer to serve a 84 pole panelboard (150A, 480/277V, 3PH, 4W) for mechanical loads.
  - Provide branch circuits to all lighting fixtures fed from central lighting control system, consisting of time of day control and occupancy sensing.
  - Provide 300 kW diesel generator at grade serving both 1895 and City Hall. (Put all generator cost in 1895 since that is expected to be completed first). Assuming (1) ATS to serve emergency lighting in each building, and (1) ATS to serve optional standby loads in each building. Generator to have belly tank and acoustical enclosure.
- Fire alarm:
  - The building will be provided with a complete fire alarm system to include automatic and manual initiating devices, occupant notification, fire safety functions and off-premises reporting in accordance with all applicable codes.
  - The system will consist of a distributed analog/addressable, microprocessor-based control panel with power supplies, operator's controls, automatic and manual initiating devices, notification appliances, primary and secondary power, and off-premises event reporting as shown and required. Occupant notification shall consist of general evacuation audio/visual signals throughout the building.
  - The system shall be integrated with the city reporting system to provide uniform event reporting and annunciation.
- Renewable energy:
  - Provide infrastructure to support 100 kW on-site PV array, combination of roof and site-mounted panels. Provide central inverters with DC optimizers. The panel board breaker fed from the PV array shall be individually metered.

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- [Array itself to be purchased in Soft Costs]
- Provide battery storage (size TBD) for resiliency and to maximize SMART solar incentive. Batteries to be located in outdoor enclosure.
- Lighting – refer to Sustainability Section.
- Metering – refer to metering/submetering section in **Sustainability**

## *Plumbing & Fire Protection Infrastructure/Systems (BR+A)*

- New 8 inch fire protection service into the building. Complete wet sprinkler and standpipe system. New fire department connection and accessories.
- New 3 inch water service to the building complete with backflow preventer and meter for building and separate backflow for irrigation.
- Water heaters (Duplex air source heat pump 16kW each with a single 250 gallon storage tank. Heat pumps Lync 250W and storage tank Lync L250A-TRO)
- Onsite rainwater holding tank and rainwater reuse system with day tank, UV recirculating system. (See **Civil**) Base scope is water used for toilet flushing and irrigation. Rainwater reclamation system is anticipated to be sufficient for toilet flushing and irrigation system needs.
  - **PLUM ALTERNATE 1:** alt-deduct; rainwater reclamation for irrigation only; omit associated filtration, storage, and plumbing associated with rainwater for flushing.

## *Technology, Communications, & Security (TCS) Infrastructure/Systems (BBB, with BR+A)*

- TECH/COMM
  - MDF – one room per building; see plans: Provide (2) 4” conduit into each of three buildings (1895, City Hall, Edgerly) and each conduit to have (2) fiber feeds, meaning 4x fiber feeds from manhole to MDF room
  - IDF Rooms/Closets: Refer to plans for locations
  - Wiring Assumption: CAT6
  - Data Drops:
    - EA. WORKSTATION (WS-1, -2, 3) to receive two data drops (digital voice + data);
    - EA. STANDARD PRIVATE OFFICE (PO-3) to receive three data drops in one face plate (one digital voice + (2) data);
    - EA. LARGE PRIVATE OFFICE (PO-1, etc.) to receive five data drops in two face plates (2 + 3)
    - EA. PHONE BOOTH, 1-ON-1 MEETING ROOM, COUNSELING ROOM, SMALL MEETING ROOM: 1 Voice and 1 data drop (1 face plate)
    - MEDIUM AND LARGE MEETING ROOMS: treat the same as LARGE PRIVATE OFFICE
  - WIRELESS: Provide Distributed Wireless Access Points throughout building, standard office
  - Other Communications: Phone drops for each elevator cab (2) and lift platform (1)
- AV – **Equipment, Soft Costs Only**
  - Provide 1-on-1, Counseling Rooms, and Small Meeting Rooms with wall-mounted 55” LED flatscreen monitor display; assume Barco-type system would be used for plug-and-play monitor mirroring from user laptop

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- Provide Medium (65" LED flatscreen) and Large Meeting Rooms with (75" LED flatscreen) display
- Sound & Communication Systems
  - Up to Small – PC-type speakers; speakerphone; webcam
  - Medium – Sound Bar; speakerphone plus spider device; webcam
  - Large – four in-ceiling speakers; videoconferencing system
- AV – **Enabling infrastructure, Include in GMP**
  - Provide duplex power, data, voice as required for equipment listed above
  - CABLE: Provide Coax cable drop for Medium and Large Meeting Rooms, as well as large Kitchen/Break Rooms
- Security
  - Provide Siemens-type or similar Keycard Access Control System for broad range of building doors including exterior entries, IDF/MDF rooms, all office suites, conference and meeting rooms, entries to staff support spaces like copy/pantry; Refer to provided plan markup.
  - Provide ethernet surveillance camera drops at each entry door plus allow for additional 4 drops per building exterior, plus 2-3 per public corridor

## Fit-Out (BBB)

### *General Fit-Out Notes*

- Walls
  - Typical partition construction is 5/8" GWB on metal stud; achieve 45 STC min for private office walls and 55 STC min for walls adjoining conference
- Ceilings
  - **1895 Building Only:** See Core & Shell for scope of fire-rated GWB at underside of joists
- Lighting
  - As noted; for general lighting approach/controls, refer to **Sustainability Section**; allow for better-than-average
- Furniture, and Fixed Furniture Systems – **Soft Costs Only**
  - See BBB Workspace Standards Document for layout/office systems; assume painted metal and laminate systems with fabric and tack surfaces for workstations and private office systems; better than average. Also allow for filing and shelving furniture within open work areas
  - See BBB Workspace Standards Document for built-in millwork in Copy/Work Rooms and Pantries/Kitchens: assume built-in PLAM shelving and cabinets, quartz countertops and backsplashes. Built-in PLAM work surface in Phone Booths
  - See BBB Workspaces Standards Document for loose furniture allowances; at small meeting rooms, assume PLAM and metal tables, side chairs on casters; at larger meeting rooms assume laminate veneer wood tables and credenzas, upholstered task chairs on casters

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- Other Finish Notes:
  - Allow \$ toward 3Form-type or off-the-shelf products for wall cladding to dress up specific spaces in cost-efficient manner (vs. custom millwork)
  - \$ for environmental graphics
  - Allow for a single moveable partition in 1895 and in Edgerly each to combine a medium and large meeting room into a community meeting room (nicer than average)
  - Allow for solar shading at all windows in offices, open offices, other common spaces; Conference space windows to receive dual solar and blackout shading; assume Mechoshade or similar

## *Fit Out Space Types and Scope Allowances*

- OFFICES
  - Closed office
    - Carpet tile with rubber base; typ painted GWB wall finish
    - Better-than-average 2'x2' ACT ceilings
    - Linear direct/indirect lighting
    - One wall glazed with above-average metal & glass storefront with wood and glass doors
  - Open office/workstation areas and Hoteling Areas
    - Carpet tile with rubber base; typ painted GWB wall finish
    - Data/power services to workstations to be provided in joist cavities below wood sub-floor (**enabling infrastructure with GMP / workstations themselves in soft costs**)
    - Painted-out high ceiling above; paint all exposed MEP and provide suspended ceiling clouds; wood accents, overall nicer than average
    - Linear direct/indirect lighting
- OFFICE SUPPORT
  - Copy/Work Rooms
    - Resilient tile floor with rubber base, typ painted GWB wall finish
    - 2' x 2' ACT ceilings
    - Linear direct/indirect lighting
    - Built-in cabinets/shelving and work surface per sketch; PLAM
  - File/Storage Rooms
    - Resilient tile floor with rubber base, typ painted GWB wall finish
    - 2' x 2' ACT ceilings
    - Linear direct/indirect lighting
    - (Metal filing systems/storage furniture in FFE Soft Costs)
  - Phone Booths
    - Carpet tile with rubber base; typ painted GWB wall finish
    - Two walls felt acoustic panel
    - 2' x 2' ACT ceilings

- Wall sconce lighting + 1 pendant
  - Work surface per sketch
- CONFERENCE
  - 1-on-1, Counseling, and Small Meeting Rooms
    - Carpet tile with rubber base; typ painted GWB wall finish; assume one long wall tackable wall surface (Forbo or similar)
    - Better-than-average 2'x2' ACT ceilings
    - Linear direct/indirect lighting
  - Medium, Large, and Community Meeting Rooms
    - Carpet tile with rubber base; typ painted GWB wall finish; assume one long wall tackable wall surface (Forbo or similar)
    - Better-than-average 2'x2' ACT ceilings
    - Linear direct/indirect lighting; assume one wall of monopoint lighting for tackable surface
- STAFF AMENITIES
  - Pantry/Kitchenette, Small and Large Break Room / Kitchen
    - Resilient tile floor with rubber base, typ painted GWB wall finish
    - 2' x 2' ACT ceilings
    - Linear direct/indirect lighting; under-cabinet millwork lighting
    - Cabinets/shelving and countertops per sketch, PLAM
    - Assume stainless steel full-size appliances, stainless steel sink and fittings.
  - Mother's Room
    - Carpet tile with rubber base; typ painted GWB wall finish
    - Two walls felt acoustic panel
    - 2' x 2' ACT ceilings
    - Wall sconce lighting
    - Built-in countertop with cabinets and mini-fridge below
- BATHROOMS (*As indicated in plan*)
  - See plumbing counts by building plans; mix of single-occupant lockable restrooms, and multi-user stalled restrooms
  - Floor: Ceramic (1x1) mosaic tile, Daltile or similar
  - Walls: wainscot-height glazed subway tile running bond with cove base
  - Ceiling: GWB with recessed lighting
  - Quartz vanity countertops with undermount porcelain sinks, metered stainless faucets, built-in mirrors and integrated indirect lighting
  - Toilet Partitions: full stud walls with GWB and tile wainscot; louvered wood doors with hollow metal frames
  - Typical stainless steel accessories for convenience and accessibility
  - Custodial Closets with floor sinks, refer to plans: provide mop sink, porcelain tile floor, and Acrovyn or similar on walls up to 4 ft AFF

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- LOBBIES/CORRIDORS/CIRCULATION (**As indicated**)
  - Large-format terrazzo tile flooring with areas of carpet tile inlay for meeting niches along corridors
  - Skim-coat all existing partitions to remain
  - Ceiling: allow for GWB drop ceiling and flush access panels to systems as required; allow for decorative soffits integrated with lighting and environmental graphics
  - Allow for accent finish upgrades around elevator landings as well as environmental graphics
  - Lighting: Decorative pendants and decorative wall lighting, also allow for track monopoints along one corridor wall
- BOH/MECH (As indicated)
  - Floors: At basement level, floor finish to be sealed concrete foundation slab; on upper floors in 1895 Building, provide sheet-good resilient floor. On upper floors in City Hall, Edgerly, sealed concrete slab.
  - No additional ceiling construction; leave the rated GWB at underside of joists exposed

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## City Hall

### Existing Conditions, Demolition, & Logistics (BBB/H&A)

#### *Hazardous Materials Removal*

- **Axiom report sent to Dharam by email, 10/13**

#### *Geotechnical Considerations (H&A)*

- None listed.

#### *Other Construction Considerations*

- None listed.

### Sustainability & Net Zero Energy (A10/Energysmiths)

#### *Overview*

- City Hall will be renovated in compliance with the City of Somerville's Zoning Ordinance which represents the minimum expectations for aligning with City-wide goals. As such, the project will be designed to achieve **Leadership in Energy and Environmental Design (LEED) Platinum** certification under LEED v4 Building Design and Construction (BD+C): New Construction (NC) and Major Renovation Program.
- The project strives to be an exemplar of high-performance, sustainable design by reducing energy use, greenhouse gas emissions, and potable water use to the greatest extent possible. To align with these goals, the building will be designed to be an **all-electric Net Zero Emissions building** in which all emissions from energy used in the building will be offset by a combination of on-site and off-site renewable energy on an annual basis.
- Note that for historic preservation reasons, City Hall envelope improvements include double pane glazing in lieu of triple pane glazing typical for the other building scope.
- **Refer to the 1895 Building Sustainability Narrative for all other sustainability requirements and targets for costing purposes.**

### Site Improvements

#### *Utilities / Civil Infrastructure (Nitsch)*

- Refer to Site Plan Sketch and 1895 Building Narrative
- New building laterals for water and sewer

#### *Accessibility Compliance (BBB)*

- Refer to Central Hill Master Plan vision illustrative plan for two landscaped accessible features within City Hall's scope: a structured sloped site path up to the east main entrance of City Hall, and the switchback ramp and stair construction linking the upper hill with the lower zone west of the new High School. The existing metal ramp on the east elevation is to be removed.
- At the west (School Street) Entrance, provide new granite ramp, stair, and knee walls similar to existing. Existing condition is deteriorated and geometry is non-compliant.



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## *Landscape & Hardscape (BBB)*

- Refer to Central Hill Master Plan vision illustrative plan diagram overlay on High School civil/landscape drawing. Divide scope into 1895 vs. City Hall Scope as indicated.

## Shell Improvements (BBB)

### *Envelope & Roof Upgrades*

- Foundation Slab
  - No new footings or foundations
  - Coordinate trenching with bathroom and any mech room drain requirements
- Below-Grade Walls up to grade are cast-in-place concrete in the north wing (1923) and rubble masonry in the south and center wings (1852, 1896)
  - Closed cell insulation
    - Provide 3" closed-cell low-GWP spray-foam insulation; exterior furring to be single 5/8" layer mold-resistant greenboard GWB on 16" OC, 20-ga, 2.5" studs. Set face of drywall 5" from interior face of masonry.
  - Moisture remediation scope at rubble-type foundation walls only – install bentonite grout injection from the exterior every 2' in plan from grade down to basement slab elevation; refer to elevation for height of wall to grade
- Above-Grade Walls (Floors B-3)
  - Existing multi-wythe load-bearing brick masonry, four wythes at basement, and three wythes for floors above; basement outer wythe(s) are cast stone set in ashlar
  - Provide 5" of open-cell spray-foam insulation; exterior furring to be continuous "smart" vapor barrier with single 5/8" layer GWB on 16" OC, 20-ga, 2.5" studs. Set interior face of drywall 8" from interior face of masonry.
- Doors and Entries
  - Main East and Main West Entries – existing stain-grade double-doors with frame and leaves in good condition: wood to be stripped and refinished with exterior-grade acrylic polyurethane,
  - Provide all new hardware in satin bronze finish; refer to Security section for access control
  - Provide Automatic Door Openers (ADOs) at all exterior entry doors
- Windows (*scope here covers out to sill and blind stops; refer to Envelope restoration for all millwork outboard*)
  - Existing windows are wood double-hung in modified original frames and appear to have gone through a retrofit project 20-30 years ago where spring balances, double-glazed IGUs, and weatherstripping were added. (The existing IGUs are true divided lites.)
  - Replacement Approach:
    - Provide new mahogany sashes with custom geometry and true divided lites to fit existing frames to be restored; new sashes to match historic sash depth (1-3/4") and muntin profiles (1-1/4")
    - Refurbish frames/sills; assume 5% full frame replacement with mahogany to match, assume another 15% is sill-only replacement with mahogany to

- match. Remaining existing wood to be stripped, primed, painted; allow for another 40% of sills to get epoxy repairs
- Provide compression weatherstripping at sash jambs and meeting rails; bronze weatherstripping in tracks
  - Configuration is double-hung windows but upper sash to be fixed in place; lower sash to have restored pulley, chain, and counterweight balances; provide traditional sash locks, limiters and lifts
  - Provide continuous sealant at exterior and interior perimeter in joint between window frame and rough opening
- Window Types:
    - Typical windows are double-hungs ganged/paired on first and second floors; single-instance double-hungs at basement and third floor; monumental window on first floor stair landing, west facade. Several windows at clock tower. Refer to elevations.
  - Roofs
    - General: Provide lightening protection system
    - Flat/Low-Slope Roof Areas
      - Existing is EPDM from 1991. Full replacement of EPDM and install rigid tapered insulation to R-38 minimum. Concrete deck to remain,
      - Allow for some level of deck repair, e.g. spall repair with localized replacement of reinforcing mesh or coating exposed rebar with corrosion-inhibitive epoxy coating; without knowing condition of the deck, assume 10% or approx. 150 SF of concrete patch repair. Refer to hazardous materials report for presence of hazardous materials within roofing assembly.
      - Replace maintenance steps over the short roof ridge (see elevations)
      - Replace wooden stair spanning over ridge with galvanized ladder
    - Pitched Areas
      - Existing is slate on wood plank sheathing; allow for replacement of 20% of sheathing and full replacement of slate with color, size to match existing
      - Approach to insulation:
        - Base Design: Provide continuous minimum R-38 minimum low-GWP closed-cell spray foam insulation at underside of roof deck **plus ignition barrier**
        - **ENV Alternate 1:** ILO of R-38 achieved by closed-cell spray foam at underside of wood deck and rafters, install ventilated roofing system above roof deck utilizing rigid insulation, e.g. Hunter polyiso panels and “Cool Vent” system, to reduce or eliminate use of spray-foam here
      - Scope to allow for replacement of 60 LF of copper step and cap flashing
      - The existing bottom four feet of pitched roof and internal gutter pocket are exposed rubber membrane on plywood substrate; assume full replacement of membrane with fluid-applied roofing (three coats on glass fiber mesh reinforcement) and assume 40% replacement of the plywood substrate, wood gutters, and fascia/soffit to be required

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- Salvage and reinstall snow fences; assume 25% of length requires replacement
- Wall-mounted rainwater leaders
  - Existing is four exposed leader boxes and rain water leaders; replace all four with new copper and add four additional leaders/leader boxes in copper (4" as well); tie in with Civil utilities at grade – see CIVIL Section.

## *Envelope Restoration / Rehabilitation*

- Rusticated Base Story: Existing is a cast stone product, set in ashlar format at exposed foundation walls, forming a water table at interface with brick above (scope here excludes terrace; see below)
  - Assume 30% repoint overall with "rope" style half-round mortar profile;
  - Patch/repair cracks typically occurring in top course of base material; allow for 200x 1-LF- long cracks (rout and fill with mortar, color to match);
  - Assume replacement of six (6) cast stone masonry headers with new pre-cast units with custom color/aggregate mix (provide allowance for mock-ups to generate mix design and identify appearance characteristics to match existing color/texture, etc.);
  - Allow for patching at spalls and areas of loss, 1 SF typical and up to 3-inch depth, x 20 instances
  - General masonry cleaning, typical; also allow for 10% of area to get heavy-duty cleaning (non-hydrochloric or hydrofluoric acid) and/or poultice treatment (provide allowance for cleaning trials to identify gentlest and most effective cleaning product(s) and methods).
- South Terrace – scope to address the cast stone ashlar walls, stairs, decorative balustrade, and pavers
  - Poor condition with high degree of weathering, as well as cracking, spalling and displacement (provide allowance for mock-ups to generate mix design and identify appearance characteristics to match existing color/texture, etc.);
  - Assume full replacement of balustrade with new precast units with custom geometry, color, and aggregate mix. Replacement extends down to cornice base profile inclusive
  - Assume all new 18" x 18" precast pavers to match existing color/aggregate, on pedestal system
  - Pedestal system set on replacement tapered insulation and replaced waterproofing layer and stainless steel flashing beneath coping units; confirm that pavers on pedestals aligns with height of existing door thresholds
  - Replace metal handrails with bronze handrail profile set on painted metal posts
  - 100% repoint of remaining cast stone at walls
  - Replacement of four ashlar units
  - Re-set 15 ashlar units encompassing 40 SF (in elevation) at the southwest corner
  - General masonry cleaning, typical; also allow for 10% of this area to get heavy-duty cleaning (non-hydrochloric or hydrofluoric acid) and/or poultice treatment
- Brick Masonry
  - Assume 20% repoint overall, except at window heads it should be 100% repoint

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- **ENV ALTERNATE 2:** Repoint *the full balance* of the building to achieve aesthetic and historic unity with the extant pigmented mortar that appears to be original
- Face brick replacement, match in-kind, to replace individual cracked or spalled units
  - South Façade: Assume replacement of 120 bricks
  - East Façade: Assume replacement of 30 bricks
  - North Façade: Assume replacement of 20 bricks
  - West Façade: Assume replacement of 40 bricks
- East Elevation - Center Section, and South Elevation of Center Section (main three-story mass):
  - Allow for 20% of brick area to receive efflorescence removal
- At the northwest corner, remove vegetation/vines, assume 100 SF
- General masonry cleaning, typical; also allow for 10% of area to get heavy-duty cleaning (non-hydrochloric or hydrofluoric acid) and/or poultice treatment
- Exterior metalwork
  - Steel/wrought iron balconette on west façade at stairwell monumental window:
    - Salvage and remove to shop (including embedded portion of support members), strip, patch, repair, and shop-paint with high-performance 3-layer epoxy coating, reinstall.
  - Painted steel fire escape on north elevation:
    - Client has informed design team that restoration of fire escape was recently completed. Assume scrape, prime, and paint only.
- Exterior wood
  - For all wood areas extending from TOP of brick pilasters UPWARDS (including all of the entablatures but excluding the clock tower woodwork):
    - Assume 100% chemical strip down to bare wood, prep/prime and paint
    - Assume 40% replacement of wood elements
  - For areas of woodwork from the TOP of pilasters DOWNWARD:
    - Total replacement of doors set in window walls per elevations
    - Allow for epoxy repairs at wood elements with exposed horizontal surfaces
  - Replace 100% of miniature cornice profile running below each window sill, replacement to run from pilaster to pilaster inclusive.
  - At raised “spandrel” panels between first and second floor windows, 100% replacement wood panel and decorative members, including quarter-round panel stops (size is 1/2” radius).
- Clock Tower
  - Assume 40% replacement of projecting wood elements
  - Assume 20% replacement of T&G planar plank cladding
  - 100% strip of existing paint
    - QUALIFICATION: that the existing wood will accept paint
  - Maintain existing copper flashing and roof; selective soldering of open joints, allow for other selective copper and metalwork repairs
  - Allowance to repair clock equipment and face elements

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- Stoops
  - Assume full demolition of east and west existing cast stone stoops and associated cast stone knee walls and railings due to deteriorated condition; See Site Improvements–Accessibility Compliance for proposed condition.

## Core Improvements

### *Structure Upgrades or Modifications (BBB, with Silman)*

- Existing Conditions:
  - Existing structure is exterior masonry bearing wall with several different structural systems within. A concrete column grid and one-way spanning concrete pan joist floor structure appears to be the typical condition in the central and north wings from the 1920s; probe work indicates this system present in the south wing as well, likely dating to same 1920s era. Probes at the underside of the second floor indicate that the primary framing system of the elevated floors consists of one-way spanning concrete slabs supported on concrete beams (refer to the structural overlay drawings for framing direction and beam locations). These beams are supported on concrete columns.
  - The Third Floor South Wing attic is supported by heavy timber trusses which support the roof and third floor assembly. Probes in the second floor ceiling indicate that the bottom chord of the existing truss has been reinforced with steel plating relatively recently; the full extent of the steel plating is unknown. In addition to the steel plating, steel pipe columns extending up from 2<sup>nd</sup> floor slab appear to have been added at some point (potentially prior to the plating) that provide additional bearing for the trusses. These posts do not align with the concrete columns passing through first floor, but do appear to align with the concrete beams in the second floor slab. The wood joist framing of the third floor also appears to have been supplemented with new wood framing, or replaced. Again, the full extent of this is unknown. In addition to the basic floor framing, a series of vaults with thick concrete walls and slabs are arrayed around the building. These vaults support primary framing beams, the floor slabs, and the pan-joist systems that abut them.
- Other General Work:
  - Note there are no new elevators this building
  - Assume new risers for MEP; note concrete pan joists systems require careful coordination of penetrations and openings which cut through ribs will require local framing
- Third Floor South Wing Attic – Reinforcing of wood trusses (see plans and notes for area)
  - At south wing, four (4) equally spaced existing heavy timber trusses with vertical metal tie rods appear to date to the 1852 original building campaign and were designed to carry the roof and third floor structure clear spanning from exterior wall to exterior; reinforced in later campaigns as noted
    - Attic trusses – allow for some level of steel plate reinforcement (see marked-up structural overlay drawings)
- Vault Removal

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- *Philosophy is to limit the removal of structural elements to stay below necessary thresholds which would require lateral building upgrades while freeing up as much space as possible for replanning without triggering a substantial (Level III) structural alteration*
- For areas of new Infill where vaults removed: Allow for 3.25" concrete on 2" metal deck with new steel framing; any new framing or new columns accomplished with structural steel. In the absence of more detailed information, for now assume 10 PSF steel allowance for infill areas

## *Life Safety Improvements (BBB)*

- Existing monumental main interior stairwell and second egress stair in south wing are existing to remain; main stair is metal pan with concrete treads and metal nosings/risers and ornamental metal guardrail with wood cap rail; secondary stair is metal pan construction with concrete treads and metal risers.
  - Main Stair: Allow for 1HR FFR rated construction at the east (access door) wall on each floor, with an allowance for 1HR FRR rated metal and glass storefront construction (with wood veneer) at each floor. It is assumed stair cheek walls meet archaic construction requirements for 1HR FRR
  - See FIT-OUT, Existing Circulation to Remain, for refinishing scope at wall wainscot
  - Secondary Stair: Allow for full rebuild of 50% of partition enclosure walls to meet 1 HR FRR requirements
  - Assume general cleaning of concrete, and selective scrape/prime/paint of main stair ornamental guardrail, along with refinishing of stain-grade wood cap rail
  - In main stair, assume new painted metal pipe handrails mounted to outside walls; extensions to comply with 521 CMR. In secondary stair, assume new wall-mounted painted metal handrails both sides.
  - Allow for new lighting, graphics, signage, etc.
- Assume all accessibility signage for public buildings per 521 CMR.
- See SHELL – Exterior metalwork for scope at exterior fire escape

## *Vertical Conveyance Improvements (BBB)*

- Existing elevator is a Beckwith Hydraulic, 80"x50" cab with 42x84 door, 2,500# cap and 125 FPM
  - Scope to include full maintenance/testing & general modernization/rehab; allow for replacement of hydraulic pump (based on age; more information needed)
  - Finish upgrades to include replace cab flooring w/ thin granite tile, replace ceiling w/ integrated LED lighting, electrostatic repaint of all doors & frames, replace hall call buttons and travel indicators w/ statuary (oil-rubbed) bronze finish
- ~~Allow for new platform wheelchair lift in the basement: 750 lb. lift at 20 FPM, with front-and-back opening doors. Lift will have a dedicated 6' x 6' vestibule at both the upper and lower landings. Manufacturer's standard finishes. No lift -- scope cut since PDP.~~

## *Mechanical Infrastructure/Systems (BR+A)*

- Mechanical system shall prioritize load reduction strategies, such as advanced ventilation energy recovery, and use a decoupled hydronic heating and cooling system. There will be no on-

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site fossil fuel combustion for heating. The air-side and water-side systems are described below. Note that two water-side systems are to be evaluated – one using air-source heat pumps and the other using ground-source heat pump. **City Hall MECH ALTERNATE 1: Note the BASE scope option is a ground source heat pump (geothermal) with the borefield to be installed with the 1895 building. Also in the BASE option, ground source heat pumps serving City Hall to be bought with City Hall project (read on for ALTERNATE 2 scope).** Building is assumed to contain multiple departments that may have different hours of operation; system shall be capable of modulating to part load to serve small areas of the building during extended hours.

- Air-side system (identical for waterside City Hall Base vs City Hall MECH ALTERNATE 1)
  - Base option: (1) 10,000 cfm semi-custom 100% outside air AHU, including dual core regenerative heat recovery, similar to Tempeff or Bousquet (or as OEM in semi-custom Daikin unit). Unit shall include the following components: MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan arrays, electric resistance heating coil (backup use only), chilled water cooling coil with wraparound heat pipe, supply and exhaust sound attenuators (pending acoustical analysis). Provide face and bypass dampers to enable low-flow operation of heat recovery core. Provide bypass dampers for cooling coil. Unit shall be located in basement mechanical room. Provide new louvers, (1) supply and (1) exhaust on exterior wall.
  - Include (1) 1,500 cfm packaged ERV, including dual core regenerative heat recovery, similar to Tempeff RGSP 2700. Unit shall include MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan, electric resistance heating coil (backup use only), chilled water cooling coil. Unit shall be located in attic above chamber. Provide access door or catwalk in attic.
  - All zones to have decoupled hydronic terminal units, except as noted below:
    - Open office areas: 4-pipe ducted fan coil units
    - Enclosed offices: if individual occupant control is desired, use cassette-style fan coil unit with 6-way changeover valve. If grouped with adjacent offices, use ducted horizontal fan coil unit
    - Conference rooms: 4-pipe fan coil units
    - Stairwells and vestibules: hot water cabinet unit heaters.
    - Council chamber: vertical concealed ducted 4-pipe fan coil units with attenuated inlet and discharge.
    - IT room: provide 2-pipe fan coil unit (primary) and fully redundant air-cooled DX backup, located on exterior housekeeping pad.
    - Ventilation shall be ducted directly to terminal units with VAV inlet damper integral to terminal unit.
    - Provide desk fans for all multi-occupant work areas
    - Provide CO<sub>2</sub>-based demand control ventilation in all multi-occupant spaces
    - Provide occupancy-based ventilation in single-occupant spaces
    - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows

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- Fan coil units shall be designed for sensible (non-condensing) operation only. Provide drip pan and moisture sensor, no condensate drain.
- (1) Medium pressure supply and exhaust duct riser. Plenum return via (2) VAV return boxes per floor.
- Assumes no dedicated perimeter heating system (enclosure upgrades, including triple glazing required)
- Water-side systems – hot water (110F) and chilled water (44F) distribution
  - Base option: Ground-source heat pump. Refer to 1895 building for the well field and infrastructure to be bought with that project.
  - 6-pipe modular GSHP chiller consisting of (3) 30 ton (nominal) VFD scroll heat recovery chiller modules, similar to Multistack VME-2,
    - Provide (2) 5 hp GTWP (vertical in-line close-coupled ECM)
    - Provide (2) 5 hp HWP (vertical in-line close-coupled ECM)
    - Provide (2) 5 hp CHWP (vertical in-line close-coupled ECM)
    - Provide (2) 400 gallon buffer tanks
  - Chiller shall contain glycol and be separated from hot water and chilled water loops with HX. Geothermal loop and wells shall contain glycol (20% PG).
    - Provide (1) plate and frame HX, 200 gpm (GTW to CHW)
    - Provide (1) plate and frame HX, 160 gpm (GTW to HW)
  - Provide smart plant controller by equipment manufacturer, similar to MultiPro

## **CITY HALL MECH ALTERNATE 1 – Air-Source Heat Pump** (will be add-alt due to City Hall benefiting from 1895 in the base scope)

- (1) 2-pipe ASHP consisting of (5) 30 ton (nominal) modules, similar to Multistack ARP-30. Actual heating output is 215 MBH per module at 12°F.
  - Heat pump shall contain glycol and be separated from hydronic loops with HX. Provide glycol tank and feed pump.
  - Provide (2) 200 gpm plate and frame HX
  - Provide (2) 5 hp GWP (vertical in-line close coupled ECM)
  - Provide (2) 5 hp HWP (vertical in-line close coupled ECM)
  - Provide (2) 5 hp CHWP (vertical in-line close coupled ECM)
  - Provide (1) 600 gpm buffer tank
  - Heat pump shall be located in equipment yard north of building.
- (1) 30 ton heat recovery chiller with dual refrigeration circuits and VFD compressors. Similar to Multistack DHRC.
  - Provide (2) 2 hp HWP (vertical in-line close coupled ECM)
  - Provide (2) 2 hp CHWP (vertical in-line close coupled ECM)
  - Provide (2) 400 gallon buffer tanks
  - Heat recovery chiller shall be located in basement mechanical room
- Provide smart plant controller by equipment manufacturer, similar to MultiPro

## *Electrical & Fire Alarm Infrastructure/Systems (BR+A)*

- Electrical:



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- Provide 1000 KVA pad mounted utility transformer located on the site. (Assumes existing utility transformer on site to be replaced.) Transformer shall feed 1600A main switchboard (480/277V, 3PH, 4W) located within an electrical room. The switchboard shall have a utility metering CT cabinet. Switchboard breakers shall have built in metering capabilities.
- Provide a lighting panel (100A, 480/277V, 3PH, 4W) on each floor.
- Provide a panel for site lighting
- Provide a 84 pole panelboard (150A, 480/277V, 3PH, 4W), fed from a 45KVA step down transformer on each floor to serve receptacle loads.
- Provide a panelboard (400A, 480/277V, 3PH, 4W) to serve mechanical loads, and a 45 KVA step down transformer to serve a 84 pole panelboard (150A, 480/277V, 3PH, 4W) for mechanical loads.
- Provide branch circuits to all lighting fixtures fed from central lighting control system, consisting of time of day control and occupancy sensing.
- Note – generator infrastructure covered in 1895 scope. Carry(1) ATS to serve emergency lighting and (1) ATS to serve optional standby loads.
- Fire alarm:
  - The building will be provided with a new complete fire alarm system to include automatic and manual initiating devices, occupant notification, fire safety functions and off-premises reporting in accordance with all applicable codes.
  - The system will consist of a distributed analog/addressable, microprocessor-based control panel with power supplies, operator's controls, automatic and manual initiating devices, notification appliances, primary and secondary power, and off-premises event reporting as shown and required. Occupant notification shall consist of general evacuation audio/visual signals throughout the building.
  - The system shall be integrated with the city reporting system to provide uniform event reporting and annunciation.
- Renewable energy:
  - Provide infrastructure to support 50 kW rooftop PV array. Provide central inverters with DC optimizers in dedicated electrical room. The panel board breaker fed from the PV array shall be individually metered.
  - [Array itself to be purchased in Soft Costs]
  - Provide battery storage (size TBD) for resiliency and to maximize SMART solar incentive. Batteries to be located in outdoor enclosure. Batteries may be combined with 1895 system.
- Lighting – refer to Sustainability Section.
- Metering – refer to metering/submetering section in **Sustainability**
- In Council Chamber, allow for lighting control system such as Lutron Magic Eye

## *Plumbing & Fire Protection Infrastructure/Systems (BR+A)*

- New 6-inch fire protection service into the building. Complete wet sprinkler and standpipe system. New fire department connection and accessories.

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- New 3-inch water service to the building complete with backflow preventer and meter for building and separate backflow for irrigation.
- Water heaters (Duplex air source heat pumps 16kW with a single 250 gallon storage tank. Heat pumps Lync 250W and storage tank Lync L250A-TRO)
- Onsite rainwater holding tank and rainwater reuse system with day tank, UV recirculating system. (See **Civil Infrastructure section**) Water used for toilet flushing and irrigation. Rainwater reclamation system is anticipated to be sufficient for toilet flushing and irrigation system needs.
- **PLUM ALTERNATE 1:** Rainwater reclamation system for irrigation only. No toilet flushing. See 1895 for alternate details.

## *Technology, Communications, & Security (TCS) Infrastructure/Systems (BBB)*

- Refer to 1895 Building for typical scope;
- City Hall Notes - Security
  - In addition to typical delineated in 1895 Building narrative, allow for keycard access control at the Mayor's Office Suite, City Council Chamber, and Committee Room
- City Hall Notes - AV
  - Infrastructure bought with GMP / AV equipment bought with soft costs – refer to 1895 General Notes
  - In Council Chamber, enabling work for Crestron-type integrated audio-visual system at lectern, microphone system for council members and Hearing officials, etc.
  - In Committee and Sub-Committee Rooms, enabling work for Crestron-type audio-visual system to be wall-mounted

## *Fit-Out (BBB)*

### *General Fit-Out Notes*

- Refer to 1895 BUILDING for Masterplan General Notes on typical construction for walls, ceilings, lighting, built-ins, furniture, and fixed furniture systems, as well as other finish notes. Exceptions for City Hall noted below.
- SPECIAL FINISH NOTES FOR CITY HALL
  - Wood interior window casing salvage and reuse – Salvage all extant interior wood window casing (stain-grade and painted), refinish (assume lead remediation on 50%) and reinstall with new jamb extensions to address the thickened furring due to insulation
  - Fire Rated Construction - Construction of City Hall is concrete joist system in the center and north wings; the structural system in the south wing is concrete joist construction except for the third floor/attic which is heavy timber truss and wood joist/wood subfloor. Assume fire-rated GWB will need to be installed to underside of floor assembly for the **third floor south wing only**.

### *Fit Out Space Types and Scope Allowances*

- OFFICES
  - Typical, see 1895 BUILDING
  - City Hall Mayor's Office Suite

- Throughout suite
  - Flooring – carpet tile, but higher quality than typical office
  - Walls – typical office see 1895 BUILDING
  - Ceiling – GWB with concealed MEP, flush access panels
- Mayor’s Personal Office and Mayor’s Conference Room
  - Walls – painted wood raised panel wainscot, base, and dado rail, picture rail, GWB above with plaster skimcoat
  - Ceiling – allow for additional GWB decorative soffit details
  - Lighting – decorative pendants, monopoints, sconces, downlights
- OFFICE SUPPORT
  - Typical, see 1895 BUILDING
- CONFERENCE
  - Typical, see 1895 BUILDING
  - City Hall - City Council Chamber
    - Scope is mix of renovation and preservation of existing;
    - Retain soffits, crown molding, and arched ceiling structure in situ; modify ceiling as necessary for MEP upgrades
    - Remove existing carpet, provide all new woven wool broadloom carpet throughout space
    - Remove wall finishes (wainscot and plaster) up to soffit level, provide envelope thermal upgrades detailed in SHELL section; salvage window painted wood casing and salvage applied painted wood pilasters for reinstall; dismantle/dispose of built-in council member horseshoe desks and dais/dais millwork
    - Provide all new painted wood wainscot to match existing profiles; refinish and reinstall painted wood pilasters and interior wood window casing with jamb extensions;
    - Allow for all new millwork FCU enclosures at windows with statuary bronze grilles
    - Lighting – salvage existing decorative pendants for reuse elsewhere; allow for new *custom* decorative pendants and sconces throughout, new cove lighting at curved ceiling, and new downlights to achieve even light levels
    - See TECH/AV section for additional scope
  - City Hall – Council Committee Room
    - Room is existing mayor’s office; contains wood wainscot with picture frame molding above chair rail, and a coffered wood and plaster ceiling
    - Flooring - Provide carpet higher quality than typical office
    - Ceiling – maintain/repair existing, MEP to be coordinated with sidewalls
    - Lighting – decorative pendants, monopoints, sconces, downlights
    - See TECH/AV section for additional scope

- City Hall - Subcommittee Room
  - Flooring – carpet tile, but higher quality than typical office
  - Walls – painted wood raised panel wainscot, base, and dado rail, picture rail, GWB above with plaster skimcoat
  - Ceiling – GWB with concealed MEP, flush access panels
  - Lighting – decorative pendants, monopoints, sconces, downlights
  - See TECH/AV section for additional scope
- STAFF AMENITIES
  - Typical, see 1895 BUILDING
- BATHROOMS
  - Typical, see 1895 BUILDING
- LOBBIES/CORRIDORS/CIRCULATION
  - Allow for environmental graphics
  - Spaces Existing to Remain:
    - Flooring – retain and restore existing insitu cementitious terrazzo flooring; patch with epoxy terrazzo with color and aggregate to match. Allow for 10% of Corridor SF of patching
    - Walls – retain plaster walls with stain-grade wood wainscot; skimcoat on plaster surface, and refinish wood stain grade elements (wainscot, dado rails, base); replace tackable surface between wainscot and dado rail with natural cork tackable surface, stained finish
    - Doors – for doors existing to remain in same location, refinish all stain-grade wood elements, provide all new door hardware
    - Doors – for new doors in existing walls, salvage leaves, frames and trim from door removals as feasible and refinish; otherwise match material, finish and geometry with new
    - Doors to be removed– salvage for reuse and infill with wainscot, dado, base, and tackable surface to match existing
    - Ceilings – assume full removal of ceilings and replacement with GWB for concealed MEP; flush access panels as required
    - Lighting – assume all new lighting (decorative pendants and wall sconces); monopoint lighting along one long side of corridors for artwork lighting
    - Mechanical terminals – assume architectural grilles, statuary bronze
  - New Circulation Spaces:
    - Floor – provide insitu terrazzo to match existing in building
    - Walls – provide GWB with plaster skimcoat and stain-grade beadboard wainscot to 42”
    - Ceilings – GWB ceiling with concealed MEP; flush access panels
    - Lighting –assume all new lighting (decorative pendants and wall sconces)

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- BOH/MECH
  - Typical, see 1895 BUILDING

## Edgerly Education Center

### Existing Conditions, Demolition, & Logistics (BBB/H&A)

#### *Hazardous Materials Removal*

- **Axiom report sent to Dharam by email, 10/13**

#### *Geotechnical Considerations (H&A)*

- None listed.

#### *Other Construction Considerations*

- Allow for two phases of construction, roughly dividing the building in half (east half, west half)

### Sustainability & Net Zero Energy (A10/Energysmiths)

#### *Overview*

- The Edgerly Education Center will be renovated in compliance with the City of Somerville's Zoning Ordinance which represents the minimum expectations for aligning with City-wide goals. As such, the project will be designed to achieve **Leadership in Energy and Environmental Design (LEED) Platinum** certification under LEED v4 Building Design and Construction (BD+C): New Construction (NC) and Major Renovation Program.
- The project strives to be an exemplar of high-performance, sustainable design by reducing energy use, greenhouse gas emissions, and potable water use to the greatest extent possible. To align with these goals, the building will be designed to be an **all-electric Net Zero Emissions building** in which all emissions from energy used in the building will be offset by a combination of on-site and off-site renewable energy on an annual basis.
- **Refer to the 1895 Building Sustainability Narrative for all other sustainability requirements and targets for costing purposes.**

### Site Improvements

#### *Utilities / Civil Infrastructure (Nitsch)*

- Refer to Conceptual Site Plan Sketch dated 10/8/21.
- 30,000 gallon [rainwater harvesting](#) tank for rainwater reuse system [for toilet flushing and irrigation](#). (See Sustainability and Plumbing Sections) [including](#)- new irrigation lines for establishing landscape plants. All new subgrade drainage infrastructure (pipes, structures, grates)
- [75% of landscape areas bioretention with underdrains, including demonstration gardens and educational signage; bioretention basins shall include 24" soil media and 12" crushed stone reservoir, as noted on plan.](#)
- New building laterals for water and sewer as noted on the plan.
- 11,000 sf extensive green roof and 11,000 sf photovoltaic array (**Also noted in Shell>Roof**)
- Softscape buffer to include 75% of landscape areas as bioretention with underdrains, including demonstration gardens and educational signage

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- Pedestrian pavement to be pitched to permeable pavers with underdrains (approx. 25% of pavement area), where shown on plan. Permeable paving section shall include 18" bank-run gravel filter course and 12" crushed stone reservoir. Refer to precedent image on plan.

## *Accessibility Compliance (BBB)*

- Refer to provided site drawing; in particular allow for new grading and landscape to provide steps and companion sloped path at new east entrance. As noted in Shell>Envelope Restoration>Stoops, provide new exterior structured ramp and handrails from sidewalk at SE corner entrance (see plans)

## *Landscape & Hardscape (BBB)*

- Refer to Nitsch and BBB's provided site drawings for hardscape vs. softscape; allow for some ground cover and street trees in softscape areas; Refer to Sustainability Goals and Edgerly Utilities/Civil Infrastructure above for further detail.

## Shell Improvements (BBB)

### *Envelope & Roof Upgrades*

- Foundation (Ground Floor) Slab is concrete; some areas lowered (existing Boxing Club, Mechanical Room); condition looks to be acceptable
  - Note floor infill of existing mechanical room and coal pocket; refer to plans and structural narrative
  - Coordinate trenching overall with bathroom and other under-slab plumbing scope
- Below-grade foundation walls – these are minimal except for mechanical room to be infilled; exclude
- Above-Grade walls (Floors G-2)
  - Cast stone at grade up to water table at ground floor, then multi-wythe brick masonry above
  - Provide 5" of low-GWP open-cell spray-foam insulation; exterior furring to be single 5/8" layer GWB on 16" OC, 20-ga, 2.5" studs. Set interior face of drywall 8" from interior face of masonry. Continuous "smart" variable permeable vapor retarder.
- Exterior Entry Systems
  - Replace existing stair exits with new metal and glass storefront entry systems
  - Provide Automatic Door Openers (ADOs) at all exterior entry doors
- Windows
  - BBB assumes all original wood window elements were removed at the time the present aluminum windows were installed; aluminum windows are overall in poor shape with chronic IGU seal failure, reports of numerous interior leaks, and rust jacking at lintels; allow for 100% replacement of windows
  - Provide the following at all windows to be replaced:
    - Thermally broken aluminum windows with dimensional traditional-style brick mold profile at M.O.
    - Allow for triple glazed 1-1/2" low-e IGUs throughout (low reflectivity)
    - Change to configuration from existing is:

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- No spandrel panel similar to exg – vision glass exclusively to be used
- Narrow (two column) windows to go from six panels to ten panels
- Wide (three column) windows to from nine panels to fifteen panels
- SOUTH AND EAST FAÇADES: Provide louvered aluminum sunscreen devices at exterior, projecting 36" typical, and interior light shelves, at all windows south and east facades.
- Roof
  - Existing is EPDM on tapered insulation, sloping to external drains, set on cast-in-place concrete slab
  - Assume full replacement of assembly down to concrete deck
  - Provide the following:
    - New EPDM roof with tapered insulation, R-38 minimum
    - Assuming total roof footprint inside parapets is +/- 25,500 SF;
    - 3,500 SF for all mechanical equipment, generator, walking paths and pipe vestibules, and other bulkheads or remainder roof zones
    - 11,000 SF for solar PV array
    - 11,000 SF for extensive green roof (sedum or similar)
    - All typical step and parapet cap flashings, penetrations, etc.
  - Roof Drainage: provide all new drains and drainage plumbing; see CIVIL and PLUMBING for rainwater capture
  - Reconstruct two (2) unit skylights above gymnasium, set on curbs at low-slope roof, 8'x12' in plan each

## *Envelope Restoration / Rehabilitation*

- Exposed 18" concrete foundation wall to water table (sill of ground floor windows):
  - Route out narrow cracks and patch; allow for 2 LF per crack, at 50 locations
  - General cleaning and remove biological staining typical for all exposed foundation concrete (non-hydrochloric or hydrofluoric acid, provide allowance for cleaning trials to identify gentlest and most effective cleaning product(s) and methods).
- Multi-wythe brick masonry, allow for:
  - Brick parapets: Allow for 20% full rebuild of 30" tall parapets
  - Remove existing louvers (29 total) where present and infill with brick masonry (8 on Bonair; 6 on Cross Street; 4 on Otis and 5 in courtyard; and 6 on alley façade). Assume 3 SF each and full depth of wall.
  - For zone extending from second floor cast stone band up to parapet, allow for 100% repoint and efflorescence cleaning, other than areas slated for rebuild in note above
  - Brick soldier course lintels at all first floor windows as well as all windows in courtyard and on west facade, show a pattern of displacement due to underlying steel angle corrosion. Masonry distress appears to extend beyond openings, indicating presence of a continuous shelf angle along façade. Repair will require removal of full soldier courses at openings and three courses running bond between openings to clean and paint lintels/repair and/or replace. Assume for now 30% replace, 30% local reinforcement,



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- 100% rust-inhibiting paint application to all areas of exposed steel identified to remain (approx. 70%).
  - While some brick may be able to salvaged, for now allow for 100% new brick to match existing where removed
- General: brick replacement and or stitching of 350 face brick units matching color mix, size, and mortar mix/profile; areas of replacement vary from 1-3 brick one-offs to longer stitching of +/-20 bricks in a single area
  - See elevations for additional notes, including full rebuild of upper portion of boiler chimney
- Allow for removal of 1'x5' long louvered openings below windows: stitch in face brick, and provide depth of brick backup wall, at 32 locations
- General: brick cleaning, 100%; allow for 100 SF of brick replacement where stains cannot be easily/fully removed, also allow for 100 SF of paint and/or tar removal. All these areas for replacement or paint/tar removal are typically 5-10 SF in size
- Vine/bio growth removal: allow for removal on 50% of north façade and 10% of west façade
- General - Brick Repoint:
  - Baseline is **100%** repoint overall due to condition: previous spot pointing appears to date to various campaigns and is sporadic. Quantity of missing, eroded, or poorly repointed mortar appears to exceed thresholds for selective repoint when considering energy and insulation retrofit.
  - **ENV Alternate 1:** Deduct Alt to repoint only 40% of brick
- Cast Stone
  - Cast stone lintels and patches at ground and second floors (not at courtyard or west elevations) show a pattern of displacement and/or cracking/spalling due to underlying steel angle corrosion. Masonry distress appears to extend beyond openings, indicating presence of a continuous shelf angle along façade, although distress here is not as chronic as in the brick areas noted above. Repair will require removal of cast stone at openings and likely adjacent units to clean and paint lintels/repair and/or replace. Assume for now 30% replace, 30% local reinforcement, 100% rust-inhibiting paint application to all areas of exposed steel identified to remain (approx. 70%). See the following for cast stone replacement:
    - String course above second floor windows: assume 30% unit replacement and 20% patching in case damaged on removal/reset
    - Water table above ground floor windows: 10% unit replacement and 30% patching in case damaged on removal/reset
  - 100% repoint of perimeter and internal joints at all cast units on building (three string courses on primary elevations, plus other locations)
  - For scope at figural units with decorative relief (six locations), see elevations
    - Refer to drawings for spall repair, vs. full unit replacement
- Cast Stone Stoops with steps and cheek walls, metal handrails:

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- Allow for full replacement of all four existing entry stoops, as well as the southwest accessible entry ramp on Otis Street

## Core Improvements

### *Structure Upgrades or Modifications (BBB, with Silman)*

- Ederly is a two-story building with full basement that is mostly above-grade. Floor system observed in multiple areas consists of a one-way spanning concrete pan joist system framing into thickened concrete beams at the exterior brick masonry wall and interior load-bearing masonry corridor walls. Several larger-volumed spaces have concrete column grids.
  - Note no new elevators this building
  - Assume new risers for MEP; note concrete pan joists systems require careful coordination of penetrations, and openings which cut through ribs will require local framing
- **Note infill of existing lower floor at former Boiler Room and Coal Pocket to match adjacent ground floor level:**
  - **BASE:** Provide a standard 5" normal weight slab on grade over a backfill of Foam Glass Aggregate (FGA); reinforce slab with welded wire fabric; **OR**
  - **STRUCT Alternate 1:** Provide new steel beams spanning width of boiler room spaced between 7 to 9 feet o.c. supporting a 3-1/4" lightweight concrete slab over 2" 18 gage composite floor deck. Allow for 10 psf of steel. Steel to be pocketed into existing masonry / concrete side walls.

### *Life Safety Improvements (BBB)*

- Existing interior stairwells are existing to remain; construction is metal pan construction with concrete treads and metal risers, and metal guardrails
  - Allow for replacement of every interior end wall (containing access door) with 1HR FRR construction and new rated doors with vision lites; it is assumed stair cheek walls meet archaic construction requirements for 1HR FRR
  - Assume general cleaning of concrete, and selective scrape/prime/paint of guardrails
  - Assume new painted metal pipe handrails wall-mounted to outside walls; extensions to comply with 521 CMR.
  - Allow for new lighting, graphics, signage, etc.
- Assume all accessibility signage for public buildings per 521 CMR.

### *Vertical Conveyance Improvements (BBB)*

- Existing elevator is a Dover Hydraulic, 56"x77" deep cab with 36x84 door, 2,600# cap and 100 FPM
  - Scope to include full maintenance/testing & general modernization/rehab;
  - Finish upgrades to include replace cab flooring w/ rubber tile flooring, replace ceiling w/ integrated LED lighting, electrostatic repaint of all doors & frames, replace hall call buttons and travel indicators w/ brushed stainless steel finish

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## *Mechanical Infrastructure/Systems (BR+A)*

- Mechanical system shall prioritize load reduction strategies, such as advanced ventilation energy recovery, and use a decoupled hydronic heating and cooling system. There will be no on-site fossil fuel combustion for heating. The air-side and water-side systems are described below. EDGERLY ADD ALT – Two water-side systems are being evaluated. The base option uses air-source heat pumps (air-to-water). The alternate uses a combination of ground-source (geothermal) and air-source. Building is assumed to contain multiple departments that may have different hours of operation; system shall be capable of modulating to part load to serve small areas of the building during extended hours.
- Air-side system
  - (2) 9,000 cfm semi-custom 100% outside air AHU, including dual core regenerative heat recovery, similar to Tempeff or Bousquet (or as OEM in semi-custom Daikin unit). Unit shall include the following components: MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan arrays, electric resistance heating coil (backup use only), chilled water cooling coil with wraparound heat pipe, supply and exhaust sound attenuators (pending acoustical analysis). Provide bypass dampers for cooling coil. Units shall be located on east and west roofs. Provide cross-connect duct with normally open damper for supply and exhaust on roof or level 3.
  - Include (1) 1,500 cfm semi-custom 100% outside air AHU, including dual enthalpy wheel heat recovery, similar to Trane or Daikin. Unit shall include MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan arrays, electric resistance heating coil (backup use only), chilled water cooling coil, supply and exhaust sound attenuators (pending acoustical analysis). Provide bypass dampers for cooling coil and enthalpy wheels. Unit shall be located on roof above gym.
  - All zones to have decoupled hydronic terminal units, except as noted below:
    - Open office areas: 4-pipe ducted fan coil units
    - Enclosed offices: if individual occupant control is desired, use cassette-style fan coil unit with 6-way changeover valve. If grouped with adjacent offices, use ducted horizontal fan coil unit
    - Conference rooms: 4-pipe fan coil units
    - Gymnasium: low-wall displacement ventilation. Supplemental cooling via vertical concealed fan coil units, low wall discharge.
    - In zones other than gymnasium, ventilation shall be ducted directly to terminal units with VAV inlet damper
    - Provide desk fans for all multi-occupant work areas
    - Provide CO<sub>2</sub>-based demand control ventilation in all multi-occupant spaces
    - Provide occupancy-based ventilation in single-occupant spaces
    - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
    - Fan coil units shall be designed for sensible (non-condensing) operation only. Provide drip pan and moisture sensor, no condensate drain.

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- (4) Medium pressure supply and exhaust duct risers. Plenum return via (8) VAV return boxes per floor.
- Assumes no dedicated perimeter heating system (enclosure upgrades, including triple glazing required)
- Water-side system – hot water (110F) and chilled water (44F) distribution
  - Base Option: Air-source heat pump
    - 2-pipe ASHP consisting of (9) 30 ton (nominal) modules, similar to Multistack ARP-30. Actual heating output is 215 MBH at 12°F
      - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX. Provide glycol tank and feed pump.
      - Provide (2) 300 gpm plate and frame HX
      - Provide (2) 7.5 hp GWP (vertical in-line close coupled ECM)
      - Provide (2) 7.5 hp HWP (vertical in-line close coupled ECM)
      - Provide (2) 7.5 hp CHWP (vertical in-line close coupled ECM)
      - Provide (1) 600 gpm buffer tank.
      - Heat pumps shall be located on roof with hydronic pumps and accessories located in enclosed penthouse or mechanical room on level below.
    - (2) 30 ton heat recovery chiller modules with dual refrigeration circuits and VFD compressors. Similar to Multistack DHRC.
      - Provide (2) 2 hp HWP (vertical in-line close coupled ECM)
      - Provide (2) 2 hp CHWP (vertical in-line close coupled ECM)
      - Provide (2) 400 gallon buffer tanks
      - Heat recovery chiller shall be located in mechanical room.
    - Provide plant controller by chiller manufacturer similar to MultiPro
  - Add-alt: air-source and ground-source – this option assumes twenty (20) 500 wells fit on the site. Note this exceeds H&A's estimate of (15) by including (5) additional wells to the east of the building adjacent to Cross St.
    - 20 closed-loop U-bend geothermal wells.
      - 500' depth
      - Wells circuited in groups of 5, with manifold and pumps on level 1
      - Utilize HDPE quad loop
      - Provide (2) 7.5 hp primary pumps (vertical in-line close coupled ECM)
      - Ground loop to utilize 25% PG. Provide glycol tank and pump.
    - 6-pipe modular GSHP chiller consisting of (3) 30 ton (nominal) VFD scroll heat recovery chiller modules, similar to Multistack VME-2.
      - Provide (2) 5 hp GTWP (vertical in-line close-coupled ECM)
      - Provide (2) 3 hp HWP (vertical in-line close-coupled ECM)
      - Provide (2) 3 hp CHWP (vertical in-line close-coupled ECM)
      - Provide (2) 450 gallon buffer tanks
      - Provide (1) plate and frame HX, 130 gpm (GTW to CHW)

- Provide (1) plate and frame HX, 110 gpm (GTW to HW)
- 2-pipe modular air-to-water heat pump consisting of (6) 30 ton (nominal) modules, similar to Multistack ARP-30
  - Heat pumps shall contain glycol and be separated from hydronic distribution loops with HX. Provide glycol tank and feed pump.
  - Provide (1) 210 gpm plate and frame HX
  - Provide (2) 5 hp primary GWP (vertical in-line close coupled ECM)
- Provide (2) 7.5 hp secondary HW distribution pumps (vertical in-line close coupled ECM)
- Provide (2) 10 hp secondary CHW distribution pumps (vertical in-line close coupled VFD)
- Provide smart plant controller by equipment manufacturer, similar to MultiPro

#### *Electrical & Fire Alarm Infrastructure/Systems (BR+A)*

- Electrical:
  - Provide 1500 KVA pad mounted utility transformer located on the site. (Assumes existing utility transformer on site to be replaced.) Transformer shall feed 2000A main switchboard (480/277V, 3PH, 4W) located within an electrical room. The switchboard shall have a utility metering CT cabinet. Switchboard breakers shall have built in metering capabilities.
  - Provide a lighting panel (100A, 480/277V, 3PH, 4W) on each floor.
  - Provide a panel for site lighting
  - Provide a 84 pole panelboard (150A, 480/277V, 3PH, 4W), fed from a 45KVA step down transformer on each floor to serve receptacle loads.
  - Provide a panelboard (400A, 480/277V, 3PH, 4W) to serve mechanical loads, and a 45 KVA step down transformer to serve a 84 pole panelboard (150A, 480/277V, 3PH, 4W) for mechanical loads.
  - Provide branch circuits to all lighting fixtures fed from central lighting control system, consisting of time of day control and occupancy sensing.
  -
- Provide battery powered fixtures for emergency egress lighting and fire alarm:
  - The building will be provided with a complete fire alarm system to include automatic and manual initiating devices, occupant notification, fire safety functions and off-premises reporting in accordance with all applicable codes.
  - The system will consist of a distributed analog/addressable, microprocessor-based control panel with power supplies, operator's controls, automatic and manual initiating devices, notification appliances, primary and secondary power, and off-premises event reporting as shown and required. Occupant notification shall consist of general evacuation audio/visual signals throughout the building.
  - The system shall be integrated with the city reporting system to provide uniform event reporting and annunciation.

# BEYER BLINDER BELLE

- Renewable energy:
  - Provide infrastructure to support 250 kW rooftop PV array (PVs IN SOFT COSTS). Provide central inverters with DC optimizers in dedicated electrical room. The panel board breaker fed from the PV array shall be individually metered.
  - Provide battery storage (size TBD) for resiliency and to maximize SMART solar incentive. Batteries to be located in outdoor enclosure.
- Lighting – refer to Sustainability Section.
- Metering – refer to metering/submetering section in **Sustainability**
- In Edgerly Auditorium/Gym, allow for lighting control system such as Lutron Magic Eye

## *Plumbing & Fire Protection Infrastructure/Systems (BR+A)*

- New 8-inch fire protection service into the building. Complete wet sprinkler and standpipe system. New fire department connection and accessories.
- New 4 inch water service to the building complete with backflow preventer and meter for building and separate backflow for irrigation.
- Water heaters (Duplex air source heat pumps 16kW with a single 250 gallon tank. Heat pumps Lync 250W and storage tank Lync L250A-TRO)
- Onsite rainwater holding tank and rainwater reuse system with day tank, UV recirculating system. (See **Civil Infrastructure section**) Water used for toilet flushing and irrigation. Rainwater reclamation system is anticipated to be sufficient for toilet flushing and irrigation system needs.
- **PLUM ALTERNATE 1**: Rainwater reclamation system for irrigation only. No toilet flushing.

## *Technology, Communications, & Security (TCS) Infrastructure/Systems (BBB)*

- Refer to 1895 Building for typical scope;
- EDGERLY NOTES:
  - In Auditorium, the back-end for integrated audio-visual system for projection, screenings, video and amplification to be bought with GMP. Equipment bought in soft costs.

## *Fit-Out (BBB)*

### *General Fit-Out Notes*

- Refer to 1895 BUILDING for Masterplan General Notes on typical construction for walls, ceilings, lighting, built-ins, furniture, and fixed furniture systems, as well as other finish notes. Exceptions for Edgerly noted below.
  - No requirement for fire-rated GWB at underside of ceiling as concrete pan joist construction is non-flammable.

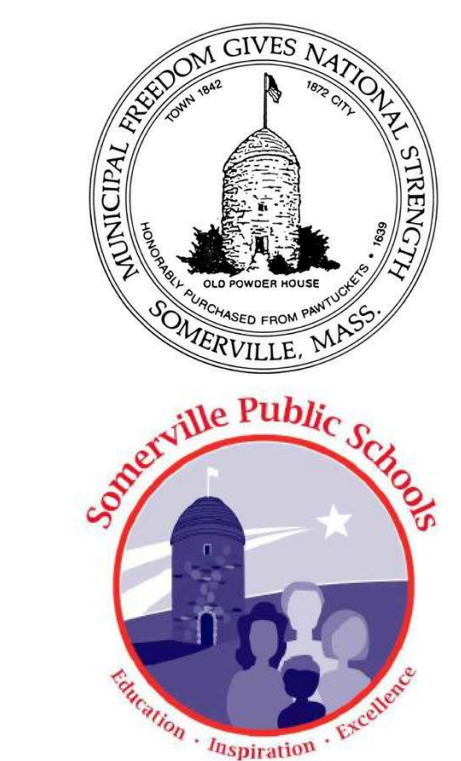
### *Fit Out Space Types and Scope Allowances*

- OFFICES
  - Typical, see 1895 BUILDING
- OFFICE SUPPORT
  - Typical, see 1895 BUILDING
- CONFERENCE

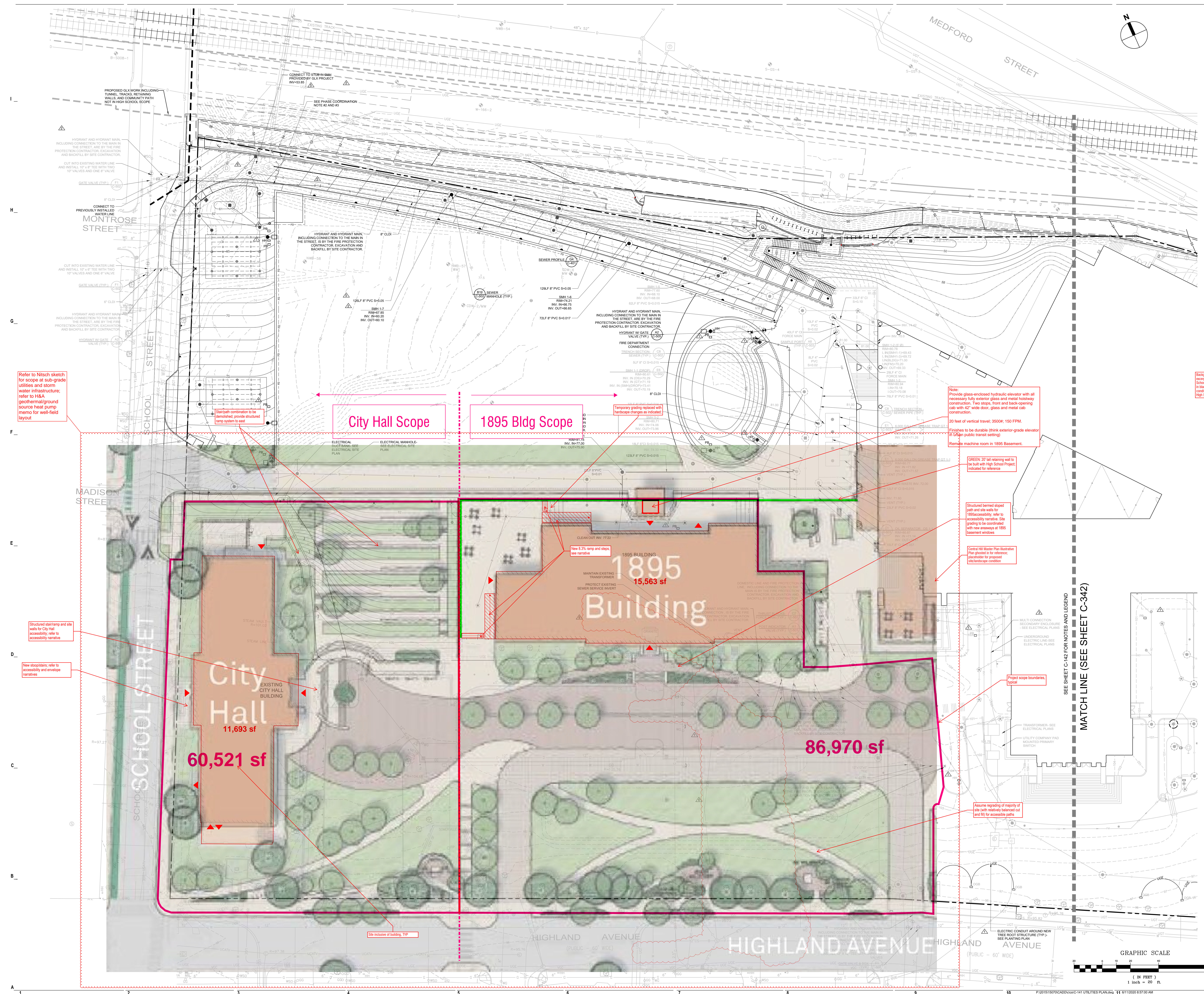
# BEYER BLINDER BELLE

- Typical, see 1895 BUILDING
- STAFF AMENITIES
  - Typical, see 1895 BUILDING
- BATHROOMS
  - Typical, see 1895 BUILDING
- LOBBIES/CORRIDORS/CIRCULATION)
  - Generally, most corridor spaces are existing volumes; see plans for new lobby and new corridors; note built-ins for constructed phone booths
  - Allow for environmental graphics
  - Flooring – resilient flooring over existing concrete slab
  - Existing Walls – Existing glazed tile up to 7 feet AFF to remain, allow for 200 SF of latex overpaint removal. Exposed brick above tile to be painted out.
  - Doors off corridor – Allow for all new doors in hollow metal frames with vision lites
  - Doors off corridor – at locations of existing door removal, provide full height glass infill in steel frame.
  - Ceilings – no need for concealed MEP full drop ceiling; allow for painting out of MEP services and ceiling clouds
  - Lighting – linear integrated into ceiling clouds
- **SPECIALITY SPACES FOR EDGERLY**
  - Play Space
    - Assume typical benchmark for ages 3-5, 1100 SF; carpet tile, ensuite children’s toilets as indicated in plan, assume office-level lighting or similar
  - Classrooms
    - Program is adult continuing education. Allow for carpet tile floors, rubber base, painted GWB walls, ceiling clouds and light similar to open office. Enabling work/IT and AV infrastructure to support classroom equipment (equipment in soft costs)
    - Note also one computer lab 600 SF, one testing center 600 SF
  - Parks & Recreation Game Room
    - Allow for finishes similar to staff breakroom
  - Existing Auditorium
    - See AV and Lighting Sections
    - Repaint exposed brick walls
    - Provide all new lighting
    - Restore balcony and projection booth
- BOH/MECH
  - Typical, see 1895 BUILDING





**SOMERVILLE HIGH SCHOOL**  
81 HIGHLAND AVENUE  
SOMERVILLE, MA 02143



Refer to Nitech sketch for scope at sub-grade utilities and storm water infrastructure; refer to H&A geothermal/ground source heat pump memo for well-field layout

Startpath combination to be demolished; provide structured ramp system to ease

**City Hall Scope**

**1895 Bldg Scope**

Temporary grading replaced with landscape changes as indicated

Note: Provide glass-enclosed hydraulic elevator with all necessary fully exterior glass and metal hardware construction. Two stops, front and back-opening cab with 42" wide door, glass and metal cab construction. 20 feet of vertical travel: 3500R; 150 FPM. Elevator to be durable (think exterior-grade elevator in Urban public transit setting). Remove machine room in 1895 Basement.

Background Site Drawing excerpted from Somerville High School Project; background content in black lines will be the "existing condition" of our project when the High School project is completed.

GREEN 20' tall retaining wall to be built with High School Project; indicated for reference

Structured bermed sloped path and site walls for 1950 accessibility; refer to accessibility narrative. Site grading to be coordinated with new steps at 1895 basement windows

Central Hill Master Plan Illustrative Plan provided in for reference; desirable to propose site/landscape condition

New 8 3/4" ramp and stairs; see narrative

Structured stairway and site walls for City Hall accessibility; refer to accessibility narrative

New stoops; refer to accessibility and envelope narratives

**City Hall**  
11,693 sf  
60,521 sf

**1895 Building**  
15,563 sf  
86,970 sf

Site inclusive of building, TYP

Assume regrading of majority of site (with relatively balanced cut and fill) for accessible paths

REVISIONS

NO.	DATE	DESCRIPTION
06/12/2020	PR3-316	
07/18/2019	PR3-309R2	
11/27/2018	PR3-309	
10/15/2018	PR3-306	
06/29/2018	ADDENDUM #1	
04/27/2018	CONSET DOCUMENTS	

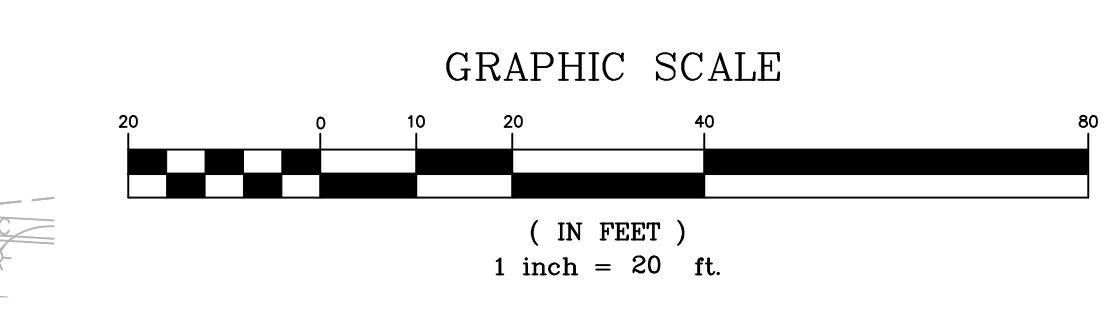
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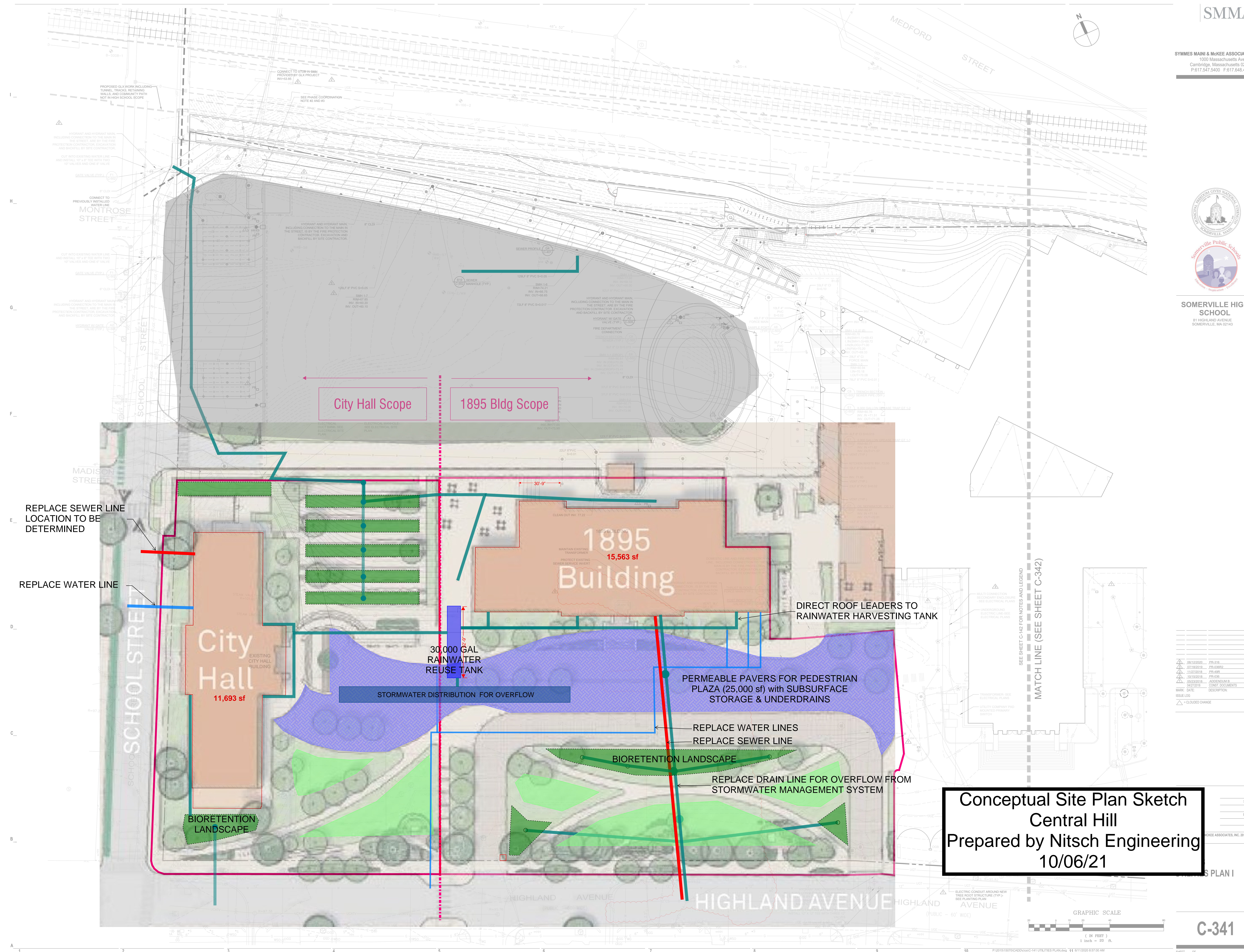
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CHECK BY	JCH
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PROJ. MGR.	LSF
JOB NO.	15070.00

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PHASE 3  
UTILITIES PLAN I







City Hall Scope

1895 Bldg Scope

City Hall  
11,693 sf

1895 Building  
15,563 sf

30,000 GAL RAINWATER REUSE TANK

PERMEABLE PAVERS FOR PEDESTRIAN PLAZA (25,000 sf) with SUBSURFACE STORAGE & UNDERDRAINS

BIORETENTION LANDSCAPE

BIORETENTION LANDSCAPE

REPLACE DRAIN LINE FOR OVERFLOW FROM STORMWATER MANAGEMENT SYSTEM

REPLACE WATER LINES  
REPLACE SEWER LINE

DIRECT ROOF LEADERS TO RAINWATER HARVESTING TANK

REPLACE SEWER LINE LOCATION TO BE DETERMINED

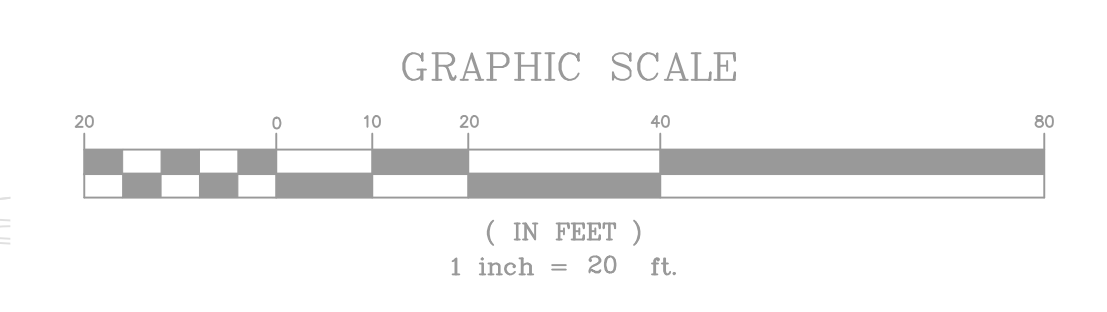
REPLACE WATER LINE

Conceptual Site Plan Sketch  
Central Hill  
Prepared by Nitsch Engineering  
10/06/21

MATCH LINE (SEE SHEET C-342)

MARK	DATE	DESCRIPTION
△	06/12/2020	PRB-316
△	07/18/2019	PRB-309R2
△	11/07/2018	PRB-309
△	10/15/2018	PRB-305
△	06/23/2018	ADDENDUM #1
△	04/27/2018	CONSET DOCUMENTS
△		ISSUE LOG
△		DESIGN CHANGE

NO.	DATE	BY	DESCRIPTION
1	10/06/21	BN	ISSUE FOR PERMITS



































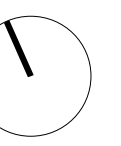
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**1895 Building**  
81 Highland Avenue,  
Somerville, MA 02143

**BEYER  
BLINDER  
BELLE**  
120 Broadway, 20th Floor  
New York, NY, 10271  
212.777.7800

KEY PLAN



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NO DATE DESCRIPTION

REVISIONS  
SUBMITTAL

**PSR Drawing Set**

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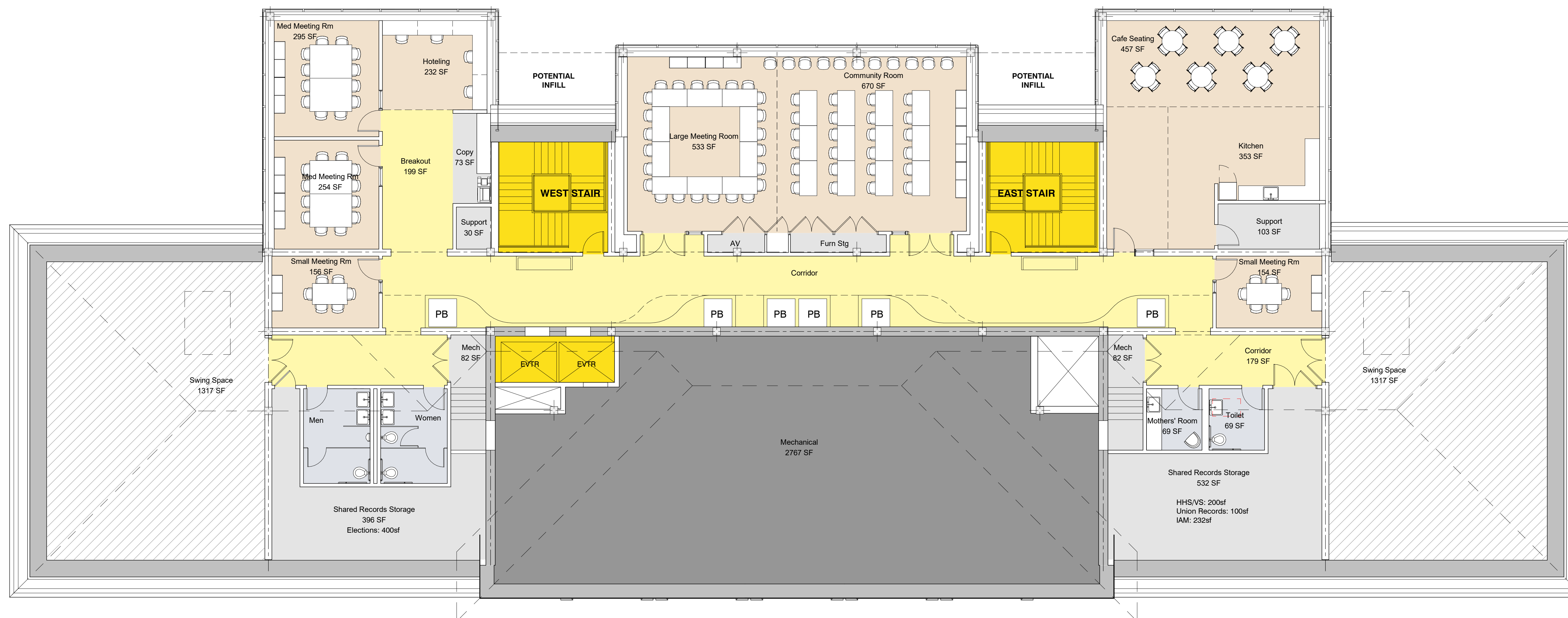
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Test-Fit Plans - Fourth Floor

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DATE 09/30/2021  
PROJECT NUMBER 2875  
DRAWING NUMBER

**A-12**

of



**1** 04 Fourth Floor\_PSR Plan  
A-12 1/8" = 1'-0"



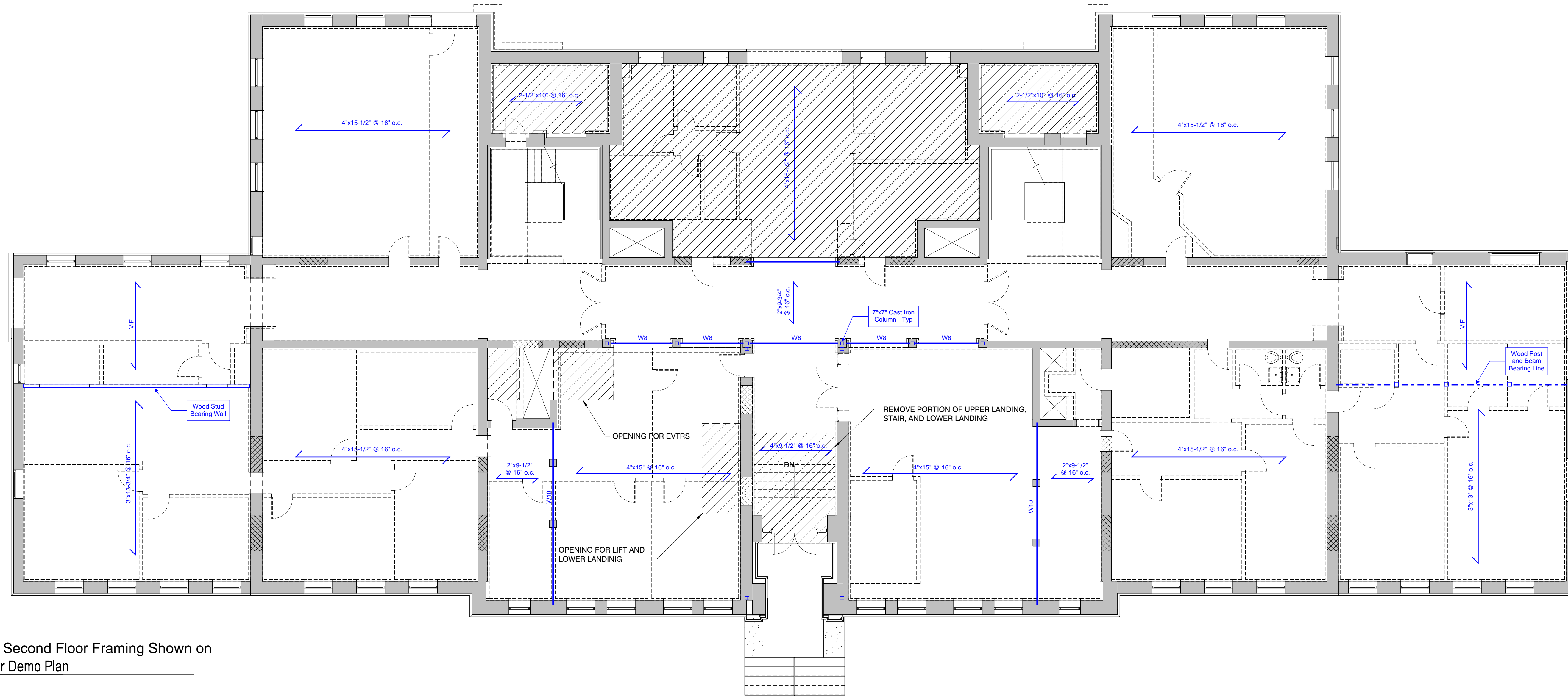




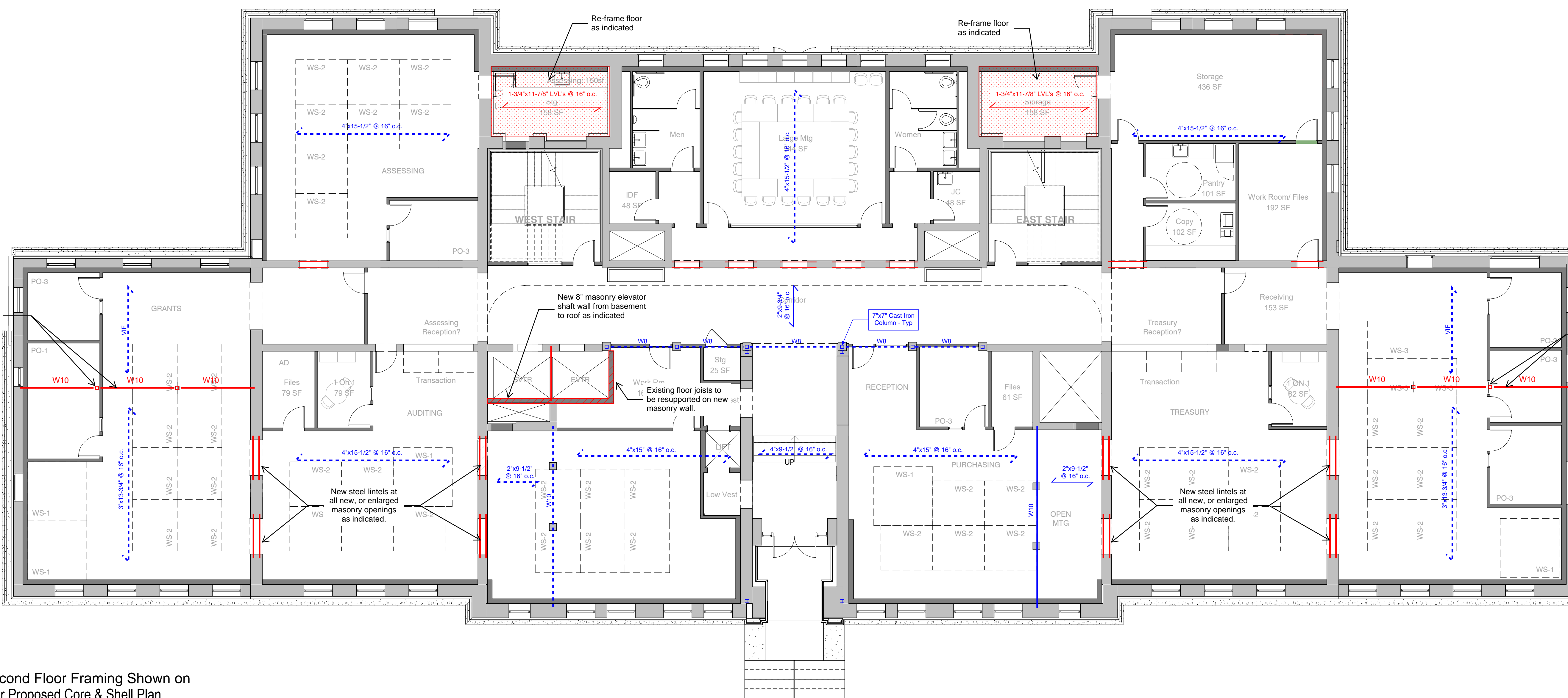




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**2**  
Existing Second Floor Framing Shown on  
First Floor Demo Plan  
1/8" = 1'-0"

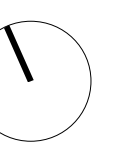


**1**  
New Second Floor Framing Shown on  
First Floor Proposed Core & Shell Plan  
1/8" = 1'-0"

**1895 Building**  
81 Highland Avenue,  
Somerville, MA 02143

**BEYER  
BLINDER  
BELLE**  
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New York, NY, 10271  
212 777 7800

KEY PLAN



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DRAWING TITLE

First Floor - Demo & Core & Shell

SCALE 1/8" = 1'-0"

DATE 10/01/21

PROJECT NUMBER 2875

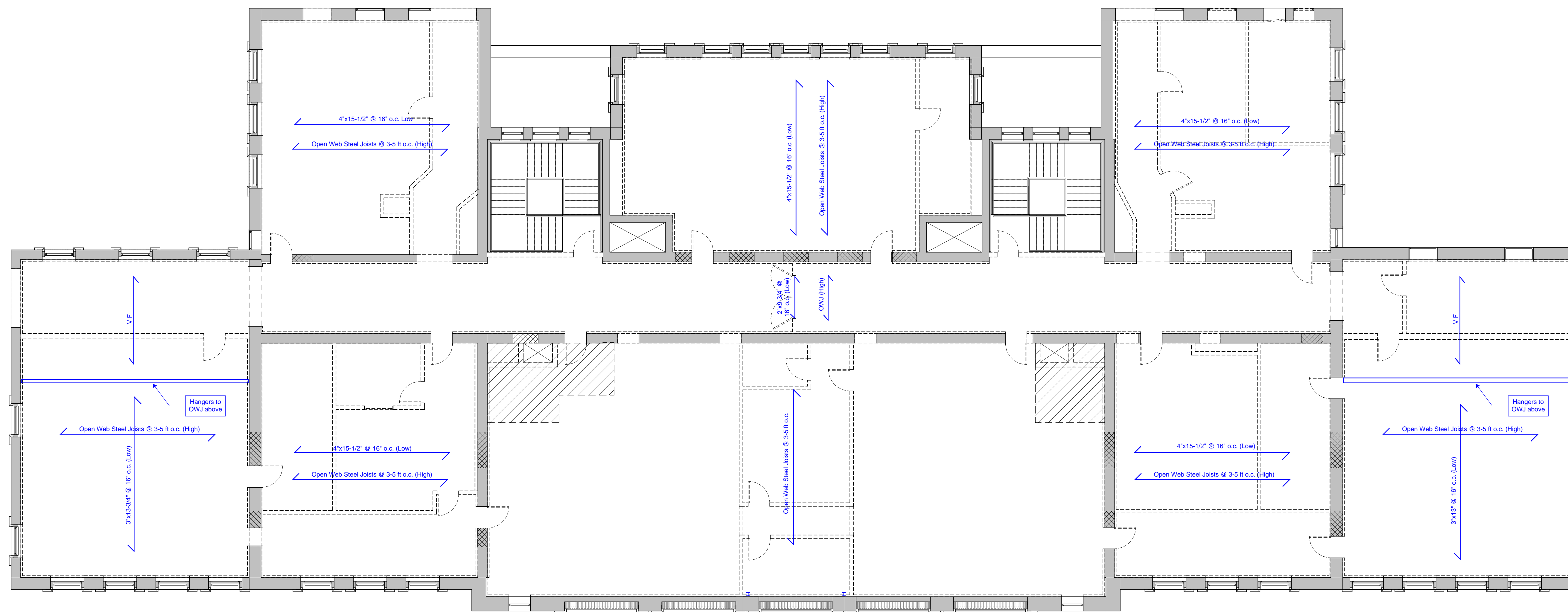
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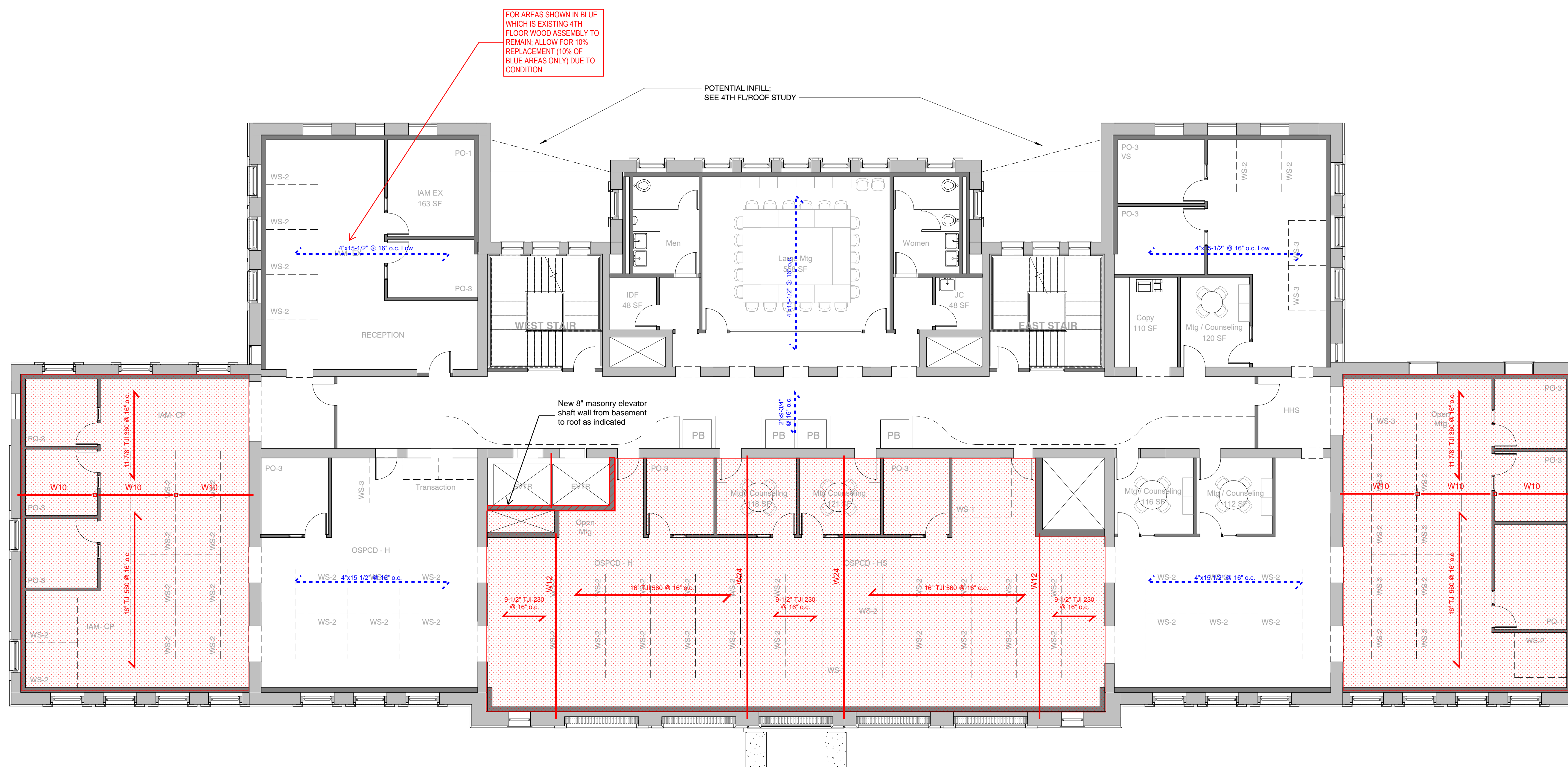
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2 Existing Ceiling/ Roof Framing Shown on  
Third Floor Demo Plan  
A-4 1/8" = 1'-0"



1 New Fourth Floor Framing Shown on  
Third Floor Proposed Core & Shell Plan  
A-4 1/8" = 1'-0"

1895 Building  
81 Highland Avenue,  
Somerville, MA 02143

**BEYER  
BLINDER  
BELLE**  
120 Broadway, 20th Floor  
New York, NY, 10271  
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**PSR Drawing Set**  
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Third Floor Demo & Core & Shell

SCALE 1/8" = 1'-0"  
DATE 10/01/21  
PROJECT NUMBER 2875  
DRAWING NUMBER

**A-4**

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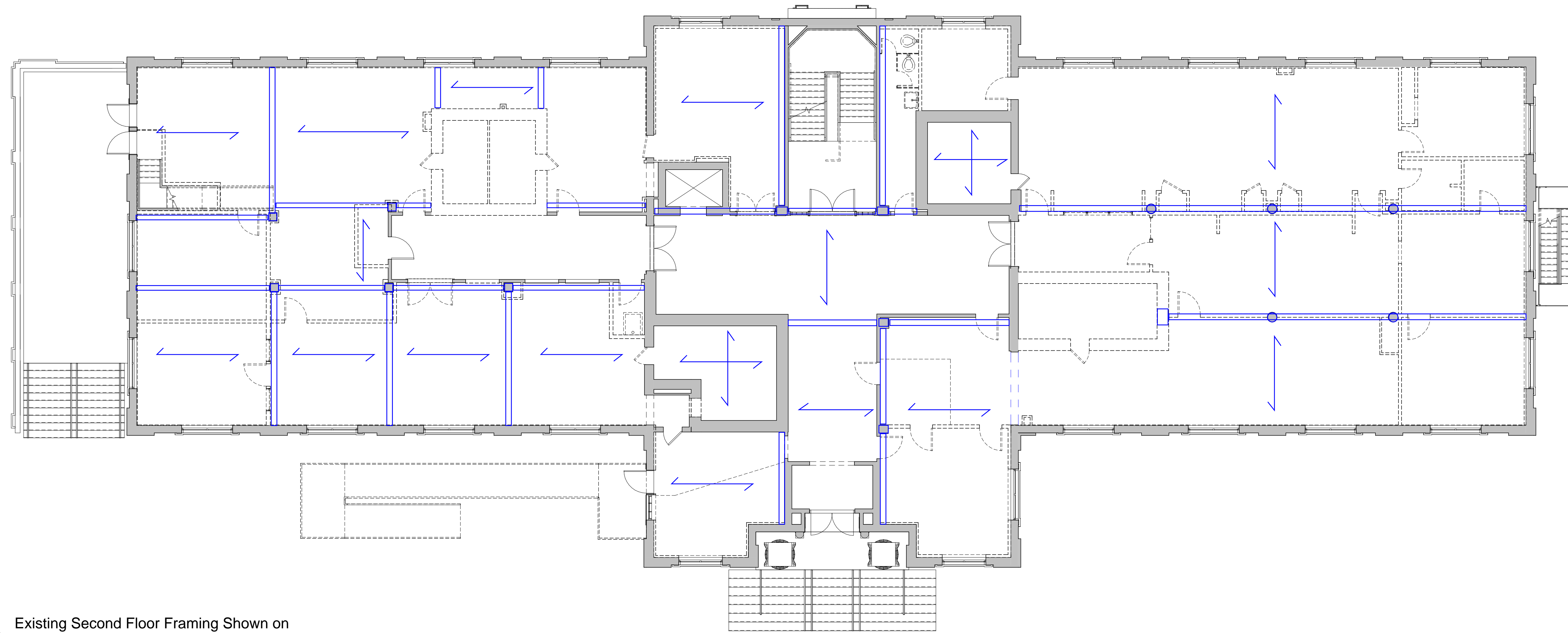




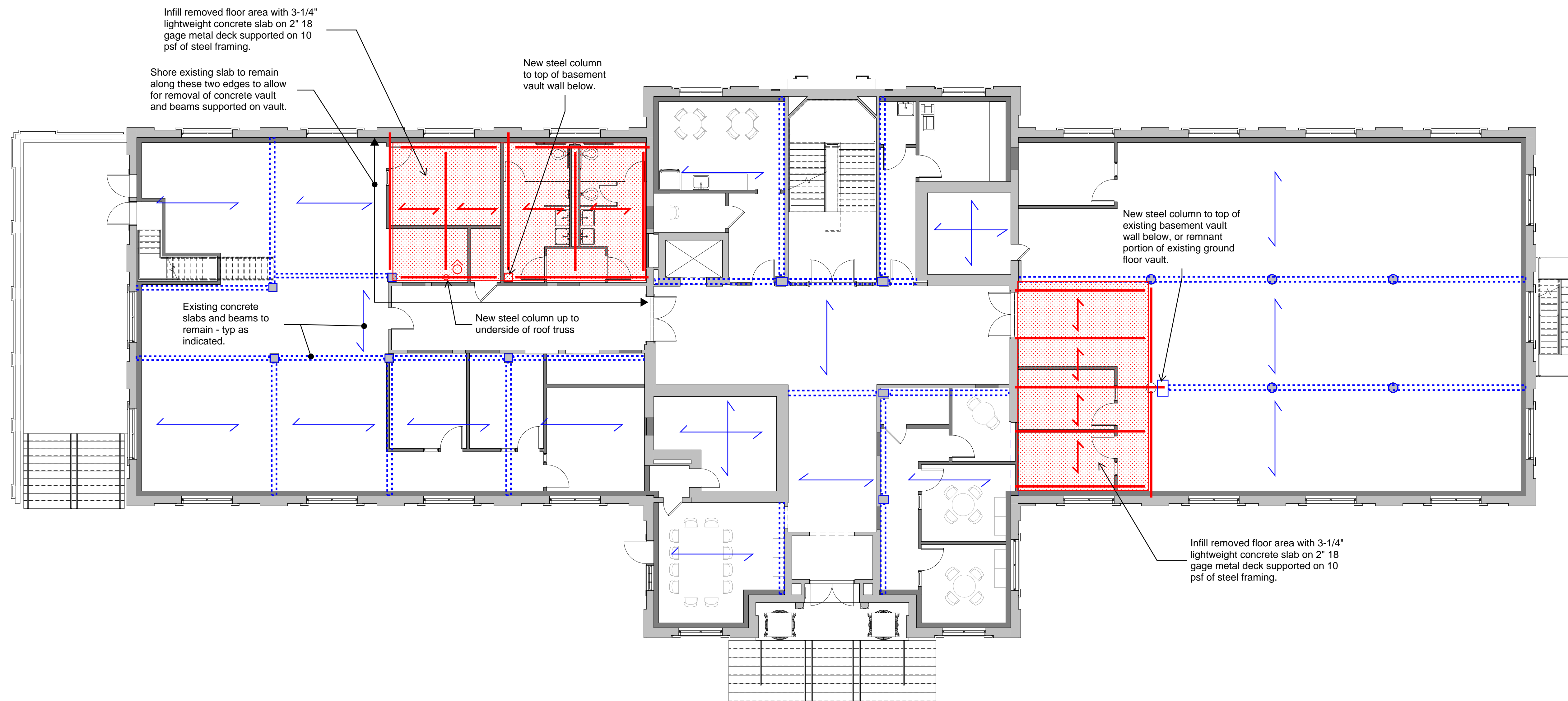




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**1**  
Existing Second Floor Framing Shown on  
First Floor Demo Plan  
A-2 1/8" = 1'-0"



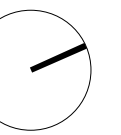
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New Second Floor Framing Shown on  
First Floor Proposed Core & Shell Plan  
A-2 1/8" = 1'-0"

**City Hall**  
93 Highland Avenue,  
Somerville, MA 02143

**BEYER  
BLINDER  
BELLE**

120 Broadway, 20th Floor  
New York, NY, 10271  
212.777.7800

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First Floor - Demo & Core & Shell

SCALE 1/8" = 1'-0"

DATE 10/04/21

PROJECT NUMBER

DRAWING NUMBER

**A-2**

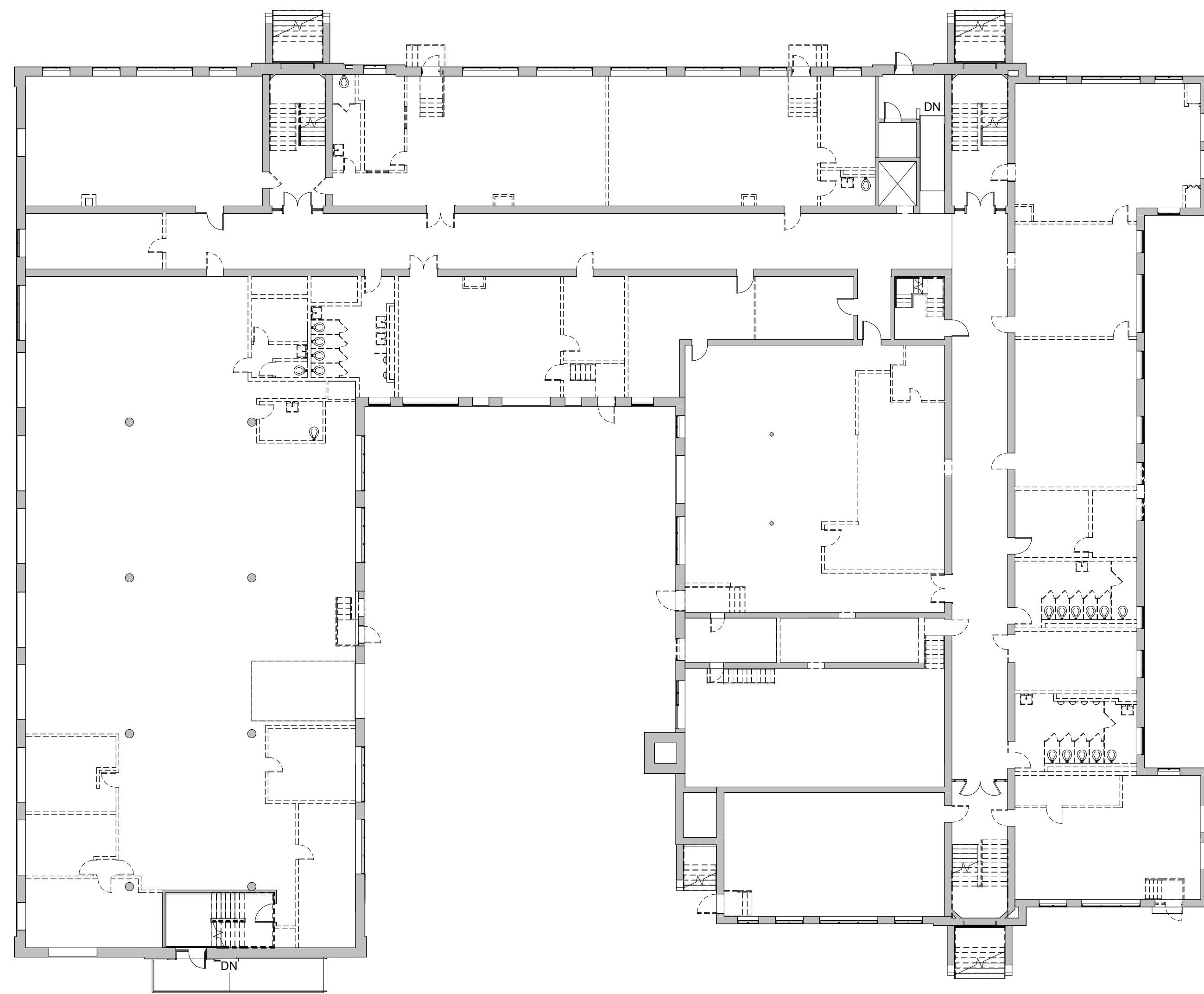
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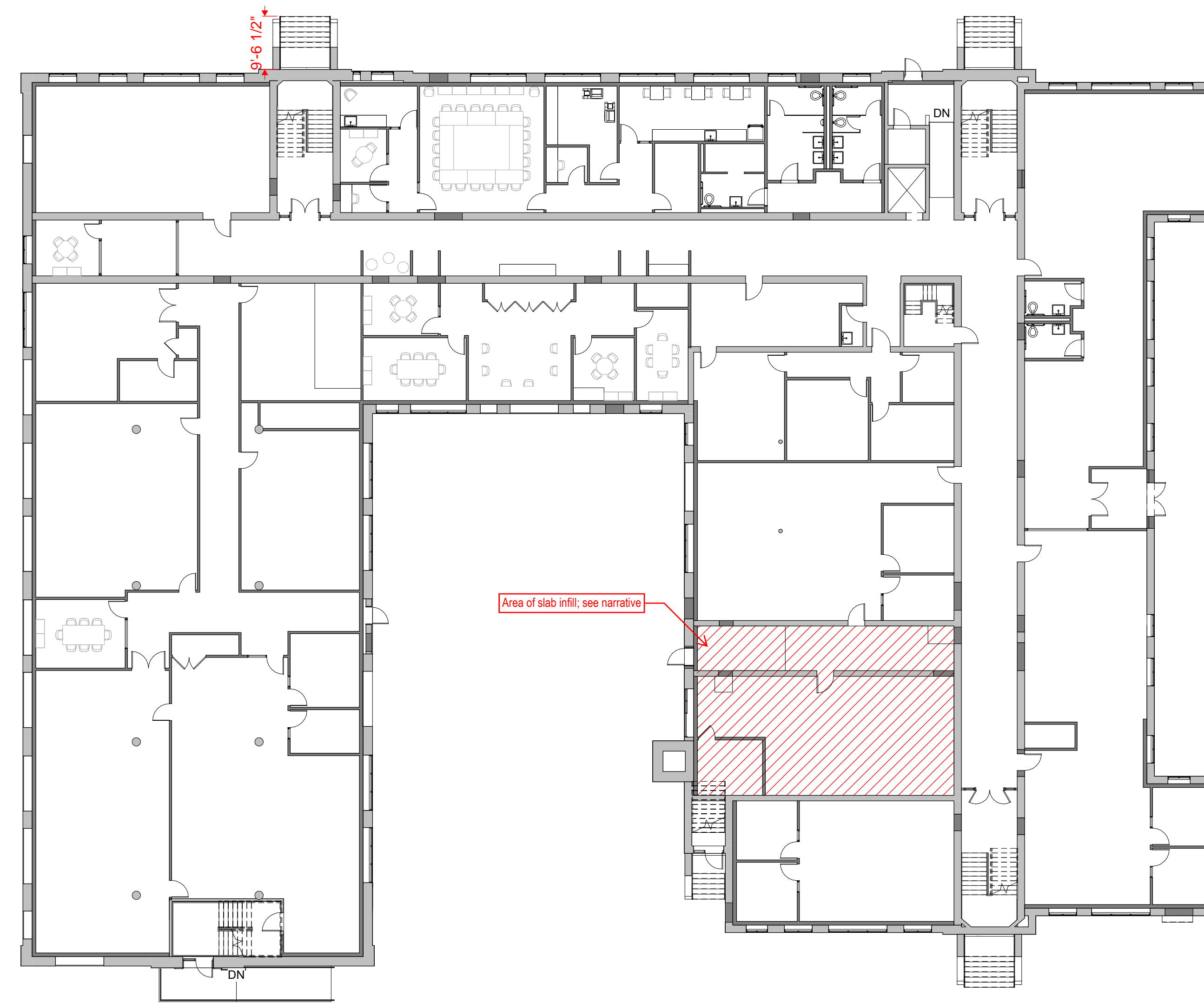




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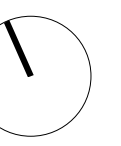


2 Ground Floor Proposed Core & Shell Plan  
A-1 1/16" = 1'-0"

**Edgerly Education Center**  
33 Cross Street  
Somerville, MA

**BEYER BLINDER BELLE**  
120 Broadway, 20th Floor  
New York, NY, 10271  
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SCALE 1/16" = 1'-0"

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PROJECT NUMBER 2875

DRAWING NUMBER

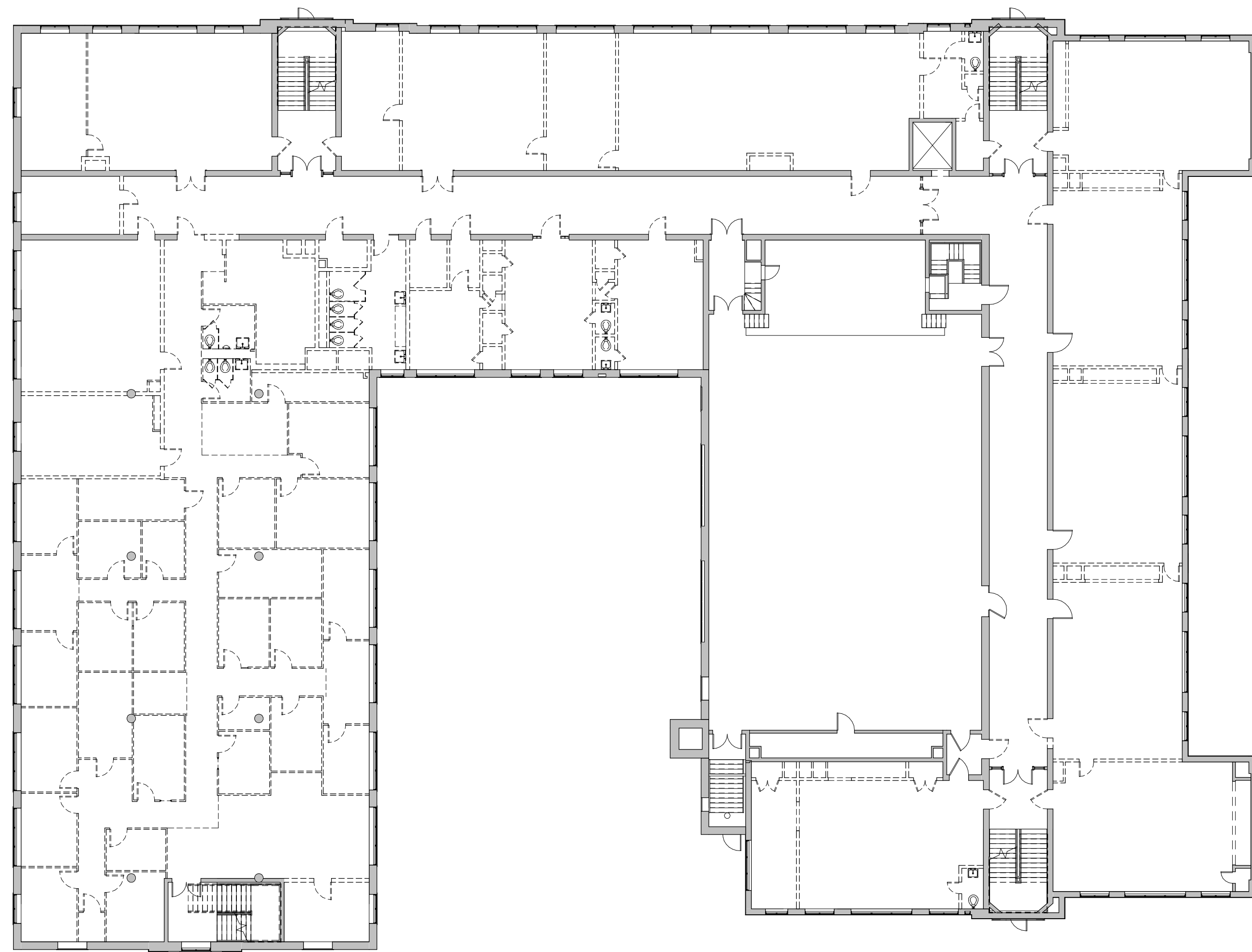
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2 First Floor Demo Plan  
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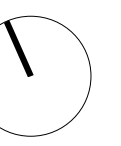


1 First Floor Proposed Core & Shell Plan  
A-2 1/16" = 1'-0"

**Edgerly Education Center**  
33 Cross Street  
Somerville, MA

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First Floor - Demo & Core & Shell

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PROJECT NUMBER 2875  
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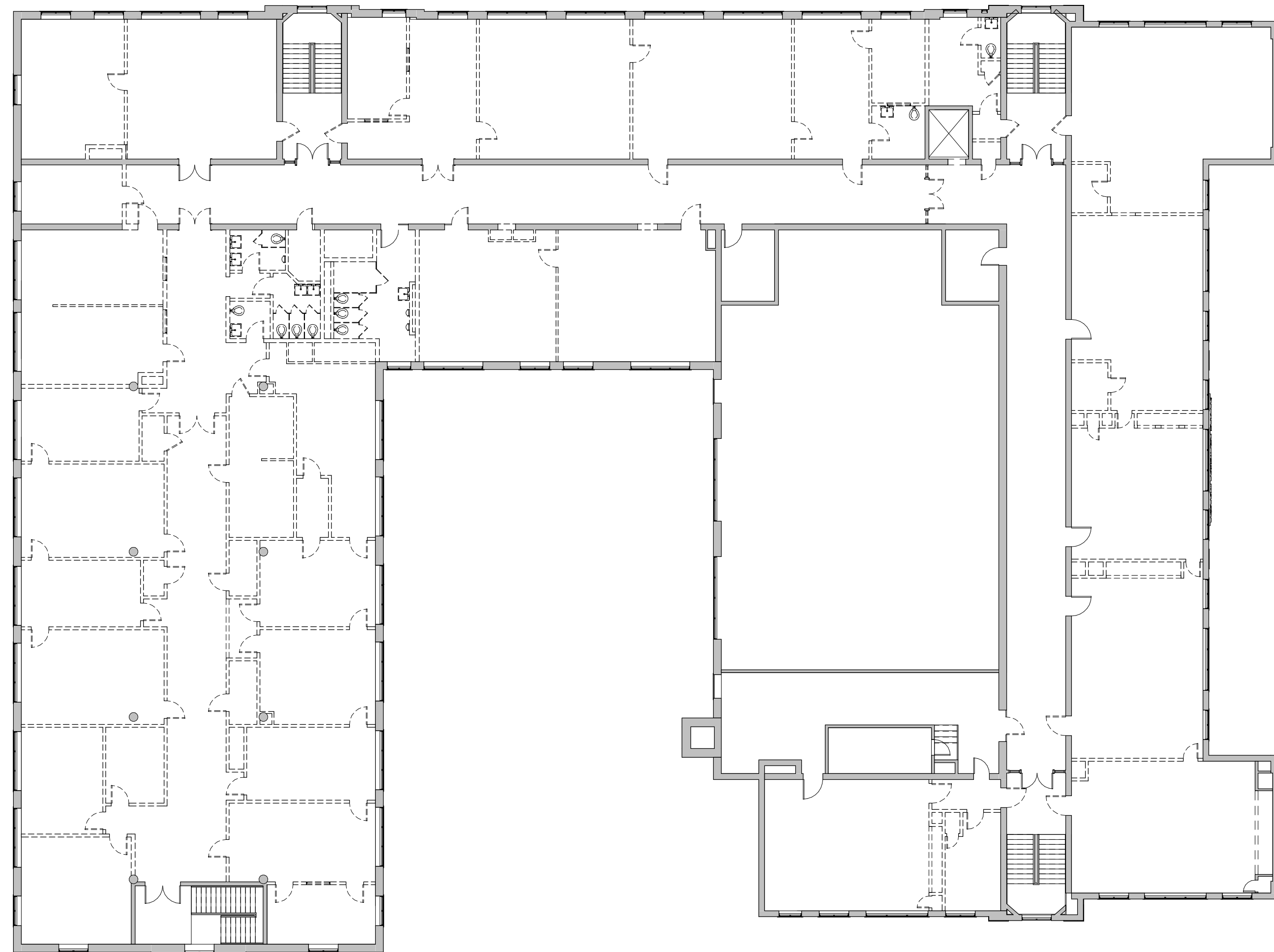
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2 Second Floor Demo Plan  
A-3 1/16" = 1'-0"



1 Second Floor Proposed Core & Shell Plan  
A-3 1/16" = 1'-0"

**Edgerly Education Center**  
33 Cross Street  
Somerville, MA

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120 Broadway, 20th Floor  
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DRAWING TITLE

Second Floor - Demo & Core & Shell

SCALE 1/16" = 1'-0"

DATE 10/04/21

PROJECT NUMBER 2875

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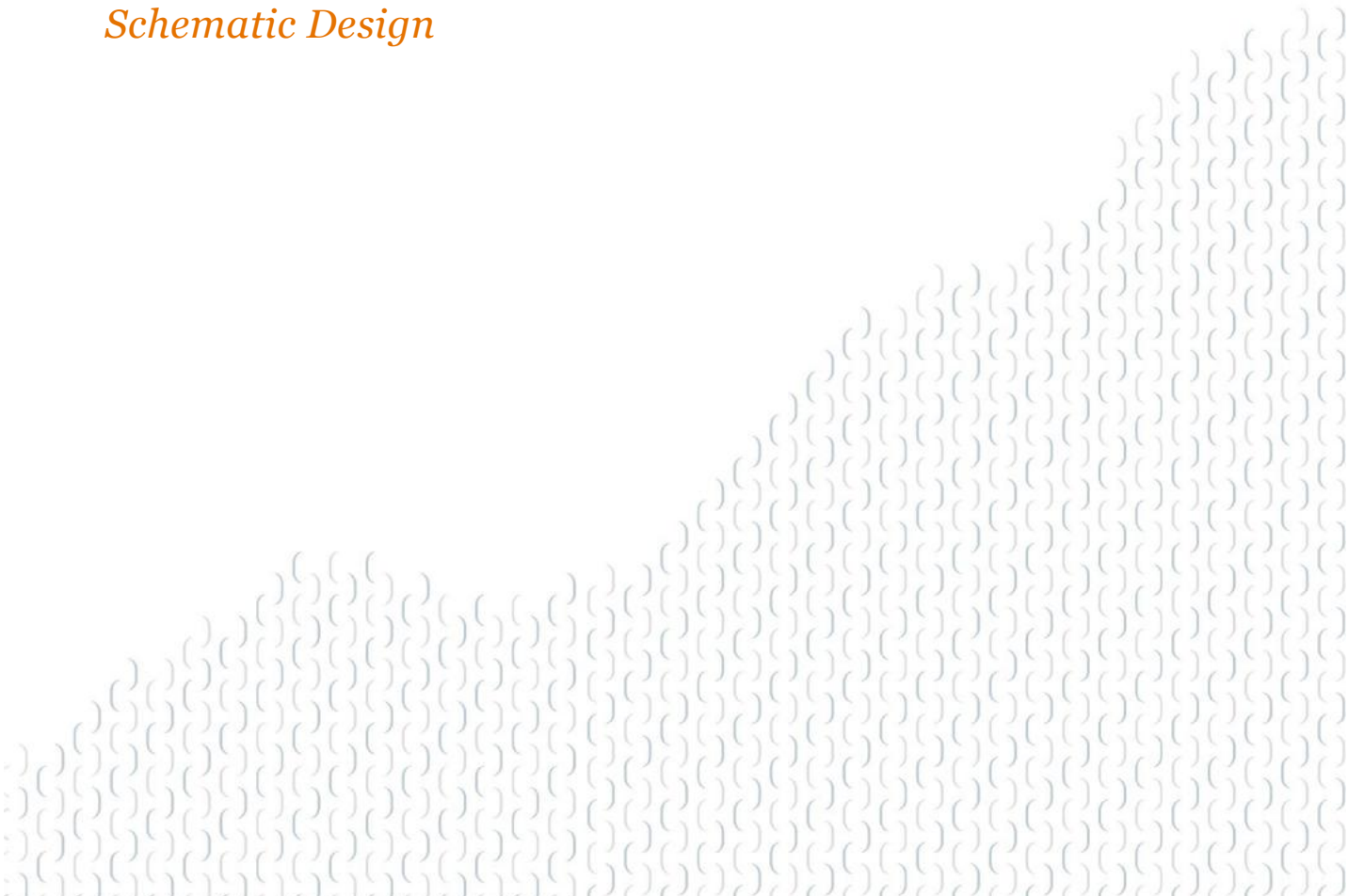






# CITY OF SOMERVILLE – 1895 BUILDING CODE COMPLIANCE APPROACH REPORT

*Schematic Design*



**JENSEN HUGHES**

Advancing the Science of Safety

**PREPARED FOR**

Beyer Blinder Belle Architects & Planners  
33 Arch Street, 17<sup>th</sup> Floor  
Boston, MA 02110

Project #: 1KTC00950  
Report #: REV 0  
Date: 11/24/2021

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[dsnow@jensenhughes.com](mailto:dsnow@jensenhughes.com)

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## 1.0 Executive Summary

The proposed renovations and addition to the existing 1895 Building at 81 Highland Street in Somerville, MA include alterations and vertical addition to accommodate the change of occupancy from an educational occupancy (decommissioned) to office building.

- + Applicable Building Code: Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)), including 780 CMR Chapter 34, Existing Structures (amended 2015 International Existing Building Code (IEBC)).
- + The project work is classified by the following types according to the Work Area Compliance Method of 780 CMR Ch. 34:
  - Repairs
  - Level 1 Alterations
  - Level 2 Alterations
  - Level 3 Alterations
  - Addition
  - Change of Occupancy
  - Historic Building
  - Relocated Building
- + Applicable Fire Code: 527 CMR 1.00 Massachusetts Comprehensive Fire Safety Code (amended version on 2015 Edition of NFPA 1 Fire Code)
- + Proposed Building Height: Approximately 65 feet (measured from grade plane to average of highest roof surface)<sup>1</sup>
- + Number of Stories: 5 stories above grade plane (4 existing plus 1 new)
- + High-rise:  Yes  No
- + Area: Approximately 75,000 gross square feet (approximately 15,000 square feet per floor)
- + Construction Type: Type IIIB
- + The building will contain (may contain) the following Occupancy Classifications as a result of the proposed renovations:

<input type="checkbox"/> A-1	<input type="checkbox"/> F-1	<input type="checkbox"/> I-1 Condition 1	<input type="checkbox"/> I-3 Condition 4	<input type="checkbox"/> R-4
<input type="checkbox"/> A-2	<input type="checkbox"/> F-2	<input type="checkbox"/> I-1 Condition 2	<input type="checkbox"/> I-3 Condition 5	<input checked="" type="checkbox"/> S-1
<input checked="" type="checkbox"/> A-3	<input type="checkbox"/> H-1	<input type="checkbox"/> I-2 Condition 1	<input type="checkbox"/> I-4	<input checked="" type="checkbox"/> S-2
<input type="checkbox"/> A-4	<input type="checkbox"/> H-2	<input type="checkbox"/> I-2 Condition 2	<input type="checkbox"/> M	<input type="checkbox"/> U
<input type="checkbox"/> A-5	<input type="checkbox"/> H-3	<input type="checkbox"/> I-3 Condition 1	<input type="checkbox"/> R-1	
<input checked="" type="checkbox"/> B	<input type="checkbox"/> H-4	<input type="checkbox"/> I-3 Condition 2	<input type="checkbox"/> R-2	
<input type="checkbox"/> E	<input type="checkbox"/> H-5	<input type="checkbox"/> I-3 Condition 3	<input type="checkbox"/> R-3	
- + Fire Protection Systems:
  - Automatic Sprinkler Protection System(s):  Yes  No
  - Fire Pump(s):  Yes  No
  - Standpipe System(s):  Class I  Class II  Class III
  - Alternative Fire Suppression System(s):  Yes  No
  - Fire Alarm System:  Yes  No
  - Emergency Voice/Alarm Communication:  Yes  No
  - Emergency Responder Communication System:  Yes  No
  - Fire Extinguishers:  Yes  No
  - Smoke Control Systems:
    - Atrium Exhaust:  Yes  No
    - Stair Pressurization:  Yes  No
    - Elevator Pressurization:  Yes  No
- + Proposed Code Alternatives:
  - No alternatives are proposed at this time.

<sup>1</sup> 780 CMR amends the definition of *high-rise building* to “buildings more than 70-feet in height above grade plane”. *Height, Building* is defined as “the distance from grade plane to the *average* height of the highest roof surface”. It is the understanding of Jensen Hughes that the height from grade plane to the average height of the pitched roof is less than 70-feet; therefore, the building is not classified as a high-rise.

## 2.0 Introduction

The proposed renovations and addition to the existing 1895 Building at 81 Highland Street in Somerville, MA include alterations and vertical addition to accommodate the change of occupancy from an educational occupancy (decommissioned) to office building.

The existing building contains approximately 60,000 gross square feet of space (15,000 square feet on each of Lower Level, Level 1, Level 2, and Level 3) on 4 stories above grade<sup>2</sup>. The building is currently unoccupied, previously utilized as an educational building, but is currently vacant. The project will position the building to be used as an office building, including meeting/conference spaces. The project will include a one-story vertical addition, resulting in the building height increasing to 5-stories above grade plane (approximately 65-feet above grade plane per diagrams provided and discussions with the Client).

The building's existing structural members consist of unprotected noncombustible and combustible elements including beams, columns, and floor/ceiling systems and noncombustible load bearing exterior walls. The existing building is equipped with a fire alarm system and is partially protected by an automatic sprinkler system.

This report is intended to serve as a reference for the design team and code enforcement officials to understand the major building code stipulations (pertaining to fire / life safety and accessibility) associated with the project. Specific trades such as structural, plumbing, electrical, mechanical, etc. and matters pertaining to energy conservation, flood hazard, and zoning compliance are not intended to be addressed by this report in detail. The information in this report is based on the following:

- + Test fit drawings dated 09/30/2021.
- + Site inspection conducted on 2/23/2021.
- + Project related discussions with the design team.

Throughout the report, code references are provided in parentheses, following requirements, to facilitate review of the provisions in detail.

As discussed below, the building will require complete automatic sprinkler protection as a result of the project. The remainder of this report assumes that the building will be fully sprinklered.

## 3.0 Applicable Codes

The Commonwealth of Massachusetts currently adopts the following codes applicable to the fire protection, life safety, and accessibility scopes of work:

- + Accessibility – Massachusetts Architectural Access Board Regulations (521 CMR) and the Americans with Disabilities Act (ADA) 2010 Standards for Accessible Design.
- + Building – Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)) including references to 780 CMR Chapter 34 (amended version of the 2015 International Existing Building Code (IEBC)).
- + Electrical – Massachusetts Electrical Code, 527 CMR 12.00 (amended version of the 2020 National Electrical Code, NFPA 70, effective January 1, 2017).
- + Elevators – Massachusetts Elevator Regulations, 524 CMR (amended version of the 2013 Edition of ASME A17.1, Safety Code for Elevators and Escalators).
- + Fire Prevention – Massachusetts Comprehensive Fire Safety Code, 527 CMR 1.00 (based on the 2015 and 2018 Editions of NFPA 1, Fire Code).
- + Mechanical – International Mechanical Code (IMC), 2015, as adopted and amended by 780 CMR.
- + Plumbing – Massachusetts Fuel Gas and Plumbing Codes, 248 CMR.

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<sup>2</sup> Based on assumption that the finished floor elevation of Level 1 is, at some point, more than 12-feet above adjacent finished ground level (780 CMR §202).



- + Energy – 780 CMR Chapter 13, which references and amends the 2018 International Energy Conservation Code (IECC) and ASHRAE 90.1-2016 and 780 CMR Appendix AA, Stretch Energy Code.
- + Other – Selected National Fire Protection Association (NFPA) Standards as referenced by 780 CMR and 527 CMR, including but not limited to:
  - NFPA 10, 2013 Edition, Standard for Portable Fire Extinguishers.
  - NFPA 13, 2013 Edition, Standard for the Installation of Sprinkler Systems.
  - NFPA 72, 2013 Edition, National Fire Alarm Code.

**This report focuses on the key issues relative to compliance with the fire protection, life safety, and accessibility provisions of the applicable codes. Other provisions of the applicable codes are noted only where pertinent to matters related to fire / life safety and accessibility.**

## 4.0 *Building Code Requirements for Existing Buildings*

### 4.1 GENERAL REQUIREMENTS

Existing buildings are subject to the requirements of 780 CMR, as outlined below:

- + The legal occupancy of any structure existing on the date of adoption of the code (780 CMR) shall be permitted to continue, without change, except as is specifically covered in 780 CMR or as is deemed necessary by the Building Official for the general safety and welfare of the occupants and the public (780 CMR §102.6).
- + Unless specifically provided otherwise in this code (780 CMR), and narrow to the provisions of 780 CMR, any existing building or structure shall meet and shall be presumed to meet the provisions of the applicable laws, codes, rules or regulations, bylaws or ordinances in effect at the time such building or structure was constructed or altered and shall be allowed to continue to be occupied pursuant to its use and occupancy, provided that the building or structure shall be maintained by the Owner in accordance with 780 CMR (780 CMR §102.6.2).
- + Means of egress, lighting, and ventilation in existing buildings, whether or not undergoing repairs, alterations, changes of occupancy, are subject to the provisions of 780 CMR §102.6.4. When applicable, the following conditions of (780 CMR §102.6.4) are susceptible to citation from the Building Official and should be corrected in all existing buildings.
  - Inadequate number of means of egress;
  - Egress components with insufficient width or so arranged to be inadequate, including signage and lighting;
  - Inadequate lighting and ventilation.

Where full compliance is not practical, the Building Official may accept compliance alternatives, engineering, or other evaluations that adequately address the deficiency.

**Jensen Hughes is not aware of any outstanding Abatement Orders or Notices of Violation issued against the building; however, it is understood that the building is currently vacant. Jensen Hughes assumes that the existing conditions we acceptable to the Building Official upon their last inspection prior to vacancy of building.**

- + All buildings and structures and all parts thereof, both existing and new, and all systems and equipment therein which are regulated by 780 CMR shall be maintained in a safe, operable and sanitary condition. All service equipment, means of egress, devices and safeguards which are required in a building or structure, or which were required by a previous statute in a building or structure, when erected, altered or repaired, shall be maintained in good working order (780 CMR §102.8). The owner shall be responsible for compliance with 780 CMR (780 CMR §102.8.1).

**Jensen Hughes is not aware of any outstanding preventative or corrective maintenance items for life safety systems. The working condition of existing life safety systems including fire alarm systems, means of egress components, and fire-rated compartmentalization must be maintained in proper working condition.**

- + The provisions of 780 CMR Chapter 34 shall apply to the repair, alteration, change of occupancy, addition to and relocation of existing buildings (780 CMR 34 §101.2).

### 4.2 CLASSIFICATION OF PROJECT WORK

The project involves the following work which has been classified by type according to the Work Area Compliance Method of 780 CMR 34 Chapter 5:

- + The project includes repairs (780 CMR 34 §502); reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.
- + The project includes removal or replacement of existing materials, elements, equipment, and/or fixtures using new materials, equipment, and/or fixtures that serve the same purpose; therefore, the requirements for Level 1 Alterations will apply in those instances (780 CMR 34 §503).
- + The project includes reconfiguration of space in most locations throughout the building. The area of reconfiguration will exceed 50 percent of the building area; therefore, the requirements for Level 3 Alterations will apply (780 CMR 34 §505).
- + The project includes selective upgrades and/or replacement of existing mechanical, electrical, and plumbing systems. Reconfigured systems will comply with the requirements of Level 2 Alterations (780 CMR §504). Note: The reconfiguration or extension of any system, or the installation of any additional equipment does not in and of itself a Create a Work Area.
- + The project includes a Change of Occupancy to Group B, Business from previous Group E, Educational (780 CMR 34 §506).
- + The project includes a vertical addition to increase the building height from 4-stories above grade plane to 5-stories above grade plane (780 CMR 34 §507).
- + The building is assumed to not be a listed historic building.

### 5.0 Use and Occupancy Classifications

The building appears to contain the following occupancy classifications and specific uses (780 CMR §302.1):

**Table 1 – Occupancy Classification**

Occupancy Classification	Uses
Group A, Assembly	Meeting/conference spaces > 50 persons or > 750 square feet
Group B, Business	Offices, assembly spaces < 50 persons or < 750 square feet
Group S-1/S-2 Storage	Low/Moderate-hazard storage

**The project will result in a Change of Occupancy to Group B, Business to allow for the office function. The project will include Group S-1/S-2, Storage occupancy to support the office activities as well as accessory Group A, Assembly spaces<sup>3</sup>.**

### 6.0 Allowable Height and Area

The height and area of the existing building are required to be analyzed for compliance with 780 CMR Chapter 5 as the project includes an Addition.

**As a result of the proposed renovations, the existing height of the building will be increased from 4-stories above grade plane to 5-stories above grade plane.**

The existing building construction most closely resembles Type IIIB, unprotected, combustible. The project will include Group B, Business occupancy<sup>4</sup> on Level 4, which is the 5<sup>th</sup> story above grade plane. Group B occupancy buildings of Type IIIB construction, protected throughout by automatic sprinkler systems are limited to maximum four (4) stories in height (780 CMR Table 504.4). **The project must modify the building construction to achieve Type IIIA, protected, combustible construction to accommodate the proposed height of 5-stories above grade plane.**

<sup>3</sup> Accessory spaces are limited to maximum 10% of the area of any floor. Group A spaces are currently shown only on Level 4 and are less than 10% of the Level 4 area.

<sup>4</sup> Accessory Group A-3, meeting/conference spaces will be located on Level 4 as well. 780 CMR §508.2.2 states that allowable building height and number of stories containing accessory occupancies is to be determined based on the main occupancy of the building. For the project, the Group B, Business occupancy is the determining occupancy classification for purposes of establishing allowable height.

## 7.0 Fire Resistance

### 7.1 STRUCTURAL FIRE RESISTANCE

The building must be upgraded so that its structural elements achieve a fire-resistance rating consistent with Type IIIA (protected noncombustible or combustable floors and columns and noncombustible exterior walls) construction, as outlined below (780 CMR Table 601).

**Table 2 – Structural Fire-Resistance Rating**

Structural Element	Hours	
Primary Structural Frame	Columns Supporting Floors	1
	Columns Supporting Roofs Only	1
	Other Primary Structural Frame Supporting Floors	1
	Other Primary Structural Frame Supporting Roofs Only	1
Bearing Walls	Exterior <sup>5</sup>	2
	Interior – Supporting Floors	1
	Interior – Supporting Roofs Only	1
Nonbearing Exterior Walls (FSD = Fire Separation Distance in feet)	FSD < 5	2 (Group S-1), 1 (Group A, B, S-2)
	$5 \leq \text{FSD} < 10$	1
	$10 \leq \text{FSD} < 30$	1
	$\text{FSD} \geq 30$	0
Floor Construction and Secondary Members	1	
Roof Construction and Secondary Members	1	

The primary structural frame includes all of the following structural members (780 CMR §202):

- + The columns;
- + Structural members having direct connections to columns, including girders, beams, trusses and spandrels;
- + Members of the floor construction and roof construction having direct connections to columns; and
- + Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading, whether or not the bracing member carries gravity loads.

Secondary members include the following structural members that are not part of the primary structural frame (780 CMR §202):

- + Structural members not having direct connections to the columns;
- + Members of the floor construction and roof construction not having direct connection to the columns; and
- + Bracing members other than those that are part of the primary structural frame.

### 7.2 FIRE-RESISTANCE RATED SEPARATIONS

New or reconfigured rooms and spaces listed in the following table are required to be enclosed / separated by fire barriers (FB).

<sup>5</sup> Not less than fire-resistance rating required based on fire separation distance for non-load bearing exterior walls.

**Table 3 – Fire-Resistance Rated Separations**

Room or Space	Code Reference	Enclosure Fire Resistance
Shafts connecting three stories or less	780 CMR §713.4	1-Hour FB
Shafts connecting four or more stories	780 CMR §713.4	2-hour FB
Non-sprinklered electrical rooms	NFPA 13 §8.15.11.3	2-Hour FB
Furnace room where any piece of equipment is over 400,000 BTU/hour input	780 CMR Table 509	1-Hour FB
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	780 CMR Table 509	1-Hour FB
Emergency electrical room	NFPA 70, 700-10(D)(2)	2-Hour FB
Elevator machine rooms, control rooms, control spaces and machinery spaces	780 CMR §3005.4	Rating of hoistway <sup>6</sup>
Electrical room containing a transformer		
- Transformer < 112 ½ kV	NFPA 70 §450.22	Noncombustible
- Transformer > 112 ½ kV	NFPA 70 §450.22	1-Hour FB
- Transformer > 35,000 volts	NFPA 70 §450.42	3-Hour FB <sup>7</sup>
- Eversource transformer vault	Eversource Specification	3-Hour vault

### 7.3 OPENING PROTECTIVES

Doors or other openings in enclosures/separations are required to be protected as follows (780 CMR §716):

- + 1-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 45-minute fire protection rating (1-hour fire protection rating when used in 1-hour shaft and exit enclosures).
- + 2-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 90-minute fire protection rating.
- + 3-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 180-minute rated.

### 7.4 DUCT AND AIR TRANSFER OPENINGS

New duct and air transfer openings through rated elements or existing openings through extended shaft enclosures must comply with 780 CMR §717.

## 8.0 Vertical Openings

All existing vertical openings are required to comply with 780 CMR 34 §701.2, §801.3, §803.2, §903.1 and all new vertical openings or extended existing vertical openings are required to comply with 780 CMR §712.1. The following sections outline the significant vertical openings located in the building.

### 8.1 NEW VERTICAL OPENINGS

Any new openings through a floor/ceiling assembly must be protected by a shaft enclosure as required by 780 CMR §712.1, unless one of several alternatives (exceptions) are employed according to 780 CMR §712.1.2 through §712.1.16.

Two-story, unenclosed vertical openings are permitted as follows (780 CMR §712.1.9):

- + Does not connect more than two stories;

<sup>6</sup> If the machine room has no openings to and does not abut the hoistway, the machine room fire resistance rating need not be more than 1-hour.

<sup>7</sup> Where transformers are protected with automatic sprinklers, water spray, or carbon dioxide, this rating may be reduced to 1-hour with ¾-hour opening protectives (NFPA 70, 450.42 Exception).

- + Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments;
- + Is not concealed within the construction of a wall or a floor/ceiling assembly; and
- + Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

Vertical openings containing unenclosed exit access stairways and ramps are permitted according to 780 CMR §712.1.12 and §1019.3, Ex. 1, as follows:

- + Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories must not be open to other stories (780 CMR §1019.3, Ex. 1).

Otherwise, the vertical opening(s) is required to be designed as an atrium or protected by a shaft enclosure.

**All new or extended vertical openings will be designed as shaft enclosures complying with 780 CMR §712.1. Since the stair enclosures and elevator hoistways are being extended to serve the new Level 4 space, the entire enclosures must be upgraded, as necessary, to achieve minimum 2-hour fire resistance rating.**

## 9.0 Exterior Walls

The change of occupancy to Groups B and S-1/S-2 result in a change to a higher risk category, assuming a non-separated mixed-use approach (driven by Group S-1). The result is that existing exterior walls must have ratings and openings in accordance with the new construction provisions of 780 CMR (780 CMR 34 §1012.6.1). All new exterior walls around Level 4 must comply with 780 CMR.

780 CMR regulates the extent to which protected and unprotected openings are permitted in the exterior walls of a building's façade based on the fire separation distance (780 CMR §602 and 780 CMR §705.8). The fire separation distance (FSD) is measured perpendicularly from the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (780 CMR §202.1). The table below lists the permissible percentage of unprotected openings in a fully sprinklered building, based on the fire separation distance measured along each exterior wall. The percentage of openings are shown as a percentage of the total area of the exterior wall, evaluated per story.

**Table 4 – Limits for Openings in Exterior Walls**

Fire Separation Distance (ft)	% of Allowable Openings
0 to < 3	Not Permitted
3 to < 5	15%
5 to < 10	25%
10 to < 15	45%
15 to < 20	75%
20 or greater	Unlimited

## 10.0 Interior Finish

### 10.1 INTERIOR WALL AND CEILING FINISH

All interior wall and ceiling finishes (new and existing) must comply with 780 CMR §803 for new construction (780 CMR 34 §1012.3, 780 CMR §803).

Where interior wall and ceiling finishes are required to comply with the requirements of 780 CMR §803, the requirements are determined by the occupancy use classification of the space. The classification requirements for interior wall and ceiling finish, when tested in accordance with ASTM E84 or UL 723 are as follows (780 CMR §803.1.1):



**Table 5 – Interior Finish Classifications**

Interior Finish Classification	Flame Spread Index	Smoke Developed Index
Class A	0 – 25	0 – 450
Class B	26 – 75	0 – 450
Class C	76 – 200	0 – 450

The following table summarizes the interior finish requirements applicable to this project (780 CMR Table 803.11).

**Table 6 – Interior Finish Requirements for Fully Sprinklered Building**

Group	Exit Enclosures and Exit Passageways	Corridors	Rooms and Enclosed Spaces
Group A-3, Assembly	Class A or B	Class A or B	Class A, B or C
Group B, Business	Class A or B	Class A, B or C	Class A, B or C
Group S-1/S-2, Storage	Class A, B or C	Class A, B or C	Class A, B or C

Class C interior finish materials are permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire blocked as required by 780 CMR §803.13.1 (780 CMR Table 803.11 Note a).

## 10.2 INTERIOR FLOOR FINISH

New interior floor finish, including new carpeting used as an interior floor finish material, must comply with 780 CMR §804 (780 CMR 34 §702.2).

New traditional floor coverings such as wood, vinyl, terrazzo, and other resilient floor coverings (not comprised of fibers) are allowed throughout the building (780 CMR §804.1, Exception).

New interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by partitions extending from the floor to the underside of the ceiling must withstand a minimum critical radiant flux not less than Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR §804.4.2). Interior floor finishes are not required to be tested in accordance with NFPA 253 (780 CMR §804.3).

## 10.3 DECORATIVE MATERIALS AND TRIM

All newly installed decorative materials and trim must comply with 780 CMR §806 (780 CMR 34 §702.3).

Note that fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes must be considered interior finish and cannot be considered decorative materials or furnishings (780 CMR §806.3).

The permissible amount of noncombustible decorative materials and trim is not limited (780 CMR §806.2).

Curtains, draperies, fabric hangings and similar combustible decorative materials suspended from walls or ceilings must meet the criteria of 780 CMR §806.4 and 527 CMR / NFPA 1 §12.6.2 when tested in accordance with NFPA 701 and must not exceed 10 percent of the specific wall or ceiling area to which such materials are attached (780 CMR §806.3; 527 CMR / NFPA 1 §12.6.2).

Foam plastics, whether exposed or used in conjunction with a textile or vinyl facing or cover, must not be used as interior trim except as provided in 780 CMR §806.5 or §2604.2 (780 CMR §801.8, §806.5).

Material used as interior trim, other than foam plastic, must have a minimum Class C flame spread and smoke-developed rating index when tested in accordance with ASTM E84 or UL 723 as described in 780 CMR §803.1.1 (780 CMR §806.7).

Combustible trim, excluding handrails and guardrails, must not exceed 10 percent of the specific wall or ceiling area in which it is attached (780 CMR §806.7).

Note that alternatively the interior floor-wall base that is 6 inches or less in height is permitted to be Class II material tested in accordance with NFPA 253 (ASTM E648) (780 CMR §806.8).

## 11.0 Means of Egress

To date, Jensen Hughes is not aware of any active citations or abatement orders that have been issued for the building. As a result, continued use of the facility is permitted so long as the means of egress, lighting and ventilation systems are maintained appropriately throughout the building per 780 CMR §102.6.4. Additionally, areas undergoing renovations and change of occupancy are subject to compliance with the means of egress provisions of 780 CMR 34, where applicable.

**Means of egress from the newly created space on Level 4 must comply fully with the provision of 780 CMR.**

The following key requirements are provided as a reference to ensure the building's means of egress are properly maintained or modified.

### 11.1 OCCUPANT LOAD

In the absence of fixed seating, the occupant load of each space and each story of the building is determined using the greater of the following (780 CMR §1004.1.2):

- + Occupant load calculations using factors prescribed by 780 CMR Table 1004.1.2 (refer to following table), or
- + The actual number of occupants who will use each space.

Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, is permitted to be used in the determination of the design occupant load (i.e., posted occupant load) (780 CMR §1004.1.2, Exception).

The table below details the occupant load factors used within the building (780 CMR Table 1004.1.2).

**Table 7 – Occupant Load Densities**

Use / Function	ft <sup>2</sup> per occupant
Assembly (Standing Room)	5 net
Assembly (Chairs)	7 net
Assembly without fixed seats (Tables and Chairs)	15 net
Office areas	100 gross
Industrial areas	100 gross
Accessory storage / MEP	300 gross

Where the actual number of occupants in a room, space or floor exceeds the calculated occupant load from the factors in the table above, the actual number of occupants must be used. Where the actual number of occupants in a room, space or floor is less than the calculated occupant load, that lower occupant load may only be used where approved by the building official (780 CMR §1004.2).

**The occupant load will be determined in accordance with above.**

### 11.2 EGRESS CAPACITY

The required egress capacity for the building and rooms/areas is determined using egress capacity factors and the occupant load being served. The following egress capacity factors are applicable to this project as the building is not expected to include an emergency voice/alarm communication system (780 CMR §1005.3):

- + Level egress elements, including ramps: 0.20 inch per occupant
- + Exit stairways: 0.30 inch per occupant

Where egress from floors above and below converge at an intermediate story or landing, the capacity of the means of egress from the point of convergence will not be less than that calculated by the sum of the two floors (780 CMR §1005.6). Multiple means of egress must be sized such that the loss of any one means of egress will not reduce the available capacity or width to less than 50 percent of the required capacity or width (780 CMR §1005.5).

**Each floor is served by two exit stairway enclosures, East and West stairs. The stairs each have a calculated exit capacity of 160-people, limited by 32-inch clear width doors, for a total per-floor occupant load of 320-people. It should be noted that the Lower Level and Level 1 are additionally served by separate doors to the exterior. The**

result is that the exit capacity on these levels is increased by 340-people, for a total of 660-people for the Lower Level and Level 1.

Convergence of Level 2 and the Lower Level in the East and West stairs must be considered when evaluating means of egress for those levels.

### 11.3 NUMBER OF EXITS

Each space in the building is required to have access to at least two exits or exit access doorways where either the design occupant load exceeds a set maximum value based on occupancy (refer to table below) or the common path of travel limit for that occupancy is exceeded (780 CMR Table 1006.2.1). Where these values are exceeded, at least two exits or exit access doorways are required to serve a space.

**Table 8 – Maximum Occupant Load for Single Means of Egress**

Occupancy	Maximum Occupant Load
Group A-3	49
Group B	49
Group S-1/S-2	29

Each story of the building must have access to the number of exits outlined in the following table. If the occupant load of a story exceeds 500 occupants, access to three exits is required (780 CMR Table 1006.3.1).

**Table 9 – Exits Per Story**

Number of Occupants	Minimum Required Number of Exits
500 or less	2
501 to 1,000	3
Greater than 1,000	4

The required exits (i.e., exit or exit access doors) must be separated by a distance not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served (780 CMR §1007.1.1, Ex. 2). This dimension is measured in a straight line between exit doors or exit access doorways.

### 11.4 EXIT DISCHARGE

Exits are required to discharge directly to the exterior either at grade or at a point that will provide direct path of egress travel to grade. The exit discharge is not permitted to reenter the building (780 CMR §1028.1), except:

- + Not more than 50% of the number and required capacity of interior exit stairways is permitted to egress through areas on the level of exit discharge provided the following conditions are met:
  - Discharge from the interior exit stairway enclosure is provided with a free unobstructed path of travel to an exterior exit door such that the exit door is readily visible and identifiable from the point of termination of the exit enclosure;
  - The entire area of the level of exit discharge is separated from the areas below by construction conforming to the fire resistance rating of the enclosure; and
  - The egress path is protected by an approved automatic sprinkler system.

**The East stair discharges directly to the exterior via a protected exit passageway. The West stair discharges to the building interior. The path of travel from the termination of the West Stair enclosure to the door to the exterior must be separated from the Lower Level below by 2-hour fire-resistance rated construction.**

### 11.5 EXIT ACCESS TRAVEL DISTANCE

The travel distance from all rooms and spaces within the building to an exit must comply with the following table, based on the occupancy classification of the room or space (780 CMR Table 1017.2).

**Note that travel distance on exit access stairways must be included in the exit access travel distance measurement.** The measurement along stairways must be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings (780 CMR §1017.3.1).

**Table 10 – Exit Travel Distance Limitations**

<b>Occupancy</b>	<b>Maximum Travel Distance (ft)</b>
Groups A-3, S-1	250
Group B	300
Group S-2	400

### 11.6 COMMON PATH OF TRAVEL

The maximum allowable common path of egress travel will comply with the table below (780 CMR Table 1006.2.1).

**Table 11 – Common Path of Travel Limitations**

<b>Occupancy</b>	<b>Maximum Common Path of Travel (ft)</b>
Group A-3	75
Groups B, S-1/S-2	100

### 11.7 DEAD-END CORRIDORS

Where more than one exit or exit access doorway is required, the exit access will be arranged such that there are no dead-ends in corridors more than as shown in the table below (780 CMR §1020.4).

**Table 12 – Dead End Corridor Limitations**

<b>Occupancy</b>	<b>Maximum Dead End (ft)</b>
Group A-3	20
Groups B, S-1/S-2	50

A dead-end corridor can be increased beyond the prescribed values where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor (780 CMR §1020.4, Ex. 3).

### 11.8 DOORS

Doors must provide a minimum clear width sufficient for the occupant load thereof and not less than 32 inches and a minimum height of 80 inches (780 CMR §1010.1.1). When two door leaves are provided without a mullion, one leaf must provide a clear width opening of at least 32 inches.

Egress doors are required to be pivoted or side-hinged swinging type except as follows (780 CMR §1010.1.2):

- + Office areas and storage areas with an occupant load of 10 or less;
- + Revolving doors complying with 780 CMR §1010.1.4.1;
- + Power-operated doors in accordance with 780 CMR §1010.1.4.2;
- + Special purpose horizontal sliding, accordion, or folding doors complying with 780 CMR §1010.1.4.3; and
- + Manually operated horizontal sliding doors are permitted from rooms or spaces with an occupant load of 10 or less.

Doors serving the following rooms or spaces are required to swing in the direction of egress travel (780 CMR §1006.2.2.2, §1010.1.2.1, §1010.1.10):

- + Rooms or spaces with an occupant load of 50 or more;
- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices; and
- + Refrigeration machinery rooms.

Doors equipped with a latch or lock serving the following rooms or spaces are required to be provided with panic hardware or fire exit hardware (780 CMR §1010.1.10):

- + Group A occupancy rooms or spaces with an occupant load of 50 or more; and

- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices.

## 11.9 STAIRWAYS

The width of new stairways must not be less than 44 inches and must be at least wide enough to provide the required capacity to accommodate each floor's occupant load (except that stairways serving less than 50 occupants are permitted to be no less than 36 inches wide). The stair width must not decrease in the direction of travel. Exit stairs must not be used for any purpose other than egress (780 CMR §1011.2). The headroom on stairs is required to be not less than 80 inches (780 CMR §1011.3).

The treads of new stairs are required to have a minimum depth of 11 inches. New stair risers are required to have a minimum height of 4 inches and maximum height of 7 inches (780 CMR §1009.5.2). Stair dimensions will be uniform. The tolerance between the largest and the smallest treads will not exceed 3/8 inch in any flight of stairs (780 CMR §1009.5.4).

New stair tread nosing must have a curvature or bevel of not less than 1/16-inch but not more than 1/2-inch from the foremost projection of the tread. The undersides of nosings must not be abrupt. Risers must be solid and vertical or sloped under the tread above from the underside of the nosing above at an angle of not more than 30 degrees from the vertical (60 degrees from the horizontal) (780 CMR §1011.5.5; 521 CMR §27.3). Nosings must not project more than 1¼-inches beyond the tread below (780 CMR §1011.5.5.1; 521 CMR §27.3). Nosing projections of the leading edges of treads must be of uniform size, including the projections of the nosing's leading edge of the floor at the top of the flight (780 CMR §1011.5.5.2).

The minimum dimension of landings and platforms in new stairways must be at least the width of the stairway served. The landing dimension in the direction of travel is not required to exceed 4 feet when travel from one flight to the next flight is a straight run. Landings must have a width equal to the width of the stair or a door opening onto a landing, whichever is greater. Doors opening onto landings must not reduce the required landing width by more than one half at any point during the door's swing and not more than 7 inches when fully open (780 CMR §1011.6). The maximum vertical height between landings is 12 feet (780 CMR §1011.8).

**The existing stairways must be altered, as necessary to meet above, as they serve as egress from the newly created Level 4 space.**

## 11.10 RAMPS

The clear width of ramps must not be less than 36 inches and must be a minimum width of 44 inches where serving an occupant load of greater than 50 occupants, but not less than the width required for egress capacity (780 CMR §1012.5.1, §1020.2). The ramp may not reduce in width in the direction of egress travel (780 CMR §1012.5.3).

The maximum slope of a ramp must be 1 unit vertical to 12 units horizontal, equivalent to an 8.3 percent slope. The cross slope of a ramp must not exceed 1 to 48, or a 2 percent slope (780 CMR §1012.3). Ramps are required to have slip-resistant surfaces (780 CMR §1012.7.1). The maximum rise of a ramp between landings or level surfaces is 30 inches (780 CMR §1012.4).

The minimum ramp landing length and headroom must be 60 inches and 80 inches, respectively (780 CMR §1012.5.2, §1012.6.3). The slope of a ramp landing must not be more than 1 to 48 in any direction. Changes in level are not permitted (780 CMR §1012.6.1). Where changes in direction of travel occur at landings between ramp runs, the landing must have minimum dimensions of 60 inches by 60 inches (780 CMR §1012.6.4).

## 11.11 EXIT PASSAGEWAYS

Exit passageways can serve as components of an exit enclosure and must be constructed in accordance with the provisions of 780 CMR §1024.

Exit passageways must be of construction (walls, floor, ceiling) equal to the rating of the exit enclosure they serve, but not less than 1-hour.

**The project includes an exit passageway to provide access to exterior from the East stair. The passageway must be enclosed in 2-hour fire-resistance rated construction, including the floor assembly.**

## 11.12 MEANS OF EGRESS LIGHTING

In normal, non-emergency conditions, means of egress must be equipped with artificial lighting facilities to provide one (1) foot-candle intensity floor lighting continuously during the time that the building, or portion thereof, is occupied (780 CMR §1008.2).



Means of egress must be provided with artificial lighting throughout the building in accordance with the requirements of 780 CMR (780 CMR §1008.1). In the event of power supply failure, an emergency electrical system must automatically illuminate the following areas (780 CMR §1008.3.1, §1008.3.2, §1013.1.1):

- + Exit access aisles in rooms and spaces which require two or more means of egress;
- + Electrical equipment rooms;
- + Fire pump room(s);
- + Generator room(s);
- + Public restrooms with an area greater than 300 square feet;
- + Transformer vaults;
- + Exit access corridors, exit access stairways and ramps;
- + Exit stairways and exit passageways;
- + Exterior egress components at other than the level of exit discharge until exit discharge is accomplished;
- + Interior exit discharge elements, as permitted in 780 CMR §1028.1; and
- + The portion of the exterior exit discharge immediately adjacent to exit discharge doorways.

In emergency conditions, emergency power must be provided for a minimum of 120 minutes (780 CMR §1008.3, §2702.1.4). Emergency lighting facilities must provide an average initial illumination of one (1) foot-candle and a minimum at any point of 0.1 foot-candle measured at any point along the path of egress at floor level. Illumination levels are permitted to decline to 60 percent of the initial illumination levels at the end of 90-minutes. A maximum to minimum illumination ratio of 40:1 must not be exceeded (780 CMR §1008.3.4).

### 11.13 EXIT SIGNAGE

Exits and exit access doors must be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits must be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits must be marked by exit signs. Exit sign placement must be such that no point in an exit access corridor or exit passageway is more than 100 feet or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign. Exit signs are not required in rooms or areas that require only one exit or exit access. Exit signs must be internally or externally illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means must be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator (780 CMR §1013).

Additionally, a sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 must be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway or ramp, an exit passageway and the exit discharge (780 CMR §1013.4).

Transformer vaults must have additional exit signage such that the top of the sign is within 18 inches of the floor and adjacent to the opening side of the door (780 CMR §1013.1.1).

## 12.0 Fire Protection Systems

### 12.1 AUTOMATIC SPRINKLER SYSTEM

The building is currently partially sprinklered. The project Addition and significant renovation necessitate extending (and bolstering as needed) sprinkler protection to meet the provisions of 780 CMR 903.3.1.1 and NFPA 13.

**The project will include providing automatic sprinkler protection throughout the building.**

### 12.2 STANDPIPE SYSTEM

Class I<sup>8</sup> standpipe systems must be installed where the floor level of the highest story is more than 30-feet above the lowest level of fire department vehicle access.

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<sup>8</sup> Permitted where the building is fully sprinklered.

**The newly created Level 4 will be located more than 30-feet above the lowest level of fire department vehicle access and a Class I standpipe system will be provided.**

### 12.3 PORTABLE FIRE EXTINGUISHERS

Fire extinguishers must be provided throughout the building in accordance with NFPA 10, Standard for Portable Fire Extinguishers and 780 CMR §906. Extinguishers must be selected based on the anticipated hazard and classified for protection of that hazard. Fire extinguishers must be conspicuously located and readily accessible to building occupants.

### 12.4 FIRE DETECTION AND ALARM

Activation of the fire sprinkler system must activate a fire alarm system in accordance with 780 CMR §907 (780 CMR §903.4.2).

**The project will include installation of a fire alarm system designed in accordance with 780 CMR §907 and NFPA 72, throughout the building.**

## 13.0 *Emergency and Standby Power Systems*

If the building is equipped with existing emergency and/or standby power systems, they should be maintained.

Emergency power systems and standby power systems are required to be installed in accordance with 780 CMR Chapter 27 and NFPA 70, NFPA 110, and NFPA 111 (780 CMR §2701.1.2).

Where the emergency/standby power system includes a generator set inside the building, the system must be located in a separate room enclosed with 2-hour fire barriers and/or horizontal assemblies (NFPA 110). Stationary emergency and standby power generators must be listed in accordance with UL 2200 (780 CMR §2702.1.1).

Emergency power systems automatically provide secondary power within ten (10) seconds after primary power is lost. Standby power systems automatically provide secondary power within 60 seconds after primary power is lost (780 CMR §2702.1.3).

Emergency power systems and standby power systems must provide the required power for a minimum duration of 2 hours without being refueled or recharged (780 CMR §2702.1.4).

The following features/systems are required to be provided with emergency power:

- + Fire detection and alarm systems (780 CMR §907.6.2, NFPA 72)
- + Exit signs (780 CMR §1013.6.3, §2702.2.5)
- + Means of egress illumination (780 CMR §1008.3, §2702.2.11)

The following features/systems are required to be provided with standby power:

- + Elevators if serving as a component of the accessible means of egress (780 CMR §1009.4).

## 14.0 *Elevators*

It should be noted that the following requirements pertaining to elevators require all floors of the building to be accessed by elevator(s) satisfying the noted requirements.

### 14.1 PASSENGER ELEVATORS

New elevators (and existing elevators serving new levels) are required to comply with ASME A17.1, *Safety Code for Elevators and Escalators*, 2013 as adopted by 524 CMR Chapter 35.

All elevators must be equipped with Phase I and II automatic recall and Fire Department control features (780 CMR §30.00; 524 CMR 35-ASME A17.1 §2.27.3).

A two-way communication system is required at the elevator landing on each accessible floor that is one (1) or more stories above or below the level of exit discharge. The system must provide communication between each required location and a central control point location approved by the fire department. Additionally, where the central control point is not constantly attended, the system must have timed automatic telephone dial-out capability to a monitoring location or 9-1-1. The two-way communication system(s) is required to include both audible and visual signals. Directions for use of the system and other required information are required to be posted adjacent to each device (780 CMR §1009.8).

A permanent sign is required to be mounted on the head jamb of the main floor elevator entrance, which will read “MRL-CONTROL ROOM LOCATED ON --- FLOOR.” The sign is to be a minimum of ¼ inch high letters and be of a contrasting color with that of the background (524 CMR 13.03(15)).

### 15.0 Plumbing Fixtures

The Massachusetts Plumbing Code (248 CMR) regulates the number of plumbing fixtures required in buildings. The minimum number of plumbing fixtures is established by 248 CMR 10.10(18) Table 1 based on the building use and the expected population as established by the local Plumbing Inspector per 248 CMR 10.10(18)(a)(2). Typically, this population is based on the designer’s determination of the actual number of people expected within the building and such established population must not be exceeded.

The following table summarizes the plumbing fixture requirements based on 248 CMR for expected occupancies within the building:

**Table 13 – Plumbing Requirements**

Occupancy Clarification	Female Toilets	Male Toilets	Urinals	Lavatories (Sinks) Each Gender	Drinking Water Stations	Service Sink
Assembly (conference/waiting)	1 per 50	1 per 100	Up to 50% substitution	1 per 200	-	-
Business	1 per 20	1 per 25	Up to 33% substitution	1 per 50	1 per floor	1 per floor

### 16.0 Accessibility

The requirements of the 2010 ADA Standards and 521 CMR Regulations are applicable. Specific areas of the building that strictly limit access to employees only, are exempt from compliance with 521 CMR. However, these areas are still subject to the 2010 ADA Standards.

New construction, alterations, and additions are required to comply with the scoping and technical specifications of all applicable regulations, codes, and standards. In cases where there is a disparity in the scoping or technical criteria among the applicable codes and standards, the most stringent requirements shall prevail as long as these do not conflict with or provide a lower level of accessibility than is required by the other codes and standards. This section summarizes scoping criteria of each applicable code.

#### 16.1 MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (521 CMR)

In order to determine the 521 CMR accessibility compliance obligations stipulated by the proposed project work, the full and fair cash value of the existing building (building value only, exclusive of land value), must be established and compared to the construction cost of the Project work and any other work performed in the building in the previous or subsequent 36 months from the project permit date.<sup>9</sup>

According to 521 CMR, the full and fair cash value of a building is defined as:

*“The assessed valuation of a building (not including the land) as recorded in the Assessor’s Office of the municipality at the time the building permit is issued equalized at 100 percent valuation. The 100 percent equalized assessed valuation shall be based upon Massachusetts Department of Revenue’s determination of the particular city’s or town’s assessment ratio.”*

The construction cost of the renovations, plus the cost of construction from work performed in the building within the previous or next three years (if applicable), is expected to be more than 30 percent of the full and fair cash value of the building. As a result, the entire building, exclusive of employee only work areas and other tenant spaces, is required to comply fully with the new construction accessibility requirements of 521 CMR (521 CMR §3.3.2). Otherwise, variances for specific nonconforming features of accessibility to remain noncompliant may be applied for where repairs are determined by the Massachusetts

<sup>9</sup> When the work performed on a building is divided into separate phases or projects or is under separate building permits, the total cost of such work in any 36-month period shall be added together in applying 521 CMR 3.3, Existing Buildings.

Architectural Access Board (MAAB) to be impractical (“excessive cost with little benefit” or “technologically infeasible”) (521 CMR §4.1). Note that such variances granted by MAAB do not necessarily relieve the owner of their obligations to comply with applicable federal requirements, such as those found under the ADA.

**It is expected that the project costs will exceed 30% of the full and fair cash value of the building; therefore, the entire building (existing and new) must comply fully with 521 CMR. Jensen Hughes recommends that a detailed accessibility assessment of the existing building be conducted to understand inventory of required upgrades. Evaluation of this inventory will inform whether variances from the Massachusetts Architectural Access Board are necessary.**

## 16.2 ADA

Alterations to existing buildings and facilities are required to comply with the Americans with Disabilities Act (ADA). With the exception of alterations to areas of primary function, the ADA does not utilize cost thresholds as part of the scoping criteria. The ADA contains the following scoping requirements:

- + Where existing elements or spaces are altered, each altered element or space must comply with the applicable provisions.
- + Although limiting the scope of an alteration to individual elements is permitted, it should be noted that the alteration of multiple elements within a room or space might provide a cost-effective opportunity to make the entire room or space accessible.
  - Altered elements or spaces are not required to be located on an accessible route unless they are associated with a primary function area.
  - In alterations where compliance is technically infeasible, the alteration must provide accessibility to the maximum extent feasible. Any elements or spaces of the building or facility that are being altered and can be made accessible must be made accessible within the scope of the alteration.
- + An alteration that decreases or has the effect of decreasing the accessibility of a building or facility below the requirement for new construction at the time of the alteration is prohibited.
- + An alteration of an existing element, space, or area of a building or facility must not impose a requirement for accessibility greater than required for new construction.

Note that the building may include features that were constructed and potentially renovated or altered at various dates; which may have been designed under current or previous versions of ADA Standards, including the 2010 and 1991 versions. Accessible elements designed and constructed after the applicable dates of these standards that are not compliant with the applicable standard(s) at the time of construction are considered barriers to access and are a liability for the property. The ADA prohibits alterations that decrease, or have the effect of decreasing, the accessibility of a building below the requirements for new construction. Therefore, even spaces which are out of the scope of work for the proposed project, if not constructed in accordance with applicable ADA regulations and standards at the time of construction are considered barriers to access and are a liability for the property.

To date, Jensen Hughes only surveyed existing spaces within the scope of work and as affected by the scope of work to assess the general condition of the building as related to accessibility using the 2010 ADA Standards.

**All new work must comply with ADA.**

### 16.2.1 Alteration to an Area of Primary Function

An alteration that affects or could affect the usability of or access to an area of a facility that contains a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the cost and scope of such alterations is disproportionate to the cost of the overall alteration. [ADA §36.403 and ADA §35.151(b)(4)]

Per the ADA regulations, a primary function is a major activity for which the facility is intended. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors, restrooms, and parking areas are examples of areas that are not considered primary function. [ADA §36.403(a) and (b) and ADA §35.151(b)(4)(i)]

A "path of travel" as defined by ADA includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entrance to the facility, and other parts of the facility. An accessible path of travel may consist of walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps; clear floor paths through lobbies, corridors, rooms, and other improved areas; parking access aisles; elevators and lifts; or a combination of these elements. For the purposes of this ADA requirement, the term "path of travel" also includes the restrooms, telephones, and drinking fountains serving the altered area. [ADA §36.403(e) and ADA §35.151(b)(4)]

ADA §36.403(f) and (g) and ADA §35.151(b)(4)(iii) and (iv) state that alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20 percent of the cost of the alteration to the primary function area; and costs that may be counted as expenditures required to provide an accessible path of travel may include:

1. Costs associated with providing an accessible entrance and an accessible route to the altered area, for example, the cost of widening doorways or installing ramps;
2. Costs associated with making restrooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes, or installing accessible faucet controls;
3. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices, or installing a text telephone;
4. Costs associated with relocating an inaccessible drinking fountain.

To determine the threshold of disproportionality for expenditures to provide an accessible path of travel, calculate the cost to alter the primary function area not including the above items, and multiply that alteration cost by 20 percent. When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs (in other words, the full 20 percent must be spent on path of travel upgrades unless there happen to be no, or not enough, issues requiring correction). In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance;
2. An accessible route to the altered area;
3. At least one accessible restroom for each sex or a single unisex restroom;
4. Accessible telephones;
5. Accessible drinking fountains; and
6. When possible, additional accessible elements such as parking, storage, and alarms.

**It is Jensen Hughes' understanding that the scope of work of the project will address path of travel requirements.**

### **16.2.2 Readily Achievable Barrier Removal**

ADA Title III regulations, Part 36, Subpart B, §36.304, Removal of Barriers, requires removal of architectural barriers in existing places of public accommodation constructed or altered prior to the ADA, including communication barriers that are structural in nature, where such removal is readily achievable. This means that at places of public accommodation, non-compliant elements that were installed prior to the effective date of ADA, or elements that were not regulated by the 1991 Standards but which are now regulated by current ADA Standards, are subject to the requirement for readily achievable barrier removal – whether or not alterations or additions are otherwise being undertaken at the facilities. Readily achievable is defined as “easily accomplishable and able to be carried out without much difficulty or expense.” Jensen Hughes has not made a determination of what actions are readily achievable – this is the responsibility of the public accommodation.

Although all accessibility deficiencies should be considered critical, it is understood that the public accommodation's finances or business operations may result in the need to prioritize and phase the removal of barriers. ADA Title III regulations, Part 36, Subpart B, §36.304 prioritizes the measures potentially taken to comply with barrier removal. Accessible approach and entrance (providing access to a place of public accommodation from public sidewalks and parking) is the highest priority; access to goods and services is the second highest priority; Access to public toilet rooms is the third highest priority; and the fourth highest priority are those other measures necessary to provide access to the other facilities, privileges, advantages, or accommodations of the place of public accommodation. Per §36.104, “Readily achievable means easily accomplishable and able to be carried out without much difficulty or expense.” Please note that it is the facility owner's/operator's responsibility to



determine on a case-by-case basis whether removal of a barrier is readily achievable. In determining whether an action is readily achievable, factors to be considered include [§36.301]:

- + The nature and cost of the action;
- + The overall financial resources of the site or sites involved; the number of persons employed at the site; the effect on expenses and resources; legitimate safety requirements necessary for safe operation, including crime prevention measures; or any other impact of the action on the operation of the site;
- + The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to any parent corporation or entity;
- + If applicable, the overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities; and
- + If applicable, the type of operation or operations of any parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity.”

If it is determined that the measures required to remove a barrier and create full compliance would not be readily achievable, then a public accommodation may take other readily achievable measures to remove the barrier that do not fully comply with the specified requirements.

Commentary found in the Title III Regulations notes that there is no given or expected time frame associated with barrier removal, however there is an expectation that a good faith and ongoing effort will be made to remove existing barriers to accessibility.

It is Jensen Hughes’ understanding that the scope of work will address existing barriers. However, in the case that the scope of work does not include all spaces and elements of the building, Jensen Hughes recommends that the facility owner/operator create an “implementation plan” which lists existing barriers in the facility, estimates the cost associated with removing each barrier, and states a time frame in which the facility expects it will be readily achievable to remove each barrier. Having such a document on file and actually following through with the phased implementation of barrier removal would help to demonstrate that the facility is making a good faith effort to improve accessibility over time.

## *17.0 Alternative Compliance*

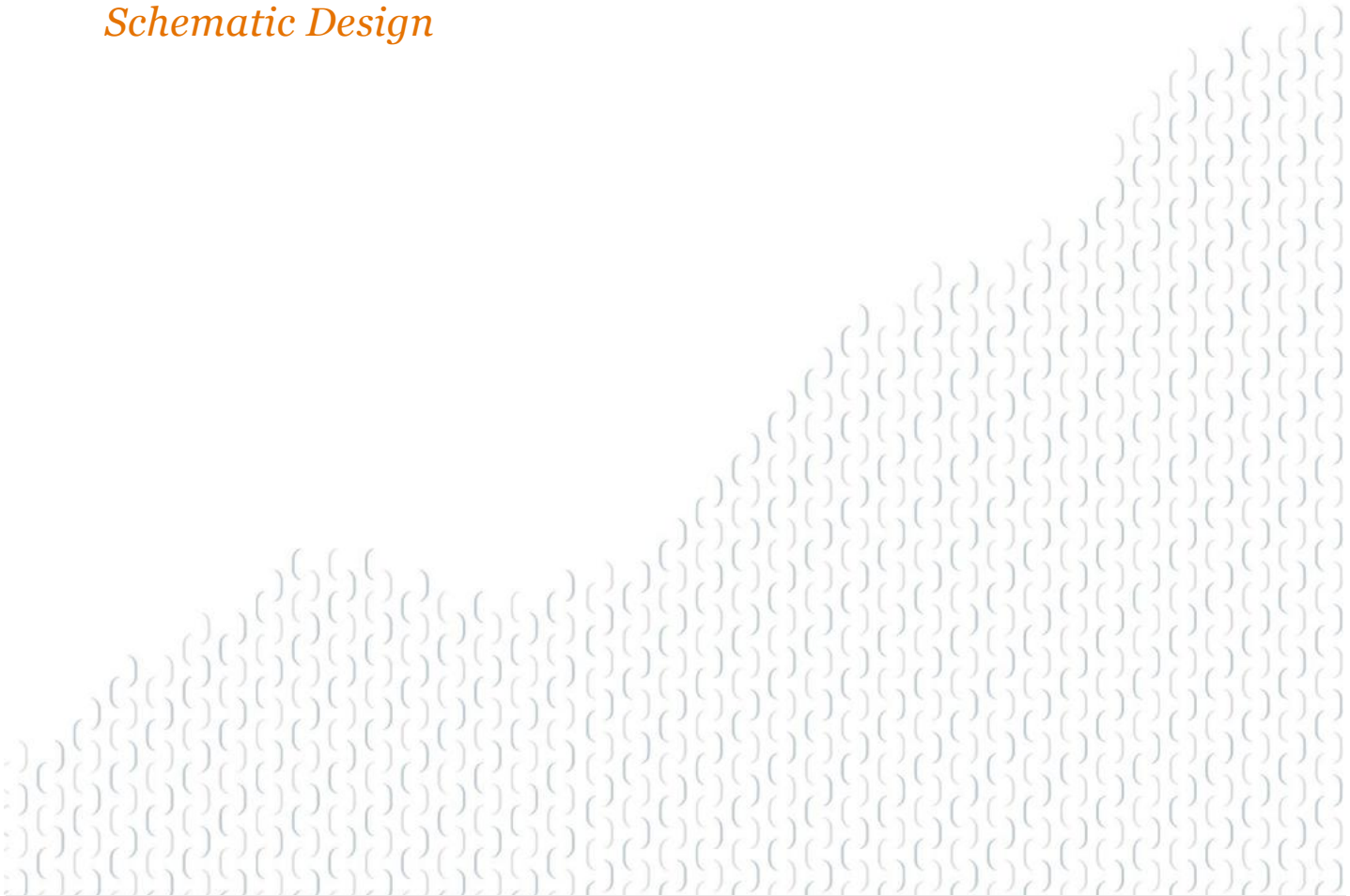
### 17.1 PROPOSED ALTERNATE METHODS OF COMPLIANCE FOR 780 CMR

Pursuant to 780 CMR §104.10, the following alternative(s) to prescriptive compliance with 780 CMR will be presented to the Authority Having Jurisdiction for approval:

- + None identified at this time.

# CITY OF SOMERVILLE – CITY HALL CODE COMPLIANCE APPROACH REPORT

*Schematic Design*



**JENSEN HUGHES**

Advancing the Science of Safety

**PREPARED FOR**

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## 1.0 Executive Summary

The proposed renovations to the existing City Hall building located at 93 Highland Street in Somerville, MA include alterations to accommodate the proposed tenant improvements.

- + Applicable Building Code: Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)), including 780 CMR Chapter 34, Existing Structures (amended 2015 International Existing Building Code (IEBC)).
- + The project work is classified by the following types according to the Work Area Compliance Method of 780 CMR Ch. 34:
  - Repairs
  - Level 1 Alterations
  - Level 2 Alterations
  - Level 3 Alterations
  - Addition
  - Change of Occupancy
  - Historic Building
  - Relocated Building
- + Applicable Fire Code: 527 CMR 1.00 Massachusetts Comprehensive Fire Safety Code (amended version on 2015 Edition of NFPA 1 Fire Code)
- + Proposed Building Height: Approximately 61.5 feet (measured from grade plane to highest roof surface)<sup>1</sup>
- + Number of Stories: 4 stories above grade plane
- + High-rise:  Yes  No
- + Area: Approximately 34,800 gross square feet (not more than 10,100 square feet per story)
- + Construction Type: Type IIIB
- + The building will contain (may contain) the following Occupancy Classifications as a result of the proposed renovations:
  - A-1
  - A-2
  - A-3
  - A-4
  - A-5
  - B
  - E
  - F-1
  - F-2
  - H-1
  - H-2
  - H-3
  - H-4
  - H-5
  - I-1 Condition 1
  - I-1 Condition 2
  - I-2 Condition 1
  - I-2 Condition 2
  - I-3 Condition 1
  - I-3 Condition 2
  - I-3 Condition 3
  - I-3 Condition 4
  - I-3 Condition 5
  - I-4
  - M
  - R-1
  - R-2
  - R-3
  - R-4
  - S-1 (Accessory)
  - S-2 (Accessory)
  - U
- + Fire Protection Systems:
  - Automatic Sprinkler Protection System(s):  Yes  No
  - Fire Pump(s):  Yes  No
  - Standpipe System(s):  Class I  Class II  Class III
  - Alternative Fire Suppression System(s):  Yes  No
  - Fire Alarm System:  Yes  No
  - Emergency Voice/Alarm Communication:  Yes  No
  - Emergency Responder Communication System:  Yes  No
  - Fire Extinguishers:  Yes  No
  - Smoke Control Systems:
    - Atrium Exhaust:  Yes  No
    - Stair Pressurization:  Yes  No
    - Elevator Pressurization:  Yes  No
- + Proposed Code Alternatives:
  - No alternatives are proposed at this time.

<sup>1</sup> The building Clock Tower is assumed to be an existing rooftop structure that does not require consideration with respect to determining building height.



## 2.0 Introduction

The proposed renovations to the existing City Hall building at 93 Highland Street in Somerville, MA include alterations to accommodate the proposed tenant improvements.

The existing building contains approximately 34,800 gross square feet of space (not more than 10,100 square feet per story) on four (4) stories above grade<sup>2</sup>. The building is an office facility serving a City Hall function, consisting of office workspace, meeting/conference spaces, City Council chamber, break rooms, and storage/MEP areas. The project will involve renovations throughout the building for the purpose of general tenant improvement. The project will maintain the building as a City Hall; however, it will be better served as a result of the proposed renovations.

The building's existing structural members consist of a combination of structural systems. Lower floors are generally concrete columns or concrete bearing walls at the interior, supporting concrete pan joists. There may be some wood joists left over from the oldest construction period. Some roofing is supported by unprotected steel trusses, while other roofing is supported by heavy timber framing and wood purlins. The exterior walls are loadbearing brick walls. The roof deck appears to be wood in some areas, terra cotta in others. Surfacing material is slate on inclines and membrane at flat areas. The clock tower is wood with steel skeleton structure. The existing building is equipped with a fire alarm system but is not provided with an automatic sprinkler system.

This report is intended to serve as a reference for the design team and code enforcement officials to understand the major building code stipulations (pertaining to fire / life safety and accessibility) associated with the project. Specific trades such as structural, plumbing, electrical, mechanical, etc. and matters pertaining to energy conservation, flood hazard, and zoning compliance are not intended to be addressed by this report in detail. The information in this report is based on the following:

- + Test fit drawings dated 09/30/2021.
- + Site inspection conducted on 02/23/2021.
- + Project related discussions with the design team.

Throughout the report, code references are provided in parentheses, following requirements, to facilitate review of the provisions in detail.

As discussed below, the building will require complete automatic sprinkler protection as a result of the project. The remainder of this report assumes that the building will be fully sprinklered.

## 3.0 Applicable Codes

The Commonwealth of Massachusetts currently adopts the following codes applicable to the fire protection, life safety, and accessibility scopes of work:

- + Accessibility – Massachusetts Architectural Access Board Regulations (521 CMR) and the Americans with Disabilities Act (ADA) 2010 Standards for Accessible Design.
- + Building – Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)) including references to 780 CMR Chapter 34 (amended version of the 2015 International Existing Building Code (IEBC)).
- + Electrical – Massachusetts Electrical Code, 527 CMR 12.00 (amended version of the 2020 National Electrical Code, NFPA 70, effective January 1, 2017).
- + Elevators – Massachusetts Elevator Regulations, 524 CMR (amended version of the 2013 Edition of ASME A17.1, Safety Code for Elevators and Escalators).
- + Fire Prevention – Massachusetts Comprehensive Fire Safety Code, 527 CMR 1.00 (based on the 2015 and 2018 Editions of NFPA 1, Fire Code).
- + Mechanical – International Mechanical Code (IMC), 2015, as adopted and amended by 780 CMR.
- + Plumbing – Massachusetts Fuel Gas and Plumbing Codes, 248 CMR.

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<sup>2</sup> Based on assumption that the finished floor elevation of the First Floor is, at some point, more than 12-feet above adjacent finished Basement Level (780 CMR §202).

- + Energy – 780 CMR Chapter 13, which references and amends the 2018 International Energy Conservation Code (IECC) and ASHRAE 90.1-2016 and 780 CMR Appendix AA, Stretch Energy Code.
- + Other – Selected National Fire Protection Association (NFPA) Standards as referenced by 780 CMR and 527 CMR, including but not limited to:
  - NFPA 10, 2013 Edition, Standard for Portable Fire Extinguishers.
  - NFPA 13, 2013 Edition, Standard for the Installation of Sprinkler Systems.
  - NFPA 72, 2013 Edition, National Fire Alarm Code.

**This report focuses on the key issues relative to compliance with the fire protection, life safety, and accessibility provisions of the applicable codes. Other provisions of the applicable codes are noted only where pertinent to matters related to fire / life safety and accessibility.**

## 4.0 Building Code Requirements for Existing Buildings

### 4.1 GENERAL REQUIREMENTS

Existing buildings are subject to the requirements of 780 CMR, as outlined below:

- + The legal occupancy of any structure existing on the date of adoption of the code (780 CMR) shall be permitted to continue, without change, except as is specifically covered in 780 CMR or as is deemed necessary by the Building Official for the general safety and welfare of the occupants and the public (780 CMR §102.6).
- + Unless specifically provided otherwise in this code (780 CMR), and narrow to the provisions of 780 CMR, any existing building or structure shall meet and shall be presumed to meet the provisions of the applicable laws, codes, rules or regulations, bylaws or ordinances in effect at the time such building or structure was constructed or altered and shall be allowed to continue to be occupied pursuant to its use and occupancy, provided that the building or structure shall be maintained by the Owner in accordance with 780 CMR (780 CMR §102.6.2).
- + Means of egress, lighting, and ventilation in existing buildings, whether or not undergoing repairs, alterations, changes of occupancy, are subject to the provisions of 780 CMR §102.6.4. When applicable, the following conditions of (780 CMR §102.6.4) are susceptible to citation from the Building Official and should be corrected in all existing buildings.
  - Inadequate number of means of egress;
  - Egress components with insufficient width or so arranged to be inadequate, including signage and lighting;
  - Inadequate lighting and ventilation.

Where full compliance is not practical, the Building Official may accept compliance alternatives, engineering, or other evaluations that adequately address the deficiency.

**Jensen Hughes is not aware of any outstanding Abatement Orders or Notices of Violation issued against the building; therefore, the existing conditions are assumed to have been acceptable to the Building Official upon their last inspection.**

- + All buildings and structures and all parts thereof, both existing and new, and all systems and equipment therein which are regulated by 780 CMR shall be maintained in a safe, operable and sanitary condition. All service equipment, means of egress, devices and safeguards which are required in a building or structure, or which were required by a previous statute in a building or structure, when erected, altered or repaired, shall be maintained in good working order (780 CMR §102.8). The owner shall be responsible for compliance with 780 CMR (780 CMR §102.8.1).

**Jensen Hughes is not aware of any outstanding preventative or corrective maintenance items for life safety systems. The working condition of existing life safety systems including fire alarm systems, means of egress components, and fire-rated compartmentalization must be maintained in proper working condition.**

- + The provisions of 780 CMR Chapter 34 shall apply to the repair, alteration, change of occupancy, addition to and relocation of existing buildings (780 CMR 34 §101.2).

### 4.2 CLASSIFICATION OF PROJECT WORK

The project involves the following work which has been classified by type according to the Work Area Compliance Method of 780 CMR 34 Chapter 5:

- + The project includes repairs (780 CMR 34 §502); reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.
- + The project includes removal or replacement of existing materials, elements, equipment, and/or fixtures using new materials, equipment, and/or fixtures that serve the same purpose; therefore, the requirements for Level 1 Alterations will apply in those instances (780 CMR 34 §503).
- + The project includes reconfiguration of space in most locations throughout the building. The area of reconfiguration will exceed 50 percent of the building area; therefore, the requirements for Level 3 Alterations will apply (780 CMR 34 §505).
- + The project includes selective upgrades and/or replacement of existing mechanical, electrical, and plumbing systems. Reconfigured systems will comply with the requirements of Level 2 Alterations (780 CMR §504). Note: The reconfiguration or extension of any system, or the installation of any additional equipment does not in and of itself a Create a Work Area.
- + The project does not include a Change of Occupancy (780 CMR 34 §506).
- + The project does not include vertical or horizontal additions (780 CMR 34 §507).
- + The building is assumed to not be a listed historic building.

### 5.0 Use and Occupancy Classifications

The building appears to contain the following occupancy classifications and specific uses (780 CMR §302.1):

**Table 1 – Occupancy Classification**

Occupancy Classification	Uses
Group A-3, Assembly	Council Chamber, assembly spaces $\geq$ 50 persons or $\geq$ 750 square feet
Group B, Business	Offices, assembly spaces < 50 persons or < 750 square feet
Group S-1/S-2 Storage (Accessory)	Low/Moderate-hazard storage / MEP

**While a change of occupancy classification is not expected to occur in the building based on the proposed renovations, the current use and occupancy classification(s) must be confirmed through existing documentation on record with the City of Somerville.**

### 6.0 Allowable Height and Area

The height and area of the existing building is only required to be analyzed for compliance with 780 CMR Chapter 5 when a change of occupancy classification to a higher hazard or an addition is proposed.

**As a result of the proposed renovations, the existing building construction is permitted to be maintained.**

### 7.0 Fire Resistance

#### 7.1 STRUCTURAL FIRE RESISTANCE

The existing building construction most closely resembles Type IIIB unprotected construction.

New structural members must be constructed with a fire-resistance rating consistent with Type IIIB (unprotected noncombustible or combustible floors and columns and noncombustible exterior walls) construction, as outlined below (780 CMR Table 601).

**Table 2 – Structural Fire-Resistance Rating**

Structural Element	Hours	
Primary Structural Frame	Columns Supporting Floors	0
	Columns Supporting Roofs Only	0

Structural Element		Hours
Bearing Walls	Other Primary Structural Frame Supporting Floors	0
	Other Primary Structural Frame Supporting Roofs Only	0
	Exterior <sup>3</sup>	2
	Interior – Supporting Floors	0
	Interior – Supporting Roofs Only	0
Nonbearing Exterior Walls (FSD = Fire Separation Distance in feet)	FSD < 5	2 (Group S-1) 1 (Group A, B, S-2)
	$5 \leq \text{FSD} < 10$	1
	$10 \leq \text{FSD} < 30$	1
	FSD $\geq 30$	0
	Floor Construction and Secondary Members	0
Roof Construction and Secondary Members	0	

The primary structural frame includes all of the following structural members (780 CMR §202):

- + The columns;
- + Structural members having direct connections to columns, including girders, beams, trusses and spandrels;
- + Members of the floor construction and roof construction having direct connections to columns; and
- + Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading, whether or not the bracing member carries gravity loads.

Secondary members include the following structural members that are not part of the primary structural frame (780 CMR §202):

- + Structural members not having direct connections to the columns;
- + Members of the floor construction and roof construction not having direct connection to the columns; and
- + Bracing members other than those that are part of the primary structural frame.

## 7.2 FIRE-RESISTANCE RATED SEPARATIONS

New or reconfigured rooms and spaces listed in the following table are required to be enclosed / separated by fire barriers (FB).

**Table 3 – Fire-Resistance Rated Separations**

Room or Space	Code Reference	Enclosure Fire Resistance
Shafts connecting three stories or less	780 CMR §713.4	1-Hour FB
Stair enclosures connecting three stories or less	780 CMR §1023.2	1-Hour FB
Shafts connecting four or more stories	780 CMR §713.4	2-hour FB
Stair enclosures connecting four or more stories	780 CMR §1023.2	2-Hour FB
Non-sprinklered electrical rooms	NFPA 13 §8.15.11.3	2-Hour FB
Furnace room where any piece of equipment is over 400,000 BTU/hour input	780 CMR Table 509	1-Hour FB
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	780 CMR Table 509	1-Hour FB

<sup>3</sup> Not less than fire-resistance rating required based on fire separation distance for non-load bearing exterior walls per 780 CMR Table 602.

Room or Space	Code Reference	Enclosure Fire Resistance
Emergency electrical room	NFPA 70, 700-10(D)(2)	2-Hour FB
Elevator machine rooms, control rooms, control spaces and machinery spaces	780 CMR §3005.4	Rating of hoistway <sup>4</sup>
Electrical room containing a transformer		
- Transformer < 112 ½ kV	NFPA 70 §450.22	Noncombustible
- Transformer > 112 ½ kV	NFPA 70 §450.22	1-Hour FB
- Transformer > 35,000 volts	NFPA 70 §450.42	3-Hour FB <sup>5</sup>
- Eversource transformer vault	Eversource Specification	3-Hour vault

### 7.3 OPENING PROTECTIVES

Doors or other openings in enclosures/separations are required to be protected as follows (780 CMR §716):

- + 1-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 45-minute fire protection rating (1-hour fire protection rating when used in 1-hour shaft and exit enclosures).
- + 2-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 90-minute fire protection rating.
- + 3-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 180-minute rated.

### 7.4 DUCT AND AIR TRANSFER OPENINGS

New duct and air transfer openings through rated elements must comply with 780 CMR §717.

## 8.0 Vertical Openings

All existing vertical openings are required to comply with 780 CMR 34 §701.2, §801.3, §803.2, §903.1 and all new vertical openings are required to comply with 780 CMR §712.1. The following sections outline the significant vertical openings located in the building.

### 8.1 EXISTING VERTICAL OPENINGS

All existing interior vertical openings connecting two or more floors must be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protectives, unless vertical opening enclosure is not required by 780 CMR. A minimum 30-minute enclosure is permitted to protect all vertical openings not exceeding 3 stories. Existing exit stairways that are part of the means of egress must be enclosed from the highest work area floor to, and including, the level of exit discharge and all floors below.

### 8.2 NEW VERTICAL OPENINGS

Any new openings through a floor/ceiling assembly must be protected by a shaft enclosure as required by 780 CMR §712.1, unless one of several alternatives (exceptions) are employed according to 780 CMR §712.1.2 through §712.1.16.

Two-story, unenclosed vertical openings are permitted as follows (780 CMR §712.1.9):

- + Does not connect more than two stories;
- + Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments;
- + Is not concealed within the construction of a wall or a floor/ceiling assembly; and
- + Is separated from floor openings and air transfer openings serving other floors by construction conforming to required

<sup>4</sup> If the machine room has no openings to and does not abut the hoistway, the machine room fire resistance rating need not be more than 1 hour.

<sup>5</sup> Where transformers are protected with automatic sprinklers, water spray, or carbon dioxide, this rating may be reduced to 1-hour with ¾-hour opening protectives (NFPA 70, 450.42 Exception).



shaft enclosures.

Vertical openings containing unenclosed exit access stairways and ramps are permitted according to 780 CMR §712.1.12 and §1019.3, Ex. 1, as follows:

- + Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories must not be open to other stories (780 CMR §1019.3, Ex. 1).

Otherwise, the vertical opening(s) is required to be designed as an atrium or protected by a shaft enclosure.

**Any new vertical openings will comply with one of the allowances above or will be designed as shaft enclosures complying with 780 CMR §712.1.**

## 9.0 Exterior Walls

Existing exterior walls and openings are permitted to remain as-is as a result of the proposed renovations.

Any new or modified exterior walls must comply with the opening limitations in 780 CMR. 780 CMR regulates the extent to which protected and unprotected openings are permitted in the exterior walls of a building's façade based on the fire separation distance (780 CMR §602 and 780 CMR §705.8). The fire separation distance (FSD) is measured perpendicularly from the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (780 CMR §202.1). The table below lists the permissible percentage of openings, protected or unprotected in a fully sprinklered building, based on the fire separation distance measured along each exterior wall. The percentage of openings are shown as a percentage of the total area of the exterior wall, evaluated per story.

**Table 4 – Limits for Openings in Exterior Walls**

Fire Separation Distance (ft)	% of Allowable Openings
0 to < 3	Not Permitted
3 to < 5	15%
5 to < 10	25%
10 to < 15	45%
15 to < 20	75%
20 or greater	Unlimited

## 10.0 Interior Finish

### 10.1 INTERIOR WALL AND CEILING FINISH

All newly installed interior wall and ceiling finishes must comply with 780 CMR §803 for new construction (780 CMR 34 §702.1).

Existing-to-remain interior wall and ceiling finishes in exits and corridors serving any work area must comply with 780 CMR §803 for new construction throughout each floor (780 CMR 34 §903.3).

Where interior wall and ceiling finishes are required to comply with the requirements of 780 CMR §803, the requirements are determined by the occupancy use classification of the space. The classification requirements for interior wall and ceiling finish, when tested in accordance with ASTM E84 or UL 723 are as follows (780 CMR §803.1.1):

**Table 5 – Interior Finish Classifications**

Interior Finish Classification	Flame Spread Index	Smoke Developed Index
Class A	0 – 25	0 – 450
Class B	26 – 75	0 – 450
Class C	76 – 200	0 – 450

The following table summarizes the interior finish requirements applicable to this project (780 CMR Table 803.11).

**Table 6 – Interior Finish Requirements for Fully Sprinklered Building**

Group	Exit Enclosures and Exit Passageways	Corridors	Rooms and Enclosed Spaces
Group A-3, Assembly	Class A or B	Class A or B	Class A, B or C
Group B, Business	Class A or B	Class A, B or C	Class A, B or C
Group S-1/S-2, Storage	Class A, B or C	Class A, B or C	Class A, B or C

Class C interior finish materials are permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire blocked as required by 780 CMR §803.13.1 (780 CMR Table 803.11 Note a).

## 10.2 INTERIOR FLOOR FINISH

New interior floor finish, including new carpeting used as an interior floor finish material, must comply with 780 CMR §804 (780 CMR 34 §702.2).

New traditional floor coverings such as wood, vinyl, terrazzo, and other resilient floor coverings (not comprised of fibers) are allowed throughout the building (780 CMR §804.1, Exception).

New interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by partitions extending from the floor to the underside of the ceiling must withstand a minimum critical radiant flux not less than Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR §804.4.2). Interior floor finishes are not required to be tested in accordance with NFPA 253 (780 CMR §804.3).

## 10.3 DECORATIVE MATERIALS AND TRIM

All newly installed decorative materials and trim must comply with 780 CMR §806 (780 CMR 34 §702.3).

Note that fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes must be considered interior finish and cannot be considered decorative materials or furnishings (780 CMR §806.3).

The permissible amount of noncombustible decorative materials and trim is not limited (780 CMR §806.2).

Curtains, draperies, fabric hangings and similar combustible decorative materials suspended from walls or ceilings must meet the criteria of 780 CMR §806.4 and 527 CMR / NFPA 1 §12.6.2 when tested in accordance with NFPA 701 and must not exceed 10 percent of the specific wall or ceiling area to which such materials are attached (780 CMR §806.3; 527 CMR / NFPA 1 §12.6.2).

Foam plastics, whether exposed or used in conjunction with a textile or vinyl facing or cover, must not be used as interior trim except as provided in 780 CMR §806.5 or §2604.2 (780 CMR §801.8, §806.5).

Material used as interior trim, other than foam plastic, must have a minimum Class C flame spread and smoke-developed rating index when tested in accordance with ASTM E84 or UL 723 as described in 780 CMR §803.1.1 (780 CMR §806.7).

Combustible trim, excluding handrails and guardrails, must not exceed 10 percent of the specific wall or ceiling area in which it is attached (780 CMR §806.7).

Note that alternatively the interior floor-wall base that is 6 inches or less in height is permitted to be Class II material tested in accordance with NFPA 253 (ASTM E648) (780 CMR §806.8).

## 11.0 Means of Egress

To date, Jensen Hughes is not aware of any active citations or abatement orders that have been issued for the building. As a result, continued use of the facility is permitted so long as the means of egress, lighting and ventilation systems are maintained appropriately throughout the building per 780 CMR §102.6.4. Additionally, areas undergoing renovations are subject to compliance with the means of egress provisions of 780 CMR 34, where applicable. The following key requirements are provided as a reference to ensure the building's means of egress are properly maintained or modified.

### 11.1 OCCUPANT LOAD

In the absence of fixed seating, the occupant load of each space and each story of the building is determined using the greater of the following (780 CMR §1004.1.2):

- + Occupant load calculations using factors prescribed by 780 CMR Table 1004.1.2 (refer to following table), or
- + The actual number of occupants who will use each space.

Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, is permitted to be used in the determination of the design occupant load (i.e., posted occupant load) (780 CMR §1004.1.2, Exception).

The table below details the occupant load factors used within the building (780 CMR Table 1004.1.2).

**Table 7 – Occupant Load Densities**

Use / Function	ft <sup>2</sup> per occupant
Assembly (Standing Room)	5 net
Assembly (Chairs)	7 net
Assembly without fixed seats (Tables and Chairs)	15 net
Office areas	100 gross
Industrial areas	100 gross
Accessory storage / MEP	300 gross

Where the actual number of occupants in a room, space or floor exceeds the calculated occupant load from the factors in the table above, the actual number of occupants must be used. Where the actual number of occupants in a room, space or floor is less than the calculated occupant load, that lower occupant load may only be used where approved by the building official (780 CMR §1004.2).

**The occupant load will be determined in accordance with above.**

### 11.2 EGRESS CAPACITY

The required egress capacity for the building and rooms/areas is determined using egress capacity factors and the occupant load being served. The following egress capacity factors are applicable to this project as the building is not expected to include an emergency voice/alarm communication system (780 CMR §1005.3):

- + Level egress elements, including ramps: 0.20 inch per occupant
- + Exit stairways: 0.30 inch per occupant

Where egress from floors above and below converge at an intermediate story or landing, the capacity of the means of egress from the point of convergence will not be less than that calculated by the sum of the two floors (780 CMR §1005.6). Multiple means of egress must be sized such that the loss of any one means of egress will not reduce the available capacity or width to less than 50 percent of the required capacity or width (780 CMR §1005.5).

**The building is served by two (2) exit stairway enclosures, Main and South stairs. Both stairs discharge directly to the exterior of the building.**

**The Main stair serves all floors of the building, and the South stair serves the First through Third Floor of the building (does not serve the Basement). The Basement and First Floor additionally have access to doors to the exterior.**

**The Main stair has a calculated exit capacity of 193-people, limited by the 58-inch stair width. The South stair has a calculated capacity of 160-people, limited by a 32-inch clear width door. The total per-floor occupant load, for each floor is as follows:**

- + **Basement – 353-people**
- + **First Floor – 706-people (door to exterior limited to 353-people per 780 CMR §1005.5)**
- + **Second Floor – 320-people (Main stair capacity limited to 160-people per 780 CMR §1005.5)**

**+ Third Floor – 320 people (Main stair capacity limited to 160-people per 780 CMR §1005.5)**

**11.3 NUMBER OF EXITS**

Each space in the building is required to have access to at least two exits or exit access doorways where either the design occupant load exceeds a set maximum value based on occupancy (refer to table below) or the common path of travel limit for that occupancy is exceeded (780 CMR Table 1006.2.1). Where these values are exceeded, at least two exits or exit access doorways are required to serve a space.

**Table 8 – Maximum Occupant Load for Single Means of Egress**

Occupancy	Maximum Occupant Load
Group A-3	49
Group B	49
Group S-1/S-2	29

Each story of the building must have access to the number of exits outlined in the following table. If the occupant load of a story exceeds 500 occupants, access to three exits is required (780 CMR Table 1006.3.1).

**Table 9 – Exits Per Story**

Number of Occupants	Minimum Required Number of Exits
500 or less	2
501 to 1,000	3
Greater than 1,000	4

The required exits (i.e., exit or exit access doors) must be separated by a distance not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served (780 CMR §1007.1.1, Ex. 2). This dimension is measured in a straight line between exit doors or exit access doorways.

**11.4 EXIT DISCHARGE**

Exits are required to discharge directly to the exterior either at grade or at a point that will provide direct path of egress travel to grade. The exit discharge is not permitted to reenter the building (780 CMR §1028.1), except:

- + Not more than 50% of the number and required capacity of interior exit stairways is permitted to egress through areas on the level of exit discharge provided the following conditions are met:
  - Discharge from the interior exit stairway enclosure is provided with a free unobstructed path of travel to an exterior exit door such that the exit door is readily visible and identifiable from the point of termination of the exit enclosure;
  - The entire area of the level of exit discharge is separated from the areas below by construction conforming to the fire resistance rating of the enclosure; and
  - The egress path is protected by an approved automatic sprinkler system.

**The two (2) interior exit enclosures discharge directly to the exterior of the building.**

**11.5 EXIT ACCESS TRAVEL DISTANCE**

The travel distance from all rooms and spaces within the building to an exit must comply with the following table, based on the occupancy classification of the room or space (780 CMR Table 1017.2).

The measurement along stairways must be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings (780 CMR §1017.3.1).

**Table 10 – Exit Travel Distance Limitations**

<b>Occupancy</b>	<b>Maximum Travel Distance (ft)</b>
Groups A-3, S-1	250
Group B	300
Group S-2	400

### 11.6 COMMON PATH OF TRAVEL

The maximum allowable common path of egress travel will comply with the table below (780 CMR Table 1006.2.1).

**Table 11 – Common Path of Travel Limitations**

<b>Occupancy</b>	<b>Maximum Common Path of Travel (ft)</b>
Group A-3	75
Groups B, S-1/S-2	100

### 11.7 DEAD-END CORRIDORS

Where more than one exit or exit access doorway is required, the exit access will be arranged such that there are no dead-ends in corridors more than as shown in the table below (780 CMR §1020.4).

**Table 12 – Dead End Corridor Limitations**

<b>Occupancy</b>	<b>Maximum Dead End (ft)</b>
Group A-3	20
Groups B, S-1/S-2	50

A dead-end corridor can be increased beyond the prescribed values where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor (780 CMR §1020.4, Ex. 3).

### 11.8 DOORS

Doors must provide a minimum clear width sufficient for the occupant load thereof and not less than 32 inches and a minimum height of 80 inches (780 CMR §1010.1.1). When two door leaves are provided without a mullion, one leaf must provide a clear width opening of at least 32 inches.

Egress doors are required to be pivoted or side-hinged swinging type except as follows (780 CMR §1010.1.2):

- + Office areas and storage areas with an occupant load of 10 or less;
- + Revolving doors complying with 780 CMR §1010.1.4.1;
- + Power-operated doors in accordance with 780 CMR §1010.1.4.2;
- + Special purpose horizontal sliding, accordion, or folding doors complying with 780 CMR §1010.1.4.3; and
- + Manually operated horizontal sliding doors are permitted from rooms or spaces with an occupant load of 10 or less.

Doors serving the following rooms or spaces are required to swing in the direction of egress travel (780 CMR §1006.2.2.2, §1010.1.2.1, §1010.1.10):

- + Rooms or spaces with an occupant load of 50 or more;
- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices; and
- + Refrigeration machinery rooms.

Doors equipped with a latch or lock serving the following rooms or spaces are required to be provided with panic hardware or fire exit hardware (780 CMR §1010.1.10):

- + Group A occupancy rooms or spaces with an occupant load of 50 or more; and



- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices.

**The project includes an exit access corridor leading to the South exit stair on the Second Floor which is noted for emergency use only. Egress doors must be readily openable from the egress side without the use of a key or special knowledge or effort. If there is controlled egress and/or locking arrangement to access this corridor and stair, the arrangement must comply with one of the permitted operations in accordance with 780 CMR §1010.1.9 as applicable.**

## 11.9 STAIRWAYS

The width of new stairways must not be less than 44 inches and must be at least wide enough to provide the required capacity to accommodate each floor's occupant load (except that stairways serving less than 50 occupants are permitted to be no less than 36 inches wide). The stair width must not decrease in the direction of travel. Exit stairs must not be used for any purpose other than egress (780 CMR §1011.2). The headroom on stairs is required to be not less than 80 inches (780 CMR §1011.3).

The treads of new stairs are required to have a minimum depth of 11 inches. New stair risers are required to have a minimum height of 4 inches and maximum height of 7 inches (780 CMR §1009.5.2). Stair dimensions will be uniform. The tolerance between the largest and the smallest treads will not exceed 3/8 inch in any flight of stairs (780 CMR §1009.5.4).

New stair tread nosing must have a curvature or bevel of not less than 1/16-inch but not more than 1/2-inch from the foremost projection of the tread. The undersides of nosings must not be abrupt. Risers must be solid and vertical or sloped under the tread above from the underside of the nosing above at an angle of not more than 30 degrees from the vertical (60 degrees from the horizontal) (780 CMR §1011.5.5; 521 CMR §27.3). Nosings must not project more than 1¼-inches beyond the tread below (780 CMR §1011.5.5.1; 521 CMR §27.3). Nosing projections of the leading edges of treads must be of uniform size, including the projections of the nosing's leading edge of the floor at the top of the flight (780 CMR §1011.5.5.2).

The minimum dimension of landings and platforms in new stairways must be at least the width of the stairway served. The landing dimension in the direction of travel is not required to exceed 4 feet when travel from one flight to the next flight is a straight run. Landings must have a width equal to the width of the stair or a door opening onto a landing, whichever is greater. Doors opening onto landings must not reduce the required landing width by more than one half at any point during the door's swing and not more than 7 inches when fully open (780 CMR §1011.6). The maximum vertical height between landings is 12 feet (780 CMR §1011.8).

### 11.10 RAMPS

The clear width of ramps must not be less than 36 inches and must be a minimum width of 44 inches where serving an occupant load of greater than 50 occupants, but not less than the width required for egress capacity (780 CMR §1012.5.1, §1020.2). The ramp may not reduce in width in the direction of egress travel (780 CMR §1012.5.3).

The maximum slope of a ramp must be 1 unit vertical to 12 units horizontal, equivalent to an 8.3 percent slope. The cross slope of a ramp must not exceed 1 to 48, or a 2 percent slope (780 CMR §1012.3). Ramps are required to have slip-resistant surfaces (780 CMR §1012.7.1). The maximum rise of a ramp between landings or level surfaces is 30 inches (780 CMR §1012.4).

The minimum ramp landing length and headroom must be 60 inches and 80 inches, respectively (780 CMR §1012.5.2, §1012.6.3). The slope of a ramp landing must not be more than 1 to 48 in any direction. Changes in level are not permitted (780 CMR §1012.6.1). Where changes in direction of travel occur at landings between ramp runs, the landing must have minimum dimensions of 60 inches by 60 inches (780 CMR §1012.6.4).

### 11.11 MEANS OF EGRESS LIGHTING

In normal, non-emergency conditions, means of egress must be equipped with artificial lighting facilities to provide one (1) foot-candle intensity floor lighting continuously during the time that the building, or portion thereof, is occupied (780 CMR §1008.2).

Means of egress must be provided with artificial lighting throughout the building in accordance with the requirements of 780 CMR (780 CMR §1008.1). In the event of power supply failure, an emergency electrical system must automatically illuminate the following areas (780 CMR §1008.3.1, §1008.3.2, §1013.1.1):

- + Exit access aisles in rooms and spaces which require two or more means of egress;
- + Electrical equipment rooms;

- + Fire pump room(s);
- + Generator room(s);
- + Public restrooms with an area greater than 300 square feet;
- + Transformer vaults;
- + Exit access corridors, exit access stairways and ramps;
- + Exit stairways and exit passageways;
- + Exterior egress components at other than the level of exit discharge until exit discharge is accomplished;
- + Interior exit discharge elements, as permitted in 780 CMR §1028.1; and
- + The portion of the exterior exit discharge immediately adjacent to exit discharge doorways.

In emergency conditions, emergency power must be provided for a minimum of 120 minutes (780 CMR §1008.3, §2702.1.4). Emergency lighting facilities must provide an average initial illumination of one (1) foot-candle and a minimum at any point of 0.1 foot-candle measured at any point along the path of egress at floor level. Illumination levels are permitted to decline to 60 percent of the initial illumination levels at the end of 90-minutes. A maximum to minimum illumination ratio of 40:1 must not be exceeded (780 CMR §1008.3.4).

#### 11.12 EXIT SIGNAGE

Exits and exit access doors must be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits must be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits must be marked by exit signs. Exit sign placement must be such that no point in an exit access corridor or exit passageway is more than 100 feet or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign. Exit signs are not required in rooms or areas that require only one exit or exit access. Exit signs must be internally or externally illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means must be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator (780 CMR §1013).

Additionally, a sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 must be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway or ramp, an exit passageway and the exit discharge (780 CMR §1013.4).

Transformer vaults must have additional exit signage such that the top of the sign is within 18 inches of the floor and adjacent to the opening side of the door (780 CMR §1013.1.1).

### 12.0 Fire Protection Systems

#### 12.1 AUTOMATIC SPRINKLER SYSTEM

The building is not currently protected throughout with an automatic sprinkler system.

**Since the building area is greater than 7,500 gross square feet, it is subject to the requirements of M.G.L. Chapter 148, Section 26G which are enforced by the City of Somerville. Section 26G requires automatic sprinkler protection to be installed in a building undergoing a “major alteration”. The significant renovations necessitate automatic sprinkler protection throughout the building to meet the provisions of 780 CMR 903.3.1.1 and NFPA 13.**

#### 12.2 STANDPIPE SYSTEM

The building is equipped with a standpipe system.

**The existing standpipe system will be modified, as necessary, in accordance with 780 CMR §905 and NFPA 14 to accommodate the project changes.**

#### 12.3 PORTABLE FIRE EXTINGUISHERS

Fire extinguishers must be provided throughout the building in accordance with NFPA 10, Standard for Portable Fire Extinguishers and 780 CMR §906. Extinguishers must be selected based on the anticipated hazard and classified for protection of that hazard. Fire extinguishers must be conspicuously located and readily accessible to building occupants.

## 12.4 FIRE DETECTION AND ALARM

The building is provided with a fire alarm system; however, based on its condition and apparent age of its components, a full replacement is recommended. Activation of the fire sprinkler system must activate a fire alarm system in accordance with 780 CMR §907 (780 CMR §903.4.2).

**The new fire alarm system must be designed in accordance with 780 CMR §907 and NFPA 72 and provided throughout the building. While not anticipated, should the total Group A occupant load exceed 1,000 persons, the fire alarm system must initiate a signal using an emergency voice/alarm communications system in accordance with 780 CMR §907.5.2.2. (780 CMR §907.2.1.1).**

## 13.0 Emergency and Standby Power Systems

Emergency power systems and standby power systems are required to be installed in accordance with 780 CMR Chapter 27 and NFPA 70, NFPA 110, and NFPA 111 (780 CMR §2701.1.2).

Where the emergency/standby power system includes a generator set inside the building, the system must be located in a separate room enclosed with 2-hour fire barriers and/or horizontal assemblies (NFPA 110). Stationary emergency and standby power generators must be listed in accordance with UL 2200 (780 CMR §2702.1.1).

Emergency power systems automatically provide secondary power within ten (10) seconds after primary power is lost. Standby power systems automatically provide secondary power within 60 seconds after primary power is lost (780 CMR §2702.1.3).

Emergency power systems and standby power systems must provide the required power for a minimum duration of 2 hours without being refueled or recharged (780 CMR §2702.1.4).

The following features/systems are required to be provided with emergency power:

- + Fire detection and alarm systems (780 CMR §907.6.2, NFPA 72)
- + Exit signs (780 CMR §1013.6.3, §2702.2.5)
- + Means of egress illumination (780 CMR §1008.3, §2702.2.11)

The following features/systems are required to be provided with standby power:

- + Existing elevators, maintain if currently provided
- + New elevators if serving as a component of the accessible means of egress (780 CMR 1009.4)

## 14.0 Plumbing Fixtures

The Massachusetts Plumbing Code (248 CMR) regulates the number of plumbing fixtures required in buildings. The minimum number of plumbing fixtures is established by 248 CMR 10.10(18) Table 1 based on the building use and the expected population as established by the local Plumbing Inspector per 248 CMR 10.10(18)(a)(2). Typically, this population is based on the designer's determination of the actual number of people expected within the building and such established population must not be exceeded.

The following table summarizes the plumbing fixture requirements based on 248 CMR for expected occupancies within the building:

**Table 13 – Plumbing Requirements**

Occupancy Clarification	Female Toilets	Male Toilets	Urinals	Lavatories (Sinks) Each Gender	Drinking Water Stations	Service Sink
Assembly (conference/waiting)	1 per 50	1 per 100	Up to 50% substitution	1 per 200	-	-
Business	1 per 20	1 per 25	Up to 33% substitution	1 per 50	1 per floor	1 per floor

## 15.0 Accessibility

The requirements of the 2010 ADA Standards and 521 CMR Regulations are applicable. Specific areas of the building that strictly limit access to employees only, are exempt from compliance with 521 CMR. However, these areas are still subject to the 2010 ADA Standards.

New construction, alterations, and additions are required to comply with the scoping and technical specifications of all applicable regulations, codes, and standards. In cases where there is a disparity in the scoping or technical criteria among the applicable codes and standards, the most stringent requirements shall prevail as long as these do not conflict with or provide a lower level of accessibility than is required by the other codes and standards. This section summarizes scoping criteria of each applicable code.

### 15.1 MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (521 CMR)

In order to determine the 521 CMR accessibility compliance obligations stipulated by the proposed project work, the full and fair cash value of the existing building (building value only, exclusive of land value), must be established and compared to the construction cost of the Project work and any other work performed in the building in the previous or subsequent 36 months from the project permit date.<sup>6</sup>

According to 521 CMR, the full and fair cash value of a building is defined as:

*“The assessed valuation of a building (not including the land) as recorded in the Assessor’s Office of the municipality at the time the building permit is issued equalized at 100 percent valuation. The 100 percent equalized assessed valuation shall be based upon Massachusetts Department of Revenue’s determination of the particular city’s or town’s assessment ratio.”*

The construction cost of the renovations, plus the cost of construction from work performed in the building within the previous or next three years (if applicable), is expected to be more than 30 percent of the full and fair cash value of the building. As a result, the entire building, exclusive of employee only work areas and other tenant spaces, is required to comply fully with the new construction accessibility requirements of 521 CMR (521 CMR §3.3.2). Otherwise, variances for specific nonconforming features of accessibility to remain noncompliant may be applied for where repairs are determined by the Massachusetts Architectural Access Board (MAAB) to be impractical (“excessive cost with little benefit” or “technologically infeasible”) (521 CMR §4.1). Note that such variances granted by MAAB do not necessarily relieve the owner of their obligations to comply with applicable federal requirements, such as those found under the ADA.

**It is expected that the project costs will exceed 30% of the full and fair cash value of the building; therefore, the entire building (existing and new) must comply fully with 521 CMR. Jensen Hughes recommends that a detailed accessibility assessment of the existing building be conducted to understand inventory of required upgrades. Evaluation of this inventory will inform whether variances from the Massachusetts Architectural Access Board are necessary.**

### 15.2 ADA

Alterations to existing buildings and facilities are required to comply with the Americans with Disabilities Act (ADA). With the exception of alterations to areas of primary function, the ADA does not utilize cost thresholds as part of the scoping criteria. The ADA contains the following scoping requirements:

- + Where existing elements or spaces are altered, each altered element or space must comply with the applicable provisions.
- + Although limiting the scope of an alteration to individual elements is permitted, it should be noted that the alteration of multiple elements within a room or space might provide a cost-effective opportunity to make the entire room or space accessible.
  - Altered elements or spaces are not required to be located on an accessible route unless they are associated with a primary function area.

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<sup>6</sup> When the work performed on a building is divided into separate phases or projects or is under separate building permits, the total cost of such work in any 36-month period shall be added together in applying 521 CMR 3.3, Existing Buildings.

- In alterations where compliance is technically infeasible, the alteration must provide accessibility to the maximum extent feasible. Any elements or spaces of the building or facility that are being altered and can be made accessible must be made accessible within the scope of the alteration.
- + An alteration that decreases or has the effect of decreasing the accessibility of a building or facility below the requirement for new construction at the time of the alteration is prohibited.
- + An alteration of an existing element, space, or area of a building or facility must not impose a requirement for accessibility greater than required for new construction.

Note that the building may include features that were constructed and potentially renovated or altered at various dates; which may have been designed under current or previous versions of ADA Standards, including the 2010 and 1991 versions. Accessible elements designed and constructed after the applicable dates of these standards that are not compliant with the applicable standard(s) at the time of construction are considered barriers to access and are a liability for the property. The ADA prohibits alterations that decrease, or have the effect of decreasing, the accessibility of a building below the requirements for new construction. Therefore, even spaces which are out of the scope of work for the proposed project, if not constructed in accordance with applicable ADA regulations and standards at the time of construction are considered barriers to access and are a liability for the property.

To date, Jensen Hughes only surveyed existing spaces within the scope of work and as affected by the scope of work to assess the general condition of the building as related to accessibility using the 2010 ADA Standards.

### **All new work must comply with ADA.**

#### **15.2.1 Alteration to an Area of Primary Function**

An alteration that affects or could affect the usability of or access to an area of a facility that contains a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the cost and scope of such alterations is disproportionate to the cost of the overall alteration. [ADA §36.403 and ADA §35.151(b)(4)]

Per the ADA regulations, a primary function is a major activity for which the facility is intended. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors, restrooms, and parking areas are examples of areas that are not considered primary function. [ADA §36.403(a) and (b) and ADA §35.151(b)(4)(i)]

A "path of travel" as defined by ADA includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entrance to the facility, and other parts of the facility. An accessible path of travel may consist of walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps; clear floor paths through lobbies, corridors, rooms, and other improved areas; parking access aisles; elevators and lifts; or a combination of these elements. For the purposes of this ADA requirement, the term "path of travel" also includes the restrooms, telephones, and drinking fountains serving the altered area. [ADA §36.403(e) and ADA §35.151(b)(4)]

ADA §36.403(f) and (g) and ADA §35.151(b)(4)(iii) and (iv) state that alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20 percent of the cost of the alteration to the primary function area; and costs that may be counted as expenditures required to provide an accessible path of travel may include:

1. Costs associated with providing an accessible entrance and an accessible route to the altered area, for example, the cost of widening doorways or installing ramps;
2. Costs associated with making restrooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes, or installing accessible faucet controls;
3. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices, or installing a text telephone;
4. Costs associated with relocating an inaccessible drinking fountain.

To determine the threshold of disproportionality for expenditures to provide an accessible path of travel, calculate the cost to alter the primary function area not including the above items, and multiply that alteration cost by 20 percent. When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the



overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs (in other words, the full 20 percent must be spent on path of travel upgrades unless there happen to be no, or not enough, issues requiring correction). In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance;
2. An accessible route to the altered area;
3. At least one accessible restroom for each sex or a single unisex restroom;
4. Accessible telephones;
5. Accessible drinking fountains; and
6. When possible, additional accessible elements such as parking, storage, and alarms.

**It is Jensen Hughes' understanding that the scope of work of the project will address path of travel requirements.**

### 15.2.2 Readily Achievable Barrier Removal

ADA Title III regulations, Part 36, Subpart B, §36.304, Removal of Barriers, requires removal of architectural barriers in existing places of public accommodation constructed or altered prior to the ADA, including communication barriers that are structural in nature, where such removal is readily achievable. This means that at places of public accommodation, non-compliant elements that were installed prior to the effective date of ADA, or elements that were not regulated by the 1991 Standards but which are now regulated by current ADA Standards, are subject to the requirement for readily achievable barrier removal – whether or not alterations or additions are otherwise being undertaken at the facilities. Readily achievable is defined as “easily accomplishable and able to be carried out without much difficulty or expense.” Jensen Hughes has not made a determination of what actions are readily achievable – this is the responsibility of the public accommodation.

Although all accessibility deficiencies should be considered critical, it is understood that the public accommodation's finances or business operations may result in the need to prioritize and phase the removal of barriers. ADA Title III regulations, Part 36, Subpart B, §36.304 prioritizes the measures potentially taken to comply with barrier removal. Accessible approach and entrance (providing access to a place of public accommodation from public sidewalks and parking) is the highest priority; access to goods and services is the second highest priority; Access to public toilet rooms is the third highest priority; and the fourth highest priority are those other measures necessary to provide access to the other facilities, privileges, advantages, or accommodations of the place of public accommodation. Per §36.104, “Readily achievable means easily accomplishable and able to be carried out without much difficulty or expense.” Please note that it is the facility owner's/operator's responsibility to determine on a case-by-case basis whether removal of a barrier is readily achievable. In determining whether an action is readily achievable, factors to be considered include [§36.301]:

- + The nature and cost of the action;
- + The overall financial resources of the site or sites involved; the number of persons employed at the site; the effect on expenses and resources; legitimate safety requirements necessary for safe operation, including crime prevention measures; or any other impact of the action on the operation of the site;
- + The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to any parent corporation or entity;
- + If applicable, the overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities; and
- + If applicable, the type of operation or operations of any parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity.”

If it is determined that the measures required to remove a barrier and create full compliance would not be readily achievable, then a public accommodation may take other readily achievable measures to remove the barrier that do not fully comply with the specified requirements.

Commentary found in the Title III Regulations notes that there is no given or expected time frame associated with barrier removal, however there is an expectation that a good faith and ongoing effort will be made to remove existing barriers to accessibility.

It is Jensen Hughes' understanding that the scope of work will address existing barriers. However, in the case that the scope of work does not include all spaces and elements of the building, Jensen Hughes recommends that the facility owner/operator create an “implementation plan” which lists existing barriers in the facility, estimates the cost associated with

removing each barrier, and states a time frame in which the facility expects it will be readily achievable to remove each barrier. Having such a document on file and actually following through with the phased implementation of barrier removal would help to demonstrate that the facility is making a good faith effort to improve accessibility over time.

## *16.0 Alternative Compliance*

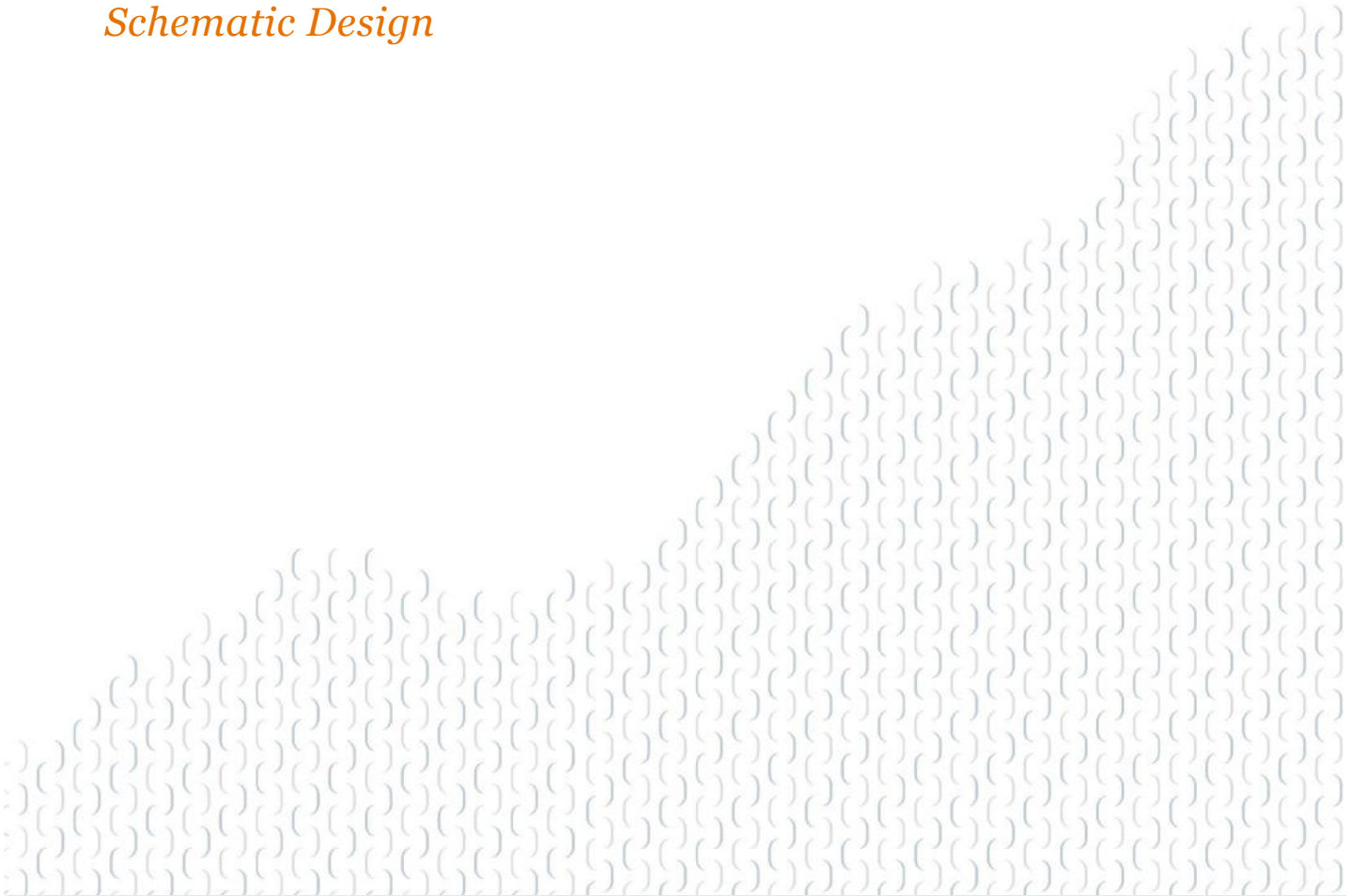
### 16.1 PROPOSED ALTERNATE METHODS OF COMPLIANCE FOR 780 CMR

Pursuant to 780 CMR §104.10, the following alternative(s) to prescriptive compliance with 780 CMR will be presented to the Authority Having Jurisdiction for approval:

- + None identified at this time.

# CITY OF SOMERVILLE – EDGERLY CENTER CODE COMPLIANCE APPROACH REPORT

*Schematic Design*



**JENSEN HUGHES**

Advancing the Science of Safety

**PREPARED FOR**

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## 1.0 Executive Summary

The proposed renovations to the existing Egerly Center at 33 Cross Street in Somerville, MA include alterations and change of use to an office building / adult learning center.

- + Applicable Building Code: Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)), including 780 CMR Chapter 34, Existing Structures (amended 2015 International Existing Building Code (IEBC)).
- + The project work is classified by the following types according to the Work Area Compliance Method of 780 CMR Ch. 34:
  - Repairs
  - Level 1 Alterations
  - Level 2 Alterations
  - Level 3 Alterations
  - Addition
  - Change of Occupancy
  - Historic Building
  - Relocated Building
- + Applicable Fire Code: 527 CMR 1.00 Massachusetts Comprehensive Fire Safety Code (amended version on 2015 Edition of NFPA 1 Fire Code)
- + Proposed Building Height: Approximately 41 feet (measured from grade plane to highest roof surface)
- + Number of Stories: 3 existing stories above grade plane
- + High-rise:  Yes  No
- + Area: Approximately 76,200 gross square feet (25,400 square feet per floor)
- + Construction Type: Type IIA
- + The building will contain (may contain) the following Occupancy Classifications as a result of the proposed renovations:
  - A-1     F-1     I-1 Condition 1     I-3 Condition 4     R-4
  - A-2     F-2     I-1 Condition 2     I-3 Condition 5     S-1 (Accessory)
  - A-3     H-1     I-2 Condition 1     I-4     S-2 (Accessory)
  - A-4     H-2     I-2 Condition 2     M     U
  - A-5     H-3     I-3 Condition 1     R-1
  - B     H-4     I-3 Condition 2     R-2
  - E     H-5     I-3 Condition 3     R-3
- + Fire Protection Systems:
  - Automatic Sprinkler Protection System(s):  Yes  No
  - Fire Pump(s):  Yes  No
  - Standpipe System(s):  Class I     Class II     Class III
  - Alternative Fire Suppression System(s):  Yes  No
  - Fire Alarm System:  Yes  No
  - Emergency Voice/Alarm Communication:  Yes  No
  - Emergency Responder Communication System:  Yes  No
  - Fire Extinguishers:  Yes  No
  - Smoke Control Systems:
    - Atrium Exhaust:  Yes  No
    - Stair Pressurization:  Yes  No
    - Elevator Pressurization:  Yes  No
- + Proposed Code Alternatives:
  - No alternatives are proposed at this time.

## 2.0 Introduction

The proposed renovations to the existing Edgerly Center at 33 Cross Street in Somerville, MA include alterations and change of use to an office building / adult learning center.

The existing building contains approximately 76,200 gross square feet of space (25,400 square feet on each of Ground Floor, First Floor, and Second Floor) on 3 stories above grade. The building is a K-12 educational building consisting of multiple classrooms, staff offices, café, kitchen, combination gymnasium / stage area, support rooms, and storage/MEP space. The project will position the building to be used as an office building, including meeting/conference spaces, and an adult learning center with classrooms and associated administrative office space. The building will also include some recreation areas such as a new game room and use of the existing gymnasium/auditorium.

The building's existing structural members consist of brick and/or masonry wall construction and cast-in-place concrete floor assemblies. Larger-span areas include concrete columns. The exterior walls are load-bearing brick. The existing building is equipped with a fire alarm system but is not provided with automatic sprinkler protection.

This report is intended to serve as a reference for the design team and code enforcement officials to understand the major building code stipulations (pertaining to fire / life safety and accessibility) associated with the project. Specific trades such as structural, plumbing, electrical, mechanical, etc. and matters pertaining to energy conservation, flood hazard, and zoning compliance are not intended to be addressed by this report in detail. The information in this report is based on the following:

- + Test fit drawings dates 09/30/2021.
- + Site inspection conducted on 02/23/2021.
- + Project related discussions with the design team.

Throughout the report, code references are provided in parentheses, following requirements, to facilitate review of the provisions in detail.

As discussed below, the building will require complete automatic sprinkler protection as a result of the project. The remainder of this report assumes that the building will be fully sprinklered.

## 3.0 Applicable Codes

The Commonwealth of Massachusetts currently adopts the following codes applicable to the fire protection, life safety, and accessibility scopes of work:

- + Accessibility – Massachusetts Architectural Access Board Regulations (521 CMR) and the Americans with Disabilities Act (ADA) 2010 Standards for Accessible Design.
- + Building – Massachusetts State Building Code (780 CMR) 9th Edition (amended version of the 2015 International Building Code (IBC)) including references to 780 CMR Chapter 34 (amended version of the 2015 International Existing Building Code (IEBC)).
- + Electrical – Massachusetts Electrical Code, 527 CMR 12.00 (amended version of the 2020 National Electrical Code, NFPA 70, effective January 1, 2017).
- + Elevators – Massachusetts Elevator Regulations, 524 CMR (amended version of the 2013 Edition of ASME A17.1, Safety Code for Elevators and Escalators).
- + Fire Prevention – Massachusetts Comprehensive Fire Safety Code, 527 CMR 1.00 (based on the 2015 and 2018 Editions of NFPA 1, Fire Code).
- + Mechanical – International Mechanical Code (IMC), 2015, as adopted and amended by 780 CMR.
- + Plumbing – Massachusetts Fuel Gas and Plumbing Codes, 248 CMR.
- + Energy – 780 CMR Chapter 13, which references and amends the 2018 International Energy Conservation Code (IECC) and ASHRAE 90.1-2016 and 780 CMR Appendix AA, Stretch Energy Code.
- + Other – Selected National Fire Protection Association (NFPA) Standards as referenced by 780 CMR and 527 CMR, including but not limited to:
  - NFPA 10, 2013 Edition, Standard for Portable Fire Extinguishers.

- NFPA 13, 2013 Edition, Standard for the Installation of Sprinkler Systems.
- NFPA 72, 2013 Edition, National Fire Alarm Code.

**This report focuses on the key issues relative to compliance with the fire protection, life safety, and accessibility provisions of the applicable codes. Other provisions of the applicable codes are noted only where pertinent to matters related to fire / life safety and accessibility.**

## 4.0 *Building Code Requirements for Existing Buildings*

### 4.1 GENERAL REQUIREMENTS

Existing buildings are subject to the requirements of 780 CMR, as outlined below:

- + The legal occupancy of any structure existing on the date of adoption of the code (780 CMR) shall be permitted to continue, without change, except as is specifically covered in 780 CMR or as is deemed necessary by the Building Official for the general safety and welfare of the occupants and the public (780 CMR §102.6).
- + Unless specifically provided otherwise in this code (780 CMR), and narrow to the provisions of 780 CMR, any existing building or structure shall meet and shall be presumed to meet the provisions of the applicable laws, codes, rules or regulations, bylaws or ordinances in effect at the time such building or structure was constructed or altered and shall be allowed to continue to be occupied pursuant to its use and occupancy, provided that the building or structure shall be maintained by the Owner in accordance with 780 CMR (780 CMR §102.6.2).
- + Means of egress, lighting, and ventilation in existing buildings, whether or not undergoing repairs, alterations, changes of occupancy, are subject to the provisions of 780 CMR §102.6.4. When applicable, the following conditions of (780 CMR §102.6.4) are susceptible to citation from the Building Official and should be corrected in all existing buildings.
  - Inadequate number of means of egress;
  - Egress components with insufficient width or so arranged to be inadequate, including signage and lighting;
  - Inadequate lighting and ventilation.

Where full compliance is not practical, the Building Official may accept compliance alternatives, engineering, or other evaluations that adequately address the deficiency.

**Jensen Hughes is not aware of any outstanding Abatement Orders or Notices of Violation issued against the building; therefore, the existing conditions are assumed to have been acceptable to the Building Official upon their last inspection.**

- + All buildings and structures and all parts thereof, both existing and new, and all systems and equipment therein which are regulated by 780 CMR shall be maintained in a safe, operable and sanitary condition. All service equipment, means of egress, devices and safeguards which are required in a building or structure, or which were required by a previous statute in a building or structure, when erected, altered or repaired, shall be maintained in good working order (780 CMR §102.8). The owner shall be responsible for compliance with 780 CMR (780 CMR §102.8.1).

**Jensen Hughes is not aware of any outstanding preventative or corrective maintenance items for life safety systems. The working condition of existing life safety systems including fire alarm systems, means of egress components, and fire-rated compartmentalization must be maintained in proper working condition.**

- + The provisions of 780 CMR Chapter 34 shall apply to the repair, alteration, change of occupancy, addition to and relocation of existing buildings (780 CMR 34 §101.2).

### 4.2 CLASSIFICATION OF PROJECT WORK

The project involves the following work which has been classified by type according to the Work Area Compliance Method of 780 CMR 34 Chapter 5:

- + The project includes repairs (780 CMR 34 §502); reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.
- + The project includes removal or replacement of existing materials, elements, equipment, and/or fixtures using new materials, equipment, and/or fixtures that serve the same purpose; therefore, the requirements for Level 1 Alterations will apply in those instances (780 CMR 34 §503).

- + The project includes reconfiguration of space in most locations throughout the building. The area of reconfiguration will exceed 50 percent of the building area; therefore, the requirements for Level 3 Alterations will apply (780 CMR 34 §505).
- + The project may include selective upgrades and/or replacement of existing mechanical, electrical, and plumbing systems. Reconfigured systems will comply with the requirements of Level 2 Alterations (780 CMR §504). Note: The reconfiguration or extension of any system, or the installation of any additional equipment does not in and of itself a Create a Work Area.
- + The project includes a Change of Use but does not include a Change of Occupancy Classification (780 CMR 34 §506).
- + The project does not include vertical or horizontal additions (780 CMR 34 §507).
- + The building is assumed to not be a listed historic building.

### 5.0 Use and Occupancy Classifications

The building appears to contain the following occupancy classifications and specific uses (780 CMR §302.1):

**Table 1 – Occupancy Classification**

Occupancy Classification	Uses
Group A-1, Assembly	Stage
Group A-3, Assembly	Assembly spaces $\geq$ 50 persons or $\geq$ 750 square feet; Gymnasium without spectator seating
Group A-4, Assembly	Gymnasium with spectator seating
Group B, Business	Offices, assembly/classroom spaces < 50 persons or < 750 square feet
Group S-1/S-2, Storage (Accessory)	Low/Moderate-hazard storage

While a room or space used for assembly purposes that is associated with a Group E occupancy (i.e., gymnasium, auditorium, cafeteria) may not be considered a separate occupancy per 780 CMR §303.1.3, the existing building is understood to have assembly functions within such spaces that are not ancillary and supportive to the educational operation of the building. Therefore, these spaces fall outside the intent of 780 CMR §303.1.3 and are classified according to their respective assembly group as existing occupancies within the building. This report assumes the assembly (A-1, A-3, and A-4) occupancies listed in the above table are existing (and will remain) in the building.

The project will result in a decommissioning of the Group E, Educational occupancy within the building. Group E classrooms and associated areas will be converted to offices and adult learning functions contributing to the existing Group B, Business occupancy as well as recreational rooms contributing to the existing Group A-3, Assembly occupancy. A change of use will take place, but a change of occupancy classification will not apply as the building already contains Groups A and B occupancies.

The occupancy classification(s) assumptions stated above inform the balance of the report and should be confirmed through review of existing documentation on record with the City of Somerville.

### 6.0 Allowable Height and Area

The height and area of the existing building is only required to be analyzed for compliance with 780 CMR Chapter 5 when a change of occupancy classification to a higher hazard or an addition is proposed.

**As a result of the proposed renovations, the existing building construction is permitted to be maintained.**

## 7.0 Fire Resistance

### 7.1 STRUCTURAL FIRE RESISTANCE

The existing building construction most closely resembles Type IIA<sup>1</sup>, protected, noncombustible.

New structural members must be constructed with a fire-resistance rating consistent with Type IIA (protected, noncombustible) construction, as outlined below (780 CMR Table 601).

**Table 2 – Structural Fire-Resistance Rating**

Structural Element	Hours	
Primary Structural Frame	Columns Supporting Floors	1
	Columns Supporting Roofs Only	1
	Other Primary Structural Frame Supporting Floors	1
	Other Primary Structural Frame Supporting Roofs Only	1
Bearing Walls	Exterior <sup>2</sup>	1
	Interior – Supporting Floors	1
	Interior – Supporting Roofs Only	1
Nonbearing Exterior Walls (FSD = Fire Separation Distance in feet)	FSD < 5	2 (Group S-1), 1 (Group A, B, S-2)
	$5 \leq \text{FSD} < 10$	1
	$10 \leq \text{FSD} < 30$	1
	FSD $\geq 30$	0
Floor Construction and Secondary Members	1	
Roof Construction and Secondary Members	1	

The primary structural frame includes all of the following structural members (780 CMR §202):

- + The columns;
- + Structural members having direct connections to columns, including girders, beams, trusses and spandrels;
- + Members of the floor construction and roof construction having direct connections to columns; and
- + Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading, whether or not the bracing member carries gravity loads.

Secondary members include the following structural members that are not part of the primary structural frame (780 CMR §202):

- + Structural members not having direct connections to the columns;
- + Members of the floor construction and roof construction not having direct connection to the columns; and
- + Bracing members other than those that are part of the primary structural frame.

### 7.2 FIRE-RESISTANCE RATED SEPARATIONS

New or reconfigured rooms and spaces listed in the following table are required to be enclosed / separated by fire barriers (FB).

<sup>1</sup> Type IIA classification is based on concrete protected structural elements. Jensen Hughes did not conduct any destructive testing to confirm fire resistance rating of any elements.

<sup>2</sup> Not less than fire-resistance rating required based on fire separation distance for non-load bearing exterior walls.



**Table 3 – Fire-Resistance Rated Separations**

Room or Space	Code Reference	Enclosure Fire Resistance
Shafts connecting three stories or less	780 CMR §713.4	1-Hour FB
Stair enclosures connecting three stories or less	780 CMR §1023.2	1-Hour FB
Non-sprinklered electrical rooms	NFPA 13 §8.15.11.3	2-Hour FB
Furnace room where any piece of equipment is over 400,000 BTU/hour input	780 CMR Table 509	1-Hour FB
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	780 CMR Table 509	1-Hour FB
Emergency electrical room	NFPA 70, 700-10(D)(2)	2-Hour FB
Elevator machine rooms, control rooms, control spaces and machinery spaces	780 CMR §3005.4	Rating of hoistway <sup>3</sup>
Electrical room containing a transformer		
- Transformer < 112 ½ kV	NFPA 70 §450.22	Noncombustible
- Transformer > 112 ½ kV	NFPA 70 §450.22	1-Hour FB
- Transformer > 35,000 volts	NFPA 70 §450.42	3-Hour FB <sup>4</sup>
- Eversource transformer vault	Eversource Specification	3-Hour vault

### 7.3 OPENING PROTECTIVES

Doors or other openings in enclosures/separations are required to be protected as follows (780 CMR §716):

- + 1-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 45-minute fire protection rating (1-hour fire protection rating when used in 1-hour shaft and exit enclosures).
- + 2-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 90-minute fire protection rating.
- + 3-hour Fire Barrier – Listed, labeled, self-closing or automatic-closing on smoke detection, positive latching, 180-minute rated.

### 7.4 DUCT AND AIR TRANSFER OPENINGS

New duct and air transfer openings through rated elements must comply with 780 CMR §717.

## 8.0 Vertical Openings

All existing vertical openings are required to comply with 780 CMR 34 §701.2, §801.3, §803.2, §903.1 and all new vertical openings are required to comply with 780 CMR §712.1. The following sections outline the significant vertical openings located in the building.

### 8.1 EXISTING VERTICAL OPENINGS

All existing interior vertical openings connecting two or more floors must be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protectives, unless vertical opening enclosure is not required by 780 CMR. A minimum 30-minute enclosure is permitted to protect all vertical openings not exceeding 3 stories. Existing exit stairways that are part of the means of egress must be enclosed from the highest work area floor to, and including, the level of exit discharge and all floors below.

<sup>3</sup> If the machine room has no openings to and does not abut the hoistway, the machine room fire-resistance rating need not be more than 1-hour.

<sup>4</sup> Where transformers are protected with automatic sprinklers, water spray, or carbon dioxide, this rating may be reduced to 1-hour with ¾-hour opening protectives (NFPA 70, 450.42 Exception).

Existing exit access stairways are permitted to remain (780 CMR 34 §803.2.1, Ex. 1, §803.2.3, Exception; 780 CMR §1019.3, Item 1). Pursuant to 780 §1019.3, unenclosed exit access stairways connecting only two stories and that do not atmospherically connect other stories are permitted.

## 8.2 NEW VERTICAL OPENINGS

Any new openings through a floor/ceiling assembly must be protected by a shaft enclosure as required by 780 CMR §712.1, unless one of several alternatives (exceptions) are employed according to 780 CMR §712.1.2 through §712.1.16.

Two-story, unenclosed vertical openings are permitted as follows (780 CMR §712.1.9):

- + Does not connect more than two stories;
- + Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments;
- + Is not concealed within the construction of a wall or a floor/ceiling assembly; and
- + Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

Vertical openings containing unenclosed exit access stairways and ramps are permitted according to 780 CMR §712.1.12 and §1019.3, Ex. 1, as follows:

- + Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories must not be open to other stories (780 CMR §1019.3, Ex. 1).

Otherwise, the vertical opening(s) is required to be designed as an atrium or protected by a shaft enclosure.

**Any new vertical openings will comply with one of the allowances above or will be designed as shaft enclosures complying with 780 CMR §712.1.**

## 9.0 Exterior Walls

Existing exterior walls and openings are permitted to remain as-is as a result of the proposed renovations.

Any new or modified exterior walls must comply with the opening limitations in 780 CMR. 780 CMR regulates the extent to which protected and unprotected openings are permitted in the exterior walls of a building's façade based on the fire separation distance (780 CMR §602 and 780 CMR §705.8). The fire separation distance (FSD) is measured perpendicularly from the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (780 CMR §202.1). The table below lists the permissible percentage of openings, protected or unprotected in a fully sprinklered building, based on the fire separation distance measured along each exterior wall. The percentage of openings are shown as a percentage of the total area of the exterior wall, evaluated per story.

*Table 4 – Limits for Openings in Exterior Walls*

Fire Separation Distance (ft)	% of Allowable Openings
0 to < 3	Not Permitted
3 to < 5	15%
5 to < 10	25%
10 to < 15	45%
15 to < 20	75%
20 or greater	Unlimited

## 10.0 Stage/Platform Requirements

A stage is a space within a building utilized for entertainment or presentations, which includes overhead hanging curtains, drops, scenery or stage effects other than lighting and sound (780 CMR Chapter 2). A platform is a raised area within a building used for entertainment purposes wherein, other than horizontal sliding curtains, lighting and sound, there are no overhead hanging curtains, drops, scenery or stage effects. New stages and platforms must comply with the applicable

portions of 780 CMR §410.

**The existing stage/platform is permitted to remain as-is. Modifications must be performed in accordance with 780 CMR §410.**

## 11.0 Interior Finish

### 11.1 INTERIOR WALL AND CEILING FINISH

All newly installed interior wall and ceiling finishes must comply with 780 CMR §803 for new construction (780 CMR 34 §702.1).

Existing-to-remain interior wall and ceiling finishes in exits and corridors serving any work area must comply with 780 CMR §803 for new construction throughout each floor (780 CMR 34 §903.3).

Where interior wall and ceiling finishes are required to comply with the requirements of 780 CMR §803, the requirements are determined by the occupancy use classification of the space. The classification requirements for interior wall and ceiling finish, when tested in accordance with ASTM E84 or UL 723 are as follows (780 CMR §803.1.1):

**Table 5 – Interior Finish Classifications**

Interior Finish Classification	Flame Spread Index	Smoke Developed Index
Class A	0 – 25	0 – 450
Class B	26 – 75	0 – 450
Class C	76 – 200	0 – 450

The following table summarizes the interior finish requirements applicable to this project (780 CMR Table 803.11).

**Table 6 – Interior Finish Requirements for Fully Sprinklered Building**

Group	Exit Enclosures and Exit Passageways	Corridors	Rooms and Enclosed Spaces
Group A-1, Assembly	Class A or B	Class A or B	Class A, B or C
Group A-3, Assembly	Class A or B	Class A or B	Class A, B or C
Group A-4, Assembly	Class A or B	Class A or B	Class A, B or C
Group B, Business	Class A or B	Class A, B or C	Class A, B or C
Group S-1/S-2, Storage	Class A, B or C	Class A, B or C	Class A, B or C

Class C interior finish materials are permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire blocked as required by 780 CMR §803.13.1 (780 CMR Table 803.11 Note a).

### 11.2 INTERIOR FLOOR FINISH

New interior floor finish, including new carpeting used as an interior floor finish material, must comply with 780 CMR §804 (780 CMR 34 §702.2).

New traditional floor coverings such as wood, vinyl, terrazzo, and other resilient floor coverings (not comprised of fibers) are allowed throughout the building (780 CMR §804.1, Exception).

New interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by partitions extending from the floor to the underside of the ceiling must withstand a minimum critical radiant flux not less than Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR §804.4.2). Interior floor finishes are not required to be tested in accordance with NFPA 253 (780 CMR §804.3).

### 11.3 DECORATIVE MATERIALS AND TRIM

All newly installed decorative materials and trim must comply with 780 CMR §806 (780 CMR 34 §702.3).

Note that fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes must be considered interior finish and cannot be considered decorative materials or furnishings (780 CMR §806.3).

The permissible amount of noncombustible decorative materials and trim is not limited (780 CMR §806.2).

Curtains, draperies, fabric hangings and similar combustible decorative materials suspended from walls or ceilings must meet the criteria of 780 CMR §806.4 and 527 CMR / NFPA 1 §12.6.2 when tested in accordance with NFPA 701 and must not exceed 10 percent of the specific wall or ceiling area to which such materials are attached (780 CMR §806.3; 527 CMR / NFPA 1 §12.6.2).

Foam plastics, whether exposed or used in conjunction with a textile or vinyl facing or cover, must not be used as interior trim except as provided in 780 CMR §806.5 or §2604.2 (780 CMR §801.8, §806.5).

Material used as interior trim, other than foam plastic, must have a minimum Class C flame spread and smoke-developed rating index when tested in accordance with ASTM E84 or UL 723 as described in 780 CMR §803.1.1 (780 CMR §806.7).

Combustible trim, excluding handrails and guardrails, must not exceed 10 percent of the specific wall or ceiling area in which it is attached (780 CMR §806.7).

Note that alternatively the interior floor-wall base that is 6 inches or less in height is permitted to be Class II material tested in accordance with NFPA 253 (ASTM E648) (780 CMR §806.8).

## 12.0 Means of Egress

To date, Jensen Hughes is not aware of any active citations or abatement orders that have been issued for the building. As a result, continued use of the facility is permitted so long as the means of egress, lighting and ventilation systems are maintained appropriately throughout the building per 780 CMR §102.6.4. Additionally, areas undergoing renovations are subject to compliance with the means of egress provisions of 780 CMR 34, where applicable. The following key requirements are provided as a reference to ensure the building's means of egress are properly maintained or modified.

### 12.1 OCCUPANT LOAD

In the absence of fixed seating, the occupant load of each space and each story of the building is determined using the greater of the following (780 CMR §1004.1.2):

- + Occupant load calculations using factors prescribed by 780 CMR Table 1004.1.2 (refer to following table), or
- + The actual number of occupants who will use each space.

Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, is permitted to be used in the determination of the design occupant load (i.e., posted occupant load) (780 CMR §1004.1.2, Exception).

The table below details the occupant load factors used within the building (780 CMR Table 1004.1.2).

**Table 7 – Occupant Load Densities**

<b>Use / Function</b>	<b>ft<sup>2</sup> per occupant</b>
Assembly (Standing Room)	5 net
Assembly (Chairs)	7 net
Assembly without fixed seats (Tables and Chairs)	15 net
Stages and platforms	15 net
Educational, Classrooms	20 net
Office areas	100 gross
Industrial areas	100 gross
Accessory storage / MEP	300 gross

Where the actual number of occupants in a room, space or floor exceeds the calculated occupant load from the factors in the table above, the actual number of occupants must be used. Where the actual number of occupants in a room, space or floor

is less than the calculated occupant load, that lower occupant load may only be used where approved by the building official (780 CMR §1004.2).

**The occupant load will be determined in accordance with above.**

### 12.2 EGRESS CAPACITY

The required egress capacity for the building and rooms/areas is determined using egress capacity factors and the occupant load being served. The following egress capacity factors are applicable to this project as the building is not expected to include an emergency voice/alarm communication system (780 CMR §1005.3):

- + Level egress elements, including ramps: 0.20 inch per occupant
- + Exit stairways: 0.30 inch per occupant

Where egress from floors above and below converge at an intermediate story or landing, the capacity of the means of egress from the point of convergence will not be less than that calculated by the sum of the two floors (780 CMR §1005.6). Multiple means of egress must be sized such that the loss of any one means of egress will not reduce the available capacity or width to less than 50 percent of the required capacity or width (780 CMR §1005.5).

**Each floor is served by four (4) exit stairway enclosures, one in each corner of the building. The stairs each have a calculated exit capacity of 160-people, limited by 32-inch clear width discharge doors, resulting in a total per-floor occupant load 640-people.**

**It should be noted that the exit discharge door for three (3) of the exit stairs is located at the half-level landing between the Ground floor and First Floor. Convergence of the Ground Floor and First Floor occupants in these stairs must be considered when evaluating the means of egress system for those levels.**

### 12.3 NUMBER OF EXITS

Each space in the building is required to have access to at least two exits or exit access doorways where either the design occupant load exceeds a set maximum value based on occupancy (refer to table below) or the common path of travel limit for that occupancy is exceeded (780 CMR Table 1006.2.1). Where these values are exceeded, at least two exits or exit access doorways are required to serve a space.

**Table 8 – Maximum Occupant Load for Single Means of Egress**

Occupancy	Maximum Occupant Load
Groups A-1/A-3/A-4	49
Group B	49
Groups S-1/S-2	29

Each story of the building must have access to the number of exits outlined in the following table. If the occupant load of a story exceeds 500 occupants, access to three exits is required (780 CMR Table 1006.3.1).

**Table 9 – Exits Per Story**

Number of Occupants	Minimum Required Number of Exits
500 or less	2
501 to 1,000	3
Greater than 1,000	4

The required exits (i.e., exit or exit access doors) must be separated by a distance not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served (780 CMR §1007.1.1, Ex. 2). This dimension is measured in a straight line between exit doors or exit access doorways.

### 12.4 EXIT DISCHARGE

Exits are required to discharge directly to the exterior either at grade or at a point that will provide direct path of egress travel to grade. The exit discharge is not permitted to reenter the building (780 CMR §1028.1), except:



- + Not more than 50% of the number and required capacity of interior exit stairways is permitted to egress through areas on the level of exit discharge provided the following conditions are met:
  - Discharge from the interior exit stairway enclosure is provided with a free unobstructed path of travel to an exterior exit door such that the exit door is readily visible and identifiable from the point of termination of the exit enclosure;
  - The entire area of the level of exit discharge is separated from the areas below by construction conforming to the fire resistance rating of the enclosure; and
  - The egress path is protected by an approved automatic sprinkler system.

**The four (4) interior exit enclosures, which serve all floor levels, discharge directly to the exterior.**

### 12.5 EXIT ACCESS TRAVEL DISTANCE

The travel distance from all rooms and spaces within the building to an exit must comply with the following table, based on the occupancy classification of the room or space (780 CMR Table 1017.2).

**Note that travel distance on exit access stairways must be included in the exit access travel distance measurement.**

The measurement along stairways must be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings (780 CMR §1017.3.1).

**Table 10 – Exit Travel Distance Limitations**

Occupancy	Maximum Travel Distance (ft)
Groups A-1, A-3, A-4, S-1	250
Group B	300
Group S-2	400

### 12.6 COMMON PATH OF TRAVEL

The maximum allowable common path of egress travel will comply with the table below (780 CMR Table 1006.2.1).

**Table 11 – Common Path of Travel Limitations**

Occupancy	Maximum Common Path of Travel (ft)
Groups A-1, A-3, A-4	75
Groups B, S-1/S-2	100

### 12.7 DEAD-END CORRIDORS

Where more than one exit or exit access doorway is required, the exit access will be arranged such that there are no dead-ends in corridors more than as shown in the table below (780 CMR §1020.4).

**Table 12 – Dead End Corridor Limitations**

Occupancy	Maximum Dead End (ft)
Groups A-1, A-3, A-4	20
Groups B, S-1/S-2	50

A dead-end corridor can be increased beyond the prescribed values where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor (780 CMR §1020.4, Ex. 3).

### 12.8 DOORS

Doors must provide a minimum clear width sufficient for the occupant load thereof and not less than 32 inches and a minimum height of 80 inches (780 CMR §1010.1.1). When two door leaves are provided without a mullion, one leaf must provide a clear width opening of at least 32 inches.

Egress doors are required to be pivoted or side-hinged swinging type except as follows (780 CMR §1010.1.2):

- + Office areas and storage areas with an occupant load of 10 or less;
- + Revolving doors complying with 780 CMR §1010.1.4.1;
- + Power-operated doors in accordance with 780 CMR §1010.1.4.2;
- + Special purpose horizontal sliding, accordion, or folding doors complying with 780 CMR §1010.1.4.3; and
- + Manually operated horizontal sliding doors are permitted from rooms or spaces with an occupant load of 10 or less.

Doors serving the following rooms or spaces are required to swing in the direction of egress travel (780 CMR §1006.2.2.2, §1010.1.2.1, §1010.1.10):

- + Rooms or spaces with an occupant load of 50 or more;
- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices; and
- + Refrigeration machinery rooms.

Doors equipped with a latch or lock serving the following rooms or spaces are required to be provided with panic hardware or fire exit hardware (780 CMR §1010.1.10):

- + Group A occupancy rooms or spaces with an occupant load of 50 or more; and
- + Transformer vaults and electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain overcurrent devices, switching devices or control devices.

## 12.9 STAIRWAYS

The width of new stairways must not be less than 44 inches and must be at least wide enough to provide the required capacity to accommodate each floor's occupant load (except that stairways serving less than 50 occupants are permitted to be no less than 36 inches wide). The stair width must not decrease in the direction of travel. Exit stairs must not be used for any purpose other than egress (780 CMR §1011.2). The headroom on stairs is required to be not less than 80 inches (780 CMR §1011.3).

The treads of new stairs are required to have a minimum depth of 11 inches. New stair risers are required to have a minimum height of 4 inches and maximum height of 7 inches (780 CMR §1009.5.2). Stair dimensions will be uniform. The tolerance between the largest and the smallest treads will not exceed 3/8 inch in any flight of stairs (780 CMR §1009.5.4).

New stair tread nosing must have a curvature or bevel of not less than 1/16-inch but not more than 1/2-inch from the foremost projection of the tread. The undersides of nosings must not be abrupt. Risers must be solid and vertical or sloped under the tread above from the underside of the nosing above at an angle of not more than 30 degrees from the vertical (60 degrees from the horizontal) (780 CMR §1011.5.5; 521 CMR §27.3). Nosings must not project more than 1¼-inches beyond the tread below (780 CMR §1011.5.5.1; 521 CMR §27.3). Nosing projections of the leading edges of treads must be of uniform size, including the projections of the nosing's leading edge of the floor at the top of the flight (780 CMR §1011.5.5.2).

The minimum dimension of landings and platforms in new stairways must be at least the width of the stairway served. The landing dimension in the direction of travel is not required to exceed 4 feet when travel from one flight to the next flight is a straight run. Landings must have a width equal to the width of the stair or a door opening onto a landing, whichever is greater. Doors opening onto landings must not reduce the required landing width by more than one half at any point during the door's swing and not more than 7 inches when fully open (780 CMR §1011.6). The maximum vertical height between landings is 12 feet (780 CMR §1011.8).

## 12.10 RAMPS

The clear width of ramps must not be less than 36 inches and must be a minimum width of 44 inches where serving an occupant load of greater than 50 occupants, but not less than the width required for egress capacity (780 CMR §1012.5.1, §1020.2). The ramp may not reduce in width in the direction of egress travel (780 CMR §1012.5.3).

The maximum slope of a ramp must be 1 unit vertical to 12 units horizontal, equivalent to an 8.3 percent slope. The cross slope of a ramp must not exceed 1 to 48, or a 2 percent slope (780 CMR §1012.3). Ramps are required to have slip-resistant surfaces (780 CMR §1012.7.1). The maximum rise of a ramp between landings or level surfaces is 30 inches (780 CMR §1012.4).

The minimum ramp landing length and headroom must be 60 inches and 80 inches, respectively (780 CMR §1012.5.2, §1012.6.3). The slope of a ramp landing must not be more than 1 to 48 in any direction. Changes in level are not permitted

(780 CMR §1012.6.1). Where changes in direction of travel occur at landings between ramp runs, the landing must have minimum dimensions of 60 inches by 60 inches (780 CMR §1012.6.4).

### 12.11 MEANS OF EGRESS LIGHTING

In normal, non-emergency conditions, means of egress must be equipped with artificial lighting facilities to provide one (1) foot-candle intensity floor lighting continuously during the time that the building, or portion thereof, is occupied (780 CMR §1008.2).

Means of egress must be provided with artificial lighting throughout the building in accordance with the requirements of 780 CMR (780 CMR §1008.1). In the event of power supply failure, an emergency electrical system must automatically illuminate the following areas (780 CMR §1008.3.1, §1008.3.2, §1013.1.1):

- + Exit access aisles in rooms and spaces which require two or more means of egress;
- + Electrical equipment rooms;
- + Fire pump room(s);
- + Generator room(s);
- + Public restrooms with an area greater than 300 square feet;
- + Transformer vaults;
- + Exit access corridors, exit access stairways and ramps;
- + Exit stairways and exit passageways;
- + Exterior egress components at other than the level of exit discharge until exit discharge is accomplished;
- + Interior exit discharge elements, as permitted in 780 CMR §1028.1; and
- + The portion of the exterior exit discharge immediately adjacent to exit discharge doorways.

In emergency conditions, emergency power must be provided for a minimum of 120 minutes (780 CMR §1008.3, §2702.1.4). Emergency lighting facilities must provide an average initial illumination of one (1) foot-candle and a minimum at any point of 0.1 foot-candle measured at any point along the path of egress at floor level. Illumination levels are permitted to decline to 60 percent of the initial illumination levels at the end of 90-minutes. A maximum to minimum illumination ratio of 40:1 must not be exceeded (780 CMR §1008.3.4).

### 12.12 EXIT SIGNAGE

Exits and exit access doors must be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits must be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits must be marked by exit signs. Exit sign placement must be such that no point in an exit access corridor or exit passageway is more than 100 feet or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign. Exit signs are not required in rooms or areas that require only one exit or exit access. Exit signs must be internally or externally illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means must be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator (780 CMR §1013).

Additionally, a sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 must be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway or ramp, an exit passageway and the exit discharge (780 CMR §1013.4).

Transformer vaults must have additional exit signage such that the top of the sign is within 18 inches of the floor and adjacent to the opening side of the door (780 CMR §1013.1.1).

## 13.0 Fire Protection Systems

### 13.1 AUTOMATIC SPRINKLER SYSTEM

The building is not currently protected throughout with an automatic sprinkler system.

**Since the building area is greater than 7,500 gross square feet, it is subject to the requirements of M.G.L. Chapter 148, Section 26G which are enforced by the City of Somerville. Section 26G requires automatic sprinkler protection**

**to be installed in a building undergoing a “major alteration”. The significant renovations necessitate automatic sprinkler protection throughout the building to meet the provisions of 780 CMR 903.3.1.1 and NFPA 13.**

### 13.2 STANDPIPE SYSTEM

**The existing building is not anticipated to be equipped with a standpipe hose system.** Where a work area is located more than 50 feet above or below the lowest level of fire department access, a standpipe system must be provided. Standpipes are required to have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access (780 CMR 34 §804.3).

**All work areas are positioned less than 50 feet above the lowest level of fire department vehicle access; therefore a standpipe system is not required to be installed.**

### 13.3 PORTABLE FIRE EXTINGUISHERS

Fire extinguishers must be provided throughout the building in accordance with NFPA 10, Standard for Portable Fire Extinguishers and 780 CMR §906. Extinguishers must be selected based on the anticipated hazard and classified for protection of that hazard. Fire extinguishers must be conspicuously located and readily accessible to building occupants.

### 13.4 FIRE DETECTION AND ALARM

The building is provided with a fire alarm system; however, based on its condition, a full replacement is recommended. Activation of the fire sprinkler system must activate a fire alarm system in accordance with 780 CMR §907 (780 CMR §903.4.2).

**The new fire alarm system must be designed in accordance with 780 CMR §907 and NFPA 72 and provided throughout the building. While not anticipated, should the total Group A occupant load exceed 1,000 persons, the fire alarm system must initiate a signal using an emergency voice/alarm communications system in accordance with 780 CMR §907.5.2.2. (780 CMR §907.2.1.1).**

## 14.0 Emergency and Standby Power Systems

If the building is equipped with existing emergency and/or standby power systems, they should be maintained.

Emergency power systems and standby power systems are required to be installed in accordance with 780 CMR Chapter 27 and NFPA 70, NFPA 110, and NFPA 111 (780 CMR §2701.1.2).

Where the emergency/standby power system includes a generator set inside the building, the system must be located in a separate room enclosed with 2-hour fire barriers and/or horizontal assemblies (NFPA 110). Stationary emergency and standby power generators must be listed in accordance with UL 2200 (780 CMR §2702.1.1).

Emergency power systems automatically provide secondary power within ten (10) seconds after primary power is lost. Standby power systems automatically provide secondary power within 60 seconds after primary power is lost (780 CMR §2702.1.3).

Emergency power systems and standby power systems must provide the required power for a minimum duration of 2 hours without being refueled or recharged (780 CMR §2702.1.4).

The following features/systems are required to be provided with emergency power:

- + Fire detection and alarm systems (780 CMR §907.6.2, NFPA 72)
- + Exit signs (780 CMR §1013.6.3, §2702.2.5)
- + Means of egress illumination (780 CMR §1008.3, §2702.2.11)

The following features/systems are required to be provided with standby power:

- + Existing elevators, maintain if currently provided
- + New elevators if serving as a component of the accessible means of egress (780 CMR 1009.4)

## 15.0 Elevators

It should be noted that the following requirements pertaining to elevators require all floors of the building to be accessed by elevator(s) satisfying the noted requirements.

### 15.1 PASSENGER ELEVATORS

New elevators are required to comply with ASME A17.1, *Safety Code for Elevators and Escalators*, 2013 as adopted by 524 CMR Chapter 35.

All elevators must be equipped with Phase I and II automatic recall and Fire Department control features (780 CMR §30.00; 524 CMR 35-ASME A17.1 §2.27.3).

A two-way communication system is required at the elevator landing on each accessible floor that is one (1) or more stories above or below the level of exit discharge. The system must provide communication between each required location and a central control point location approved by the fire department. Additionally, where the central control point is not constantly attended, the system must have timed automatic telephone dial-out capability to a monitoring location or 9-1-1. The two-way communication system(s) is required to include both audible and visual signals. Directions for use of the system and other required information are required to be posted adjacent to each device (780 CMR §1009.8).

A permanent sign is required to be mounted on the head jamb of the main floor elevator entrance, which will read "MRL-CONTROL ROOM LOCATED ON --- FLOOR." The sign is to be a minimum of ¾ inch high letters and be of a contrasting color with that of the background (524 CMR 13.03(15)).

### 16.0 Plumbing Fixtures

The Massachusetts Plumbing Code (248 CMR) regulates the number of plumbing fixtures required in buildings. The minimum number of plumbing fixtures is established by 248 CMR 10.10(18) Table 1 based on the building use and the expected population as established by the local Plumbing Inspector per 248 CMR 10.10(18)(a)(2). Typically, this population is based on the designer's determination of the actual number of people expected within the building and such established population must not be exceeded.

The following table summarizes the plumbing fixture requirements based on 248 CMR for expected occupancies within the building:

**Table 13 – Plumbing Requirements**

Occupancy Clarification	Female Toilets	Male Toilets	Urinals	Lavatories (Sinks) Each Gender	Drinking Water Stations	Service Sink
Assembly (conference/waiting)	1 per 50	1 per 100	Up to 50% substitution	1 per 200	-	-
Business	1 per 20	1 per 25	Up to 33% substitution	1 per 50	1 per floor	1 per floor

### 17.0 Accessibility

The requirements of the 2010 ADA Standards and 521 CMR Regulations are applicable. Specific areas of the building that strictly limit access to employees only, are exempt from compliance with 521 CMR. However, these areas are still subject to the 2010 ADA Standards.

New construction, alterations, and additions are required to comply with the scoping and technical specifications of all applicable regulations, codes, and standards. In cases where there is a disparity in the scoping or technical criteria among the applicable codes and standards, the most stringent requirements shall prevail as long as these do not conflict with or provide a lower level of accessibility than is required by the other codes and standards. This section summarizes scoping criteria of each applicable code.

#### 17.1 MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (521 CMR)

In order to determine the 521 CMR accessibility compliance obligations stipulated by the proposed project work, the full and fair cash value of the existing building (building value only, exclusive of land value), must be established and compared to the



construction cost of the Project work and any other work performed in the building in the previous or subsequent 36 months from the project permit date.<sup>5</sup>

According to 521 CMR, the full and fair cash value of a building is defined as:

*“The assessed valuation of a building (not including the land) as recorded in the Assessor’s Office of the municipality at the time the building permit is issued equalized at 100 percent valuation. The 100 percent equalized assessed valuation shall be based upon Massachusetts Department of Revenue’s determination of the particular city’s or town’s assessment ratio.”*

The construction cost of the renovations, plus the cost of construction from work performed in the building within the previous or next three years (if applicable), is expected to be more than 30 percent of the full and fair cash value of the building. As a result, the entire building, exclusive of employee only work areas and other tenant spaces, is required to comply fully with the new construction accessibility requirements of 521 CMR (521 CMR §3.3.2). Otherwise, variances for specific nonconforming features of accessibility to remain noncompliant may be applied for where repairs are determined by the Massachusetts Architectural Access Board (MAAB) to be impractical (“excessive cost with little benefit” or “technologically infeasible”) (521 CMR §4.1). Note that such variances granted by MAAB do not necessarily relieve the owner of their obligations to comply with applicable federal requirements, such as those found under the ADA.

**It is expected that the project costs will exceed 30% of the full and fair cash value of the building; therefore, the entire building (existing and new) must comply fully with 521 CMR. Jensen Hughes recommends that a detailed accessibility assessment of the existing building be conducted to understand inventory of required upgrades. Evaluation of this inventory will inform whether variances from the Massachusetts Architectural Access Board are necessary.**

## 17.2 ADA

Alterations to existing buildings and facilities are required to comply with the Americans with Disabilities Act (ADA). With the exception of alterations to areas of primary function, the ADA does not utilize cost thresholds as part of the scoping criteria. The ADA contains the following scoping requirements:

- + Where existing elements or spaces are altered, each altered element or space must comply with the applicable provisions.
- + Although limiting the scope of an alteration to individual elements is permitted, it should be noted that the alteration of multiple elements within a room or space might provide a cost-effective opportunity to make the entire room or space accessible.
  - Altered elements or spaces are not required to be located on an accessible route unless they are associated with a primary function area.
  - In alterations where compliance is technically infeasible, the alteration must provide accessibility to the maximum extent feasible. Any elements or spaces of the building or facility that are being altered and can be made accessible must be made accessible within the scope of the alteration.
- + An alteration that decreases or has the effect of decreasing the accessibility of a building or facility below the requirement for new construction at the time of the alteration is prohibited.
- + An alteration of an existing element, space, or area of a building or facility must not impose a requirement for accessibility greater than required for new construction.

Note that the building may include features that were constructed and potentially renovated or altered at various dates; which may have been designed under current or previous versions of ADA Standards, including the 2010 and 1991 versions. Accessible elements designed and constructed after the applicable dates of these standards that are not compliant with the applicable standard(s) at the time of construction are considered barriers to access and are a liability for the property. The ADA prohibits alterations that decrease, or have the effect of decreasing, the accessibility of a building below the requirements for new construction. Therefore, even spaces which are out of the scope of work for the proposed project, if not

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<sup>5</sup> When the work performed on a building is divided into separate phases or projects or is under separate building permits, the total cost of such work in any 36-month period shall be added together in applying 521 CMR 3.3, Existing Buildings.

constructed in accordance with applicable ADA regulations and standards at the time of construction are considered barriers to access and are a liability for the property.

To date, Jensen Hughes only surveyed existing spaces within the scope of work and as affected by the scope of work to assess the general condition of the building as related to accessibility using the 2010 ADA Standards.

**All new work must comply with ADA.**

**17.2.1 Alteration to an Area of Primary Function**

An alteration that affects or could affect the usability of or access to an area of a facility that contains a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs, unless the cost and scope of such alterations is disproportionate to the cost of the overall alteration. [ADA §36.403 and ADA §35.151(b)(4)]

Per the ADA regulations, a primary function is a major activity for which the facility is intended. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors, restrooms, and parking areas are examples of areas that are not considered primary function. [ADA §36.403(a) and (b) and ADA §35.151(b)(4)(i)]

A "path of travel" as defined by ADA includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entrance to the facility, and other parts of the facility. An accessible path of travel may consist of walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps; clear floor paths through lobbies, corridors, rooms, and other improved areas; parking access aisles; elevators and lifts; or a combination of these elements. For the purposes of this ADA requirement, the term "path of travel" also includes the restrooms, telephones, and drinking fountains serving the altered area. [ADA §36.403(e) and ADA §35.151(b)(4)]

ADA §36.403(f) and (g) and ADA §35.151(b)(4)(iii) and (iv) state that alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20 percent of the cost of the alteration to the primary function area; and costs that may be counted as expenditures required to provide an accessible path of travel may include:

1. Costs associated with providing an accessible entrance and an accessible route to the altered area, for example, the cost of widening doorways or installing ramps;
2. Costs associated with making restrooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes, or installing accessible faucet controls;
3. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices, or installing a text telephone;
4. Costs associated with relocating an inaccessible drinking fountain.

To determine the threshold of disproportionality for expenditures to provide an accessible path of travel, calculate the cost to alter the primary function area not including the above items, and multiply that alteration cost by 20 percent. When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs (in other words, the full 20 percent must be spent on path of travel upgrades unless there happen to be no, or not enough, issues requiring correction). In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance;
2. An accessible route to the altered area;
3. At least one accessible restroom for each sex or a single unisex restroom;
4. Accessible telephones;
5. Accessible drinking fountains; and
6. When possible, additional accessible elements such as parking, storage, and alarms.

**It is Jensen Hughes' understanding that the scope of work of the project will address path of travel requirements.**

### 17.2.2 Readily Achievable Barrier Removal

ADA Title III regulations, Part 36, Subpart B, §36.304, Removal of Barriers, requires removal of architectural barriers in existing places of public accommodation constructed or altered prior to the ADA, including communication barriers that are structural in nature, where such removal is readily achievable. This means that at places of public accommodation, non-compliant elements that were installed prior to the effective date of ADA, or elements that were not regulated by the 1991 Standards but which are now regulated by current ADA Standards, are subject to the requirement for readily achievable barrier removal – whether or not alterations or additions are otherwise being undertaken at the facilities. Readily achievable is defined as “easily accomplishable and able to be carried out without much difficulty or expense.” Jensen Hughes has not made a determination of what actions are readily achievable – this is the responsibility of the public accommodation.

Although all accessibility deficiencies should be considered critical, it is understood that the public accommodation’s finances or business operations may result in the need to prioritize and phase the removal of barriers. ADA Title III regulations, Part 36, Subpart B, §36.304 prioritizes the measures potentially taken to comply with barrier removal. Accessible approach and entrance (providing access to a place of public accommodation from public sidewalks and parking) is the highest priority; access to goods and services is the second highest priority; Access to public toilet rooms is the third highest priority; and the fourth highest priority are those other measures necessary to provide access to the other facilities, privileges, advantages, or accommodations of the place of public accommodation. Per §36.104, “Readily achievable means easily accomplishable and able to be carried out without much difficulty or expense.” Please note that it is the facility owner’s/operator’s responsibility to determine on a case-by-case basis whether removal of a barrier is readily achievable. In determining whether an action is readily achievable, factors to be considered include [§36.301]:

- + The nature and cost of the action;
- + The overall financial resources of the site or sites involved; the number of persons employed at the site; the effect on expenses and resources; legitimate safety requirements necessary for safe operation, including crime prevention measures; or any other impact of the action on the operation of the site;
- + The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to any parent corporation or entity;
- + If applicable, the overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities; and
- + If applicable, the type of operation or operations of any parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity.”

If it is determined that the measures required to remove a barrier and create full compliance would not be readily achievable, then a public accommodation may take other readily achievable measures to remove the barrier that do not fully comply with the specified requirements.

Commentary found in the Title III Regulations notes that there is no given or expected time frame associated with barrier removal, however there is an expectation that a good faith and ongoing effort will be made to remove existing barriers to accessibility.

It is Jensen Hughes’ understanding that the scope of work will address existing barriers. However, in the case that the scope of work does not include all spaces and elements of the building, Jensen Hughes recommends that the facility owner/operator create an “implementation plan” which lists existing barriers in the facility, estimates the cost associated with removing each barrier, and states a time frame in which the facility expects it will be readily achievable to remove each barrier. Having such a document on file and actually following through with the phased implementation of barrier removal would help to demonstrate that the facility is making a good faith effort to improve accessibility over time.

## 18.0 *Alternative Compliance*

### 18.1 PROPOSED ALTERNATE METHODS OF COMPLIANCE FOR 780 CMR

Pursuant to 780 CMR §104.10, the following alternative(s) to prescriptive compliance with 780 CMR will be presented to the Authority Having Jurisdiction for approval:

- + None identified at this time.

# LEED v4 for New Construction

## Somerville Masterplan - 1895 Building

Achievability			
high	med	low	NP
75	24	10	3

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 or more points  
 Achievability rating: High = 90%, Med = 60%, Low = 10%, NP = not possible.

### 83 Projected Points

1	0	0	0			
				<b>Integrative Process</b>		<b>Standard</b>
1				IP Credit 1	<b>v4.1 Integrative Process</b>	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.
				<b>Location &amp; Transportation</b>		<b>Standard</b>
				9	6	2
				16		
				LT Credit 1	<b>LEED for Neighborhood Development Location</b>	Locate the project in within a development certified under LEED for Neighborhood Development.
1				LT Credit 2	<b>Sensitive Land Protection</b>	Locate the development footprint on land that has been previously developed - OR - does not meet LEED criteria for sensitive land (prime farmland, floodplains, habitat for threatened species, near water bodies, in or near wetlands).
		2		LT Credit 3	<b>High Priority Site</b>	Locate the project on an infill site in historic district (1pt) - OR - site with priority designation (1pt) - OR - brownfield site where contaminated soil/groundwater remediation is required (2pts).
3	2			LT Credit 4	<b>Surrounding Density and Diverse Uses</b>	Locate on a site with an existing density of 22,000sf/acre - 35,000 sf/acre and within 1/2 mile of 4-8 basic services.
2	4			LT Credit 5	<b>v4.1 Access to Quality Transit</b>	Locate project within 1/2 mile of a rail station or ferry terminal that meets min. daily transit service - OR - 1/4 mile of bus, streetcar or rideshare that meets min. daily transit service.
1				LT Credit 6	<b>v4.1 Bicycle Facilities</b>	Provide short term (2.5% peak visitors) and long term (5% all regular occupants) bike parking within 100 ft of main entrance, FTE showers, and access to bicycle network.
1				LT Credit 7	<b>v4.1 Reduced Parking Footprint</b>	Provide preferred parking for carpools for 5% of the total parking spaces and provide parking capacity below base ratios determined by ITE Planning Handbook.
1				LT Credit 8	<b>v4.1 Green Vehicles</b>	Provide preferred parking for Green Vehicles for 5% of all parking spaces, and electric vehicle charging or alternative fuel facility for 2%
				<b>Sustainable Sites</b>		<b>Standard</b>
6	4	0	0			
Y				SS Prereq 1	<b>Construction Activity Pollution Prevention</b>	Create and implement erosion control plan that meets the 2012 EPA Construction General Permit.
1				SS Credit 1	<b>Site Assessment</b>	Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
1	1			SS Credit 2	<b>Protect or Restore Habitat</b>	Protect 40% of greenfield area, restore soils, and restore 30% of previously developed site with native/adapted plants (2pts) - OR - provide \$0.40/sf to accredited land trust (1pt).
1				SS Credit 3	<b>Open Space</b>	Provide outdoor space greater than or equal to 30% of the total site area (including building footprint), with min. 25% vegetated.
	3			SS Credit 4	<b>v4.1 Rainwater Management</b>	Manage runoff for the 95th percentile (2pt) or 98th percentile (+1pt) using low-impact development (LID) and green infrastructure.
2				SS Credit 5	<b>Heat Island Reduction</b>	Meet high albedo requirements for roof and site (2pts) - OR - place a minimum of 75% parking under cover (1pt).
1				SS Credit 6	<b>Light Pollution Reduction</b>	Meet uplight and light trespass requirements, and do not exceed exterior signage luminance requirements.
				<b>Water Efficiency</b>		<b>Standard</b>
7	2	0	3			
Y				WE Prereq 1	<b>Outdoor Water Use Reduction: 30%</b>	Reduce outdoor water use by 30% compared to the LEED baseline.
Y				WE Prereq 2	<b>Indoor Water Use Reduction: 20%</b>	Reduce indoor water use by 20% compared to the LEED baseline, use fixtures with WaterSense label, and meet requirements for process water use.
Y				WE Prereq 3	<b>Building-Level Water Metering</b>	Install permanent water meters for building and grounds, and commit to share data with USGBC for 5 years.
2				WE Credit 1	<b>Outdoor Water Use Reduction: 50% Reduction / No Potable Water Use</b>	Reduce potable water used for irrigation by 50% (1pt) - AND - use no potable water for irrigation (1pt).
4	2			WE Credit 2	<b>Indoor Water Use Reduction: 25% / 30% / 35% / 40% / 45% / 50%</b>	Reduce indoor water use compared to the LEED baseline.

			3	WE Credit 3	<b>Cooling tower water use</b>	Pilot Alternative Path -Projects may earn full credit if all conditions are met: the baseline system designated for the building using ASHRAE 90.1-2010 Appendix G Table G3.1.1 includes a cooling tower (systems 7 & 8). The design case mechanical system does not use the latent heat of the evaporative cooling of water.
1				WE Credit 4	<b>Water Metering</b>	Install permanent water meters for two or more water subsystems.
25	5	3	0	<b>Energy &amp; Atmosphere</b>		<b>Standard</b>
Y				EA Prereq 1	<b>Fundamental Commissioning and Verification</b>	Engage commissioning agent by end of DD, develop and execute a commissioning plan, and prepare O&M plan for current facilities.
Y				EA Prereq 2	<b>Minimum Energy Performance</b>	Reduce energy cost by 5%, compared to ASHRAE 90.1-2010, Appendix G; meet mandatory provisions of ASHRAE 90.1-2010.
Y				EA Prereq 3	<b>Building-Level Energy Metering</b>	Install meters to provide data on total energy consumption, and commit to share data with USGBC for 5 years.
Y				EA Prereq 4	<b>Fundamental Refrigerant Management</b>	Eliminate CFCs in building HVAC&R, and complete CFC phase-out conversion before project completion for any CFC equipment to remain.
6				EA Credit 1	<b>Enhanced Commissioning</b>	Complete CD review, post occupancy review, and recommissioning manual (3pts), and develop monitoring procedures (+1pt) - AND/OR - complete envelope Cx (+2pts)
6				EA Credit 2	<b>Optimize Energy Performance: 6% / 8% / 10% / 12% / 14% / 16%</b>	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
6				EA Credit 2	<b>Optimize Energy Performance: 18% / 20% / 22% / 24% / 26% / 29%</b>	Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2010, Appendix G.
	3	3		EA Credit 2	<b>Optimize Energy Performance: 32% / 35% / 38% / 42% / 46% / 50%</b>	Reduce building energy cost by 32%/ 35%/ 38% compared to ASHRAE 90.1-2010, Appendix G.
1				EA Credit 3	<b>Advanced Energy Metering</b>	Install energy metering for whole building energy and individual energy end uses representing 10% of more of total consumption.
1	1			EA Credit 4	<b>v4.1 Grid Harmonization</b>	Design building and equipment for participation in demand response programs through load shedding or shifting (2pts) - OR - if DR program not available, provide infrastructure for future (1pt).
5				EA Credit 5	<b>v4.1 Renewable Energy</b>	Use on-site renewable energy systems, procure renewable energy from offsite sources, or offset the greenhouse gas emissions from all or a portion of the building's annual energy use (1-5 pts).
	1			EA Credit 6	<b>Enhanced Refrigerant Management</b>	Select refrigerants with low global warming potential and ozone depletion potential.
8	4	1	0	<b>Materials &amp; Resources</b>		<b>Standard</b>
Y				MR Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Provide space for the collection and storage of paper, cardboard, glass, plastic, metals, and at least two of the following: batteries, mercury-containing lamps, and electronic waste.
Y				MR Prereq 2	<b>Construction and Demolition Waste Management Planning</b>	Develop and implement a construction and demolition waste management plan.
3	2			MR Credit 1	<b>v4.1 Building Life-Cycle Impact Reduction</b>	Conduct a life-cycle assessment that demonstrates a minimum of 10% reduction in at least three of the six impact measures (3pts). - OR - Maintain existing building structure, envelope, and interior nonstructural elements of a historic building (5pts).- OR - Reuse or salvage building materials from off site or on site as percentage (25%/50%/75%) of surface area (2-4pts).
1		1		MR Credit 2	<b>v4.1 Building Product Disclosure &amp; Optimization: Environmental Product Declarations</b>	Use 20 products sourced from five different manufacturers that meet disclosure criteria (1pt) - AND/OR - use products that exhibit optimized performance, 10% by cost, or use at least 10 permanently installed products sources from at least three different manufacturers (1 pt).
1	1			MR Credit 3	<b>v4.1 Building Product Disclosure &amp; Optimization: Sourcing of Raw Materials</b>	Use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria for 20%, by material cost (1pt) - OR - 40% by material cost (2 pts).
1	1			MR Credit4	<b>v4.1 Building Product Disclosure &amp; Optimization: Material Ingredients</b>	Use 20 products sourced from five different manufacturers that demonstrate the chemical inventory of the products (1pt) - AND/OR - use products that document their material ingredient optimization, either 10 compliant products or 10% by material cost (1pt).
2				MR Credit 5	<b>v4.1 Construction &amp; Demolition Waste Management: 50% / 75%</b>	Divert 50%, three material streams (1pt) - OR - 75%, four material streams (2pts), - OR - generate less than 2.5 lbs waste/sf (2pts)
10	2	4	0	<b>Indoor Environmental Quality</b>		<b>Standard</b>
Y				EQ Prereq 1	<b>Minimum IAQ Performance</b>	For mechanically ventilated spaces: Meet minimum outdoor air intake flow requirements determined by ASHRAE 62.1-2010 ventilation rate procedure, meet sections 4 through 7 of ASHRAE 62.1-2010, and monitor outdoor air intake flows. For naturally ventilated spaces: Meet minimum outdoor air opening and space configuration requirements determined by ASHRAE 62.1-2010 natural ventilation procedure; confirm natural ventilation is effective per CIBSE Applications Manual AM10, March 2005 Fig. 2.8.; and meet one of the following: measure exhaust airflow; provide automatic indication devices on natural ventilation openings; or monitor CO2 concentrations.
Y				EQ Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Prohibit smoking inside building, locate exterior smoking areas at least 25 feet away from building, and post no-smoking signage within 10 ft of all building entrances.
2				EQ Credit 1	<b>Enhanced Air Quality Strategies</b>	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) - AND/OR - prevent exterior contamination or increase ventilation or monitor CO2 (1pt).
3				EQ Credit 2	<b>v4.1 Low-Emitting Materials: 2 / 3 / 4 / 5 categories</b>	Achieve the threshold level of compliance with VOC emissions and content standards for 2, 3, 4, or 5 product categories.



1				EQ Credit 3	<b>Construction IAQ Management Plan</b>	Develop an IAQ plan for construction and preoccupancy phases that meets SMACNA IAQ Guidelines for Occupied Buildings Under Construction.
2				EQ Credit 4	<b>Indoor Air Quality Assessment</b>	Perform pre-occupancy building flush out (1pt) or air quality testing (2pts).
1				EQ Credit 5	<b>Thermal Comfort</b>	Meet ASHRAE 55-2010, Thermal Comfort Conditions for Human Occupancy, provide individual thermal comfort controls for at least 50% of individual occupant spaces, and provide group controls for all shared multioccupant spaces.
1	1			EQ Credit 6	<b>Interior Lighting</b>	Provide lighting controls for 90% of individuals and 100% of shared multi-occupant spaces (1pt) - AND/OR - meet four of LEED's lighting quality requirements (1pt).
		3		EQ Credit 7	<b>v4.1 Daylight: 40% / 55% / 75%</b>	Meet spatial daylight autonomy and annual sunlight exposure requirements for percentage (50%/55%/75%) of regularly occupied floor area through simulation (1-3pts) - OR - meet illuminance level requirements for percentage (55%/75%/90%) of regularly occupied floor area through simulation (1-3pts) or measurement (2-3pts).
		1		EQ Credit 8	<b>Quality Views</b>	Provide direct views to the outside that meet 2 out of 4 LEED view criteria in 75% of regularly occupied spaces.
	1			EQ Credit 9	<b>Acoustic Performance</b>	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.
6	0	0	0	<b>Innovation</b>		<b>Standard</b>
1				IN Credit 1.1	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.2	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.3	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.4	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.5	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 2	<b>LEED™ Accredited Professional</b>	LEED Accredited Professional on design team.
3	1	0	0	<b>Regional Priority</b>		<b>Standard</b>
	1			RP Credit 1.1	<b>Regional Priority, SSc4 Rainwater Management</b>	Achieve at least 2 points for SSc4 Rainwater Management
1				RP Credit 1.2	<b>Regional Priority, EAc2 Optimize Energy Performance</b>	Achieve at least 8 points for EAc2 Optimize Energy Performance
1				RP Credit 1.3	<b>Regional Priority, WEc2 Indoor Water Use Reduction</b>	Achieve at least 4 points for WEc2 Indoor Water Use Reduction
1				RP Credit 1.4	<b>Regional Priority, MRc1 Building Life-Cycle Impact Reduction</b>	Achieve at least 2 points for MRc1 Building Life-Cycle Impact Reduction

# LEED v4 for New Construction

## Somerville Masterplan - City Hall

Achievability			
high	med	low	NP
78	22	9	3

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 or more points  
 Achievability rating: High = 90%, Med = 60%, Low = 10%, NP = not possible.

### 84 Projected Points

1	0	0	0			
				<b>Integrative Process</b>		<b>Standard</b>
1				IP Credit 1	<b>v4.1 Integrative Process</b>	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.
				<b>Location &amp; Transportation</b>		<b>Standard</b>
10	6	1	0	16	LT Credit 1	<b>LEED for Neighborhood Development Location</b>
						Locate the project in within a development certified under LEED for Neighborhood Development.
1					LT Credit 2	<b>Sensitive Land Protection</b>
						Locate the development footprint on land that has been previously developed - OR - does not meet LEED criteria for sensitive land (prime farmland, floodplains, habitat for threatened species, near water bodies, in or near wetlands).
1		1			LT Credit 3	<b>High Priority Site</b>
						Locate the project on an infill site in historic district (1pt) - OR - site with priority designation (1pt) - OR - brownfield site where contaminated soil/groundwater remediation is required (2pts).
3	2				LT Credit 4	<b>Surrounding Density and Diverse Uses</b>
						Locate on a site with an existing density of 22,000sf/acre - 35,000 sf/acre and within 1/2 mile of 4-8 basic services.
2	4				LT Credit 5	<b>v4.1 Access to Quality Transit</b>
						Locate project within 1/2 mile of a rail station or ferry terminal that meets min. daily transit service - OR - 1/4 mile of bus, streetcar or rideshare that meets min. daily transit service.
1					LT Credit 6	<b>v4.1 Bicycle Facilities</b>
						Provide short term (2.5% peak visitors) and long term (5% all regular occupants) bike parking within 100 ft of main entrance, FTE showers, and access to bicycle network.
1					LT Credit 7	<b>v4.1 Reduced Parking Footprint</b>
						Provide preferred parking for carpools for 5% of the total parking spaces and provide parking capacity below base ratios determined by ITE Planning Handbook.
1					LT Credit 8	<b>v4.1 Green Vehicles</b>
						Provide preferred parking for Green Vehicles for 5% of all parking spaces, and electric vehicle charging or alternative fuel facility for 2%
				<b>Sustainable Sites</b>		<b>Standard</b>
Y					SS Prereq 1	<b>Construction Activity Pollution Prevention</b>
						Create and implement erosion control plan that meets the 2012 EPA Construction General Permit.
1					SS Credit 1	<b>Site Assessment</b>
						Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
1	1				SS Credit 2	<b>Protect or Restore Habitat</b>
						Protect 40% of greenfield area, restore soils, and restore 30% of previously developed site with native/adapted plants (2pts) - OR - provide \$0.40/sf to accredited land trust (1pt).
1					SS Credit 3	<b>Open Space</b>
						Provide outdoor space greater than or equal to 30% of the total site area (including building footprint), with min. 25% vegetated.
	3				SS Credit 4	<b>v4.1 Rainwater Management</b>
						Manage runoff for the 95th percentile (2pt) or 98th percentile (+1pt) using low-impact development (LID) and green infrastructure.
2					SS Credit 5	<b>Heat Island Reduction</b>
						Meet high albedo requirements for roof and site (2pts) - OR - place a minimum of 75% parking under cover (1pt).
1					SS Credit 6	<b>Light Pollution Reduction</b>
						Meet uplight and light trespass requirements, and do not exceed exterior signage luminance requirements.
				<b>Water Efficiency</b>		<b>Standard</b>
Y					WE Prereq 1	<b>Outdoor Water Use Reduction: 30%</b>
						Reduce outdoor water use by 30% compared to the LEED baseline.
Y					WE Prereq 2	<b>Indoor Water Use Reduction: 20%</b>
						Reduce indoor water use by 20% compared to the LEED baseline, use fixtures with WaterSense label, and meet requirements for process water use.
Y					WE Prereq 3	<b>Building-Level Water Metering</b>
						Install permanent water meters for building and grounds, and commit to share data with USGBC for 5 years.
2					WE Credit 1	<b>Outdoor Water Use Reduction: 50% Reduction / No Potable Water Use</b>
						Reduce potable water used for irrigation by 50% (1pt) - AND - use no potable water for irrigation (1pt).
4	2				WE Credit 2	<b>Indoor Water Use Reduction: 25% / 30% / 35% / 40% / 45% / 50%</b>
						Reduce indoor water use compared to the LEED baseline.

			3	WE Credit 3	<b>Cooling tower water use</b>	Pilot Alternative Path -Projects may earn full credit if all conditions are met: the baseline system designated for the building using ASHRAE 90.1-2010 Appendix G Table G3.1.1 includes a cooling tower (systems 7 & 8). The design case mechanical system does not use the latent heat of the evaporative cooling of water.
1				WE Credit 4	<b>Water Metering</b>	Install permanent water meters for two or more water subsystems.
25	5	3	0	<b>Energy &amp; Atmosphere</b>		<b>Standard</b>
Y				EA Prereq 1	<b>Fundamental Commissioning and Verification</b>	Engage commissioning agent by end of DD, develop and execute a commissioning plan, and prepare O&M plan for current facilities.
Y				EA Prereq 2	<b>Minimum Energy Performance</b>	Reduce energy cost by 5%, compared to ASHRAE 90.1-2010, Appendix G; meet mandatory provisions of ASHRAE 90.1-2010.
Y				EA Prereq 3	<b>Building-Level Energy Metering</b>	Install meters to provide data on total energy consumption, and commit to share data with USGBC for 5 years.
Y				EA Prereq 4	<b>Fundamental Refrigerant Management</b>	Eliminate CFCs in building HVAC&R, and complete CFC phase-out conversion before project completion for any CFC equipment to remain.
6				EA Credit 1	<b>Enhanced Commissioning</b>	Complete CD review, post occupancy review, and recommissioning manual (3pts), and develop monitoring procedures (+1pt) - AND/OR - complete envelope Cx (+2pts)
6				EA Credit 2	<b>Optimize Energy Performance: 6% / 8% / 10% / 12% / 14% / 16%</b>	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
6				EA Credit 2	<b>Optimize Energy Performance: 18% / 20% / 22% / 24% / 26% / 29%</b>	Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2010, Appendix G.
	3	3		EA Credit 2	<b>Optimize Energy Performance: 32% / 35% / 38% / 42% / 46% / 50%</b>	Reduce building energy cost by 32%/ 35%/ 38% compared to ASHRAE 90.1-2010, Appendix G.
1				EA Credit 3	<b>Advanced Energy Metering</b>	Install energy metering for whole building energy and individual energy end uses representing 10% of more of total consumption.
1	1			EA Credit 4	<b>v4.1 Grid Harmonization</b>	Design building and equipment for participation in demand response programs through load shedding or shifting (2pts) - OR - if DR program not available, provide infrastructure for future (1pt).
5				EA Credit 5	<b>v4.1 Renewable Energy</b>	Use on-site renewable energy systems, procure renewable energy from offsite sources, or offset the greenhouse gas emissions from all or a portion of the building's annual energy use (1-5 pts).
	1			EA Credit 6	<b>Enhanced Refrigerant Management</b>	Select refrigerants with low global warming potential and ozone depletion potential.
10	2	1	0	<b>Materials &amp; Resources</b>		<b>Standard</b>
Y				MR Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Provide space for the collection and storage of paper, cardboard, glass, plastic, metals, and at least two of the following: batteries, mercury-containing lamps, and electronic waste.
Y				MR Prereq 2	<b>Construction and Demolition Waste Management Planning</b>	Develop and implement a construction and demolition waste management plan.
5				MR Credit 1	<b>v4.1 Building Life-Cycle Impact Reduction</b>	Conduct a life-cycle assessment that demonstrates a minimum of 10% reduction in at least three of the six impact measures (3pts). - OR - Maintain existing building structure, envelope, and interior nonstructural elements of a historic building (5pts).- OR - Reuse or salvage building materials from off site or on site as percentage (25%/50%/75%) of surface area (2-4pts).
1		1		MR Credit 2	<b>v4.1 Building Product Disclosure &amp; Optimization: Environmental Product Declarations</b>	Use 20 products sourced from five different manufacturers that meet disclosure criteria (1pt) - AND/OR - use products that exhibit optimized performance, 10% by cost, or use at least 10 permanently installed products sources from at least three different manufacturers (1 pt).
1	1			MR Credit 3	<b>v4.1 Building Product Disclosure &amp; Optimization: Sourcing of Raw Materials</b>	Use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria for 20%, by material cost (1pt) - OR - 40% by material cost (2 pts).
1	1			MR Credit4	<b>v4.1 Building Product Disclosure &amp; Optimization: Material Ingredients</b>	Use 20 products sourced from five different manufacturers that demonstrate the chemical inventory of the products (1pt) - AND/OR - use products that document their material ingredient optimization, either 10 compliant products or 10% by material cost (1pt).
2				MR Credit 5	<b>v4.1 Construction &amp; Demolition Waste Management: 50% / 75%</b>	Divert 50%, three material streams (1pt) - OR - 75%, four material streams (2pts), - OR - generate less than 2.5 lbs waste/sf (2pts)
10	2	4	0	<b>Indoor Environmental Quality</b>		<b>Standard</b>
Y				EQ Prereq 1	<b>Minimum IAQ Performance</b>	For mechanically ventilated spaces: Meet minimum outdoor air intake flow requirements determined by ASHRAE 62.1-2010 ventilation rate procedure, meet sections 4 through 7 of ASHRAE 62.1-2010, and monitor outdoor air intake flows. For naturally ventilated spaces: Meet minimum outdoor air opening and space configuration requirements determined by ASHRAE 62.1-2010 natural ventilation procedure; confirm natural ventilation is effective per CIBSE Applications Manual AM10, March 2005 Fig. 2.8.; and meet one of the following: measure exhaust airflow; provide automatic indication devices on natural ventilation openings; or monitor CO2 concentrations.
Y				EQ Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Prohibit smoking inside building, locate exterior smoking areas at least 25 feet away from building, and post no-smoking signage within 10 ft of all building entrances.
2				EQ Credit 1	<b>Enhanced Air Quality Strategies</b>	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) - AND/OR - prevent exterior contamination or increase ventilation or monitor CO2 (1pt).
3				EQ Credit 2	<b>v4.1 Low-Emitting Materials: 2 / 3 / 4 / 5 categories</b>	Achieve the threshold level of compliance with VOC emissions and content standards for 2, 3, 4, or 5 product categories.

1				EQ Credit 3	<b>Construction IAQ Management Plan</b>	Develop an IAQ plan for construction and preoccupancy phases that meets SMACNA IAQ Guidelines for Occupied Buildings Under Construction.
2				EQ Credit 4	<b>Indoor Air Quality Assessment</b>	Perform pre-occupancy building flush out (1pt) or air quality testing (2pts).
1				EQ Credit 5	<b>Thermal Comfort</b>	Meet ASHRAE 55-2010, Thermal Comfort Conditions for Human Occupancy, provide individual thermal comfort controls for at least 50% of individual occupant spaces, and provide group controls for all shared multioccupant spaces.
1	1			EQ Credit 6	<b>Interior Lighting</b>	Provide lighting controls for 90% of individuals and 100% of shared multi-occupant spaces (1pt) - AND/OR - meet four of LEED's lighting quality requirements (1pt).
		3		EQ Credit 7	<b>v4.1 Daylight: 40% / 55% / 75%</b>	Meet spatial daylight autonomy and annual sunlight exposure requirements for percentage (50%/55%/75%) of regularly occupied floor area through simulation (1-3pts) - OR - meet illuminance level requirements for percentage (55%/75%/90%) of regularly occupied floor area through simulation (1-3pts) or measurement (2-3pts).
		1		EQ Credit 8	<b>Quality Views</b>	Provide direct views to the outside that meet 2 out of 4 LEED view criteria in 75% of regularly occupied spaces.
	1			EQ Credit 9	<b>Acoustic Performance</b>	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.
6	0	0	0	<b>Innovation</b>		<b>Standard</b>
1				IN Credit 1.1	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.2	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.3	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.4	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.5	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 2	<b>LEED™ Accredited Professional</b>	LEED Accredited Professional on design team.
3	1	0	0	<b>Regional Priority</b>		<b>Standard</b>
	1			RP Credit 1.1	<b>Regional Priority, SSc4 Rainwater Management</b>	Achieve at least 2 points for SSc4 Rainwater Management
1				RP Credit 1.2	<b>Regional Priority, EAc2 Optimize Energy Performance</b>	Achieve at least 8 points for EAc2 Optimize Energy Performance
1				RP Credit 1.3	<b>Regional Priority, WEc2 Indoor Water Use Reduction</b>	Achieve at least 4 points for WEc2 Indoor Water Use Reduction
1				RP Credit 1.4	<b>Regional Priority, MRc1 Building Life-Cycle Impact Reduction</b>	Achieve at least 2 points for MRc1 Building Life-Cycle Impact Reduction

# LEED v4 for New Construction

## Somerville Masterplan - Edgerly School

Achievability			
high	med	low	NP
76	21	12	3

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 or more points  
 Achievability rating: High = 90%, Med = 60%, Low = 10%, NP = not possible.

### 82 Projected Points

1	0	0	0	<b>Integrative Process</b>		Standard
1				IP Credit 1	<b>v4.1 Integrative Process</b>	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.
9	6	2	0	<b>Location &amp; Transportation</b>		Standard
			16	LT Credit 1	<b>LEED for Neighborhood Development Location</b>	Locate the project in within a development certified under LEED for Neighborhood Development.
1				LT Credit 2	<b>Sensitive Land Protection</b>	Locate the development footprint on land that has been previously developed - OR - does not meet LEED criteria for sensitive land (prime farmland, floodplains, habitat for threatened species, near water bodies, in or near wetlands).
		2		LT Credit 3	<b>High Priority Site</b>	Locate the project on an infill site in historic district (1pt) - OR - site with priority designation (1pt) - OR - brownfield site where contaminated soil/groundwater remediation is required (2pts).
3	2			LT Credit 4	<b>Surrounding Density and Diverse Uses</b>	Locate on a site with an existing density of 22,000sf/acre - 35,000 sf/acre and within 1/2 mile of 4-8 basic services.
2	4			LT Credit 5	<b>v4.1 Access to Quality Transit</b>	Locate project within 1/2 mile of a rail station or ferry terminal that meets min. daily transit service - OR - 1/4 mile of bus, streetcar or rideshare that meets min. daily transit service.
1				LT Credit 6	<b>v4.1 Bicycle Facilities</b>	Provide short term (2.5% peak visitors) and long term (5% all regular occupants) bike parking within 100 ft of main entrance, FTE showers, and access to bicycle network.
1				LT Credit 7	<b>v4.1 Reduced Parking Footprint</b>	Provide preferred parking for carpools for 5% of the total parking spaces and provide parking capacity below base ratios determined by ITE Planning Handbook.
1				LT Credit 8	<b>v4.1 Green Vehicles</b>	Provide preferred parking for Green Vehicles for 5% of all parking spaces, and electric vehicle charging or alternative fuel facility for 2%
6	3	1	0	<b>Sustainable Sites</b>		Standard
Y				SS Prereq 1	<b>Construction Activity Pollution Prevention</b>	Create and implement erosion control plan that meets the 2012 EPA Construction General Permit.
1				SS Credit 1	<b>Site Assessment</b>	Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
1		1		SS Credit 2	<b>Protect or Restore Habitat</b>	Protect 40% of greenfield area, restore soils, and restore 30% of previously developed site with native/adapted plants (2pts) - OR - provide \$0.40/sf to accredited land trust (1pt).
1				SS Credit 3	<b>Open Space</b>	Provide outdoor space greater than or equal to 30% of the total site area (including building footprint), with min. 25% vegetated.
	3			SS Credit 4	<b>v4.1 Rainwater Management</b>	Manage runoff for the 95th percentile (2pt) or 98th percentile (+1pt) using low-impact development (LID) and green infrastructure.
2				SS Credit 5	<b>Heat Island Reduction</b>	Meet high albedo requirements for roof and site (2pts) - OR - place a minimum of 75% parking under cover (1pt).
1				SS Credit 6	<b>Light Pollution Reduction</b>	Meet uplight and light trespass requirements, and do not exceed exterior signage luminance requirements.
9	0	0	3	<b>Water Efficiency</b>		Standard
Y				WE Prereq 1	<b>Outdoor Water Use Reduction: 30%</b>	Reduce outdoor water use by 30% compared to the LEED baseline.
Y				WE Prereq 2	<b>Indoor Water Use Reduction: 20%</b>	Reduce indoor water use by 20% compared to the LEED baseline, use fixtures with WaterSense label, and meet requirements for process water use.
Y				WE Prereq 3	<b>Building-Level Water Metering</b>	Install permanent water meters for building and grounds, and commit to share data with USGBC for 5 years.
2				WE Credit 1	<b>Outdoor Water Use Reduction: 50% Reduction / No Potable Water Use</b>	Reduce potable water used for irrigation by 50% (1pt) - AND - use no potable water for irrigation (1pt).
6				WE Credit 2	<b>Indoor Water Use Reduction: 25% / 30% / 35% / 40% / 45% / 50%</b>	Reduce indoor water use compared to the LEED baseline.
			3	WE Credit 3	<b>Cooling tower water use</b>	Pilot Alternative Path -Projects may earn full credit if all conditions are met: the baseline system designated for the building using ASHRAE 90.1-2010 Appendix G Table G3.1.1 includes a cooling tower (systems 7 & 8). The design case mechanical system does not use the latent heat of the evaporative cooling of water.



1				WE Credit 4	<b>Water Metering</b>	Install permanent water meters for two or more water subsystems.
24	5	4	0	<b>Energy &amp; Atmosphere</b>		<b>Standard</b>
Y				EA Prereq 1	<b>Fundamental Commissioning and Verification</b>	Engage commissioning agent by end of DD, develop and execute a commissioning plan, and prepare O&M plan for current facilities.
Y				EA Prereq 2	<b>Minimum Energy Performance</b>	Reduce energy cost by 5%, compared to ASHRAE 90.1-2010, Appendix G; meet mandatory provisions of ASHRAE 90.1-2010.
Y				EA Prereq 3	<b>Building-Level Energy Metering</b>	Install meters to provide data on total energy consumption, and commit to share data with USGBC for 5 years.
Y				EA Prereq 4	<b>Fundamental Refrigerant Management</b>	Eliminate CFCs in building HVAC&R, and complete CFC phase-out conversion before project completion for any CFC equipment to remain.
6				EA Credit 1	<b>Enhanced Commissioning</b>	Complete CD review, post occupancy review, and recommissioning manual (3pts), and develop monitoring procedures (+1pt) - AND/OR - complete envelope Cx (+2pts)
6				EA Credit 2	<b>Optimize Energy Performance: 6% / 8% / 10% / 12% / 14% / 16%</b>	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
6				EA Credit 2	<b>Optimize Energy Performance: 18% / 20% / 22% / 24% / 26% / 29%</b>	Reduce building energy cost by 18% / 20% / 22% compared to ASHRAE 90.1-2010, Appendix G.
	3	3		EA Credit 2	<b>Optimize Energy Performance: 32% / 35% / 38% / 42% / 46% / 50%</b>	Reduce building energy cost by 32% / 35% / 38% compared to ASHRAE 90.1-2010, Appendix G.
1				EA Credit 3	<b>Advanced Energy Metering</b>	Install energy metering for whole building energy and individual energy end uses representing 10% of more of total consumption.
	1	1		EA Credit 4	<b>v4.1 Grid Harmonization</b>	Design building and equipment for participation in demand response programs through load shedding or shifting (2pts) - OR - if DR program not available, provide infrastructure for future (1pt).
5				EA Credit 5	<b>v4.1 Renewable Energy</b>	Use on-site renewable energy systems, procure renewable energy from offsite sources, or offset the greenhouse gas emissions from all or a portion of the building's annual energy use (1-5 pts).
	1			EA Credit 6	<b>Enhanced Refrigerant Management</b>	Select refrigerants with low global warming potential and ozone depletion potential.
8	4	1	0	<b>Materials &amp; Resources</b>		<b>Standard</b>
Y				MR Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Provide space for the collection and storage of paper, cardboard, glass, plastic, metals, and at least two of the following: batteries, mercury-containing lamps, and electronic waste.
Y				MR Prereq 2	<b>Construction and Demolition Waste Management Planning</b>	Develop and implement a construction and demolition waste management plan.
3	2			MR Credit 1	<b>v4.1 Building Life-Cycle Impact Reduction</b>	Conduct a life-cycle assessment that demonstrates a minimum of 10% reduction in at least three of the six impact measures (3pts) - OR - Maintain existing building structure, envelope, and interior nonstructural elements of a historic building (5pts). - OR - Reuse or salvage building materials from off site or on site as percentage (25%/50%/75%) of surface area (2-4pts).
1		1		MR Credit 2	<b>v4.1 Building Product Disclosure &amp; Optimization: Environmental Product Declarations</b>	Use 20 products sourced from five different manufacturers that meet disclosure criteria (1pt) - AND/OR - use products that exhibit optimized performance, 10% by cost, or use at least 10 permanently installed products sources from at least three different manufacturers (1 pt).
1	1			MR Credit 3	<b>v4.1 Building Product Disclosure &amp; Optimization: Sourcing of Raw Materials</b>	Use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria for 20%, by material cost (1pt) - OR - 40% by material cost (2 pts).
1	1			MR Credit4	<b>v4.1 Building Product Disclosure &amp; Optimization: Material Ingredients</b>	Use 20 products sourced from five different manufacturers that demonstrate the chemical inventory of the products (1pt) - AND/OR - use products that document their material ingredient optimization, either 10 compliant products or 10% by material cost (1pt).
2				MR Credit 5	<b>v4.1 Construction &amp; Demolition Waste Management: 50% / 75%</b>	Divert 50%, three material streams (1pt) - OR - 75%, four material streams (2pts), - OR - generate less than 2.5 lbs waste/sf (2pts)
10	2	4	0	<b>Indoor Environmental Quality</b>		<b>Standard</b>
Y				EQ Prereq 1	<b>Minimum IAQ Performance</b>	For mechanically ventilated spaces: Meet minimum outdoor air intake flow requirements determined by ASHRAE 62.1-2010 ventilation rate procedure, meet sections 4 through 7 of ASHRAE 62.1-2010, and monitor outdoor air intake flows. For naturally ventilated spaces: Meet minimum outdoor air opening and space configuration requirements determined by ASHRAE 62.1-2010 natural ventilation procedure; confirm natural ventilation is effective per CIBSE Applications Manual AM10, March 2005 Fig. 2.8.; and meet one of the following: measure exhaust airflow; provide automatic indication devices on natural ventilation openings; or monitor CO2 concentrations.
Y				EQ Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Prohibit smoking inside building, locate exterior smoking areas at least 25 feet away from building, and post no-smoking signage within 10 ft of all building entrances.
2				EQ Credit 1	<b>Enhanced Air Quality Strategies</b>	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) - AND/OR - prevent exterior contamination or increase ventilation or monitor CO2 (1pt).
3				EQ Credit 2	<b>v4.1 Low-Emitting Materials: 2 / 3 / 4 / 5 categories</b>	Achieve the threshold level of compliance with VOC emissions and content standards for 2, 3, 4, or 5 product categories.

1				EQ Credit 3	<b>Construction IAQ Management Plan</b>	Develop an IAQ plan for construction and preoccupancy phases that meets SMACNA IAQ Guidelines for Occupied Buildings Under Construction.
2				EQ Credit 4	<b>Indoor Air Quality Assessment</b>	Perform pre-occupancy building flush out (1pt) or air quality testing (2pts).
1				EQ Credit 5	<b>Thermal Comfort</b>	Meet ASHRAE 55-2010, Thermal Comfort Conditions for Human Occupancy, provide individual thermal comfort controls for at least 50% of individual occupant spaces, and provide group controls for all shared multioccupant spaces.
1	1			EQ Credit 6	<b>Interior Lighting</b>	Provide lighting controls for 90% of individuals and 100% of shared multi-occupant spaces (1pt) - AND/OR - meet four of LEED's lighting quality requirements (1pt).
		3		EQ Credit 7	<b>v4.1 Daylight: 40% / 55% / 75%</b>	Meet spatial daylight autonomy and annual sunlight exposure requirements for percentage (50%/55%/75%) of regularly occupied floor area through simulation (1-3pts) - OR - meet illuminance level requirements for percentage (55%/75%/90%) of regularly occupied floor area through simulation (1-3pts) or measurement (2-3pts).
		1		EQ Credit 8	<b>Quality Views</b>	Provide direct views to the outside that meet 2 out of 4 LEED view criteria in 75% of regularly occupied spaces.
	1			EQ Credit 9	<b>Acoustic Performance</b>	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.
6	0	0	0	<b>Innovation</b>		<b>Standard</b>
1				IN Credit 1.1	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.2	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.3	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.4	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 1.5	<b>Innovation, TBD</b>	Pending GBCI review and comment.
1				IN Credit 2	<b>LEED™ Accredited Professional</b>	LEED Accredited Professional on design team.
3	1	0	0	<b>Regional Priority</b>		<b>Standard</b>
	1			RP Credit 1.1	<b>Regional Priority, SSc4 Rainwater Management</b>	Achieve at least 2 points for SSc4 Rainwater Management
1				RP Credit 1.2	<b>Regional Priority, EAc2 Optimize Energy Performance</b>	Achieve at least 8 points for EAc2 Optimize Energy Performance
1				RP Credit 1.3	<b>Regional Priority, WEc2 Indoor Water Use Reduction</b>	Achieve at least 4 points for WEc2 Indoor Water Use Reduction
1				RP Credit 1.4	<b>Regional Priority, MRc1 Building Life-Cycle Impact Reduction</b>	Achieve at least 2 points for MRc1 Building Life-Cycle Impact Reduction



HALEY & ALDRICH, INC.  
465 Medford St.  
Suite 2200  
Boston, MA 02129  
617.886.7400

## MEMORANDUM

5 October 2021

File No. 2000460-001-300

TO: Aaron Lamport, AIA LEED AP  
Nate Rogers, AIA  
Beyer Blinder Belle

FROM: Haley & Aldrich, Inc.  
E. Quinn Lewis, P.E. (NY)  
John R. Kastrinos, P.G. (PA)

SUBJECT: Ground Source Heat Exchange (GSHE) Feasibility Study  
Somerville Master Plan  
Central Hill Site (1895 Building and City Hall)  
Somerville, Massachusetts

This memorandum summarizes the results of our evaluation of the potential for integrating ground source heat exchange (GSHE) heating and cooling at the subject site. GSHE is considered the base-scope option for all-electric heat exchange for the subject site and Edgerly Hall, with air-source heat exchange (ASHE) as a deduct-alternate. Based on our field observations, review of existing-conditions plans, figures, and photographs, and discussions with the design team, GSHE has been dismissed from further consideration in favor of other energy-efficiency strategies, including ASHE, at the other sites being considered in the Master Plan. This decision was based on building size, limited available space for the GSHE bore-field, the likely heating and cooling load profiles, or a combination of these and other factors.

In summary, GSHE appears viable to support some of the anticipated heating and cooling loads at the Central Hill Site, likely with auxiliary systems to cover peak load conditions, using available space along the frontage of the 1895 building for developing the GSHE bore-field. This assessment is preliminary and subject to change once detailed (hourly) heating and cooling load profiles have been developed such that realistic thermal load targets for GSHE can be developed with the project mechanical-electrical-plumbing (MEP) engineer – BR+A. In addition, a test-well drilling program is recommended to obtain subsurface thermal properties that will allow refinements to the preliminary bore-field configuration described herein.

This work was based on a site visit, a review of available published information, Haley & Aldrich experience testing bedrock thermal properties on regional projects in the Cambridge, Brookline, and metropolitan Boston areas, and our discussions with Beyer Blinder Belle (BBB) and BR+A regarding the project, including anticipated peak heating and cooling loads for GSHE. Our work was conducted in accordance with our authorized Agreement dated 13 August 2021.

In summary:

1. If the City of Somerville decides to advance GSHE at the Central Hill Site, Haley & Aldrich recommends that closed-loop systems exclusively be considered. Commercial-scale open systems in New England have been problematic due to groundwater quality and borehole stability issues.
2. Three GSHE depth alternatives were considered – 400-ft, 500-ft, and 600-ft closed loops. The feasibility of drilling deeper loops for greater system capacity can be further assessed through a drilling and testing program; however, based on recent GSHE drilling experience at nearby sites in similar geology, a combination of heavily weathered bedrock and high groundwater inflows lead to increased risk of borehole collapse at depths greater than 400 to 600 ft.
3. Based on the existing site conditions, specifically underground utilities site topography, available space outside of building footprints, and potential future site grades, it is potentially feasible to install up to sixty (60) GSHE closed loops on the site. Attachment A provides a preliminary proposed layout of the GSHE bore-field.
4. Larger commercial-scale projects that include GSHE heating and cooling often do so because of sustainability goals such as achieving fossil-fuel free or net-zero energy buildings. The Somerville Master Plan is committed to all-electric buildings at the Central Hill site, with some of the power generated on-site. In replacing fossil-fuel sources with on-site heat exchange, GSHE accordingly will help Somerville meet these commitments.

## Site Setting

City Hall and the 1895 building occupy the Central Hill campus on Highland Avenue, along with the newly re-built Somerville High School, which abuts the 1895 Building. Central Hill is one of a series of prominent drumlins that form the City's high points. The glacial till soils comprising the drumlin are expected to be dense and poorly drained; however, these characteristics have little influence on the viability of developing a GSHE system in the underlying bedrock, which is the target formation for most GSHE systems in New England outside of Cape Cod, the islands, and adjacent coastal-plain communities.

## Bedrock Geology

Based on available geotechnical test boring information and published geologic information, bedrock underlying the Site is comprised of the Cambridge Argillite (claystone) formation, which may also include sandstone, quartzite or conglomerate. Bedrock geology affects drilling production rates, pipe installation, associated costs and schedule requirements, and operation of open geothermal systems. Rock type also affects the potential for borehole collapse due to highly fractured and/or weathered zones. At the feasibility stage, important considerations include depth to bedrock, rock quality, groundwater inflows, and ambient ground temperature. These rock properties are discussed in the following sections.

## Depth to Bedrock

Based on geotechnical borings completed at the site by others, depth to bedrock likely ranges from 75 to 100 ft below the ground surface. Based on this information, depth to rock will not limit system installation (i.e., setting wellheads and piping at target elevations).

## Rock Quality

Based on our experience with geothermal evaluations of other sites located within the Cambridge Argillite formation in neighboring Cambridge and Charlestown, and observations of local drillers, the variable hardness of the formation can lead to borehole collapse through soft, highly weathered zones. GSHE test-well drilling and testing can improve our understanding of the likelihood of borehole collapse within the target depths for the GSHE bore-field.

## Groundwater Inflows

High groundwater inflows are discharged from the borehole during drilling by the air rotary method, which uses compressed air to drive the hammer bit and clear the borehole of rock cuttings and groundwater that enters the borehole through bedrock fractures. The water that is generated during drilling must be managed in sedimentation tanks, treated and discharged off-site under appropriate City, State or Federal permits, or transported for off-site disposal, which is costly for high-inflow conditions (i.e., 50 gallons per minute [gpm] or greater).

When inflows during drilling exceed a threshold value, typically in the range of 50 to 100 gpm, the contractor must employ supplemental air or use other methods to control the inflow, to advance the borehole to the design depth while maintaining acceptable production rates. Flow rates in the Argillite vary widely, from 10 gpm or less to 300 gpm; accordingly, the drilling equipment must be capable of advancing through high inflow zones and a plan is needed to permit, manage, treat, and test the water.

## Ambient Ground Temperatures

From our experience in testing geothermal systems in the Boston basin, ambient ground temperatures on average (i.e., over a typical GSHE closed-loop depth of 500 to 600 ft) are around 55°F.

## Preliminary GSHE Well Design

### OPEN SYSTEMS

In open systems, a shroud with machine or hand drilled openings is installed typically within the deepest 100-ft of the shroud, where groundwater enters under circulating conditions. The submersible pump, which is usually set within 200 ft of ground surface, draws water up the shroud and conveys it to the heat exchanger or heat pump; water exiting the heat pump or exchanger is returned to the same well through a return pipe installed on the outside of the shroud, between the well casing or borehole



sidewall and the shroud. Thermal exchange occurs as the returning water travels along the borehole to the openings at the bottom of the shroud.

Because of the narrow annulus between the shroud and the bedrock borehole in the standing-column design, conditions readily arise that limit or completely obstruct the water circulation that is critical to thermal performance. Such conditions include:

1. Collapse of heavily weathered or fractured borehole sections against the shroud.
2. Erosion of the borehole sidewalls under circulating conditions, leading to accumulation of eroded materials at the bottom of the borehole, which eventually obstructs the openings.
3. Accumulation of metal scale (typically iron hydroxide or manganese oxide deposits) within or around the shroud openings.
4. Bio-fouling by iron bacteria, sulfate-reducing bacteria, or other microbes within and/or around the shroud openings.

In our experience the Cambridge Argillite bedrock is often soft, highly weathered, or fractured and prone to mineral scale or bio-fouling particularly under cooling conditions (when heat is rejected to the subsurface). These bedrock conditions would likely cause one or more of the problems listed above if an open geothermal system were to be installed at the Central Hill site. Further, systems installed at sites in coastal areas, including the greater Boston area, have encountered increasing chloride concentrations with depth. In our experience, although the chloride concentrations are typically well below sea water concentrations, they are high enough to cause corrosion, which is exacerbated by increased return-water temperatures that occur during the cooling season. Although corrosive water can be designed for in open systems using corrosion-resistant materials and sacrificial anodes, conditions are difficult to predict and design for and costly to remedy. Accordingly, standing-column systems require regular maintenance and frequently require repairs that are expensive and not always successful.

**Given the above considerations, and the minimal operation and maintenance required of closed-loop systems, Haley & Aldrich recommends closed-loop GSHE designs be considered exclusively.**

## CLOSED SYSTEMS

In closed loops, the GSHE piping is connected from the wellhead to horizontal circuit piping at the top of the borehole. The piping is entirely sealed such that there is no groundwater circulation. Thermal exchange occurs primarily through conduction following the thermal gradient between the bedrock and the circulating fluids. Closed loops are typically sealed with thermally-enhanced grout, to improve thermal exchange (i.e., compared to an un-grouted borehole with a column of groundwater, which has higher thermal resistance than grout).

The attached figure provides a preliminary GSHE bore-field layout, including supply and return piping connecting the GSHE loops in a series of circuits. Piping to the mechanical room must be configured to avoid conflicts with utilities and other construction elements. These conflicts are typically resolved in design-development, as schematic design details are subject to change.

## GSHE Wellfield Options

### GHSE Modeling

To support efficient long-term system operation, the annual heating and cooling loads, which include the peak loads, must be relatively balanced. We understand that hourly load profiles have not been developed to date for the project; accordingly, to support schematic-level GSHE modeling, the following rough order of magnitude (ROM) annual building heating and cooling loads were estimated based on our experience with similar projects, considering estimated peak loads of 250 tons cooling and 150 tons heating as provided by BR+A:

- Peak Cooling: 250 tons (3,000 kBH)
- Peak Heating: 150 tons (1,800 kBH)
- Annual Cooling: 2,985,000 (kBtu)
- Annual Heating: 4,035,000 (kBtu)

The ROM hourly load profile was incorporated in Ground Loop Design (GLD) software to model the ground thermal exchange and projected entering and exiting water temperatures (ExWTs) to the heat pumps. For a given range of ExWTs that would allow for GSHE operation at acceptable efficiency, the model produces a target borehole length for a given spacing between boreholes. The schematic level ranges for modeling-input parameters were as follows:

- Number of boreholes: 60
- Nominal borehole depths: 400 to 600 ft
- Borehole piping: 1 ¼-in HDPE Quad-Loops (400 ft and 500 ft), 1 ½-in HDPE Single U-Loops (600 ft). All boreholes sealed with thermally enhanced grout
- Nominal borehole diameter: 6-in
- Borehole spacing center-to-center: 25 ft
- Formation thermal conductivity: 1.7 to 2.2 Btu/hr-ft-°F
- Formation thermal diffusivity: 1.15 to 1.17 ft<sup>2</sup>/day
- Initial undisturbed formation (ground) temperature: 54 to 57 °F
- GSHE loop fluid type: 100% water or water/propylene glycol (25% mix)
- GSHE loop target temperature range: 45°F to 95°F (EWTs\*) – water only  
30°F to 95°F (ExWTs\*) – water/glycol mix
- GSHE Performance Prediction Period: 20-25 years

\*- Exiting water temperatures from heat pumps

### GHSE Modeling Results

Based on the schematic-level ROM loads and the estimated number of loops that can fit within the site, the following table summarizes the potential GSHE thermal capacities considering water only for the GSHE loop fluid:

Number of Wells	Borehole Depth - Piping Size, Type	Ground Thermal Parameters	Cooling						Heating					
			GSHE			Supplemental			GSHE			Supplemental		
			Peak Cooling (%)	Peak Cooling (Tons)	Annual Cooling (%)	Peak Cooling (%)	Peak Cooling (Tons)	Annual Cooling (%)	Peak Heating (%)	Peak Heating (kBH)	Annual Heating (%)	Peak Heating (%)	Peak Heating (kBH)	Annual Heating (%)
60	600 ft-1 1/2" Single U-Loop	Less Optimal	55%	138	98%	45%	62	2%	45%	810	80%	55%	990	20%
60	600 ft-1 1/2" Single U-Loop	More Optimal	100%	250	100%	0%	0	0%	55%	990	89%	45%	810	11%
60	500 ft-1 1/4" Quad-Loop	Less Optimal	50%	125	97%	50%	63	3%	44%	792	79%	56%	1008	21%
60	500 ft-1 1/4" Quad-Loop	More Optimal	100%	250	100%	0%	0	0%	55%	990	89%	45%	810	11%
60	400 ft-1 1/4" Quad-Loop	Less Optimal	27%	68	82%	73%	49	18%	32%	576	63%	68%	1224	37%
60	400 ft-1 1/4" Quad-Loop	More Optimal	42%	105	94%	58%	61	6%	40%	720	74%	60%	1080	26%

A conceptual level assessment for the potential GSHE thermal capacities considering use of water with 25% propylene glycol for the GSHE loop fluid suggests that potentially 100% of the annual and peak heating loads may be provided by the GSHE, with an increase of approximately 15% to 20%, respectively, in annual and peak cooling loads provided by GHSE. If the GSHE program is selected to advance further, the glycol option should be further evaluated based on hourly building loads.

The alternative wellfield design depths represent a tradeoff between increased thermal capacity and increased risks inherent in drilling to 600 ft using spacing between loops of 20 to 25 ft, which has become an industry standard for closed loops in the New England area. The depth limit is partly due to the increased head loss (and associated pump energy demands) from friction loss in conventional high-density polyethylene (HDPE) "U-bend" designs at depths below 500 to 600 ft.

Further, for Quad Loops at this time we recommend limiting the depths to 500 ft, as the larger diameter of the loop bundle may make it challenging or infeasible to advance the loops to 600 ft. The 600-ft loop options in the matrix above are reserved for conventional, single U-bends. Test-well drilling would further inform loop depths, alternative designs, and other details based on drilling conditions encountered and site-specific ground thermal properties derived by thermal-conductivity testing.

### Cost Considerations

Double U-bends (Quad Loops) are more expensive than conventional single U-bends; however, the improved thermal exchange is typically cost-effective for bore-fields of this size. Payback periods based on energy savings for closed-loop GSHE systems have not been determined; however, decisions on advancing GSHE are often driven more by sustainability goals, such as a commitment to constructing fossil-fuel free or net-zero energy buildings, than return-on-investment (ROI) estimates.

## Regulatory Setting

### STATE-LEVEL PERMITTING REVIEW

Per Massachusetts Department of Environmental Protection (MassDEP) revisions to the Groundwater Discharge Permit Program at 314 CMR 5.0, dated December 2016, closed-loop wells do not require registration under the UIC Program (310 CMR 27.00) since groundwater is not circulated in the system. The UIC regulations define a minimum setback distance of 10 ft from GSHE closed-loops to water- or sewer lines.

### LOCAL-LEVEL PERMITTING REVIEW

The City of Somerville has not adopted any requirements or permits that are specific to geothermal wells.

## Incentives

### STATE INCENTIVES

Ground-Source Heat Exchange Systems qualify as Renewable Thermal Energy Units under the State of Massachusetts Alternative Energy Portfolio Standard (APS). The APS offers the opportunity for GSHE-system owners to apply for Alternative Energy Credits (AECs) for GSHE heating, specifically, provided the GSHE system serves 100% of the annual building heat load. A system serving the two buildings at Central Hill will likely qualify as a large GSHE project (over 1,000,000 Btu/hr).

Projects that meet the APS criteria are eligible for 1 MW-hr of alternative energy credit for every 3.412 MMBtu of thermal energy produced and verified by an on-site utility grade meter. Metering guidelines are described in the Massachusetts Department of Energy Resources (DOER) *Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units*. For GSHE systems, consumption is determined based on metered rates of grid-electrical consumption and manufacturer's coefficient of performance (COP) data for the heat pumps.

AEC values are subject to change per market conditions. The program applies a multiplier to the AECs according to the Department of Energy Resources (DOER) Guidelines on Multipliers for Renewable Thermal Generation Units.

### FEDERAL INCENTIVES

A tax credit of up to 10% of expenditures is available for corporations under the federal Business Energy Investment Tax Credit (ITC) program; however, the City of Somerville's tax-exempt status likely makes it ineligible for this incentive.

## Limitations

This report has been prepared in general accordance with standard hydrogeological and engineering consulting practices applied to GSHE heating and cooling. The work was completed in general accordance with the scope of work in our authorized Agreement dated 13 August 2021. No other warranty, express or implied is made.

## ATTACHMENTS

Attachment A Site Plan Showing Preliminary GSHE Bore-Field Configuration

## REFERENCES

1. Subsurface data contained in Construction Documents, Somerville High School, SMMA No. 15070, dated 4/27/2018.
2. Massachusetts Clean Energy Center, 2018. Commercial-Scale Ground-Source Heat Pump Program Manual, dated 3 January 2018.
3. Massachusetts Alternative Energy Portfolio Standard, at <https://www.mass.gov/alternative-energy-portfolio-standard>.
4. Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs, Department of Energy Resources, 2017. Alternative Energy Portfolio Standard Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units – Part 1, dated 29 December 2017.

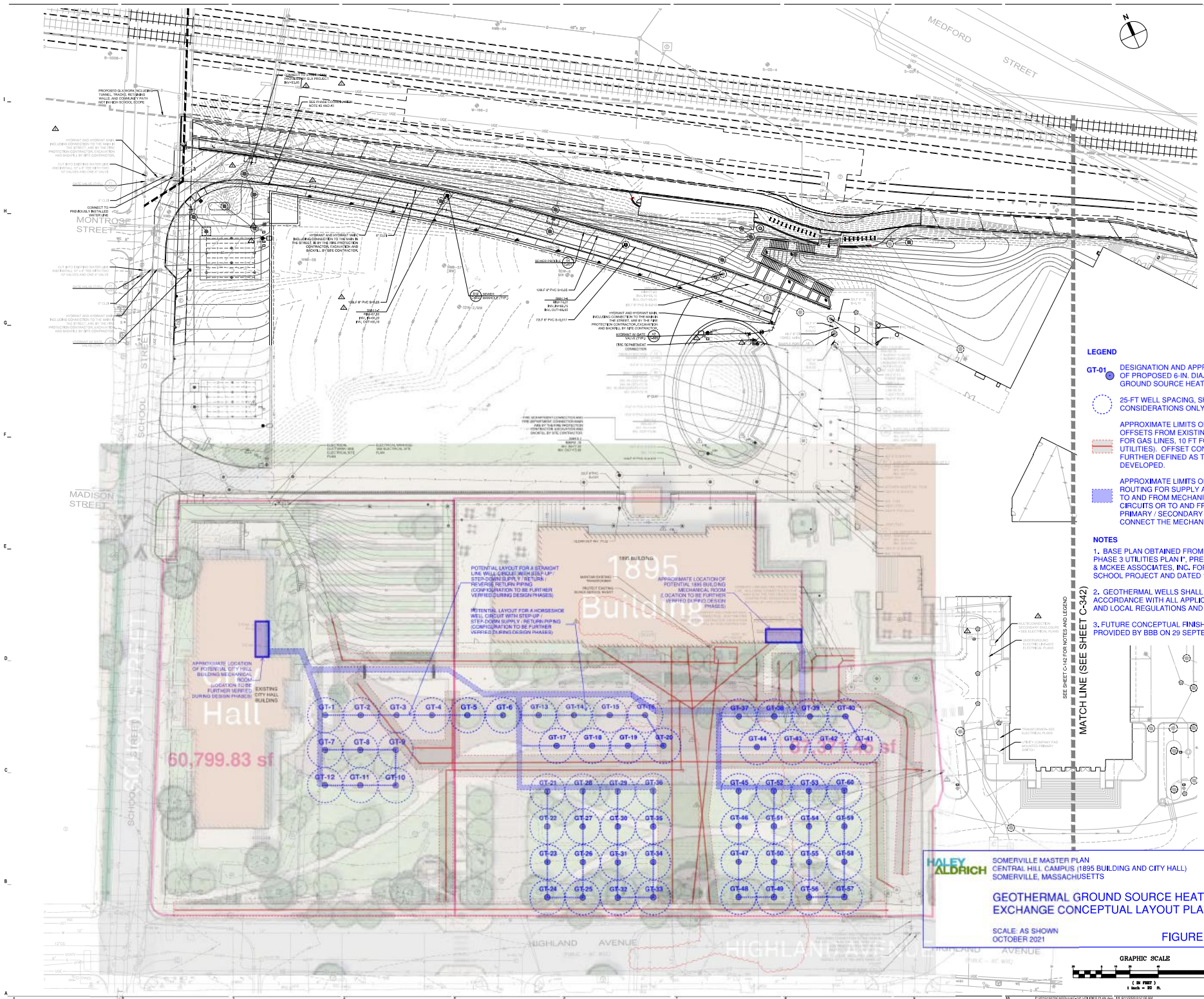


**ATTACHMENT A**

**Site Plan Showing Preliminary GSHE Bore-Field Configuration**



SOMERVILLE HIGH SCHOOL  
100 HIGHLAND AVENUE  
SOMERVILLE, MA 02153



LEGEND

- GT-01 DESIGNATION AND APPROXIMATE LOCATION OF PROPOSED 6-IN. DIA. GEOTHERMAL GROUND SOURCE HEAT EXCHANGE WELL
- 25-FT WELL SPACING, SHOWN FOR SPACING CONSIDERATIONS ONLY
- APPROXIMATE LIMITS OF POTENTIAL OFFSETS FROM EXISTING UTILITIES (20 FT FOR GAS LINES, 10 FT FOR OTHER UTILITIES). OFFSET CONSIDERATIONS TO BE FURTHER DEFINED AS THE DESIGN IS DEVELOPED.
- APPROXIMATE LIMITS OF POTENTIAL PIPE ROUTING FOR SUPPLY AND RETURN LINES TO AND FROM MECHANICAL ROOMS AND CIRCUITS OR TO AND FROM CIRCUITS TO A PRIMARY / SECONDARY PIPING SCHEME TO CONNECT THE MECHANICAL ROOMS.

NOTES

1. BASE PLAN OBTAINED FROM DRAWING TITLED "C-341 PHASE 3 UTILITIES PLAN I", PREPARED BY SYMMES MAINI & MCKEE ASSOCIATES, INC. FOR THE SOMERVILLE HIGH SCHOOL PROJECT AND DATED 12 JUNE 2020.
2. GEOTHERMAL WELLS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS AND REQUIREMENTS.
3. FUTURE CONCEPTUAL FINISHED LANDSCAPE PLAN AS PROVIDED BY BBB ON 29 SEPTEMBER 2021.

---	PROPOSED	GEOTHERMAL WELL
---	EXISTING	GEOTHERMAL WELL
---	PROPOSED	PIPE
---	EXISTING	PIPE
---	PROPOSED	MECHANICAL ROOM
---	EXISTING	MECHANICAL ROOM
---	PROPOSED	UTILITY
---	EXISTING	UTILITY
---	PROPOSED	LANDSCAPE
---	EXISTING	LANDSCAPE
---	PROPOSED	CONSTRUCTION
---	EXISTING	CONSTRUCTION
---	PROPOSED	ROADWAY
---	EXISTING	ROADWAY
---	PROPOSED	RAILROAD
---	EXISTING	RAILROAD
---	PROPOSED	UTILITY
---	EXISTING	UTILITY
---	PROPOSED	MECHANICAL ROOM
---	EXISTING	MECHANICAL ROOM
---	PROPOSED	UTILITY
---	EXISTING	UTILITY
---	PROPOSED	LANDSCAPE
---	EXISTING	LANDSCAPE
---	PROPOSED	CONSTRUCTION
---	EXISTING	CONSTRUCTION
---	PROPOSED	ROADWAY
---	EXISTING	ROADWAY
---	PROPOSED	RAILROAD
---	EXISTING	RAILROAD

**HALEY ALDRICH**

SOMERVILLE MASTER PLAN  
CENTRAL HILL CAMPUS (1895 BUILDING AND CITY HALL)  
SOMERVILLE, MASSACHUSETTS

**GEOTHERMAL GROUND SOURCE HEAT EXCHANGE CONCEPTUAL LAYOUT PLAN**

SCALE: AS SHOWN  
OCTOBER 2021

FIGURE 1

SCALE	1"=20'
DRAWN BY	BBB/STP
CHECKED BY	STP
PROJECT LEADER	SCJ/STP
PROJECT MGR.	LP
DATE	10/20/21
© SYMMES MAINI & MCKEE ASSOCIATES, INC. 2021	

PHASE 3 UTILITIES PLAN I



HALEY & ALDRICH, INC.  
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Suite 2200  
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617.886.7400

## MEMORANDUM

8 October 2021

File No. 2000460-001-300

TO: Nate Rogers, AIA  
Beyer Blinder Belle

FROM: Haley & Aldrich, Inc.  
E. Quinn Lewis, P.E. (NY)  
John R. Kastrinos, P.G. (PA)

SUBJECT: Ground Source Heat Exchange (GSHE) Feasibility Study  
Somerville Master Plan  
Edgerly Education Center Site  
Somerville, Massachusetts

This memorandum summarizes the results of our evaluation of the potential for integrating ground source heat exchange (GSHE) heating and cooling at the subject site. GSHE is considered the base-scope option for all-electric heat exchange for the Edgerly Education Center site, with air-source heat exchange (ASHE) as a deduct-alternate. This assessment is based on our field observations, review of existing plans, discussions with the design team, and our experience testing bedrock thermal properties on regional projects in the Cambridge, Brookline, and metropolitan Boston areas. Our work was conducted in accordance with our authorized Agreement dated 13 August 2021.

In summary, given the available space within the existing building footprint, proximity to public rights-of-way, potential existing utilities in and around the building, and depth limitations related to the local geology, GSHE could support a small percentage of the likely heating and cooling loads at the Edgerly School site. We estimate that a field of 15 closed loops, installed within the courtyard/parking area may provide from roughly 15 to 45 tons of heating and cooling, depending on loop depth and design, and assuming a balanced load profile. If the City of Somerville elects to advance with a GSHE-based design, a test-well drilling program is recommended to obtain subsurface thermal properties that will allow us to refine our preliminary estimates of thermal exchange with a GSHE bore-field of 15 closed loops.

### Site Setting

The Edgerly Education Center is in a dense, largely residential neighborhood; as such, there is limited space available for a GSHE bore-field. Through our discussions with BBB and BR+A, the parking-area courtyard on the south side of the building offers the most space for advancing multiple boreholes to support GSHE heating and cooling. The attached site plan markup depicts a schematic layout of GSHE boreholes in the courtyard.

As discussed in our separate memorandum regarding the Central Hill site, the bedrock geology in the Somerville area is best suited to closed GSHE systems installed to depths of 400 to 600 ft. The feasibility of drilling deeper loops for greater system capacity can be further assessed through a drilling and testing program; however, based on recent GSHE drilling experience at nearby sites in similar geology, a combination of heavily weathered bedrock and high groundwater inflows lead to increased risk of borehole collapse at depths greater than 400 to 600 ft. Due to the limited space availability, borehole spacing considerations for the Edgerly site, and potential constraints for locating drilling and support equipment required for bore-field installation, depth limits of 400 to 500 ft would likely be considered.

## **GSHE Potential**

To support efficient long-term system operation, the annual heating and cooling loads, which include the peak loads, must be relatively balanced. We understand that hourly load profiles have not been developed to date for the project; however, based on the estimated number of loops that can fit within the site, a GSHE production bore-field of fifteen (15) loops, 400 to 500 ft in depth, can provide an estimated range of roughly 15 to 45 tons of heating and cooling to the building, depending on loop depth and design. If deeper loops are considered, to provide greater thermal exchange, Haley & Aldrich recommends advancing a test-well drilling and testing program to further assess the viability and cost-effectiveness of installing closed loops to 1,000 ft or greater.

Bore-field modeling was not performed for this evaluation as the site capacity for GSHE is limited due to the minimal space available and likely depth limitations due to local geology. Additional challenges to GSHE development at the Edgerly site include:

1. Limited space available for staging of drilling equipment, drill-spoils management, and water management would limit production rates as no more than one drill rig at a time would likely fit within the available space.
2. Multiple tanks will likely be required for groundwater management, potentially extending the footprint of the drilling operation onto the neighboring Otis Street.
3. Noise and potential vibrations from the drilling operation may disturb building occupants and abutting residents and lead to limited work hours. Drilling noise would be exacerbated by the confining walls bounding the parking area/courtyard where the bore-field would be advanced.

## **Regulatory Setting**

### **STATE-LEVEL PERMITTING REVIEW**

Per Massachusetts Department of Environmental Protection (MassDEP) revisions to the Groundwater Discharge Permit Program at 314 CMR 5.0, dated December 2016, closed-loop wells do not require registration



under the UIC Program (310 CMR 27.00) since groundwater is not circulated in the system. The UIC regulations define a minimum setback distance of 10 ft from GSHE closed-loops to water- or sewer lines.

## LOCAL-LEVEL PERMITTING REVIEW

The City of Somerville has not adopted any requirements or permits that are specific to geothermal wells.

## Incentives

### STATE INCENTIVES

Ground-Source Heat Exchange Systems qualify as Renewable Thermal Energy Units under the State of Massachusetts Alternative Energy Portfolio Standard (APS). The APS offers the opportunity for GSHE-system owners to apply for Alternative Energy Credits (AECs) for GSHE heating, specifically, provided the GSHE system serves 100% of the annual building heat load.

Projects that meet the APS criteria are eligible for 1 MW-hr of alternative energy credit for every 3.412 MMBtu of thermal energy produced and verified by an on-site utility grade meter. Metering guidelines are described in the Massachusetts Department of Energy Resources (DOER) *Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units*. For GSHE systems, consumption is determined based on metered rates of grid-electrical consumption and manufacturer's coefficient of performance (COP) data for the heat pumps.

AEC values are subject to change per market conditions. The program applies a multiplier to the AECs according to the Department of Energy Resources (DOER) Guidelines on Multipliers for Renewable Thermal Generation Units.

### FEDERAL INCENTIVES

A tax credit of up to 10% of expenditures is available for corporations under the federal Business Energy Investment Tax Credit (ITC) program; however, the City of Somerville's tax-exempt status likely makes it ineligible for this incentive.

## Limitations

This report has been prepared in general accordance with standard hydrogeological and engineering consulting practices applied to GSHE heating and cooling. The work was completed in general accordance with the scope of work in our authorized Agreement dated 13 August 2021. No other warranty, express or implied is made.



## **ATTACHMENTS**

Attachment A Site Plan Showing Preliminary GSHE Bore-Field Configuration

## **REFERENCES**

1. Massachusetts Clean Energy Center, 2018. Commercial-Scale Ground-Source Heat Pump Program Manual, dated 3 January 2018.
2. Massachusetts Alternative Energy Portfolio Standard, at <https://www.mass.gov/alternative-energy-portfolio-standard>.
3. Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs, Department of Energy Resources, 2017. Alternative Energy Portfolio Standard Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units – Part 1, dated 29 December 2017.

**ATTACHMENT A**

**Site Plan Showing Preliminary GSHE Bore-Field Configuration**



**HAZARDOUS BUILDING MATERIALS SURVEY REPORT  
FORMER 1895 HIGH SCHOOL BUILDING  
81 HIGHLAND AVENUE, SOMERVILLE, MA**



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**SEPTEMBER 29, 2021**



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**APPENDICES**

Appendix A      Asbestos Bulk and PCB Bulk Sample Results



Appendix B	Lead Paint Testing Results
Appendix C	Hazardous Building Materials Tables
Appendix D	Non-ACMs Tables
Appendix E	Photographs
Appendix F	Hazardous Building Materials Abatement Cost Estimate
Appendix G	Former Testing Report - 2015

### **CERTIFICATION OF RESULTS**

This report has been prepared for the exclusive use of AXIOM's Client, Haley & Aldrich, Inc. Photocopying of this document by parties other than those designated by the Client or use of this document for purposes other than it is intended, is strictly prohibited.

Respectfully submitted this 29<sup>th</sup> day of September 2021

Prepared by:



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Geoff Gerace  
Asbestos Inspector/Project Manager

Reviewed by:



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## 1.0 PURPOSE AND SCOPE OF WORK

Axiom Partners, Inc. (AXIOM) was retained by Haley & Aldrich, Inc. to perform an inspection of the referenced building in advance of planned property renovation work.

The purpose of this investigation was to identify Asbestos-Containing Materials (ACMs), Lead-Containing Paint (LCP), Polychlorinated Biphenyls (PCBs), Mercury (Hg), Chlorofluorocarbons (CFCs) and other miscellaneous hazardous materials and wastes for abatement prior to or in conjunction with planned property redevelopment activities.

## 2.0 SITE DESCRIPTION

The building is an unoccupied three-story building with a basement and a footprint of approximately 60,000 square feet. The building was formerly occupied by Somerville High School. The floors are designated as basement, second floor, third floor and fourth floor. The building was constructed in 1895 and was reportedly renovated over many years to the present day. It is constructed of steel and masonry, concrete and wood. Most notably, the building's areas consist of classrooms, hallways, offices, a boiler room, storage rooms, bathrooms, and mechanical rooms. The exterior walls are brick façade over CMU block. Interior walls are a combination of concrete, plaster and painted drywall. The vast majority of the floors have hardwood floor planking, carpeting and vinyl flooring as well as some ceramic floor tile coverings. The majority of spaces have plaster and/or drywall walls and ceilings covering wood decking. The building has a flat rubber roof system.

## 3.0 INSPECTION PERSONNEL, METHODS AND LABORATORY

### 3.1 Inspection Personnel and Process

#### 3.1.1 *Inspection Personnel*

The investigative survey was conducted from September 8-10th, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Geoff Gerace and Jesse DeGeorge (Massachusetts Asbestos Inspector License Number AI034620 and AI031684, respectively) and was assisted by Jeff Albert of AXIOM.

#### 3.1.2 *Inspection Process*

The inspection for ACMs and hazardous building materials (HBMs) was conducted in a systematic manner using AXIOM's standard safety procedures and inspection protocols including:

1. A visual inspection of the building' interiors, exteriors and roofs to locate, quantify and assess the condition of materials suspected to contain asbestos, lead, PCBs, CFCs, Mercury and other hazardous chemicals, materials and wastes.
2. Collection and analysis of materials as described herein to determine their composition.
3. Review of previous asbestos survey and post-abatement reports, sampling reports and laboratory analysis for ACMs. Reports or related testing data were provided to AXIOM during this investigation and there was related historical knowledge regarding ACMs in the building. This report and its findings can be found in Appendix G.

## 3.2 Asbestos-Containing Materials (ACM) Investigation

### 3.2.1 Methodology

The inspection for suspect ACMs included:

1. Collection of representative bulk samples of each homogeneous application of suspect material in sufficient numbers to comply with EPA/AHERA criteria (see Chart A below).
2. To prevent release of any airborne asbestos, samples of suspect friable materials were collected by wetting the suspect materials and then removing a small full-thickness sample and placing it in a sealed plastic bag labeled with a unique sample identification number.
3. Chain-of-custody documentation was used to ensure sample integrity.
4. Analysis of the bulk samples by an accredited laboratory using the EPA-approved Polarized Light Microscopy (PLM) method.
5. A review of the inspection findings and lab results to ensure proper and consistent identification and characterization of all confirmed and presumed ACMs.

**Chart A**

#### Minimum Asbestos Bulk Sampling Criteria

Type of Suspect Material <sup>1</sup>	Minimum Sampling Criteria
Surfacing	EPA/AHERA mandated statistically random criteria (Min. of 3 samples; Max. of 7 samples)
Miscellaneous	A sufficient number of samples to determine if material is an ACM (typically 2 samples of each homogeneous application)
Thermal System Insulations	Three random samples of each homogeneous material

### 3.2.2 Definition of Key Inspection Terms

Given the specific purposes and objectives of this inspection, the following definitions were used for the terms: Suspect Materials, Non-Suspect Materials, Homogeneous Applications or Areas, Inaccessible Building Areas, and Confirmed ACMs:

1. Suspect Materials: Installed building materials that either were pre-formed (i.e., manufactured off-site) or were prepared and installed on-site. All building materials are considered to be suspect ACMs except as noted in #2 below.

<sup>1</sup> Per homogeneous material or area

2. Non-Suspect Materials: For the purposes of this inspection, the following materials were considered non-suspect and were not assessed or sampled if observed:
  - Plastic
  - Glass
  - Wood or Wood Composite Materials
  - Brick, Granite, Marble, or Other Stonework
  - Pink or Yellow Fiberglass Insulation on Pipes or Other Mechanical Components
  - Clay or Ceramic Tiles
  - Rubber or Synthetic Foam
  - Paint (unless textured)
  - Concrete or Mortar (except Gypcrete)
  - Carpeting, Curtains, Wallpaper, and Other Paper/Natural Fiber, Fabric, or Synthetics
3. Homogeneous Applications or Areas: Are suspect materials which serve the same function or purpose (e.g., floor or ceiling tiles) have similar color and texture and were likely installed at or near the same time. Note that the homogeneity of certain materials such as wall and ceiling plaster at times cannot be readily determined.
4. Inaccessible Building Areas: Areas that AXIOM could not survey because it was unsafe or impractical to disassemble or remove systems or coverings or because a human being cannot physically enter or observe the area or components. These areas include, but are not limited to, Transite pipes coming on to the site from municipal utilities mains from the surrounding streets, underground trenches, boilers, vessels, storage tanks and mechanical systems. Also, the roof system was inaccessible at the time of the survey.
5. Confirmed ACMs: Suspect materials where at least one of the bulk samples contains an asbestos concentration greater than 1%. According to the EPA/AHERA criteria, if all bulk samples of a homogeneous area of material are found to contain less than 1% asbestos, the material may be classified as a non-asbestos material.
6. Friable and Non-Friable ACMs: An ACM that can be crumbled, crushed or otherwise reduced to powder by hand pressure is a friable material; non-friable ACMs cannot. This is important with respect to managing ACMs. Additionally, some non-friable ACMs are regulated differently.

### 3.3 Asbestos Laboratory Services

#### 3.3.1 PLM Bulk Sample Analysis

Bulk samples collected during the inspection were submitted to and analyzed by EMSL Analytical, Inc. (EMSL) located in Woburn, Massachusetts. EMSL is a Massachusetts-licensed asbestos bulk sample laboratory (License #AA000188). Bulk samples were analyzed for asbestos content using EPA Method 600/R-93/116. A chain-of-custody form was used to ensure sample integrity.

The entire inventory of collected samples may not have required analysis. Initially, one sample per material was analyzed. If the first sample was found to contain asbestos, the remaining samples were not analyzed (*Positive Stop* protocol). If the first sample was determined not to contain asbestos, however, the remaining samples were analyzed until >1% asbestos was detected or until the entire sample set was analyzed.

### 3.4 Lead Containing Paint (LCP) Investigation

Representative testing of paints for the presence of lead was performed in the building as part of AXIOM's scope of work.

### *3.4.1 Introduction*

Historically, lead was added to paint because its color stability properties made it a desirable pigment and because it enhances durability. Lead-Containing Paint (LCP) becomes harmful when ingested or inhaled as dust or fumes. Once lead was proven to be a health hazard, it was officially banned in 1978 from paints used in residences.

In an occupational setting, if lead-based painted surfaces are to be impacted by renovation or demolition activities, contractor personnel exposure (per OSHA compliance) and waste disposal (per EPA compliance) issues must be addressed and factored into the cost of the project.

### *3.4.2 Testing Methodology*

AXIOM utilized a Portable X-Ray Fluorescence Analyzer (XRF) to perform the lead paint survey. The XRF is a hand-held instrument that contains a radioisotopic source and operates on the principle of X-ray fluorescence. The depression of a spring-loaded trigger mechanism on the XRF unit opens a shutter in the faceplate that allows radiation from an isotopic source to stimulate the lead atoms in the paint. This stimulation causes the atoms to emit (fluoresce) X-rays which the unit detects and converts into electrical pulses which are then processed, and the result is read through a digital display on the instrument.

AXIOM used a NITON Model XLp300 which analyzes surfaces quickly, accurately, and non-destructively. Surface levels of lead are measured in milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ). This unit can measure the concentration of LCP on surfaces as little as  $0.01 \text{ mg of lead}/\text{cm}^2$ .

### *3.4.3 XRF Testing Procedures*

Upon arrival at the site, a "validation test" was performed to ensure that the XRF instrument was operating properly. The validation test was performed on a calibration test sheet supplied by the manufacturer to determine if the instrument is consistently measuring lead content. During this survey, the XRF was functioning properly as defined by the manufacturer.

In conducting the LCP survey representative tests were performed on homogeneous (similar color and use) painted surfaces. Results were related to other surfaces possessing similar homogeneous characteristics. By following this sampling protocol, every painted surface did not have to be tested. Representative testing was performed for the presence of lead-based paint (LBP) and lead-containing paint (LCP) on accessible interior and exterior painted surfaces.

## **3.5 Polychlorinated Biphenyls (PCBs) Investigation**

AXIOM conducted an inspection of the building and grounds to identify suspect PCB-containing fluorescent light fixture ballasts, electrical transformers and bulk products. The survey was conducted in a systematic manner that included:



1. Performing a detailed walk-through to inspect and categorize the various types of accessible fluorescent light fixtures and electrical transformers.
2. Preparing an inventory of electrical light ballasts and transformers known or suspected to contain PCBs. Nameplate data was recorded if it was present and legible.
3. AXIOM inspected the building to identify suspect PCB-containing caulking. The survey included identifying and testing representative caulking compounds materials for PCBs. The bulk samples were collected using hand tools and placed into seal containers (glass sample jars) which were promptly labeled and placed into a cooler with ice. Samples were picked up at the site by a courier and hand delivered to Alpha Analytical Laboratory located in Westborough, MA for analysis. The samples were prepared using the Soxhlet extraction method and analyzed for PCBs by the Environmental Protection Agency (EPA) Methods 3540C and 8082. The complete laboratory reports can be found in Appendix A.

### **3.6 Mercury Light Tube and Thermostat Investigation**

AXIOM inspected the building to identify suspect Mercury-containing equipment as follows:

1. Preparing an inventory of fluorescent light bulbs that contain Mercury vapor in conjunction with the light ballast inspection described in Section 3.5.
2. Performing a walkthrough to identify and inventory thermostats, switches, actuators and other equipment that contain liquid Mercury.

### **3.7 Chlorofluorocarbons (CFCs) Investigation**

AXIOM inspected the building to identify suspect chlorofluorocarbons (CFCs) associated with refrigeration and air conditioning equipment and prepared an inventory of equipment including an estimate of CFC quantities. Nameplate data was recorded if it was present and legible. Assumptions were made if the unit was inaccessible or if the nameplate was not present or illegible.

### **3.8 Miscellaneous Hazardous Building Materials**

AXIOM inspected the building for miscellaneous hazardous building materials and chemical wastes including oil-containing devices (e.g. boilers, generators, elevators, motors, grease traps, etc.) and miscellaneous items such as lead acid batteries, paints, cleaners and other chemicals.

## **4.0 FINDINGS AND RECOMMENDATIONS**

### **4.1 Asbestos-Containing Materials**

#### *4.1.1 Asbestos-Containing Materials (ACMs)*

Materials **confirmed** to contain >1% asbestos for the survey are as follows:

**TABLE 1A - CONFIRMED ACMs**  
**FORMER 1895 HIGH SCHOOL BUILDING, 81 HIGHLAND AVENUE, SOMERVILLE, MA**

**Hazardous Building Materials Survey Report  
Former 1895 High School Building  
81 Highland Avenue, Somerville, MA**

*Axiom Partners, Inc.*

Sample Reference	Sample Description	Sample Location	Estimated Quantity <sup>2</sup>	Results
091021-57-13A&B	Transite Lab Hood	Rooms 423,425,427	150 SF	25% CHR
091021-57-16A-16C	12" x 12" Dark Gray Floor Tile Mastic	Rooms- 429C, 4 <sup>th</sup> Floor Hallway, 304, 303, 3 <sup>rd</sup> floor Storage, 3 <sup>rd</sup> Floor Hallway, 235, 127, 125, Basement Hallway	10,900 SF	5% CHR
091021-57-18A-18C	12" x 12" Light Gray Floor Tile Mastic	Rooms- 439, 425,423,423A,430,435,329,327,334,335,228,225,223, 230,234,239,123,121, Basement Hall	15,500 SF	10% CHR
091021-57-21A-21C	9" x 9" Gray/Brown Floor Tile	Bottom Layer Throughout 2-4 Floors	48,000 SF	5% CHR
091021-57-22A-22C	9" x 9" Gray/Brown Floor Tile Mastic	Bottom Layer Throughout 2-4 Floors	48,000 SF	10% CHR
091021-57-42A-42C	6" Pipe Insulation	Rooms-121,123,125	250 LF	35% CHR
091021-57-43A-43C	6" Pipe Elbow Insulation	Rooms-121,123,125	35	40% CHR
091021-57-50A&B	Exterior Door Caulking	Throughout	4 Units	3% CHR
091021-57-52A&B	Black Waterproofing Mastic	Exterior Brick Façade Throughout	25,500 SF	12% CHR
092321-95-02A&B	Green Floor Tile	2 <sup>nd</sup> Floor Throughout Bottom Layer	16,000 SF	5% CHR
092321-95-04A&B	White Floor Tile	3 <sup>rd</sup> Floor Throughout Bottom Layer	16,000 SF	5% CHR

**TABLE 1B - CONFIRMED ACMs FORMER REPORTS  
FORMER 1895 HIGH SCHOOL BUILDING, 81 HIGHLAND AVENUE, SOMERVILLE, MA**

Material	Location	Estimated Quantity	Friability
Window Caulking old under new	Throughout	20,000 LF	Non-Friable
12" x 12" and 9' x 9" floor tiles and black mastic (various types)	Throughout	64,000 SF	Non-Friable
Black Vapor Barrier on CMU Block Wall	Throughout	75,000 SF	Non-Friable
Exterior Door Caulking	Throughout	500 LF	TBD

<sup>2</sup> SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos

**Hazardous Building Materials Survey Report  
Former 1895 High School Building  
81 Highland Avenue, Somerville, MA**

*Axiom Partners, Inc.*

Material	Location	Estimated Quantity	Friability
Exterior black tar on coping	Coping Throughout	5,000 SF	Non-Friable
Exterior caulk at roof penthouse	Roof	NA	Non-Friable
White pipe fitting and elbow insulation	Throughout	18,000 LF	Non-Friable
Black Sink Coating	Chemistry and Biology Labs 4 <sup>th</sup> Floor	150 Each	Non-Friable
Multicolored Sheet Flooring	Chemistry Storage Room	150 SF	Non-Friable
Coating on Roof Curbing	Roof	NA	Non-Friable

*4.1.2 Presumed Asbestos-Containing Materials (PACMs)*

The following presumed ACMs (PACMs) may be present in or on the building or at the site that could not be investigated or tested due to inaccessibility:

**TABLE 2  
PRESUMED ACMs**

Material	Location	Estimated Quantity	Friability
Asphaltic Damp Proofing	On Foundations, Footings	5,000 SF	Non-Friable
Buried Pipes	Beneath Building or at Site	TBD	TBD
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	168 Units	Non-Friable
Roofing Materials Assoc. w/ Flat Roof System	Main Roof Field & Flashing	16,000 SF	TBD
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	Various Areas Building's Interiors	TBD	Friable
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	Friable

\* = Floor Trenches observed in the basement and a mechanical room. AXIOM did not observe any pipe/fitting insulation and/or other suspect ACMs in the trenches; however, the full extent of the trenches was not determined due to site restraints.

*4.1.3 Non-Asbestos-Containing Materials*

Materials **confirmed** to be Non-ACMs for the survey can be found in Appendix D.

*4.1.4 Discussion and Recommendations*

The mere presence of asbestos in a building does not mean that the health of building occupants is necessarily at risk. As long as the ACMs remain in good condition and are not disturbed, exposure is unlikely. However, when building maintenance, repair, renovation, demolition or other

activities disturb ACMs, or if ACMs are damaged, asbestos fibers are released creating a potential hazard to building occupants.

ACMs associated with the subject building are friable and were in poor to good condition. Since the subject building will be demolished and/or renovated, all ACMs must be removed by a Massachusetts-licensed Asbestos Removal Contractor prior to or in conjunction with the demolition work. As required by governing regulations, completion of each asbestos removal task must include a visual inspection by a Massachusetts-licensed Asbestos Project Monitor and final clearance air testing if asbestos removal is performed inside a negative pressure enclosure (containment).

Regulations require that all ACMs be included in a site-specific asbestos operations and maintenance (O&M) program designed, at a minimum, to comply with 29 CFR 1910.1001 and 1926.1101, incorporating the basic components in the EPA's *Guide to Managing Asbestos in Building*.

PACMs that may be present are identified in Table 2.

Removal of ACMs, PACMs and other HBMs should be clearly defined in a project specification which is used to obtain competitive bids for the work. A detailed cost estimate for removal of ACMs is present in Appendix F and includes an allowance for the removal of PACMs and HBMs.

#### 4.2 Lead-Containing Paints (LCP)

The HUD<sup>3</sup> lead paint standard classifies Lead Based Paint (LBP) as paint having  $\geq 1.0$  mg/cm<sup>2</sup> as measured by the XRF or  $\geq 0.5\%$  of lead by weight as analyzed by Atomic Absorption. With respect to renovation and demolition work, OSHA defines a lead-containing paint (LCP) as paint containing detectable amounts of lead.

Testing revealed one paint at the subject building are LBPs. A complete listing of the testing results can be found in Appendix B; however, Table 3 provides a summary of the LBPs at the site.

**TABLE 3  
SUMMARY OF LBP RESULTS**

Description	Location	XRF Reading (mg/cm <sup>2</sup> )
Room	Baseboard	0.20
Room	Window Casing	0.08
Room	Ceiling	0.00
Room	Radiator Cover	0.00
Hallway	Door Frame	0.00
<b>Office 234A-2</b>	<b>Wall</b>	<b>3.8</b>
Main Office	Column	0.10
Main Office	Chair Rail	0.25

<sup>3</sup> U.S. Department of Housing and Urban Development

Description	Location	XRF Reading (mg/cm <sup>2</sup> )
Vault	Ceiling	0.00
Office Area	Cove Base	0.09

Based on analytical results, several the paint samples contained lead in detectable quantities. The most elevated levels of lead were detected in the plaster of Office 234. The other levels were non-detectable and substantially below the regulatory limit for lead toxicity.

Contractors should be made aware of the presence of lead paint testing results to satisfy the hazard communication requirements set forth by OSHA regulations. Specifically, contractors and subcontractors should be required to comply with OSHA regulation 29 CFR 1926.62 and Massachusetts regulation 453 CMR 22.11 for lead exposure in construction and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This could be accomplished by providing the affected contractors with a copy of this report. The General Contractor is responsible for informing and managing their employees and subcontractors.

The current interpretation of the EPA's Resource Conservation and Recovery Act (RCRA) requires that waste generated during projects where LCPs are present and will be disposed of is tested for the toxicity characteristic of lead in the waste stream. TCLP<sup>4</sup> testing is performed to determine whether waste (construction/demolition debris) must be classified as hazardous because of its lead content or if it can be disposed in a conventional construction and demolition (C&D) landfill. The regulatory limit for lead toxicity is 5.0 milligrams per liter (mg/L) using the EPA Method SW846-7420 for Atomic Absorption Spectroscopy (AAS). Since the need for TCLP testing is typically determine by the disposal facility/landfill, AXIOM recommends that pre-disposal testing is the contractor's responsibility.

### 4.3 Polychlorinated Biphenyls (PCBs) and Mercury in Electrical Equipment

#### 4.3.1 Fluorescent Light Fixtures

AXIOM identified six (6) type of fluorescent light fixture in the subject building. AXIOM was unable to dismantle and inspect the light fixtures due to height restraints and occupied spaces. Therefore, the ballasts are presumed to contain PCBs. If there were ballasts labeled "No PCBs" they would be presumed to contain di (2-ethylhexyl) phthalate (DEHP). A summary of fluorescent light fixtures is provided in Appendix C.

Handling and disposal of fluorescent light ballasts that contain PCBs should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. There are two methods currently available for disposal of PCB-containing ballasts including incineration and disposal. Incineration is typically more expensive. Regardless of the method, documentation must be provided that verifies the proper removal, transportation, and disposal (destruction/incineration) at an approved facility. In general, PCB ballasts must be placed in 55-gallon drums which once filled, the drums must be closed and properly labeled for temporary storage, transport, and disposal in accordance with all applicable regulations. Drums containing

<sup>4</sup> Toxicity Characteristic Leachate Procedure (TCLP)



PCB ballasts must be transported to an EPA-approved disposal facility (landfill or incinerator). Documentation must be provided that verifies the proper removal, transportation, and disposal (or destruction/incineration) at the approved facility. Drums containing non-PCB fluids, ballasts or capacitors shall be disposed of at a legally permitted disposal facility. There is presently no regulatory mandate for special handling and disposal of DEHP-containing ballasts, however, since there are a number of regulations that may be indirectly applicable<sup>5</sup> and since the disposal cost is not significant, AXIOM recommends disposing of DEHP-containing ballasts similarly.

#### 4.3.2 Transformers

AXIOM did not observe any transformers in the subject building and/or on the site.

#### 4.3.3 Mercury-Containing Items

There are approximately one thousand two hundred twenty (1,220) fluorescent light bulbs associated with actual light fixtures at the subject building. A summary of mercury-containing items is provided in Appendix C.

Handling and disposal of fluorescent light bulbs that contain Mercury should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. Guidance documents are also available from the EPA (e.g. the 1994 Green Lights Program for Lighting Waste Disposal). If fluorescent lamps become broken or damaged during removal, the broken lamps should be managed as hazardous waste. Note that fluorescent light tubes may be reused.

Mercury-containing devices must be properly recycled in accordance with 310 CMR 30.1034.

### 4.4 Chlorofluorocarbons (CFCs)

AXIOM identified several water fountains and refrigerators units at the subject building. A summary of CFC-Containing items is provided in Appendix C.

### 4.5 Polychlorinated Biphenyls (PCBs) Testing

#### 4.5.1 Summary of PCB Bulk Product Testing Results

The following table provide the laboratory results of analysis of caulking for PCBs. The laboratory reports are in Appendix A.

**TABLE 4**  
**SUMMARY OF PCBs IN CAULKING COMPOUND RESULTS**

<sup>5</sup> Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"), Solid Waste Disposal Act, the Clean Water Act, Safe Drinking Water Act and the Toxic Substances Control Act.

Sample Number	Description	Location	Analysis Results <sup>6</sup>
PCB-01	Exterior Basement Window Glazing Compound	Exterior Front and Rear Side of Building	ND
PCB-02	Exterior Window Glazing Compound (w/ wood double hung window)	Exterior Throughout	ND
PCB-03	Door Caulking	Exterior Throughout	ND

Laboratory results are reported in micrograms per kilograms (*ug/kg*) which AXIOM converted to milligrams per kilograms (*mg/kg*) which is equivalent to parts per million (*ppm*) for comparison to EPA definitions.

#### 4.5.2 Discussion

According to 40 CFR 761, the EPA specifies that products and materials containing greater than 50 ppm are PCB bulk products. Based on the result of this investigation, **none** of the caulking are considered a PCB bulk product.

## 4.6 Miscellaneous Hazardous Wastes

### 4.6.1 Miscellaneous Hazardous Materials/Wastes

AXIOM identified other hazardous materials/wastes including batteries associated with exit signs, batteries associated with emergency lighting, fire extinguishers and chemicals. These items are also listed in Appendix C.

The above listed materials/components are not typically considered hazardous wastes while in use. However, those that are left behind must be properly characterized and disposed of in compliance with governing regulations.

Intact, non-leaking batteries should be handled and disposed of in accordance with the Universal Waste Management Standard 310 CMR 30.1034. If batteries are damaged or become damaged or leak during removal and/or handling, they should be managed as hazardous waste.

## 5.0 LIMITATIONS AND EXCLUSIONS

### 5.1 Limitations and Conditions of This Investigation

#### 5.1.1 NESHAPs Asbestos Survey

This NESHAPs survey involved an investigation for ACMs in preparation for building demolition. Although this investigation attempted to identify and sample inaccessible building materials, some

<sup>6</sup> ND = PCBs not detected at the Reporting Limit (RL) for the specific samples. Refer to lab report for PCB Reporting Limits; Results are reported in milligrams per kilogram (*mg/kg*) which is equivalent to parts per million (*ppm*); all ND results include Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268 unless specifically noted otherwise.

materials were inaccessible, and the potential remains that concealed ACMs may be encountered in the building or at the site.

#### 5.1.2 *Inaccessible Materials and Locations*

Inaccessible building areas, systems, structural components, or surfaces which may not have been observed because it was unsafe or impractical to demolish, disassemble, or remove systems or coverings, or because a human being cannot physically enter or observe the area or component. Unless specifically noted, inaccessible materials or areas may include:

- buried or otherwise concealed pipe trenches and utility vaults/corridors;
- buried foundations;
- enclosed wall and ceiling cavities;
- electrical equipment/wire;
- concealed mechanical materials;
- concealed pipe/fitting insulation;
- roofing materials associated with the flat roof system.
- remnant window and door caulking that have been replaced or in-filled.

AXIOM made every reasonable effort to address these potential ACMs. However, the potential remains that concealed ACMs could be encountered during renovation or demolition work.

#### 5.1.3 *Other Environmental Exclusions*

1. This investigation did not include an assessment of air quality or analysis of soil, surface water or groundwater. Furthermore, this study did not include any subsurface exploration, testing or assessment for wetlands.
2. This investigation did not include assessments for the presence of pesticides, herbicides, urea-formaldehyde or Radon, nor any air quality monitoring, or any chemical analysis of soil, surface water, or groundwater at the Site.
3. No attempt was made to check the compliance of present or past owners of the Site with Federal, State, or local laws.
4. The testing for lead paint was performed by an experienced Industrial Hygienist. It is intended only to satisfy the requirements of OSHA regulations including 29 CFR 1926.62, *Lead Exposure in Construction: Interim Final Rule* and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This investigation was not performed by an EPA HUD<sup>7</sup> or state accredited/licensed Lead Inspector which is often required for residential structures where children under the age of six live.

#### 5.1.4 *Project Specifications*

Users are cautioned that this document is an inspection report, not a project specification. Although it is often feasible to use a report such as this to obtain bids for asbestos and related abatement

<sup>7</sup> US Department of Housing and Urban Development

work, it does not provide a proper and/or complete document for defining the scope of work and specifying contractual obligations.

## APPENDIX A

### Asbestos Bulk and PCB Bulk Sample Results





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EMSL Order: 132106890

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
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**Received Date:** 09/13/2021 11:00 AM

**Analysis Date:** 09/21/2021

**Collected Date:** 09/10/2021

**Project:** 01164.117 - City of Somerville; 1895 High School; 81 Highland Avenue; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-01A <small>132106890-0001</small>	Room 429 - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091021-57-01B <small>132106890-0002</small>	Room 425A - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091021-57-01C <small>132106890-0003</small>	Room 329 - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091021-57-01D <small>132106890-0004</small>	Room 228 - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091021-57-01E <small>132106890-0005</small>	Basement Mens Room - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091021-57-02A <small>132106890-0006</small>	Room 429 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-02B <small>132106890-0007</small>	Room 425A - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-02C <small>132106890-0008</small>	Room 329 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-02D <small>132106890-0009</small>	Room 228 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-02E <small>132106890-0010</small>	Basement Mens Room - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-03A <small>132106890-0011</small>	Room 429 - 4" Vinyl Cove Base Mastic	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-03B <small>132106890-0012</small>	Room 303 - 4" Vinyl Cove Base Mastic	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-03C <small>132106890-0013</small>	Room 225A - 4" Vinyl Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-04A <small>132106890-0014</small>	Room 429 - 6" Vinyl Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-04B <small>132106890-0015</small>	Room 420 - 6" Vinyl Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-04C <small>132106890-0016</small>	Room 329 - 6" Vinyl Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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**EMSL Order:** 132106890  
**Customer ID:** AXIO80  
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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-04D <small>132106890-0017</small>	Room 228 - 6" Vinyl Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-05A <small>132106890-0018</small>	Room 429 - Moisture Barrier Assoc. w/ Hardwood Flooring	Brown/Black Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
091021-57-05B <small>132106890-0019</small>	Room 225A - Moisture Barrier Assoc. w/ Hardwood Flooring	Brown/Black Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
091021-57-06A <small>132106890-0020</small>	Room 429A - 2'x4' White Fissured Ceiling Tile	Gray Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-06B <small>132106890-0021</small>	Room 329 - 2'x4' White Fissured Ceiling Tile	Gray Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-06C <small>132106890-0022</small>	2nd Floor Hallway Middle - 2'x4' White Fissured Ceiling Tile	Gray Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-06D <small>132106890-0023</small>	Room 225 - 2'x4' White Fissured Ceiling Tile	Gray Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-07A <small>132106890-0024</small>	Room 429 - Lab Counter Top	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-07B <small>132106890-0025</small>	Room 324 - Lab Counter Top	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-08A <small>132106890-0026</small>	Room 425 N Wall - Blackboard Adhesive	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-08B <small>132106890-0027</small>	Room 425 N Wall - Blackboard Adhesive	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-11A <small>132106890-0028</small>	Room 429 Back Room - Tan/Gold Stone Pattern Sheet Flooring	Gray/Tan Fibrous Homogeneous	10% Cellulose 5% Glass	85% Non-fibrous (Other)	None Detected
091021-57-11B <small>132106890-0029</small>	Room 421 Office - Tan/Gold Stone Pattern Sheet Flooring	Gray/Tan Fibrous Homogeneous	10% Cellulose 5% Glass	85% Non-fibrous (Other)	None Detected
091021-57-12A <small>132106890-0030</small>	Room 429 Back Room - Tan/Gold Stone Pattern Sheet Flooring Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-12B <small>132106890-0031</small>	Room 421 Office - Tan/Gold Stone Pattern Sheet Flooring Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-13A <small>132106890-0032</small>	Room 427 - Transite Lab Hood	Gray Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
091021-57-13B <small>132106890-0033</small>	Room 425 - Transite Lab Hood				Positive Stop (Not Analyzed)

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-14A <small>132106890-0034</small>	Room 427 - Gray Duct Seam Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-14B <small>132106890-0035</small>	Room 425 - Gray Duct Seam Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-15A <small>132106890-0036</small>	Room 429C - 12"x12" Dark Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-15B <small>132106890-0037</small>	4th Floor Hallway - 12"x12" Dark Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-15C <small>132106890-0038</small>	Room 125C - 12"x12" Dark Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-16A <small>132106890-0039</small>	Room 429C - 12"x12" Dark Gray Floor Tile Mastic	Black Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
091021-57-16B <small>132106890-0040</small>	4th Floor Hallway - 12"x12" Dark Gray Floor Tile Mastic				Positive Stop (Not Analyzed)
091021-57-16C <small>132106890-0041</small>	Room 125C - 12"x12" Dark Gray Floor Tile Mastic				Positive Stop (Not Analyzed)
091021-57-17A <small>132106890-0042</small>	Room 439 - 12"x12" Light Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-17B <small>132106890-0043</small>	Room 423 - 12"x12" Light Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-17C <small>132106890-0044</small>	Room 330 - 12"x12" Light Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-17D <small>132106890-0045</small>	Room 228 - 12"x12" Light Gray Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-18A <small>132106890-0046</small>	Room 439 - 12"x12" Light Gray Floor Tile Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-18B <small>132106890-0047</small>	Room 423 - 12"x12" Light Gray Floor Tile Mastic				Insufficient Material
091021-57-18C <small>132106890-0048</small>	Room 330 - 12"x12" Light Gray Floor Tile Mastic	Black Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
091021-57-18D <small>132106890-0049</small>	Room 228 - 12"x12" Light Gray Floor Tile Mastic				Positive Stop (Not Analyzed)
091021-57-19A <small>132106890-0050</small>	Room 421 Office - Safety Glass Glazing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-19B <small>132106890-0051</small>	2nd Floor Hallway - Safety Glass Glazing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-20A <small>132106890-0052</small>	Room 421 Office West Side - Interior Window Caulking	Various Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-20B <small>132106890-0053</small>	Room 324 West - Interior Window Caulking	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-20C <small>132106890-0054</small>	2nd Floor Suffolk Field Office - Interior Window Caulking	Various Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-21A <small>132106890-0055</small>	Room 435 Bottom Layer - 9"x9" Gray/Brown Floor Tile	Tan Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
091021-57-21B <small>132106890-0056</small>	2nd Floor Room 329 Bottom Layer - 9"x9" Gray/Brown Floor Tile				Positive Stop (Not Analyzed)
091021-57-21C <small>132106890-0057</small>	Room 225 Bottom Layer - 9"x9" Gray/Brown Floor Tile				Positive Stop (Not Analyzed)
091021-57-22A <small>132106890-0058</small>	Room 435 Bottom Layer - 9"x9" Gray/Brown Floor Tile Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-22B <small>132106890-0059</small>	3rd Floor Room 329 Bottom Layer - 9"x9" Gray/Brown Floor Tile Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-22C <small>132106890-0060</small>	Room 225 Bottom Layer - 9"x9" Gray/Brown Floor Tile Mastic	Black Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
091021-57-23A <small>132106890-0061</small>	Room 435 Bottom Layer - Gray Floor Leveler	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-23B <small>132106890-0062</small>	3rd Floor Room 329 Bottom Layer - Gray Floor Leveler	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-23C <small>132106890-0063</small>	Room 225 Bottom Layer - Gray Floor Leveler	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-24A <small>132106890-0064</small>	Rom 325 - 2'x2' White Ceiling Tile	Gray/White Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-24B <small>132106890-0065</small>	Basement Cafeteria Area - 2'x2' White Ceiling Tile	Gray/White Fibrous Homogeneous	40% Cellulose 30% Min. Wool	30% Non-fibrous (Other)	None Detected
091021-57-25A <small>132106890-0066</small>	Room 325 - 12"x12" White Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-25B <small>132106890-0067</small>	Room 225 Office - 12"x12" White Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-25C <small>132106890-0068</small>	Room 223 - 12"x12" White Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-26A <small>132106890-0069</small>	Room 325 - 12"x12" White Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-26B <small>132106890-0070</small>	Room 225 Office - 12"x12" White Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-26C <small>132106890-0071</small>	Room 223 - 12"x12" White Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-27A <small>132106890-0072</small>	Room 325 NE Corner - Clear Carept Mastic	Clear Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-27B <small>132106890-0073</small>	Room 325 SW Corner - Clear Carept Mastic	Clear Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-28A <small>132106890-0074</small>	Room 330 - Orange Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-28B <small>132106890-0075</small>	Room 339 - Orange Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-29A <small>132106890-0076</small>	Room 339 Storage Area - 12"x12" Blue Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-29B <small>132106890-0077</small>	Basement Cafeteria Area - 12"x12" Blue Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-30A <small>132106890-0078</small>	Room 339 Storage Area - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-30B <small>132106890-0079</small>	Basement Cafeteria Area - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-31A <small>132106890-0080</small>	Room 339 Storage Area Bottom Layer - Red Sheet Flooring	Various Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
091021-57-31B <small>132106890-0081</small>	Room 339 Storage Area Bottom Layer - Red Sheet Flooring	Various Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
091021-57-32A <small>132106890-0082</small>	Stairwell 3E - Stair Tread Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-32B <small>132106890-0083</small>	Stairwell 2D - Stair Tread Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-33A <small>132106890-0084</small>	Room 225 North - Gray Sheet Flooring	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-33B <small>132106890-0085</small>	2nd Floor Hallway SE - Gray Sheet Flooring	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-34A <small>132106890-0086</small>	Room 225 North - Gray Sheet Flooring Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-34B <small>132106890-0087</small>	2nd Floor Hallway SE - Gray Sheet Flooring Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-35A <small>132106890-0088</small>	Room 239 - Tectam Board	Tan/White Non-Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
091021-57-35B <small>132106890-0089</small>	Room 239 - Tectam Board	Tan/White Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected

Initial report from: 09/21/2021 18:50:16





# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

**EMSL Order:** 132106890  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-36A <small>132106890-0090</small>	3rd Floor Hallway - Textured Wall Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-36B <small>132106890-0091</small>	2nd Floor Hallway - Textured Wall Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-37A <small>132106890-0092</small>	Basement Sprinkler Room - White End Cap Sealant	White/Yellow Non-Fibrous Homogeneous	20% Cellulose 5% Glass	75% Non-fibrous (Other)	None Detected
091021-57-37B <small>132106890-0093</small>	Basement Hallway - White End Cap Sealant	White/Yellow Fibrous Homogeneous	20% Cellulose 5% Glass	75% Non-fibrous (Other)	None Detected
091021-57-37C <small>132106890-0094</small>	Basement Room 121 - White End Cap Sealant	White Fibrous Homogeneous	20% Cellulose 5% Glass	75% Non-fibrous (Other)	None Detected
091021-57-39A <small>132106890-0095</small>	Mens Room Basement - 4"x4" Gray Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-39B <small>132106890-0096</small>	Womens Room Basement - 4"x4" Gray Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-40A <small>132106890-0097</small>	Mens Room Basement - 4"x4" Gray Ceramic Tile Adhesive	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-40B <small>132106890-0098</small>	Womens Room Basement - 4"x4" Gray Ceramic Tile Adhesive	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-42A <small>132106890-0099</small>	Room 125 Locker Room - 6" Pipe Insulation	Gray Non-Fibrous Homogeneous		65% Non-fibrous (Other)	35% Chrysotile
091021-57-42B <small>132106890-0100</small>	Room 125 Locker Room - 6" Pipe Insulation				Positive Stop (Not Analyzed)
091021-57-42C <small>132106890-0101</small>	Room 123 - 6" Pipe Insulation				Positive Stop (Not Analyzed)
091021-57-43A <small>132106890-0102</small>	Room 125 - 6" Pipe Elbow Insulation	White Non-Fibrous Homogeneous		60% Non-fibrous (Other)	40% Chrysotile
091021-57-43B <small>132106890-0103</small>	Room 123 - 6" Pipe Elbow Insulation				Positive Stop (Not Analyzed)
091021-57-43C <small>132106890-0104</small>	Room 121 - 6" Pipe Elbow Insulation				Positive Stop (Not Analyzed)
091021-57-44A <small>132106890-0105</small>	Basement Cafeteria Area - 12" Spline Ceiling Tile	White Fibrous Homogeneous	80% Min. Wool	20% Non-fibrous (Other)	None Detected
091021-57-44B <small>132106890-0106</small>	2nd Floor Hallway - 12" Spline Ceiling Tile	White Fibrous Homogeneous	80% Min. Wool	20% Non-fibrous (Other)	None Detected
091021-57-45A <small>132106890-0107</small>	Basement Hallway NW - 4"x4" Mosaic Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-45B <small>132106890-0108</small>	Basement Hallway SW - 4"x4" Mosaic Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-46A <small>132106890-0109</small>	Basement Hallway NW - 4"x4" Mosaic Tile Adhesive	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-46B <small>132106890-0110</small>	Basement Hallway SW - 4"x4" Mosaic Tile Adhesive	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-47A <small>132106890-0111</small>	West Side - Exterior Basement Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-47B <small>132106890-0112</small>	NE Corner - Exterior Basement Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-48A <small>132106890-0113</small>	West Side 1st Floor - Exterior Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-48B <small>132106890-0114</small>	West Side 2nd Floor - Exterior Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-48C <small>132106890-0115</small>	SE Corner 3rd Floor - Exterior Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-49A <small>132106890-0116</small>	SW Corner - Mortar Assoc. w/ Stone Coping	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-49B <small>132106890-0117</small>	NW Corner - Mortar Assoc. w/ Stone Coping	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-50A <small>132106890-0118</small>	West Side - Exterior Door Caulking	Gray/Tan Non-Fibrous Homogeneous	10% Cellulose	87% Non-fibrous (Other)	3% Chrysotile
091021-57-50B <small>132106890-0119</small>	East Side - Exterior Door Caulking				Positive Stop (Not Analyzed)
091021-57-51A <small>132106890-0120</small>	Exterior N - Red Brick Mortar	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-51B <small>132106890-0121</small>	Exterior W - Red Brick Mortar	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-51C <small>132106890-0122</small>	Exterior E - Red Brick Mortar	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-52A <small>132106890-0123</small>	South Side - Black Waterproofing Mastic	Black Non-Fibrous Homogeneous		88% Non-fibrous (Other)	12% Chrysotile
091021-57-52B <small>132106890-0124</small>	North Side - Black Waterproofing Mastic				Positive Stop (Not Analyzed)

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**EMSL Order:** 132106890

**Customer ID:** AXIO80

**Customer PO:**

**Project ID:**

Analyst(s)

*John McCarthy (37)*

*Kevin McKenzie (74)*

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/21/2021 18:50:16



AXIOM PARTNERS  
 ONE PLEASURE ISLAND RD  
 WAKEFIELD, MA 01880  
 PHONE: 781.213.9198

EMSL LABORATORY ORDER #:

**132106890**

Sample(s) received in good condition? [Y] [N]

Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

<b>Sampled by:</b>	Geoff Gerace	<b>Date Collected:</b>	9/10/2021
<b>Project Name:</b>	Asbestos-Containing Materials Survey-City of Somerville-1895 High School		
<b>Project Site:</b>	81 Highland Ave, Somerville MA		
<b>Project ID/Number:</b>	01164.117		
<b>Special Lab Instructions:</b>	Positive Stop, E-Mail Results to <a href="mailto:ggerace@axiomenv.com">ggerace@axiomenv.com</a>		

**TURNAROUND TIME – If turn around time is not chosen standard turnaround time applies (6 + Days)**

<b>3 Hours</b>	<b>6 Hours</b>	<b>2 Hours</b>	<b>24 Hours</b>	<b>48 Hours</b>	<b>72 Hours</b>	<b>4 Days</b>	<input checked="" type="checkbox"/> <b>5 Days</b>	<b>6-10 Days</b>
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**TYPE OF ASBESTOS ANALYSIS**

<p>PCM – Air</p> <p><input type="checkbox"/> NIOSH 7400 (A) Issue 2: August 1994</p> <p><input type="checkbox"/> OSHA w/TWA</p> <p>PLM – Bulk</p> <p><input checked="" type="checkbox"/> <b>EPA 600/R-93/116</b></p> <p><input type="checkbox"/> California Air Resource Board (CARB) 435</p> <p><input type="checkbox"/> <b>NY Stratified Point Count</b></p> <p><input type="checkbox"/> NIOSH 9002</p> <p><input type="checkbox"/> PLM NOB (Gravimetric) NYS 198.1</p> <p><input type="checkbox"/> EPA Point Count (400 Points)</p> <p><input type="checkbox"/> EPA Point Count (1,000 Points)</p> <p><input type="checkbox"/> <b>Standard Addition Point Count</b></p>	<p>SOILS</p> <p><input type="checkbox"/> <b>EPA Protocol Qualitative</b></p> <p><input type="checkbox"/> <b>EPA Protocol Quantitative</b></p> <p><input type="checkbox"/> EMSL MSD 9000 Method fibers/gram</p> <p><input type="checkbox"/> Superfund EPA 540-R097-028 (dust generation)</p> <p>TEM AIR</p> <p><input type="checkbox"/> <b>AHERA 40 CFR, Part 763 Subpart E</b></p> <p><input type="checkbox"/> NIOSH 7402 Issue 2</p> <p><input type="checkbox"/> EPA Level II</p> <p>TEM WIPE</p> <p><input type="checkbox"/> <b>ASTM D-6480-99</b></p> <p><input type="checkbox"/> Qualitative</p>	<p>TEM MICROVAC</p> <p><input type="checkbox"/> ASTM D 5755-95 (Quantitative)</p> <p>TEM BULK</p> <p><input type="checkbox"/> <b>Drop Mount (Qualitative)</b></p> <p><input type="checkbox"/> Chatfield SOP-1988-02</p> <p><input type="checkbox"/> TEM NOB (Gravimetric) NY 198.4</p> <p>TEM WATER</p> <p><input type="checkbox"/> EPA 100.1</p> <p><input type="checkbox"/> EPA 100.2</p> <p><input type="checkbox"/> <b>NYS 198.2</b></p> <p><input type="checkbox"/> <b>Other: Page 1 of 7</b></p>
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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-01A	Gypsum Wallboard	Room 429
091021-57-01B	Gypsum Wallboard	Room 425A
091021-57-01C	Gypsum Wallboard	Room 329
091021-57-01D	Gypsum Wallboard	Room 228
091021-57-01E	Gypsum Wallboard	Basement Mens Room
091021-57-02A	Joint Compound a/w Gypsum Wallboard	Room 429
091021-57-02B	Joint Compound a/w Gypsum Wallboard	Room 425A
091021-57-02C	Joint Compound a/w Gypsum Wallboard	Room 329
091021-57-02D	Joint Compound a/w Gypsum Wallboard	Room 228
091021-57-02E	Joint Compound a/w Gypsum Wallboard	Basement Mens Room
091021-57-03A	4" Vinyl Covebase Mastic	Room 429
091021-57-03B	4" Vinyl Covebase Mastic	Room 303
091021-57-03C	4" Vinyl Covebase Mastic	Room 225A
091021-57-04A	6" Vinyl Covebase Mastic	Room 429

REC'D *SP-1120*  
 EMSL-BOSTON  
**SEP 13 2021**  
*W-11*





AXIOM PARTNERS  
ONE PLEASURE ISLAND RD  
WAKEFIELD, MA 01880  
PHONE: 781.213.9198

EMSL LABORATORY ORDER #:

132106890

Sample(s) received in good condition? [Y] [N]  
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### Asbestos Analysis – Chain of Custody Form

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-04B	6" Vinyl Covebase Mastic	Room 420
091021-57-04C	6" Vinyl Covebase Mastic	Room 329
091021-57-04D	6" Vinyl Covebase Mastic	Room 228
091021-57-05A	Moisture Barrier a/w Hardwood Flooring	Room 429
091021-57-05B	Moisture Barrier a/w Hardwood Flooring	Room 225A
091021-57-06A	2' x 4' White Fissured Ceiling Tile	Room 429A
091021-57-06B	2' x 4' White Fissured Ceiling Tile	Room 329
091021-57-06C	2' x 4' White Fissured Ceiling Tile	2 <sup>nd</sup> Floor Hallway Middle
091021-57-06D	2' x 4' White Fissured Ceiling Tile	Room 225
091021-57-07A	Lab Counter Top	Room 429
091021-57-07B	Lab Counter Top	Room 324
091021-57-08A	Blackboard Adhesive	Room 425 N Wall
091021-57-08B	Blackboard Adhesive	Room 425 N Wall
091021-57-11A	Tan/Gold Stone Pattern Sheet Flooring	Room 429 Backroom
091021-57-11B	Tan/Gold Stone Pattern Sheet Flooring	Room 421 Office
091021-57-12A	Tan/Gold Stone Pattern Sheet Flooring Mastic	Room 429 Backroom
091021-57-12B	Tan/Gold Stone Pattern Sheet Flooring Mastic	Room 421 Office
091021-57-13A	Transite Lab Hood	Room 427
091021-57-13B	Transite Lab Hood	Room 425
091021-57-14A	Gray Duct Seam Sealant	Room 427
091021-57-14B	Gray Duct Seam Sealant	Room 425
091021-57-15A	12" x 12" Dark Gray Floor Tile	Room 429C
091021-57-15B	12" x 12" Dark Gray Floor Tile	4 <sup>th</sup> Floor Hallway
091021-57-15C	12" x 12" Dark Gray Floor Tile	Room 125C
091021-57-16A	12" x 12" Dark Gray Floor Tile Mastic	Room 429C





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**Asbestos Analysis – Chain of Custody Form**

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-16B	12" x 12" Dark Gray Floor Tile Mastic	4 <sup>th</sup> Floor Hallway
091021-57-16C	12" x 12" Dark Gray Floor Tile Mastic	Room 125C
091021-57-17A	12" x 12" Light Gray Floor Tile	Room 439
091021-57-17B	12" x 12" Light Gray Floor Tile	Room 423
091021-57-17C	12" x 12" Light Gray Floor Tile	Room 330
091021-57-17D	12" x 12" Light Gray Floor Tile	Room 228
091021-57-18A	12" x 12" Light Gray Floor Tile Mastic	Room 439
091021-57-18B	12" x 12" Light Gray Floor Tile Mastic	Room 423
091021-57-18C	12" x 12" Light Gray Floor Tile Mastic	Room 330
091021-57-18D	12" x 12" Light Gray Floor Tile Mastic	Room 228
091021-57-19A	Safety Glass Glazing	Room 421 Office
091021-57-19B	Safety Glass Glazing	2 <sup>nd</sup> Floor Hallway
091021-57-20A	Interior Window Caulking	Room 421 Office West Side
091021-57-20B	Interior Window Caulking	Room 324 West
091021-57-20C	Interior Window Caulking	2 <sup>nd</sup> Floor Suffolk Field Office
091021-57-21A	9" x 9" Gray/Brown Floor Tile	Room 435 Bottom Layer
091021-57-21B	9" x 9" Gray/Brown Floor Tile	3 <sup>rd</sup> Floor Room 329 Bottom Layer
091021-57-21C	9" x 9" Gray/Brown Floor Tile	Room 225 Bottom Layer
091021-57-22A	9" x 9" Gray/Brown Floor Tile Mastic	Room 435 Bottom Layer
091021-57-22B	9" x 9" Gray/Brown Floor Tile Mastic	3 <sup>rd</sup> Floor Room 329 Bottom Layer



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### Asbestos Analysis – Chain of Custody Form

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-22C	9" x 9" Gray/Brown Floor Tile Mastic	Room 225 Bottom Layer
091021-57-23A	Gray Floor Leveler	Room 435 Bottom Layer
091021-57-23B	Gray Floor Leveler	3 <sup>rd</sup> Floor Room 329 Bottom Layer
091021-57-23C	Gray Floor Leveler	Room 225 Bottom Layer
091021-57-24A	2' x 2' White Ceiling Tile	Room 325
091021-57-24B	2' x 2' White Ceiling Tile	Basement Cafeteria Area
091021-57-25A	12" x 12" White Floor Tile	Room 325
091021-57-25B	12" x 12" White Floor Tile	Room 225 Office
091021-57-25C	12" x 12" White Floor Tile	Room 223
091021-57-26A	12" x 12" White Floor Tile Mastic	Room 325
091021-57-26B	12" x 12" White Floor Tile Mastic	Room 225 Office
091021-57-26C	12" x 12" White Floor Tile Mastic	Room 223
091021-57-27A	Clear Carpet Mastic	Room 325 NE Corner
091021-57-27B	Clear Carpet Mastic	Room 325 SW Corner
091021-57-28A	Orange Carpet Mastic	Room 330
091021-57-28B	Orange Carpet Mastic	Room 339
091021-57-29A	12" x 12" Blue Floor Tile	Room 339 Storage Area
091021-57-29B	12" x 12" Blue Floor Tile	Basement Cafeteria Area
091021-57-30A	12" x 12" Blue Floor Tile Mastic	Room 339 Storage Area
091021-57-30B	12" x 12" Blue Floor Tile Mastic	Basement Cafeteria Area





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### Asbestos Analysis – Chain of Custody Form

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-31A	Red Sheet Flooring	Room 339 Storage Area Bottom Layer
091021-57-31B	Red Sheet Flooring	Room 339 Storage Area Bottom Layer
091021-57-32A	Stair tread Mastic	Stairwell 3E
091021-57-32B	Stair tread Mastic	Stairwell 2D
091021-57-33A	Gray Sheet Flooring	Room 225 North
091021-57-33B	Gray Sheet Flooring	2 <sup>nd</sup> Floor Hallway SE
091021-57-34A	Gray Sheet Flooring Mastic	Room 225 North
091021-57-34B	Gray Sheet Flooring Mastic	2 <sup>nd</sup> Floor Hallway SE
091021-57-35A	Tectam Board	Room 239
091021-57-35B	Tectam Board	Room 239
091021-57-36A	Textured Wall Coating	3 <sup>rd</sup> Floor Hallway
091021-57-36B	Textured Wall Coating	2 <sup>nd</sup> Floor Hallway
091021-57-37A	White End Cap Sealant	Basement Sprinkler Room
091021-57-37B	White End Cap Sealant	Basement Hallway
091021-57-37C	White End Cap Sealant	Basement Room 121
091021-57-39A	4" x 4" Gray Ceramic Tile Grout	Mens Room Basement
091021-57-39B	4" x 4" Gray Ceramic Tile Grout	Womens Room Basement
091021-57-40A	4" x 4" Gray Ceramic Tile Adhesive	Mens Room Basement
091021-57-40B	4" x 4" Gray Ceramic Tile Adhesive	Womens Room Basement
091021-57-42A	6" Pipe Insulation	Room 125 Locker room



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**Asbestos Analysis – Chain of Custody Form**

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-42B	6" Pipe Insulation	Room 125 Locker Room
091021-57-42C	6" Pipe Insulation	Room 123
091021-57-43A	6" Pipe Elbow Insulation	Room 125
091021-57-43B	6" Pipe Elbow Insulation	Room 123
091021-57-43C	6" Pipe Elbow Insulation	Room 121
091021-57-44A	12" Spline Ceiling Tile	Basement Cafeteria Area
091021-57-44B	12" Spline Ceiling Tile	2 <sup>nd</sup> Floor Hallway
091021-57-45A	4" x 4" Mosaic Tile Grout	Basement Hallway NW
091021-57-45B	4" x 4" Mosaic Tile Grout	Basement Hallway SW
091021-57-46A	4" x 4" Mosaic Tile Adhesive	Basement Hallway NW
091021-57-46B	4" x 4" Mosaic Tile Adhesive	Basement Hallway SW
091021-57-47A	Exterior Basement Window Caulking	West Side
091021-57-47B	Exterior Basement Window Caulking	NE Corner
091021-57-48A	Exterior Window Caulking	West Side 1 <sup>st</sup> Floor
091021-57-48B	Exterior Window Caulking	West Side Second Floor
091021-57-48C	Exterior Window Caulking	SE Corner 3 <sup>rd</sup> Floor
091021-57-49A	Mortar a/w Stone Coping	SW Corner
091021-57-49B	Mortar a/w Stone Coping	NW Corner
091021-57-50A	Exterior Door Caulking	West Side
091021-57-50B	Exterior Door Caulking	East Side







# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132106229

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 08/27/2021 8:30 AM

**Analysis Date:** 08/30/2021

**Collected Date:**

**Project:** 01164.117 / 1895 Bldg. / 81 Highland Ave. Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01A-Skim Coat <small>132106229-0001</small>	Lower Level - Stairwell North - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01A-Base Coat <small>132106229-0001A</small>	Lower Level - Stairwell North - Plaster - Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B <small>132106229-0002</small>	Lower Level - Hall North - Plaster - Ceiling	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01C-Skim Coat <small>132106229-0003</small>	Lower Level - Stairwell South - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01C-Base Coat <small>132106229-0003A</small>	Lower Level - Stairwell South - Plaster - Wall	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01D-Skim Coat <small>132106229-0004</small>	Lower Level - Hall South - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01D-Base Coat <small>132106229-0004A</small>	Lower Level - Hall South - Plaster - Ceiling	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01E-Skim Coat <small>132106229-0005</small>	1st Floor - 324 Office - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01E-Base Coat <small>132106229-0005A</small>	1st Floor - 324 Office - Plaster - Wall	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01F-Skim Coat <small>132106229-0006</small>	1st Floor - Hall North - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01F-Base Coat <small>132106229-0006A</small>	1st Floor - Hall North - Plaster - Wall	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01G-Skim Coat <small>132106229-0007</small>	1st Floor - Rm 228 - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01G-Base Coat <small>132106229-0007A</small>	1st Floor - Rm 228 - Plaster - Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01H-Skim Coat <small>132106229-0008</small>	1st Floor - Hall Center - Plaster - Ceiling	Tan/White Fibrous Homogeneous	5% Synthetic	95% Non-fibrous (Other)	None Detected
01H-Base Coat <small>132106229-0008A</small>	1st Floor - Hall Center - Plaster - Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01I-Skim Coat <small>132106229-0009</small>	2nd Floor - Stairwell South - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 08/30/2021 09:46:38



# EMSL Analytical, Inc.

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Tel/Fax: (781) 933-8411 / (781) 933-8412

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**EMSL Order:** 132106229  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01I-Base Coat <small>132106229-0009A</small>	2nd Floor - Stairwell South - Plaster - Wall	Gray Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01J-Skim Coat <small>132106229-0010</small>	2nd Floor - Hall North - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01J-Base Coat <small>132106229-0010A</small>	2nd Floor - Hall North - Plaster - Wall	Tan Fibrous Homogeneous	5% Glass	95% Non-fibrous (Other)	None Detected
01K-Skim Coat <small>132106229-0011</small>	2nd Floor - Hall Middle - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01K-Base Coat <small>132106229-0011A</small>	2nd Floor - Hall Middle - Plaster - Ceiling	Tan Fibrous Homogeneous	5% Glass	95% Non-fibrous (Other)	None Detected
01L-Skim Coat <small>132106229-0012</small>	2nd Floor - Classroom 324 - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01L-Base Coat <small>132106229-0012A</small>	2nd Floor - Classroom 324 - Plaster - Ceiling	Tan Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
01M-Skim Coat <small>132106229-0013</small>	3rd Floor - Classroom 429 - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01M-Base Coat <small>132106229-0013A</small>	3rd Floor - Classroom 429 - Plaster - Wall	Tan Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
01N-Skim Coat <small>132106229-0014</small>	3rd Floor - Classroom 439 - Plaster - Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01N-Base Coat <small>132106229-0014A</small>	3rd Floor - Classroom 439 - Plaster - Wall	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
01O-Skim Coat <small>132106229-0015</small>	3rd Floor - Classroom 420 - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01O-Base Coat <small>132106229-0015A</small>	3rd Floor - Classroom 420 - Plaster - Ceiling	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
01P-Skim Coat <small>132106229-0016</small>	3rd Floor - Classroom 320 - Plaster - Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01P-Base Coat <small>132106229-0016A</small>	3rd Floor - Classroom 320 - Plaster - Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 08/30/2021 09:46:38



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<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132106229

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Elizabeth Stutts (31)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 08/30/2021 09:46:38



**Asbestos Bulk Building Materials - Chain of Custody**

EMSL Order Number / Lab Use Only

EMSL Analytical, Inc.  
5 Constitution Way, Unit A

EMSL ANALYTICAL, INC.  
LABORATORY • PRODUCTS • TRAINING

132106229

Woburn, MA 01801  
PHONE: (781) 933-8411  
EMAIL: bostonlab@emsl.com

<b>Customer Information</b> Customer ID: Company Name: <b>Axiom Partners, Inc.</b> Contact Name: <b>Geoff Gerace</b> Street Address: <b>50B Salem Street, Suite 103</b> City, State, Zip: <b>Lynnfield MA 01940</b> Country: <b>US</b> Phone: <b>781-213-9198</b> Email(s) for Report: <b>ggerace@axiomenv.com</b>	<b>Billing Information</b> Billing ID: Company Name: <b>Axiom Partners, Inc.</b> Billing Contact: <b>Geoff Gerace</b> Street Address: <b>50B Salem Street, Suite 103</b> City, State, Zip: <b>Lynnfield MA 01940</b> Country: Phone: <b>781-213-9198</b> Email(s) for Invoice:
---	---

**Project Information**

Project Name/No: **01164.117 / 1895 Bldg., 81 Highland Ave., Somerville MA** Purchase Order:  
 EMSL LIMS Project ID: (If applicable, EMSL will provide) US State where samples collected: **MA** State of Connecticut (CT) must select project location:  
 Commercial (Taxable)  Residential (Non-Taxable)  
 Sampled By Name: Sampled By Signature: No. of Samples in Shipment:  
**Turn-Around-Time (TAT)**  
 3 Hour  6 Hour  24 Hour  32 Hour  48 Hour  72 Hour  96 Hour  1 Week  2 Week  
 Please call ahead for large projects and/or turnaround times 6 Hours or Less. \*32 Hour TAT available for select tests only; samples must be submitted by 11:30am.

<b>PLM - Bulk (reporting limit)</b> <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) <input type="checkbox"/> POINT COUNT <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) POINT COUNT w/ GRAVIMETRIC <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) <input type="checkbox"/> NIOSH 9002 (<1%) <input type="checkbox"/> NYS 198.1 (Friable - NY) <input type="checkbox"/> NYS 198.6 NOB (Non-Friable - NY) <input type="checkbox"/> NYS 198.8 (Vermiculite SM-V)	<b>Test Selection</b> <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (Non-Friable-NY) <input type="checkbox"/> TEM EPA 600/R-93/1'5 w Milling Prep (0.1%) <b>Other Tests (please specify)</b> REC'D <b>RHS 0830 IPed BLP</b> EMSL-BOSTON <b>AUG 27 2021</b> <input type="checkbox"/> Positive Stop - Clearly Identified Homogeneous Areas (HA)
---	--

Sample Number	HA Number	Sample Location	Material Description
01A		LOWER LEVEL ~ Stairwell North	Plaster - Wall
01B			- Ceiling
01C		- Hall North	- Wall
01D		- Stairwell South	- Ceiling
01E		- Hall South	- Wall
01F		1st Floor ~ 324 Office	- Wall
01G		- Hall North	- Wall
01H		- Rm 228	- Ceiling
01I		- Hall Center	- Ceiling
01J		2nd Floor ~ Stairwell South	- Wall
01K		~ Hall North	- Wall

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Email results to Geoff Gerace & Jesse DeGeorge

Method of Shipment:		Sample Condition Upon Receipt:	
Relinquished by: <b>Yusef A. DeGeorge</b>	Date/Time: <b>8-26-21</b>	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Controlled Document - COC-01 Asbestos Bulk R6 05/09/2021  AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.









# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107076

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 09/23/2021 2:00 PM

**Analysis Date:** 09/24/2021

**Collected Date:** 09/23/2021

**Project:** 01164.117 - 1895 School Building, Floor Sampling; 81 Highland Avenue; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
092321-95-01A 132107076-0001	1st Floor, Conference Room 220 - Floor Core NA-3a - Tar Paper/Mastic (Under Wood & on Wood)	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
092321-95-01B 132107076-0002	1st Floor, Conference Room 220 - Floor Core NA-3a - Tar Paper/Mastic (Under Wood & on Wood)	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
092321-95-02A 132107076-0003	1st Floor, Corridor 117 - Floor Core NA-3b - Green Vinyl Floor Tile (Under Wood)	Green Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
092321-95-02B 132107076-0004	1st Floor, Corridor 117 - Floor Core NA-3b - Green Vinyl Floor Tile (Under Wood)				Positive Stop (Not Analyzed)
092321-95-03A 132107076-0005	1st Floor, Corridor 117 - Floor Core NA-3b - Tar Paper/Mastic w/ Sample 02A	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-03B 132107076-0006	1st Floor, Corridor 117 - Floor Core NA-3b - Tar Paper/Mastic w/ Sample 02B	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-04A 132107076-0007	3rd Floor, Computer Lab 427 - Floor Core NA-3c - Green Vinyl Floor Tile (Under Wood & on Wood)	Beige Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
092321-95-04B 132107076-0008	3rd Floor, Classroom 429 - Floor Core NA-3d - Green Vinyl Floor Tile (Under Wood & on Wood)				Positive Stop (Not Analyzed)
092321-95-05A 132107076-0009	3rd Floor, Computer Lab 427 - Floor Core NA-3c - Tar Paper/Mastic w/ Sample 04A	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-05B 132107076-0010	3rd Floor, Classroom 429 - Floor Core NA-3d - Tar Paper/Mastic w/ Sample 04B	Black Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected

Initial report from: 09/24/2021 16:09:29



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

**EMSL Order:** 132107076

**Customer ID:** AXIO80

**Customer PO:**

**Project ID:**

Analyst(s)

Elizabeth Stutts (8)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/24/2021 16:09:29



AXIOM PARTNERS  
 50B SALEM STREET, STE 103  
 LYNNFIELD, MA 01490  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #:  
132107076  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis - Chain of Custody Form**

Sampled by: Jesse A. DeGeorge Date Collected: 09-23-21  
 Project Name: 1895 School Building - Floor Sampling  
 Project Site: 81 Highland Ave., Somerville, MA  
 Project ID/Number: 01164.117  
 Special Lab Instructions: **POSITIVE STOP**; email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com

**TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (6 + Days)**

3 Hours     6 Hours     12 Hours     24 Hours     48 Hours     72 Hours     4 Days     5 Days     6-10 Days

**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
092321-95-01A	Tar Paper/Mastic (under wood & on wood)	1 <sup>st</sup> Fl., Conference Rm. 220 - Floor Core NA-3a	
092321-95-01B	*	*	
092321-95-02A	Green Vinyl Floor Tile (under wood)	1 <sup>st</sup> Fl., Corridor 117 - Floor Core NA-3b	
092321-95-02B	*	*	
092321-95-03A	Tar Paper/Mastic w/ Sample #02A	1 <sup>st</sup> Fl., Corridor 117 - Floor Core NA-3b	
092321-95-03B	Tar Paper/Mastic w/ Sample #02B	*	
092321-95-04A	Green Vinyl Floor Tile (under wood & on wood)	3 <sup>rd</sup> Fl., Computer Lab 427 - Floor Core NA-3c	
092321-95-04B	*	3 <sup>rd</sup> Fl., Classroom 429 - Floor Core NA-3d	
092321-95-05A	Tar Paper/Mastic w/ Sample #04A	3 <sup>rd</sup> Fl., Computer Lab 427 - Floor Core NA-3c	
092321-95-05B	Tar Paper/Mastic w/ Sample #04B	3 <sup>rd</sup> Fl., Classroom 429 - Floor Core NA-3d	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-23-21 Time: ~  
 Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

REC'D  
 EMSL-BOSTON  
 SEP 23 2021  
*Om Hoo*  
*Walk in*



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107076

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 09/23/2021 2:00 PM

**Analysis Date:** 09/24/2021

**Collected Date:** 09/23/2021

**Project:** 01164.117 - 1895 School Building, Floor Sampling; 81 Highland Avenue; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
092321-95-01A 132107076-0001	1st Floor, Conference Room 220 - Floor Core NA-3a - Tar Paper/Mastic (Under Wood & on Wood)	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
092321-95-01B 132107076-0002	1st Floor, Conference Room 220 - Floor Core NA-3a - Tar Paper/Mastic (Under Wood & on Wood)	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
092321-95-02A 132107076-0003	1st Floor, Corridor 117 - Floor Core NA-3b - Green Vinyl Floor Tile (Under Wood)	Green Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
092321-95-02B 132107076-0004	1st Floor, Corridor 117 - Floor Core NA-3b - Green Vinyl Floor Tile (Under Wood)				Positive Stop (Not Analyzed)
092321-95-03A 132107076-0005	1st Floor, Corridor 117 - Floor Core NA-3b - Tar Paper/Mastic w/ Sample 02A	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-03B 132107076-0006	1st Floor, Corridor 117 - Floor Core NA-3b - Tar Paper/Mastic w/ Sample 02B	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-04A 132107076-0007	3rd Floor, Computer Lab 427 - Floor Core NA-3c - Green Vinyl Floor Tile (Under Wood & on Wood)	Beige Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
092321-95-04B 132107076-0008	3rd Floor, Classroom 429 - Floor Core NA-3d - Green Vinyl Floor Tile (Under Wood & on Wood)				Positive Stop (Not Analyzed)
092321-95-05A 132107076-0009	3rd Floor, Computer Lab 427 - Floor Core NA-3c - Tar Paper/Mastic w/ Sample 04A	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
092321-95-05B 132107076-0010	3rd Floor, Classroom 429 - Floor Core NA-3d - Tar Paper/Mastic w/ Sample 04B	Black Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected

Initial report from: 09/24/2021 16:09:29



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EMSL Order: 132107076

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Elizabeth Stutts (8)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/24/2021 16:09:29







## ANALYTICAL REPORT

Lab Number:	L2149090
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY OF SOMERVILLE HS
Project Number:	01164.117
Report Date:	09/20/21

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2149090-01	PCB-01	SOLID	81 HIGHLAND AVE, SOMERVILLE, MA	09/01/21 14:20	09/13/21
L2149090-02	PCB-02	SOLID	81 HIGHLAND AVE, SOMERVILLE, MA	09/01/21 14:30	09/13/21
L2149090-03	PCB-03	SOLID	81 HIGHLAND AVE, SOMERVILLE, MA	09/01/21 14:41	09/13/21

**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

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**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21


**Case Narrative (continued)**

PCBs

L2149090-01D and -02D: The sample has elevated detection limits due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 09/20/21



# ORGANICS

# PCBS

**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

**SAMPLE RESULTS**

Lab ID: L2149090-01 D  
 Client ID: PCB-01  
 Sample Location: 81 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/01/21 14:20  
 Date Received: 09/13/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/20/21 13:24  
 Analyst: AWS  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/17/21 23:30  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/19/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	2930	--	5	A
Aroclor 1221	ND		ug/kg	2930	--	5	A
Aroclor 1232	ND		ug/kg	2930	--	5	A
Aroclor 1242	ND		ug/kg	1470	--	5	A
Aroclor 1248	ND		ug/kg	2930	--	5	A
Aroclor 1254	ND		ug/kg	2930	--	5	A
Aroclor 1260	ND		ug/kg	2930	--	5	A
Aroclor 1262	ND		ug/kg	2930	--	5	A
Aroclor 1268	ND		ug/kg	1470	--	5	A
PCBs, Total	ND		ug/kg	1470	--	5	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	58		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	57		30-150	B
Decachlorobiphenyl	58		30-150	B

**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

**SAMPLE RESULTS**

Lab ID: L2149090-02 D  
 Client ID: PCB-02  
 Sample Location: 81 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/01/21 14:30  
 Date Received: 09/13/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/20/21 13:15  
 Analyst: AWS  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/17/21 23:30  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/19/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	3100	--	5	A
Aroclor 1221	ND		ug/kg	3100	--	5	A
Aroclor 1232	ND		ug/kg	3100	--	5	A
Aroclor 1242	ND		ug/kg	1550	--	5	A
Aroclor 1248	ND		ug/kg	3100	--	5	A
Aroclor 1254	ND		ug/kg	3100	--	5	A
Aroclor 1260	ND		ug/kg	3100	--	5	A
Aroclor 1262	ND		ug/kg	3100	--	5	A
Aroclor 1268	ND		ug/kg	1550	--	5	A
PCBs, Total	ND		ug/kg	1550	--	5	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	55		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	66		30-150	B

**Project Name:** CITY OF SOMERVILLE HS**Lab Number:** L2149090**Project Number:** 01164.117**Report Date:** 09/20/21**SAMPLE RESULTS**

Lab ID: L2149090-03  
 Client ID: PCB-03  
 Sample Location: 81 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/01/21 14:41  
 Date Received: 09/13/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/19/21 22:27  
 Analyst: AWS  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/17/21 23:30  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/19/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/19/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	643	--	1	A
Aroclor 1221	ND		ug/kg	643	--	1	A
Aroclor 1232	ND		ug/kg	643	--	1	A
Aroclor 1242	ND		ug/kg	322	--	1	A
Aroclor 1248	ND		ug/kg	643	--	1	A
Aroclor 1254	ND		ug/kg	643	--	1	A
Aroclor 1260	ND		ug/kg	643	--	1	A
Aroclor 1262	ND		ug/kg	643	--	1	A
Aroclor 1268	ND		ug/kg	322	--	1	A
PCBs, Total	ND		ug/kg	322	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	48		30-150	A
Decachlorobiphenyl	50		30-150	A
2,4,5,6-Tetrachloro-m-xylene	43		30-150	B
Decachlorobiphenyl	44		30-150	B



**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8082A  
Analytical Date: 09/19/21 19:56  
Analyst: AWS

Extraction Method: EPA 3540C  
Extraction Date: 09/17/21 23:30  
Cleanup Method: EPA 3630  
Cleanup Date: 09/19/21  
Cleanup Method: EPA 3665A  
Cleanup Date: 09/19/21  
Cleanup Method: EPA 3660B  
Cleanup Date: 09/19/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-03 Batch: WG1547871-1						
Aroclor 1016	ND		ug/kg	617	--	A
Aroclor 1221	ND		ug/kg	617	--	A
Aroclor 1232	ND		ug/kg	617	--	A
Aroclor 1242	ND		ug/kg	309	--	A
Aroclor 1248	ND		ug/kg	617	--	A
Aroclor 1254	ND		ug/kg	617	--	A
Aroclor 1260	ND		ug/kg	617	--	A
Aroclor 1262	ND		ug/kg	617	--	A
Aroclor 1268	ND		ug/kg	309	--	A
PCBs, Total	ND		ug/kg	309	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	75		30-150	B
Decachlorobiphenyl	73		30-150	B

## Lab Control Sample Analysis

### Batch Quality Control

Project Name: CITY OF SOMERVILLE HS

Project Number: 01164.117

Lab Number: L2149090

Report Date: 09/20/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-03 Batch: WG1547871-2 WG1547871-3									
Aroclor 1016	72		82		40-140	13		50	A
Aroclor 1260	70		79		40-140	12		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		82		30-150	A
Decachlorobiphenyl	71		80		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		82		30-150	B
Decachlorobiphenyl	69		79		30-150	B

**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

Serial\_No:09202115:24  
**Lab Number:** L2149090  
**Report Date:** 09/20/21

**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

**Cooler**                      **Custody Seal**  
A                                      Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2149090-01A	Glass 120ml/4oz unpreserved	A	NA		2.2	Y	Absent		PCB-8082-CAULK(365)
L2149090-02A	Glass 120ml/4oz unpreserved	A	NA		2.2	Y	Absent		PCB-8082-CAULK(365)
L2149090-03A	Glass 120ml/4oz unpreserved	A	NA		2.2	Y	Absent		PCB-8082-CAULK(365)

\*Values in parentheses indicate holding time in days



**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
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## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



**Project Name:** CITY OF SOMERVILLE HS  
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#### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report





**Project Name:** CITY OF SOMERVILLE HS  
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**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** CITY OF SOMERVILLE HS  
**Project Number:** 01164.117

**Lab Number:** L2149090  
**Report Date:** 09/20/21

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



## Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpeneol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 9/13/21

ALPHA Job #: L21490910

8 Walkup Drive  
Westboro, MA 01581  
Tel: 508-896-9220

320 Forbes Blvd  
Mansfield, MA 02048  
Tel: 508-822-9300

### Project Information

Project Name: City of Somerville HS  
Project Location: 81 Highland Ave  
Project #: 01164-117  
Project Manager: Geoff Gerace  
ALPHA Quote #:

### Report Information - Data Deliverables

ADEX  EMAIL

### Billing Information

Same as Client info PO #:

### Client Information

Client: AXIOM  
Address: 50B Salem St  
Lynnfield, MA  
Phone: 978 995 5101  
Email: ggeerac@axiomenv.com

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved!)

Date Due:

### Additional Project Information:

1825 High School  
81 Highland Ave  
Somerville, MA

### Regulatory Requirements & Project Information Requirements

Yes  No MA MCP Analytical Methods  Yes  No CT RCP Analytical Methods  
 Yes  No Matrix Spike Required on this SDG? (Required for MCP Inorganics)  
 Yes  No GW1 Standards (Info Required for Metals & EPH with Targets)  
 Yes  No NPDES RGP  
 Other State /Fed Program \_\_\_\_\_ Criteria \_\_\_\_\_

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
<u>490910-01</u>	<u>PCB-01</u>	<u>9/10/21</u>	<u>2:20</u>	<u>Bulk</u>	<u>GG</u>
<u>02</u>	<u>PCB-02</u>	<u>↓</u>	<u>2:30</u>	<u>↓</u>	<u>↓</u>
<u>03</u>	<u>PCB-03</u>	<u>↓</u>	<u>2:41</u>	<u>↓</u>	<u>↓</u>

ANALYSIS										SAMPLE INFO		TOTAL # BOTTLES
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB <input type="checkbox"/> PEST <u>5082/5082A</u>	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint				Filtration	
											<input type="checkbox"/> Field	
											<input type="checkbox"/> Lab to do	
											Preservation	
											<input type="checkbox"/> Lab to do	
											Sample Comments	

Basement Windows  
Double Hung 4  
Door Caulks

**Container Type**  
P= Plastic  
A= Amber glass  
V= Vial  
G= Glass  
B= Bacteria cup  
C= Cube  
O= Other  
E= Encore  
D= BOD Bottle

**Preservative**  
A= None  
B= HCl  
C= HNO<sub>3</sub>  
D= H<sub>2</sub>SO<sub>4</sub>  
E= NaOH  
F= MeOH  
G= NaHSO<sub>4</sub>  
H = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
I= Ascorbic Acid  
J = NH<sub>4</sub>Cl  
K= Zn Acetate  
O= Other

Container Type: A  
Preservative: N

Relinquished By: [Signature] Date/Time: 9/10/21  
[Signature] Date/Time: 9/13/21 17:00

Received By: [Signature] Date/Time: 9/13/21 13:30  
[Signature] Date/Time: 9/13/21 17:00

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.  
FORM NO: 01-01 (rev. 12-Mar-2012)

**APPENDIX B**  
**Lead Paint Testing Results**



**XRF Paint Testing Results**  
**September 8, 2021**  
**81 Highland Avenue, Somerville, MA**

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm <sup>2</sup> )	Color/ Comments
Calibration SRM 2570				0.00	
Calibration SRM 2573				0.9	
Calibration SRM 2574				0.7	
Calibration SRM 2571				3.8	
Calibration SRM 2572				1.7/1.4	
Calibration SRM 2575				0.30	
<b>FOURTH FLOOR</b>					
Hallway	Wall	P	1	0.00	White
Hallway	Chair Rail	W	1	0.13	White
Hallway	Window Stool	W	1	0.08	Gray
RM 429	Wall	G	1	0.00	Tan
Hallway	Wall	P	4	0.00	Yellow
Stairwell	Wall	P	4	0.00	Yellow
Stairwell	Stair Rail Post	M	1	0.6	Beige
Room 435	Door	M	1	0.00	Yellow
Room 435	Window Casing	W	1	0.4	Beige
Room 432	Wall	P	4	0.00	Beige
Room 400	Wall	B	4	0.01	White
Hallway	Wall Locker	M	1	0.00	Tan
Hallway	Electric Panel	M	1	0.00	Beige
Hallway	Window Casing	W	4	0.06	Gray
<b>THIRD FLOOR</b>					
Hallway	Radiator	M	1	0.04	White
Hallway	Windowsill	W	1	0.06	Gray
Hallway	Locker	M	1	0.00	Blue
Hallway	Chair Rail	W	1	0.07	Gray

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)



**XRF Paint Testing Results**  
**September 8, 2021**  
**81 Highland Avenue, Somerville, MA**

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm <sup>2</sup> )	Color/ Comments
Hallway	Wall	G	1	0.20	White
Hallway	Fire Door	M	1	0.01	Orange
Hallway	Wall	P	4	0.30	White
Stairwell	Stair Stringer	M	1	0.70	Gray
Room	Baseboard	W	2	0.20	White
Room	Window Casing	W	1	0.08	Beige
Room	Ceiling	P	1	0.00	White
Room	Radiator Cover	W	1	0.00	Blue
Hallway	Door Frame	M	1	0.00	Yellow
Hallway Behind Locker	Wall	P	1	0.00	Beige
Wainscotting	Wall	W	1	0.05	Gray
<b>SECOND FLOOR</b>					
Main Office	Column	W	1	0.10	Beige
Main Office	Chair Rail	W	1	0.25	Beige
Vault	Ceiling	P	1	0.00	White
Office Area	Cove Base	W	1	0.09	White
Office Area	Door Frame	M	1	0.00	Green
Office Area	Window Casing	W	1	0.03	White
Office Area	Door	M	1	0.14	Green
Hallway	Windowsill	W	1	0.13	Gray
Hallway	Chair Rail	W	1	0.14	Gray
Stairwell	Handrail	M	1	0.00	Gray
<b>Office 234A-2</b>	<b>Wall</b>	<b>P</b>	<b>4</b>	<b>3.8</b>	<b>Green</b>
Hallway	Window Casing	W	1	0.13	Gray
<b>BASEMENT</b>					
Electric Room	Wall	W	1	0.08	Blue
Hallway	Wall	CB	1	0.00	Orange
Hallway	Wall	B	4	0.00	Green

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST-Stair Railing; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

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**XRF Paint Testing Results**  
**September 8, 2021**  
**81 Highland Avenue, Somerville, MA**

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm <sup>2</sup> )	Color/ Comments
Hallway	Wall	P	1	0.00	White
Hallway	Column	B	1	0.21	White
Hallway	Wall	CB	4	0.11	Yellow
Hallway	Wall	B	4	0.8	White

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)



**APPENDIX C**  
**Hazardous Building Materials**  
**Summary Tables**

**MISCELLANEOUS HAZARDOUS BUILDING MATERIALS INVENTORY**

81 Highland Avenue, Somerville, MA

**Bulbs & Ballasts**

Description	Location	Mfg./Model	Quantity	PCB Content
1'x4' Box Type Fixture, Suspended, 2 x 4' Bulbs	Hallways	N/A	48 Bulbs	U
Ballasts	"	Universal/Ultim 8	24	No PCBs
1'x4' Ceiling Mounted Fixture, 2 x 4' Bulbs	Classrooms	N/A	586 Bulbs	U
Ballasts	"	Universal/ Ultim 8	293	No PCBs
1'x4' Suspended Fixture, 2 x 4' Bulbs	Classrooms	N/A	240 Bulbs	U
Ballasts	"	Universal/ Ultim 8	120	No PCBs
8'x1' Box Type Fixture, Surface Mounted, 4 4' Bulbs	Stairwells/Hallways	N/A	314 Bulbs	U
Ballasts	"	Universal/ Ultim 8	157	No PCBs
Fluorescent Fixtures Inside Fume Hoods	Classrooms	N/A	2 Bulbs	U
Ballasts	"	N/A	2	N/A
2'x4' Lay-in Fixture, 4 x 4' Bulbs	Second Floor	N/A	28 Bulbs	U
2 Ballasts per	"	N/A	7	N/A

**CFC-Containing Items**

Description/Location	HVAC Manufacturer	Number of Units	Amount/Type of RCFCs
Water bubblers, built-in/Hallways	N/A	6	N/A
Refrigerator, Retail/Display type/Cafeteria	N/A	2	N/A

**Mercury-Containing Items**

Description	Location	Manufacturer	Number of Units
None Identified			



### Miscellaneous Items

Description	Location	Quantity
Dry Cell Batteries with Exit Signs	Throughout	14
Fire Extinguishers, CO2 Type	Throughout	7
Science Room Sink Traps	Throughout	50
Chemical storage containers associated with science classrooms, filled and empty, bottles, cans, etc.	Fourth Floor, Science Classrooms	~400
White goods, appliances, dishwasher	Third Floor	1
Chemical storage containers associated with photography development	Third Floor, Photography Classrooms	~100
Medical Type, Oxygen Tank, 3 feet tall on wheels	Second Floor	1
Dry Cell Batteries with Fire Panels (12volt, 6volt)	Second Floor	8
Acid Collection Tank, Plastic, 100 Gallon	First Floor	1

**APPENDIX D**  
**Non-ACMs Tables**

## Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-01A	Gypsum Wallboard	Throughout
091021-57-02A	Joint Compound a/w Gypsum Wallboard	Throughout
091021-57-03A	4" Vinyl Covebase Mastic	Throughout
091021-57-04A	6" Vinyl Covebase Mastic	Throughout
091021-57-05A	Moisture Barrier a/w Hardwood Flooring	Throughout
091021-57-06D	2' x 4' White Fissured Ceiling Tile	Throughout
091021-57-07A	Lab Counter Top	4 <sup>th</sup> Floor Science Rooms
091021-57-08B	Blackboard Adhesive	Throughout
091021-57-11A	Tan/Gold Stone Pattern Sheet Flooring	Chemistry Back Room
091021-57-12A	Tan/Gold Stone Pattern Sheet Flooring Mastic	
091021-57-14B	Gray Duct Seam Sealant	Throughout
091021-57-15A	12" x 12" Dark Gray Floor Tile	Throughout
091021-57-17D	12" x 12" Light Gray Floor Tile	Throughout
091021-57-19B	Safety Glass Glazing	Throughout
091021-57-20A	Interior Window Caulking	Throughout
091021-57-23C	Gray Floor Leveler	Throughout
091021-57-24A	2' x 2' White Ceiling Tile	Throughout
091021-57-25C	12" x 12" White Floor Tile	Room 223
091021-57-26A	12" x 12" White Floor Tile Mastic	Room 325
091021-57-27B	Clear Carpet Mastic	Throughout
091021-57-28A	Orange Carpet Mastic	Throughout
091021-57-29B	12" x 12" Blue Floor Tile	Basement Cafeteria Area
091021-57-30A	12" x 12" Blue Floor Tile Mastic	Room 339 Storage Area

## Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091021-57-31B	Red Sheet Flooring	Room 339 Storage Area Bottom Layer
091021-57-32A	Stair tread Mastic	Stairwells
091021-57-33B	Gray Sheet Flooring	2 <sup>nd</sup> Floor Hallway, Room 225
091021-57-34A	Gray Sheet Flooring Mastic	2 <sup>nd</sup> Floor Hallway, Room 225
091021-57-35B	Tectam Board	Room 239
091021-57-36A	Textured Wall Coating	Hallways
091021-57-37C	White End Cap Sealant	Throughout
091021-57-39A	4" x 4" Gray Ceramic Tile Grout	Men's & Women's Room Basement
091021-57-40B	4" x 4" Gray Ceramic Tile Adhesive	Men's & Women's Room Basement
091021-57-44B	12" Spline Ceiling Tile	2 <sup>nd</sup> Floor Hallway, Cafeteria
091021-57-45A	4" x 4" Mosaic Tile Grout	Basement Hallway
091021-57-46B	4" x 4" Mosaic Tile Adhesive	Basement Hallway
091021-57-47A	Exterior Basement Window Caulking	Throughout
091021-57-48C	Exterior Window Caulking	Throughout
091021-57-49A	Mortar a/w Stone Coping	Throughout
091021-57-51C	Red Brick Mortar	Throughout
01A-01P	White Skim coat Plaster	Throughout
02A-02P	Gray Base coat Plaster	Throughout
092321-95-01A&01B	Tar Paper/Mastic	Bottom Layer Floor Cores

### Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
092321-95-03A&03B	Tar Paper/Mastic	Bottom Layer Floor Cores



**APPENDIX E**  
**Photographs**



**Photo 1**

View of Asbestos-Containing Lab Hoods



**Photo 2**

View of Asbestos-Containing 12" Dark Gray Floor Tile Mastic



**Photo 3**

View of Asbestos-Containing 12" Light Gray Floor Tile Mastic



**Photo 4**

View of Asbestos-Containing 9" Tan/Gray Vinyl Floor Tile



**Photo 5**

View of Asbestos-Containing Exterior Door  
Caulking, Exterior All Sides of Building



**Photo 6**

View of Asbestos-Containing Waterproofing  
Mastic



**Photo 7**

View of Asbestos-Containing Green/White  
Vinyl Floor Tile



**Photo 8**

View of Asbestos-Containing Pipe  
Insulation

## **APPENDIX F**

### **Asbestos and Hazardous Building Materials Abatement Cost Estimate**

**Asbestos & Hazardous Building Materials Abatement Cost Estimate  
Former 1895 High School Building  
81 Highland Avenue, Somerville, MA**

**Asbestos Removal, ACMs**

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Transite Lab Hood	Rooms 423,425,427	150 SF	\$2,000
12" x 12" Dark Gray Floor Tile Mastic	Rooms- 429C, 4 <sup>th</sup> Floor Hallway, 304, 303, 3 <sup>rd</sup> floor Storage, 3 <sup>rd</sup> Floor Hallway, 235, 127, 125, Basement Hallway	10,900 SF	\$43,600
12" x 12" Light Gray Floor Tile Mastic	Rooms- 439, 425,423,423A,430,435,329,327,334,335,228,225,223,230,234,239, 123,121, Basement Hall	15,500 SF	\$62,000
9" x 9" Gray/Brown Floor Tile	Bottom Layer Throughout 2-4 Floors	48,000 SF	\$288,000
9" x 9" Gray/Brown Floor Tile Mastic	Bottom Layer Throughout 2-4 Floors	48,000 SF	Included above
6" Pipe Insulation	Rooms-121,123,125	250 LF	\$5,000
6" Pipe Elbow Insulation	Rooms-121,123,125	35	\$525
Exterior Door Caulking	Throughout	4 Units	\$500
Black Waterproofing Mastic	Exterior Brick Façade Throughout	25,500 SF	\$255,000
Green Floor Tile	1st Floor Throughout Bottom Layer	16,000 SF	\$96,000
White Floor Tile	3 <sup>rd</sup> Floor Throughout Bottom Layer	16,000 SF	\$96,000
Window Caulking old under new	Throughout	20,000 LF	\$21,000
12" x 12" and 9' x 9" floor tiles and black mastic (various types)	Throughout	64,000 SF	Included Above
Black Vapor Barrier on CMU Block Wall	Throughout	75,000 SF	\$600,000
Exterior Door Caulking	Throughout	500 LF	\$2,500
Exterior black tar on coping	Coping Throughout	5,000 SF	\$25,000
Exterior caulk at roof penthouse	Roof	NA	TBD
White pipe fitting and elbow insulation	Throughout	18,000 LF	\$90,000
Black Sink Coating	Chemistry and Biology Labs 4 <sup>th</sup> Floor	150 Each	\$1,500



**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**Former 1895 High School Building**  
**81 Highland Avenue, Somerville, MA**

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Multicolored Sheet Flooring	Chemistry Storage Room	150 SF	\$750
Coating on Roof Curbing	Roof	NA	TBD
<b>Subtotal, Asbestos Removal (Confirmed ACMs)</b>			<b>\$ 1,589,375</b>

**Asbestos Removal, PACMs**

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	5,000 SF	\$100,000
Buried Pipes	Beneath Building or at Site	TBD	NA*
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	168 Units	\$21,000
Roofing Materials Assoc. w/ Flat Roof System	Main Roof Field & Flashing	16,000 SF	\$80,000
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	Various Areas Building's Interiors	TBD	NA*
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	\$3,000
<b>Subtotal, PACM Removal (Recommended Allowance)</b>			<b>\$ 204,000</b>

\*N/A – Not applicable at this time

**Abatement Cost Estimate Summary**

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 1,589,375
Asbestos Removal, Presumed ACMs	\$ 204,000
Miscellaneous Hazardous Building Materials	\$ 10,000
~10% Contingency	\$ 180,338
Estimated Abatement Design/Bid & Monitoring Fee	\$ 50,000
<b>Total Hazardous Building Materials Abatement</b>	<b>\$ 2,033,713</b>

**Cost Estimate Assumptions**

- Based on current market conditions by a non-union contractor.
- Power, water and heat provided by the Owner.

**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**Former 1895 High School Building**  
**81 Highland Avenue, Somerville, MA**

- Does not include demolition to access concealed ACMs.
- Includes materials, labor, equipment, notifications/permits, transportation and disposal.
- Excludes the cost for removal of any other hazardous materials or conditions not identified herein.

**APPENDIX G**

**Former Report-CDW- 2015**

GREEN LINE EXTENTION

LINE OF PROPOSED  
ADDITION FOOTPRINT



SCHOOL ST.

HIGHLAND AVE.

# Preliminary Design Program

## Somerville High School

81 Highland Avenue, Somerville MA

February 29, 2016

SMMA No. 15070.00

Symmes Maini & McKee  
Associates

**SMMA**



# PMA Consultants

25 Braintree Hill Office Park, Suite 303  
Braintree, MA 02184  
Tel: 781.794.1404  
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## TRANSMITTAL

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**To:** Karl Brown

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**Company:** MSBA

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**Phone:**

**Fax:**

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**From:** Chad Crittenden

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**Re:** Somerville High School Project – PDP Submission

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**Date:** February 29, 2016

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**CC:** File

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**ENCLOSURES:**

**Information**     **Document(s)**     **Letter(s)**     **Schedule(s)**     **Report(s)**

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**COMMENTS:**

**Urgent**     **Please Review**     **Please Comment**     **Please Reply**

---

**Comments:**

Includes:

(2) Hard Copies of PDP

(2) Electronic Copies (compact disk) of PDP

(1) Electronic File of Entire Submission in PDF Format (via MSBA dropbox)



Karl Brown  
Project Manager  
Massachusetts School Building Authority  
40 Broad Street, Suite 500  
Boston, MA 02109

February 29, 2016

**RE: Preliminary Design Program for Somerville High School Project**

Dear Mr. Karl Brown:

In accordance with the MSBA's Feasibility Study Submittal Procedures, PMA has reviewed and coordinated the materials contained within the Somerville High School Project's Preliminary Design Program submittal.

PMA finds the submittal to be complete and certifies that that Somerville High School Building Committee has officially approved the submittal and the materials contained within. The formal approval of the School Building Committee was obtained on the evening of Wednesday, February 10th, 2016. Meeting minutes from this meeting are contained within the PDP submission as required under section 3.1.7.

The District, along with PMA and SMMA have performed in-depth analysis on a total of nine alternatives for the purposes of this study; two of the considered alternatives consisted of new construction on two different sites (existing site and Trum/DPW site), five of the alternatives were varying approaches to an addition/renovation scheme and the two remaining options were a base code upgrade and a base repair which will not satisfy the district's Educational Program as submitted.

Due to a combination of site size constraints, soil contaminant concerns, a lengthy Article 97 land disposition policy process, and traffic/parking limitations at the Trum Field / DPW site, the District, PMA and SMMA feel that the remaining addition/renovation options on the existing High School site are more economically viable alternatives and warrant further investigation during development of the Preferred Schematic Report.

We look forward to the MSBA's review and are eager to begin final evaluation of the proposed alternatives. As always, please feel free to contact me with any questions or concerns.

Sincerely,



Chad Crittenden  
Director | Senior Project Manager  
PMA Consultants, LLC



25 Braintree  
Office Hill Park  
Suite 303  
Braintree, MA  
02184  
Tel: 781.794.1404  
Fax: 781.794.1405

**PRELIMINARY DESIGN  
PROGRAM**

SOMERVILLE HIGH SCHOOL  
81 Highland Avenue, Somerville MA

**SMMA**  
1000 Massachusetts Avenue  
Cambridge, MA 02138  
www.smma.com

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CDW CONSULTANTS, INC.  
CIVIL & ENVIRONMENTAL ENGINEERS

## HAZARDOUS MATERIALS SUMMARY REPORT

**Somerville High School  
81 Highland Avenue  
Somerville, Massachusetts**

Prepared for

Symmes Maini & Mckee  
1000 Massachusetts Avenue  
Cambridge, MA 02138

November 2015

CDW Project # 1491.0





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## 1.0 INTRODUCTION

CDW Consultants, Inc. (CDW) is pleased to present this letter report summarizing the findings of the suspect asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs) and hazardous materials inspection of the Somerville High School (“Site”) located in Somerville, Massachusetts. The scope of work was to conduct a non-destructive feasibility inspection to identify and quantify suspect ACM and hazardous materials located in the building.

In November 2015, Ms. Susan Cahalan (Massachusetts DOS Asbestos Inspector #AI60784) and Mr. Ted Sherry (Massachusetts DOS Asbestos Inspector #AI325702) conducted an interior and exterior building inspection for suspect materials. An inspection is required by the United States Environmental Protection Agency (USEPA) National Emission Standards for Hazardous Air Pollutants (NESHAPs), prior to scheduled building demolition. Samples of suspect materials were collected to confirm the presence or absence of ACM, LBP, & PCBs. Suspect materials were grouped into homogenous areas. By definition a homogenous area is an area that is similar in color, texture and date of application. Hand tools were used to collect bulk samples which were promptly placed in sealed plastic bags using a unique numbering system. Samples were not collected of non-suspect materials, including wood, fiberglass, plastic/vinyl, ceramic, concrete, neoprene/rubber, glass, and carpeting.

## 2.0 GENERAL SITE CONDITIONS

- A Wing was constructed in 1929, and contains offices and administrative space. The walls are painted gypsum board or plaster. Flooring consists of vinyl composition floor tile (VCT), wood flooring and rubber flooring. Refrigerants associated with water fountains and mercury thermostats were noted. Cleaning agents are located in the custodial closets in original containers.
- B Wing was constructed in 1895 and contains offices and administrative space. There are four floors. The walls are painted gypsum board or plaster. Flooring consists of VCT, wood flooring and rubber flooring near the main entrance. Many of the floor surfaces are uneven, suggesting multiple layers exist. Refrigerants associated with water fountains and mercury thermostats were noted. Cleaning agents are located in the custodial closets in original containers. There is one elevator.
- B Wing addition, was constructed in 1917 and the auditorium in 1929, and contains classrooms, cafeteria, kitchen, boiler room and auditorium. The classrooms are world



language, social studies, English and science subjects. The hallways consist of VCT flooring and the classrooms hardwood flooring. Ceilings consist of spline set ceiling tiles and the walls are plaster or sheetrock. There are two fume hoods for mixing chemicals. Both fume hoods are constructed of transite with metal exhausts. The hallways in the lower levels have covered trenches with fiberglass insulated steam pipes. The boiler room contains a custodial office, four oil fired boilers, pumps, hot water tanks, expansion tanks, boiler breeching exhaust and fiberglass insulated piping. C wing was constructed in 1929, and consist of classrooms, band rooms, career and technical education located on the first level of C wing. The hallways have VCT floors and the classrooms hardwood floors. The walls are sheetrock or plaster. One of the classrooms is a dental tech training center. Chemical and powders for mold impressions are stored in original containers in cabinets. The dental tech classroom also contains a x-ray machine.

- D Wing was constructed in 1929, and consists of the library, locker rooms, TV studio and daycare. The library is the largest portion of this wing, and contains books, media and computers in an open floor plan with steel beams near the ceiling. The ceilings consist of 1' x 1' or 2' x 4' spline set suspended ceiling tiles, painted CMU or plaster walls and 1' x 1' floor tile.
- E Wing was constructed in 1988, consists of the gym and vocational classrooms. The vocational classrooms are the restaurant with kitchen, nursing, cosmetology, graphic design, electrical, auto repair and carpentry. The ceilings consist of 1' x 1' or 2' x 4' spline set suspended ceiling tiles, painted CMU walls and 1' x 1' floor tile.

### **3.0 ASBESTOS SURVEY**

#### **3.1 Methods**

The investigative work for the asbestos survey included conducting a limited visual inspection of physically accessible areas of the structure followed by limited destructive testing to allow access to inaccessible locations. Destructive testing included: installing test holes into roof, exterior vapor barrier, opening access panels and opening of drop ceiling systems.

Once the visual inspection was completed, the building components were categorized into homogeneous areas. These homogeneous areas included: surfacing materials, thermal system insulation, and miscellaneous materials.



CDW collected bulk samples of different homogeneous suspect materials for asbestos analysis. The bulk samples were delivered under chain of custody to Asbestos Identification Laboratory, Inc. (AIL) located in Woburn, Massachusetts. AIL is a state licensed (#AA000208) and NVLAP-accredited laboratory (lab code #200919-0) for asbestos analysis. Bulk samples were analyzed for asbestos content by polarized light microscopy (PLM) using EPA Method 600/R-93/116. A positive stop method was used – if one sample in a homogeneous group is positive then additional samples of the same material are not analyzed. The asbestos analytical results are provided in Attachment A. Samples analyzed to contain greater than 1% asbestos are to be treated as ACMs as defined by the USEPA and Commonwealth of Massachusetts Department of Environmental Protection (MassDEP).

### **3.2 Findings**

In summary, CDW identified the following ACMs within the Site building:

- Window caulk, old under new at the A, B, C and D wing windows;
- 12” x 12” and 9” x 9” floor tiles and Black Mastic (various types);
- Black vapor barrier on CMU block behind brick façade of the 1988 wing;
- Exterior door caulk;
- Exterior black tar at coping of 1929 D wing;
- Exterior caulk at roof penthouse on B wing;
- White pipe fitting insulation and fittings, behind wet walls, pipe chases, various diameters;
- Black sink coating;
- Coating on roof curbing A wing and B wing;
- Interior Boiler Components;
- Flex connectors located throughout the school’s mechanical rooms;
- Transite fume hoods;
- Mastic under rubber gym floor;
- Blackboard glue daubs;



- Coating behind classroom univents;
- Chimney lining;
- Foundation coating;
- Remnant roofing materials; and,
- Subsurface transite

The asbestos laboratory results are summarized in Table 1. The laboratory analytical results are provided in Attachment A.

### **3.3 Recommendations**

Prior to disturbance, the ACM identified must be abated by a Commonwealth of Massachusetts-licensed asbestos abatement contractor following all federal, state & local regulations governing asbestos abatement. A copy of the asbestos Waste Shipment record must be received within 45 days of removal from the Site. Asbestos air quality sampling must be conducted under USEPA regulations following asbestos abatement and prior to re-occupancy of the spaces. If additional materials are discovered that have not been sampled, those materials should be considered ACMs until laboratory analysis determines otherwise.

## **4.0 LEAD-BASED PAINT**

### **4.1 Methods**

CDW performed a visual inspection of painted surfaces. CDW collected samples from different color paints on various types of building component substrates. Samples were submitted to EMSL Laboratories in Cinnaminson, New Jersey for analysis via Atomic Absorption Spectrometry (AAS).

### **4.2 Findings**

The results of the testing revealed that seven of the nine samples analyzed had detectable concentrations of lead. The Environmental Protection Agency (EPA) defines LBP as any paint or surface coating that contains lead equal to exceeding one milligram per square centimeter (1.0 mg/cm<sup>2</sup>) or 0.5% by weight. OSHA has not set numerical threshold limits for lead and the OSHA lead-in-construction standard defines lead containing paint (LCP) as a paint or coating containing any detectable level of lead.





Based on the EPA and OSHA criteria listed above, the results of 7 samples revealed building components coated with LBP. These components finished with LBP included: exterior red paint on A wing, classroom wall paint, door frames, brick walls, and radiators. The lead paint analytical results are provided in Table 2. The laboratory analytical report is included in Attachment B.

### **4.3 Recommendations**

Based on the conclusions of this testing, the following recommendations are offered:

- Removal of the LBP is not required. However, in accordance with the EPA Lead Renovation, Repair, and Painting (RRP) Rule 40 CFR 745, workers, students, visitors and the general public must be protected from lead dust generated during the demolition of LBP or LCP coated surfaces.
- Components identified to contain the presence of lead should not be disturbed in an uncontrolled manner. Disturbance of these materials should only be done by properly trained personnel in a controlled and documented manner to allow for the safety of the workers, bystanders and disposal of waste materials.
- Specifications for the proper work practices, controls and disposal should be developed to document compliance with all applicable regulations.
- Those components/colors not tested, or in locations not inventoried in this report, should be tested for lead content prior to disturbance that may cause airborne release of lead.

## **5.0 PCB AND OTHER HAZARDOUS MATERIALS SURVEY**

### **5.1 Methods**

#### PCB Sample Collection and Analysis

CDW conducted a visual inspection for suspect PCB containing building materials. CDW collected including exterior window caulk and expansion joint. Samples were submitted to Phoenix Environmental Laboratories in Manchester, Connecticut for analysis via EPA Method 8082 with Soxhlet extraction 3540C.



### Mercury Sample Collection and Analysis

CDW conducted a visual inspection of rubber flooring suspected to contain mercury. Two samples of the rubber gymnasium floor and two samples of the rubber stair tread were collected. The samples were submitted to ESML Analytical of Cinnaminson, New Jersey for analysis. The samples were analyzed for mercury using EPA SW-846 Method 7471B.

### OHM Visual Inspection

CDW visually inspected the Site building for universal, special and hazardous wastes associated with building materials. These included but were not limited to the following:

- Mercury-containing devices (fluorescent light tubes, thermostats, gauges, etc.);
- Polychlorinated bi-phenyl (PCB)-containing articles, equipment and devices (light ballasts, electrical switches, etc.);
- Chlorofluorocarbon (CFC)-containing equipment (refrigerants, air conditioners/HVAC equipment, water bubblers, etc.)
- Tritium-containing devices (Exit signs);
- Lead-Acid batteries (emergency lights, etc.); and
- Pressurized-cylinders (fire extinguishers, etc.).

## **5.2 Findings**

### PCBs

The analytical results are compared to the USEPA standard of 50 parts per million (ppm), which is the threshold for bulk product waste, as defined by USEPA 40 CFR § 761.3, and regulated under the Toxic Substances Control Act. None of the samples collected had detectable concentrations of PCBs.

The PCB analytical results are summarized in Table 3. A copy of the PCB laboratory report is provided in Attachment C.



## Mercury

The analytical results are compared to the total concentration results and divided by 20 and compared to the regulatory concentrations on the TCLP list. The result is less than the TCLP regulatory limit of 0.2, therefore then materials sampled are not a “toxicity characteristic” hazardous waste.

The mercury analytical results are summarized in Table 4. A copy of the mercury laboratory report is provided in Attachment D.

## OHM

The visual survey for hazardous materials identified mercury-containing light tubes, PCB-containing light ballasts, mercury containing thermostats and switches, lead and tritium batteries, refrigerants and other hazardous materials. No hazardous materials sampling or analysis was conducted as part of this preliminary survey. A list of OHMs identified are included in Table 5.

### **5.3 Recommendations**

Prior to removal, light tubes, ballasts, compact florescent bulbs, lead and tritium batteries, thermostats and switches will require proper handling, removal, transportation and off-site recycling/reclamation. Hydraulic oil from the automobile lift and refrigerants will require handling and disposal in accordance with regulations. Any sludge in the science sink traps will need to be sampled for laboratory analysis of lead and mercury via TCLP to determine proper disposal requirements. Laboratory chemicals should be properly stored, in their original containers, and are recommended for re-use.

## **Limitations**

The conclusions are limited to the information available at the time of the field survey and the scope of services, as defined. No subsurface soil or groundwater testing was performed. Where access to portions of the Site or to structures on the site was unavailable or limited, CDW renders no opinion as to the presence of hazardous material or the presence of indirect evidence related to hazardous material in that portion of the site or structure. This report cannot be solely relied upon for demolition. The testing performed forms the basis for conclusions expressed and areas inaccessible for testing limits those conclusions. No other conclusions, interpretations or recommendations are contained or implied in this report other than those expressed. No other use of this report is warranted without the written consent of CDW Consultants, Inc.



Somerville High School  
Somerville, MA  
CDW Project #1491.0

CDW appreciates the opportunity to provide our services to you on this project.

Very truly yours,

CDW CONSULTANTS, INC.

A handwritten signature in cursive script, appearing to read 'Susan Cahalan'.

Susan Cahalan, PG  
Project Manager

## **TABLES**



**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
1	Exterior Tan Expansion Joint Caulk 1988 E Wing	1A, 1B, 1C, 1D, 1E, 1F, 1G	Non-ACM, Sampled	1988 E Wing	NA	NA	
2	Exterior Gray Caulk	2A, 2B, 2C	Non-ACM, Sampled	At Base of Building Between Brick and Sidewalk	NA	NA	
3	Exterior Door Caulk	3A, 3B	Cat. 2 Non-friable ACM	Gym Door	500	LF	Also Assumed Others
4	Exterior Black Tar	4A, 4B, 4C	Cat. 2 Non-friable ACM	Exterior Coping 1929 D Wing Exterior Walls	5,000	SF	
5	Exterior Door Caulk	5A, 5B	Non-ACM, Sampled	Exterior Door #37	NA	NA	
6	Exterior Gray Window Caulk	6A, 6B, 6C	Non-ACM, Sampled	1929 C Wing	NA	NA	
7	Exterior Red Window Caulk	7A, 7B, 7C, 7D, 7E	Non-ACM, Sampled	1929 C Wing	NA	NA	The same caulk is located on A Wing, B Wing, C Wing and D wing
8	Exterior Window Glaze	8A, 8B	Non-ACM, Sampled	1929 C Wing	NA	NA	Silicone-Rubber
9	Exterior Red Louver Caulk	9A, 9B, 9C	Non-ACM, Sampled	1929 C Wing	NA	NA	
10	Exterior Red Window Caulk	10A, 10B, 10C, 10D, 10E, 10F, 10G	Non-ACM, Sampled	1895 B Wing	NA	NA	
11	Exterior White Window Caulk	11A, 11B, 11C, 11D, 11E, 11F, 11G	Non-ACM, Sampled	Under Red Caulk 1895 B Wing	NA	NA	
12	Red Exterior Louver Caulk	12A, 12B, 12C	Non-ACM, Sampled	1895 B Wing	NA	NA	
13	Exterior Door Caulk	13A, 13B, 13C	Non-ACM, Sampled	Door #2	NA	NA	
14	Exterior Door Glaze	14A, 14B	Non-ACM, Sampled	Door #2	NA	NA	
15	Exterior White Caulk Under New Caulk	15A, 15B, 15C	Cat. 2 Non-friable ACM	1929 A Wing	20,000	LF	A Wing, B Wing, C Wing and D Wing

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
16	Exterior Black Caulk	16A, 16B	Non-ACM, Sampled	At Front Decorative Roof Design at 1929 A Wing	NA	NA	
17	White Cementitious Stand Pipe	17A, 17B	Non-ACM, Sampled	Roof of 1895 B Wing	NA	NA	
18	Exterior White Caulk	18A, 18B	Cat. 2 Non-friable ACM	1895 B Wing Auditorium Brick to Roof	250	LF	
19	Black Tar	19A, 19B	Non-ACM, Sampled	On Stand Pipes on Roof	NA	NA	
20	Exterior Gray Caulk	20A, 20B	Non-ACM, Sampled	Intersection of 1929A to 1895B Wing	NA	NA	
21	Black Vapor Barrier	Brick-1, Brick-2	Cat. 2 Non-friable ACM	Behind Brick Facade 1988 Wing	75,000	SF	Black Tar on Fiberboard Attached to CMU Behind Brick Façade
22	2' x 4' Suspended Ceiling tile	21A, 21B, 21C	Non-ACM, Sampled	A Wing Halls	NA	NA	
23	Felt	22A, 22B, 22C	Non-ACM, Sampled	Lining to HVAC Access Hatches A Wing	NA	NA	
24	1' x 1' Spline Set Ceiling Tile	23A, 23B, 23C, 23D, 23E	Non-ACM, Sampled	A Wing Classrooms	NA	NA	
25	Wall Plaster	24A, 24B, 24C	Non-ACM, Sampled	Room 409 A Wing	NA	NA	
26	Hard Ceiling Plaster	25A, 25B, 25C	Non-ACM, Sampled	Room 409 A Wing	NA	NA	
27	Tan Glue	26A, 26B, 26C	Non-ACM, Sampled	Under Cove Base 4th Floor A Wing	NA	NA	
28	Door Glaze	27A, 27B	Non-ACM, Sampled	Door 4A - A Wing	NA	NA	
29	Door Side Light Glaze	28A, 28B	Non-ACM, Sampled	Door Assembly A Wing	NA	NA	
30	White Skim Coat	29A, 29B, 29C	Non-ACM, Sampled	Ceiling 4th Floor Hall A Wing	NA	NA	

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
31	Brown Plaster	30A, 30B, 30C	Non-ACM, Sampled	Under White Skim Coat Ceiling 4th Floor Hall A Wing	NA	NA	
32	Glue	31	Non-ACM, Sampled	Under Rubber Floor in Stairwell A Wing	NA	NA	
33	Glue on Paper	32A, 32B, 32C	Non-ACM, Sampled	Behind Ceramic Tile B Wing	NA	NA	
34	Grout	33A, 33B	Non-ACM, Sampled	Behind Ceramic Tile B Wing	NA	NA	
35	Brown Paper	34A, 34B	Non-ACM, Sampled	Behind Ceramic Tile B Wing	NA	NA	
36	Levelastic	35A, 35B	Non-ACM, Sampled	Janitor Closet B Wing	NA	NA	
37	1' x 1' Gray Floor Tile	36A, 36B	Non-ACM, Sampled	B Wing Hall	NA	NA	
38	Black Mastic	37A, 37B	Non-ACM, Sampled	Under Gray Floor Tile B Wing Hall	NA	NA	
39	Hard Plaster	38	Non-ACM, Sampled	Ceiling Janitor Storage	NA	NA	
40	Black Sink Coating	39	Cat. 2 Non-friable ACM	Janitor Room B Wing	150	EA	Quantity Includes Sinks Throughout including Science
41	Insulation	40	Non-ACM, Sampled	Inside Blodgett Stove Cafeteria Kitchen	NA	NA	
42	1' x 1' Spline Set Ceiling Tile	41A, 41B	Non-ACM, Sampled	Cafeteria	NA	NA	
43	Wall Plaster	42A, 42B	Non-ACM, Sampled	Cafeteria	NA	NA	
44	Glue	43A, 43B	Non-ACM, Sampled	Under Covebase in Cafeteria	NA	NA	

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
45	1' x 1' Gray/Blue Floor tile	44A, 44B	Non-ACM, Sampled	Cafeteria	NA	NA	
46	Mastic/Levelastic Mix	45A, 45B	Non-ACM, Sampled	Cafeteria Under floor Tile	NA	NA	
47	Interior Window Glaze	46	Non-ACM, Sampled	Door to Trachers Lounge	NA	NA	
48	Wall Plaster	47A, 47B	Non-ACM, Sampled	Lower Level A Wing	NA	NA	
49	Glue	48A, 48B	Non-ACM, Sampled	Under Sheet Flooring A Wing	NA	NA	
50	Levelastic	49A, 49B	Non-ACM, Sampled	Under Sheet Flooring A Wing	NA	NA	
51	Yellow Mastic	51	Non-ACM, Sampled	Under Tan 1'x1' Floor Tile Room 140	NA	NA	
52	Pink Rosin Paper	52	Non-ACM, Sampled	Under Wood Floor Room 140	NA	NA	
53	Wall Plaster	53A, 53B	Non-ACM, Sampled	B Wing 4th Floor Hall	NA	NA	
54	Black Science Table Top	54	Non-ACM, Sampled	Science 429	NA	NA	
55	Black Glue	55	Non-ACM, Sampled	Under Cove Base at Science Table	NA	NA	
56	Brown Paper with Wire Lathe	56	Non-ACM, Sampled	Behind White Plaster Room 429	NA	NA	

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
57	White Wall Plaster	57	Non-ACM, Sampled	Room 429	NA	NA	
58	Multi Colored Sheet Flooring	58, 59A, 59B	Cat. 2 Non-friable ACM	Chemistry Storage	150	SF	
59	Black Skim on Foundation	69	Non-ACM, Sampled	B Wing	NA	NA	
60	Tan Glue	61A, 61B	Non-ACM, Sampled	Under Cove Base 1988 Wing	NA	NA	
61	Interior Window Glaze	62	Non-ACM, Sampled	Door to Auto Repair	NA	NA	
62	1' x 1' Gray Floor Tile	63A, 65A	Cat. 2 Non-friable ACM	Lower and Main Level 1988 Wing	10,000	SF	
63	Black Mastic Under 1' x 1' Gray Floor Tile	63B, 65B	Cat. 2 Non-friable ACM	Lower and Main Level 1988 Wing	Inc. in Above Qty	NA	
64	Interior Window Glaze	64	Non-ACM, Sampled	Weight Room Door	NA	NA	
65	Wall Plaster	66	Non-ACM, Sampled	D Wing Hall	NA	NA	
66	Door Glaze	67	Non-ACM, Sampled	Door 3G Assembly D Wing	NA	NA	
67	Glue Under Rubber Stair Mat	68	Non-ACM, Sampled	D Wing Stairs	NA	NA	
68	Black Science Table Top	69	Non-ACM, Sampled	Chemistry	NA	NA	
70	Exterior Window Caulk - Old Under New	70A, 70B	Cat. 2 Non-friable ACM	C Wing	Inc. in Quantity for #15	NA	
71	Foundation Skim	71	Non-ACM, Sampled	1988 Wing	NA	NA	
72	Wall Plaster	72	Non-ACM, Sampled	B wing Hall	NA	NA	

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
73	1' x 1' Spine Set Ceiling Tile	73A, 73B	Non-ACM, Sampled	1988 Wing	NA	NA	
74	2' x 4' Ceiling Tile	74A, 74B	Non-ACM, Sampled	1988 Wing	NA	NA	
75	2' x 4' Suspended Ceiling Tile	75A, 75B	Non-ACM, Sampled	C Wing Hall	NA	NA	
76	2' x 4' Suspended Ceiling Tile	76A, 76B	Non-ACM, Sampled	B Wing Hall	NA	NA	
77	Green/Gray Floor Tile	77A, 77B	Cat. 2 Non-friable ACM	B Wing Hall	240,000	SF	Multiple layer Floor Tile System Old wood flooring under green/gray floor tile, tan floor tile over green/gray floor tile, levelastic over tan floor tile, and 1' x 1' gray floor tile on top
78	Black Mastic Under # 77	78A, 78B	Non-ACM, Sampled	B Wing Hall	Inc. in Qty for # 77	NA	
79	1' x 1' Light Tan Floor Tile	79A, 79B	Cat. 2 Non-friable ACM	B Wing Hall	Inc. in Qty for # 77	NA	
80	Brown Mastic	80A, 80B	Cat. 2 Non-friable ACM	B Wing Hall	Inc. in Qty for # 77	NA	
81	Levelastic	81	Non-ACM, Sampled	Biology	Inc. in Qty for # 77	NA	Contaminated
82	1' x 1' Gray Floor Tile	82	Cat. 2 Non-friable ACM	B Wing Hall	Inc. in Qty for # 77	NA	
83	Black Mastic	83	Cat. 2 Non-friable ACM	Black Mastic Under #82	Inc. in Qty for # 77	NA	
84	Boiler Breeching	01A, 01B, 01C	Non-ACM, Sampled	Boiler Room	NA	NA	
85	Boiler Gasket	02A, 02B	Non-ACM, Sampled	Boiler Room	NA	NA	
86	Boiler Door Material	03A, 03B, 03C	Non-ACM, Sampled	Boiler Room	NA	NA	
87	Hot Water Tank Insulation	04A, 04B, 04C	Non-ACM, Sampled	Boiler Room	NA	NA	



**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
88	Interior Window Glaze	90	Non-ACM, Sampled	Boiler Room	NA	NA	
89	Rubber Stair Tread mastic	91	Non-ACM, Sampled	A Wing 4th Floor	NA	NA	
90	Floor Leveler	92A, 92B	Non-ACM, Sampled	A Wing	NA	NA	
91	Mastic	93	Non-ACM, Sampled	Under Stage 1st Layer	NA	NA	
92	Glue under rubber, Gray paper on top of Foam, Fiberboard, White Deck	1929 Roof-1A, 1B, 1C. 1929 Roof-2A, 2B. 1929 Roof 3A, 3B, 3C.	Non-ACM, Sampled	1929 A Wing Roof	NA	NA	Each Layer Analyzed Separately. Roof Consists of Rubber, Gray Paper, Foam, Fiberboard and White Board Deck.
93	Glue under rubber, Gray paper on top of Foam, Tar Above Deck, White Deck	1895-1A, 1B, 1C, 1D. 1895-2A, 2B, 2C, 2D. 1895-4A, 4B, 4C, 4D, 4E. 1895-5A, 5B, 5C. 1895-6A, 6B, 6C, 6D, 6E. 1985-13A, 13B, 13C.	Non-ACM, Sampled	1895 B Wing Roof	NA	NA	Each Layer Analyzed Separately. Roof Consists of Rubber, Gray Paper, Foam, Tar on Deck, and White Board Deck.
94	Gray paper Top of Foam, Gray Paper Bottom of Foam	1929C-7A, 7B. 1929C-8A, 8B, 1929C-9A, 9B	Non-ACM, Sampled	1929 C Roof	NA	NA	Each Layer Analyzed Separately. Roof Consists of Rubber, Gray Paper, Foam.
95	Roof Shingle	1929D-10, 11, 12.	Non-ACM, Sampled	1929 D Wing Roof	NA	NA	Shingles over Wood Frame Roof
96	Coating on Roof Curbing	Curb-1, Curb-2	Cat. 1 Non Friable ACM	A Wing and B Wing Roof	5,500	SF	
97	Gray Paper on Bottom Of Foam	1988-1A, 1B, 1C	Non-ACM, Sampled	1988 Wing Roof	NA	NA	Roof Consists of Rubber, Foam, Gray Paper, Gypsum and Steel Deck
98	White Gypsum Deck	1988-2A, 2B, 2C	Non-ACM, Sampled	1988 Wing Roof	NA	NA	
99	Interior Boiler Components	NA	Suspect ACM, Not Sampled	Interior of Older Boilers	4	EA	
100	Black Mastic/Insulation	NA	Suspect ACM, Not Sampled	Walk in Refrigerator and Freezer Coating	6	EA	

**Table 1  
Asbestos Analytical Results  
Somerville High School  
Somerville Massachusetts**

HA No.	Material Description	Laboratory Sample No.	NESHAP Cat.	Location	Est. Quantity	Units	Comments
101	Transite Fume Hoods	NA	Suspect ACM, Not Sampled	Biology and Chemistry - Visual	120	SF	
102	Other Hidden Transite Panels	NA	Suspect ACM, Not Sampled	Other	5,000	SF	Not Seen, Contingency
103	Flex Connctors on HVAC Behind Walls	NA	Suspect ACM, Not Sampled	Mechanical Equipment Throughout	1,000	SF	
104	Pipe Insulation and Fittings	NA	Suspect ACM, Not Sampled	Hidden Behind Wet Walls, Unknown Trenches etc.	18,000	LF	Note All Visible Piping in Boiler Room and Some Trenches are Fiberglass Insulated.
105	Glue or Mastic Under Rubber Gym Floor	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	25,300	SF	
106	Blackboard Glue Daubs	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	600	EA	
107	Coating Behing Classroom Univents	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	5,000	SF	
107	Hidden/Buried Walls With Plaster	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	20,000	SF	
108	Foundation Coating	NA	Suspect ACM, Not Sampled	Not Seen, Down Hear Footings - Contingency	5,000	SF	
109	Subsurface Transite	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	5,000	LF	
110	Chimney - Firebrick or Lining	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	1	EA	
111	Hidden Roofing Materials	NA	Suspect ACM, Not Sampled	Not Seen - Contingency	10,000	SF	
NA = Not Applicable							
HA = Homegenous Area							

**Table 2**  
**Lead Based Paint Analytical Results**  
**Somerville High School**  
**Somerville, MA**

Sample ID	Location	Substrate	Result
LP-1	Red Paint	On Concrete Exterior of A Wing	0.00093
LP-2	White Paint	Classroom Wall Room A09	0.00084
LP-3	Tan Paint	On Metal Radiator	0.45%
LP-4	Tan Paint	Door Frame B Wing	0.09%
LP-5	White Paint	On Brick B Wing	0.02%
LP-6	White Paint	A Wing Hall	<0.013%
LP-7	White Paint	On Radiator B Wing	0.71%
LP-8	Red Paint	On Concrete Exterior D Wing	0.02%
LP-9	White Paint	On Concrete Hall D Wing	<0.011%

**TABLE 3**  
**PCB Analytical Results**  
**Somerville High School**  
**Somerville, Massachusetts**

Sample #	Description	Result	Concentration (mg/kg)
PCB-1	Dark Tan Expansion Joint Exterior 1988 Wing	ND	NA
PCB-2	Gray Caulk at Bottom of Building and Stairs Exterior	ND	NA
PCB-3	Exterior Door Caulk	ND	NA
PCB-4	Gray Exterior Window Caulk 1929 C Wing	ND	NA
PCB-5	Exterior Red Window Caulk C Wing	ND	NA
PCB-6	Exterior Red Window Caulk B Wing	ND	NA

Mg/kg = Milligrams per kilograms = parts per million

**TABLE 4**  
**Rubber Floor Mercury Analytical Results**  
**Somerville High School**  
**Somerville, Massachusetts**

<b>Sample ID</b>	<b>Location</b>	<b>Mercury (mg/kg)</b>
Merc-1	Top Tan Layer Gym Floor	0.33
Merc-2	Bottom Dark Brown Layer Gym Floor	ND
Merc-3	Black Rubber Stair Tread A Wing	0.056
Merc-4	Black Rubber Stair Tread B Wing	0.05

Mg/kg = milligrams per kilograms (parts per million)

**TABLE 5  
OHM LIST  
Somerville High School  
Somerville, MA**

<b>Material Description</b>	<b>Location</b>	<b>Est. Quantity</b>	<b>Units</b>
Compact Fluorescent Bulbs	Throughout	500	EA
Fluorescent Bulbs (Mercury)	Throughout	18000	Tubes
Thermostats and Switches (Mercury)	Throughout	300	Ampules
Emergency Light Batteries (Lead)	Throughout	100	EA
Refrigerants Associated With HVAC	Throughout	10000	Gallons
Fire Extinguishers (Compressed Gas)	Throughout	100	EA
Lead-Based Paint	Metal	NA	NA
Refrigerants Associated with Water Bubblers	Throughout	30	Gallons
Exit Signs (Tritium)	Throughout	110	EA
Chemicals (Mercury and Lead)	Science Sink Traps	Assumed	NA
Laboratory Chemicals	Science Labs	NA	NA
X-Ray Machine	Dental Tech	NA	NA
Ash from Chimney	Chimney	--	--
Waste Oil, Used Antifreeze and Used Filters	Auto Shop	--	--
Welding Supplies, Gases	Welding	--	--
Underground Storage Tank Removal	(2) 15,000 Gallon Fuel Oil (1) 1,000 Gallon Diesel	--	--
Hydraulic Fluid	Old Hydraulic Lift in Auto Shop and Elevators	2000	Gallons



## **PHOTOGRAPHS**



**Boiler Room with Fiberglass Pipe Insulation**



**ACM Tar on Coping 1929 D Wing**





**ACM Caulk on B Wing Roof Auditorium**



**Older Chimney With Possible ACM**



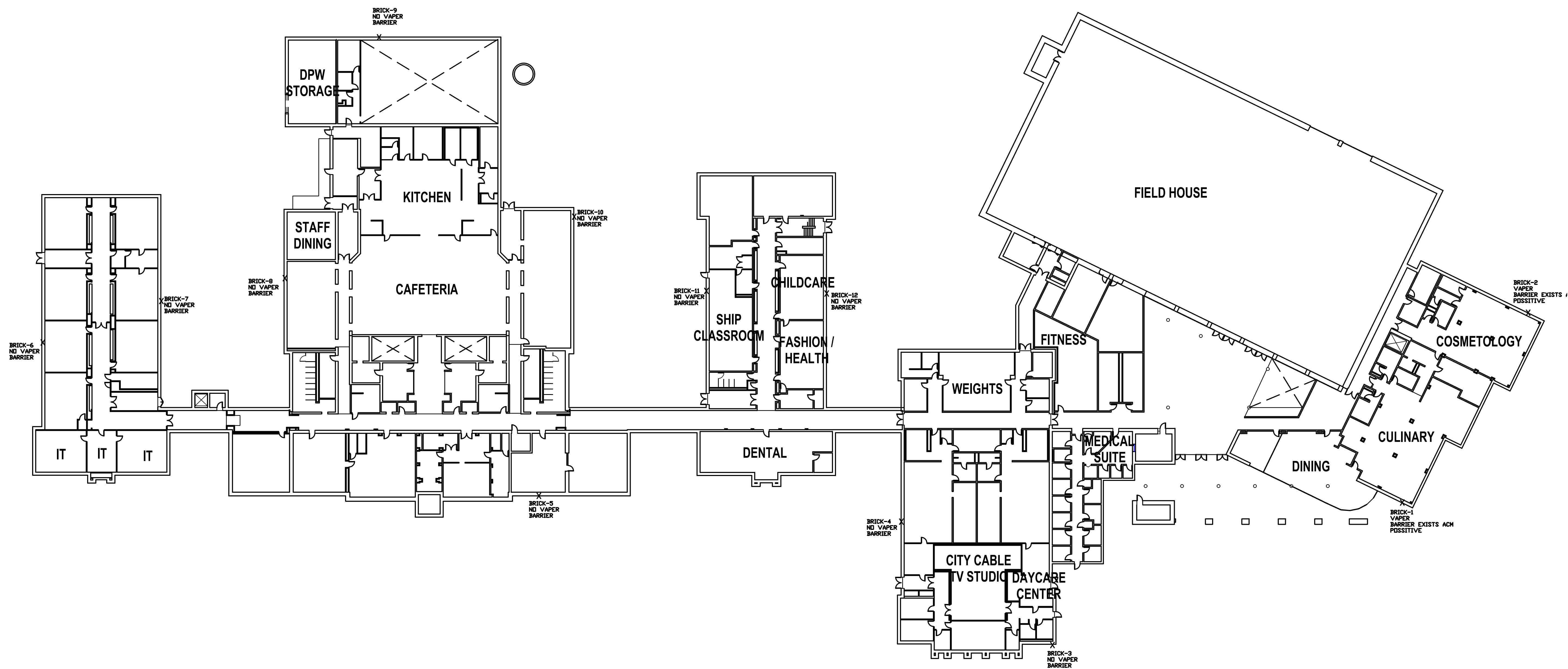
**ACM Floor Tile in 1988 Wing**



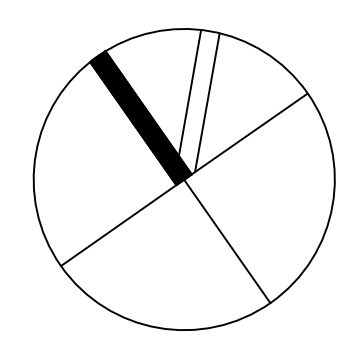


**Multiple Layers ACM Flooring B Wing**

## **FIGURES**



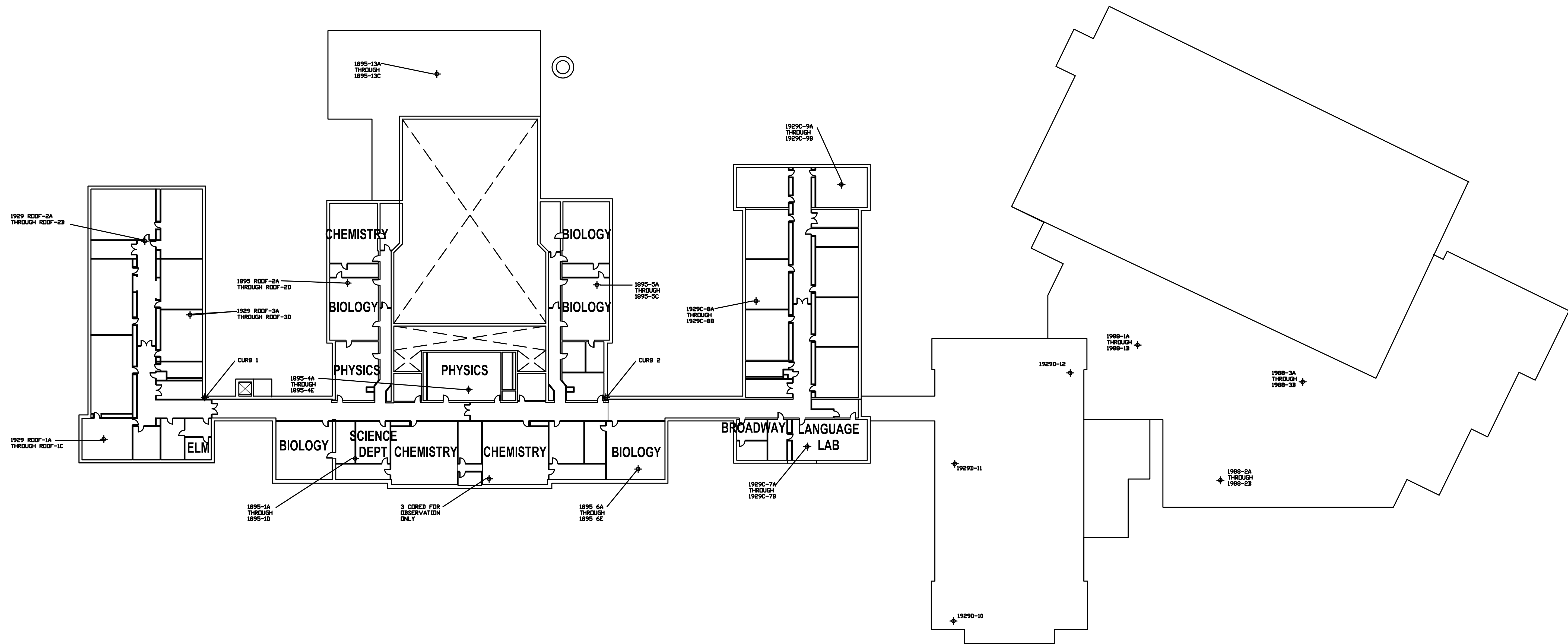
Somerville High School GSF	
LEVEL	AREA
SHOP LEVEL	45900 SF
1ST FLOOR	125420 SF
2ND FLOOR	20690 SF
3RD FLOOR	54080 SF
4TH FLOOR	44220 SF
<b>TOTAL GSF:</b>	<b>290310 SF</b>



FIRST FLOOR PROGRAM PLAN – BRICK EXPLORE LOCATIONS

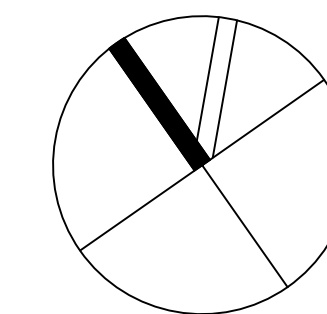
N.T.S.

Somerville High School



**SCIENCE CLASSROOMS & SUPPORT**

Somerville High School GSF	
LEVEL	AREA
SHOP LEVEL	45900 SF
1ST FLOOR	125420 SF
2ND FLOOR	20690 SF
3RD FLOOR	54080 SF
4TH FLOOR	44220 SF
<b>TOTAL GSF:</b>	<b>290310 SF</b>



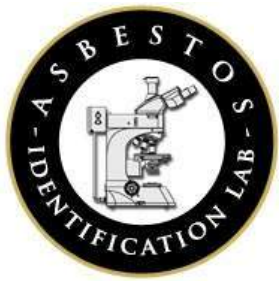
FOURTH FLOOR PROGRAM PLAN – ROOFING SAMPLE LOCATIONS

N.T.S.

Somerville High School

PLANNING & DESIGN CONSULTANTS, INC. 1000 STATE STREET, SUITE 200, BOSTON, MA 02118

## **ATTACHMENT A**



## Asbestos Identification Laboratory

165 New Boston St., Ste 271  
Woburn, MA 01801  
781-932-9600

Web: [www.asbestosidentificationlab.com](http://www.asbestosidentificationlab.com)  
Email: [mikemanning@asbestosidentificationlab.com](mailto:mikemanning@asbestosidentificationlab.com)

Batch: 9527



November 02, 2015

Susan Cahalan  
CDW Consultants, Inc.  
40 Speen St.  
Suite 301  
Framingham, MA 01701

**Project Number:**

**Project Name:** Somerville High School

**Date Sampled:** 2015-10-22

**Work Received:** 2015-10-28

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

Dear Susan Cahalan,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations Department of Health Certification: AAL-121

Thank you Susan Cahalan for your business.

Michael Manning  
Owner/Director



Susan Cahalan  
 CDW Consultants, Inc.  
 40 Speen St.  
 Suite 301  
 Framingham, MA 01701

**Project Number:**  
**Project Name:** Somerville High School

**Date Sampled:** 2015-10-22  
**Work Received:** 2015-10-28

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
1A	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102660					
1B	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102661					
1C	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102662					
1D	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102663					
1E	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102664					
1F	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102665					
1G	Tan Expansion Joint Caulk	1980's Wing	tan	Non-Fibrous 100	None Detected
102666					
2A	Grey Caulk	@ Bottom Building 1980's Wing	gray	Non-Fibrous 100	None Detected
102667					
2B	Grey Caulk	@ Bottom Building 1980's Wing	gray	Non-Fibrous 100	None Detected
102668					
2C	Grey Caulk	@ Bottom Building 1980's Wing	gray	Non-Fibrous 100	None Detected
102669					
3A	DK Brown Caulk	Ext Door to Gym	tan	Non-Fibrous 98	Detected Chrysotile 2
102670					
3B	DK Brown Caulk	Ext Door to Gym	null		Not Analyzed
102671					
4A	Black Tar	On Ext Coping 1929 Wing	black	Non-Fibrous 80	Detected Chrysotile 20
102672					
4B	Black Tar	On Ext Coping 1929 Wing	null		Not Analyzed
102673					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
4C	Black Tar	On Ext Coping 1929 Wing	null		Not Analyzed
102674					
5A	Ext Door Caulk	Door 37	gray	Non-Fibrous	100 None Detected
102675					
5B	Ext Door Caulk	Door 37	gray	Non-Fibrous	100 None Detected
102676					
6A	Exterior Gray Window Caulk	1929 Wing	gray	Non-Fibrous	100 None Detected
102677					
6B	Exterior Gray Window Caulk	1929 Wing	gray	Non-Fibrous	100 None Detected
102678					
6C	Exterior Gray Window Caulk	1929 Wing	gray	Non-Fibrous	100 None Detected
102679					
7A	Ext Red Window Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102680					
7B	Ext Red Window Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102681					
7C	Ext Red Window Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102682					
7D	Ext Red Window Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102683					
7E	Ext Red Window Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102684					
8A	Ext Window Glaze	1929 "C" Wing	gray	Non-Fibrous	100 None Detected
102685					
8B	Ext Window Glaze	1929 "C" Wing	gray	Non-Fibrous	100 None Detected
102686					
9A	Ext Lower Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102687					
9B	Ext Lower Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102688					
9C	Ext Lower Caulk	1929 "C" Wing	red	Non-Fibrous	100 None Detected
102689					
10A	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102690					
10B	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102691					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
10C	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102692					
10D	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102693					
10E	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102694					
10F	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102695					
10G	Ext Window Caulk	1895 B Wing	red	Non-Fibrous	100 None Detected
102696					
11A	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102697					
11B	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102698					
11C	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102699					
11D	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102700					
11E	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102701					
11F	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102702					
11G	Ext White Window Caulk	Under New 1895 B Wing	white	Non-Fibrous	100 None Detected
102703					
12A	Ext Louver Caulk	1895 B Wing	gray	Non-Fibrous	100 None Detected
102704					
12B	Ext Louver Caulk	1895 B Wing	gray	Non-Fibrous	100 None Detected
102705					
12C	Ext Louver Caulk	1895 B Wing	gray	Non-Fibrous	100 None Detected
102706					
13A	Ext Door Caulk	Door #2	red	Non-Fibrous	100 None Detected
102707					
13B	Ext Door Caulk	Door #2	red	Non-Fibrous	100 None Detected
102708					
14A	Ext Door Glaze	Door #2	black	Non-Fibrous	100 None Detected
102709					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
14B	Ext Door Glaze	Door #2	black	Non-Fibrous 100	None Detected
102710					
15A	White w/ Grey Ext Window Caulk	1929 A Wing	gray	Non-Fibrous 97	Detected Chrysotile 3
102711					
15B	White w/ Grey Ext Window Caulk	1929 A Wing	null		Not Analyzed
102712					
15C	White w/ Grey Ext Window Caulk	1929 A Wing	null		Not Analyzed
102713					
16A	Ext Caulk	@ Roof Decoration	brown	Non-Fibrous 100	None Detected
102714					
16B	Ext Caulk	@ Roof Decoration	brown	Non-Fibrous 100	None Detected
102715					
17A	White Cementitious Stand Pipe	Roof 1895 B Wing	gray	Non-Fibrous 100	None Detected
102716					
17B	White Cementitious Stand Pipe	Roof 1895 B Wing	gray	Non-Fibrous 100	None Detected
102717					
18A	White Caulk	Penthouse 1895 B Wing	gray	Non-Fibrous 98	Detected Chrysotile 2
102718					
18B	White Caulk	Penthouse 1895 B Wing	null		Not Analyzed
102719					
19A	Black Tar	On Stand Pipe Roof	black	Non-Fibrous 100	None Detected
102720					
19B	Black Tar	On Stand Pipe Roof	black	Non-Fibrous 100	None Detected
102721					
20A	Caulk	Roof Interior	gray	Non-Fibrous 100	None Detected
102722					
20B	Caulk	Roof Interior	gray	Non-Fibrous 100	None Detected
102723					
Brick-1	Black Vapor Barrier	1988 Wing	black	Non-Fibrous 75	Detected Chrysotile 25
102724					
Brick-2	Black Vapor Barrier	1988 Wing	null		Not Analyzed
102725					

Monday 02 November

Analyzed by:



End of Report

Batch: 9527

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SFS

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp In Cellulose =	Stereo Scope					Optical Properties							Non-Asbestos Percentage (%)									
			Material / Location	% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous	
19	BB	11	Material 11																					
20	19A	11	Material Blade Tool Location ON SANDPIPER ROAD	0	BLN	BLN	BLN	BLN																100
21	19B	11	Material 11 Location 11	0	BLN	BLN	BLN	BLN																100
22	20A	11	Material Caulk Location ROCK INTERSECT	0	BLN	BLN	BLN	BLN																100
23	20B	11	Material 11 Location 11	0	BLN	BLN	BLN	BLN																100

DNA

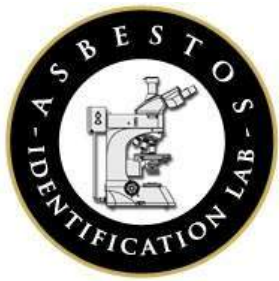
SFD

Page

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Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp In Celsius =	Stereo Scope					Optical Properties							Non-Asbestos Percentage (%)								
			Material / Location	% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
24	Brick-1	Material Location 1988 WWR						Chrysotile	25 W														
	Brick-2	Material Location 11						Amosite															
10772		Material Location 1						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location						Amosite															
		Material Location						Crocidolite															
		Material Location						Tremolite															
		Material Location						Anthrophyllite															
		Material Location						Actinolite															
		Material Location						Chrysotile															
		Material Location																					





## Asbestos Identification Laboratory

165 New Boston St., Ste 271  
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781-932-9600

Web: [www.asbestosidentificationlab.com](http://www.asbestosidentificationlab.com)  
Email: [mikemanning@asbestosidentificationlab.com](mailto:mikemanning@asbestosidentificationlab.com)

Batch: 9854



November 18, 2015

Susan Cahalan  
CDW Consultants, Inc.  
40 Speen St.  
Suite 301  
Framingham, MA 01701

**Project Number:**

**Project Name:** Somerville High School

**Date Sampled:** 2015-11-03

**Work Received:** 2015-11-10

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

Dear Susan Cahalan,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations Department of Health Certification: AAL-121

Thank you Susan Cahalan for your business.

Michael Manning  
Owner/Director

Susan Cahalan  
 CDW Consultants, Inc.  
 40 Speen St.  
 Suite 301  
 Framingham, MA 01701

**Project Number:****Project Name:** Somerville High School**Date Sampled:** 2015-11-03**Work Received:** 2015-11-10**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
21A	2x4 Ceiling Tile	Halls A Wing	multi	Mineral Wool Cellulose Non-Fibrous	40 None Detected 40 20
106304					
21B	2x4 Ceiling Tile	Halls A Wing	multi	Mineral Wool Cellulose Non-Fibrous	40 None Detected 40 20
106305					
21C	2x4 Ceiling Tile	Halls A Wing	multi	Mineral Wool Cellulose Non-Fibrous	40 None Detected 40 20
106306					
22A	Felt	Living to HVAC Hatches	black	Non-Fibrous	100 None Detected
106307					
22B	Felt	Living to HVAC Hatches	black	Non-Fibrous	100 None Detected
106308					
22C	Felt	Living to HVAC Hatches	black	Non-Fibrous	100 None Detected
106309					
23A	1x1 Spine Set Ceiling Tile	A Wing Classrooms	white	Fiberglass Non-Fibrous	75 None Detected 25
106310					
23B	1x1 Spine Set Ceiling Tile	A Wing Classrooms	white	Fiberglass Non-Fibrous	75 None Detected 25
106311					
23C	1x1 Spine Set Ceiling Tile	A Wing Classrooms	white	Mineral Wool Non-Fibrous	75 None Detected 25
106312					
23D	1x1 Spine Set Ceiling Tile	A Wing Classrooms	white	Mineral Wool Non-Fibrous	75 None Detected 25
106313					
23E	1x1 Spine Set Ceiling Tile	A Wing Classrooms	white	Mineral Wool Non-Fibrous	75 None Detected 25
106314					
24A	Wall Plaster	Room 409 A Wing	multi	Non-Fibrous	100 None Detected
106315					
24B	Wall Plaster	Room 409 A Wing	white	Non-Fibrous	100 None Detected
106316					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
24C	Wall Plaster	Room 409 A Wing	multi	Non-Fibrous	100 None Detected
106317					
25A	Hard Ceiling Plaster	Room 409	white	Non-Fibrous	100 None Detected
106318					
25B	Hard Ceiling Plaster	Room 409	white	Non-Fibrous	100 None Detected
106319					
25C	Hard Ceiling Plaster	Room 409	multi	Non-Fibrous	100 None Detected
106320					
26A	Tan Glue	Under Cove Base 4th Floor tan Hall A Wing		Non-Fibrous	100 None Detected
106321					
26B	Tan Glue	Under Cove Base 4th Floor tan Hall A Wing		Non-Fibrous	100 None Detected
106322					
26C	Tan Glue	Under Cove Base 4th Floor tan Hall A Wing		Non-Fibrous	100 None Detected
106323					
27A	Door Glaze	Door 4A A Wing	black	Non-Fibrous	100 None Detected
106324					
27B	Door Glaze	Door 4A A Wing	black	Non-Fibrous	100 None Detected
106325					
28A	Side Light Glaze	Door Assembly A Wing	black	Non-Fibrous	100 None Detected
106326					
28B	Side Light Glaze	Door Assembly A Wing	black	Non-Fibrous	100 None Detected
106327					
29A	White Skim Coat	Ceiling 4th Floor A Wing	white	Non-Fibrous	100 None Detected
106328					
29B	White Skim Coat	Ceiling 4th Floor A Wing	white	Non-Fibrous	100 None Detected
106329					
29C	White Skim Coat	Ceiling 4th Floor A Wing	white	Non-Fibrous	100 None Detected
106330					
30A	Brown Skim	Under White Skim #29A	brown	Cellulose Hair Non-Fibrous	2 < 1 98 None Detected
106331					
30B	Brown Skim	Under White Skim #29B	brown	Cellulose Hair Non-Fibrous	< 1 < 1 100 None Detected
106332					
30C	Brown Skim	Under White Skim #29C	brown	Cellulose Hair Non-Fibrous	2 < 1 98 None Detected
106333					
31	Glue	Under Rubber in Stairwell A Wing	brown	Non-Fibrous	100 None Detected
106334					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
<b>LabID</b>					
Wednesday 18	<i>Michael Thumming</i>	End of Report			Page 3 of 3
Analyzed by:		<b>Batch:</b> 9854			







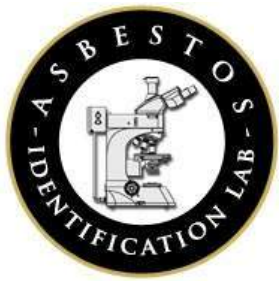












## Asbestos Identification Laboratory

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Email: [mikemanning@asbestosidentificationlab.com](mailto:mikemanning@asbestosidentificationlab.com)

Batch: 9937



November 20, 2015

Susan Cahalan  
CDW Consultants, Inc.  
40 Speen St.  
Suite 301  
Framingham, MA 01701

**Project Number:**

**Project Name:** Somerville High School

**Date Sampled:** 2015-11-12

**Work Received:** 2015-11-17

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

Dear Susan Cahalan,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

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Thank you Susan Cahalan for your business.

Michael Manning  
Owner/Director



Susan Cahalan  
 CDW Consultants, Inc.  
 40 Speen St.  
 Suite 301  
 Framingham, MA 01701

**Project Number:****Project Name:** Somerville High School**Date Sampled:** 2015-11-12**Work Received:** 2015-11-17**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
32A	Glue on Paper	Behind Ceramic Tile B Wing	tan	Non-Fibrous 100	None Detected
107512					
32B	Glue on Paper	Behind Ceramic Tile B Wing	tan	Non-Fibrous 100	None Detected
107513					
32C	Glue on Paper	Behind Ceramic Tile B Wing	tan	Non-Fibrous 100	None Detected
107514					
33A	Grout	Ceramic Tile Hall B Wing	gray	Non-Fibrous 100	None Detected
107515					
33B	Grout	Ceramic Tile Hall B Wing	gray	Non-Fibrous 100	None Detected
107516					
34A	Brown Paper	Behind Tile B Wing Hall	brown	Cellulose 95 Non-Fibrous 5	None Detected
107517					
34B	Brown Paper	Behind Tile B Wing Hall	brown	Cellulose 95 Non-Fibrous 5	None Detected
107518					
35A	Levelastic	Janitor Closet B Wing	gray	Non-Fibrous 100	None Detected
107519					
35B	Levelastic	Janitor Closet B Wing	gray	Non-Fibrous 100	None Detected
107520					
36A	1x1 Gray Floor Tile	B Wing Hall	gray	Non-Fibrous 100	None Detected
107521					
36B	1x1 Gray Floor Tile	B Wing Hall	gray	Non-Fibrous 100	None Detected
107522					
37A	Black Mastic	Under B Wing Hall	multi	Non-Fibrous 100	None Detected
107523					
37B	Black Mastic	Under B Wing Hall	multi	Non-Fibrous 100	None Detected
107524					
38	Hard Plaster	Ceiling Storage Janitor Room	gray	Non-Fibrous 100	None Detected
107525					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
39	Black Sink Coating	Janitor Room	black	Non-Fibrous	90 <b>Detected</b> <b>Chrysotile</b> 10
107526					
40	Insulation	Inside B. Stove	gray	Mineral Wool Non-Fibrous	85 None Detected 15
107527					
41A	1x1 Spline Set Ceiling Tile	Cafeteria	gray	Fiberglass Non-Fibrous	90 None Detected 10
107528					
41B	1x1 Spline Set Ceiling Tile	Cafeteria	gray	Fiberglass Non-Fibrous	90 None Detected 10
107529					
42A	Wall Plaster	Cafe	white	Non-Fibrous	100 None Detected
107530					
42B	Wall Plaster	Cafe	white	Non-Fibrous	100 None Detected
107531					
43A	Glue	Under Cove Base Cafeteria	yellow	Non-Fibrous	100 None Detected
107532					
43B	Glue	Under Cove Base Cafeteria	yellow	Non-Fibrous	100 None Detected
107533					
44A	1x1 FT Gray Blue	Cafeteria	gray	Non-Fibrous	100 None Detected
107534					
44B	1x1 FT Gray Blue	Cafeteria	gray	Non-Fibrous	100 None Detected
107535					
45A	Mastic/Levelastic Mix	Under 1x1 Gray Blue Floor Tile	multi	Non-Fibrous	100 None Detected
107536					
45B	Mastic/Levelastic Mix	Under 1x1 Gray Blue Floor Tile	multi	Non-Fibrous	100 None Detected
107537					
46	Interior Window Glaze	Door to Teachers Lounge	multi	Non-Fibrous	100 None Detected
107538					
47A	Wall Plaster	Lower Level A Wing	white	Non-Fibrous	100 None Detected
107539					
47B	Wall Plaster	Lower Level A Wing	white	Non-Fibrous	100 None Detected
107540					
48A	Glue	Under Sheet Flooring A Wing	yellow	Cellulose Non-Fibrous	5 None Detected 95
107541					
48B	Glue	Under Sheet Flooring A Wing	yellow	Cellulose Non-Fibrous	10 None Detected 90
107542					
49A	Levelastic	Under Sheet Flooring A Wing	gray	Non-Fibrous	100 None Detected
107543					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
49B	Levelastic	Under Sheet Flooring A Wing	gray	Non-Fibrous 100	None Detected
107544					
50	Tan 1x1 Floor Tile	Room 140	gray	Cellulose Non-Fibrous 97	3 None Detected
107545					
51	Yellow Mastic	Under Tan 1x1 FT Room 140	yellow	Non-Fibrous 100	None Detected
107546					
52	Pink Rosin Paper	Under Wood Floor Room 140	pink	Cellulose Non-Fibrous 98	None Detected 2
107547					
53A	Wall Plaster	B Wing 4th Floor Hall	gray	Non-Fibrous 100	None Detected
107548					
53B	Wall Plaster	B Wing 4th Floor Hall	gray	Non-Fibrous 100	None Detected
107549					
54	Black Science Table Top	Room 429	black	Non-Fibrous 100	None Detected
107550					
55	Black Glue	Under Cove Base @ Science Table	brown	Non-Fibrous 100	None Detected
107551					
56	Brown Paper with Wire Lathe	Behind White Plaster Room 429	multi	Non-Fibrous 100	None Detected
107552					
57	White Wall Plaster	Room 429	white	Non-Fibrous 100	None Detected
107553					
58	Sheet Flooring	Science Storage	multi	Cellulose Non-Fibrous 50	None Detected 50
107554					
59A			gray	Non-Fibrous 98	Detected Chrysotile 2
107555					
59B			null		Not Analyzed
107556					
60	Skim (Black) Coating	B Wing Foundation	black	Non-Fibrous 100	None Detected
107557					
61A	Tan Glue	Under Cove Base 1988 Wing	tan	Non-Fibrous 100	None Detected
107558					
61B	Tan Glue	Under Cove Base 1988 Wing	tan	Non-Fibrous 100	None Detected
107559					
62	Interior Window Glaze	Auto Repair	black	Non-Fibrous 100	None Detected
107560					
63A	1x1 Gray FT	Lower Level 1988 Wing	gray	Non-Fibrous 100	Detected Chrysotile < 1
107561					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
63B	Black Mastic	Under 1x1 FT	black	Non-Fibrous	90 <b>Detected Chrysotile</b> 10
107562					
64	Interior Window Glaze	Weight Room	black	Non-Fibrous	100 None Detected
107563					
65A	1x1 Floor Tile Grey	Main Level 88 Wing	gray	Non-Fibrous	100 <b>Detected Chrysotile</b> < 1
107564					
65B	Black Mastic Under 1x1 Floor Tile	Main Level 88 Wing	black	Non-Fibrous	90 <b>Detected Chrysotile</b> 10
107565					
66	Wall Plaster	D Wing Hall	gray	Non-Fibrous	100 None Detected
107566					
67	Door Glaze	3G Assembly D Wing	gray	Non-Fibrous	100 None Detected
107567					
68	Glue Under Rubber Mat	D Wing	multi	Non-Fibrous	100 None Detected
107568					
69	Science Table	Chemistry	black	Non-Fibrous	100 None Detected
107569					
70A	Ext Window Caulk	Old Under New C Wing	gray	Non-Fibrous	97 <b>Detected Chrysotile</b> 3
107570					
70B	Ext Window Caulk	Old Under New C Wing	null		Not Analyzed
107571					
71	Foundation Skim	1988 Wing	black	Non-Fibrous	100 None Detected
107572					
72	Hall Wall Plaster	B Wing Hall	white	Non-Fibrous	100 None Detected
107573					
73A	1x1 Spline Set Ceiling Tile	1988 Wing	gray	Mineral Wool Cellulose Non-Fibrous	30 60 10 None Detected
107574					
73B	1x1 Spline Set Ceiling Tile	1988 Wing	gray	Mineral Wool Cellulose Non-Fibrous	30 60 10 None Detected
107575					
74A	2x4 Ceiling Tile	1988 Wing	gray	Mineral Wool Cellulose Non-Fibrous	20 70 10 None Detected
107576					
74B	2x4 Ceiling Tile	1988 Wing	gray	Mineral Wool Cellulose Non-Fibrous	20 70 10 None Detected
107577					
75A	2x4 Suspended Ceiling Tile	C Wing Hall	gray	Mineral Wool Cellulose Non-Fibrous	20 70 10 None Detected
107578					
75B	2x4 Suspended Ceiling Tile	C Wing Hall	gray	Mineral Wool Cellulose Non-Fibrous	20 70 10 None Detected
107579					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
76A 107580	2x4 Suspended Ceiling Tile	B Wing Hall	gray	Mineral Wool Cellulose Non-Fibrous	30 None Detected 60 10
76B 107581	2x4 Suspended Ceiling Tile	B Wing Hall	gray	Mineral Wool Cellulose Non-Fibrous	30 None Detected 60 10
77A 107582	Green/Slate Old Floor Tile Over Wood	B Wing Hall	green	Non-Fibrous	98 <b>Detected Chrysotile</b> 2
77B 107583	Green/Slate Old Floor Tile Over Wood	B Wing Hall	null		Not Analyzed
78A 107584	Black Mastic	Under Old Floor Tile Over Wood	black	Non-Fibrous	100 None Detected
78B 107585	Black Mastic	Under Old Floor Tile Over Wood	black	Non-Fibrous	100 None Detected
79A 107586	1x1 Tan Floor Tile Light	Over Old Grey Green FT	tan	Non-Fibrous	98 <b>Detected Chrysotile</b> 2
79B 107587	1x1 Tan Floor Tile Light	Over Old Grey Green FT	null		Not Analyzed
80A 107588	Brown Mastic	Under Tan 1x1 Floor Tile	black	Non-Fibrous	90 <b>Detected Chrysotile</b> 10
80B 107589	Brown Mastic		null		Not Analyzed
81 107590	Levelastic	Over Tan + Gray Green FT	gray	Non-Fibrous	100 None Detected
82 107591	1x1 Gray FT	Over Levelastic B Wing	gray	Non-Fibrous	100 <b>Detected Chrysotile</b> < 1
83 107592	Black Mastic	Under 1x1 Gray FT	black	Non-Fibrous	90 <b>Detected Chrysotile</b> 10

Friday 20 November  
Analyzed by:

*Michael Manning*

End of Report  
Batch: 9937

Page 5 of 5





















875

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp In Celsius = 21	Stereo Scope					Optical Properties										Non-Asbestos Percentage (%)					
			% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous	
50	57	Back-Joiner Table Top	0	BLN	any																		100
51	55	Black Blue Location under cover base @ science table	0	BLN	any																		100
52	56	Brown Plaster with blue paper Location behind white Plaster room 429	0	BLN	any																		100
53	57	White wall Plaster Location Room-429	0	BLN	any																		100
54	58	Sheet Flooring Location Science Storage	0	BLN	any																		100

55 S9A  
59B  
061W any

Chrysotile  
Amosite  
Crocidolite  
Tremolite  
Anthophyllite  
Actinolite

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SR

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp In Celsius = 21	Stereo Scope					Asbestos Minerals	Optical Properties						Non-Asbestos Percentage (%)							
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
57	U00	Swim (Back) Location B wing foundation	0 BK	N	even																	100
58	U1A	Tan Glue Location Under Carbase 1998 wing	0 T	N	even																	100
59	U1B	'' Location ''	0 T	N	even																	100
60	U2	Material Fiberglass window Location Auto repair	0 BK	N	even																	100
61	U3A	Material 18" gray FT Location Under wheel 1998 wing	0 BK	N	even																	100

- Chrysotile
- Amosite
- Crocidolite
- Tremolite
- Anthophyllite
- Actinolite
- Chrysotile
- Amosite
- Crocidolite
- Tremolite
- Anthophyllite
- Actinolite
- Chrysotile
- Amosite
- Crocidolite
- Tremolite
- Anthophyllite
- Actinolite

772 W P T 2 N BSC 1551











SFS

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope					Asbestos Minerals	Optical Properties						Ri	Non-Asbestos Percentage (%)					
			Temp in Celsius =	% of Asbestos	Color	Homogeneity	Texture		Friable	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence		Pleochroism	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic
28	77A	Material: green paint Dirt floor tile over wood Location: Burn		0	burn	burn	Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite	2	W	✓	7	2W	1SS6 650								98
83	77B	Material: " Location: "					Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite														
48	78A	Material: Black Mastic Location: Under old floor tile over wood		0	burn	burn	Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite														100
88	78B	Material: " Location: "		0	burn	burn	Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite														100
98	79A	Material: Light Tan Floor tile Location: Over old grey green ft		0	burn	burn	Chrysotile Amosite Crocidolite Tremolite Anthophyllite Actinolite	2	W	P	7	2W	1SS6 650								95

DNA

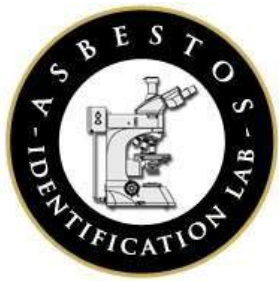
845

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp In Celsius =	Stereo Scope					Optical Properties							Non-Asbestos Percentage (%)												
			Material / Location	% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous				
88	79B		Material 11 Location 11																								
88	BDA		Material Brown Mastic Location Under Tan 1X1' Floor Tile	0	Black	Even																				90	
89	80B		Material 11 Location 11																								
90	81		Material Epoxylastic Location W/ TAN + gray Green Et.	0	Grey	Even																				100	
90	82		Material 1X1' Gray F Location W/ Epoxylastic 1 wing	0	Grey	Even																				100	

DNA

DNA





## Asbestos Identification Laboratory

165 New Boston St., Ste 271  
Woburn, MA 01801  
781-932-9600

Web: [www.asbestosidentificationlab.com](http://www.asbestosidentificationlab.com)  
Email: [mikemanning@asbestosidentificationlab.com](mailto:mikemanning@asbestosidentificationlab.com)

Batch: 9905



November 19, 2015

Susan Cahalan  
CDW Consultants, Inc.  
40 Speen St.  
Suite 301  
Framingham, MA 01701

**Project Number:**

**Project Name:** Somerville HS

**Date Sampled:** 2015-11-12

**Work Received:** 2015-11-18

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

Dear Susan Cahalan,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations Department of Health Certification: AAL-121

Thank you Susan Cahalan for your business.

Michael Manning  
Owner/Director

Susan Cahalan  
 CDW Consultants, Inc.  
 40 Speen St.  
 Suite 301  
 Framingham, MA 01701

**Project Number:**  
**Project Name:** Somerville HS

**Date Sampled:** 2015-11-12  
**Work Received:** 2015-11-18

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
01A	Boiler Breeching	Boiler Room	white	Synthetic Non-Fibrous	2 None Detected 98
107108					
01B	Boiler Breeching	Boiler Room	white	Synthetic Non-Fibrous	3 None Detected 97
107109					
01C	Boiler Breeching	Boiler Room	white	Synthetic Non-Fibrous	2 None Detected 98
107110					
02A	Boiler Gasket	Boiler Room	gray	Fiberglass Non-Fibrous	5 None Detected 95
107111					
02B	Boiler Gasket	Boiler Room	gray	Fiberglass Non-Fibrous	5 None Detected 95
107112					
03A	Boiler Door Material	Boiler Room	gray	Non-Fibrous	100 None Detected
107113					
03B	Boiler Door Material	Boiler Room	gray	Non-Fibrous	100 None Detected
107114					
03C	Boiler Door Material	Boiler Room	gray	Non-Fibrous	100 None Detected
107115					
04A	Hot Water Tank Insulation	Boiler Room	tan	Cellulose Non-Fibrous	2 None Detected 98
107116					
04B	Hot Water Tank Insulation	Boiler Room	tan	Cellulose Non-Fibrous	2 None Detected 98
107117					
04C	Hot Water Tank Insulation	Boiler Room	tan	Cellulose Non-Fibrous	2 None Detected 98
107118					
90	Interior Window Glaze	Boiler Room	tan	Non-Fibrous	100 None Detected
107119					
91	Stair Tread Mastic	A Wing 4th Floor	black	Non-Fibrous	100 None Detected
107120					
92A	Floor Leveler	A Wing	gray	Non-Fibrous	100 None Detected
107121					



FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
92B	Floor Leveler	A Wing	gray	Non-Fibrous 100	None Detected
107122					
93	Mastic	Under Stage 1st Layer	tan	Non-Fibrous 100	None Detected
107123					
94	Black Mastic on Wood	Under Stage 2nd Layer	brown	Non-Fibrous 100	None Detected
107124					
Thursday 19	<i>Michael Thumming</i>	End of Report	Page 2 of 2		
Analyzed by:		Batch: 9905			

Client: CDJ CONTACTS  
 Address: AD SPENST, SUITE 201 HANNOVER MA  
 Project Site & #: SOMERVILLE HS

Phone / email address:  
978 875 2057 / cel@cdjcontacts.com  
978 875 2057 / cel@cdjcontacts.com

Contact: SEAN GABRIEL  
 Relinquish by date: 11/17/15  
 Received by date: DAVE 11/18/15

# of Samples Received: 17

**CHAIN OF CUSTODY**  
 EPA/600/R-93/116

**Asbestos Identification Lab**  
 165-U New Boston St.  
 Suite 271  
 Woburn, MA 01801  
 (781) 932-9600  
 www.asbestosidentificationlab.com

Date Sampled: 11/21/15  
 BATCH#: QAQ05 Rev. 6/12



Page 1 of 4  
 Turnaround Time Sample Method

Rush  
 Same Day  
 Next Day  
 Two Day  
 Stop on 1st Positive  
 Bulk  
 Soil  
 Wipe  
 Point Count

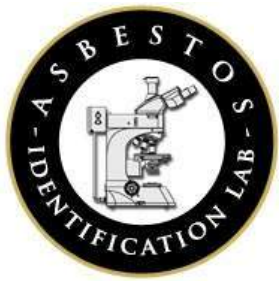
Notify Method: Mail/E-Mail/Verbal  
 Analyzed By: ANNA WILLIAMS  
 Date: 11/19/15

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celsius = <u>21</u>	Stereo Scope				Optical Properties							RI	Non-Asbestos Percentage (%)							
			Material / Location	% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation		Birefringence	Pleochroism	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other
<u>101108</u>	<u>O1A</u>		<u>Boiler Breaching Location</u>	<u>OWN</u>	<u>GREEN</u>	<u>GREEN</u>	<u>GREEN</u>	<u>GREEN</u>												<u>2</u>		<u>98</u>
<u>09</u>	<u>O1B</u>		<u>Boiler Breaching Location</u>	<u>OWN</u>	<u>GREEN</u>	<u>GREEN</u>	<u>GREEN</u>													<u>3</u>		<u>97</u>
<u>10</u>	<u>O1C</u>		<u>Boiler Breaching Location</u>	<u>OWN</u>	<u>GREEN</u>	<u>GREEN</u>	<u>GREEN</u>													<u>2</u>		<u>98</u>









## Asbestos Identification Laboratory

165 New Boston St., Ste 271  
Woburn, MA 01801  
781-932-9600

Web: [www.asbestosidentificationlab.com](http://www.asbestosidentificationlab.com)  
Email: [mikemanning@asbestosidentificationlab.com](mailto:mikemanning@asbestosidentificationlab.com)

Batch: 9780



November 16, 2015

Susan Cahalan  
CDW Consultants, Inc.  
40 Speen St.  
Suite 301  
Framingham, MA 01701

**Project Number:**

**Project Name:** Somerville High School (SHS)

**Date Sampled:** 2015-11-03

**Work Received:** 2015-11-10

**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

Dear Susan Cahalan,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations Department of Health Certification: AAL-121

Thank you Susan Cahalan for your business.

Michael Manning  
Owner/Director



Susan Cahalan  
 CDW Consultants, Inc.  
 40 Speen St.  
 Suite 301  
 Framingham, MA 01701

**Project Number:****Project Name:** Somerville High School (SHS)**Date Sampled:** 2015-11-03**Work Received:** 2015-11-10**Analysis Method:** BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
1895-5A	Glue	Under Rubber Roof 1895 Wing	yellow	Non-Fibrous 100	None Detected
105457					
1895-5B	Gray Paper	Under Foam 1895 Roof	gray	Fiberglass 10 Cellulose 75 Non-Fibrous 15	None Detected
105458					
1895-5C	White Board	Bottom Layer Roof 1895 Wing	white	Cellulose 5 Non-Fibrous 95	None Detected
105459					
1929 Roof-1A	Flue Under Rubber	1929 A Wing Roof	black	Cellulose 75 Non-Fibrous 25	None Detected
105460					
1929 Roof-1B	Black Paper Top of Foam	1929 A Wing Roof	black	Fiberglass 5 Cellulose 25 Non-Fibrous 70	None Detected
105461					
1929 Roof-1C	Fiberboard	1929 A Wing Roof	brown	Cellulose 70 Non-Fibrous 30	None Detected
105462					
1929 Roof-2A	Glue Under Rubber	1929 A Roof	yellow	Non-Fibrous 100	None Detected
105463					
1929 Roof-2B	Glue Under Foam on Wood Deck	1929 A Roof	yellow	Non-Fibrous 100	None Detected
105464					
1929-3A	Glue Under Rubber	1929 A Wing Roof	yellow	Non-Fibrous 100	None Detected
105465					
1929-3B	Paper Top of Foam	1929 A Wing Roof	black	Fiberglass 5 Cellulose 10 Non-Fibrous 85	None Detected
105466					
1929-3C	Paper Bottom of Foam	1929 A Wing Roof	black	Fiberglass 5 Cellulose 15 Non-Fibrous 80	None Detected
105467					
1929-3D	White Top of Deck	1929 A Wing Roof	white	Non-Fibrous 100	None Detected
105468					
1895-1A	Glue Under Rubber	1895 B Wing Roof	yellow	Non-Fibrous 100	None Detected
105469					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
1895-1B	Paper Top of Foam	1895 B Wing Roof	black	Fiberglass Non-Fibrous	10 None Detected 90
105470					
1895-1C	Tar Above Deck	1895 B Wing Roof	black	Cellulose Non-Fibrous	20 None Detected 80
105471					
1895-1D	White Deck	1895 B Wing Roof	gray	Non-Fibrous	100 None Detected
105472					
1895-2A	Glue Under Rubber	1895 B Wing Roof	yellow	Non-Fibrous	100 None Detected
105473					
1895-2B	Gray Paper	Top of Foam 1895 B Wing Roof	gray	Cellulose Non-Fibrous	80 None Detected 20
105474					
1895-2C	Gray Paper	Bottom of Foam 1895 B Wing Roof	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105475					
1895-2D	White Top of Deck	1895 B Wing Roof	white	Cellulose Non-Fibrous	5 None Detected 95
105476					
1895-4A	Glue Under Rubber	1895 B Wing Roof	black	Non-Fibrous	100 None Detected
105477					
1895-4B	Gray Paper Top of Foam	1895 B Wing Roof	black	Fiberglass Non-Fibrous	10 None Detected 90
105478					
1895-4C	Gray Paper Under Foam	1895 B Wing Roof	brown	Cellulose Non-Fibrous	60 None Detected 40
105479					
1895-4D	Gray Membrane Over White Deck	1895 B Wing Roof	black	Cellulose Non-Fibrous	40 None Detected 60
105480					
1895-4E	White Deck	1895 B Wing Roof	gray	Non-Fibrous	100 None Detected
105481					
1895-6A	Glue Under Rubber	1895 B Wing Roof	yellow	Non-Fibrous	100 None Detected
105482					
1895-6B	Gray Felt	Over Gray Paper 1895 B Wing Roof	gray	Cellulose Non-Fibrous	40 None Detected 60
105483					
1895-6C	DK Gray Paper	Over Foam 1895 B Wing Roof	black	Fiberglass Non-Fibrous	5 None Detected 95
105484					
1895-6D	Black Paper	Bottom of Foam 1895 B Wing Roof	black	Cellulose Non-Fibrous	30 None Detected 70
105485					
1895-6E	Gray Cement	Top of Deck 1895 B Wing Roof	gray	Non-Fibrous	100 None Detected
105486					
1929C-7A	Gray Paper	Top of Foam 1929 C Wing Roof	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105487					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
1929C-7B	Gray Paper	Bottom of Foam 1925 C Wing Roof	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105488					
1929C-8A	Gray Paper	Top of Foam	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105489					
1929C-8B	Gray Paper	Bottom of Foam 1929 C Wing	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105490					
1929C-9A	Gray Paper	Top of Foam 1929 C Wing	gray	Fiberglass Cellulose Non-Fibrous	5 None Detected 85 10
105491					
1929C-9B	Gray Paper Bottom of Foam	1929 C Wing	gray	Fiberglass Cellulose Non-Fibrous	5 None Detected 85 10
105492					
1929D-10	Roof Shingle	1929 D Wing	black	Cellulose Non-Fibrous	30 None Detected 70
105493					
1929D-11	Roof Shingle	1929 D Wing	black	Cellulose Non-Fibrous	30 None Detected 70
105494					
1929D-12	Roof Shingle	1929 D Wing	black	Cellulose Non-Fibrous	30 None Detected 70
105495					
1895-13A	Glue Under Rubber	1895 B Wing	clear	Non-Fibrous	100 None Detected
105496					
1895-13B	Gray Paper	Top of Foam	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105497					
1895-13C	Gray Paper	Bottom of Foam	gray	Fiberglass Cellulose Non-Fibrous	10 None Detected 80 10
105498					
Curb-1	Curb, Black	A Wing	black	Non-Fibrous	80 <b>Detected Chrysotile 20</b>
105499					
Curb-2	Curb, Black	B Wing	black	Non-Fibrous	80 <b>Detected Chrysotile 20</b>
105500					
1988-1A	Gray Paper	Bottom of Foam 1988 Wing	gray	Fiberglass Non-Fibrous	20 None Detected 80
105501					
1988-2A	Gray Paper	Bottom of Foam 1988 Wing	gray	Fiberglass Non-Fibrous	20 None Detected 80
105502					
1988-3A	Gray Paper	Bottom of Foam 1988 Wing	gray	Fiberglass Non-Fibrous	30 None Detected 70
105503					
1988-2B	White Gypsum Deck	1988 Wing	white	Fiberglass Cellulose Non-Fibrous	5 None Detected 2 93
105504					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
1988-1B	White Gypsum Deck	1988 Wing	white	Fiberglass Cellulose Non-Fibrous	5 None Detected 2 93
105505					
1988-3B	White Gypsum Deck	1988 Wing	white	Fiberglass Cellulose Non-Fibrous	5 None Detected 2 93
105506					
Monday 16 November	<i>Michael Thanning</i>	End of Report			Page 4 of 4
Analyzed by:		Batch: 9780			



























## **ATTACHMENT B**

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 786-5974

<http://www.EMSL.com>[cinnaminsonleadlab@emsl.com](mailto:cinnaminsonleadlab@emsl.com)

EMSL Order: 201513355

CustomerID: CDWC26

CustomerPO:

ProjectID:

Attn: **Susan Cahalan**  
**CDW Consultants**  
**40 Speen Street**  
**Suite 301**  
**Framingham, MA 01701**

Phone: (508) 875-2657  
 Fax:  
 Received: 11/18/15 10:35 AM  
 Collected: 11/12/2015

Project: **Sommerville H.S.****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
LP-1 Site: Red Paint on Concrete Exterior A Wing	201513355-0001	11/12/2015	11/19/2015	0.093 % wt
LP-2 Site: White Classroom Paint A09	201513355-0002	11/12/2015	11/19/2015	0.084 % wt
LP-3 Site: Tan Paint on Metal Radiator	201513355-0003	11/12/2015	11/19/2015	0.45 % wt
LP-4 Site: Door Frame Paint Int. B Wing	201513355-0004	11/12/2015	11/19/2015	0.093 % wt
LP-5 Site: White Paint on Brick B Wing	201513355-0005	11/12/2015	11/19/2015	0.016 % wt
LP-6 Site: White Wall Paint A Wing Hall Lower	201513355-0006	11/12/2015	11/19/2015	<0.013 % wt
LP-7 Site: White Radiator Paint 4th Floor B Wing	201513355-0007	11/12/2015	11/19/2015	0.71 % wt
LP-8 Site: Ext. Red Paint on Concrete D Wing	201513355-0008	11/12/2015	11/19/2015	0.015 % wt
LP-9 Site: White Paint on Concrete Hall D Wing	201513355-0009	11/12/2015	11/19/2015	<0.011 % wt

Julie Smith - Laboratory Director  
 NJ-NELAP Accredited:03036  
 or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 11/20/2015 11:06:33



# Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

Cinnaminson, NJ 08077  
 PHONE: 1-800-220-3675  
 FAX: (856) 786-5974

EMSL ANALYTICAL, INC.  
 LABORATORY • PRODUCTS • TRAINING

201513355

Company: CDW Consultants		EMSL-Bill to: <input type="checkbox"/> Different <input checked="" type="checkbox"/> Same <small>If Bill to is Different note instructions in Comments**</small>	
Street: 40 Speen Street Suite 301		Third Party Billing requires written authorization from third party	
City: Framingham	State/Province: MA	Zip/Postal Code: 01701	Country: United States
Report To (Name): susan cahalan		Telephone #: 5088752657	
Email Address: scahalan@cdwconsultants.com		Fax #:	Purchase Order:
Project Name/Number: <i>Somerville H.S.</i>		Please Provide Results: <input type="checkbox"/> FAX <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: MA		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options\* - Please Check

3 Hour  
  6 Hour  
  24 Hour  
  48 Hour  
  72 Hour  
  96 Hour  
  1 Week  
  2 Week

\*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm <sup>2</sup> <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO <sub>3</sub> pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO <sub>3</sub> pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler: \_\_\_\_\_ Signature of Sampler: \_\_\_\_\_

Sample #	Location	Volume/Area	Date/Time Sampled
LP-1	Red paint on Concrete <i>Exterior A wing</i>	NA	11/12/15
LP-2	White Classroom paint 409	↓	↓
LP-3	Tan paint on Metal Radiator		
LP-4	Door frame paint Int. B wing		
LP-5	White paint on brick B wing		

Client Sample #'s	Total # of Samples:	
Relinquished (Client): <i>[Signature]</i>	Date: 11/17/15	Time:
Received (Lab): <i>[Signature]</i>	Date: 11/18/15	Time: 1035
Comments: <i>Fedex</i>		





## **ATTACHMENT C**



Thursday, November 12, 2015

Ms. Susan Cahalan  
CDW Consultants, Inc  
40 Speen Street  
Suite 301  
Framingham, MA 01701

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
Sample ID#s: BK19397 - BK19402

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
November 12, 2015

FOR: Ms. Susan Cahalan  
CDW Consultants, Inc  
40 Speen Street  
Suite 301  
Framingham, MA 01701

Sample Information

Matrix: SOLID  
Location Code: CDW-PCB  
Rush Request: Standard  
P.O.#:

Custody Information

Collected by:  
Received by: LK  
Analyzed by: see "By" below

Date

11/02/15  
11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
Phoenix ID: BK19397

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
Client ID: PCB-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1221	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1232	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1242	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1248	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1254	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1260	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1262	ND	17	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1268	ND	17	mg/Kg	100	11/11/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	Diluted Out		%	100	11/11/15	AW	30 - 150 %
% TCMX	Diluted Out		%	100	11/11/15	AW	30 - 150 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

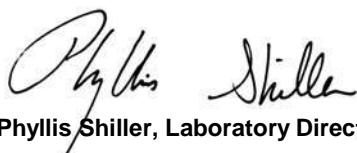
PCB Comment:

For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported. Multiple cleanup steps were performed but were unsuccessful. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisisl.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
November 12, 2015

FOR: Ms. Susan Cahalan  
CDW Consultants, Inc  
40 Speen Street  
Suite 301  
Framingham, MA 01701

Sample Information

Matrix: SOLID  
Location Code: CDW-PCB  
Rush Request: Standard  
P.O.#:

Custody Information

Collected by:  
Received by: LK  
Analyzed by: see "By" below

Date

11/02/15  
11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
Phoenix ID: BK19398

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
Client ID: PCB-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1221	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1232	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1242	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1248	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1254	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1260	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1262	ND	16	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1268	ND	16	mg/Kg	100	11/11/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	Diluted Out		%	100	11/11/15	AW	30 - 150 %
% TCMX	Diluted Out		%	100	11/11/15	AW	30 - 150 %



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

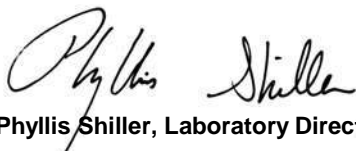
**PCB Comment:**

For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported. Multiple cleanup steps were performed but were unsuccessful. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisisil.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
November 12, 2015

FOR: Ms. Susan Cahalan  
CDW Consultants, Inc  
40 Speen Street  
Suite 301  
Framingham, MA 01701

Sample Information

Matrix: SOLID  
Location Code: CDW-PCB  
Rush Request: Standard  
P.O.#:

Custody Information

Collected by:  
Received by: LK  
Analyzed by: see "By" below

Date

11/02/15  
11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
Phoenix ID: BK19399

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
Client ID: PCB-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1221	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1232	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1242	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1248	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1254	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1260	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1262	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1268	ND	0.32	mg/Kg	1	11/09/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	93		%	1	11/09/15	AW	30 - 150 %
% TCMX	85		%	1	11/09/15	AW	30 - 150 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

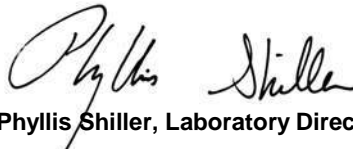
**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 12, 2015

FOR: Ms. Susan Cahalan  
 CDW Consultants, Inc  
 40 Speen Street  
 Suite 301  
 Framingham, MA 01701

Sample Information

Matrix: SOLID  
 Location Code: CDW-PCB  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LK  
 Analyzed by: see "By" below

Date

11/02/15  
 11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
 Phoenix ID: BK19400

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
 Client ID: PCB-4

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1221	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1232	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1242	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1248	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1254	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1260	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1262	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A
PCB-1268	ND	0.33	mg/Kg	1	11/09/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	76		%	1	11/09/15	AW	30 - 150 %
% TCMX	77		%	1	11/09/15	AW	30 - 150 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

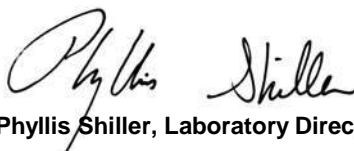
**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 12, 2015

FOR: Ms. Susan Cahalan  
 CDW Consultants, Inc  
 40 Speen Street  
 Suite 301  
 Framingham, MA 01701

Sample Information

Matrix: SOLID  
 Location Code: CDW-PCB  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LK  
 Analyzed by: see "By" below

Date

11/02/15  
 11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
 Phoenix ID: BK19401

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
 Client ID: PCB-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1221	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1232	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1242	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1248	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1254	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1260	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1262	ND	33	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1268	ND	33	mg/Kg	100	11/11/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	Diluted Out		%	100	11/11/15	AW	30 - 150 %
% TCMX	Diluted Out		%	100	11/11/15	AW	30 - 150 %



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

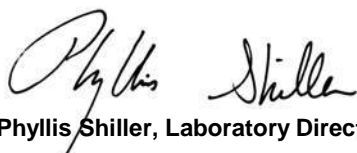
**PCB Comment:**

For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported. Multiple cleanup steps were performed but were unsuccessful. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisisil.

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**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
November 12, 2015

FOR: Ms. Susan Cahalan  
CDW Consultants, Inc  
40 Speen Street  
Suite 301  
Framingham, MA 01701

Sample Information

Matrix: SOLID  
Location Code: CDW-PCB  
Rush Request: Standard  
P.O.#:

Custody Information

Collected by:  
Received by: LK  
Analyzed by: see "By" below

Date

11/02/15  
11/06/15

Time

13:45

Laboratory Data

SDG ID: GBK19397  
Phoenix ID: BK19402

Project ID: SOMERVILLE HIGH SCHOOL (SHS)  
Client ID: PCB-6

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Extraction for PCB	Completed				11/06/15	QQ/W	SW3540C

**PCB (Soxhlet SW3540C)**

PCB-1016	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1221	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1232	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1242	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1248	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1254	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1260	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1262	ND	31	mg/Kg	100	11/11/15	AW	SW8082A
PCB-1268	ND	31	mg/Kg	100	11/11/15	AW	SW8082A

**QA/QC Surrogates**

% DCBP	Diluted Out		%	100	11/11/15	AW	30 - 150 %
% TCMX	Diluted Out		%	100	11/11/15	AW	30 - 150 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

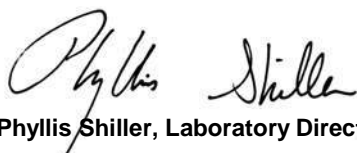
**PCB Comment:**

For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported. Multiple cleanup steps were performed but were unsuccessful. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisol.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**November 12, 2015**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

November 12, 2015

## QA/QC Data

SDG I.D.: GBK19397

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 326027 (mg/Kg), QC Sample No: BK19631 10X (BK19397, BK19398, BK19399, BK19400, BK19401, BK19402)										
<b>Polychlorinated Biphenyls - Solid</b>										
PCB-1016	ND	0.17	78	73	6.6	71	68	4.3	40 - 140	20
PCB-1221	ND	0.17							40 - 140	20
PCB-1232	ND	0.17							40 - 140	20
PCB-1242	ND	0.17							40 - 140	20
PCB-1248	ND	0.17							40 - 140	20
PCB-1254	ND	0.17							40 - 140	20
PCB-1260	ND	0.17	93	88	5.5	89	82	8.2	40 - 140	20
PCB-1262	ND	0.17							40 - 140	20
PCB-1268	ND	0.17							40 - 140	20
% DCBP (Surrogate Rec)	95	%	101	99	2.0	95	87	8.8	30 - 150	20
% TCMX (Surrogate Rec)	77	%	83	75	10.1	71	73	2.8	30 - 150	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

Phyllis Shiller, Laboratory Director  
 November 12, 2015

# Sample Criteria Exceedences Report

## GBK19397 - CDW-PCB

Criteria: None

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
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\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Cooler: Yes  No   
 IPK  ICE   
 Temp 10°C Pg of

**CHAIN OF CUSTODY RECORD**

Data Delivery:  
 Fax # \_\_\_\_\_  
 Email: \_\_\_\_\_

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040  
 Email: info@phoenixlabs.com Fax (860) 645-0823  
 Client Services (860) 645-8726

Customer: OW Conner Health  
 Address: 40 Spear St South Foly  
Bridgewater MA 01701

Project: Somerville High School (SHS) Project P.O.  
 Report to: Susan Chakala  
 Invoice to: OW Consultants  
 Phone #: 508 875-2657  
 Fax #: \_\_\_\_\_

This section MUST be completed with Bottle Quantities.

Samplers Signature: [Signature] Date: 11/2/15

Client Sample - Information - Identification  
 DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water  
 RW=Raw Water SE=Settlement SL=Sludge S=Soil SD=Solid LW=Liquid  
 OIL=Oil B=Bulk L=Liquid

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Analysis Request
19397	pcb-1 <u>EST 805</u>	SD	11/2/15	-	X
19398	pcb-2 <u>EST 805</u>	SD	11/2/15	-	X
19399	pcb-3 <u>EST 805</u>	SD	11/2/15	-	X
19400	pcb-4 <u>EST 805</u>	SD	11/2/15	-	X
19401	pcb-5 <u>EST 805</u>	SD	11/2/15	-	X
19402	pcb-6 <u>EST 805</u>	SD	11/2/15	-	X

Refilled by	Accepted by	Date	Time	RI	GI	MA	Data Format
<u>[Signature]</u>	<u>[Signature]</u>	11/2/15	12:20	<input type="checkbox"/> Direct Exposure (Residential) <input type="checkbox"/> GW <input type="checkbox"/> Other	<input type="checkbox"/> RCP Cert <input type="checkbox"/> GW Protection <input type="checkbox"/> SW Protection <input type="checkbox"/> GA Mobility <input type="checkbox"/> GB Mobility <input type="checkbox"/> Residential DEC <input type="checkbox"/> IC DEC <input type="checkbox"/> Other	<input type="checkbox"/> MCP Certification <input type="checkbox"/> GW-1 <input type="checkbox"/> GW-2 <input type="checkbox"/> GW-3 <input type="checkbox"/> S-1 <input type="checkbox"/> S-2 <input type="checkbox"/> S-3 <input type="checkbox"/> MWRA eSMART <input type="checkbox"/> Other	<input type="checkbox"/> Excel <input type="checkbox"/> PDF <input type="checkbox"/> GIS/Key <input type="checkbox"/> EQUIS <input type="checkbox"/> Other  Data Package <input type="checkbox"/> Tier II Checklist <input type="checkbox"/> Full Data Package* <input type="checkbox"/> Phoenix Std Report <input type="checkbox"/> Other

State where samples were collected: MA  
 Turnaround:  
 1 Day\*  
 2 Days\*  
 3 Days\*  
 Standard  
 Other  
 \*SURCHARGE APPLIES

Comments, Special Requirements or Regulations:  
TSOA Detection Units



## **APPENDIX D**



**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

---

Attn:

**Susan Cahalan  
CDW Consultants  
40 Speen Street  
Suite 301  
Framingham, MA 01701**

11/19/2015

Phone: (508) 875-2657

Fax:

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 11/17/2015. The results are tabulated on the attached data pages for the following client designated project:

**Somerville High School**

The reference number for these samples is EMSL Order #011506902. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

---

Julie Smith - Laboratory Director



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.

NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077  
 Phone/Fax: (856) 303-2500 / (856) 858-4571  
<http://www.EMSL.com> [EnvChemistry2@emsl.com](mailto:EnvChemistry2@emsl.com)

EMSL Order: 011506902  
 CustomerID: CDWC26  
 CustomerPO:  
 ProjectID:

Attn: **Susan Cahalan**  
**CDW Consultants**  
**40 Speen Street**  
**Suite 301**  
**Framingham, MA 01701**

Phone: (508) 875-2657  
 Fax:  
 Received: 11/17/15 9:40 AM

Project: **Somerville High School**

**Analytical Results**

**Client Sample Description** Merc-1 **Collected:** 11/13/2015 **Lab ID:** 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
7471B	Mercury	0.33	0.048	mg/Kg	11/19/2015	JS	11/19/2015	JS

**Client Sample Description** Merc-2 **Collected:** 11/13/2015 **Lab ID:** 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
7471B	Mercury	ND	0.050	mg/Kg	11/19/2015	JS	11/19/2015	JS

**Client Sample Description** Merc-3 **Collected:** 11/13/2015 **Lab ID:** 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
7471B	Mercury	0.056	0.050	mg/Kg	11/19/2015	JS	11/19/2015	JS

**Client Sample Description** Merc-4 **Collected:** 11/13/2015 **Lab ID:** 0004

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
7471B	Mercury	0.094	0.050	mg/Kg	11/19/2015	JS	11/19/2015	JS

**Definitions:**

ND - indicates that the analyte was not detected at the reporting limit  
 RL - Reporting Limit

EMSL ANALYTICAL, INC.  
LABORATORY PRODUCTS DIVISION



01506902

**Environmental Chemistry**  
**Chain of Custody**  
EMSL Order Number (Lab Use Only):

EMSL Analytical, Inc.  
200 Route 130 North  
Cinnaminson, NJ 08077  
PHONE: 1-800-220-3675  
FAX: (856) 786-5974

Report To Contact Name: susan cahalan		Bill To Company: CDW Consultants					
Company Name: CDW Consultants		Attention To: susan cahalan					
Street: 40 Speen Street Suite 301		Street: 40 Speen Street Suite 301					
City: Framingham	State/Province: MA	City: Framingham	State/Province: MA				
Zip Code: 01701	Zip Code: 01701	Phone: 5088752657	Fax:				
Project Name: Somerville High School		U.S. State where Samples Collected: MA					
Number of Samples in Shipment:		Purchase Order: Somerville HS					
Please Provide results: <input type="checkbox"/> FAX <input checked="" type="checkbox"/> B-mail <input type="checkbox"/> Mail		Email Results To: scahalan@cdwconsultants.com					
Standard Turnaround Time: <input type="checkbox"/> 2 Weeks		The following TAT's are subject to lab approval: <input type="checkbox"/> 1 Week <input type="checkbox"/> 4 Days <input checked="" type="checkbox"/> 3 Days <input type="checkbox"/> 2 Days <input type="checkbox"/> 1 Day					
Failure to complete will hinder processing of samples							
Client Sample ID	Comp	Grab	Date/Time	Matrix	Preservative	List Test(s) Needed	Comments
Merc-1		X	11/13/15	0	5		TOTAL Mercury
Merc-2		X		0	5		
Merc-3		X		0	5		
Merc-4		X		0	5		
Released By (Signature)		Date & Time		Received By		Date & Time	
		11/10/15				20c 11/17/15 0940	

Instructions or Comments:

Results Only  Results and QC  Reduced Deliverables  Disk Deliverable  Other

**HAZARDOUS BUILDING MATERIALS SURVEY REPORT  
CITY HALL BUILDING  
93 HIGHLAND AVENUE, SOMERVILLE, MA**



*PREPARED FOR:*

**HALEY & ALDRICH, INC.  
465 MEDFORD STREET, SUITE 2200  
BOSTON, MA 02129**

*PREPARED BY:*

**AXIOM PARTNERS, INC.  
50B SALEM STREET, SUITE #103  
LYNNFIELD, MA 01490**

**SEPTEMBER 22, 2021**



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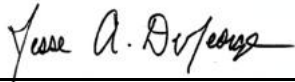


## CERTIFICATION OF RESULTS

This report has been prepared for the exclusive use of AXIOM's Client, Haley & Aldrich, Inc. Photocopying of this document by parties other than those designated by the Client or use of this document for purposes other than it is intended, is strictly prohibited.

Respectfully submitted this 22<sup>nd</sup> day of September 2021

Prepared by:



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Jesse A. DeGeorge  
Asbestos Inspector/Assistant Project Manager

Reviewed by:



---

Edward Kearney  
Project Manager/Principal

## **1.0 PURPOSE AND SCOPE OF WORK**

Axiom Partners, Inc. (AXIOM) was retained by Haley & Aldrich, Inc. to perform an inspection of the referenced building in advance of building renovation activities.

The purpose of this investigation was to identify Asbestos-Containing Materials (ACMs), Lead-Containing Paint (LCP), Polychlorinated Biphenyls (PCBs), Mercury (Hg), Chlorofluorocarbons (CFCs) and other miscellaneous hazardous materials and wastes for abatement prior to or in conjunction with planned property redevelopment activities.

## **2.0 SITE DESCRIPTION**

The building is an occupied three-story building with a basement and a footprint of approximately 40,000 square feet. The building is occupied by the Somerville's City Hall. The floors are designated as lower level, first floor, second floor and third floor. The building was constructed in 1867 and was reportedly renovated over many years to the present day. It is constructed of steel and masonry, concrete and wood. Most notably, the building's areas consist of offices, conference rooms, electrical rooms, bathrooms, break rooms, counsel chamber rooms, storage areas, hallways, and mechanical rooms. The exterior walls are brick over concrete and CMU. Interior walls are a combination of concrete, CMU, plaster, and painted drywall. The vast majority of the floors have terrazzo, carpeting and ceramic flooring as well as some vinyl floor coverings. The majority of spaces have plaster and/or drywall walls and ceilings and some suspended ceiling tiles covering wood and concrete decking. The building has a multi-elevation pitched slate shingle roof system. The building has a former steam radiator heat system, which is no longer in service, as the building is currently heated by temporary heat systems.

## **3.0 INSPECTION PERSONNEL, METHODS AND LABORATORY**

### **3.1 Inspection Personnel and Process**

#### *3.1.1 Inspection Personnel*

The investigative survey was conducted on August 25 & 26, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Jesse A. DeGeorge (Massachusetts Asbestos Inspector License Number 1031684). Mr. DeGeorge was assisted by inspector Geoff Gerace also from AXIOM.

#### *3.1.2 Inspection Process*

The inspection for ACMs and hazardous building materials (HBMs) was conducted in a systematic manner using AXIOM's standard safety procedures and inspection protocols including:

1. A visual inspection of the building's interiors, exteriors and roofs to locate, quantify and assess the condition of materials suspected to contain asbestos, lead, PCBs, CFCs, Mercury and other hazardous chemicals, materials and wastes.
2. Collection and analysis of materials as described herein to determine their composition.

3. Review of previous asbestos survey and post-abatement reports, sampling reports and laboratory analysis for ACMs. No reports or related testing data were provided to AXIOM during this investigation and there was no one that provided any related historical knowledge regarding ACMs in the building.

### 3.2 Asbestos-Containing Materials (ACM) Investigation

#### 3.2.1 Methodology

The inspection for suspect ACMs included:

1. Collection of representative bulk samples of each homogeneous application of suspect material in sufficient numbers to comply with EPA/AHERA criteria (see Chart A below).
2. To prevent release of any airborne asbestos, samples of suspect friable materials were collected by wetting the suspect materials and then removing a small full-thickness sample and placing it in a sealed plastic bag labeled with a unique sample identification number.
3. Chain-of-custody documentation was used to ensure sample integrity.
4. Analysis of the bulk samples by an accredited laboratory using the EPA-approved Polarized Light Microscopy (PLM) method.
5. A review of the inspection findings and lab results to ensure proper and consistent identification and characterization of all confirmed and presumed ACMs.

**Chart A**

#### Minimum Asbestos Bulk Sampling Criteria

Type of Suspect Material <sup>1</sup>	Minimum Sampling Criteria
Surfacing	EPA/AHERA mandated statistically random criteria (Min. of 3 samples; Max. of 7 samples)
Miscellaneous	A sufficient number of samples to determine if material is an ACM (typically 2 samples of each homogeneous application)
Thermal System Insulations	Three random samples of each homogeneous material

#### 3.2.2 Definition of Key Inspection Terms

Given the specific purposes and objectives of this inspection, the following definitions were used for the terms: Suspect Materials, Non-Suspect Materials, Homogeneous Applications or Areas, Inaccessible Building Areas, and Confirmed ACMs:

<sup>1</sup> Per homogeneous material or area

1. Suspect Materials: Installed building materials that either were pre-formed (i.e., manufactured off-site) or were prepared and installed on-site. All building materials are considered to be suspect ACMs except as noted in #2 below.
2. Non-Suspect Materials: For the purposes of this inspection, the following materials were considered non-suspect and were not assessed or sampled if observed:
  - Plastic
  - Glass
  - Wood or Wood Composite Materials
  - Brick, Granite, Marble, or Other Stonework
  - Pink or Yellow Fiberglass Insulation on Pipes or Other Mechanical Components
  - Clay or Ceramic Tiles
  - Rubber or Synthetic Foam
  - Paint (unless textured)
  - Concrete or Mortar (except Gypcrete)
  - Carpeting, Curtains, Wallpaper, and Other Paper/Natural Fiber, Fabric, or Synthetics
3. Homogeneous Applications or Areas: Are suspect materials which serve the same function or purpose (e.g., floor or ceiling tiles) have similar color and texture and were likely installed at or near the same time. Note that the homogeneity of certain materials such as wall and ceiling plaster at times cannot be readily determined.
4. Inaccessible Building Areas: Areas that AXIOM could not survey because it was unsafe or impractical to disassemble or remove systems or coverings or because a human being cannot physically enter or observe the area or components. These areas include, but are not limited to, Transite pipes coming on to the site from municipal utilities mains from the surrounding streets, underground trenches, boilers, vessels, storage tanks and mechanical systems.
5. Confirmed ACMs: Suspect materials where at least one of the bulk samples contains an asbestos concentration greater than 1%. According to the EPA/AHERA criteria, if all bulk samples of a homogeneous area of material are found to contain less than 1% asbestos, the material may be classified as a non-asbestos material.
6. Friable and Non-Friable ACMs: An ACM that can be crumbled, crushed, or otherwise reduced to powder by hand pressure is a friable material; non-friable ACMs cannot. This is important with respect to managing ACMs. Additionally, some non-friable ACMs are regulated differently.
7. Asbestos-Containing Waste Material (ACWM): Massachusetts Department of Environmental Protection (MADEP) defines an ACWM as "any ACM removed during a demolition or renovation project and anything contaminated with asbestos in the course of a demolition or renovation project including, but not limited to, asbestos waste from control devices, bags or containers that previously contained asbestos, contaminated clothing, materials used to enclose the work area during the demolition or renovation operation, and demolition or renovation debris. Asbestos-Containing Waste Material (ACWM) shall also include ACM on and/or in facility components that are inoperable or have been taken out of service and any ACM that is damaged or deteriorated to the point where it is no longer attached as originally applied or is no longer serving the intended purpose for which it was originally installed."

### 3.3 Asbestos Laboratory Services

### 3.3.1 *PLM Bulk Sample Analysis*

Bulk samples collected during the inspection were submitted to and analyzed by EMSL Analytical, Inc. (EMSL) located in Woburn, Massachusetts. EMSL is a Massachusetts-licensed asbestos bulk sample laboratory (License #AA000188). Bulk samples were analyzed for asbestos content using EPA Method 600/R-93/116. A chain-of-custody form was used to ensure sample integrity.

The entire inventory of collected samples may not have required analysis. Initially, one sample per material was analyzed. If the first sample was found to contain asbestos, the remaining samples were not analyzed (*Positive Stop* protocol). If the first sample was determined not to contain asbestos, however, the remaining samples were analyzed until >1% asbestos was detected or until the entire sample set was analyzed.

## 3.4 **Lead Containing Paint (LCP) Investigation**

Representative testing of paints for the presence of lead was performed in the building as part of AXIOM's scope of work.

### 3.4.1 *Introduction*

Historically, lead was added to paint because its color stability properties made it a desirable pigment and because it enhances durability. Lead-Containing Paint (LCP) becomes harmful when ingested or inhaled as dust or fumes. Once lead was proven to be a health hazard, it was officially banned in 1978 from paints used in residences.

In an occupational setting, if lead-based painted surfaces are to be impacted by renovation or demolition activities, contractor personnel exposure (per OSHA compliance) and waste disposal (per EPA compliance) issues must be addressed and factored into the cost of the project.

### 3.4.2 *Testing Methodology*

AXIOM utilized a Portable X-Ray Fluorescence Analyzer (XRF) to perform the lead paint survey. The XRF is a hand-held instrument that contains a radioisotopic source and operates on the principle of X-ray fluorescence. The depression of a spring-loaded trigger mechanism on the XRF unit opens a shutter in the faceplate that allows radiation from an isotopic source to stimulate the lead atoms in the paint. This stimulation causes the atoms to emit (fluoresce) X-rays which the unit detects and converts into electrical pulses which are then processed, and the result is read through a digital display on the instrument.

AXIOM used a NITON Model XLp300 which analyzes surfaces quickly, accurately, and non-destructively. Surface levels of lead are measured in milligrams per square centimeter (mg/cm<sup>2</sup>). This unit can measure the concentration of LCP on surfaces as little as 0.01 mg of lead/cm<sup>2</sup>.

### 3.4.3 *XRF Testing Procedures*

Upon arrival at the site, a "validation test" was performed to ensure that the XRF instrument was operating properly. The validation test was performed on a calibration test sheet supplied by the manufacturer to determine if the instrument is consistently measuring lead content. During this survey, the XRF was functioning properly as defined by the manufacturer.

In conducting the LCP survey representative tests were performed on homogeneous (similar color and use) painted surfaces. Results were related to other surfaces possessing similar homogeneous characteristics. By following this sampling protocol, every painted surface did not have to be tested. Representative testing was performed for the presence of lead-based paint (LBP) and lead-containing paint (LCP) on accessible interior and exterior painted surfaces.

### **3.5 Polychlorinated Biphenyls (PCBs) Investigation**

AXIOM conducted an inspection of the building and grounds to identify suspect PCB-containing fluorescent light fixture ballasts, electrical transformers, and bulk products. The survey was conducted in a systematic manner that included:

1. Performing a detailed walk-through to inspect and categorize the various types of accessible fluorescent light fixtures and electrical transformers.
2. Preparing an inventory of electrical light ballasts and transformers known or suspected to contain PCBs. Nameplate data was recorded if it was present and legible.
3. AXIOM inspected the building to identify suspect PCB-containing caulking. The survey included identifying and testing representative caulking compounds materials for PCBs. The bulk samples were collected using hand tools and placed into seal containers (glass sample jars) which were promptly labeled and placed into a cooler with ice. Samples were picked up at the site by a courier and hand delivered to Alpha Analytical Laboratory located in Westborough, MA for analysis. The samples were prepared using the Soxhlet extraction method and analyzed for PCBs by the Environmental Protection Agency (EPA) Methods 3540C and 8082. The complete laboratory reports can be found in Appendix A.

### **3.6 Mercury Light Tube and Thermostat Investigation**

AXIOM inspected the building to identify suspect Mercury-containing equipment as follows:

1. Preparing an inventory of fluorescent light bulbs that contain Mercury vapor in conjunction with the light ballast inspection described in Section 3.5.
2. Performing a walkthrough to identify and inventory thermostats, switches, actuators, and other equipment that contain liquid Mercury.

### **3.7 Chlorofluorocarbons (CFCs) Investigation**

AXIOM inspected the building to identify suspect chlorofluorocarbons (CFCs) associated with refrigeration and air conditioning equipment and prepared an inventory of equipment including an estimate of CFC quantities. Nameplate data was recorded if it was present and legible. Assumptions were made if the unit was inaccessible or if the nameplate was not present or illegible.



### 3.8 Miscellaneous Hazardous Building Materials

AXIOM inspected the building for miscellaneous hazardous building materials and chemical wastes including oil-containing devices (e.g., boilers, generators, elevators, motors, grease traps, etc.) and miscellaneous items such as lead acid batteries, paints, cleaners, and other chemicals.

## 4.0 FINDINGS AND RECOMMENDATIONS

### 4.1 Asbestos-Containing Materials

#### 4.1.1 Asbestos-Containing Materials (ACMs)

Materials **confirmed** to contain >1% asbestos for the survey are as follows:

**TABLE 1 - CONFIRMED ACMs**  
**CITY HALL BUILDING, 93 HIGHLAND AVENUE, SOMERVILLE, MA**

Sample Reference	Sample Description	Sample Location	Estimated Quantity <sup>2</sup>	Results
082521-95-01A – 01C	Exterior Door Caulking (main door)	Exterior All Sides of Building	5 EA	5% CHR
082521-95-02A – 02C	Exterior Window Caulking (w/ wood double hung window)	Exterior All Sides of Building (1 <sup>st</sup> – 3 <sup>rd</sup> Floors)	80 EA	2% CHR
082521-95-23A & 23B	White/Gray Sink Undercoating	Lower Level – 3 <sup>rd</sup> Floor, Offices & Break Rooms	10 EA	8% CHR
082521-95-26A & 26B <b>(NOTE: Mastic not an ACM)</b>	Pebble Patterned Vinyl Sheet Flooring (under carpet, under other Non-ACM flooring & on concrete)	1 <sup>st</sup> Floor, Offices West & Hallways East	2,000 SF	15% CHR
082521-95-28A & 28B <b>(NOTE: Mastic not an ACM)</b>	9" x 9" Green/Black Checkered Vinyl Floor Tile (under carpet, under other Non-ACM flooring & on concrete)	2 <sup>nd</sup> Floor, City Council Chamber Room & Mayor's Office	3,500 SF	5% CHR
082521-95-32A & 32B <b>(NOTE: Mastic not an ACM)</b>	12" x 12" White w/ Gray Flecks Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Floor, Committee Room & 3 <sup>rd</sup> Floor, Planning Board Office	800 SF	2% CHR
082521-95-34A & 34B	Remnant Black Tile Mastic (under carpet & on concrete)	2 <sup>nd</sup> Floor, Mayor's Office	300 SF	10% CHR
082521-95-35A - 35C	Pipe Insulation (0-6" O.D.) <sup>3</sup>	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	450 LF	20% CHR

<sup>2</sup> SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos; CRO = Crocidolite Asbestos

<sup>3</sup> This ACM is also located above suspended ceiling tile.

Sample Reference	Sample Description	Sample Location	Estimated Quantity <sup>2</sup>	Results
082521-95-36A – 36C	Pipe Fitting Insulation (0-6" O.D.) <sup>3</sup>	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	35 EA	25% CHR, 10% CRO
082521-95-37A – 37C	Pipe Insulation (6-10" O.D.) <sup>3</sup>	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	60 LF	20% CHR
082521-95-38A – 38C	Pipe Fitting Insulation (6-10" O.D.) <sup>3</sup>	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	15 EA	30% CHR
082521-57-11A – 11G	Plaster Walls & Ceilings - Base Coat Only <sup>4</sup>	Lower Level – 3 <sup>rd</sup> Floor Throughout	NA	TR% CHR

#### 4.1.2 Presumed Asbestos-Containing Materials (PACMs)

The following presumed ACMs (PACMs) may be present in or on the building or at the site that could not be investigated or tested due to inaccessibility:

**TABLE 2**  
**PRESUMED ACMs**

Material	Location	Estimated Quantity	Friability
Asphaltic Damp Proofing	On Foundations, Footings	TBD	Non-Friable
Buried Pipes	Beneath Building or at Site	TBD	TBD
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	TBD	Non-Friable
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall & Ceiling Surfaces	Various Areas Building's Interiors	TBD	Friable
Grouts/Thin Sets w/ Terrazzo Floors & Ceramic Wall & Floor Tiles	Various Areas Building's Interiors	TBD	Friable
Decorative Plaster	2 <sup>nd</sup> Floor Counsel Chamber Room	TBD	TBD
Mirror Mastic	Various Areas Building's Interiors	TBD	TBD

#### 4.1.3 Non-Asbestos-Containing Materials

Materials **confirmed** to be Non-ACMs for the survey can be found in Appendix D.

#### 4.1.4 Discussion and Recommendations

<sup>4</sup> = Due to the large quantity of this ACM, AXIOM would recommend additional sampling and testing to further determine the extent of this ACM. There's a possibility that this ACM is isolated to a specific location within the Lower-Level Areas.

The mere presence of asbestos in a building does not mean that the health of building occupants is necessarily at risk. As long as the ACMs remain in good condition and are not disturbed, exposure is unlikely. However, when building maintenance, repair, renovation, demolition, or other activities disturb ACMs, or if ACMs are damaged, asbestos fibers are released creating a potential hazard to building occupants.

ACMs associated with the subject building are friable and non-friable and were in fair to good condition. Since the subject building will be demolished and/or renovated, all ACMs must be removed by a Massachusetts-licensed Asbestos Removal Contractor prior to or in conjunction with the renovation work. As required by governing regulations, completion of each asbestos removal task must include a visual inspection by a Massachusetts-licensed Asbestos Project Monitor and final clearance air testing if asbestos removal is performed inside a negative pressure enclosure (containment).

Regulations require that all ACMs be included in a site-specific asbestos operations and maintenance (O&M) program designed, at a minimum, to comply with 29 CFR 1910.1001 and 1926.1101, incorporating the basic components in the EPA's *Guide to Managing Asbestos in Building*. However, since all ACMs will imminently be removed during building renovation and/or demolition, the O&M program will not be required.

PACMs that may be present are identified in Table 2.

Removal of ACMs, PACMs and other HBMs should be clearly defined in a project specification which is used to obtain competitive bids for the work.

A detailed cost estimate for removal of ACMs is present in Appendix F and includes an allowance for the removal of PACMs and HBMs.

#### **4.2 Lead-Containing Paints (LCP)**

The HUD<sup>5</sup> lead paint standard classifies Lead Based Paint (LBP) as paint having  $\geq 1.0$  mg/cm<sup>2</sup> as measured by the XRF or  $\geq 0.5\%$  of lead by weight as analyzed by Atomic Absorption. With respect to renovation and demolition work, OSHA defines a lead-containing paint (LCP) as paint containing detectable amounts of lead.

Testing revealed several paints at the subject building are LBPs. A complete listing of the testing results can be found in Appendix B; however, Table 3 provides a summary of the LBPs at the site.

**TABLE 3  
SUMMARY OF LBPs**

Description	Location	XRF Reading (mg/cm <sup>2</sup> )
White Paint on Wood Window Casing (ground level)	Exterior All Sides of Building	4.4

<sup>5</sup> U.S. Department of Housing and Urban Development

**Hazardous Building Materials Survey Report**  
**City Hall Building**  
**93 Highland Avenue, Somerville, MA**

*Axiom Partners, Inc.*

Description	Location	XRF Reading (mg/cm <sup>2</sup> )
White Paint on Wood Window Casing (upper levels)	Exterior All Sides of Building	5.9
White Paint on Wood Structural Support Column	Exterior All Sides of Building	28.9
Brown Paint on Wood Door	1 <sup>st</sup> Floor, Offices	6.7
Brown Paint on Wood Door	1 <sup>st</sup> Floor, Offices	10.0
Beige Paint on Plaster Wall	2 <sup>nd</sup> Floor, Janitor's Closet	4.8
White Paint on Wood Baseboard	2 <sup>nd</sup> Floor, Mayor's Office	12.5
White Paint on Wood Door Casing	2 <sup>nd</sup> Floor, Mayor's Office	12.9
White Paint on Wood Door	2 <sup>nd</sup> Floor, Mayor's Office	9.3
White Paint on Wood Chair Rail	2 <sup>nd</sup> Floor, Mayor's Office	10.9
Gray Paint on Plaster Wall	2 <sup>nd</sup> Floor, Mayor's Office	1.0
Gray Paint on Plaster Window Casing	2 <sup>nd</sup> Floor, Mayor's Office	10.2
Gray Paint on Plaster Window Sash	2 <sup>nd</sup> Floor, Mayor's Office	10.4
White Paint on Plaster Wall	3 <sup>rd</sup> Floor, Hallway	13.5
White Paint on Wood Trim	3 <sup>rd</sup> Floor, Hallway	14.8

Based on testing performed by AXIOM, several paints were found to contain detectable lead; however, the paints listed in Table 3 have significant lead levels and are therefore characterized as LBPs. The paints are generally in fair to good condition.

Contractors should be made aware of the presence of lead paint testing results to satisfy the hazard communication requirements set forth by OSHA regulations. Specifically, contractors and subcontractors should be required to comply with OSHA regulation 29 CFR 1926.62 and Massachusetts regulation 453 CMR 22.11 for lead exposure in construction and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This could be accomplished by providing the affected contractors with a copy of this report. The General Contractor is responsible for informing and managing their employees and subcontractors.

The current interpretation of the EPA's Resource Conservation and Recovery Act (RCRA) requires that waste generated during projects where LCPs are present and will be disposed of is tested for the toxicity characteristic of lead in the waste stream. TCLP<sup>6</sup> testing is performed to determine whether waste (construction/demolition debris) must be classified as hazardous because of its lead content or if it can be disposed in a conventional construction and demolition (C&D) landfill. The regulatory limit for lead toxicity is 5.0 milligrams per liter (mg/L) using the EPA Method SW846-7420 for Atomic Absorption Spectroscopy (AAS). Since the need for TCLP testing is typically determined by the disposal facility/landfill, AXIOM recommends that pre-disposal testing is the contractor's responsibility.

<sup>6</sup> Toxicity Characteristic Leachate Procedure (TCLP)

### **4.3 Polychlorinated Biphenyls (PCBs) and Mercury in Electrical Equipment**

#### *4.3.1 Fluorescent Light Fixtures*

AXIOM identified three (3) types of fluorescent light fixtures in the subject building. AXIOM was unable to dismantle and inspect the light fixtures due to height restraints and occupied spaces. Therefore, the ballasts are presumed to contain PCBs. If there were ballasts labeled "No PCBs" they would be presumed to contain di (2-ethylhexyl) phthalate (DEHP). A summary of fluorescent light fixtures is provided in Appendix C.

Handling and disposal of fluorescent light ballasts that contain PCBs should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. There are two methods currently available for disposal of PCB-containing ballasts including incineration and disposal. Incineration is typically more expensive. Regardless of the method, documentation must be provided that verifies the proper removal, transportation, and disposal (destruction/incineration) at an approved facility. In general, PCB ballasts must be placed in 55-gallon drums which once filled, the drums must be closed and properly labeled for temporary storage, transport, and disposal in accordance with all applicable regulations. Drums containing PCB ballasts must be transported to an EPA-approved disposal facility (landfill or incinerator). Documentation must be provided that verifies the proper removal, transportation, and disposal (or destruction/incineration) at the approved facility. Drums containing non-PCB fluids, ballasts or capacitors shall be disposed of at a legally permitted disposal facility. There is presently no regulatory mandate for special handling and disposal of DEHP-containing ballasts, however, since there are a number of regulations that may be indirectly applicable<sup>7</sup> and since the disposal cost is not significant, AXIOM recommends disposing of DEHP-containing ballasts similarly.

#### *4.3.2 Transformers*

AXIOM did observe an electrical transformer in the subject building. The label indicated "dry type" transformer. A summary of transformers is provided in Appendix C.

#### *4.3.3 Mercury-Containing Items*

There are approximately three thousand eight hundred four (3,804) fluorescent light bulbs associated with actual light fixtures at the subject building. A summary of mercury-containing items is provided in Appendix C.

Handling and disposal of fluorescent light bulbs that contain Mercury should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. Guidance documents are also available from the EPA (e.g., the 1994 Green Lights Program for Lighting Waste Disposal). If fluorescent lamps become broken or damaged during

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<sup>7</sup> Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"), Solid Waste Disposal Act, the Clean Water Act, Safe Drinking Water Act, and the Toxic Substances Control Act.

removal, the broken lamps should be managed as hazardous waste. Note that fluorescent light tubes may be reused.

Mercury-containing devices must be properly recycled in accordance with 310 CMR 30.1034.

#### 4.4 Chlorofluorocarbons (CFCs)

AXIOM identified several window-mounted air conditioners and rooftop air conditioners located in the building's interiors and the roofs. Several refrigerators were also observed during the survey. A summary of CFC-Containing items is provided in Appendix C.

#### 4.5 Polychlorinated Biphenyls (PCBs) Testing

##### 4.5.1 Summary of PCB Bulk Product Testing Results

The following table provide the laboratory results of analysis of caulking for PCBs. The laboratory reports are in Appendix A.

**TABLE 4**  
**SUMMARY OF PCBs IN CAULKING COMPOUND RESULTS**

Sample Number	Description	Location	Analysis Results <sup>8</sup>
PCB-01	Exterior Window Caulking (w/ wood fixed ground level window)	Exterior Front Side of Building	<b>Aroclor 1254: 1,650 ppm</b>
PCB-02	Exterior Window Caulking (w/ wood double hung window)	Exterior Left Side of Building	Aroclor 1254: 25.8 ppm
PCB-03	Exterior Door Caulking	Exterior Front Side of Building	Aroclor 1254: 0.714
PCB-04	Exterior Window Glazing Compound (w/ wood double hung)	Exterior Left Side of Building	ND
PCB-05	Exterior Window Caulking (w/ wood fixed ground level window)	Exterior Front -Right Side of Building	ND
PCB-06	Exterior Window Caulking (w/ wood fixed ground level window)	Exterior Front-Right Side of Building	Aroclor 1254: 1.8 ppm
PCB-07	Exterior Window Caulking (w/ wood fixed ground level window)	Exterior Front-Middle Side of Building	<b>Aroclor 1254: 62.4 ppm</b>

<sup>8</sup> ND = PCBs not detected at the Reporting Limit (RL) for the specific samples. Refer to lab report for PCB Reporting Limits; Results are reported in milligrams per kilogram (mg/kg) which is equivalent to parts per million (ppm); all ND results include Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268 unless specifically noted otherwise.



Laboratory results are reported in micrograms per kilograms ( $\mu\text{g}/\text{kg}$ ) which AXIOM converted to milligrams per kilograms ( $\text{mg}/\text{kg}$ ) which is equivalent to parts per million (ppm) for comparison to EPA definitions.

#### 4.5.2 Discussion

According to 40 CFR 761, the EPA specifies that products and materials containing greater than 50 ppm are PCB bulk products. Based on the results of this investigation, **two types** of caulking are considered to be a PCB bulk product which is regulated by EPA Region 1 and has special handling and disposal requirements. Results for all other caulking and glazing samples had no PCBs detected or PCBs concentrations below 50 ppm.

Use of caulking or glazing with concentrations of PCBs greater than 50 ppm was not authorized by the USEPA, as such removal and disposal is required in accordance with 40 CFR 761.

For disposal purposes, caulking/glazing that are similar in appearance, texture, flexibility, and use to those identified above should be presumed to contain PCBs at concentrations greater than 50 ppm or should otherwise be tested to confirm the concentration of PCBs. Similarly, caulking and glazing that are similar in appearance, texture, flexibility, and use to those tested as part of this investigation and found to contain PCBs at less than 50 ppm may be presumed to have similarly low concentrations of PCBs.

Because PCBs can migrate from the caulking into the adjoining substrate materials, the USEPA allows the caulking/glazing **and adjoining substrate** to be removed and disposed as a PCB Bulk Product Waste, provided the substrate is designated for removal and disposal along with the caulking. Otherwise, the substrate must be removed and disposed as a PCB Remediation Waste, which requires EPA notification and approval prior to proceeding with the remediation effort.

Testing of the substrate for PCBs prior to removal of the caulking is recommended to demonstrate that the concentrations of PCBs remaining in the substrate are less than 1 ppm. Removal of substrate with PCB concentrations less than 1 ppm is not required. Sampling of the substrate in the vicinity of caulking/sealant that contains PCBs at concentrations greater than 50 ppm is recommended prior to demolition to estimate the quantity (volume and weight) of substrate material that will require disposal, preferably as PCB Bulk Product Waste.

Samples PCB-01 through PCB-04 were obtained from the building on August 8, 2021. Laboratory analytical results for PCB-01 was obtained from a small southeast-facing window located near the south corner of the building and appears to be the only window of this size. Results for samples PCB-02 indicated a PCB concentration of 25.8 ppm, for PCB-03 as not detected above the laboratory reporting limit, and PCB-04 had a PCB concentration of less than 1.0 ppm. Samples PCB-05 through PCB-07 were obtained from the building on September 23, 2021, to evaluate and confirm the extent of caulking containing PCBs greater than 50 ppm.

Samples PCB-02 and PCB-07 were obtained from windows similar in appearance. Concentrations of PCB can vary from location to location due to the passage of time and differing environmental exposures. Based on the results for PCB-02 and PCB-07, it can be assumed that caulking utilized on these represented windows likely contained PCBs greater than 50 ppm, as such, windows of this style should be assumed require removal as PCB Bulk Product Waste. As indicated above, substrate samples should be obtained from these windows to determine the amount of substrate that would require removal with these windows as bulk product waste.

Similarly, samples PCB-05 and PCB-06 were obtained from two similar window located at the ground level and from opposite sides of the building. These samples were obtained based on the concentration detected in sample PCB-01. While sharing some characteristics with the window from which sample PCB-01 was obtained, they are not identical. Further evaluation of these window types or associated substrate is not necessary. Substrate in contact with the caulking represented by sample PCB-01 should be evaluated.

## **4.6 Miscellaneous Hazardous Wastes**

### *4.6.1 Miscellaneous Hazardous Materials/Wastes*

AXIOM identified other hazardous materials/wastes including batteries associated with exit signs, batteries associated with emergency lighting, fire extinguishers and an elevator with hydraulic oil fluids. These items are also listed in Appendix C.

The above listed materials/components are not typically considered hazardous wastes while in use. However, those that are left behind must be properly characterized and disposed of in compliance with governing regulations.

Intact, non-leaking batteries should be handled and disposed of in accordance with the Universal Waste Management Standard 310 CMR 30.1034. If batteries are damaged or become damaged or leak during removal and/or handling, they should be managed as hazardous waste.

## **5.0 LIMITATIONS AND EXCLUSIONS**

### **5.1 Limitations and Conditions of This Investigation**

#### *5.1.1 NESHAPs Asbestos Survey*

This NESHAPs survey involved an investigation for ACMs in preparation for building demolition. Although this investigation attempted to identify and sample inaccessible building materials, some materials were inaccessible, and the potential remains that concealed ACMs may be encountered in the building or at the site.

#### *5.1.2 Inaccessible Materials and Locations*

Inaccessible building areas, systems, structural components, or surfaces which may not have been observed because it was unsafe or impractical to demolish, disassemble, or remove systems or coverings, or because a human being cannot physically enter or observe the area or component. Unless specifically noted, inaccessible materials or areas may include:

- buried or otherwise concealed pipe trenches and utility vaults/corridors;
- buried foundations;
- enclosed wall and ceiling cavities;
- electrical equipment/wire;
- concealed mechanical materials; and
- remnant window and door caulking that have been replaced or in-filled.

AXIOM made every reasonable effort to address these potential ACMs. However, the potential remains that concealed ACMs could be encountered during renovation or demolition work.

#### 5.1.3 *Other Environmental Exclusions*

1. This investigation did not include an assessment of air quality or analysis of soil, surface water or groundwater. Furthermore, this study did not include any subsurface exploration, testing or assessment for wetlands.
2. This investigation did not include assessments for the presence of pesticides, herbicides, urea-formaldehyde, or Radon, nor any air quality monitoring, or any chemical analysis of soil, surface water, or groundwater at the Site.
3. No attempt was made to check the compliance of present or past owners of the Site with Federal, State, or local laws.
4. The testing for lead paint was performed by an experienced Industrial Hygienist. It is intended only to satisfy the requirements of OSHA regulations including 29 CFR 1926.62, *Lead Exposure in Construction: Interim Final Rule* and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This investigation was not performed by an EPA HUD<sup>9</sup> or state accredited/licensed Lead Inspector which is often required for residential structures where children under the age of six live.

#### 5.1.4 *Project Specifications*

Users are cautioned that this document is an inspection report, not a project specification. Although it is often feasible to use a report such as this to obtain bids for asbestos and related abatement work, it does not provide a proper and/or complete document for defining the scope of work and specifying contractual obligations.

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<sup>9</sup> US Department of Housing and Urban Development

## APPENDIX A

### Asbestos Bulk and PCB Bulk Sample Results



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

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EMSL Order: 132106418

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 08/27/2021 1:20 PM

**Analysis Date:** 09/07/2021

**Collected Date:** 08/25/2021

**Project:** 01164.117 - City Hall Building; 93 Highland Avenue; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-01A <small>132106418-0001</small>	Exterior Left Side of Building - Exterior Door Caulking (Man Door)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-01B <small>132106418-0002</small>	Exterior Rear Side of Building - Exterior Door Caulking (Man Door)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-01C <small>132106418-0003</small>	Exterior Front Side of Building - Exterior Door Caulking (Man Door)	Tan/White Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
082521-95-02A <small>132106418-0004</small>	Exterior Left Side of Building - Exterior Window Caulking ( w/ Wood Double Hung)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-02B <small>132106418-0005</small>	Exterior Rear Side of Building - Exterior Window Caulking ( w/ Wood Double Hung)	Tan/White Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
082521-95-02C <small>132106418-0006</small>	Exterior Front Side of Building - Exterior Window Caulking ( w/ Wood Double Hung)				Positive Stop (Not Analyzed)
082521-95-03A <small>132106418-0007</small>	Exterior Left Side of Building - Exterior Window Glazing Compound (w/ Wood Double Hung)	Tan/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-03B <small>132106418-0008</small>	Exterior Rear Side of Building - Exterior Window Glazing Compound (w/ Wood Double Hung)	Tan/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-03C <small>132106418-0009</small>	Exterior Front Side of Building - Exterior Window Glazing Compound (w/ Wood Double Hung)	Tan/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-04A <small>132106418-0010</small>	Exterior Front Side of Building - Ground Level - Exterior Window Caulking (w/ Wood Fixed)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-04B <small>132106418-0011</small>	Exterior Rear Side of Building - Ground Level - Exterior Window Caulking (w/ Wood Fixed)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/07/2021 14:05:25



# EMSL Analytical, Inc.

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**EMSL Order:** 132106418  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-05A <small>132106418-0012</small>	Exterior Front Side of Building - Ground Level - Exterior Window Glazing Compound (w/ Wood Fixed)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-05B <small>132106418-0013</small>	Exterior Rear Side of Building - Ground Level - Exterior Window Glazing Compound (w/ Wood Fixed)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-06A <small>132106418-0014</small>	Lower Level, Offices South - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
082521-95-06B <small>132106418-0015</small>	3rd Floor, Office - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
082521-95-07A <small>132106418-0016</small>	Lower Level, Offices West - Fire Sprinkler Pipe Thread Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-07B <small>132106418-0017</small>	3rd Floor, Offices - Fire Sprinkler Pipe Thread Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-08A <small>132106418-0018</small>	3rd Floor, Mechanical Room - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
082521-95-08B <small>132106418-0019</small>	2nd Floor, Hall - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
082521-95-08C <small>132106418-0020</small>	1st Floor, Offices East - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
082521-95-08D <small>132106418-0021</small>	Lower Level, Offices West - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
082521-95-09A <small>132106418-0022</small>	3rd Floor, Mechanical Room - Joint Compound w/ Sample 08A	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-09B <small>132106418-0023</small>	2nd Floor, Hall - Joint Compound w/ Sample 08B	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-09C <small>132106418-0024</small>	1st Floor, Offices East - Joint Compound w/ Sample 08C	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-09D <small>132106418-0025</small>	Lower Level, Offices West - Joint Compound w/ Sample 08D	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-12A <small>132106418-0026</small>	Lower Level, Mechanical Room - Red Duct Sealant	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-12B <small>132106418-0027</small>	Lower Level, Offices West - Red Duct Sealant	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/07/2021 14:05:25





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**EMSL Order:** 132106418  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-13A <small>132106418-0028</small>	Lower Level, Employee Break Room - 12"x12" White/Beige Checkered Vinyl Floor Tile (on Concrete)	White/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-13B <small>132106418-0029</small>	Lower Level, Employee Break Room - 12"x12" White/Beige Checkered Vinyl Floor Tile (on Concrete)	White/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-14A <small>132106418-0030</small>	Lower Level, Employee Break Room - Mastic w/ Sample 13A	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-14B <small>132106418-0031</small>	Lower Level, Employee Break Room - Mastic w/ Sample 13B	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-16A <small>132106418-0032</small>	Lower Level, Offices - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-16B <small>132106418-0033</small>	1st Floor, Offices - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-17A <small>132106418-0034</small>	Lower Level, Offices South - Beige Vinyl Sheet Flooring (on Concrete)	Gray/Beige Fibrous Homogeneous	15% Cellulose 5% Glass	80% Non-fibrous (Other)	None Detected
082521-95-18A <small>132106418-0035</small>	Lower Level, Offices South - Mastic w/ Sample 17A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-19A <small>132106418-0036</small>	Lower Level, Offices East - 1'x1' Ceiling Tile (Spline)	Gray/White Fibrous Homogeneous	75% Min. Wool	25% Non-fibrous (Other)	None Detected
082521-95-19B <small>132106418-0037</small>	Lower Level, Offices East - 1'x1' Ceiling Tile (Spline)	Gray/White Fibrous Homogeneous	75% Min. Wool	25% Non-fibrous (Other)	None Detected
082521-95-20A <small>132106418-0038</small>	Lower Level, Hall East - 12"x12" Gray/White Checkered Vinyl Floor Tile (on Concrete)	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-20B <small>132106418-0039</small>	Lower Level, Hall East - 12"x12" Gray/White Checkered Vinyl Floor Tile (on Concrete)	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-21A <small>132106418-0040</small>	Lower Level, Hall East - Mastic w/ Sample 20A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-21B <small>132106418-0041</small>	Lower Level, Hall East - Mastic w/ Sample 20B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-22A <small>132106418-0042</small>	1st Floor, Offices East - 4" Gray Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/07/2021 14:05:25



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**EMSL Order:** 132106418  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-22B <small>132106418-0043</small>	3rd Floor, Offices - 4" Gray Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-49A <small>132106418-0044</small>	3rd Floor, Planning Board Offices - 4" Brown Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-49B <small>132106418-0045</small>	1st Floor, Offices - 4" Brown Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-23A <small>132106418-0046</small>	1st Floor, Offices East - White/Gray Sink Undercoating	White Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile
082521-95-23B <small>132106418-0047</small>	1st Floor, Employee Break Room - White/Gray Sink Undercoating				Positive Stop (Not Analyzed)
082521-95-24A <small>132106418-0048</small>	1st Floor, Offices South - Brown Vinyl Sheet Flooring w/ Canvas Backing (Under Carpet & on Concrete)	Brown/Tan Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
082521-95-24B <small>132106418-0049</small>	3rd Floor, Offices East - Brown Vinyl Sheet Flooring w/ Canvas Backing (Under Carpet & on Concrete)	Brown/Tan Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
082521-95-25A <small>132106418-0050</small>	1st Floor, Offices South - Mastic w/ Sample 24A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-25B <small>132106418-0051</small>	3rd Floor, Offices East - Mastic w/ Sample 24B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-26A <small>132106418-0052</small>	1st Floor, Offices South - Pebble Patterned Vinyl Sheet Flooring (Under Carpet & on Concrete)	Brown/Gray Fibrous Homogeneous		85% Non-fibrous (Other)	15% Chrysotile
082521-95-26B <small>132106418-0053</small>	1st Floor, Hall East - Pebble Patterned Vinyl Sheet Flooring (Under Carpet & on Concrete)				Positive Stop (Not Analyzed)
082521-95-27A <small>132106418-0054</small>	1st Floor, Offices West - Mastic w/ Sample 26A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-27B <small>132106418-0055</small>	1st Floor, Hall East - Mastic w/ Sample 26B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-28A <small>132106418-0056</small>	2nd Floor, Council Chamber - 9"x9" Green/Black Checkered Vinyl Floor Tile (Under Carpet & on Concrete)	Green Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile

Initial report from: 09/07/2021 14:05:25



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

<b>EMSL Order:</b> 132106418
<b>Customer ID:</b> AXIO80
<b>Customer PO:</b>
<b>Project ID:</b>

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-28B <small>132106418-0057</small>	2nd Floor, Council Chamber - 9"x9" Green/Black Checkered Vinyl Floor Tile (Under Carpet & on Concrete)				Positive Stop (Not Analyzed)
082521-95-29A <small>132106418-0058</small>	2nd Floor, Council Chamber - Mastic w/ Sample 28A	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-29B <small>132106418-0059</small>	2nd Floor, Council Chamber - Mastic w/ Sample 28B	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-30A <small>132106418-0060</small>	2nd Floor, Council Chamber - 12"x12" Red/Beige Checkered Vinyl Floor Tile (Under Carpet & on Concrete)	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-30B <small>132106418-0061</small>	2nd Floor, Council Chamber - 12"x12" Red/Beige Checkered Vinyl Floor Tile (Under Carpet & on Concrete)	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-31A <small>132106418-0062</small>	2nd Floor, Council Chamber - Mastic w/ Sample 30A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-31B <small>132106418-0063</small>	2nd Floor, Council Chamber - Mastic w/ Sample 30B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-48A <small>132106418-0064</small>	2nd Floor, Council Chamber - Backer Board w/ Sample 30A	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
082521-95-48B <small>132106418-0065</small>	2nd Floor, Council Chamber - Backer Board w/ Sample 30B	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
082521-95-32A <small>132106418-0066</small>	2nd Floor, Committee Room - 12"x12" White w/ Gray Flecks Vinyl Floor Tile (Under Carpet & on Concrete)	Gray Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
082521-95-32B <small>132106418-0067</small>	3rd Floor, Planning Board Office - 12"x12" White w/ Gray Flecks Vinyl Floor Tile (Under Carpet & on Concrete)				Positive Stop (Not Analyzed)
082521-95-33A <small>132106418-0068</small>	2nd Floor, Committee Room - Mastic w/ Sample 32A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-33B <small>132106418-0069</small>	3rd Floor, Planning Board Office - Mastic w/ Sample 32B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-34A <small>132106418-0070</small>	2nd Floor, Major's Office - Remnant Black Tile Mastic (Under Carpet & on Concrete)	Black Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile

Initial report from: 09/07/2021 14:05:25



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**EMSL Order:** 132106418  
**Customer ID:** AXIO80  
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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-34B <small>132106418-0071</small>	2nd Floor, Major's Office - Remnant Black Tile Mastic (Under Carpet & on Concrete)				Positive Stop (Not Analyzed)
082521-95-35A <small>132106418-0072</small>	3rd Floor, Copy Room - Pipe Insulation (0-6" OD)	White Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
082521-95-35B <small>132106418-0073</small>	3rd Floor, Copy Room - Pipe Insulation (0-6" OD)				Positive Stop (Not Analyzed)
082521-95-35C <small>132106418-0074</small>	3rd Floor, Offices South - Pipe Insulation (0-6" OD)				Positive Stop (Not Analyzed)
082521-95-36A <small>132106418-0075</small>	3rd Floor, Copy Room - Pipe Fitting Insulation (0-6" OD)	Tan Fibrous Homogeneous		65% Non-fibrous (Other)	25% Chrysotile 10% Crocidolite
082521-95-36B <small>132106418-0076</small>	3rd Floor, Copy Room - Pipe Fitting Insulation (0-6" OD)				Positive Stop (Not Analyzed)
082521-95-36C <small>132106418-0077</small>	3rd Floor, Offices South - Pipe Fitting Insulation (0-6" OD)				Positive Stop (Not Analyzed)
082521-95-37A <small>132106418-0078</small>	3rd Floor, Office East - Pipe Insulation (6-10" OD)	White Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
082521-95-37B <small>132106418-0079</small>	3rd Floor, Office East - Pipe Insulation (6-10" OD)				Positive Stop (Not Analyzed)
082521-95-37C <small>132106418-0080</small>	3rd Floor, Offices South - Pipe Insulation (6-10" OD)				Positive Stop (Not Analyzed)
082521-95-38A <small>132106418-0081</small>	3rd Floor, Office East - Pipe Fitting Insulation (6-10" OD)	Tan Fibrous Homogeneous		70% Non-fibrous (Other)	30% Chrysotile
082521-95-38B <small>132106418-0082</small>	3rd Floor, Office East - Pipe Fitting Insulation (6-10" OD)				Positive Stop (Not Analyzed)
082521-95-38C <small>132106418-0083</small>	3rd Floor, Offices South - Pipe Fitting Insulation (6-10" OD)				Positive Stop (Not Analyzed)
082521-95-39A <small>132106418-0084</small>	3rd Floor, Break Room - 12"x12" Black Vinyl Floor Tile (Under Carpet & on Concrete)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-40A <small>132106418-0085</small>	3rd Floor, Break Room - Mastic w/ Sample 39A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-41A <small>132106418-0086</small>	3rd Floor, Attic Space East - Loose Fill Insulation	Gray Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
082521-95-41B <small>132106418-0087</small>	3rd Floor, Attic Space East - Loose Fill Insulation	Gray Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
082521-95-41C <small>132106418-0088</small>	3rd Floor, Attic Space East - Loose Fill Insulation	Gray Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected

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EMSL Order: 132106418

Customer ID: AXIO80

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-95-42A <small>132106418-0089</small>	3rd Floor, Attic Space East - Vibration Dampening Cloth	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
082521-95-43A <small>132106418-0090</small>	3rd Floor, Attic Space East - Gray Duct Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-43B <small>132106418-0091</small>	1st Floor, Offices - Gray Duct Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-44A <small>132106418-0092</small>	3rd Floor, Break Room - Black Sink Undercoating	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-45A <small>132106418-0093</small>	3rd Floor, Stairwell - Interior Window Glazing Compound (w/ Wood Security Windows)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-45B <small>132106418-0094</small>	2nd Floor, Hall - Interior Window Glazing Compound (w/ Wood Security Windows)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-45C <small>132106418-0095</small>	Lower Level, Hall - Interior Window Glazing Compound (w/ Wood Security Windows)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-46A <small>132106418-0096</small>	3rd Floor, Hall West - 12"x12" Light Tan Mottled Vinyl Floor Tile (Under Carpet & on Concrete)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-46B <small>132106418-0097</small>	Lower Level, Hall East - 12"x12" Light Tan Mottled Vinyl Floor Tile (Under Carpet & on Concrete)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-47A <small>132106418-0098</small>	3rd Floor, Hall West - Mastic w/ Sample 46A	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-95-47B <small>132106418-0099</small>	Lower Level, Hall East - Mastic w/ Sample 46B	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132106418

Customer ID: AXIO80

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Project ID:

Analyst(s)

Kevin McKenzie (85)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/07/2021 14:05:25





AXIOM PARTNERS  
 50B SALEM STREET, STE 103  
 LYNNFIELD, MA 01490  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #:  
**132106418**  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

Sampled by:	Jesse A. DeGeorge	Date Collected:	08-25-21 & 08-26-21
Project Name:	City Hall Building		
Project Site:	93 Highland Ave., Somerville, MA		
Project ID/Number:	01164.117 "positive STOP"		
Special Lab Instructions:	POSITIVE STOP email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com		

**TURNAROUND TIME – If turnaround time is not chosen standard turnaround time applies (6 + Days)**

3 Hours  
  6 Hours  
  12 Hours  
  24 Hours  
  48 Hours  
  72 Hours  
  4 Days  
 5 Days  
 6-10 Days

**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
082521-95-01A	Exterior Door Caulking (man door)	Exterior Left Side of Bldg.	
082521-95-01B	.	Exterior Rear Side of Bldg.	
082521-95-01C	.	Exterior Front Side of Bldg.	
082521-95-02A	Exterior Window Caulking (w/ wood dble. hung)	Exterior Left Side of Bldg.	
082521-95-02B	.	Exterior Rear Side of Bldg.	
082521-95-02C	.	Exterior Front Side of Bldg.	
082521-95-03A	Exterior Window Glazing Compound (w/ wood dble. hung)	Exterior Left Side of Bldg.	
082521-95-03B	.	Exterior Rear Side of Bldg.	
082521-95-03C	.	Exterior Front Side of Bldg.	
082521-95-04A	Exterior Window Caulking (w/ wood fixed)	Exterior Front Side of Bldg. – Ground Level	
082521-95-04B	.	Exterior Rear Side of Bldg. – Ground Level	
082521-95-05A	Exterior Window Glazing Compound (w/ wood fixed)	Exterior Front Side of Bldg. – Ground Level	
082521-95-05B	.	Exterior Rear Side of Bldg. – Ground Level	
082521-95-06A	2' x 4' Suspended Ceiling Tile	Lower Level, Offices South	
082521-95-06B	.	3 <sup>rd</sup> Fl., Office	
082521-95-07A	Fire Sprinkler Pipe Thread Sealant	Lower Level, Offices West	
082521-95-07B	.	3 <sup>rd</sup> Fl., Offices	
082521-95-08A	Gypsum Wallboard	3 <sup>rd</sup> Fl., Mechanical Room	
082521-95-08B	.	2 <sup>nd</sup> Fl., Hall	

**Relinquished:** \_\_\_\_\_ Date: 08-26-21 Time: ~  
 Jesse A. DeGeorge *Jesse A. DeGeorge*  
**Received:** \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

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**AXIOM PARTNERS**  
 50B SALEM STREET, STE 103  
 LYNNFIELD, MA 01490  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #: <b>132106418</b>
Sample(s) received in good condition? [Y] [N]
Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

<b>Sampled by:</b>	Jesse A. DeGeorge	<b>Date Collected:</b>	08-25-21 & 08-26-21
<b>Project Name:</b>	City Hall Building		
<b>Project Site:</b>	93 Highland Ave., Somerville, MA		
<b>Project ID/Number:</b>	01164.117		
<b>Special Lab Instructions:</b>	POSITIVE STOP email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com		

**TURNAROUND TIME – If turnaround time is not chosen standard turnaround time applies (6 + Days)**

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input checked="" type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
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**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
082521-95-08C	.	1 <sup>st</sup> Fl., Offices East	
082521-95-08D	.	Lower Level, Offices West	
082521-95-09A	Joint Compound w/ Sample #08A	3 <sup>rd</sup> Fl., Mechanical Room	
082521-95-09B	Joint Compound w/ Sample #08B	2 <sup>nd</sup> Fl., Hall	
082521-95-09C	Joint Compound w/ Sample #08C	1 <sup>st</sup> Fl., Offices East	
082521-95-09D	Joint Compound w/ Sample #08D	Lower Level, Offices West	
082521-95-12A	Red Duct Sealant	Lower Level, Mechanical Room	
082521-95-12B	.	Lower Level, Offices West	
082521-95-13A	12" x 12" White/Beige Checkered Vinyl Floor Tile (on concrete)	Lower Level, Employee Break Room	
082521-95-13B	.	.	
082521-95-14A	Mastic w/ Sample #13A	Lower Level, Employee Break Room	
082521-95-14B	Mastic w/ Sample #13B	.	
082521-95-16A	Carpet Mastic	Lower Level, Offices	
082521-95-16B	.	1 <sup>st</sup> Fl., Offices	
082521-95-17A	Beige Vinyl Sheet Flooring (on concrete)	Lower Level, Offices South	
082521-95-18A	Mastic w/ Sample #17A		
082521-95-19A	1' x 1' Ceiling Tile (spline)	Lower Level, Offices East	
082521-95-19B	.	.	
082521-95-20A	12" x 12" Gray/White Checkered Vinyl Floor Tile (on concrete)	Lower Level, Hall East	

**Relinquished:** \_\_\_\_\_ *Jesse A. DeGeorge* **Date:** 08-26-21 **Time:** ~

**Received:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Time:** \_\_\_\_\_

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LABORATORY ORDER #: **132106418**  
 Sample(s) received in good condition? [Y] [N]  
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**Asbestos Analysis – Chain of Custody Form**

Sampled by:	Jesse A. DeGeorge	Date Collected:	08-25-21 & 08-26-21
Project Name:	City Hall Building		
Project Site:	93 Highland Ave., Somerville, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	<b>POSITIVE STOP</b> email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com		

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<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input checked="" type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
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**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
082521-95-20B	.	.	
082521-95-21A	Mastic w/ Sample #20A	Lower Level, Hall East	
082521-95-21B	Mastic w/ Sample #20B	.	
082521-95-22A	4" Gray Cove Base Mastic	1 <sup>st</sup> Fl., Offices East	
082521-95-22B	.	3 <sup>rd</sup> Fl., Offices	
082521-95-49A	4" Brown Cove Base Mastic	3 <sup>rd</sup> Fl., Planning Board Offices	
082521-95-49B	.	1 <sup>st</sup> Fl., Offices	
082521-95-23A	White/Gray Sink Undercoating	1 <sup>st</sup> Fl., Offices East	
082521-95-23B	.	1 <sup>st</sup> Fl., Employee Break Room	
082521-95-24A	Brown Vinyl Sheet Flooring w/ Canvas Backing (under carpet & on concrete)	1 <sup>st</sup> Fl., Offices South	
082521-95-24B	.	3 <sup>rd</sup> Fl., Offices East	
082521-95-25A	Mastic w/ Sample #24A	1 <sup>st</sup> Fl., Offices South	
082521-95-25B	Mastic w/ Sample #24B	3 <sup>rd</sup> Fl., Offices East	
082521-95-26A	Pebble Patterned Vinyl Sheet Flooring (under carpet & on concrete)	1 <sup>st</sup> Fl., Offices West	
082521-95-26B	.	1 <sup>st</sup> Fl., Hall East	
082521-95-27A	Mastic w/ Sample #26A	1 <sup>st</sup> Fl., Offices West	
082521-95-27B	Mastic w/ Sample #26B	1 <sup>st</sup> Fl., Hall East	
082521-95-28A	9" x 9" Green/Black Checkered Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Fl., Council Chamber	
082521-95-28B	.	.	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 08-26-21 Time: -

Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

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AXIOM PARTNERS  
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 LYNNFIELD, MA 01490  
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LABORATORY ORDER#: **132106418**

Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

Sampled by: *Jesse A. DeGeorge* Date Collected: *08-25-21 & 08-26-21*

Project Name: *City Hall Building*

Project Site: *93 Highland Ave., Somerville, MA*

Project ID/Number: *01164.117*

Special Lab Instructions: **POSITIVE STOP** email results to *ggerace@axiomenv.com* and *jesse.degeorge@gmail.com*

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  6-10 Days

**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
082521-95-29A	Mastic w/ Sample #28A	2 <sup>nd</sup> Fl., Council Chamber	
082521-95-29B	Mastic w/ Sample #28B	.	
082521-95-30A	12" x 12" Red/Beige Checkered Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Fl., Council Chamber	
082521-95-30B	.	.	
082521-95-31A	Mastic w/ Sample #30A	2 <sup>nd</sup> Fl., Council Chamber	
082521-95-31B	Mastic w/ Sample #30B	.	
082521-95-48A	Backer Board w/ Sample #30A	2 <sup>nd</sup> Fl., Council Chamber	
082521-95-48B	Backer Board w/ Sample #30B	.	
082521-95-32A	12" x 12" White w/ Gray Flecks Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Fl., Committee Room	
082521-95-32B	.	3 <sup>rd</sup> Fl., Planning Board Office	
082521-95-33A	Mastic w/ Sample #32A	2 <sup>nd</sup> Fl., Committee Room	
082521-95-33B	Mastic w/ Sample #32B	3 <sup>rd</sup> Fl., Planning Board Office	
082521-95-34A	Remnant Black Tile Mastic (under carpet & on concrete)	2 <sup>nd</sup> Fl., Major's Office	
082521-95-34B	.	.	
082521-95-35A	Pipe Insulation (0-6" O.D.)	3 <sup>rd</sup> Fl., Copy Room	
082521-95-35B	.	.	
082521-95-35C	.	3 <sup>rd</sup> Fl., Offices South	
082521-95-36A	Pipe Fitting Insulation (0-6" O.D.)	3 <sup>rd</sup> Fl., Copy Room	
082521-95-36B	.	.	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 08-26-21 Time: -

Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**REC'D EMSL-BOSTON AUG 27 2021**



AXIOM PARTNERS  
 50B SALEM STREET, STE 103  
 LYNNFIELD, MA 01490  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #:

**132106418**

Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis - Chain of Custody Form**

Sampled by:	Jesse A. DeGeorge	Date Collected:	08-25-21 & 08-26-21
Project Name:	City Hall Building		
Project Site:	93 Highland Ave., Somerville, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com		

**TURNAROUND TIME** - If turnaround time is not chosen standard turnaround time applies (5 Days)

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input checked="" type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
----------------------------------	----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------	---------------------------------	--	------------------------------------

**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
082521-95-36C	.	3 <sup>rd</sup> Fl., Offices South	
082521-95-37A	Pipe Insulation (6-10" O.D.)	3 <sup>rd</sup> Fl., Office East	
082521-95-37B	.	.	
082521-95-37C	.	3 <sup>rd</sup> Fl., Offices South	
082521-95-38A	Pipe Fitting Insulation (6-10" O.D.)	3 <sup>rd</sup> Fl., Office East	
082521-95-38B	.	.	
082521-95-38C	.	3 <sup>rd</sup> Fl., Offices South	
082521-95-39A	12" x 12" Black Vinyl Floor Tile (under carpet & on concrete)	3 <sup>rd</sup> Fl., Break Room	
082521-95-40A	Mastic w/ Sample #39A		
082521-95-41A	Loose Fill Insulation	3 <sup>rd</sup> Fl., Attic Space East	
082521-95-41B	.	.	
082521-95-41C	.	.	
082521-95-42A	Vibration Dampening Cloth	3 <sup>rd</sup> Fl., Attic Space East	
082521-95-43A	Gray Duct Sealant	3 <sup>rd</sup> Fl., Attic Space East	
082521-95-43B	.	1 <sup>st</sup> Fl., Offices	
082521-95-44A	Black Sink Undercoating	3 <sup>rd</sup> Fl., Break Room	
082521-95-45A	Interior Window Glazing Compound (w/ wood security windows)	3 <sup>rd</sup> Fl., Stairwell	
082521-95-45B	.	2 <sup>nd</sup> Fl., Hall	
082521-95-45C	.	Lower Level, Hall	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 08-26-21 Time: -

Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

REC'D  
 FMSI - BOSTON  
 AUG 27 2021









# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132106143

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 08/25/2021 2:35 PM

**Analysis Date:** 08/26/2021

**Collected Date:** 08/25/2021

**Project:** 01164.117 - 93 Highland Avenue; City Hall; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
082521-57-10A <small>132106143-0001</small>	3rd Floor Planning Office - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10B <small>132106143-0002</small>	3rd Floor Transportation - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10C <small>132106143-0003</small>	2nd Floor Law Office - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10D <small>132106143-0004</small>	2nd Floor E Stairwell - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10E <small>132106143-0005</small>	2nd Floor Men's Janitor's Closet - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10F <small>132106143-0006</small>	1st Floor Payroll Office - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-10G <small>132106143-0007</small>	Base Restroom Hall - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-11A <small>132106143-0008</small>	3rd Floor Planning Office - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
082521-57-11B <small>132106143-0009</small>	3rd Floor Transportation - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
082521-57-11C <small>132106143-0010</small>	2nd Floor Law Office - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
082521-57-11D <small>132106143-0011</small>	2nd Floor E Stairwell - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
082521-57-11E <small>132106143-0012</small>	2nd Floor Men's Janitor's Closet - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
082521-57-11F <small>132106143-0013</small>	1st Floor Payroll Office - Gray Base Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082521-57-11G <small>132106143-0014</small>	Base Restroom Hall - Gray Base Coat Plaster	Gray Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	<1% Chrysotile

Initial report from: 08/26/2021 12:27:50



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

**EMSL Order:** 132106143

**Customer ID:** AXIO80

**Customer PO:**

**Project ID:**

Analyst(s)

Kevin Pine (14)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 08/26/2021 12:27:50



**Asbestos Bulk Building Materials - Chain of Custody**

EMSL Order Number / Lab Use Only

EMSL Analytical, Inc.  
5 Constitution Way, Unit A

EMSL ANALYTICAL, INC.  
LABORATORY PRODUCTS TRAINING

132106143

Woburn, MA 01801  
PHONE: (781) 933-8411  
EMAIL: bostonlab@emsl.com

<b>Customer Information</b> Customer ID: Company Name: <b>Axiom Partners, Inc.</b> Contact Name: <b>Geoff Gerace</b> Street Address: <b>50B Salem Street, Suite 103</b> City, State, Zip: <b>Lynnfield MA 01940</b> Country: <b>US</b> Phone: <b>781-213-9198</b> Email(s) for Report: <b>ggerace@axiomenv.com</b>	<b>Billing Information</b> Billing ID: Company Name: <b>Axiom Partners, Inc.</b> Billing Contact: <b>Geoff Gerace</b> Street Address: <b>50B Salem Street, Suite 103</b> City, State, Zip: <b>Lynnfield MA 01940</b> Country: Phone: <b>781-213-9198</b> Email(s) for invoice:
---	---

<b>Project Information</b>	
Project Name/No: <b>01164.117 93 Highland Ave City Hall Somerville MA</b>	Purchase Order:
EMSL LIMS Project ID: (If applicable, EMSL will provide)	US State where samples collected: <b>MA</b> State of Connecticut (CT) must select project location: <input type="checkbox"/> Commercial (Taxable) <input type="checkbox"/> Residential (Non-Taxable)
Sampled By Name: <b>Geoff Gerace</b>	Sampled By Signature: <i>[Signature]</i> No. of Samples in Shipment:
<b>Turn-Around-Time (TAT)</b> <input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input checked="" type="checkbox"/> 24 Hour <input type="checkbox"/> 32 Hour <input type="checkbox"/> 48 Hour <input type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week <small>Please call ahead for large projects and/or turnaround times 6 Hours or Less. *32 Hour TAT available for select tests only; samples must be submitted by 11:30am.</small>	

<b>PLM - Bulk (reporting limit)</b> <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) <input type="checkbox"/> POINT COUNT <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) POINT COUNT w/ GRAVIMETRIC <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1,000 (<0.1%) <input type="checkbox"/> NIOSH 9002 (<1%) <input type="checkbox"/> NYS 198.1 (Friable - NY) <input type="checkbox"/> NYS 198.6 NOB (Non-Friable - NY) <input type="checkbox"/> NYS 198.8 (Vermiculite SM-V)	<b>Test Selection</b> <b>TEM - Bulk</b> <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (Non-Friable-NY) <input type="checkbox"/> TEM EPA 600/R-93/116 w Milling Prep (0.1%)  <u>Other Tests (please specify)</u>  <input type="checkbox"/> Positive Stop - Clearly Identified Homogeneous Areas (HA)
---	---

Sample Number	HA Number	Sample Location	Material Description
082521-57-	10A	3rd FL Planning office	White Skimcoat PLASTER
	10B	3rd FL Transportation	
	10C	2nd FL Law OFFICE	
	10D	2nd FL E Stairwell	
	10E	2nd FL Mens Janitors Closet	
	10F	1st FL <del>Restroom</del> Payroll Office	
	10G	BASE Restroom Hall	
	10A	3rd FL Planning OFFICE	Gray Base Coat PLASTER
	11B	3rd FL Transportation	
	11C	2nd FL Law OFFICE	

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Method of Shipment:	Sample Condition Upon Receipt:
Relinquished by: <b>Geoff Gerace</b> Date/Time: <b>8/25/21</b>	Received by: <i>[Signature]</i> Date/Time:
Relinquished by:	Received by: <b>REC'D EMSL-BOSTON</b> Date/Time: <b>AUG 25 2021</b>

Controlled Document - COC-01 Asbestos Bulk R6 05/06/2021  AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.







# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132106838

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 09/13/2021 11:00 AM

**Analysis Date:** 09/20/2021

**Collected Date:** 09/10/2021

**Project:** 01164.117 - City Hall Roof; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091021-57-50A <small>132106838-0001</small>	N. Roof - 1/2" Fiberboard Insulation	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
091021-57-50B <small>132106838-0002</small>	S. Roof - 1/2" Fiberboard Insulation	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
091021-57-51A <small>132106838-0003</small>	N. Roof - Built-up Roofing	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
091021-57-51B <small>132106838-0004</small>	S. Roof - Built-up Roofing	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
091021-57-52A <small>132106838-0005</small>	N. Roof - Black Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-52B <small>132106838-0006</small>	S. Roof - Black Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-53A <small>132106838-0007</small>	N. Roof - Tar Paper Assoc. w/ Wood Siding	Black Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
091021-57-53B <small>132106838-0008</small>	S. Roof - Tar Paper Assoc. w/ Wood Siding	Black Fibrous Homogeneous	50% Cellulose	50% Non-fibrous (Other)	None Detected
091021-57-54A <small>132106838-0009</small>	E. Side Slate Roof - Slaters Cement	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-54B <small>132106838-0010</small>	W. Side Slate Roof - Slaters Cement	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-55A <small>132106838-0011</small>	W. Side Copola - Exterior Window Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-55B <small>132106838-0012</small>	E. Side Copola - Exterior Window Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-56A <small>132106838-0013</small>	W. Side Copola - Exterior Window Glazing	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-57-56B <small>132106838-0014</small>	E. Side Copola - Exterior Window Glazing	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/20/2021 11:36:22



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132106838

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Elizabeth Stutts (14)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/20/2021 11:36:22





EMSL Order Number / Lab Use Only

132106838

PHONE: (781) 933-8411  
EMAIL: bostonlab@gmail.com

EMSL ANALYTICAL, INC.  
TESTING LABS • PRODUCTS • TRAINING

Customer Information	Customer ID:	Billing ID:
	Company Name: <b>AXIOM</b>	Company Name: <b>same as</b>
	Contact Name: <b>Geoff Gerace</b>	Billing Contact:
	Street Address: <b>50B Salem St, Suite 103</b>	Street Address:
	City, State, Zip: <b>Lynnfield, MA</b> Country:	City, State, Zip: Country:
	Phone: <b>978 995-5101</b>	Phone:
Email(s) for Report: <b>ggerace@axiomenu.com</b>	Email(s) for Invoice:	

**Project Information**

Project Name/No: **01164.117- City Hall Roof Somerville, MA** Purchase Order:

EMSL LIMS Project ID: (If applicable, EMSL will provide)

US State where samples collected: **MA** State of Connecticut (CT) must select project location:  
 Commercial (Taxable)  Residential (Non-Taxable)

Sampled By Name: \_\_\_\_\_ Sampled By Signature: \_\_\_\_\_ No. of Samples in Shipment: \_\_\_\_\_

**Turn-Around-Time (TAT)**

3 Hour  6 Hour  24 Hour  32 Hour  48 Hour  72 Hour  96 Hour  1 Week  2 Week

Please call ahead for large projects and/or turnaround times 6 Hours or Less. \*32 Hour TAT available for select tests only; samples must be submitted by 11:30am.

**PLM - Bulk (reporting limit)**

PLM EPA 800/R-93/116 (<1%)  
 PLM EPA NOB (<1%)  
 POINT COUNT

400 (<0.25%)  1,000 (<0.1%)  
 POINT COUNT w/ GRAVIMETRIC  
 400 (<0.25%)  1,000 (<0.1%)  
 NIOSH 9002 (<1%)  
 NYS 198.1 (Friable - NY)  
 NYS 198.6 NOB (Non-Friable - NY)  
 NYS 198.8 (Vermiculite SM-V)

**Test Selection**

**TEM - Bulk**

TEM EPA NOB  
 NYS NOB 198.4 (Non-Friable-NY)  
 TEM EPA 600/R-93/116 w Milling Prep (0.1%)

**Other Tests (please specify)**

Positive Stop - Clearly Identified Homogeneous Areas (HA)

Sample Number	HA Number	Sample Location	Material Description
091021-57-	50A	N. Roof	1/2" Fiberboard Insulation
	50B	S. Roof	"
	51A	N. Roof	Built up Roofing
	51B	S. Roof	"
	52A	N. Roof	Black Seam Sealant
	52B	S. Roof	"
	53A	N. Roof	Tar Paper w/w wood siding
	53B	S. Roof	"
	54A	G. SIDE SLATE ROOF	SLATERS CEMENT
	54B	W. SIDE SLATE ROOF	"

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

REC'D SEP 11 2021  
EMSL-BOSTON SEP 13 2021

Method of Shipment:	Sample Condition Upon Receipt:
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____

Controlled Document - COC-01 Asbestos Bulk R6 5/06/2021  AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.





## ANALYTICAL REPORT

Lab Number:	L2145575
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY HALL
Project Number:	01164.117
Report Date:	09/01/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2145575-01	PCB-01, EXT.WINDOW CAULK(GROUND LEVEL)	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	08/25/21 09:30	08/25/21
L2145575-02	PCB-02, EXT.WINDOW CAULK(UPPER LEVEL)	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	08/25/21 10:00	08/25/21
L2145575-03	PCB-03, EXT.DOOR CAULK	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	08/25/21 10:30	08/25/21
L2145575-04	PCB-04, EXT.WINDOW GLAZING COMPOUND	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	08/25/21 10:35	08/25/21

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

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**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

### Case Narrative (continued)

#### PCBs

L2145575-01D: The surrogate recoveries are below the acceptance criteria for 2,4,5,6-tetrachloro-m-xylene (0%) and decachlorobiphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

*Melissa Sturgis* Melissa Sturgis

Title: Technical Director/Representative

Date: 09/01/21



# ORGANICS

# PCBS

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

**SAMPLE RESULTS**

Lab ID: L2145575-01 D  
 Client ID: PCB-01, EXT.WINDOW CAULK(GROUND LEVEL)  
 Sample Location: 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 08/25/21 09:30  
 Date Received: 08/25/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 08/31/21 19:03  
 Analyst: CW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 08/29/21 22:50  
 Cleanup Method: EPA 3630  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 08/30/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	279000	--	500	A
Aroclor 1221	ND		ug/kg	279000	--	500	A
Aroclor 1232	ND		ug/kg	279000	--	500	A
Aroclor 1242	ND		ug/kg	140000	--	500	A
Aroclor 1248	ND		ug/kg	279000	--	500	A
Aroclor 1254	1650000		ug/kg	279000	--	500	A
Aroclor 1260	ND		ug/kg	279000	--	500	A
Aroclor 1262	ND		ug/kg	279000	--	500	A
Aroclor 1268	ND		ug/kg	140000	--	500	A
PCBs, Total	1650000		ug/kg	140000	--	500	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	0	Q	30-150	A
Decachlorobiphenyl	0	Q	30-150	A
2,4,5,6-Tetrachloro-m-xylene	0	Q	30-150	B
Decachlorobiphenyl	0	Q	30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

**SAMPLE RESULTS**

Lab ID: L2145575-02  
 Client ID: PCB-02, EXT.WINDOW CAULK(UPPER LEVEL)  
 Sample Location: 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 08/25/21 10:00  
 Date Received: 08/25/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 08/30/21 23:31  
 Analyst: AD  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 08/29/21 22:50  
 Cleanup Method: EPA 3630  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 08/30/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	592	--	1	A
Aroclor 1221	ND		ug/kg	592	--	1	A
Aroclor 1232	ND		ug/kg	592	--	1	A
Aroclor 1242	ND		ug/kg	296	--	1	A
Aroclor 1248	ND		ug/kg	592	--	1	A
Aroclor 1254	25800		ug/kg	592	--	1	A
Aroclor 1260	ND		ug/kg	592	--	1	A
Aroclor 1262	ND		ug/kg	592	--	1	A
Aroclor 1268	ND		ug/kg	296	--	1	A
PCBs, Total	25800		ug/kg	296	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	65		30-150	A
2,4,5,6-Tetrachloro-m-xylene	70		30-150	B
Decachlorobiphenyl	70		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

**SAMPLE RESULTS**

Lab ID: L2145575-03  
 Client ID: PCB-03, EXT.DOOR CAULK  
 Sample Location: 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 08/25/21 10:30  
 Date Received: 08/25/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 08/31/21 14:07  
 Analyst: JAW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 08/30/21 07:45  
 Cleanup Method: EPA 3630  
 Cleanup Date: 08/31/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 08/31/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	556	--	1	A
Aroclor 1221	ND		ug/kg	556	--	1	A
Aroclor 1232	ND		ug/kg	556	--	1	A
Aroclor 1242	ND		ug/kg	278	--	1	A
Aroclor 1248	ND		ug/kg	556	--	1	A
Aroclor 1254	714		ug/kg	556	--	1	B
Aroclor 1260	ND		ug/kg	556	--	1	A
Aroclor 1262	ND		ug/kg	556	--	1	A
Aroclor 1268	ND		ug/kg	278	--	1	A
PCBs, Total	714		ug/kg	278	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	58		30-150	A
Decachlorobiphenyl	62		30-150	A
2,4,5,6-Tetrachloro-m-xylene	65		30-150	B
Decachlorobiphenyl	64		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

**SAMPLE RESULTS**

Lab ID: L2145575-04  
 Client ID: PCB-04, EXT.WINDOW GLAZING COMPOUND  
 Sample Location: 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 08/25/21 10:35  
 Date Received: 08/25/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 08/30/21 23:38  
 Analyst: AD  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 08/29/21 22:50  
 Cleanup Method: EPA 3630  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 08/30/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 08/30/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	635	--	1	A
Aroclor 1221	ND		ug/kg	635	--	1	A
Aroclor 1232	ND		ug/kg	635	--	1	A
Aroclor 1242	ND		ug/kg	317	--	1	A
Aroclor 1248	ND		ug/kg	635	--	1	A
Aroclor 1254	ND		ug/kg	635	--	1	A
Aroclor 1260	ND		ug/kg	635	--	1	A
Aroclor 1262	ND		ug/kg	635	--	1	A
Aroclor 1268	ND		ug/kg	317	--	1	A
PCBs, Total	ND		ug/kg	317	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	66		30-150	A
Decachlorobiphenyl	67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	69		30-150	B
Decachlorobiphenyl	69		30-150	B



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8082A  
Analytical Date: 08/31/21 00:29  
Analyst: AD

Extraction Method: EPA 3540C  
Extraction Date: 08/29/21 22:50  
Cleanup Method: EPA 3630  
Cleanup Date: 08/30/21  
Cleanup Method: EPA 3665A  
Cleanup Date: 08/30/21  
Cleanup Method: EPA 3660B  
Cleanup Date: 08/30/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-04 Batch: WG1540499-1						
Aroclor 1016	ND		ug/kg	633	--	A
Aroclor 1221	ND		ug/kg	633	--	A
Aroclor 1232	ND		ug/kg	633	--	A
Aroclor 1242	ND		ug/kg	316	--	A
Aroclor 1248	ND		ug/kg	633	--	A
Aroclor 1254	ND		ug/kg	633	--	A
Aroclor 1260	ND		ug/kg	633	--	A
Aroclor 1262	ND		ug/kg	633	--	A
Aroclor 1268	ND		ug/kg	316	--	A
PCBs, Total	ND		ug/kg	316	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	65		30-150	B

## Lab Control Sample Analysis

Batch Quality Control

Project Name: CITY HALL

Project Number: 01164.117

Lab Number: L2145575

Report Date: 09/01/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-04 Batch: WG1540499-2 WG1540499-3									
Aroclor 1016	64		71		40-140	10		50	A
Aroclor 1260	54		61		40-140	12		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		71		30-150	A
Decachlorobiphenyl	55		60		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		73		30-150	B
Decachlorobiphenyl	61		70		30-150	B

Project Name: CITY HALL

Project Number: 01164.117

**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information****Cooler**                      **Custody Seal**

A                                      Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2145575-01A	Glass 120ml/4oz unpreserved	A	NA		3.0	Y	Absent		PCB-8082-CAULK(365)
L2145575-02A	Glass 120ml/4oz unpreserved	A	NA		3.0	Y	Absent		PCB-8082-CAULK(365)
L2145575-03A	Glass 120ml/4oz unpreserved	A	NA		3.0	Y	Absent		PCB-8082-CAULK(365)
L2145575-04A	Glass 120ml/4oz unpreserved	A	NA		3.0	Y	Absent		PCB-8082-CAULK(365)

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



**Project Name:** CITY HALL  
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#### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



**Project Name:** CITY HALL  
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**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2145575  
**Report Date:** 09/01/21

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



## Certification Information

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The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpeneol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

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The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

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For a complete listing of analytes and methods, please contact your Alpha Project Manager.



# CHAIN OF CUSTODY

PAGE 1 OF 1

8 Walkup Drive  
Westboro, MA 01581  
Tel: 508-896-9220

320 Forbes Blvd  
Mansfield, MA 02048  
Tel: 508-822-9300

Date Rec'd in Lab: 8/25/21  
ALPHA Job #: L2145575

### Project Information

Project Name: City Hall  
Project Location: 93 Highland Ave., Somerville, MA  
Project #: 01164.117  
Project Manager: Geoff Gerace  
ALPHA Quote #:

### Report Information - Data Deliverables

ADEX  EMAIL  Same as Client info PO #:

### Regulatory Requirements & Project Information Requirements

Yes  No MA MCP Analytical Methods  Yes  No CT RCP Analytical Methods  
 Yes  No Matrix Spike Required on this SDG? (Required for MCP Inorganics)  
 Yes  No GW1 Standards (Info Required for Metals & EPH with Targets)  
 Yes  No NPDES RGP  
 Other State /Fed Program \_\_\_\_\_ Criteria \_\_\_\_\_

### Client Information

Client: AXIOM Partners, Inc.  
Address: 50B Salem St., Ste 103, Lynnfield, MA  
Phone: 603.970.1135  
Email: jesse.degeorge@axiom.com

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved)  
Date Due:

### Additional Project Information:

Email results to Geoff Gerace & Jesse DeGeorge

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	SAMPLE INFO <input type="checkbox"/> Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do	TOTAL # BOTTLES
SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15		
METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only		
VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> PCB <input type="checkbox"/> PEST		
TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	PCBs via Soxhlet Method		
Sample Comments			

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
5575-01	PEB-01, EXT. Window Caulk (Ground Level)	8-25-21	0930	S	JAD
-02	DCB-02, EXT. Window Caulk (Upper Levels)		1000		
-03	PCB-03, EXT. Floor Caulk		1030		
-04	PCB-04, EXT. Window Glazing Compound		1035		

<b>Container Type</b> Plastic Amber glass Vial Glass Bacteria cup Cube Other Incubator 30D Bottle	<b>Preservative</b> A= None B= HCl C= HNO <sub>3</sub> D= H <sub>2</sub> SO <sub>4</sub> E= NaOH F= MeOH G= NaHSO <sub>4</sub> H= Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub> I= Ascorbic Acid J= NH <sub>4</sub> Cl K= Zn Acetate O= Other
--	---

Container Type	A
Preservative	D

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Jesse DeGeorge</i>	8-25-21	<i>John AAC</i>	8/25/21 1230
<i>Geoff Gerace</i>	8/25/21 1814	<i>MW</i>	8/25/21 1814

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.  
FORM NO: 01-01 (rev. 12-Mar-2012)



## ANALYTICAL REPORT

Lab Number:	L2151582
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY HALL
Project Number:	01164.117
Report Date:	09/27/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2151582-01	PCB-05, EXTERIOR WINDOW CAULKING(GROUND LEVEL)	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	09/23/21 11:08	09/23/21
L2151582-02	PCB-06, EXTERIOR WINDOW CAULKING(GROUND LEVEL)	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	09/23/21 11:15	09/23/21
L2151582-03	PCB-07, EXTERIOR WINDOW CAULKING(1ST FLOOR)	SOLID	93 HIGHLAND AVE, SOMERVILLE, MA	09/23/21 11:25	09/23/21

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

*Melissa Sturgis* Melissa Sturgis

Title: Technical Director/Representative

Date: 09/27/21



# ORGANICS

# PCBS

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

**SAMPLE RESULTS**

Lab ID: L2151582-01  
 Client ID: PCB-05, EXTERIOR WINDOW CAULKING(GROUND  
 Sample Location: LEVEL)  
 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/23/21 11:08  
 Date Received: 09/23/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/26/21 20:38  
 Analyst: JAW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/24/21 17:10  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/26/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	517	--	1	A
Aroclor 1221	ND		ug/kg	517	--	1	A
Aroclor 1232	ND		ug/kg	517	--	1	A
Aroclor 1242	ND		ug/kg	258	--	1	A
Aroclor 1248	ND		ug/kg	517	--	1	A
Aroclor 1254	ND		ug/kg	517	--	1	A
Aroclor 1260	ND		ug/kg	517	--	1	A
Aroclor 1262	ND		ug/kg	517	--	1	A
Aroclor 1268	ND		ug/kg	258	--	1	A
PCBs, Total	ND		ug/kg	258	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	81		30-150	A
Decachlorobiphenyl	86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	89		30-150	B
Decachlorobiphenyl	90		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

**SAMPLE RESULTS**

Lab ID: L2151582-02  
 Client ID: PCB-06, EXTERIOR WINDOW CAULKING(GROUND  
 Sample Location: LEVEL)  
 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/23/21 11:15  
 Date Received: 09/23/21  
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/26/21 20:47  
 Analyst: JAW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/24/21 17:10  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/26/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	576	--	1	A
Aroclor 1221	ND		ug/kg	576	--	1	A
Aroclor 1232	ND		ug/kg	576	--	1	A
Aroclor 1242	ND		ug/kg	288	--	1	A
Aroclor 1248	ND		ug/kg	576	--	1	A
Aroclor 1254	1820		ug/kg	576	--	1	A
Aroclor 1260	ND		ug/kg	576	--	1	A
Aroclor 1262	ND		ug/kg	576	--	1	A
Aroclor 1268	ND		ug/kg	288	--	1	A
PCBs, Total	1820		ug/kg	288	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	89		30-150	A
2,4,5,6-Tetrachloro-m-xylene	91		30-150	B
Decachlorobiphenyl	93		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

**SAMPLE RESULTS**

Lab ID: L2151582-03 D  
 Client ID: PCB-07, EXTERIOR WINDOW CAULKING(1ST FLOOR)  
 Sample Location: 93 HIGHLAND AVE, SOMERVILLE, MA

Date Collected: 09/23/21 11:25  
 Date Received: 09/23/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/26/21 22:05  
 Analyst: JAW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/24/21 17:10  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/26/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/26/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	2940	--	5	A
Aroclor 1221	ND		ug/kg	2940	--	5	A
Aroclor 1232	ND		ug/kg	2940	--	5	A
Aroclor 1242	ND		ug/kg	1470	--	5	A
Aroclor 1248	ND		ug/kg	2940	--	5	A
Aroclor 1254	62400		ug/kg	2940	--	5	A
Aroclor 1260	ND		ug/kg	2940	--	5	A
Aroclor 1262	ND		ug/kg	2940	--	5	A
Aroclor 1268	ND		ug/kg	1470	--	5	A
PCBs, Total	62400		ug/kg	1470	--	5	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	73		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8082A  
Analytical Date: 09/26/21 20:10  
Analyst: JAW

Extraction Method: EPA 3540C  
Extraction Date: 09/24/21 17:10  
Cleanup Method: EPA 3630  
Cleanup Date: 09/26/21  
Cleanup Method: EPA 3665A  
Cleanup Date: 09/26/21  
Cleanup Method: EPA 3660B  
Cleanup Date: 09/26/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-03 Batch: WG1550604-1						
Aroclor 1016	ND		ug/kg	623	--	A
Aroclor 1221	ND		ug/kg	623	--	A
Aroclor 1232	ND		ug/kg	623	--	A
Aroclor 1242	ND		ug/kg	312	--	A
Aroclor 1248	ND		ug/kg	623	--	A
Aroclor 1254	ND		ug/kg	623	--	A
Aroclor 1260	ND		ug/kg	623	--	A
Aroclor 1262	ND		ug/kg	623	--	A
Aroclor 1268	ND		ug/kg	312	--	A
PCBs, Total	ND		ug/kg	312	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	79		30-150	A
2,4,5,6-Tetrachloro-m-xylene	81		30-150	B
Decachlorobiphenyl	88		30-150	B



## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-03 Batch: WG1550604-2 WG1550604-3									
Aroclor 1016	70		73		40-140	4		50	A
Aroclor 1260	66		68		40-140	3		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		85		30-150	A
Decachlorobiphenyl	89		87		30-150	A
2,4,5,6-Tetrachloro-m-xylene	93		92		30-150	B
Decachlorobiphenyl	96		92		30-150	B

**Project Name:** CITY HALL  
**Project Number:** 01164.117

Serial\_No:09272109:57  
**Lab Number:** L2151582  
**Report Date:** 09/27/21

**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

<b>Cooler</b>	<b>Custody Seal</b>
A	Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2151582-01A	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		PCB-8082-CAULK(365)
L2151582-02A	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		PCB-8082-CAULK(365)
L2151582-03A	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		PCB-8082-CAULK(365)

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

#### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** CITY HALL  
**Project Number:** 01164.117

**Lab Number:** L2151582  
**Report Date:** 09/27/21

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





## Certification Information

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The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpeneol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

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The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

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For a complete listing of analytes and methods, please contact your Alpha Project Manager.

**AKLom**



# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 9/23/21

ALPHA Job #: L215158L

8 Walkup Drive  
Westboro, MA 01581  
Tel: 508-898-9220

320 Forbes Blvd  
Mansfield, MA 02048  
Tel: 508-822-9300

### Project Information

Project Name: City Hall

Project Location: 93 Highland Ave, Somerville, MA

Project #: 01164.114

Project Manager: Geoff Berace

ALPHA Quote #:

### Report Information - Data Deliverables

ADEx  EMAIL

### Billing Information

Same as Client info PO #:

### Client Information

Client: AKLom Partners, Inc.

Address: 50B Salem St, Ste 103, Lynnfield, MA

Phone: 603-970-1135

Email: jesse.degeorge@gmail.com

### Regulatory Requirements & Project Information Requirements

Yes  No MA MCP Analytical Methods  Yes  No CT RCP Analytical Methods

Yes  No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

Yes  No GW1 Standards (Info Required for Metals & EPH with Targets)

Yes  No NPDES RGP

Other State /Fed Program \_\_\_\_\_ Criteria \_\_\_\_\_

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved)

Date Due: MON, 9/27/21

Additional Project Information:

Email results to Geoff Berace & Jesse DeGeorge

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15	EPH: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	SAMPLE INFO Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do	TOTAL # BOTTLES

*PCBs via Soxhlet Method*

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS	SVOC	METALS	EPH	VPH	PCB	TPH	SAMPLE INFO	TOTAL # BOTTLES
		Date	Time											
51512-01	PCB-05 Exterior Window Caulking (ground level)	9-23-21	1108	S	JAT								X	1
02	PCB-06 Exterior Window Caulking (ground level)	9-23-21	1115	S	JAD								X	1
03	PCB-07 Exterior Window Caulking (1st Floor)	9-23-21	1125	S	JAD								X	1

**Container Type**  
P= Plastic  
A= Amber glass  
V= Vial  
G= Glass  
B= Bacteria cup  
C= Cube  
O= Other  
E= Encore  
D= BOD Bottle

**Preservative**  
A= None  
B= HCl  
C= HNO<sub>3</sub>  
D= H<sub>2</sub>SO<sub>4</sub>  
E= NaOH  
F= MeOH  
G= NaHSO<sub>4</sub>  
H= Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
I= Ascorbic Acid  
J= NH<sub>4</sub>Cl  
K= Zn Acetate  
O= Other

Container Type	
Preservative	

Relinquished By: Rob Maestri Date/Time: 9/23/21 1510

Received By: Rob Maestri Date/Time: 9/23/21 1720

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.  
FORM NO: 01-01 (rev. 12-Mar-2012)

**APPENDIX B**  
**Lead Paint Testing Results**

## XRF Lead Paint Testing Results

**Building Name: City Hall Building**  
**Location Address: 93 Highland Ave., Somerville MA**

Location	Description	Substrate	Paint Condition	XRF Reading	Color/ Comments
Exterior	Window Casing	Wood	Poor	0.13	White
"	Window Sill	Wood	Poor	0.10	White
"	Door Casing	Wood	Poor	0.00	White
"	Door	Wood	Poor	0.01	White
"	<b>Basement Window Casing</b>	<b>Wood</b>	<b>Fair</b>	<b>4.4</b>	<b>White</b>
"	Railing	Metal	Fair	0.1	Black
"	<b>Structural Column</b>	<b>Wood</b>	<b>Good</b>	<b>28.9</b>	<b>White</b>
"	<b>Window Casing</b>	<b>Wood</b>	<b>Poor</b>	<b>5.9</b>	<b>White</b>
"	Window Sash	Wood	Poor	0.01	White
"	Window Sill	Wood	Fair	0.24	White
Lower Level	Wall	Plaster	Good	0.00	Green
"	Door Trim	Wood	Good	0.0	Stain
"	Door Casing	Metal	Good	0.0	Brown
"	Door	Wood	Good	0.0	Stain
"	Base Board	Wood	Good	0.05	Brown
"	Wall	Plaster	Good	0.4	Beige
"	Railing	Metal	Good	0.01	Black
"	<b>Safe Door</b>	<b>Metal</b>	<b>Good</b>	<b>3.3</b>	<b>Black</b>
"	Wall	Plaster	Good	0.0	Blue
"	Radiator	Metal	Fair	0.7	Blue
1 <sup>st</sup> Floor	Stair Railing	Metal	Good	0.18	Black
"	Stair Tread	Metal	Good	0.18	Black

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; M-Miscellaneous; P-Piping; R-Railing; RD-Radiator; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

A-Asphalt; B-Brick; C-Concrete; CB-Concrete Block; G-Gypsum Board; M-Metal; PA-Paneling; P-Plaster; T-Tile; U-Unknown; W-Wood;

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)



## XRF Lead Paint Testing Results

**Building Name: City Hall Building**  
**Location Address: 93 Highland Ave., Somerville MA**

Location	Description	Substrate	Paint Condition	XRF Reading	Color/ Comments
"	Radiator	Metal	Good	0.0	Beige
"	<b>Door</b>	<b>Wood</b>	<b>Good</b>	<b>6.7</b>	<b>Brown</b>
"	<b>Door Casing</b>	<b>Wood</b>	<b>Good</b>	<b>10.0</b>	<b>Brown</b>
"	Column	Wood	Good	0.01	Brown
"	Wall	Plaster	Good	0.0	Red
"	Wall	Plaster	Good	0.27	Blue
"	Elevator Door Casing	Metal	Good	0.30	Brown
"	Window Casing	Wood	Good	0.27	Brown
"	Window Sill	Wood	Good	0.12	Brown
"	Wall	Plaster	Good	0.02	Blue
"	Base board	Wood	Good	0.01	Brown
2 <sup>nd</sup> Floor	Pipe	Metal	Good	0.00	Brown
"	Railing	Metal	Good	0.4	Black
"	Radiator	Metal	Good	0.0	Beige
"	<b>Door</b>	<b>Wood</b>	<b>Good</b>	<b>5.7</b>	<b>Brown</b>
"	<b>Door Casing</b>	<b>Wood</b>	<b>Good</b>	<b>6.0</b>	<b>Brown</b>
"	Wainscoting	Wood	Good	0.01	Stain
"	Wall	Plaster	Good	0.1	Red
"	Wall	Plaster	Good	0.0	Be
"	Elevator Door Casing	Metal	Good	0.30	Brown
"	Window Casing	Wood	Good	0.27	Beige
"	Window Sill	Wood	Good	0.03	Brown

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; M-Miscellaneous; P-Piping; R-Railing; RD-Radiator; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; SR-Stair Railing; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

A-Asphalt; B-Brick; C-Concrete; CB-Concrete Block; G-Gypsum Board; M-Metal; PA-Paneling; P-Plaster; T-Tile; U-Unknown; W-Wood;

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)



## XRF Lead Paint Testing Results

**Building Name: City Hall Building**  
**Location Address: 93 Highland Ave., Somerville MA**

Location	Description	Substrate	Paint Condition	XRF Reading	Color/ Comments
Janitors Closet	Wall	Plaster	Good	4.8	Beige
Mayor's Office	Base board	Wood	Good	12.5	White
Mayor's Office	Door Casing	Wood	Good	12.9	White
"	Chair Rail	Wood	Good	10.9	White
"	Door	Wood	Good	9.3	White
"	Wall	Plaster	Good	1.0	Gray
"	Wall Paneling	Wood	Good	0.0	White
"	Window Casing	Plaster	Good	10.2	Gray
"	Window Sash	Plaster	Good	10.4	Gray
3 <sup>rd</sup> Floor	Wall	Plaster	Good	13.5	White
"	Trim	Wood	Good	14.8	White
"	Window Casing	Wood	Good	0.27	Brown
"	Window Sill	Wood	Good	0.07	Brown
"	Wall	Plaster	Good	0.02	Beige
"	Base board	Wood	Good	0.00	Brown

**SAMPLE CODE:**  
 BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; M-Miscellaneous; P-Piping; R-Railing; RD-Radiator; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; SR-Stair Railing; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**  
 A-Asphalt; B-Brick; C-Concrete; CB-Concrete Block; G-Gypsum Board; M-Metal; PA-Paneling; P-Plaster; T-Tile; U-Unknown; W-Wood;

**PAINT CONDITION:**  
 1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)





**APPENDIX C**  
**Hazardous Building Materials**  
**Summary Tables**

## CFC, PCB AND Hg INVENTORY

Building Name: City Hall Building  
 Location Address: 93 Highland Ave., Somerville, MA

### Bulbs & Ballasts

Description	Location	Mfg./Model	Quantity	PCB Content (Y/N/U)
4' Fluorescent Bulbs	Throughout	NA	810	U*
4' Fluorescent Ballast	Throughout	NA	405	U
2' Fluorescent Bulbs	Throughout	NA	206	U
2' Fluorescent Ballast	Throughout	NA	103	U
1' Fluorescent Bulbs	Throughout Stairwells	NA	12	U
1' Fluorescent Ballast	Throughout Stairwells	NA	6	U

\* = Unknown means the ballasts are assumed to contain PCBs

### HVAC Units

Description/Location	HVAC Manufacturer	Number of Units	Amount/Type of RCFCs
Air Conditioners / Roof Top Units	Puron	3	~3-5 lbs. / R-410A
Chiller Unit / Exterior Rear Side of Building	Unknown	1	Unknown
Air Conditioners (Window Mount Units) / Exterior All Sides of Building	Unknown	2	Unknown
Air Conditioners / Exterior Right Side of Building	Sanyo	2	Unknown

### Miscellaneous Items

Description	Location	Size	Quantity
Batteries associated with Exit Lighting	Throughout	NA*	35
Batteries associated with Emergency Lighting	Throughout	NA	16
Freon associated with Refrigerators	Throughout	NA	4
Hydraulic Fluid associated with Elevator	Elevator Machine Room Roof	NA	1
Dry Type Transformer	Rear of Building	NA	1
Propane Tank	Rear of Building	NA	1

\* NA = Not Applicable

**APPENDIX D**  
**Non-ACMs Tables**

**CITY HALL BUILDING  
93 HIGHLAND AVENUE, SOMERVILLE, MA**

**CONFIRMED NON-ACMS**

Sample Reference	Material	Location(s)
082521-95-03A – 03C	Exterior Window Glazing Compound (w/ wood dble. hung)	Exterior All Sides of Building
082521-95-04A & 04B	Exterior Window Caulking (w/ wood fixed)	Exterior Front & Rear Sides of Building (@ Ground Level)
082521-95-05A & 05B	Exterior Window Glazing Compound (w/ wood fixed)	Exterior Front Side of Building (@ Ground Level)
082521-95-06A & 06B	2' x 4' Suspended Ceiling Tile	Lower Level – 3 <sup>rd</sup> Floor Throughout
082521-95-07A & 07B	Fire Sprinkler Pipe Thread Sealant	Lower Level – 3 <sup>rd</sup> Floor Throughout
082521-95-08A – 08D	Gypsum Wallboard	Lower Level - 3 <sup>rd</sup> Floor Throughout
082521-95-09A -09D	Joint Compound w/ Gypsum Wallboard	Lower Level - 3 <sup>rd</sup> Floor Throughout
082521-95-12A & 12B	Red Duct Sealant	Lower Level, Mechanical Room & Offices
082521-95-13A & 13B	12" x 12" White/Beige Checkered Vinyl Floor Tile (on concrete)	Lower Level, Employee Break Room
082521-95-14A & 14B	Mastic w/ 12" x 12" White/Beige Checkered Vinyl Floor Tile	Lower Level, Employee Break Room
082521-95-16A & 16B	Carpet Mastic	Lower Level – 3 <sup>rd</sup> Floor Throughout
082521-95-17A	Beige Vinyl Sheet Flooring (on concrete)	Lower Level, Offices South
082521-95-18A	Mastic w/ Beige Vinyl Sheet Flooring	Lower Level, Offices South
082521-95-19A & 19B	1' x 1' Ceiling Tile (spline)	Lower Level, Offices East
082521-95-20A & 20B	12" x 12" Gray/White Checkered Vinyl Floor Tile (on concrete)	Lower Level, Hall East
082521-95-21A & 21B	Mastic w/ 12" x 12" Gray/White Checkered Vinyl Floor Tile	Lower Level, Hall East
082521-95-22A & 22B	4" Gray Cove Base Mastic	1 <sup>st</sup> – 3 <sup>rd</sup> Floor, Offices
082521-95-49A & 49B	4" Brown Cove Base Mastic	1 <sup>st</sup> – 3 <sup>rd</sup> Floor, Offices
082521-95-24A & 24B	Brown Vinyl Sheet Flooring w/ Canvas Backing (under carpet & on concrete)	1 <sup>st</sup> – 3 <sup>rd</sup> Floor, Offices
082521-95-25A & 25B	Mastic w/ Brown Vinyl Sheet Flooring w/ Canvas Backing	1 <sup>st</sup> – 3 <sup>rd</sup> Floor, Offices

Sample Reference	Material	Location(s)
082521-95-27A & 27B	Mastic w/ Pebble Patterned Vinyl Sheet Flooring	1 <sup>st</sup> Floor, Offices West & Hall East
082521-95-29A & 29B	Mastic w/ 9" x 9" Green/Black Checkered Vinyl Floor Tile	2 <sup>nd</sup> Floor, Council Chamber
082521-95-30A & 30B	12" x 12" Red/Beige Checkered Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Floor, Council Chamber
082521-95-31A & 31B	Mastic w/ 12" x 12" Red/Beige Checkered Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Floor, Council Chamber
082521-95-48A & 48B	Backer Board w/ 12" x 12" Red/Beige Checkered Vinyl Floor Tile	2 <sup>nd</sup> Floor, Council Chamber
082521-95-33A & 33B	Mastic w/ 12" x 12" White w/ Gray Flecks Vinyl Floor Tile	2 <sup>nd</sup> Floor, Committee Room & 3 <sup>rd</sup> Floor, Planning Board Office
082521-95-39A	12" x 12" Black Vinyl Floor Tile (on concrete)	3 <sup>rd</sup> Floor, Break Room
082521-95-40A	Mastic w/ 12" x 12" Black Vinyl Floor Tile	3 <sup>rd</sup> Floor, Break Room
082521-95-41A – 41C	Loose Fill Insulation	3 <sup>rd</sup> Floor, Attic Space East
082521-95-42A	Vibration Dampening Cloth	3 <sup>rd</sup> Floor, Attic Space East
082521-95-43A & 43B	Gray Duct Sealant	1 <sup>st</sup> - 3 <sup>rd</sup> Floor Throughout
082521-95-44A	Black Sink Undercoating	3 <sup>rd</sup> Floor, Break Room
082521-95-45A – 45C	Interior Window Glazing Compound (w/ wood security windows)	Lower Level - 3 <sup>rd</sup> Floor, Stairwell & Hall
082521-95-46A & 46B	12" x 12" Lt. Tan Mottled Vinyl Floor Tile (under carpet & on concrete)	Lower Level, Hall East & 3 <sup>rd</sup> Floor, Hall West
082521-95-47A & 47B	Mastic w/ 12" x 12" Lt. Tan Mottled Vinyl Floor Tile	Lower Level, Hall East & 3 <sup>rd</sup> Floor, Hall West
082521-57-10A – 10G	Plaster Wall & Ceiling – White Skim Coat	Lower Level – 3 <sup>rd</sup> Floor Throughout
091021-57-50A & 50B	½" Fiberboard Insulation	Main Roof Field (north & south)
091021-57-51A & 51B	Asphaltic Built-Up Roofing	Main Roof Field (north & south)
091021-57-52A & 52B	Black Seam Sealant	Main Roof Field (north & south)
091021-57-53A & 53B	Tar Paper w/ Wood Siding	Main Roof Field (north & south)
091021-57-54A & 54B	Slater's Cement w/ Slate Shingles	Main Roof Field Throughout
091021-57-55A & 55B	Exterior Window Caulking	Main Roof Field, Cupola
091021-57-56A & 56B	Exterior Window Glazing Compound	Main Roof Field, Cupola

**APPENDIX E**  
**Photographs**





**Photo 1**

View of Asbestos-Containing Exterior Door and Window Caulking, Exterior All Sides of Building



**Photo 2**

View of Asbestos-Containing Pebble Patterned Vinyl Sheet Flooring (under carpet & non-ACM flooring & on concrete), 1<sup>st</sup> Floor Offices West & Hallways East



**Photo 3**

View of Asbestos-Containing 9" x 9" Green/Black Checkered Vinyl Floor Tile (under carpet, under other Non-ACM flooring & on concrete), 2<sup>nd</sup> Floor, City Council Chamber Room & Mayor's Office



**Photo 4**

View of Asbestos-Containing 12" x 12" White w/ Gray Flecks Vinyl Floor Tile (under carpet & on concrete), 2<sup>nd</sup> Floor, Committee Room & 3<sup>rd</sup> Floor, Planning Board Office



**Photo 5**

View of Asbestos-Containing Remnant Black Tile Mastic (under carpet & on concrete), 2<sup>nd</sup> Floor Mayor's Office



**Photo 6**

View of Asbestos-Containing Pipe/Fitting Insulation, 3<sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East

## **APPENDIX F**

### **Asbestos and Hazardous Building Materials Abatement Cost Estimate**

**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**City Hall Building**  
**93 Highland Avenue, Somerville, MA**

**Asbestos Removal, ACMs**

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Exterior Door Caulking (man door)	Exterior All Sides of Building	5 EA	\$1,500
Exterior Window Caulking (w/ wood dble. hung window)	Exterior All Sides of Building (1 <sup>st</sup> – 3 <sup>rd</sup> Floors)	80 EA	\$12,000
White/Gray Sink Undercoating	Lower Level – 3 <sup>rd</sup> Floor, Offices & Break Rooms	10 EA	\$1,000
Pebble Patterned Vinyl Sheet Flooring (under carpet, under other Non-ACM flooring & on concrete)	1 <sup>st</sup> Floor, Offices West & Hallways East	2,000 SF	\$16,000
9" x 9" Green/Black Checkered Vinyl Floor Tile (under carpet, under other Non-ACM flooring & on concrete)	2 <sup>nd</sup> Floor, City Council Chamber Room & Mayor's Office	3,500 SF	\$28,000
12" x 12" White w/ Gray Flecks Vinyl Floor Tile (under carpet & on concrete)	2 <sup>nd</sup> Floor, Committee Room & 3 <sup>rd</sup> Floor, Planning Board Office	800 SF	\$6,500
Remnant Black Tile Mastic (under carpet & on concrete)	2 <sup>nd</sup> Floor, Mayor's Office	300 SF	\$1,200
Pipe Insulation (0-6" O.D.)	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	450 LF	\$9,000
Pipe Fitting Insulation (0-6" O.D.)	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	35 EA	Incl. Above
Pipe Insulation (6-10" O.D.)	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	60 LF	\$1,200
Pipe Fitting Insulation (6-10" O.D.)	3 <sup>rd</sup> Floor, Copy Room & Offices South & Attic Space East	15 EA	Incl. Above
Plaster Walls & Ceilings -Base Coat Only	Lower Level – Restroom Hallway	1,200 SF	\$10,800
<b>Subtotal, Asbestos Removal (Confirmed ACMs)</b>			<b>\$ 87,200</b>

**Asbestos Removal, PACMs**

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	TBD	\$150,000
Buried Pipes/Steam Tunnels	Beneath Building or at Site	TBD	\$250,000
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	TBD	NA*

\*

**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**City Hall Building**  
**93 Highland Avenue, Somerville, MA**

Material	Location	Quantity	Removal Cost
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall & Ceiling Surfaces	Various Areas Building's Interiors	TBD	NA*
Grouts/Thin Sets w/ Terrazzo Floors & Ceramic Wall & Floor Tiles	Various Areas Building's Interiors	TBD	NA*
Decorative Plaster	2 <sup>nd</sup> Floor Counsel Chamber Room	7,500 SF	\$60,000
Mirror Mastic	Various Areas Building's Interiors	TBD	NA*
<b>Subtotal, PACM Removal (Recommended Allowance)</b>			<b>\$ 460,000</b>

\*N/A – Not applicable at this time

**Abatement Cost Estimate Summary**

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 87,200
Asbestos Removal, Presumed ACMs	\$ 460,000
Miscellaneous Hazardous Building Materials	\$ 15,000
~10% Contingency	\$ 49,100
Estimated Abatement Design/Bid & Monitoring Fee	\$ 25,000
<b>Total Hazardous Building Materials Abatement</b>	<b>\$ 636,300</b>

**Cost Estimate Assumptions**

- Based on current market conditions by a non-union contractor.
- Power, water, and heat provided by the Owner.
- Does not include demolition to access concealed ACMs.
- Includes materials, labor, equipment, notifications/permits, transportation, and disposal.
- Excludes the cost for removal of any other hazardous materials or conditions not identified herein.

\*

**HAZARDOUS BUILDING MATERIALS SURVEY REPORT  
THE EDGERLY SCHOOL BUILDING  
33 CROSS STREET, SOMERVILLE, MA**



*PREPARED FOR:*

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**OCTOBER 12, 2021**





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**APPENDICES**

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Appendix B	Lead Paint Testing Results
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Appendix E	Photographs
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Appendix G	Former Testing Report - 2016

### **CERTIFICATION OF RESULTS**

This report has been prepared for the exclusive use of AXIOM's Client, Haley & Aldrich, Inc. Photocopying of this document by parties other than those designated by the Client or use of this document for purposes other than it is intended, is strictly prohibited.

Respectfully submitted this 12<sup>th</sup> day of October 2021

Prepared by:



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Geoff Gerace  
Asbestos Inspector/Project Manager

Reviewed by:



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Edward Kearney  
Project Manager/Principal

## 1.0 PURPOSE AND SCOPE OF WORK

Axiom Partners, Inc. (AXIOM) was retained by Haley & Aldrich, Inc. to perform an inspection of the referenced building in advance of planned property renovation work.

The purpose of this investigation was to identify Asbestos-Containing Materials (ACMs), Lead-Containing Paint (LCP), Polychlorinated Biphenyls (PCBs), Mercury (Hg), Chlorofluorocarbons (CFCs) and other miscellaneous hazardous materials and wastes for abatement prior to or in conjunction with planned property redevelopment activities.

## 2.0 SITE DESCRIPTION

The building is an occupied three-story building and a footprint of approximately 80,000 square feet. The floors are designated as first floor, second floor, and third floor. The building was constructed in 1920 and was reportedly renovated over many years to the present day. It is constructed of steel and masonry, concrete and wood. Most notably, the building's areas consist of classrooms, hallways, offices, a boiler room, storage rooms, bathrooms, and mechanical rooms. The exterior walls are brick façade over CMU block. Interior walls are a combination of concrete, plaster, and painted drywall. The vast majority of the floors have hardwood floor planking, carpeting and vinyl flooring as well as some ceramic floor tile coverings. The majority of spaces have plaster and/or drywall walls and ceilings covering wood decking. The building has a flat rubber roof system with a built-up layer underneath.

## 3.0 INSPECTION PERSONNEL, METHODS AND LABORATORY

### 3.1 Inspection Personnel and Process

#### 3.1.1 *Inspection Personnel*

The investigative survey was conducted from September 15-16<sup>th</sup> and October 5, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Geoff Gerace and Jesse DeGeorge (Massachusetts Asbestos Inspector License Number A1034620 and A1031684, respectively) and was assisted by Jeff Albert of AXIOM.

#### 3.1.2 *Inspection Process*

The inspection for ACMs and hazardous building materials (HBMs) was conducted in a systematic manner using AXIOM's standard safety procedures and inspection protocols including:

1. A visual inspection of the building' interiors, exteriors and roofs to locate, quantify and assess the condition of materials suspected to contain asbestos, lead, PCBs, CFCs, Mercury and other hazardous chemicals, materials and wastes.
2. Collection and analysis of materials as described herein to determine their composition.
3. Review of previous asbestos survey and post-abatement reports, sampling reports and laboratory analysis for ACMs. Reports or related testing data were provided to AXIOM during this investigation and there was related historical knowledge regarding ACMs in the building. This report and its findings can be found in Appendix G.

### 3.2 Asbestos-Containing Materials (ACM) Investigation

#### 3.2.1 Methodology

The inspection for suspect ACMs included:

1. Collection of representative bulk samples of each homogeneous application of suspect material in sufficient numbers to comply with EPA/AHERA criteria (see Chart A below).
2. To prevent release of any airborne asbestos, samples of suspect friable materials were collected by wetting the suspect materials and then removing a small full-thickness sample and placing it in a sealed plastic bag labeled with a unique sample identification number.
3. Chain-of-custody documentation was used to ensure sample integrity.
4. Analysis of the bulk samples by an accredited laboratory using the EPA-approved Polarized Light Microscopy (PLM) method.
5. A review of the inspection findings and lab results to ensure proper and consistent identification and characterization of all confirmed and presumed ACMs.

**Chart A**  
**Minimum Asbestos Bulk Sampling Criteria**

Type of Suspect Material <sup>1</sup>	Minimum Sampling Criteria
Surfacing	EPA/AHERA mandated statistically random criteria (Min. of 3 samples; Max. of 7 samples)
Miscellaneous	A sufficient number of samples to determine if material is an ACM (typically 2 samples of each homogeneous application)
Thermal System Insulations	Three random samples of each homogeneous material

#### 3.2.2 Definition of Key Inspection Terms

Given the specific purposes and objectives of this inspection, the following definitions were used for the terms: Suspect Materials, Non-Suspect Materials, Homogeneous Applications or Areas, Inaccessible Building Areas, and Confirmed ACMs:

1. Suspect Materials: Installed building materials that either were pre-formed (i.e., manufactured off-site) or were prepared and installed on-site. All building materials are considered to be suspect ACMs except as noted in #2 below.

---

<sup>1</sup> Per homogeneous material or area

2. Non-Suspect Materials: For the purposes of this inspection, the following materials were considered non-suspect and were not assessed or sampled if observed:
  - Plastic
  - Glass
  - Wood or Wood Composite Materials
  - Brick, Granite, Marble, or Other Stonework
  - Pink or Yellow Fiberglass Insulation on Pipes or Other Mechanical Components
  - Clay or Ceramic Tiles
  - Rubber or Synthetic Foam
  - Paint (unless textured)
  - Concrete or Mortar (except Gypcrete)
  - Carpeting, Curtains, Wallpaper, and Other Paper/Natural Fiber, Fabric, or Synthetics
3. Homogeneous Applications or Areas: Are suspect materials which serve the same function or purpose (e.g., floor or ceiling tiles) have similar color and texture and were likely installed at or near the same time. Note that the homogeneity of certain materials such as wall and ceiling plaster at times cannot be readily determined.
4. Inaccessible Building Areas: Areas that AXIOM could not survey because it was unsafe or impractical to disassemble or remove systems or coverings or because a human being cannot physically enter or observe the area or components. These areas include, but are not limited to, Transite pipes coming on to the site from municipal utilities mains from the surrounding streets, underground trenches, boilers, vessels, storage tanks and mechanical systems. Also, the roof system was inaccessible at the time of the survey.
5. Confirmed ACMs: Suspect materials where at least one of the bulk samples contains an asbestos concentration greater than 1%. According to the EPA/AHERA criteria, if all bulk samples of a homogeneous area of material are found to contain less than 1% asbestos, the material may be classified as a non-asbestos material.
6. Friable and Non-Friable ACMs: An ACM that can be crumbled, crushed, or otherwise reduced to powder by hand pressure is a friable material; non-friable ACMs cannot. This is important with respect to managing ACMs. Additionally, some non-friable ACMs are regulated differently.

### 3.3 Asbestos Laboratory Services

#### 3.3.1 PLM Bulk Sample Analysis

Bulk samples collected during the inspection were submitted to and analyzed by EMSL Analytical, Inc. (EMSL) located in Woburn, Massachusetts. EMSL is a Massachusetts-licensed asbestos bulk sample laboratory (License #AA000188). Bulk samples were analyzed for asbestos content using EPA Method 600/R-93/116. A chain-of-custody form was used to ensure sample integrity.

The entire inventory of collected samples may not have required analysis. Initially, one sample per material was analyzed. If the first sample was found to contain asbestos, the remaining samples were not analyzed (*Positive Stop* protocol). If the first sample was determined not to contain asbestos, however, the remaining samples were analyzed until >1% asbestos was detected or until the entire sample set was analyzed.

### **3.4 Lead Containing Paint (LCP) Investigation**

Representative testing of paints for the presence of lead was performed in the building as part of AXIOM's scope of work.

#### *3.4.1 Introduction*

Historically, lead was added to paint because its color stability properties made it a desirable pigment and because it enhances durability. Lead-Containing Paint (LCP) becomes harmful when ingested or inhaled as dust or fumes. Once lead was proven to be a health hazard, it was officially banned in 1978 from paints used in residences.

In an occupational setting, if lead-based painted surfaces are to be impacted by renovation or demolition activities, contractor personnel exposure (per OSHA compliance) and waste disposal (per EPA compliance) issues must be addressed and factored into the cost of the project.

#### *3.4.2 Testing Methodology*

AXIOM utilized a Portable X-Ray Fluorescence Analyzer (XRF) to perform the lead paint survey. The XRF is a hand-held instrument that contains a radioisotopic source and operates on the principle of X-ray fluorescence. The depression of a spring-loaded trigger mechanism on the XRF unit opens a shutter in the faceplate that allows radiation from an isotopic source to stimulate the lead atoms in the paint. This stimulation causes the atoms to emit (fluoresce) X-rays which the unit detects and converts into electrical pulses which are then processed, and the result is read through a digital display on the instrument.

AXIOM used a NITON Model XLp300 which analyzes surfaces quickly, accurately, and non-destructively. Surface levels of lead are measured in milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ). This unit can measure the concentration of LCP on surfaces as little as  $0.01 \text{ mg}/\text{cm}^2$ .

#### *3.4.3 XRF Testing Procedures*

Upon arrival at the site, a "validation test" was performed to ensure that the XRF instrument was operating properly. The validation test was performed on a calibration test sheet supplied by the manufacturer to determine if the instrument is consistently measuring lead content. During this survey, the XRF was functioning properly as defined by the manufacturer.

In conducting the LCP survey representative tests were performed on homogeneous (similar color and use) painted surfaces. Results were related to other surfaces possessing similar homogeneous characteristics. By following this sampling protocol, every painted surface did not have to be tested. Representative testing was performed for the presence of lead-based paint (LBP) and lead-containing paint (LCP) on accessible interior and exterior painted surfaces.

### **3.5 Polychlorinated Biphenyls (PCBs) Investigation**

AXIOM conducted an inspection of the building and grounds to identify suspect PCB-containing fluorescent light fixture ballasts, electrical transformers, and bulk products. The survey was conducted in a systematic manner that included:



1. Performing a detailed walk-through to inspect and categorize the various types of accessible fluorescent light fixtures and electrical transformers.
2. Preparing an inventory of electrical light ballasts and transformers known or suspected to contain PCBs. Nameplate data was recorded if it was present and legible.
3. AXIOM inspected the building to identify suspect PCB-containing caulking. The survey included identifying and testing representative caulking compounds materials for PCBs. The bulk samples were collected using hand tools and placed into seal containers (glass sample jars) which were promptly labeled and placed into a cooler with ice. Samples were picked up at the site by a courier and hand delivered to Alpha Analytical Laboratory located in Westborough, MA for analysis. The samples were prepared using the Soxhlet extraction method and analyzed for PCBs by the Environmental Protection Agency (EPA) Methods 3540C and 8082. The complete laboratory reports can be found in Appendix A.

### **3.6 Mercury Light Tube and Thermostat Investigation**

AXIOM inspected the building to identify suspect Mercury-containing equipment as follows:

1. Preparing an inventory of fluorescent light bulbs that contain Mercury vapor in conjunction with the light ballast inspection described in Section 3.5.
2. Performing a walkthrough to identify and inventory thermostats, switches, actuators, and other equipment that contain liquid Mercury.

### **3.7 Chlorofluorocarbons (CFCs) Investigation**

AXIOM inspected the building to identify suspect chlorofluorocarbons (CFCs) associated with refrigeration and air conditioning equipment and prepared an inventory of equipment including an estimate of CFC quantities. Nameplate data was recorded if it was present and legible. Assumptions were made if the unit was inaccessible or if the nameplate was not present or illegible.

### **3.8 Miscellaneous Hazardous Building Materials**

AXIOM inspected the building for miscellaneous hazardous building materials and chemical wastes including oil-containing devices (e.g., boilers, generators, elevators, motors, grease traps, etc.) and miscellaneous items such as lead acid batteries, paints, cleaners, and other chemicals.

## **4.0 FINDINGS AND RECOMMENDATIONS**

### **4.1 Asbestos-Containing Materials**

#### *4.1.1 Asbestos-Containing Materials (ACMs)*

Materials **confirmed** to contain >1% asbestos for the survey are as follows:

**TABLE 1A - CONFIRMED ACMs  
EDGERLY SCHOOL BUILDING, 33 CROSS STREET, SOMERVILLE, MA**

Sample Reference	Sample Description	Sample Location	Estimated Quantity <sup>2</sup>	Results
091621-57-01A-01C	Black Exterior Window Caulking	Exterior Throughout	155 Units	3% CHR
091621-57-24A&B	12" x 12" Pink Floor Tile Mastic	Room 108 & 108A Classroom (Bottom Layer), 2 <sup>nd</sup> Floor Bathrooms	2,500 SF	8% CHR
091621-57-31A-31C	3" Pipe Insulation	Café Rear Storage Room	6 LF	70% CHR
091621-57-32A-32C	3" Pipe Elbow Insulation	Café Rear Storage Room	2 Each	65% CHR
091721-12-04A&B	Chimney Cap Waterproofing	Roof	16 SF	12% CHR
100521-95-04A&B	Asphaltic Coating on Hardwood Planking	2 <sup>nd</sup> Floor Gym	3,900 SF	14% CHR
100521-95-05A&B	Asphaltic Coating on Hardwood Planking	2 <sup>nd</sup> Floor Hardwood Flooring	12,000 SF	14% CHR
100521-95-06A&B	Asphaltic Coating on Hardwood Planking	3 <sup>rd</sup> Floor Hardwood Flooring	11,500 SF	14% CHR

**TABLE 1B - CONFIRMED ACMs FORMER REPORTS  
EDGERLY SCHOOL BUILDING, 33 CROSS STREET, SOMERVILLE, MA**

Material	Location	Estimated Quantity	Friability
Pipe Insulation	Trenches Boiler Room	150 LF	Friable
Boiler Breeching	Boiler Room	600 SF	Friable
Tank Insulation	Boiler Room	400 SF	Friable

**4.1.2 Presumed Asbestos-Containing Materials (PACMs)**

The following presumed ACMs (PACMs) may be present in or on the building or at the site that could not be investigated or tested due to inaccessibility:

**TABLE 2  
PRESUMED ACMs**

<sup>2</sup> SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos

Material	Location	Estimated Quantity	Friability
Asphaltic Damp Proofing	On Foundations, Footings	5,000 SF	Non-Friable
Buried Pipes	Beneath Building or at Site	TBD	TBD
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	Various Areas Building's Interiors	TBD	Friable
FRP Paneling Mastic	1 <sup>st</sup> Floor Bath	300 SF	Non-Friable
Blackboard Adhesive	Classrooms Throughout	800 SF	Non-Friable
Hardwood Flooring Moisture Barrier	Throughout	TBD	Non-Friable
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	Friable

\* = Floor Trenches observed in the boiler room. AXIOM did not observe any pipe/fitting insulation and/or other suspect ACMs in the trenches; however, the full extent of the trenches was not determined due to site restraints.

#### 4.1.3 Non-Asbestos-Containing Materials

Materials **confirmed** to be Non-ACMs for the survey can be found in Appendix D.

#### 4.1.4 Discussion and Recommendations

The mere presence of asbestos in a building does not mean that the health of building occupants is necessarily at risk. As long as the ACMs remain in good condition and are not disturbed, exposure is unlikely. However, when building maintenance, repair, renovation, demolition, or other activities disturb ACMs, or if ACMs are damaged, asbestos fibers are released creating a potential hazard to building occupants.

ACMs associated with the subject building are friable and were in poor to good condition. Since the subject building will be demolished and/or renovated, all ACMs must be removed by a Massachusetts-licensed Asbestos Removal Contractor prior to or in conjunction with the demolition work. As required by governing regulations, completion of each asbestos removal task must include a visual inspection by a Massachusetts-licensed Asbestos Project Monitor and final clearance air testing if asbestos removal is performed inside a negative pressure enclosure (containment).

Regulations require that all ACMs be included in a site-specific asbestos operations and maintenance (O&M) program designed, at a minimum, to comply with 29 CFR 1910.1001 and 1926.1101, incorporating the basic components in the EPA's *Guide to Managing Asbestos in Building*.

PACMs that may be present are identified in Table 2.

Removal of ACMs, PACMs and other HBMs should be clearly defined in a project specification which is used to obtain competitive bids for the work. A detailed cost estimate for removal of ACMs is present in Appendix F and includes an allowance for the removal of PACMs and HBMs.

## 4.2 Lead-Containing Paints (LCP)

The HUD<sup>3</sup> lead paint standard classifies Lead Based Paint (LBP) as paint having  $\geq 1.0$  mg/cm<sup>2</sup> as measured by the XRF or  $\geq 0.5\%$  of lead by weight as analyzed by Atomic Absorption. With respect to renovation and demolition work, OSHA defines a lead-containing paint (LCP) as paint containing detectable amounts of lead.

Testing revealed one paint at the subject building are LBPs. A complete listing of the testing results can be found in Appendix B; however, Table 3 provides a summary of the LBPs at the site.

**TABLE 3  
SUMMARY OF LBP RESULTS**

Description	Location	XRF Reading (mg/cm <sup>2</sup> )
White Metal Utility Door	3 <sup>rd</sup> Floor	5.9
White Metal Air Handling Cover	3 <sup>rd</sup> Floor	12.1
Green Wood Stairwell Post	2 <sup>nd</sup> Floor	1.6
Green Metal Stair Stringer	2 <sup>nd</sup> Floor	1.3
Green Plaster Wall	Gymnasium	1.7
Beige Metal Radiator	1 <sup>st</sup> Floor	1.6
Green Metal Utility Door	1 <sup>st</sup> Floor	1.6
Green Metal Coal Shute Door	Exterior	2.6

Based on analytical results, several the paint samples contained lead in detectable quantities. The most elevated levels of lead were detected in the Utility doors, metal air handling covers, stairwell posts, stair stringer, plaster wall, radiators, and metal coal chute door. The other levels were non-detectable and substantially below the regulatory limit for lead toxicity.

Contractors should be made aware of the presence of lead paint testing results to satisfy the hazard communication requirements set forth by OSHA regulations. Specifically, contractors and subcontractors should be required to comply with OSHA regulation 29 CFR 1926.62 and Massachusetts regulation 453 CMR 22.11 for lead exposure in construction and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This could be accomplished by providing the affected contractors with a copy of this report. The General Contractor is responsible for informing and managing their employees and subcontractors.

The current interpretation of the EPA's Resource Conservation and Recovery Act (RCRA) requires that waste generated during projects where LCPs are present and will be disposed of is tested for the toxicity characteristic of lead in the waste stream. TCLP<sup>4</sup> testing is performed to determine whether waste (construction/demolition debris) must be classified as hazardous because of its lead content or if it can be disposed in a conventional construction and demolition (C&D) landfill. The regulatory limit for lead toxicity is 5.0 milligrams per liter (mg/L) using the EPA Method SW846-7420 for Atomic Absorption Spectroscopy (AAS). Since the need for TCLP testing is typically

<sup>3</sup> U.S. Department of Housing and Urban Development

<sup>4</sup> Toxicity Characteristic Leachate Procedure (TCLP)

determine by the disposal facility/landfill, AXIOM recommends that pre-disposal testing is the contractor's responsibility.

### **4.3 Polychlorinated Biphenyls (PCBs) and Mercury in Electrical Equipment**

#### *4.3.1 Fluorescent Light Fixtures*

AXIOM identified four (4) type of fluorescent light fixture in the subject building. AXIOM was unable to dismantle and inspect the light fixtures due to height restraints and occupied spaces. Therefore, the ballasts are presumed to contain PCBs. If there were ballasts labeled "No PCBs" they would be presumed to contain di (2-ethylhexyl) phthalate (DEHP). A summary of fluorescent light fixtures is provided in Appendix C.

Handling and disposal of fluorescent light ballasts that contain PCBs should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. There are two methods currently available for disposal of PCB-containing ballasts including incineration and disposal. Incineration is typically more expensive. Regardless of the method, documentation must be provided that verifies the proper removal, transportation, and disposal (destruction/incineration) at an approved facility. In general, PCB ballasts must be placed in 55-gallon drums which once filled, the drums must be closed and properly labeled for temporary storage, transport, and disposal in accordance with all applicable regulations. Drums containing PCB ballasts must be transported to an EPA-approved disposal facility (landfill or incinerator). Documentation must be provided that verifies the proper removal, transportation, and disposal (or destruction/incineration) at the approved facility. Drums containing non-PCB fluids, ballasts or capacitors shall be disposed of at a legally permitted disposal facility. There is presently no regulatory mandate for special handling and disposal of DEHP-containing ballasts, however, since there are a number of regulations that may be indirectly applicable<sup>5</sup> and since the disposal cost is not significant, AXIOM recommends disposing of DEHP-containing ballasts similarly.

#### *4.3.2 Transformers*

AXIOM did not observe any transformers in the subject building and/or on the site.

#### *4.3.3 Mercury-Containing Items*

There are approximately five hundred seventy-two (572) fluorescent light bulbs associated with actual light fixtures at the subject building. A summary of mercury-containing items is provided in Appendix C.

Handling and disposal of fluorescent light bulbs that contain Mercury should be performed in accordance with the Massachusetts Universal Waste Management Standard (310 CMR 30.1034) and EPA's Resource Conservation and Recovery Act (RCRA) and other governing regulations and requirements. Guidance documents are also available from the EPA (e.g., the 1994 Green Lights

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<sup>5</sup> Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"), Solid Waste Disposal Act, the Clean Water Act, Safe Drinking Water Act and the Toxic Substances Control Act.

Program for Lighting Waste Disposal). If fluorescent lamps become broken or damaged during removal, the broken lamps should be managed as hazardous waste. Note that fluorescent light tubes may be reused.

Mercury-containing devices must be properly recycled in accordance with 310 CMR 30.1034.

#### 4.4 Chlorofluorocarbons (CFCs)

AXIOM identified widow air conditioners, several water fountains, and refrigerators units at the subject building. A summary of CFC-Containing items is provided in Appendix C.

#### 4.5 Polychlorinated Biphenyls (PCBs) Testing

##### 4.5.1 Summary of PCB Bulk Product Testing Results

The following table provide the laboratory results of analysis of caulking for PCBs. The laboratory reports are in Appendix A.

**TABLE 4  
SUMMARY OF PCBs IN CAULKING COMPOUND RESULTS**

Sample Number	Description	Location	Analysis Results <sup>6</sup>
PCB-01	Exterior Door Caulking	Exterior Throughout	ND
PCB-02	Exterior Window Caulking w/metal double hung window)	Exterior Throughout	ND

Laboratory results are reported in micrograms per kilograms (*ug/kg*) which AXIOM converted to milligrams per kilograms (*mg/kg*) which is equivalent to parts per million (*ppm*) for comparison to EPA definitions.

##### 4.5.2 Discussion

According to 40 CFR 761, the EPA specifies that products and materials containing greater than 50 ppm are PCB bulk products. Based on the result of this investigation, **none** of the caulking are considered a PCB bulk product.

#### 4.6 Miscellaneous Hazardous Wastes

##### 4.6.1 Miscellaneous Hazardous Materials/Wastes

<sup>6</sup> ND = PCBs not detected at the Reporting Limit (RL) for the specific samples. Refer to lab report for PCB Reporting Limits; Results are reported in milligrams per kilogram (*mg/kg*) which is equivalent to parts per million (*ppm*); all ND results include Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268 unless specifically noted otherwise.



AXIOM identified other hazardous materials/wastes including batteries associated with exit signs, batteries associated with emergency lighting, fire extinguishers and chemicals. These items are also listed in Appendix C.

The above listed materials/components are not typically considered hazardous wastes while in use. However, those that are left behind must be properly characterized and disposed of in compliance with governing regulations.

Intact, non-leaking batteries should be handled and disposed of in accordance with the Universal Waste Management Standard 310 CMR 30.1034. If batteries are damaged or become damaged or leak during removal and/or handling, they should be managed as hazardous waste.

## **5.0 LIMITATIONS AND EXCLUSIONS**

### **5.1 Limitations and Conditions of This Investigation**

#### *5.1.1 NESHAPs Asbestos Survey*

This NESHAPs survey involved an investigation for ACMs in preparation for building demolition. Although this investigation attempted to identify and sample inaccessible building materials, some materials were inaccessible, and the potential remains that concealed ACMs may be encountered in the building or at the site.

#### *5.1.2 Inaccessible Materials and Locations*

Inaccessible building areas, systems, structural components, or surfaces which may not have been observed because it was unsafe or impractical to demolish, disassemble, or remove systems or coverings, or because a human being cannot physically enter or observe the area or component. Unless specifically noted, inaccessible materials or areas may include:

- buried or otherwise concealed pipe trenches and utility vaults/corridors;
- buried foundations;
- enclosed wall and ceiling cavities;
- electrical equipment/wire;
- concealed mechanical materials;
- concealed pipe/fitting insulation;

AXIOM made every reasonable effort to address these potential ACMs. However, the potential remains that concealed ACMs could be encountered during renovation or demolition work.

#### *5.1.3 Other Environmental Exclusions*

1. This investigation did not include an assessment of air quality or analysis of soil, surface water or groundwater. Furthermore, this study did not include any subsurface exploration, testing or assessment for wetlands.

2. This investigation did not include assessments for the presence of pesticides, herbicides, urea-formaldehyde, or Radon, nor any air quality monitoring, or any chemical analysis of soil, surface water, or groundwater at the Site.
3. No attempt was made to check the compliance of present or past owners of the Site with Federal, State, or local laws.
4. The testing for lead paint was performed by an experienced Industrial Hygienist. It is intended only to satisfy the requirements of OSHA regulations including 29 CFR 1926.62, *Lead Exposure in Construction: Interim Final Rule* and 29 CFR 1926.59, *Hazard Communication for the Construction Industry*. This investigation was not performed by an EPA HUD<sup>7</sup> or state accredited/licensed Lead Inspector which is often required for residential structures where children under the age of six live.

#### 5.1.4 *Project Specifications*

Users are cautioned that this document is an inspection report, not a project specification. Although it is often feasible to use a report such as this to obtain bids for asbestos and related abatement work, it does not provide a proper and/or complete document for defining the scope of work and specifying contractual obligations.

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<sup>7</sup> US Department of Housing and Urban Development

## APPENDIX A

### Asbestos Bulk and PCB Bulk Sample Results



# EMSL Analytical, Inc.

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Tel/Fax: (781) 933-8411 / (781) 933-8412

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EMSL Order: 132107113

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
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**Phone:** (781) 213-9198

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**Received Date:** 09/20/2021 10:15 AM

**Analysis Date:** 09/27/2021

**Collected Date:** 09/16/2021

**Project:** 01164.117 - City of Somerville; Edgerly School; 33 Cross Street; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-01A <small>132107113-0001</small>	Exterior NE Corner 1st Floor - Black Exterior Window Caulking	Black Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
091621-57-01B <small>132107113-0002</small>	Exterior West 2nd Floor - Black Exterior Window Caulking				Positive Stop (Not Analyzed)
091621-57-01C <small>132107113-0003</small>	Exterior SE 3rd Floor - Black Exterior Window Caulking				Positive Stop (Not Analyzed)
091621-57-02A <small>132107113-0004</small>	Exterior N Side - Gray Exterior Door Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-02BA <small>132107113-0005</small>	Exterior S Side - Gray Exterior Door Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-03A <small>132107113-0006</small>	Exterior NW Corner - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-03B <small>132107113-0007</small>	Exterior West Side - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-03C <small>132107113-0008</small>	Room 209 - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-04A <small>132107113-0009</small>	Room 100 - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
091621-57-04B <small>132107113-0010</small>	Room 105 - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
091621-57-04C <small>132107113-0011</small>	Room 10, 3rd Floor - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
091621-57-04D <small>132107113-0012</small>	Room 200 - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	45% Cellulose 20% Min. Wool	35% Non-fibrous (Other)	None Detected
091621-57-05A <small>132107113-0013</small>	Room 100 - 4" Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-05B <small>132107113-0014</small>	Room 207A - 4" Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-05C <small>132107113-0015</small>	Room 314 - 4" Cove Base Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-06A <small>132107113-0016</small>	Room 100 - 12"x12" Beige Floor Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/27/2021 17:00:18



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**EMSL Order:** 132107113  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-06B <i>132107113-0017</i>	Room 200 - 12"x12" Beige Floor Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-07A <i>132107113-0018</i>	Room 100 - 12"x12" Beige Floor Tile Mastic	Black/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-07B <i>132107113-0019</i>	Room 200 - 12"x12" Beige Floor Tile Mastic	Black/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-09A <i>132107113-0020</i>	Room 101 - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-09B <i>132107113-0021</i>	Room 201 - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-09C <i>132107113-0022</i>	Room 314 - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-10A <i>132107113-0023</i>	Men's Room, 1st Floor SE - 12"x12" Purple/Blue Floor Tile	Purple Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-10B <i>132107113-0024</i>	Men's Room, 1st Floor NW - 12"x12" Purple/Blue Floor Tile	Purple Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-11A <i>132107113-0025</i>	Men's Room, 1st Floor SE - 12"x12" Purple/Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-11B <i>132107113-0026</i>	Men's Room, 1st Floor NW - 12"x12" Purple/Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-12A <i>132107113-0027</i>	Men's Room, 1st Floor NW - 4"x4" White/Gray Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-12B <i>132107113-0028</i>	Women's Room, 3rd Floor - 4"x4" White/Gray Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-14A <i>132107113-0029</i>	Men's Room, 1st Floor NW - Asphaltic Cove Base	White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-14B <i>132107113-0030</i>	Women's Room, 3rd Floor - Asphaltic Cove Base	White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-15A <i>132107113-0031</i>	Men's Room, 1st Floor - Plaster Ceiling	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-15B <i>132107113-0032</i>	1st Floor Hallway - Plaster Ceiling	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-15C <i>132107113-0033</i>	Room 303 - Plaster Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-15D <i>132107113-0034</i>	Room 305 - Plaster Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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EMSL Order: 132107113

Customer ID: AXIO80

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-15E <i>132107113-0035</i>	Room 200 - Plaster Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-15F <i>132107113-0036</i>	Room 206 - Plaster Ceiling	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-16A <i>132107113-0037</i>	Room 104, Women's Bath - 12"x12" Green Floor Tile	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-16B <i>132107113-0038</i>	Room 105, Bottom Layer - 12"x12" Green Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-17A <i>132107113-0039</i>	Room 104, Women's Bath - 12"x12" Green Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-17B <i>132107113-0040</i>	Room 105, Bottom Layer - 12"x12" Green Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-18A <i>132107113-0041</i>	1st Floor Hallway, Middle - Gas Pipe Dope	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-18B <i>132107113-0042</i>	3rd Floor Hallway, NW Corner - Gas Pipe Dope	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-19A <i>132107113-0043</i>	Room 105 - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091621-57-19B <i>132107113-0044</i>	Room 304 - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091621-57-19C <i>132107113-0045</i>	Room 202 - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
091621-57-20A <i>132107113-0046</i>	Room 105 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-20B <i>132107113-0047</i>	Room 304 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-20C <i>132107113-0048</i>	Room 202 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-21A <i>132107113-0049</i>	Room 108, Classroom - 18"x24" Gray Floor Tile	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-21B <i>132107113-0050</i>	Room 108, Kitchen - 18"x24" Gray Floor Tile	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-22A <i>132107113-0051</i>	Room 108, Classroom - 18"x24" Gray Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-22B <i>132107113-0052</i>	Room 108, Kitchen - 18"x24" Gray Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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EMSL Order: 132107113

Customer ID: AXIO80

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Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-23A 132107113-0053	Room 108, Classroom (Bottom Layer) - 12"x12" Pink Floor Tile	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-23B 132107113-0054	2nd Floor, Men's Room - 12"x12" Pink Floor Tile	Pink Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-24A 132107113-0055	Room 108, Classroom (Bottom Layer) - 12"x12" Pink Floor Tile Mastic	Black Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile
091621-57-24B 132107113-0056	2nd Floor, Men's Room - 12"x12" Pink Floor Tile Mastic				Positive Stop (Not Analyzed)
091621-57-26A 132107113-0057	Room 108, Kitchen - Black Sink Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-26B 132107113-0058	Room 211, Kitchen Area - Black Sink Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-27A 132107113-0059	Room 113, Copy Room - 12"x12" Blue Mottled Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-27B 132107113-0060	Room 113, Storage Area - 12"x12" Blue Mottled Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-28A 132107113-0061	Room 113, Copy Room - 12"x12" Blue Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-28B 132107113-0062	Room 113, Storage Area - 12"x12" Blue Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-29A 132107113-0063	Cafeteria, NE Corner - 12"x12" Gray Mottled Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-29B 132107113-0064	3rd Floor, Hall Bath - 12"x12" Gray Mottled Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-30A 132107113-0065	Cafeteria, NE Corner - 12"x12" Gray Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-30B 132107113-0066	3rd Floor, Hall Bath - 12"x12" Gray Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-31A 132107113-0067	Café, Rear Storage Room - 3" Pipe Insulation	White Fibrous Homogeneous		30% Non-fibrous (Other)	70% Chrysotile
091621-57-31B 132107113-0068	Café, Rear Storage Room - 3" Pipe Insulation				Positive Stop (Not Analyzed)
091621-57-31C 132107113-0069	Café, Rear Storage Room - 3" Pipe Insulation				Positive Stop (Not Analyzed)

Initial report from: 09/27/2021 17:00:18



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

<b>EMSL Order:</b> 132107113
<b>Customer ID:</b> AXIO80
<b>Customer PO:</b>
<b>Project ID:</b>

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-32A <small>132107113-0070</small>	Café, Rear Storage Room - Pipe Elbow Assoc. w/ 3" Pipe Insulation	Gray Fibrous Homogeneous		35% Non-fibrous (Other)	65% Chrysotile
091621-57-32B <small>132107113-0071</small>	Café, Rear Storage Room - Pipe Elbow Assoc. w/ 3" Pipe Insulation				Positive Stop (Not Analyzed)
091621-57-32C <small>132107113-0072</small>	Café, Rear Storage Room - Pipe Elbow Assoc. w/ 3" Pipe Insulation				Positive Stop (Not Analyzed)
091621-57-33A <small>132107113-0073</small>	1st Floor Hallway, Near Café - Tan Quarry Tile Mortar	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-33B <small>132107113-0074</small>	2nd Floor Hallway, N Stairwell - Tan Quarry Tile Mortar	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-33C <small>132107113-0075</small>	3rd Floor Hallway, Near 300 - Tan Quarry Tile Mortar	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34A <small>132107113-0076</small>	Room 300 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34B <small>132107113-0077</small>	Room 302 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34C <small>132107113-0078</small>	Storage Room Near 300 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34D <small>132107113-0079</small>	Room 200 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34E <small>132107113-0080</small>	Room 202 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34F <small>132107113-0081</small>	Room 206 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-34G <small>132107113-0082</small>	Room 214 - White Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35A <small>132107113-0083</small>	Room 300 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35B <small>132107113-0084</small>	Room 302 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35C <small>132107113-0085</small>	Storage Room Near 300 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35D <small>132107113-0086</small>	Room 200 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35E <small>132107113-0087</small>	Room 202 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/27/2021 17:00:18



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**EMSL Order:** 132107113  
**Customer ID:** AXIO80  
**Customer PO:**  
**Project ID:**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091621-57-35F <i>132107113-0088</i>	Room 206 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-35G <i>132107113-0089</i>	Room 214 - Gray Base Coat Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-37A <i>132107113-0090</i>	Room 304 - 12"x12" Tan Floor Tile	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-37B <i>132107113-0091</i>	Room 305 - 12"x12" Tan Floor Tile	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-38A <i>132107113-0092</i>	Room 304 - 12"x12" Tan Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-38B <i>132107113-0093</i>	Room 305 - 12"x12" Tan Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091621-57-39A <i>132107113-0094</i>	Room 211 NW Corner - Cloth Covered Prefab Drywall Panel	White Fibrous Homogeneous	3% Cellulose	97% Non-fibrous (Other)	None Detected
091621-57-39B <i>132107113-0095</i>	Room 211 SE Corner - Cloth Covered Prefab Drywall Panel	White Fibrous Homogeneous	3% Cellulose	97% Non-fibrous (Other)	None Detected

Analyst(s)

Kevin McKenzie (88)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/27/2021 17:00:18



**AXIOM PARTNERS**  
 ONE PLEASURE ISLAND RD  
 WAKEFIELD, MA 01880  
 PHONE: 781.213.9198

EMSL LABORATORY ORDER #:  
**132107113**  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

<b>Sampled by:</b>	Geoff Gerace	<b>Date Collected:</b>	9/10/2021
<b>Project Name:</b>	Asbestos-Containing Materials Survey-City of Somerville-Edgerly School		
<b>Project Site:</b>	33 Cross Street, Somerville MA		
<b>Project ID/Number:</b>	01164.117		
<b>Special Lab Instructions:</b>	Positive Stop, E-Mail Results to <a href="mailto:ggerace@axiomenv.com">ggerace@axiomenv.com</a>		

**TURNAROUND TIME – If turn around time is not chosen standard turnaround time applies (6 + Days)**

<b>3 Hours</b>	<b>6 Hours</b>	<b>2 Hours</b>	<b>24 Hours</b>	<b>48 Hours</b>	<b>72 Hours</b>	<b>4 Days</b>	<input checked="" type="checkbox"/> <b>5 Days</b>	<b>6-10 Days</b>
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**TYPE OF ASBESTOS ANALYSIS**

PCM – Air <input type="checkbox"/> NIOSH 7400 (A) Issue 2: August 1994 <input type="checkbox"/> OSHA w/TWA PLM – Bulk <input checked="" type="checkbox"/> <b>EPA 600/R-93/116</b> <input type="checkbox"/> California Air Resource Board (CARB) 435 <input type="checkbox"/> <b>NY Stratified Point Count</b> <input type="checkbox"/> NIOSH 9002 <input type="checkbox"/> PLM NOB (Gravimetric) NYS 198.1 <input type="checkbox"/> EPA Point Count (400 Points) <input type="checkbox"/> EPA Point Count (1,000 Points) <input type="checkbox"/> <b>Standard Addition Point Count</b>	SOILS <input type="checkbox"/> <b>EPA Protocol Qualitative</b> <input type="checkbox"/> <b>EPA Protocol Quantitative</b> <input type="checkbox"/> EMSL MSD 9000 Method fibers/gram <input type="checkbox"/> Superfund EPA 540-R097-028 (dust generation) TEM AIR <input type="checkbox"/> <b>AHERA 40 CFR, Part 763 Subpart E</b> <input type="checkbox"/> NIOSH 7402 Issue 2 <input type="checkbox"/> EPA Level II TEM WIPE <input type="checkbox"/> <b>ASTM D-6480-99</b> <input type="checkbox"/> Qualitative	TEM MICROVAC <input type="checkbox"/> ASTM D 5755-95 (Quantitative) TEM BULK <input type="checkbox"/> <b>Drop Mount (Qualitative)</b> <input type="checkbox"/> Chatfield SOP-1988-02 <input type="checkbox"/> TEM NOB (Gravimetric) NY 198.4 TEM WATER <input type="checkbox"/> EPA 100.1 <input type="checkbox"/> EPA 100.2 <input type="checkbox"/> <b>NYS 198.2</b> <input type="checkbox"/> <b>Other: Page 1 of 5</b>
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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-01A	Black Exterior Window Caulking	Exterior NE Corner 1 <sup>st</sup> Floor
091621-57-01B	Black Exterior Window Caulking	Exterior West 2 <sup>nd</sup> Floor
091621-57-01C	Black Exterior Window Caulking	Exterior SE 3 <sup>rd</sup> Floor
091621-57-02A	Gray Exterior Door Caulking	Exterior N Side
091621-57-02BA	Gray Exterior Door Caulking	Exterior S Side
091621-57-03A	Red Brick Mortar	Exterior NW Corner
091621-57-03B	Red Brick Mortar	Exterior West Side
091621-57-03C	Red Brick Mortar	Room 209
091621-57-04A	2' x 4' White Fissured Ceiling Tile	Room 100
091621-57-04B	2' x 4' White Fissured Ceiling Tile	Room 105
091621-57-04C	2' x 4' White Fissured Ceiling Tile	Room 10 3 <sup>rd</sup> Floor
091621-57-04D	2' x 4' White Fissured Ceiling Tile	Room 200
091621-57-05A	4" Covebase Mastic	Room 100
091621-57-05B	4" Covebase Mastic	Room 207A

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 1521-04185





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EMSL LABORATORY ORDER #:

132107113

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### Asbestos Analysis – Chain of Custody Form

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-05C	4" Covebase Mastic	Room 314
091621-57-06A	12" x 12" Beige Floor Tile	Room 100
091621-57-06B	12" x 12" Beige Floor Tile	Room 200
091621-57-07A	12" x 12" Beige Floor Tile Mastic	Room 100
091621-57-07B	12" x 12" Beige Floor Tile Mastic	Room 200
091621-57-09A	Carpet Mastic	Room 101
091621-57-09B	Carpet Mastic	Room 201
091621-57-09C	Carpet Mastic	Room 314
091621-57-10A	12" x 12" Purple/Blue Floor Tile	Mens Room 1 <sup>st</sup> Floor SE
091621-57-10B	12" x 12" Purple/Blue Floor Tile	Mens Room 1 <sup>st</sup> Floor NW
091621-57-11A	12" x 12" Purple/Blue Floor Tile Mastic	Mens Room 1 <sup>st</sup> Floor SE
091621-57-11B	12" x 12" Purple/Blue Floor Tile Mastic	Mens Room 1 <sup>st</sup> Floor NW
091621-57-12A	4" x 4" White/Gray Ceramic Tile Grout	Mens Room 1 <sup>st</sup> Floor NW
091621-57-12B	4" x 4" White/Gray Ceramic Tile Grout	Womens Room 3 <sup>rd</sup> Floor
091621-57-14A	Asphaltic Covebase	Mens Room 1 <sup>st</sup> Floor NW
091621-57-14B	Asphaltic Covebase	Womens Room 3 <sup>rd</sup> Floor
091621-57-15A	Plaster Ceiling	Mens Room 1 <sup>st</sup> Floor
091621-57-15B	Plaster Ceiling	1 <sup>st</sup> Floor Hallway
091621-57-15C	Plaster Ceiling	Room 303
091621-57-15D	Plaster Ceiling	Room 305
091621-57-15E	Plaster Ceiling	Room 200
091621-57-15F	Plaster Ceiling	Room 206
091621-57-16A	12" x 12" Green Floor Tile	Room 104 Womens Bath
091621-57-16B	12" x 12" Green Floor Tile	Room 105 Bottom Layer
091621-57-17A	12" x 12" Green Floor Tile Mastic	Room 104 Womens Bath

EMSL-BOSTON SEP 20 2021



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WAKEFIELD, MA 01880  
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EMSL LABORATORY ORDER #:

**132107113**

Sample(s) received in good condition? [Y] [N]

Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-17B	12" x 12" Green Floor Tile Mastic	Room 105 Bottom Layer
091621-57-18A	Gas Pipe Dope	1 <sup>st</sup> Floor Hallway Middle
091621-57-18B	Gas Pipe Dope	3 <sup>rd</sup> Floor Hallway NW Corner
091621-57-19A	Gypsum Wall Board	Room 105
091621-57-19B	Gypsum Wall Board	Room 304
091621-57-19C	Gypsum Wall Board	Room 202
091621-57-20A	Joint Compound a/w Gypsum Wall Board	Room 105
091621-57-20B	Joint Compound a/w Gypsum Wall Board	Room 304
091621-57-20C	Joint Compound a/w Gypsum Wall Board	Room 202
091621-57-21A	18" x 24" Gray Floor Tile	Room 108 Classroom
091621-57-21B	18" x 24" Gray Floor Tile	Room 108 Kitchen
091621-57-22A	18" x 24" Gray Floor Tile Mastic	Room 108 Classroom
091621-57-22B	18" x 24" Gray Floor Tile Mastic	Room 108 Kitchen
091621-57-23A	12" x 12" Pink Floor Tile	Room 108 Classroom (Bottom Layer)
091621-57-23B	12" x 12" Pink Floor Tile	2 <sup>nd</sup> Floor Mens Room
091621-57-24A	12" x 12" Pink Floor Tile Mastic	Room 108 Classroom (Bottom Layer)
091621-57-24B	12" x 12" Pink Floor Tile Mastic	2 <sup>nd</sup> Floor Mens Room
091621-57-26A	Black Sink Mastic	Room 108 Kitchen
091621-57-26B	Black Sink Mastic	Room 211 Kitchen Area
091621-57-27A	12" x 12" Blue Mottled Floor Tile	Room 113 Copy Room

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PHONE: 781.213.9198

EMSL LABORATORY ORDER #:

**132107113**

Sample(s) received in good condition? [Y] [N]

Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-27B	12" x 12" Blue Mottled Floor Tile	Room 113 Storage Area
091621-57-28A	12" x 12" Blue Mottled Floor Tile Mastic	Room 113 Copy Room
091621-57-28B	12" x 12" Blue Mottled Floor Tile Mastic	Room 113 Storage Area
091621-57-29A	12" x 12" Gray Mottled Floor Tile	Cafeteria NE Corner
091621-57-29B	12" x 12" Gray Mottled Floor Tile	3 <sup>rd</sup> Floor Bath Hall
091621-57-30A	12" x 12" Gray Mottled Floor Tile Mastic	Cafeteria NE Corner
091621-57-30B	12" x 12" Gray Mottled Floor Tile Mastic	3 <sup>rd</sup> Floor Bath Hall
091621-57-31A	3" Pipe Insulation	Café Rear Storage Room
091621-57-31B	3" Pipe Insulation	Café Rear Storage Room
091621-57-31C	3" Pipe Insulation	Café Rear Storage Room
091621-57-32A	Pipe Elbow a/w 3" Pipe Insulation	Café Rear Storage Room
091621-57-32B	Pipe Elbow a/w 3" Pipe Insulation	Café Rear Storage Room
091621-57-32C	Pipe Elbow a/w 3" Pipe Insulation	Café Rear Storage Room
091621-57-33A	Tan Quarry Tile Mortar	1 <sup>st</sup> Floor Hallway Near Cafe
091621-57-33B	Tan Quarry Tile Mortar	2 <sup>nd</sup> Floor Hallway N Stairwell
091621-57-33C	Tan Quarry Tile Mortar	3 <sup>rd</sup> Floor Hallway near 300
091621-57-34A	White Skimcoat Plaster	Room 300
091621-57-34B	White Skimcoat Plaster	Room 302
091621-57-34C	White Skimcoat Plaster	Storage Room near 300
091621-57-34D	White Skimcoat Plaster	Room 200

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 PHONE: 781.213.9198

EMSL LABORATORY ORDER #:  
132107113  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-34E	White Skimcoat Plaster	Room 202
091621-57-34F	White Skimcoat Plaster	Room 206
091621-57-34G	White Skimcoat Plaster	Room 214
091621-57-35A	Gray Basecoat Plaster	Room 300
091621-57-35B	Gray Basecoat Plaster	Room 302
091621-57-35C	Gray Basecoat Plaster	Storage Room near 300
091621-57-35D	Gray Basecoat Plaster	Room 200
091621-57-35E	Gray Basecoat Plaster	Room 202
091621-57-35F	Gray Basecoat Plaster	Room 206
091621-57-35G	Gray Basecoat Plaster	Room 214
091621-57-37A	12" x 12" Tan Floor Tile	Room 304
091621-57-37B	12" x 12" Tan Floor Tile	Room 305
091621-57-38A	12" x 12" Tan Floor Tile Mastic	Room 304
091621-57-38B	12" x 12" Tan Floor Tile Mastic	Room 305
091621-57-39A	Cloth Covered Prefab Drywall Panel	Room 211 NW Corner
091621-57-39B	Cloth Covered Prefab Drywall Panel	Room 211 SE Corner

Relinquished: Geoff Gerace Date: 9-17-21 Time: 11:00  
 Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

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# EMSL Analytical, Inc.

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<http://www.EMSL.com> / [bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132107078

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 09/21/2021 3:30 PM

**Analysis Date:** 09/24/2021

**Collected Date:** 09/20/2021

**Project:** 01164.117 - Somerville Boxing Club, Interiors Only; 33 Cross Street; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
092021-95-01A <small>132107078-0001</small>	1st Floor Office - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	60% Cellulose 20% Min. Wool	20% Non-fibrous (Other)	None Detected
092021-95-01B <small>132107078-0002</small>	1st Floor Office - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	60% Cellulose 20% Min. Wool	20% Non-fibrous (Other)	None Detected
092021-95-02A <small>132107078-0003</small>	1st Floor Locker Room - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
092021-95-02B <small>132107078-0004</small>	1st Floor Locker Room - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
092021-95-03A <small>132107078-0005</small>	1st Floor Locker Room - Joint Compound w/ Sample 02A	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092021-95-03B <small>132107078-0006</small>	1st Floor Locker Room - Joint Compound w/ Sample 02B	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092021-95-04A <small>132107078-0007</small>	1st Floor Main Gym Area - Remnant Carpet Mastic (on Concrete)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092021-95-04B <small>132107078-0008</small>	1st Floor Main Gym Area - Remnant Carpet Mastic (on Concrete)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092021-95-05A <small>132107078-0009</small>	1st Floor Office - Carpet Mastic (on Concrete)	Gray/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092021-95-05B <small>132107078-0010</small>	1st Floor Office - Carpet Mastic (on Concrete)	Gray/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/24/2021 16:49:54



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

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EMSL Order: 132107078

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Elizabeth Stutts (10)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/24/2021 16:49:54





AXIOM PARTNERS  
 50B SALEM STREET, 3RD  
 LYNNFIELD, MA 01902  
 PHONE: 781.213.9499  
 FAX: 781.213.9999

Sample(s) received in good condition?  Yes  No  
 (If applicable, please include quantity)

**Asbestos Analysis - Chain of Custody Form**

Sampled by: Jesse A. DeGeorge Date Collected: 09-20-21  
 Project Name: Somerville Boxing Club - Interiors Only  
 Project Site: 33 Cross St., Somerville, MA  
 Project ID/Number: 01164.117  
 Special Lab Instructions: POSITIVE STOP; email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com

TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (6 + Days)

3 Hours  6 Hours  12 Hours  24 Hours  48 Hours  72 Hours  4 Days  5 Days  6-10 Days

TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
092021-95-01A	2' x 4' Suspended Ceiling Tile	1 <sup>st</sup> Fl. Office	
092021-95-01B	.	.	
092021-95-02A	Gypsum Wallboard	1 <sup>st</sup> Fl. Locker Room	
092021-95-02B	.	.	
092021-95-03A	Joint Compound w/ Sample #02A	1 <sup>st</sup> Fl. Locker Room	
092021-95-03B	Joint Compound w/ Sample #02B	.	
092021-95-04A	Remnant Carpet Mastic (on concrete)	1 <sup>st</sup> Fl. Main Gym Area	
092021-95-04B	.	.	
092021-95-05A	Carpet Mastic (on concrete)	1 <sup>st</sup> Fl. Office	
092021-95-05B	.	.	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-21-21 Time: -  
 Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

REC'D  
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 SEP 21 2021  
 Wainin



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107196

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Jeff Albert  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (978) 767-1051

**Fax:** (781) 213-6992

**Received Date:** 09/23/2021 12:50 PM

**Analysis Date:** 09/29/2021

**Collected Date:** 09/17/2021

**Project:** 01164.117 - City of Somerville; 33 Cross Street; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
091721-12-01A <small>132107196-0001</small>	Roof, Field 1 - Roof Tar - Mop Down Layer	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-01B <small>132107196-0002</small>	Roof, Field 2 - Roof Tar - Mop Down Layer	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-02A <small>132107196-0003</small>	Roof, Flashing 1 - Roof Tar - Mop Down Layer	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-02B <small>132107196-0004</small>	Roof, Flashing 2 - Roof Tar - Mop Down Layer	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-03A <small>132107196-0005</small>	Roof - Pipe Penetration Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-03B <small>132107196-0006</small>	Roof - Pipe Penetration Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-12-04A <small>132107196-0007</small>	Roof - Chimney Cap Waterproofing	Black Non-Fibrous Homogeneous		88% Non-fibrous (Other)	12% Chrysotile
091721-12-04B <small>132107196-0008</small>	Roof - Chimney Cap Waterproofing				Positive Stop (Not Analyzed)
091721-12-05A <small>132107196-0009</small>	Raised Roof, Field 3 - Roof Tar - Mop Down Layer	Gray/Black Fibrous Homogeneous	40% Cellulose 10% Glass	50% Non-fibrous (Other)	None Detected
091721-12-05B <small>132107196-0010</small>	Raised Roof, Field 4 - Roof Tar - Mop Down Layer	Gray/Black Fibrous Homogeneous	20% Cellulose 5% Glass	75% Non-fibrous (Other)	None Detected

Analyst(s)

John McCarthy (9)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 09/29/2021 17:18:46





**AXIOM PARTNERS**  
 ONE PLEASURE ISLAND ROAD  
 WAKEFIELD, MA 01880  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #:  
132107196  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis - Chain of Custody Form**

Sampled by:	JEFF ALBERT	Date Collected:	SEPT. 17, 2021
Project Name:	HALEY & ALDRICH/CITY OF SOMERVILLE		
Project Site:	33 CROSS ST., SOMERVILLE, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	POSITIVE STOP PROTOCOL - SEND RESULTS TO JEFF ALBERT, JALBERT@AXIOMENV.COM		

TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (6 + Days)

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input checked="" type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
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TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION
091721-12-01A	ROOF TAR - MOP DOWN LAYER	ROOF, FIELD 1
091721-12-01B	ROOF TAR - MOP DOWN LAYER	ROOF, FIELD 2
091721-12-02A	ROOF TAR - MOP DOWN LAYER	ROOF, FLASHING 1
091721-12-02B	ROOF TAR - MOP DOWN LAYER	ROOF, FLASHING 2
091721-12-03A	PIPE PENETRATION TAR FLASHING	ROOF
091721-12-03B	PIPE PENETRATION TAR FLASHING	ROOF
091721-12-04A	CHIMNEY CAP WATERPROOFING	ROOF
091721-12-04B	CHIMNEY CAP WATERPROOFING	ROOF
091721-12-05A	ROOF TAR - MOP DOWN LAYER	RAISED ROOF, FIELD 3
091721-12-05B	ROOF TAR - MOP DOWN LAYER	RAISED ROOF FIELD 4

Relinquished:

*Jeff Albert*

Date:

09/23/21

Time:

12:51 P.M.

Received:

Date:

Time:

REC'D  
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 SEP 23 2021  
 WAIN IN



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107463

Customer ID: AXIO80

Customer PO:

Project ID:

**Attention:** Geoff Gerace  
Axiom Partners, Inc.  
50B Salem Street, Suite 103  
Lynnfield, MA 01940

**Phone:** (781) 213-9198

**Fax:** (781) 213-6992

**Received Date:** 10/05/2021 2:00 PM

**Analysis Date:** 10/06/2021

**Collected Date:** 10/05/2021

**Project:** 01164.117 - Edgerly School Building; 33 Cross Street; Somerville, MA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
100521-95-01A <small>132107463-0001</small>	1st Floor, Room 110 - Paper Under Wood Floor (Under Carpet & on Wood Substrate)	Tan/Black Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
100521-95-01B <small>132107463-0002</small>	1st Floor, Room 110 - Paper Under Wood Floor (Under Carpet & on Wood Substrate)	Tan Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
100521-95-02A <small>132107463-0003</small>	2nd Floor, Room 201 - Paper Under Hardwood Planking Floor (on Wood Substrate)	Tan/Black Non-Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
100521-95-02B <small>132107463-0004</small>	2nd Floor, Room 201 - Paper Under Hardwood Planking Floor (on Wood Substrate)	Brown Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
100521-95-03A <small>132107463-0005</small>	2nd Floor, Gym - Fiberboard Underlayment Under Hardwood Planking Floor (on Concrete Substrate)	Tan/Black Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (Other)	None Detected
100521-95-03B <small>132107463-0006</small>	2nd Floor, Gym - Fiberboard Underlayment Under Hardwood Planking Floor (on Concrete Substrate)	Tan/Black Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (Other)	None Detected
100521-95-04A <small>132107463-0007</small>	2nd Floor, Gym - Asphaltic Coating Under Hardwood Planking Floor (on Concrete Substrate)	Black Non-Fibrous Homogeneous		86% Non-fibrous (Other)	14% Chrysotile
100521-95-04B <small>132107463-0008</small>	2nd Floor, Gym - Asphaltic Coating Under Hardwood Planking Floor (on Concrete Substrate)				Positive Stop (Not Analyzed)
100521-95-05A <small>132107463-0009</small>	2nd Floor, Special Education Area Room 211, Break Room - Asphaltic Tar Paper/Mastic Under Hardwood Planking Floor (on Concrete Substrate)	Black Non-Fibrous Homogeneous		86% Non-fibrous (Other)	14% Chrysotile

Initial report from: 10/06/2021 16:20:08



# EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

<b>EMSL Order:</b> 132107463
<b>Customer ID:</b> AXIO80
<b>Customer PO:</b>
<b>Project ID:</b>

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
100521-95-05B <i>132107463-0010</i>	2nd Floor, Special Education Area Room 211, Break Room - Asphaltic Tar Paper/Mastic Under Hardwood Planking Floor (on Concrete Substrate)				Positive Stop (Not Analyzed)
100521-95-06A <i>132107463-0011</i>	3rd Floor, Room 7 (Office/Classroom) - Asphaltic Coating Under Hardwood Planking Floor (on Concrete Substrate)	Black Fibrous Homogeneous		86% Non-fibrous (Other)	14% Chrysotile
100521-95-06B <i>132107463-0012</i>	3rd Floor, Room 7 (Office/Classroom) - Asphaltic Coating Under Hardwood Planking Floor (on Concrete Substrate)				Positive Stop (Not Analyzed)
100521-95-07A <i>132107463-0013</i>	3rd Floor, Room 301 (Classroom) - Paper Under Hardwood Planking Floor (on Concrete Substrate)	Brown/Black Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
100521-95-07B <i>132107463-0014</i>	3rd Floor, Room 301 (Classroom) - Paper Under Hardwood Planking Floor (on Concrete Substrate)	Tan/Black Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected

Analyst(s)

John McCarthy (11)

Steve Grise, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 10/06/2021 16:20:08





**AXIOM PARTNERS**  
 50B SALEM STREET, STE 103  
 LYNNFIELD, MA 01490  
 PHONE: 781.213.9198  
 FAX: 781.213.6992

LABORATORY ORDER #:  
132107463  
 Sample(s) received in good condition? [Y] [N]  
 Discernable field blank submitted? [Y] [N]

**Asbestos Analysis – Chain of Custody Form**

Sampled by:	Jesse A. DeGeorge	Date Collected:	09-20-21
Project Name:	Edgerly School Building ~ Floor Survey Only		
Project Site:	33 Cross St., Somerville, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	<b>POSITIVE STOP</b> ; email results to ggerace@axiomenv.com and jesse.degeorge@gmail.com		

**TURNAROUND TIME – If turnaround time is not chosen standard turnaround time applies (6 + Days)**

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input checked="" type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
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**TYPE OF ASBESTOS ANALYSIS: EPA 600/R-93/116**

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
100521-95-01A	Paper under Wood Floor (under carpet & on wood substrate)	1 <sup>st</sup> Fl., Room #110	
100521-95-01B	*	*	
100521-95-02A	Paper under Hardwood Planking Floor (on wood substrate)	2 <sup>nd</sup> Fl., Room #201	
100521-95-02B	*	*	
100521-95-03A	Fiberboard Underlayment under Hardwood Planking Floor (on concrete substrate)	2 <sup>nd</sup> Fl., Gym	
100521-95-03B	*	*	
100521-95-04A	Asphaltic Coating under Hardwood Planking Floor (on concrete substrate)	2 <sup>nd</sup> Fl., Gym	
100521-95-04B	*	*	
100521-95-05A	Asphaltic Tar Paper/Mastic under Hardwood Planking Floor (on concrete substrate)	2 <sup>nd</sup> Fl., Special Education Area Rm. 211, Break Room	
100521-95-05B	*	*	
100521-95-06A	Asphaltic Coating under Hardwood Planking Floor (on concrete substrate)	3 <sup>rd</sup> Fl., Room 7 (Office/Classroom)	
100521-95-06B	*	*	
100521-95-07A	Paper under Hardwood Planking Floor (on concrete substrate)	3 <sup>rd</sup> Fl., Room 301 (Classroom)	
100521-95-07B	*	*	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 10-05-21 Time: -

Received: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

REC'D SPG 1400 w...  
 EMSL-BOSTON OCT 05 2021



## ANALYTICAL REPORT

Lab Number:	L2151189
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY OF SOMERVILLE, EDGERLY
Project Number:	01164.117
Report Date:	09/28/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2151189-01	PCB-01	SOLID	33 CROSS ST	09/16/21 14:21	09/22/21
L2151189-02	PCB-02	SOLID	33 CROSS ST	09/16/21 14:34	09/22/21



**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.


Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 09/28/21

# ORGANICS

# PCBS

**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

**SAMPLE RESULTS**

Lab ID: L2151189-01  
 Client ID: PCB-01  
 Sample Location: 33 CROSS ST

Date Collected: 09/16/21 14:21  
 Date Received: 09/22/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/28/21 10:43  
 Analyst: CW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/27/21 02:02  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/28/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/28/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/28/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	604	--	1	A
Aroclor 1221	ND		ug/kg	604	--	1	A
Aroclor 1232	ND		ug/kg	604	--	1	A
Aroclor 1242	ND		ug/kg	302	--	1	A
Aroclor 1248	ND		ug/kg	604	--	1	A
Aroclor 1254	ND		ug/kg	604	--	1	A
Aroclor 1260	ND		ug/kg	604	--	1	A
Aroclor 1262	ND		ug/kg	604	--	1	A
Aroclor 1268	ND		ug/kg	302	--	1	A
PCBs, Total	ND		ug/kg	302	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	58		30-150	A
Decachlorobiphenyl	53		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	52		30-150	B

**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

**SAMPLE RESULTS**

Lab ID: L2151189-02  
 Client ID: PCB-02  
 Sample Location: 33 CROSS ST

Date Collected: 09/16/21 14:34  
 Date Received: 09/22/21  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Solid  
 Analytical Method: 1,8082A  
 Analytical Date: 09/28/21 10:59  
 Analyst: CW  
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C  
 Extraction Date: 09/27/21 02:02  
 Cleanup Method: EPA 3630  
 Cleanup Date: 09/28/21  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 09/28/21  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 09/28/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	545	--	1	A
Aroclor 1221	ND		ug/kg	545	--	1	A
Aroclor 1232	ND		ug/kg	545	--	1	A
Aroclor 1242	ND		ug/kg	272	--	1	A
Aroclor 1248	ND		ug/kg	545	--	1	A
Aroclor 1254	ND		ug/kg	545	--	1	A
Aroclor 1260	ND		ug/kg	545	--	1	A
Aroclor 1262	ND		ug/kg	545	--	1	A
Aroclor 1268	ND		ug/kg	272	--	1	A
PCBs, Total	ND		ug/kg	272	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65		30-150	A
Decachlorobiphenyl	61		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	62		30-150	B

**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8082A  
Analytical Date: 09/28/21 09:48  
Analyst: JM

Extraction Method: EPA 3540C  
Extraction Date: 09/27/21 02:02  
Cleanup Method: EPA 3630  
Cleanup Date: 09/28/21  
Cleanup Method: EPA 3665A  
Cleanup Date: 09/28/21  
Cleanup Method: EPA 3660B  
Cleanup Date: 09/28/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-02 Batch: WG1551033-1						
Aroclor 1016	ND		ug/kg	602	--	A
Aroclor 1221	ND		ug/kg	602	--	A
Aroclor 1232	ND		ug/kg	602	--	A
Aroclor 1242	ND		ug/kg	301	--	A
Aroclor 1248	ND		ug/kg	602	--	A
Aroclor 1254	ND		ug/kg	602	--	A
Aroclor 1260	ND		ug/kg	602	--	A
Aroclor 1262	ND		ug/kg	602	--	A
Aroclor 1268	ND		ug/kg	301	--	A
PCBs, Total	ND		ug/kg	301	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	57		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		30-150	B
Decachlorobiphenyl	56		30-150	B



## Lab Control Sample Analysis

### Batch Quality Control

Project Name: CITY OF SOMERVILLE, EDGERLY

Project Number: 01164.117

Lab Number: L2151189

Report Date: 09/28/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1551033-2 WG1551033-3									
Aroclor 1016	67		70		40-140	4		50	A
Aroclor 1260	71		74		40-140	4		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		65		30-150	A
Decachlorobiphenyl	59		61		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		66		30-150	B
Decachlorobiphenyl	58		60		30-150	B

**Project Name:** CITY OF SOMERVILLE, EDGERLY

**Lab Number:** L2151189

**Project Number:** 01164.117

**Report Date:** 09/28/21

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

**Cooler**                      **Custody Seal**  
A                                      Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2151189-01A	Glass 120ml/4oz unpreserved	A	NA		2.7	Y	Absent		PCB-8082-CAULK(365)
L2151189-02A	Glass 120ml/4oz unpreserved	A	NA		2.7	Y	Absent		PCB-8082-CAULK(365)

\*Values in parentheses indicate holding time in days



**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

**Lab Number:** L2151189  
**Report Date:** 09/28/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



**Project Name:** CITY OF SOMERVILLE, EDGERLY  
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### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



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#### **Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** CITY OF SOMERVILLE, EDGERLY  
**Project Number:** 01164.117

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**Report Date:** 09/28/21

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





## Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpeneol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



**APPENDIX B**  
**Lead Paint Testing Results**

## XRF PAINT TESTING RESULTS

33 Cross Street, Somerville, MA

LOCATION	SAMPLE CODE	SUBSTRATE TYPE	PAINT CONDITION	XRF READING (mg/cm <sup>2</sup> )	COLOR/ COMMENTS
Calibration SRM 2570				0.00	White
Calibration SRM 2573				0.9	Dark Orange
Calibration SRM 2574				0.6	Gold
Calibration SRM 2571				3.7	Yellow
Calibration SRM 2572				1.5	Lite Orange
Calibration SRM 2575				0.4	Green
Third Floor	Stairs Post	Metal	1	0.8	Yellow
Third Floor	Stairs Guardrail	Wood	1	0.00	Gray
Third Floor	Floor	Concrete	2	0.05	Gray
Third Floor	Window Frame	Metal	1	0.00	Green
Third Floor	Wall	Block	1	0.00	White
Third Floor	Structural Column	Concrete	1	0.00	White
Third Floor	Radiator	Metal	1	0.14	White
Third Floor	Door Frame	Metal	1	0.18	White
Third Floor	Wall	Gypsum	1	0.00	Peach
Third Floor	Chair Rail	Wood	1	0.00	White
Third Floor	Window Casing	Wood	1	0.00	White
Third Floor	Return Air Grill	Metal	1	0.00	White
Third Floor	Window Frame	Wood	1	0.00	White
<b>Third Floor</b>	<b>Utility Door</b>	<b>Metal</b>	<b>1</b>	<b>5.9</b>	<b>White</b>
Third Floor	Wall	Block	1	0.01	White

**Bold Results** are paints exceeding the US Housing and Urban Development (HUD) "Lead-Based Paint" definition of greater than 1.0 milligram per square centimeter (mg/cm<sup>2</sup>) of lead by XRF testing.

Note that the US Occupational Safety and Health Administration (OSHA) considers any paint containing any level of lead as "Lead-Containing Paint" or LCP.

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)

## XRF PAINT TESTING RESULTS

33 Cross Street, Somerville, MA

LOCATION	SAMPLE CODE	SUBSTRATE TYPE	PAINT CONDITION	XRF READING (mg/cm <sup>2</sup> )	COLOR/ COMMENTS
Third Floor	Wall	Brick	1	0.00	White
Third Floor	Floor	Concrete	1	0.00	Gray
<b>Third Floor</b>	<b>Air Handler Cover</b>	<b>Metal</b>	<b>1</b>	<b>12.1</b>	<b>White</b>
Third Floor	Door Frame	Metal	1	0.9	White
Third Floor	Air Handler Cover	Metal	1	0.11	White
Third Floor	Cove Base	Wood	1	0.4	White
<b>Second Floor</b>	<b>Stair Rail Post</b>	<b>Wood</b>	<b>1</b>	<b>1.6</b>	<b>Green</b>
<b>Second Floor</b>	<b>Stair Stringer</b>	<b>Metal</b>	<b>1</b>	<b>1.3</b>	<b>Green</b>
Second Floor	Fire Door	Metal	1	0.04	Blue
Second Floor	Air Handler Cover	Metal	1	0.01	White
Second Floor	Cove Base	Wood	1	0.7	Blue
Second Floor	Shelf	Wood	1	0.00	White
Second Floor	Floor	Concrete	1	0.4	Brown
Second Floor	Wall	Brick	1	0.00	Green
Second Floor	Radiator	Metal	1	0.00	White
Second Floor	Wainscotting	Wood	1	0.08	Green
<b>Auditorium/Gym</b>	<b>Stage Plaster</b>	<b>Plaster</b>	<b>2</b>	<b>1.7</b>	<b>Green</b>
Auditorium/Gym	Wall	Plaster	1	0.00	White
Auditorium/Gym	Air Handler Cover	Metal	1	0.4	White
Auditorium/Gym	Wall	Block	1	0.02	Tan
Auditorium/Gym	Wall	Block	1	0.00	White
First Floor	Stair Handrail	Wood	1	0.01	Green
First Floor	Wall	Block	1	0.01	White
First Floor	Window Opening	Concrete	1	0.00	White
<b>First Floor</b>	<b>Radiator</b>	<b>Metal</b>	<b>3</b>	<b>1.6</b>	<b>Beige</b>

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; SR-Stair Railing; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage); 2 = Slight Damage (6-15% Damage); 3 = Moderate Damage (16-25% Damage); 4 = Extensive Damage (26-50% Damage); 5 = Severe Damage (>50% Damage)

**XRF PAINT TESTING RESULTS**  
**33 Cross Street, Somerville, MA**

LOCATION	SAMPLE CODE	SUBSTRATE TYPE	PAINT CONDITION	XRF READING (mg/cm <sup>2</sup> )	COLOR/ COMMENTS
First Floor	Structural Column	Metal	1	0.9	Yellow
First Floor	Wall	Brick	1	0.16	Yellow
First Floor	Door Frame	Wood	2	0.04	Black
<b>First Floor</b>	<b>Utility Door</b>	<b>Metal</b>	<b>1</b>	<b>1.6</b>	<b>Green</b>
First Floor	Floor	Concrete	1	0.01	Gray
Exterior	Vent Grill	Metal	1	0.00	Blue
Exterior	Wall	Block	1	0.00	Red
Exterior	Wall	Block	3	0.01	Green
Exterior	Door Opening	Brick	4	0.6	Green
<b>Exterior</b>	<b>Coal Chute Door</b>	<b>Metal</b>	<b>4</b>	<b>2.6</b>	<b>Green</b>
Exterior	Door Opening	Brick	1	0.30	Green
Exterior	Window Frame	Metal	1	0.00	Blue
Exterior	Door Frame	Metal	1	0.00	Green
Exterior	Door Frame	Metal	1	0.00	Green
Exterior	Door Frame	Metal	1	0.00	Green
Boxing Gym Area-Rear	Brick Wall	Brick	1	0.66%	White
Boxing Gym Area	Structural Column	Concrete	1	0.077%	Red
Boxing Gym Area-Locker Room	Floor	Concrete	3	ND	Gray
Boxing Gym Area	Window Sill	Concrete	1	0.12%	White

**SAMPLE CODE:**

BB-Baseboard; B-Bollards/Bumpers; C/T-Casing/Trim; CL-Ceiling; CR-Chair Rail; D-Door; DC-Door Casing; DJ-Door Jamb; DW-Duct Work; E-Equipment; FL-Floor; HR- Handrail; HVAC-Fans/Air Handlers; P-Piping; R-Railing; RD-Radiator; RC-Radiator Cover; SB-Stair Balusters; SH-Shingles/Siding; SR-Stair Riser; SS-Stair Stringer; ST, Stair Tread; STC-Structural Column; STB-Structural Beam; STM-Structure Misc; W-Wall; UW-Upper Wall; LW-Lower Wall; WSH-Window Sash; WC-Window Casing; WSL-Window Sill

**SUBSTRATE TYPE:**

W-Wood; G-Gypsum Board; P-Plaster; C-Concrete; CB- Concrete Block; PA-Paneling; T-Tile; M-Metal; B-Brick; U-Unknown

**PAINT CONDITION:**

1 to 5; 1 = Undamaged (< 5% damage) ; 2 = Slight Damage (6-15% Damage) ; 3 = Moderate Damage (16-25% Damage) ; 4 = Extensive Damage (26-50% Damage) ; 5 = Severe Damage (>50% Damage)





# EMSL Analytical, Inc.

5 Constitution Way, Unit A, Woburn, MA 01801

Phone/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com>

[bostonlab@emsl.com](mailto:bostonlab@emsl.com)

EMSL Order: 132107054

CustomerID: AXIO80

CustomerPO:

ProjectID:

Attn: **Geoff Gerace**  
**Axiom Partners, Inc.**  
**50B Salem Street, Suite 103**  
**Lynnfield, MA 01940**

Phone: (781) 213-9198  
Fax: (781) 213-6992  
Received: 9/21/2021 03:30 PM  
Collected: 9/20/2021

Project: **01164.117 - Somerville Boxing Club; 33 Cross Street; Somerville, MA**

## Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>Lead Concentration</i>
PC-01 Site: Interior, 1st Floor Main Gym Area (Rear Wall) Desc: White Paint - Brick Wall	132107054-0001	9/20/2021	9/24/2021	0.2505 g	0.66 % wt
PC-02 Site: Interior, 1st Floor Main Gym Area Desc: Red Paint - Concrete Structural Support Column	132107054-0002	9/20/2021	9/24/2021	0.2513 g	0.071 % wt
PC-03 Site: Interior, 1st Floor Locker Room Desc: Gray Paint - Concrete Floor	132107054-0003	9/20/2021	9/24/2021	0.2504 g	<0.0080 % wt
PC-04 Site: Interior, 1st Floor Weight Lifting Area Desc: White Paint - Concrete Window Sill	132107054-0004	9/20/2021	9/24/2021	0.2525 g	0.12 % wt

Eric Steele, Laboratory Manager  
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA AIHA-LAP, LLC - ELLAP Accredited #180179

Initial report from 09/24/2021 15:29:15

**ProScience Analytical Services, Inc.**  
**Chemistry Chain of Custody Record**

LABORATORY/HEADQUARTERS  
 22 Cummings Park, Woburn, MA 01801  
 T: 781-935-3212 F: 781-935-4857

www.proscience.net  
 general@proscience.net

Client: AXIOM Partners, Inc.

Address: Street 508 Salem St., Ste #103  
 Town Lynnfield, MA

State/Zip 01940

Project Site Line 1 Somerville Boxing Club  
 Line 2

Project Number 01164-117

Contact: 33 Cross St., Somerville, MA  
 Jesse A. DeGeorge

Phone  
 Fax  
 Alt/Pager

Date and Time Sampled Field ID. Sample Description/Location

Start Time End Time Air Sampling Information Start End Flowrate Flowrate

Volume (liters) Length (inch) Width (inch) Area (sq in)

Weight (grams) Diln Reading

ANALYSIS AA RESULT

Lab ID.

9/20/21 PC-01 Interior, 1st Fl, Main Gym Area (rear wall), White Paint on Brick Wall

9/20/21 PC-02 Interior, 1st Fl, Main Gym Area, Red Paint on Concrete Structural Support Column

9/20/21 PC-03 Interior, 1st Fl, Locker Room, Gray Paint on Concrete Floor

9/20/21 PC-04 Interior, 1st Fl, Weight Lifting Area, White Paint on Concrete Window Sill

NELAC analysis

TYPE OF ANALYSIS (circle)  
 DUST  
 WIPES  
 AIR  
 TSP  
 PM10  
 Other

Element  
 Cd Cr As  
 Se Ag Ba Hg  
 Other (please specify in other comments)

ASTM E1792

FOR LABORATORY USE ONLY

GC

CATCH NUMBER

C

132107054  
 Rush/6 Hours  
 Same Day  
 Next Day  
 2 Day  
 3 Day  
 5 Days

Turn Around Time Requested (circle)

Relinquished By: Jesse A. DeGeorge  
 Received By: *Jesse A. DeGeorge*

Date: 9/21/2021

Time:

Comments:

Email results to Geoff Garace at ggarace@axiomenv.com & Jesse DeGeorge at jesse.degeorge@gmail.com

Ver 3.2

PAGE 1 OF 1

REC'D  
 EMSL-BOSTON  
 SEP 21 2021  
 3:30 PM  
 J. DeGeorge

**APPENDIX C**  
**Hazardous Building Materials**  
**Summary Tables**

## MISCELLANEOUS HAZARDOUS BUILDING MATERIALS INVENTORY

33 Cross Street, Somerville, MA

### BULBS & BALLASTS

DESCRIPTION	LOCATION*	MFG./MODEL	BALLAST QUANTITY	BULB QUANTITY	PCB CONTENT
1' x 4' Surface Mounted Fixture, 2 x 4' Bulbs	Throughout	Unknown	72	144	Unknown
2' x 4' Lay-in Fixture, 2 x 4' Bulbs	Throughout	Unknown	199	398	Unknown
2' x 4' Lay-in Fixture, 1 x U-Type Bulbs	Bathrooms	Unknown	6	6	Unknown
1' x 4' Suspended Fixture, 2 x 4' Bulbs	First Floor	Unknown	12	24	Unknown

### CFC-CONTAINING ITEMS

DESCRIPTION/LOCATION	HVAC MANUFACTURER	NUMBER OF UNITS	AMOUNT/TYPE OF RCFCs
Window AC / Throughout	Various	58	Unknown / Unknown
Full Refrigerator / Throughout	Unknown	2	Unknown / Unknown
Cold Water Dispenser / Throughout	Unknown	4	Unknown / Unknown
Water bubbler, Built-in / Hallways	Unknown	4	Unknown / Unknown
Walk-in Freezer, Cafeteria	Unknown	1	Unknown / Unknown
Large Refrigerator, Cafeteria	Unknown	1	Unknown / Unknown
Large Portable Refrigerator, Cafeteria	Unknown	1	Unknown / Unknown

### MERCURY-CONTAINING ITEMS

DESCRIPTION	LOCATION	MANUFACTURER	NUMBER OF UNITS
N/A	N/A	N/A	N/A

### MISCELLANEOUS ITEMS

DESCRIPTION	LOCATION	QUANTITY
Dry Cell Batteries Associated with Emergency Lights	Throughout, Hallways	15
Dry Cell Batteries Associated with Exit Signs	Throughout, Hallways	17
Fire Extinguishers Dry Cell Type ABC	Throughout, Hallways	12
White Goods, Small/Medium Size Appliances	Throughout	4
Hydraulic Fluid/Grease Associated with Elevator	Elevator / Elevator Room	1
Fire Extinguishers Water Filled	Throughout, Hallways	2

**MISCELLANEOUS HAZARDOUS BUILDING MATERIALS INVENTORY**

**33 Cross Street, Somerville, MA**

DESCRIPTION	LOCATION	QUANTITY
Dry Cell Batteries Associated with Fire Alarm/Control Panels	First Floor Utility Room	6

**APPENDIX D**  
**Non-ACMs Tables**



## Non-ACM Table

<b>SAMPLE NUMBER</b>	<b>SAMPLE DESCRIPTION</b>	<b>SAMPLE LOCATION</b>
091621-57-02A&B	Gray Exterior Door Caulking	Exterior
091621-57-03A-03C	Red Brick Mortar	Exterior
091621-57-04A-04D	2' x 4' White Fissured Ceiling Tile	Throughout
091621-57-05A-05C	4" Covebase Mastic	Throughout
091621-57-06A&B	12" x 12" Beige Floor Tile	Rooms 100, 101,108A,109, 110, 202, 203, 204, 205, 207, 209, 213, 214
091621-57-07A&B	12" x 12" Beige Floor Tile Mastic	Rooms 100, 101,108A,109, 110, 202, 203, 204, 205, 207, 209, 213, 214
091621-57-09A-09C	Carpet Mastic	Throughout
091621-57-10A&B	12" x 12" Purple/Blue Floor Tile	Mens Room 1 <sup>st</sup> Floor
091621-57-11A&B	12" x 12" Purple/Blue Floor Tile Mastic	Mens Room 1 <sup>st</sup> Floor
091621-57-12A&B	4" x 4" White/Gray Ceramic Tile Grout	Mens Room 1 <sup>st</sup> Floor
091621-57-14A&B	Asphaltic Covebase	Bathrooms Throughout
091621-57-15A-15F	Plaster Ceiling	Throughout
091621-57-16A&B	12" x 12" Green Floor Tile	Room 105 Bottom Layer
091621-57-17A&B	12" x 12" Green Floor Tile Mastic	Room 104 Womens Bath
091621-57-18A&B	Gas Pipe Dope	3 <sup>rd</sup> Floor Hallway NW Corner
091621-57-19A-19C	Gypsum Wall Board	Room 105
091621-57-20A-20C	Joint Compound a/w Gypsum Wall Board	Room 202
091621-57-21A&B	18" x 24" Gray Floor Tile	Room 108 Classroom
091621-57-22A&B	18" x 24" Gray Floor Tile Mastic	Room 108 Kitchen
091621-57-23A&B	12" x 12" Pink Floor Tile	Room 108 Classroom (Bottom Layer)
091621-57-26A&B	Black Sink Mastic	Room 211 Kitchen Area
091621-57-27A&B	12" x 12" Blue Mottled Floor Tile	Room 113 Copy Room
091621-57-28A&B	12" x 12" Blue Mottled Floor Tile Mastic	Room 113 Storage Area

## Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
091621-57-29A&B	12" x 12" Gray Mottled Floor Tile	Cafeteria NE Corner
091621-57-30A&B	12" x 12" Gray Mottled Floor Tile Mastic	3 <sup>rd</sup> Floor Bath Hall
091621-57-33A-33C	Tan Quarry Tile Mortar	3 <sup>rd</sup> Floor Hallway near 300
091621-57-34A-34G	White Skimcoat Plaster	Room 300
091621-57-35A-35G	Gray Basecoat Plaster	Room 214
091621-57-37A&B	12" x 12" Tan Floor Tile	Room 304
091621-57-38A&B	12" x 12" Tan Floor Tile Mastic	Room 305
091621-57-39A&B	Cloth Covered Prefab Drywall Panel	Room 211 NW Corner
092021-95-01A&B	2' x 4' Suspended Ceiling Tile	Boxing Gym
092021-95-02A&B	Gypsum Wallboard	Boxing Gym
092021-95-03A&B	Joint Compound a/w Gypsum Wallboard	Boxing Gym
092021-95-04A&B	Remnant Carpet Mastic	Boxing Gym
092021-95-05A&B	Carpet Mastic	Boxing Gym
091721-12-01A&B	Roof Field Built Up Layer	Roof
091721-12-02A&B	Roof Flashing	Roof
091721-12-03A&B	Pipe Penetration Tar	Roof
091721-12-05A&B	Built Up Layer Raised Roof	Raised Roof Area

**APPENDIX E**  
**Photographs**



**Photo 1**

View of Asbestos-Containing Exterior Window Caulking



**Photo 2**

View of Asbestos-Containing 12" Pink Floor Tile Mastic



**Photo 3**

View of Asbestos-Containing Pipe Insulation



**Photo 4**

View of Asbestos-Containing Pipe Elbow Insulation



**Photo 5**

View of Asbestos-Containing Asphaltic Coating  
on Hardwood Planking

## **APPENDIX F**

### **Asbestos and Hazardous Building Materials Abatement Cost Estimate**



**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**Edgerly School Building**  
**33 Cross Street, Somerville, MA**

**Asbestos Removal, ACMs**

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Black Exterior Window Caulking	Exterior Throughout	155 Units	\$19,375
12" x 12" Pink Floor Tile Mastic	Room 108 & 108A Classroom (Bottom Layer), 2 <sup>nd</sup> Floor Bathrooms	2,500 SF	\$12,500
3" Pipe Insulation	Café Rear Storage Room	6 LF	\$200
3" Pipe Elbow Insulation	Café Rear Storage Room	2 Each	\$100
Chimney Cap Waterproofing	Roof	16 SF	\$160
Asphaltic Coating on Hardwood Planking	2 <sup>nd</sup> Floor Gym	3,900 SF	\$39,000
Asphaltic Coating on Hardwood Planking	2 <sup>nd</sup> Floor Hardwood Flooring	12,000 SF	\$120,000
Asphaltic Coating on Hardwood Planking	3 <sup>rd</sup> Floor Hardwood Flooring	11,500 SF	\$115,000
Pipe Insulation	Trenches Boiler Room	150 LF	\$3,000
Boiler Breeching	Boiler Room	600 SF	\$12,000
Tank Insulation	Boiler Room	400 SF	\$8,000
<b>Subtotal, Asbestos Removal (Confirmed ACMs)</b>			<b>\$ 329,335</b>

**Asbestos Removal, PACMs**

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	5,000 SF	\$100,000
Buried Pipes	Beneath Building or at Site	TBD	NA*
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace/Trenches under Building*	Various Areas Building's Interiors	TBD	NA*
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	\$3,000
<b>Subtotal, PACM Removal (Recommended Allowance)</b>			<b>\$ 103,000</b>

\*N/A – Not applicable at this time

**Abatement Cost Estimate Summary**

**Asbestos & Hazardous Building Materials Abatement Cost Estimate**  
**Edgerly School Building**  
**33 Cross Street, Somerville, MA**

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 329,335
Asbestos Removal, Presumed ACMs	\$ 103,000
Miscellaneous Hazardous Building Materials	\$ 6,000
~10% Contingency	\$ 43,234
Estimated Abatement Design/Bid & Monitoring Fee	\$ 16,000
<b>Total Hazardous Building Materials Abatement</b>	<b>\$ 497,569</b>

**Cost Estimate Assumptions**

- Based on current market conditions by a non-union contractor.
- Power, water, and heat provided by the Owner.
- Does not include demolition to access concealed ACMs.
- Includes materials, labor, equipment, notifications/permits, transportation, and disposal.
- Excludes the cost for removal of any other hazardous materials or conditions not identified herein.

**APPENDIX G**

**Former Report-2015**

# 6 MONTH INSPECTION

## Edgerly Education Complex

### May, 2015

### ASSUMED AND PROVEN ASBESTOS-CONTAINING MATERIALS

Material & Amount	Location	Type & Friability	Physical Assessment Category	Type/% Asbestos & # of Samples	Comment	Six Month Surveillances & Re-inspections					
						6-mo.	12-mo.	18-mo.	24-mo.	30-mo.	3-YR
Pipe insulation	Pipe trenches (100 LF) Boiler room by water tank (50 LF)	T, F	1		Previously identified as asbestos containing. <b>Insulation is damaged.</b>	C					
Breeching insulation (600 SF)	Associated with boilers in boiler room	T, F	5		Previously identified as asbestos containing. <b>The insulation is peeling.</b>	C					
Boiler insulation (600 SF)	Boiler Room	T, F	5		Previously identified as asbestos containing. <b>The insulation is peeling.</b>	C					
Tank Insulation (400 SF)	Boiler Room	T, F	5		Previously identified as asbestos containing. <b>The insulation is peeling.</b>	C					
1" Slate-like board under ceramic tile (210 SF)	Office by room 115	M, NF			One sample 24456-6 was collected, analyzed and found to be non-asbestos. However to comply with AHERA further sampling needs to be performed.	✓					
Speed tile grout	Classrooms walls: 305A & B, 305-310, 206-215, halls	M, NF			No damage noted.	✓					
Brick mortar	Gym, halls above speed tile, walls throughout 1 <sup>st</sup> floor & mixed throughout	M, NF			No damage noted.	✓					
4 x 4 Gray ceramic wall tile (grout/adhesive)	1 <sup>st</sup> Floor women's bath	M, NF			No damage noted.	✓					
4 x 4 Red ceramic tile (grout/adhesive)	Cafeteria	M, NF			No damage noted.	✓					
4 x 4 White ceramic wall tile (grout/adhesive)	1 <sup>st</sup> Floor Boy's bath	M, NF			No damage noted.	✓					

**Key**

<i>Type</i>	<i>Amount</i>	<i>Friability</i>
T-TSI	SF-Square feet	F-Friable
S-Surfacing	LF-Linear feet	NF-Non-friable

**Physical Assessment**

*Assessment Categories for Friable Materials*

1. Damaged or significantly damaged TSI
2. Damaged (D) surfacing
3. Significantly damaged (SD) surfacing
4. Damaged or significantly damaged misc.

- 5: Suspect or proven ABCM with the potential for D (\*one moderate)
- 6: Suspect or proven ABCM with the potential for SD (\*one high)
7. Any remaining suspect or proven ACBM (\*all low)

*\*Potential for future disturbance for categories 5, 6, & 7*  
 Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

Fill in the corresponding box with a ✓ for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.

<b>6-mo.</b> Date:	Signature:	<b>18-mo.</b> Date:	Signature:
<b>12-mo.</b> Date:	Signature:	<b>24-mo.</b> Date:	Signature:
<b>30-mo.</b> Date:	Signature:	<b>3-YR Re-inspect:</b> Date:	Signature:

**6 MONTH INSPECTION**  
**Elderly Education Complex**  
**May, 2015**

**ASSUMED AND PROVEN ASBESTOS-CONTAINING MATERIALS**

Material & Amount	Location	Type & Friability	Physical Assessment Category	Type/% Asbestos & # of Samples	Comment	Six Month Surveillances & Re-inspections					
						6-mo.	12-mo.	18-mo.	24-mo.	30-mo.	3-YR
CMU grout	Cafeteria, kitchen, nurse, language (206)	M, NF			No damage noted.	✓					
Window glaze	Window wall/lights, main office, 210, guidance.	M, NF			No damage noted.	✓					
Mastic associated with black vinyl cove base	210 and 106A	M, NF			No damage noted.	✓					
Sheetrock	Alternative High School (walls), Rooms 1-14 and storage 1,2, and 3	M, F	4		<b>A small hole was noted in the storage closet to the left of classroom 2.</b>	C					
Skim coat		M, F	4			C					
Sheetrock (type 2)	Wall between 208 and storage, wall between 106 and storage, wall between 105 and 106	M, F	4			✓					
Sheetrock (type 3)	Above doors in basement	M, F	4			✓					
Sheetrock (type 4)	Closets in 106A	M, F	4			✓					
Joint compound		M, F	4			✓					
Pre-fabricated sheetrock	SPED wing	M, F	4		Cloth-faced	✓					

**Key**

Type  
T-TSI  
S-Surfacing

Amount  
SF-Square feet  
LF-Linear feet

Friability  
F-Friable  
NF-Non-friable

**Physical Assessment**

Assessment Categories for Friable Materials

1. Damaged or significantly damaged TSI
2. Damaged (D) surfacing
3. Significantly damaged (SD) surfacing
4. Damaged or significantly damaged misc.

5. Suspect or proven ABCM with the potential for D (\*one moderate)
6. Suspect or proven ABCM with the potential for SD (\*one high)
7. Any remaining suspect or proven ACBM (\*all low)

\*Potential for future disturbance for categories 5, 6, & 7

Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

Fill in the corresponding box with a ✓ for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.

<b>6-mo.</b>	Date:	Signature:	<b>18-mo.</b>	Date:	Signature:
<b>12-mo.</b>	Date:	Signature:	<b>24-mo.</b>	Date:	Signature:
<b>30-mo.</b>	Date:	Signature:	<b>3-YR Re-inspect:</b>	Date:	Signature:

**6 MONTH INSPECTION**  
**Elderly Education Complex**  
**May, 2015**

**ASSUMED AND PROVEN ASBESTOS-CONTAINING MATERIALS**

Material & Amount	Location	Type & Friability	Physical Assessment Category	Type/% Asbestos & # of Samples	Comment	Six Month Surveillances & Re-inspections					
						6-mo.	12-mo.	18-mo.	24-mo.	30-mo.	3-YR
12 x 12 Blue floor tile w/dark blue dots & white flecks	Office in room 300, 1 <sup>st</sup> floor boy's bath	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 White floor tile w/olive & brown flecks	313, 305A (54SF), Stage, 100	M, NF			Minor damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Tan floor tile w/dark brown flecks (27 SF)	304A, 304	M, NF			Minor damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Light pink floor tile w/maroon	Alternative High School, Hall by baths	M, NF			Minor damage noted. <b>Missing floor tile outside of the bathrooms.</b>	C					
Associated mastic		M, NF			<b>Mastic is exposed due to missing tile.</b>	C					
12 x 12 Gray/blue mottled floor tile	206 and bath in 206, 1 <sup>st</sup> floor men's bath (102) pattern, 105	M, NF			Minor damage noted.	✓					
Associated mastic		M, NF				✓					

**Key**

<i>Type</i>	<i>Amount</i>	<i>Friability</i>
T-TSI	SF-Square feet	F-Friable
S-Surfacing	LF-Linear feet	NF-Non-friable

**Physical Assessment**

*Assessment Categories for Friable Materials*  
 1. Damaged or significantly damaged TSI  
 2. Damaged (D) surfacing  
 3. Significantly damaged (SD) surfacing  
 4. Damaged or significantly damaged misc.

- 5: Suspect or proven ABCM with the potential for D (\*one moderate)
- 6: Suspect or proven ABCM with the potential for SD (\*one high)
- 7. Any remaining suspect or proven ACBM (\*all low)

*\*Potential for future disturbance for categories 5, 6, & 7*

Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

Fill in the corresponding box with a ✓ for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.

<b>6-mo.</b> Date:	Signature:	<b>18-mo.</b> Date:	Signature:
<b>12-mo.</b> Date:	Signature:	<b>24-mo.</b> Date:	Signature:
<b>30-mo.</b> Date:	Signature:	<b>3-YR Re-inspect:</b> Date:	Signature:



**6 MONTH INSPECTION**  
**Elderly Education Complex**  
**May, 2015**

**ASSUMED AND PROVEN ASBESTOS-CONTAINING MATERIALS**

Material & Amount	Location	Type & Friability	Physical Assessment Category	Type/% Asbestos & # of Samples	Comment	Six Month Surveillances & Re-inspections					
						6-mo.	12-mo.	18-mo.	24-mo.	30-mo.	3-YR
12 x 12 Black mottled floor tile	206 (pattern)	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Pink floor tile w/dark pink flecks and	Men's and women's baths in SPED, 108, bath and kitchen.	M, NF			Minor damage noted. <b>Damage noted in bathroom off of room 108A.</b>	C					
Associated mastic		M, NF				✓					
12 x 12 Green mottled floor tile and	Girls bath on 1 <sup>st</sup> floor (104), 1 <sup>st</sup> floor men's bath (102) pattern	M, NF			Minor damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Purple mottled floor tile	1 <sup>st</sup> floor men's bath (102) pattern	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Dark gray floor tile w/white flecks	Patches in room 105	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					

**Key**

Type Amount Friability  
T-TSI SF-Square feet F-Friable  
S-Surfacing LF-Linear feet NF-Non-friable

**Physical Assessment**

Assessment Categories for Friable Materials  
1. Damaged or significantly damaged TSI  
2. Damaged (D) surfacing  
3. Significantly damaged (SD) surfacing  
4. Damaged or significantly damaged misc.

5: Suspect or proven ABCM with the potential for D (\*one moderate)  
6: Suspect or proven ABCM with the potential for SD (\*one high)  
7. Any remaining suspect or proven ACBM (\*all low)

\*Potential for future disturbance for categories 5, 6, & 7  
Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

Fill in the corresponding box with a ✓ for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.

6-mo. Date: \_\_\_\_\_ Signature: \_\_\_\_\_ 18-mo. Date: \_\_\_\_\_ Signature: \_\_\_\_\_  
12-mo. Date: \_\_\_\_\_ Signature: \_\_\_\_\_ 24-mo. Date: \_\_\_\_\_ Signature: \_\_\_\_\_  
30-mo. Date: \_\_\_\_\_ Signature: \_\_\_\_\_ 3-YR Re-inspect: Date: \_\_\_\_\_ Signature: \_\_\_\_\_

**6 MONTH INSPECTION**  
**Elderly Education Complex**  
**May, 2015**

**ASSUMED AND PROVEN ASBESTOS-CONTAINING MATERIALS**

Material & Amount	Location	Type & Friability	Physical Assessment Category	Type/% Asbestos & # of Samples	Comment	Six Month Surveillances & Re-inspections					
						6-mo.	12-mo.	18-mo.	24-mo.	30-mo.	3-YR
12 x 12 Tan mottled floor tile w/red & white	Cafeteria	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					
12 x 12 Off-white floor tile w/dark brown & maroon flecks	Baths in 108A	M, NF			No damage noted.	✓					
Associated mastic		M, NF				✓					
Brown flooring	Nurse, storage rooms in main office area & bath in main office	M, NF			Minor damage noted. 6/14 – Nurse’s office has new flooring.	C					
Floor	Gym	M, NF			Mastic on top of fiberboard is exposed.	✓					

**Key**

*Type*  
T-TSI  
S-Surfacing

*Amount*  
SF-Square feet  
LF-Linear feet

*Friability*  
F-Friable  
NF-Non-friable

**Physical Assessment**

*Assessment Categories for Friable Materials*

1. Damaged or significantly damaged TSI
2. Damaged (D) surfacing
3. Significantly damaged (SD) surfacing
4. Damaged or significantly damaged misc.

5. Suspect or proven ABCM with the potential for D (\*one moderate)
6. Suspect or proven ABCM with the potential for SD (\*one high)
7. Any remaining suspect or proven ACBM (\*all low)

*\*Potential for future disturbance for categories 5, 6, & 7*  
Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

Fill in the corresponding box with a ✓ for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.

<b>6-mo.</b>	Date:	Signature:	<b>18-mo.</b>	Date:	Signature:
<b>12-mo.</b>	Date:	Signature:	<b>24-mo.</b>	Date:	Signature:
<b>30-mo.</b>	Date:	Signature:	<b>3-YR Re-inspect:</b>	Date:	Signature:

**6 MONTH INSPECTION**  
**Elderly Education Complex**  
**May, 2015**

<b>MATERIALS THAT HAVE BEEN ABATED/REMOVED OR PROVEN TO NOT CONTAIN ASBESTOS</b>			
<u>Material</u>	<u>Location</u>	<u>Samples</u>	<u>Comment</u>
2 x 4 Thicker fissured ceiling tile w/ lots of dots (Old)	305A, 305B, 305 - 308, 314, 313, 3 <sup>rd</sup> floor boys bath, 310, guidance, 207, 207A, 207B, mixed in SPED wing, 105, 106, 106A, 108, bath in 108A and 1 <sup>st</sup> floor baths	22456-1A thru 22456-1C	Sampled and proven not to contain asbestos.
2 x 4 Thin fissured ceiling tile w/ lots of dots (new)	Alternative HC wing, 306, 207, 210, mixed in SPED wing, 106A, 100, 108A, 110, 109, office in 108A	22456-2A thru 22456-2C	Sampled and proven not to contain asbestos.
Plaster – brown coat	Walls & ceilings: 300, 304A, 200 – 205	22456-3A thru 22456-3C	Sampled and proven not to contain asbestos.
Plaster – skim coat	Ceilings: Hallways, 300A, Nurse, 309, 215, Main office, 213, 2 <sup>nd</sup> floor women’s bath, 209, 101, 103, 105A, 1 <sup>st</sup> Floor offices (113 -115)	22456-4A thru 22456-4C	Sampled and proven not to contain asbestos.

**Key**

<i>Type</i>	<i>Amount</i>	<i>Friability</i>
T-TSI	SF-Square feet	F-Friable
S-Surfacing	LF-Linear feet	NF-Non-friable

**Physical Assessment**

*Assessment Categories for Friable Materials*

1. Damaged or significantly damaged TSI
2. Damaged (D) surfacing
3. Significantly damaged (SD) surfacing
4. Damaged or significantly damaged misc.

- 5: Suspect or proven ABCM with the potential for D (\*one moderate)
- 6: Suspect or proven ABCM with the potential for SD (\*one high)
7. Any remaining suspect or proven ACBM (\*all low)

*\*Potential for future disturbance for categories 5, 6, & 7*

Access, Vibration, Air Erosion: L-low M-medium H-high

Comments: \_\_\_\_\_

**Six Month Surveillance & Re-inspections**

*Fill in the corresponding box with a  $\checkmark$  for no change in condition or a C for a change in the status of a material. Write details about changes in the comment area below the chart on the same page. The person conducting the surveillance must sign and date below.*

<b>6-mo.</b> Date:	Signature:	<b>18-mo.</b> Date:	Signature:
<b>12-mo.</b> Date:	Signature:	<b>24-mo.</b> Date:	Signature:
<b>30-mo.</b> Date:	Signature:	<b>3-YR Re-inspect:</b> Date:	Signature: