

City of Somerville

Community Services and Activities Master Plan

FINAL REPORT VOLUME II - ADDITIONAL APPENDICES

NOVEMBER 24, 2021



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Community Services and Activities Master Plan

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

THE "PERIODIC TABLE" OF THE CITY OF SOMERVILLE; DIVISIONS INTERVIEWED FOR THE CSA MASTER PLAN ARE DESIGNATED WITH A *

Programming Interview Minutes & Conceptual Space Needs Programs

MEETING MINUTES

PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	#2875.00
DATE:	21 June 2021, 11:00am -12:00pm
LOCATION:	Teams Meeting
SUBJECT:	Community Services and Activities Interview – Arts Council

PARTICIPANTS	FIRM
Gregory Jenkins	Director – Arts Council
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro, Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Elizabeth Leber, Aaron Lamport	BBB

ITEM	DESCRIPTION
1.0	Program types, scales, and frequency
1.1	<ul style="list-style-type: none"> • Arts Council’s ability to schedule events is very space dependent. <ul style="list-style-type: none"> ○ It always comes down to space availability; before the new High School using the old auditorium was almost impossible. How can physical city assets be more open to the public and other city departments? • Their success (without dedicated space and with small staff) is in their ability to create partnerships and promote community assets. <ul style="list-style-type: none"> ○ They draw value out of underutilized spaces, putting them on the map • Festivals and events happen in city streets and plazas. <ul style="list-style-type: none"> ○ Rain dates and rain venues are an important consideration (ex. Big Gay Dance Party) ○ These events happen in squares and plazas as part of economic development. Participants spend money in the businesses so they would prefer rain reschedule dates to indoor rain venues. ○ However, there are winter programs that do need indoor spaces, and they have a desire to do more of these. • Youth programs used to be primarily partnerships with non-profits. <ul style="list-style-type: none"> ○ 25 years ago, there were not a lot of these types of programs for youth; this year the non-profits have been saying “not sure we have room for you” ○ Examples: <ul style="list-style-type: none"> ▪ “Art in the Garden” – ages 6-12, 40 participants, 6 weeks <ul style="list-style-type: none"> • City-owned but run through licensing agreement with a non-profit • Entities that used to be underutilized or more underground have expanded and have worked to increase their visibility ▪ “Mystic Mural Program” <ul style="list-style-type: none"> • In partnership with Mystic Housing Authority • Summer jobs program – 10 participants • At MHA’s mercy in terms of use of the space

ITEM DESCRIPTION

- Armory summer musical program – 40 participants
 - SPS building resources could be better utilized for both summer and after school programs; have physical space resources that other groups do not.
 - Parks & Rec uses schools for staging outdoor summer programs (camps, etc.)
 - HHS Youth Connections is trying to unlock school buildings to bring city and non-profit needs together
 - Where can outdoor events go when it rains? Cummings would have been an ideal use with cafeteria plus the outdoor adjacent playground space.
 - Non-youth programs
 - Always looking for space in the community
 - Use Assembly Square to create a “WeWork” type community for artists in vacant retail spaces that can be rented hourly.
-

2.0 Additional desired programs and space needs

- 2.1**
- Gallery and artist work studio spaces are in demand
 - Currently go from \$12/SF in rough buildings, to \$22-23/SF at Joy Street (higher end spaces)
 - Artist spaces ideally would have residency arrangements, and turnover would happen every year. The challenge is to ensure turnover, and make sure dependency is not created in subsidized community spaces.
 - Artist studios are often concentrated in warehouse buildings along rail lines.
 - Cambridge has a city gallery in their annex building; Somerville has two large windows at CVS.
 - In prior conversations, it was discussed that Parks & Rec might go to Edgerly which would allow 19 Walnut to become artist spaces
 - ADA issues and required upgrades stopped these discussions as the idea became too expensive.
 - There has also been discussion around Cummings becoming gallery spaces.
 - Art Farm / Art Barn
 - Art Council would ideally manage the property, but there are other conversations around privatization and outside management as this is not necessarily the expertise of the city.
 - The hope is to use the Parks & Rec software for bookings as there will be huge demand; but this system is not ideal as currently designed.
 - Pricing will be based on whether the event operator charges admission.
 - 5000 SF total: 3500 SF main performance hall and a 1200 SF multipurpose space adjacent to it (200-250 people)
 - Barn doors will provide flexibility to have an audience in the plaza.
 - The plaza will have infrastructure to support craft markets (power, etc.)
 - Theater and performance space needs
 - There is a need for both rehearsal and production spaces.
 - Many groups produce here and perform elsewhere in the area (Boston, etc.)
 - Somerville Theater or Armory could serve these needs (if they can keep rental rates low); they want to be able to hold days to be available to the community with rates at cost.
-

3.0 Pandemic Impacts

- 3.1**
- Greater demand for outdoor programming; will result in increased demand on public spaces, likely extending into the winter months.
 - Arts may never be able to get back to the Garden space because there is such high demand. They will likely not want to provide so much space to one group for such a long time.
 - Lower income families need time and consistency. One of the problems with flexible scheduling or “drop-ins” is that it becomes socioeconomic class-based (who has flexibility) and will only serve the upper middle class.
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ITEM	DESCRIPTION
4.0	Potential buildings and sites
4.1	<ul style="list-style-type: none"> • The four buildings proposed would take very capitalized non-profits to be able to take on these kinds of projects. • The Armory could be an important addition to their partnership efforts. <ul style="list-style-type: none"> ○ Arts at the Armory is the anchor tenant, not the building. ○ Could the live-work unit there have a residency plan? ○ Could the basement be used for dance or music rehearsal space? ○ Need software for booking ○ The city could do a lot with this property particularly as density and costs continue to increase. • Ideal space(s) look like: <ul style="list-style-type: none"> ○ Flexible use – utility sinks, folding tables and chairs, adaptable lighting, acoustic treatments, shared bathrooms <ul style="list-style-type: none"> ▪ One programming example might be yoga or Pilates in the morning, youth and after school in the afternoons, and adult programs in the evening. • Could 45 College be a small theater or performance venue? • Arts Council sees the need to stabilize existing buildings that make sense for renovation or development and sell off what is not needed.
5.0	Previous studies
5.1	<ul style="list-style-type: none"> • Metropolitan Area Planning Commission (MAPC) is working with Arts Council on an Arts and Culture Master Plan. <ul style="list-style-type: none"> ○ Identifying areas and at-risk tenants that do not feel confident they can find a new space in Somerville. ○ Looking at potential to revise zoning ○ Could be interesting data for review as part of this study; Arts Council to forward. • Larger cultural planning process – working with TDC (Boston non-profit management and consulting firm) but this is in its very formative stages.

MEETING MINUTES

PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	#2875.00
DATE:	21 June 2021, 10:00am -11:00am
LOCATION:	Teams Meeting
SUBJECT:	Community Services and Activities Interview – OSPCD Economic Development

PARTICIPANTS	FIRM
Tom Galligani	Director – Economic Development
George Proakis	Executive Director - OSPCD
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Liz Leber, Aaron Lamport	BBB

ITEM	DESCRIPTION
1.0	Program types and scales:
1.1	<p>Economic Development Programs Overview:</p> <ul style="list-style-type: none"> • Most programs are not direct assistance but rather done by partners; however, ED does have the need to gather people and they see this increasing post pandemic. • 3 primary areas of Economic Development work: <ul style="list-style-type: none"> ○ Real Estate Development <ul style="list-style-type: none"> ▪ Helping businesses find new spaces, solicit input on redevelopment plans ○ Small Business Development <ul style="list-style-type: none"> ▪ Sometimes directly technical, some seminars; quarterly “one stop business shop”; monthly Town Hall for which Zoom has turned out to be a better venue ▪ Maybe once every two years they might program something big, but Somerville does not have a lot of convention-style venues; they have used Partners Healthcare in the past ○ Workforce Development <ul style="list-style-type: none"> ▪ Newest and fastest growing area; training residents for the jobs of the future or to connect to the jobs of the present ▪ Work with vendors to offer different programs (e.g., digital literacy classes – done with partners)
1.2	<p>Where are programs currently held?</p> <ul style="list-style-type: none"> • Most often held in city spaces • Finding the right size space that is accessible is an ongoing challenge. • Central Library is the most common place for events and classes <ul style="list-style-type: none"> ○ “Auditorium” holds a class of 20 comfortably ○ They also use the Library’s small conference room

ITEM	DESCRIPTION
	<ul style="list-style-type: none"> • They utilize 165 Broadway from time to time <ul style="list-style-type: none"> ◦ Large open space (now used as food pantry); upstairs not possible as not accessible • Other events such as public meetings for projects use VNA, PSB, SPS gyms and cafeterias • Often use storefronts for neighborhood planning charrettes (distributed model): <ul style="list-style-type: none"> ◦ These kinds of spaces can prove to be a challenge for tech, restrooms, etc. ◦ Use of these spaces will continue, so spaces for this type of use are not high priority as part of the CSA programming • Expect to use the new High School resources after-hours (like the Fab Lab, beginning in September, which they will co-manage)
1.3	<p>Most typical events (pre-pandemic):</p> <ul style="list-style-type: none"> • One-stop business shop <ul style="list-style-type: none"> ◦ Quarterly ◦ Moves around to different neighborhoods (may be virtual in the future) ◦ Open offices hours ◦ 10 businesses would be considered a busy night ◦ Typically squeezed into a community-owned space • Tech Goes Home <ul style="list-style-type: none"> ◦ Offered 3 times to date (typically once per year) ◦ 12 sessions (every week or every other week) ◦ Free enrollment; typically, 6-12 people – never more than 20 ◦ Requires classroom with Wi-Fi capability and presentation screen ◦ Participants are provided Chromebooks (they get to keep as graduates of program) ◦ Programs have been offered in English and Portuguese depending on need/desire ◦ Potential to be hybrid in-person/remote in the future • Neighborhood meetings <ul style="list-style-type: none"> ◦ 6x per year on average ◦ 20-60 people • Seminars on State Procurement Contracts – offered with CoS’s Purchasing Department <ul style="list-style-type: none"> ◦ Typically held in vacant storefront spaces (at Assembly Sq, both accessible and good parking) ◦ Teach participants how to apply for State contracts ◦ 50 people (Tuesday mornings) ◦ Cycle is once per year, in April ◦ Two weeks between sessions (2-3 hours each session) ◦ Run by State staff • Other notes: <ul style="list-style-type: none"> ◦ ED does have soft partnerships with SCALE but have not co-taught to date. <ul style="list-style-type: none"> ▪ They are expecting SCALE will do a lot more at the High School after hours.
2.0	Potential buildings and sites; development models
2.1	<p>There have been a lot of discussions as to how to structure these sites over many years, although less time has been invested in assessment of 165 Broadway (Cross Street Center aka CSC) and East Branch Library (EBL) locations. CoS will forward a Community Spaces report that was done in 2020.</p> <ul style="list-style-type: none"> • 45 College Ave <ul style="list-style-type: none"> ◦ Goal would be to create a meeting space(s) that cannot be accommodated across the street at the West Branch Library (WBL). ◦ Ideally could replace TAB for community program spaces.

- Could other city services be put into this building? Other community focused uses? Business incubator? Mixed use with housing and retail? Senior Housing could create synergy with a community space below available for seniors?
- At WBL, they wanted a larger community space as part of the renovation, but pushback from neighbors resulted in a smaller zoning footprint (meeting non-binding zoning benchmarks).
- It has historically been difficult to find accessible meeting spaces for events (ResiStat, etc.). Ideally would have a dedicated space in Davis that is not borrowing a church basement.
- Other uses would be fine as long as the City has some control over the use of the space. George noted that they do not want to be in a leased role with someone else managing the schedule of the space(s). The city must control the schedule of event space if a P3 arrangement. Also want to avoid a condo situation if it means the city would be a minority owner who could be outvoted.
- They expect not to be able to use Visiting Nurse on Lowell post-pandemic and are counting on the High School project to provide the larger venue when its needed.
- It has not been fully studied, but Davis is an attractive place for tech businesses so this could be an interesting model. While every neighborhood wants a community space, if they only need/use it 3x per quarter it is not realistic and becomes a utilization issue.
- General Insulation Building / 165 Broadway (CSC)
 - An RFI for the General Insulation Building was issued approximately six months before the pandemic.
 - The neighborhood and the Main Streets Organization director really wants this even though they already have CSC, EBL, and Schools.
 - The city has several Main Streets organizations, and the city provides them with some funding, but no administrative office space. Their mission is to help stimulate the private sector to be a partner. Typically, a property owner will provide discounted rent as contribution to a cause. East Somerville Main Street wants meeting spaces, and scheduling their needs in Schools or CSC has historically been problematic
 - An adjacent developer proposed to develop CSC and relocate that programming into the General Insulation building.
 - The Mayor has discussed the idea of moving the food pantry to this property and restoring CSC in some way to maintain programs for seniors in this location.
 - The food pantry needs a permanent home, but does that mean the city gives them land to build? Or builds for them? The food pantry cannot squeeze in the space for seniors.
 - One additional idea is to convince the CSC neighbor to work collaboratively and let the building and its adjacent site be redeveloped together. There was an East Somerville planning study for this, but the food hall in that study should be ignored.
- East Branch Library
 - A meeting room at EBL would generate a great deal of utility.
- Armory
 - Primarily to be used as an Arts venue
 - Has a large gathering auditorium space in the back; either the non-profit or its replacement will manage that space in the future (café, hall, and kitchen)
 - ED is in the process of negotiating use and occupancy agreements with all groups through the end of the calendar year. This is sensitive as some groups fear displacement.
 - ED will release an RFP for an operator (the existing may win it and stay) for managing the events hall, café, and kitchen in between.
 - The goal is to get rent down to sustainable rates and possibly loosen the rules on what is possible (pending neighbor agreement)
 - The RFP would ideally involve the city having free access to the auditorium within defined limits according to its needs.

ITEM	DESCRIPTION
	<ul style="list-style-type: none">○ There is an idea to move the Arts Council administrative spaces to the Armory, but this may only be a temporary move to relieve space pressures before relocating to a more permanent home.

MEETING MINUTES

PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	#2875.00
DATE:	22 June 2021, 4:00pm -5:00pm
LOCATION:	Teams Meeting
SUBJECT:	Community Services and Activities Interview – HHS / Council on Aging

PARTICIPANTS	FIRM
Doug Kress	Director - HHS
Nancy Bacci	Director – Human Services
Ashley Speliotis	Interim Director – Council on Aging
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro, Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Elizabeth Leber, Aaron Lamport	BBB

ITEM	DESCRIPTION
1.0	Program types, scales, and frequency by location (including deficiencies)
1.1	Council on Aging <ul style="list-style-type: none"> • East Somerville <ul style="list-style-type: none"> ○ 165 Broadway (CSC) <ul style="list-style-type: none"> ▪ Small but dedicated group; 10 seniors ▪ M, Tu, Th – lunches, fitness classes, English conversation groups, arts, and crafts ▪ Accessible on foot (limited parking) ▪ Moving this mainstay group to R&J for return to in-person as CSC is now the food pantry. Time will tell if the patrons attend programs at the other centers as they be reluctant to adjust to new routines or further travel. ▪ They do need the computer lab, but it could be transitioned to another location. ▪ Food prep space need is for a warming kitchen only (not a full commercial operation) ▪ 1x month larger event – such as bingo ○ R&J <ul style="list-style-type: none"> ▪ Tu, Th – 20 people ▪ Similar events ○ Larger events take place at Dilboy VFW Post or the Holiday Inn • West Somerville (TAB) <ul style="list-style-type: none"> ○ Building feels nicer and more welcoming; partly because the staff is there, and it feels like a “hub”. ○ Group sizes vary; 10 typical, 30-40 at events, 40 for lunches, 70+ use off site locations ○ Ideally CoA staff should be co-located with the primary program spaces (similar to as they are today in TAB). Programs at other locations can be more challenging because you have to get supplies there. ○ The building has good access and parking; bus stop in front and has an elevator in the building ○ Too many fire drills; very difficult to get all of the seniors down the stairs and out of the building.

ITEM	DESCRIPTION
	<ul style="list-style-type: none"> ○ Ideally would be located on the first floor of a building for ease of accessibility for patrons. ● 165 Broadway (CSC) <ul style="list-style-type: none"> ○ CSC ground floor space is a good size, but acoustics make it difficult to hear ○ Upper level used to be a youth drop-in center; attendance varied greatly. Accessibility is an issue. ● Large community group programming <ul style="list-style-type: none"> ○ Mental health and prevention services, grants and research ○ Groups range from 10 -75 ○ Use Winter Hill lunchroom, Connexion, VNA, CHA (back rooms), Little Sisters of the Poor ○ Need accessible spaces with good acoustics ● Teen Empowerment is a non-profit currently on the second floor of CSC; they are fully funded by Somerville in the HHS budget.
2.0	Co-location considerations
2.1	<ul style="list-style-type: none"> ● Intergenerational opportunities of co-location of CoA and HH programs are interesting, as the timing could work well for utilization; although also discussed that during the school day uses could instead be non-COA adult uses such job training, resume writing, etc. ● Co-locating teen and CoA programming also comes with challenges: seniors are getting younger and are not only early birds. The like evening programs as well. So, there could be scheduling conflict. ● A shared large space could be okay, but dedicated spaces for each group for programs is critical.
3.0	Pandemic Impacts
3.1	<ul style="list-style-type: none"> ● The pandemic has highlighted discrepancies in resources available across the city. A service center during the day could be a really good use for CSC. ● A key question is how to handle the food pantry at CSC moving forward. The need for the service has more than doubled. They are also doing food delivery because of transport-challenged or other target populations.
4.0	Overlaps with other departments
4.1	<ul style="list-style-type: none"> ● They coordinate programs and work with most other city departments <ul style="list-style-type: none"> ○ Schools - public health, nursing support, educational classes, afterschool programs, clinics ○ Arts Council - Events around targeted populations or arts events (Big Gay dance party) ○ Mayor's Office - Employment coordination programs ○ Police / Fire Departments – emergency preparedness ○ Shape Up Somerville coordinates food access and public health with PSUF, Schools ○ Parks & Rec – youth programming
5.0	Potential buildings and sites
5.1	<ul style="list-style-type: none"> ● 165 Broadway (CSC) <ul style="list-style-type: none"> ● Ideally would like to see CSC become a youth and family center, focused on mental health services. <ul style="list-style-type: none"> ○ Ideally flexible; one large space that could be broken up into multiple spaces ○ They need the ability to offer food. ○ They need space for kids to hang out; their lives are so scheduled (especially during the pandemic) they need a respite. ○ Dedicated programming hours focused on youth mental health needs. <ul style="list-style-type: none"> ▪ 1 on 1 therapy ▪ Group sessions ▪ Expressive art therapy ▪ General wellness opportunities – yoga and other creative endeavors. ○ At least one program per day after school; but how would the space be used in other times?

ITEM	DESCRIPTION
	<ul style="list-style-type: none">○ Consider the positions of buildings by geography – corridor and campus model<ul style="list-style-type: none">▪ staff at Edgerly, 42 Cross, Chuckie Harris Park, Foss Park
	45 College
	<ul style="list-style-type: none">• If there is to be one consolidated senior location, Davis would be ideal. This would increase opportunities for joint partnerships with neighbors.• They have access to R&J permanently (it is deeded for senior uses), so this could provide balance to 45 College Ave with location on the east side of the city.• As seniors track younger, they like hip destinations adjacent to centers. It is possible with further development East Broadway will eventually create this same draw.

MEETING MINUTES

PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	#2875.00
DATE:	22 June 2021, 12:00pm -1:00pm
LOCATION:	Teams Meeting
SUBJECT:	Community Services and Activities Interview – Libraries

PARTICIPANTS	FIRM
Cathy Piantigini	Director - Libraries
Marita Coombs	Manager – East Branch Library
Alison Mitchell	Interim Manager – West Branch Library
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro, Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Elizabeth Leber, Aaron Lamport	BBB

ITEM	DESCRIPTION
1.0	Program types, scales and frequency, desired additional programs, or space needs
1.1	<ul style="list-style-type: none"> • West Branch Library (WBL) <ul style="list-style-type: none"> ○ Children’s programming ○ Adult programming <ul style="list-style-type: none"> ▪ Would like to do more now that accessibility is no longer an issue post renovation ▪ Largest room maxes out at 40 adults which is an issue ○ Really missing a group space for larger programs (75 people) such as lectures and book talks. <ul style="list-style-type: none"> ▪ Pre pandemic they used the large auditorium at Central – Drag Kings and Queens Story Time ▪ Larger events typically use other properties outside the city-owned properties ○ Elections can be accommodated at WBL but space is limited. ○ Specialty events such as the solar eclipse often have 150 people. ○ Puppet shows (Tanglewood Marionettes) can be 100 people. ○ Community art programs (20 people) ○ Large events typically happen 4-6x per year. ○ The recent renovation was about baseline needs (accessibility and systems upgrades). The question was more about what can be done in the existing envelope rather than specific branch needs. ○ There is a general need for community space in Davis Square. • East Branch Library (EBL) <ul style="list-style-type: none"> ○ One tiny library that programs in overdrive. ○ Story time every Wednesday (25-30 people; all strollers must be left outside by necessity) ○ Family dinner and game night; 1x per month (20-40 people) ○ Book group; 1x per month during the day ○ ESL; Monday nights (20-30 people) ○ Chair yoga; daily (15-25 people)

ITEM	DESCRIPTION
	<ul style="list-style-type: none"> ○ Author events (20-30 people) ○ Partner events with local restaurants for dinners, storytelling, and cultural presentation behind the food (with East Somerville Main Streets) ○ General madness from 3:30-6:00 pm with afterschool programs, homework help, etc. <ul style="list-style-type: none"> ▪ Majority of kids that come here in the afternoons go to Prospect Hill Academy, and many of them do not live in Somerville. This may mean that local children are discouraged from coming at this time. ○ Need a dedicated room for programs separate from the main stacks/circulation area ○ Lack of storage for strollers, etc. ○ Lack of separation for anyone else who wants to come in to use the library or computers during events. <ul style="list-style-type: none"> ▪ Some patrons really want a quiet place to work or browse, and it just does not exist after 3 pm. ▪ Need a quiet tech center with scanner and fax; ideally combined with the adult collection ○ Goal is for community-based programs; larger programs would be in combination with Central and West. They would do larger programs though if they had the space. ○ Interested in additional partnering with schools for programming space. ○ They hold some outdoor programming that is purposeful (music program), and others because there is simply no room inside. <ul style="list-style-type: none"> ● Central Library <ul style="list-style-type: none"> ○ Public spaces should be neutral and should be at Central; shared spaces as part of the Central Hill administrative master planning does not do right by the library. Public events should be in third spaces. ○ The Central Library really needs investment and renovation; the fact that this is not being considered as part of the master plan is disappointing. ○ While the renovation of WBL and potential opportunities at the EBL are wonderful, they do not make up for the deficiencies at Central. ● Geographic considerations <ul style="list-style-type: none"> ○ There is overlap between locations depending on the event, but typically people gravitate to their closest branch. Bigger events can draw attendees from across the city. ● General considerations <ul style="list-style-type: none"> ○ Need more “neutral” versus “specialized” program spaces ○ The flexibility of spaces is key as program types and trends change over time. ○ Libraries partners with many other city departments: SPS, OSE, HHS, AC, etc. <ul style="list-style-type: none"> ▪ Examples include spaces to review grants, artist space, vaccination sites, etc.
2.0	Pandemic Impacts
2.1	<ul style="list-style-type: none"> ● Libraries expects a big increase in programs as people return in person; anticipate some group sizes may double
3.0	Potential buildings and sites
3.1	<ul style="list-style-type: none"> ● They love the EBL location and have great space outside, just need more space; in a perfect world would have another floor. ● Nothing can be added to EBL that would really substitute for the major needs at Central. ● As neutral and accommodating as possible should be the priorities for these potential sites ● Spaces with ancillary kitchens would provide wonderful programming options ● East Somerville is deserving of commitment/investment with regards to the EBL.

MEETING MINUTES

PROJECT: Somerville Building Renovation and Department Relocation Master Plan

BBB REF# #2875.00

DATE: 22 June 2021, 3:00pm -4:00pm

LOCATION: Teams Meeting

SUBJECT: **Community Services and Activities Interview – Schools**

Note: These interview notes contain additional written feedback provided by SFLC and CS through Jose after the interview.

PARTICIPANTS	FIRM
Mary Skipper	Superintendent of Schools
Jose Mendez	Out of Time Coordinator (HHS SomerPromise)
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro, Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Elizabeth Leber, Aaron Lamport	BBB

ITEM	DESCRIPTION
1.0	Program types, scales, and frequency (including deficiencies)
1.1	<ul style="list-style-type: none"> • Schools are very active from the close of the school day until 6 pm. After that, program spaces can be opened up to other uses. Gyms are often used up until 9 pm. • Scheduling is centralized through a secretary in Finance who issues permits and arranges with DPW. • Almost every school building has a Community Schools program in it <ul style="list-style-type: none"> ○ Group activities range from 40-100 ○ East Somerville needs more space because of its catchment size <ul style="list-style-type: none"> ▪ 4-5 programs and teachers’ clubs ▪ They are the largest K-8 in the city ▪ They are the only school with a true auditorium and a large gym ○ Brown School has no gathering space except classrooms <ul style="list-style-type: none"> ▪ Often use the school yard but no place to go in inclement weather ○ Argenziano has ample space inside and out ○ West Somerville has limited gathering space and no auditorium ○ Winter Hill has limited gathering space and no auditorium ○ Community Schools has an end of the year session celebration in each site 3x per year. The group sizes vary but is attended by 80-90% of the families that attend the program. • Gyms see a lot of use; some can be sub-divided which is helpful. • Community Schools noted that classrooms are needed for preschool classes; students are dismissed early, and teachers use the classrooms until 2:30 pm. • The new High School has great spaces and large gathering areas including an auditorium and field house which will benefit the other schools. • Extensive programming in the summer <ul style="list-style-type: none"> ○ Winter Hill is offline this year and Brown is not usable, so summer programs are very cramped

ITEM	DESCRIPTION
	<ul style="list-style-type: none"> • SPS is short on fields and open space; these also require rain locations which is challenging <ul style="list-style-type: none"> ○ Lots of pressure on fields for youth leagues, adult leagues, private leagues, and Parks & Rec all vying for their use. ○ Community Schools also benefits from open gathering spaces ○ Covered open meeting spaces (perhaps with sheltered roofs) could also be beneficial • SFLC needs indoor space for playgroups even during summer months <ul style="list-style-type: none"> ○ They offer free play groups and support groups through their Home Visiting programs and distribute literacy and educational materials to families with children under 3. ○ Program is birth to 3 years old ○ In-person typical enrollment is 15-25 as far as who shows up, but on paper it is larger (30-40) ○ Playgroups have 3 sessions, 4 days per week: approximately 100 parents / children per week ○ Parent Support Groups; weekly – 10-15 parents ○ Program started in Cummings and expanded to Capuano ○ Outdoor play space in Cumming was an idea ○ Capuano could further support it, but this would mean taking over classrooms in the building. ○ Slated for Edgerly in BMP but it has no green space ○ Could walk to East Somerville but this puts more pressure on their outdoor spaces ○ SFLC would love to expand playgroup capacity to other neighborhoods. Given the current location, they expect participation from the East side of Somerville to increase. They also expect a dramatic decrease from the West and Central parts of the city because of walkability and parking challenges. ○ Note: Parks & Rec was also running playgroups in Cummings (15-25) and sharing the same cafeteria space. • Music and Theater <ul style="list-style-type: none"> ○ Almost all students play instruments past 3rd grade. ○ Holiday performances can be 50-75 for choir, and groups of kids in the hundreds for performances ○ No schools have auditoriums except East Somerville, so this is always a deficit. ○ Visual arts programs work in more neutral spaces, but performances need good acoustics.
2.0	Pandemic Impacts
2.1	<ul style="list-style-type: none"> • Outdoor space is in demand; there have been conversations about a bubble over the Brown playground to help extend its use in inclement weather. Is there a way to repurpose the outside for multiple uses during the year? • Community Schools has seen a decrease of in-person direct services but will be moving from all remote to hybrid and eventually back to fully in person. • SFLC noted that all the workshops, community meetings, playgroups, registration, and home visits are virtual. They are doing home deliveries of clothing and education materials. They expect all support groups to return to in-person.
3.0	Overlaps with other departments
4.1	<ul style="list-style-type: none"> • Parks & Rec <ul style="list-style-type: none"> ○ Anyone can reserve space in school buildings; SPS has first priority, P&R is second, then other city departments and then outside groups. ○ Access control can be problematic in schools and is an important consideration. The new HS has the technology for restricted access to parts of the building as needed and/or after-hours. The other school buildings do not have this capability. • HHS Clinics – more one-off events
4.0	Potential buildings and sites
4.1	45 College

ITEM	DESCRIPTION
	<ul style="list-style-type: none">• Could help with programs at Brown because it is walkable 165 Broadway and 24 Cross St. E• Could assist with East Somerville School needs

MEETING MINUTES

PROJECT:	Somerville Building Renovation and Department Relocation Master Plan
BBB REF#	#2875.00
DATE:	24 June 2021, 10:30am -11:00am (Revisions per department input are in blue)
LOCATION:	Teams Meeting
SUBJECT:	Community Services and Activities Interview – Parks & Recreation

PARTICIPANTS

PARTICIPANTS	FIRM
Jill Lathan	Director
Melissa Woods	City of Somerville (CoS)
Monica Siebenmorgen, Nate Rogers	Beyer Blinder Belle (BBB)
Cc: Rich Raiche, Cortni Desir, Fred Massaro, Deb Mitrano	CoS
Blake Cuneo	PMA Consultants
Elizabeth Leber, Aaron Lamport	BBB

ITEM DESCRIPTION

1.0 Program types, scales, and frequency (including deficiencies)

- 1.1
- Parks and Recreation (P&R) noted their website as the full repository for their range of program offerings: <https://www.somervillerec.com/info/activities/default.aspx>
 - P&R noted that in an ideal world they would have a single dedicated community activity and fitness center that combines programs with administrative offices; including a welcome/check-in where you sign up for classes, reading groups, etc. It should not be combined with or in SPS spaces, and would include the following:
 - Gym space – basketball, indoor soccer
 - Game spaces
 - Computer labs
 - Senior programs – indoor pool, walking track, craft classes, reading groups
 - Spaces for preschool and STEM programs
 - Art and dance classes
 - Fitness classes
 - Summer camps
 - P&R currently provides the programs above, but they are fragmented in terms of location. They depend on access to spaces school buildings and other facilities whose scheduling they do not control. Schools controls the system to book spaces (outside of fields). While P&R has second priority, there needs to be a clear centralized and transparent system for permitting that would also clarify utilization. Many school building spaces appear to sit empty and underutilized.
 - P&R will often pilot new programs, many of which achieve success, and then other departments will adapt the same model for their own programs, sometimes supplanting P&R out of program space.
 - One example was at Cummings, where P&R introduced a preschool program, and then Schools **realized what was possible in the space and expanded their existing preschool program using the space we created.** People often want Schools and P&R to create one large group as they are working with the same population, but P&R and Schools have fundamentally different missions. The

ITEM	DESCRIPTION
	<p>SPS program is education and curriculum-focused, while the P&R program is focused on socialization, physical education, and mental health.</p> <ul style="list-style-type: none"> • There is additional programming they would like to provide for seniors, but they need consistently available spaces which the community can depend on. They would like to expand aquatic programs, in partnership with Council on Aging. They have been using the Kennedy pool for these programs. • They have participants from all areas of the city, and representation of a particular area depends on the programs being offered. Attendance is related to getting the word out and to other programming (Schools, etc.) happening in the neighborhood. • Schools does its own signup and has their own data. P&R by contrast operates on their website, word of mouth, program guides and flyers. They distribute these materials to schools, with varying levels of success depending on the staff in the particular school. • They would like to offer a greater range of programming, but do not have the kind of space or types of space they need. They go where they can find space, and this inconsistency in space availability makes program creation difficult, as well as community buy-in. • They create lots of programming and are creative and cutting edge, but they are handicapped by not having a central facility they can control, with appropriate or consistent types of spaces. This is frustrating and dilutes what they could be doing within the city.
2.0	Pandemic Impacts
2.1	<ul style="list-style-type: none"> • There is a huge desire for their programs coming out of the pandemic. They are running at capacity and the programs are full and have waiting lists. Everyone is excited for the summer season.
3.0	Potential buildings and sites
3.1	<ul style="list-style-type: none"> • P&R would take any spaces they could get if they could be dedicated. It would ideally be located close to bus and transportation routes or have available parking. 165 Broadway and 24 Cross St. E • East Somerville students really depend on summer school programs, but they may only be offered for half a day. It would be better for families and students and more attractive if they can stay in East Somerville both mornings and afternoons, and if transitions are streamlined. • CSC – Teen Empowerment (HHS) tends more towards social services and is not an ideal fit for co-location or partnering with P&R.

CONCEPTUAL SPACE NEEDS PROGRAMS

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)				0	2,200	-
Kitchen / Pantry (TAB)			K2	0	200	-
Pantry (TAB)				0	225	-
Program Space (CSC)				0	1,200	-
Kitchen / Pantry (CSC)			K2	0	200	-
Computer Lab (CSC)			C4	0	120	-
Storage (CSC)			ST1.5	0	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	-
Total	10	0				
					Staff	478
					Other	220
					ASF	698

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

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
Total	9	4			Staff	727
					Other	2,670
					ASF	3,397

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?

East Branch Library - Hypothetical Program

Description	EXISTING			PROPOSED
	WBL	Central	EBL Exg	EBL Target
Entry Area	540	680	325	500
Circulation Desk	100			
General Collections (incl. Periodicals, computers?)	3,894	10,500	823	1,500
Children's Room	2,300	1,700	460	600
Teen Room		980	117	400
Public Toilets	250	200	45	250
Community Room	593	642	-	600
Conference Room	147	100	-	200
Conference Room	99		-	120
Staff Work Space	287	1,600	100	250
Break Room/Kitchenette	120		75	100
Staff Toilets	50	-	20	50
Storage	82	?	14	200
Mechanical	?	?	?	
Total	8,462	16,402	1,979	4,770

Notes

Combine with 200 SF room as needed

1 priv office, 2 workstations, 1 work table



SOMERVILLE MP - 165 BROADWAY
CROSS ST CENTER REHAB
October 28, 2021

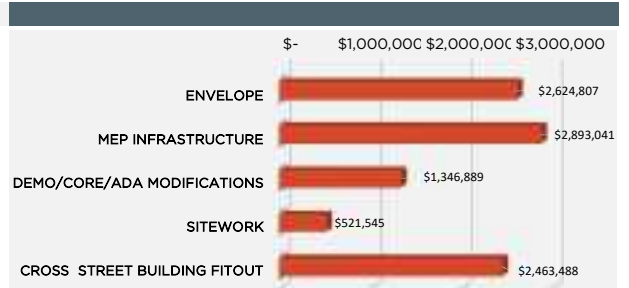


ONE BEACON STREET
15TH FLOOR
BOSTON, 02108

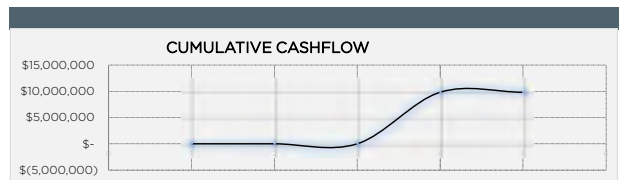
CONSTRUCTION COST
& RISK CONSULTANTS

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE CROSS STREET 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. EXCALATION IS PRESENTLY EXCLUDED FROM THE COST MODEL.

CONSTRUCTION COSTS \$ (NOT ESCALATED)				
COST ELEMENT	GSF	\$/SF	CONST \$ (NOT ESCALATED)	PROJECT \$ (NOT ESCALATED)
ENVELOPE	12,150	\$ 216	\$ 2,624,807	\$ 2,624,807
MEP INFRASTRUCTURE	12,150	\$ 238	\$ 2,893,041	\$ 2,893,041
DEMO/CORE/ADA	12,150	\$ 111	\$ 1,346,889	\$ 1,346,889
SITWORK	5,380	\$ 97	\$ 521,545	\$ 521,545
CROSS STREET BUILDING FITOUT	12,150	\$ 203	\$ 2,463,487	\$ 2,463,488
TOTAL CONSTRUCTION COSTS	12,150	\$811	\$ 9,849,769	\$ 9,849,769
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
TOTAL CAPITAL EXPENDITURE			\$ 9,849,769	\$ 9,849,769



BUILDINGS CASHFLOW FORECAST			
SPEND TOTALS	ANNUAL	CUMULATIVE	
2023	\$ -	\$ -	-
2024	\$ -	\$ -	-
2025	\$ -	\$ -	-
2026	\$ 9,849,769	\$ 9,849,769	-
2027+	\$ -	\$ 9,849,769	-



ALTS & BREAKOUTS	\$	\$/SF
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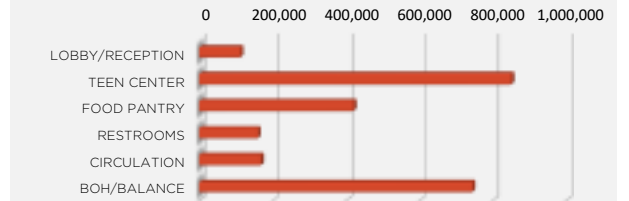
ALTERNATES (CONSTRUCTION COST VALUES)		
PLUM ALT #1: DEDUCT REUSE OF RAINWATER FOR FLUSHING	(\$55,471)	(\$4.57)

CONTINGENCY & ESCALATION SUMMARY	
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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	EXCLUDED
Project labor assumptions	Union

FITOUT USE TYPE BY COST	TOTAL \$	% MIX	CONST \$
LOBBY/RECEPTION		5%	112,870
TEEN CENTER		50%	852,515
FOOD PANTRY		25%	421,213
RESTROOMS		9%	160,792
CIRCULATION		10%	169,410
BOH/BALANCE		43%	746,686

COST BY FITOUT USE TYPE BY SQUARE FOOT	
--	--



FITOUT USE TYPE BY SQUARE FOOT	% MIX OF TYPE	AREAS SF
LOBBY/RECEPTION	4%	450
TEEN CENTER	30%	3,600
FOOD PANTRY	15%	1,800
RESTROOMS	2%	250
CIRCULATION	8%	975
BOH/BALANCE	42%	5,075

FITOUT USE TYPE BY SQUARE FOOT	
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BUILDING FIT-OUT COST \$	% MIX	CONST \$
CROSS STREET - PROGRAM FIT OUT	48%	\$ 1,386,598
CROSS STREET - CIRC & BOH FIT OUT	52%	\$ 1,076,889

COST SPLIT BY PROGRAMMABLE SPACE	
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EXCLUSIONS & ASSUMPTIONS

- 1 Escalation has been EXCLUDED from this model as project schedule is not yet known. WE have updated our escalation outlook as of Q3 2021 based on recent bid submissions, on going supply chain issues, and a strong pipeline through 2022 of active construction.

The following multipliers reflect our best projections for escalation moving forward, Due to the continued volatility in the market, these should be reviewed on a regular basis before finalizing project schedules, budgets, and scopes. Beyond 2024 we recommend carrying the typical 10-year rolling average of 4.5% for the purpose of this study.

YR	<u>Projected Escalation %</u>	<u>Compounded %</u>	<u>Compounded Escalation Multiplier</u>
2021	8.0%	1.3%	1.01 (to end of 2021)
2022	5.0%	6%	1.06
2023	4.0%	11%	1.11
2024	4.5%	16%	1.16
2025	4.5%	21%	1.21
2026	4.5%	26%	1.26
2027	4.5%	32%	1.32
2028	4.5%	38%	1.38
2029	4.5%	44%	1.44

- 2 We have excluded phasing allowances on trade costs + design contingency
- 3 We have included 12% 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 + GCSs)
- 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 project schedule construction durations provided by PMA. See GC staffing sheet at back of the report for assumed staffing.
- 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 04_2875 CoS CSA MP - PSR Cost Estimating Narrative
- 2 165Bwy_Demolition and C&S Plans_A-1 to A-2_20211018
- 3 165Bwy_EX-2 Existing Elevations with Estimating Markups_20211018
- 4 165Bwy_Nitsch Proposed Site & Utilities Concept Sketch_20211013
- 5 165Bwy_S-1 Existing Plans with Structural Markups_20211018
- 6 HBM Survey Rpt Cross St Center Somerville 092421

Systems Assumptions

General

Please see estimate backup for additional assumptions, qualifications & exclusions

Foundations/Basement Construction

Costs are included to replace 30% of the existing basement SOG
All other work to existing foundations is excluded with the exception of grouting/furring at extg below grade foundation walls

Superstructure

Repairing/reinforcing the extg concrete beams has been included per the narrative. Quantities have been included per the structural sketch.
An allowance of \$5/SF has been included for additional 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 \$2.5/SF has been included for misc sealants for the thermal envelope

Roofing

Costs are included to replace the existing roofing system, including replacing the sloped asphalt roof w/ standing seam metal at the north side of the building

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.

Code required rated GWB ceiling at wood joists is included within the ADA Core and Shell section.

Fitout costs are modeled

Stairways/Conveying

An allowance for a new hydraulic elevator in extg shaft has been included

Services

Estimate assumes full replacement of all MEP systems per narrative

A separate emergency electrical system is excluded. Emergency power to be provided by a roll up generator and a manual switch

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

Hazmat abatement has been included per the provided Axiom report. Abatement scope not identified by the reports is EXCLUDED at this time.

Site Improvements

Contaminated soil disposal is excluded

Site Mechanical Utilities

Allowances of 50LF have been assumed for connections to street services.

Site Electrical Utilities

An allowance of 15K is included for site lighting

DIVISION SUMMARY		12,150 GFA		28-Oct-21
			\$/SF	\$ TOTAL
	Project Requirements		28.05	340,791
	PROJECT REQUIREMENTS		28.05	340,791
A10.	Foundations		14.60	177,419
A20.	Basement Construction			0
A.	SUBSTRUCTURE		14.60	177,419
B10.	Superstructure		10.15	123,270
B20.	Exterior Enclosure		121.89	1,481,023
B30.	Roofing		24.59	298,811
B.	SHELL		156.63	1,903,104
C10.	Interior Construction		35.22	427,975
C30.	Interior Finishes		26.42	321,000
C.	INTERIORS		61.64	748,975
C20.	Stairways		3.21	39,000
D10.	Conveying Systems		13.25	161,000
	VERTICAL TRANSPORTATION		16.46	200,000
D20.	Plumbing Systems		28.85	350,500
D30.	Heating, Ventilating & Air Conditioning		145.32	1,765,633
D40.	Fire Protection Systems		8.42	102,275
D50.	Electric Lighting, Power & Communications		67.92	825,169
D.	SERVICES		250.50	3,043,577
E10.	Equipment		1.28	15,525
E20.	Furnishings		5.96	72,438
E.	EQUIPMENT AND FURNISHINGS		7.24	87,963
F10.	Special Construction (Sustainability allowance)		0.00	0
F20.	Selective Demolition		24.81	301,438
F.	SPECIAL CONSTRUCTION AND DEMOLITION		24.81	301,438
	TOTAL BUILDING CONSTRUCTION		559.94	6,803,266
G10.	Site Preparation		2.38	28,914
G20.	Site Improvements		18.96	230,341
G30.	Site Civil/Mechanical Utilities		5.85	71,096
G40.	Site Electrical Utilities		1.89	23,000
G90.	Other Site Construction		0.00	0
	TOTAL SITE CONSTRUCTION		29.08	353,351
	TOTAL TRADE COSTS		589.02	7,156,616
	a. Design Contingency	11.0%	64.79	787,228
	b. Phasing Allowance	0.0%	0.00	0
	c. Construction Contingency	4.5%	29.42	357,473
	d. General Conditions	10.66%	72.83	884,929
	SUBTOTAL		756.07	9,186,246
	e. Permits	0.0%	0.00	0
	f. Insurances	2.6%	19.66	238,842
	g. Bond	1.5%	11.34	137,794
	h. Fee	3.0%	23.61	286,886
	TOTAL COST TODAY		810.68	9,849,769
	i. Escalation	EXCLUDED	0.00	0
	TOTAL ANTICIPATED CONSTRUCTION COST		\$811	9,849,769

SUMMARY BY PROGRAM

12,150

GFA



TRADE		CORE & SHELL	/ SF	COMBINED FIT-OUT PROJECTS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING		\$ 216,388	\$ 17.81	\$ 85,050	\$ 7.00	\$ 301,438	\$ 24.81
FOUNDATIONS		\$ 177,419	\$ 14.60	\$ -	\$ -	\$ 177,419	\$ 14.60
BASEMENT CONSTRUCTION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE		\$ 123,270	\$ 10.15	\$ -	\$ -	\$ 123,270	\$ 10.15
EXTERIOR ENCLOSURE		\$ 1,481,023	\$ 121.89	\$ -	\$ -	\$ 1,481,023	\$ 121.89
ROOFING		\$ 298,811	\$ 24.59	\$ -	\$ -	\$ 298,811	\$ 24.59
INTERIOR CONSTRUCTION		\$ 197,500	\$ 16.26	\$ 230,475	\$ 18.97	\$ 427,975	\$ 35.22
INTERIOR FINISHES		\$ -	\$ -	\$ 321,000	\$ 26.42	\$ 321,000	\$ 26.42
STAIRWAYS		\$ 39,000	\$ 3.21	\$ -	\$ -	\$ 39,000	\$ 3.21
CONVEYING SYSTEMS		\$ 161,000	\$ 13.25	\$ -	\$ -	\$ 161,000	\$ 13.25
PLUMBING		\$ 269,650	\$ 22.19	\$ 80,850	\$ 6.65	\$ 350,500	\$ 28.85
HVAC		\$ 1,256,633	\$ 103.43	\$ 509,000	\$ 41.89	\$ 1,765,633	\$ 145.32
FIRE PROTECTION		\$ 48,600	\$ 4.00	\$ 53,675	\$ 4.42	\$ 102,275	\$ 8.42
ELECTRICAL		\$ 419,919	\$ 34.56	\$ 405,250	\$ 33.35	\$ 825,169	\$ 67.92
EQUIPMENT		\$ -	\$ -	\$ 15,525	\$ 1.28	\$ 15,525	\$ 1.28
FURNISHINGS		\$ 15,188	\$ 1.25	\$ 57,250	\$ 4.71	\$ 72,438	\$ 5.96
SUSTAINABILITY ALLOWANCE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP		\$ 28,914	\$ 2.38	\$ -	\$ -	\$ 28,914	\$ 2.38
SITE IMPROVEMENTS		\$ 230,341	\$ 18.96	\$ -	\$ -	\$ 230,341	\$ 18.96
SITE CIVIL / MECHANICAL		\$ 71,096	\$ 5.85	\$ -	\$ -	\$ 71,096	\$ 5.85
SITE ELECTRICAL		\$ 23,000	\$ 1.89	\$ -	\$ -	\$ 23,000	\$ 1.89
OTHER SITE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS		\$ 5,057,750	\$ 416.28	\$ 1,758,075	\$ 144.70	\$ 6,815,825	\$ 560.97
Design Contingency	11.00%	\$ 584,170	\$ 48.08	\$ 203,058	\$ 16.71	\$ 787,228	\$ 64.79
Phasing Allowance	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	4.50%	\$ 265,266	\$ 21.83	\$ 92,207	\$ 7.59	\$ 357,473	\$ 29.42
General Conditions	10.66%	\$ 728,636	\$ 59.97	\$ 156,293	\$ 12.86	\$ 884,929	\$ 72.83
Project Requirements	5.00%	\$ 252,888	\$ 20.81	\$ 87,904	\$ 7.23	\$ 340,791	\$ 28.05
SUBTOTAL		\$ 6,888,710	\$ 566.97	\$ 2,297,536	\$ 189.10	\$ 9,186,246	\$ 756.07
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	2.60%	\$ 179,106	\$ 14.74	\$ 59,736	\$ 4.92	\$ 238,842	\$ 19.66
Bond	1.50%	\$ 103,331	\$ 8.50	\$ 34,463	\$ 2.84	\$ 137,794	\$ 11.34
CM Fee	3.00%	\$ 215,134	\$ 17.71	\$ 71,752	\$ 5.91	\$ 286,886	\$ 23.61
SUBTOTAL		\$ 7,386,281	\$ 607.92	\$ 2,463,487	\$ 202.76	\$ 9,849,769	\$ 810.68
Escalation	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL		\$ 7,386,281	\$ 607.92	\$ 2,463,487	\$ 202.76	\$ 9,849,769	\$ 810.68

SUMMARY BY PROGRAM

TRADE	12,150		12,150		12,150		5,380	
	RENOVATION CORE & SHELL				RENOVATION CORE & SHELL			
	ENVELOPE		MEP INFRASTRUCTURE		DEMO/CORE/ADA MODIFICATIONS		SITWORK	
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ -	\$ -	\$ 36,450	\$ 3.00	\$ 179,938	\$ 14.81	\$ -	\$ -
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ 177,419	\$ 14.60	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ 123,270	\$ 10.15	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ 1,481,023	\$ 121.89	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ 298,811	\$ 24.59	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ 197,500	\$ 16.26	\$ -	\$ -
INTERIOR FINISHES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ 39,000	\$ 3.21	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ 161,000	\$ 13.25	\$ -	\$ -
PLUMBING	\$ -	\$ -	\$ 269,650	\$ 22.19	\$ -	\$ -	\$ -	\$ -
HVAC	\$ -	\$ -	\$ 1,256,633	\$ 103.43	\$ -	\$ -	\$ -	\$ -
FIRE PROTECTION	\$ -	\$ -	\$ 48,600	\$ 4.00	\$ -	\$ -	\$ -	\$ -
ELECTRICAL	\$ -	\$ -	\$ 419,919	\$ 34.56	\$ -	\$ -	\$ -	\$ -
EQUIPMENT	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FURNISHINGS	\$ -	\$ -	\$ -	\$ -	\$ 15,188	\$ 1.25	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 28,914	\$ 5.37
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 230,341	\$ 42.81
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 71,096	\$ 13.21
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 23,000	\$ 4.28
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 1,779,834	\$ 146.49	\$ 2,031,252	\$ 167.18	\$ 893,314	\$ 73.52	\$ 353,351	\$ 65.68
Design Contingency	\$ 205,571	\$ 16.92	\$ 234,610	\$ 19.31	\$ 103,178	\$ 8.49	\$ 40,812	\$ 7.59
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 93,348	\$ 7.68	\$ 106,534	\$ 8.77	\$ 46,852	\$ 3.86	\$ 18,532	\$ 3.44
General Conditions	\$ 280,244	\$ 23.07	\$ 224,196	\$ 18.45	\$ 168,147	\$ 13.84	\$ 56,049	\$ 10.42
Project Requirements	\$ 88,992	\$ 7.32	\$ 101,563	\$ 8.36	\$ 44,666	\$ 3.68	\$ 17,668	\$ 3.28
SUBTOTAL	\$ 2,447,988	\$ 201.48	\$ 2,698,153	\$ 222.07	\$ 1,256,157	\$ 103.39	\$ 486,411	\$ 90.41
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 63,648	\$ 5.24	\$ 70,152	\$ 5.77	\$ 32,660	\$ 2.69	\$ 12,647	\$ 2.35
Bond	\$ 36,720	\$ 3.02	\$ 40,472	\$ 3.33	\$ 18,842	\$ 1.55	\$ 7,296	\$ 1.36
CM Fee	\$ 76,451	\$ 6.29	\$ 84,263	\$ 6.94	\$ 39,230	\$ 3.23	\$ 15,191	\$ 2.82
SUBTOTAL	\$ 2,624,807	\$ 216.03	\$ 2,893,041	\$ 238.11	\$ 1,346,889	\$ 110.86	\$ 521,545	\$ 96.94
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 2,624,807	\$ 216.03	\$ 2,893,041	\$ 238.11	\$ 1,346,889	\$ 110.86	\$ 521,545	\$ 96.94

SUMMARY BY PROGRAM

TRADE	450		3,600		1,800		250		975		5,075	
	RENOVATION FIT-OUT MODEL											
	LOBBY/RECEPTION		TEEN CENTER		FOOD PANTRY		RESTROOMS		CIRCULATION		BOH/BALANCE	
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 3,150	\$ 7.00	\$ 25,200	\$ 7.00	\$ 12,600	\$ 7.00	\$ 1,750	\$ 7.00	\$ 6,825	\$ 7.00	\$ 35,525	\$ 7.00
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 8,100	\$ 18.00	\$ 72,000	\$ 20.00	\$ 36,000	\$ 20.00	\$ 18,750	\$ 75.00	\$ 19,500	\$ 20.00	\$ 76,125	\$ 15.00
INTERIOR FINISHES	\$ 18,000	\$ 40.00	\$ 126,000	\$ 35.00	\$ 54,000	\$ 30.00	\$ 22,500	\$ 90.00	\$ 24,375	\$ 25.00	\$ 76,125	\$ 15.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ -	\$ -	\$ 10,800	\$ 3.00	\$ 14,400	\$ 8.00	\$ 37,500	\$ 150.00	\$ 2,925	\$ 3.00	\$ 15,225	\$ 3.00
HVAC	\$ 22,500	\$ 50.00	\$ 180,000	\$ 50.00	\$ 81,000	\$ 45.00	\$ 13,750	\$ 55.00	\$ 34,125	\$ 35.00	\$ 177,625	\$ 35.00
FIRE PROTECTION	\$ 1,800	\$ 4.00	\$ 14,400	\$ 4.00	\$ 7,200	\$ 4.00	\$ 1,000	\$ 4.00	\$ 3,900	\$ 4.00	\$ 25,375	\$ 5.00
ELECTRICAL	\$ 20,250	\$ 45.00	\$ 162,000	\$ 45.00	\$ 63,000	\$ 35.00	\$ 8,750	\$ 35.00	\$ 24,375	\$ 25.00	\$ 126,875	\$ 25.00
EQUIPMENT	\$ 4,500	\$ 10.00	\$ -	\$ -	\$ 5,400	\$ 3.00	\$ 750	\$ 3.00	\$ 4,875	\$ 5.00	\$ -	\$ -
FURNISHINGS	\$ 2,250	\$ 5.00	\$ 18,000	\$ 5.00	\$ 27,000	\$ 15.00	\$ 10,000	\$ 40.00	\$ -	\$ -	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 80,550	\$ 179.00	\$ 608,400	\$ 169.00	\$ 300,600	\$ 167.00	\$ 114,750	\$ 459.00	\$ 120,900	\$ 124.00	\$ 532,875	\$ 105.00
Design Contingency	\$ 9,304	\$ 20.67	\$ 70,270	\$ 19.52	\$ 34,719	\$ 19.29	\$ 13,254	\$ 53.01	\$ 13,964	\$ 14.32	\$ 61,547	\$ 12.13
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 4,225	\$ 9.39	\$ 31,909	\$ 8.86	\$ 15,766	\$ 8.76	\$ 6,018	\$ 24.07	\$ 6,341	\$ 6.50	\$ 27,948	\$ 5.51
General Conditions	\$ 13,024	\$ 28.94	\$ 65,122	\$ 18.09	\$ 26,049	\$ 14.47	\$ 13,024	\$ 52.10	\$ 13,024	\$ 13.36	\$ 26,049	\$ 5.13
Project Requirements	\$ 4,028	\$ 8.95	\$ 30,420	\$ 8.45	\$ 15,030	\$ 8.35	\$ 5,738	\$ 22.95	\$ 6,045	\$ 6.20	\$ 26,644	\$ 5.25
SUBTOTAL	\$ 111,130	\$ 246.96	\$ 806,121	\$ 223.92	\$ 392,164	\$ 217.87	\$ 152,784	\$ 611.14	\$ 160,274	\$ 164.38	\$ 675,063	\$ 133.02
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 2,889	\$ 6.42	\$ 20,959	\$ 5.82	\$ 10,196	\$ 5.66	\$ 3,972	\$ 15.89	\$ 4,167	\$ 4.27	\$ 17,552	\$ 3.46
Bond	\$ 1,667	\$ 3.70	\$ 12,092	\$ 3.36	\$ 5,882	\$ 3.27	\$ 2,292	\$ 9.17	\$ 2,404	\$ 2.47	\$ 10,126	\$ 2.00
CM Fee	\$ 3,471	\$ 7.71	\$ 25,175	\$ 6.99	\$ 12,247	\$ 6.80	\$ 4,771	\$ 19.09	\$ 5,005	\$ 5.13	\$ 21,082	\$ 4.15
SUBTOTAL	\$ 119,157	\$ 264.79	\$ 864,348	\$ 240.10	\$ 420,490	\$ 233.61	\$ 163,820	\$ 655.28	\$ 171,851	\$ 176.26	\$ 723,822	\$ 142.63
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 119,157	\$ 264.79	\$ 864,348	\$ 240.10	\$ 420,490	\$ 233.61	\$ 163,820	\$ 655.28	\$ 171,851	\$ 176.26	\$ 723,822	\$ 142.63

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	12,150			36,450
Demolition of extg MEP systems	12,150	SF	3.00	36,450
PLUMBING	12,150			269,650
Plumbing infrastructure replacement	12,150	SF	7.00	85,050
Rainwater storage & reuse - allow				-
Rainwater treatment skid	1	LS	75,000.00	75,000
Makeup water connection w/ backflow preventer	1	LS	10,000.00	10,000
Day Tank for reuse - 2000 gal assumed	1	LS	8,000.00	8,000
Piping and connections - allow	1	LS	30,000.00	30,000
Allowance - reuse of rainwater for flushing, inclusive of risers, pumps, distribution etc.	1	LS	36,600.00	36,600
Misc. harvesting scope required	1	LS	25,000.00	25,000
HVAC	12,150			1,256,633
<u>HVAC Infrastructure</u>				-
<u>Heating/cooling equipment</u>				-
ASHP - 30 TON	3	EA	80,000.00	240,000
HX - 150 gpm plate and frame units	2	EA	22,500.00	45,000
300 Gal buffer tanks	2	EA	4,000.00	8,000
Primary/secondary pumps				-
- 3 hp HW primary pumps	2	EA	7,500.00	15,000
- 5 hp HW secondary pumps	2	EA	10,000.00	20,000
- 3 hp CHW primary pumps	2	EA	7,500.00	15,000
- 5 hp CHW secondary pumps	2	EA	10,000.00	20,000
Expansion, air separation , shot feed, pressurization, filtration (assumed)	1	EA	10,000.00	10,000
<u>Heat Recovery Systems</u>				-
New glycol system/ feed	1	LS	25,000.00	25,000
<u>Air Distribution</u>				-
AHU-1	5,000	CFM	17.00	85,000
<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				Not Req.
Pumps	8	EA	3,500.00	28,000
VFD's for exhaust fans, allow	1	EA	1,500.00	1,500
Energy Metering Allowance	1	LS	25,000.00	25,000
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves & Connections</u>				-
<u>Steam Piping</u>				Excluded, assume not required
<u>Heating/Cooling piping</u>				-
- CHW/HW mains & risers, runouts to equipment	438	LF	80.00	35,054
- Piping on floor loops	2,980	LF	40.00	119,184
Control valves on main equipment	9	EA	3,500.00	31,500
<u>Sheetmetal & Accessories</u>				-
Primary ductwork galvanized sheetmetal tying	4,350	LBS	15.50	67,425
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	14,718.75	14,719
Exhaust intake actuators for smoke				Excluded

TRADE	QTY	UNIT	RATE	TOTAL
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	3,418	LF	11.00	37,596
Ductwork insulation	3,346	SF	6.00	20,077
<u>Fuel Systems</u>				Excluded, assume not required
<u>Data room/supplemental 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	30	PTS	1,200.00	36,000
Pumps	32	PTS	1,200.00	38,400
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	43,938.20	43,938
Co-ordination, rigging, CAD, Sub-trade temp	1	LS	114,239.32	114,239
FIRE PROTECTION	12,150			48,600
Fire protection infrastructure	12,150	SF	4.00	48,600
ELECTRICAL	12,150			419,919
<u>Normal Service Distribution</u>				-
500KVA pad mounted xfmr	1	LS	55,000.00	55,000
800A swbd, CT cab	1	LS	28,000.00	28,000
45kva step down xfmr	2	EA	5,000.00	10,000
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>MTS Switches</u>				-
MTS Switches	1	EA	7,500.00	Excluded
<u>Energy Metering</u>				-
Energy meters	3	EA	3,500.00	10,500
<u>Normal Feeders</u>	12,150	SF	3.00	36,450
<u>Emergency Power Distribution</u>				-
Generator				Excluded, roll up
Acoustic enclosure allowance				Excluded, roll up
Panel/connections				Excluded, roll up
<u>Emergency Distribution Panels - allow</u>				Excluded, manual switch with roll up generator
<u>Emergency Feeders</u>				Excluded, manual switch with roll up generator
<u>Mechanical / Equipment Power</u>	12,150	SF	2.50	30,375
<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	12,150	SF	7.00	85,050
Temp fire alarm	12,150	SF	1.50	18,225
<u>BDA</u>				Excluded, assume not required
<u>Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)</u>	12,150	SF	3.00	36,450
<u>Audio visual</u>				w/ fitout
<u>Security systems allowance (head-end and backbone)</u>	12,150	SF	2.00	24,300
<u>Lightning protection</u>	12,150	SF	0.85	10,328
Testing & bonding	1	LS	12,567.10	12,567
Sub-trade temps/ gcs	1	LS	38,174.46	38,174

TRADE	QTY	UNIT	RATE	TOTAL
PROJECT REQUIREMENTS	12,150			101,563
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	2,031,252	101,563
TOTAL DIRECT COSTS				2,132,814
ALLOCATIONS				760,227
General Conditions	8.0	28,024	wks	224,196
Permits	0.0 %			-
Insurances	2.6 %			70,152
Design Contingency	11.0 %			234,610
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			106,534
Bond	1.5 %			40,472
Fee	3.0 %			84,263
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				2,893,041

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	12,150			179,938
<u>Hazmat Abatement - Per Axiom Report</u>				-
Exterior Window Caulking	57	EA	125.00	7,125
Exterior Window Glazing (w/ wood double hung window)	57	EA		Included in above
Roof Cement on Brick Wall	10	LF	30.00	300
6" Pipe Insulation	480	LF	15.63	7,500
Black Sink Mastic	2	EA	100.00	200
Asphaltic Damp Proofing	1	LS	80,000.00	80,000
Buried Pipes/Steam Tunnels	1	LS	50,000.00	50,000
Concealed Caulking and Sealants behind vinyl or aluminum window frames				TBD
Concealed pipe & fitting insulation behind hard wall and ceiling surfaces				TBD
Grouts/Thin sets with ceramic wall and floor tiles				TBD
Pipe elbow insulation	1	LS	1,000.00	1,000
Misc. Hazardous Building Materials	1	LS	5,000.00	5,000
5.5% Contingency (4.5% below line)	1	LS	8,313.25	8,313
Abatement bid and monitoring fee	1	LS	14,000.00	14,000
<u>Demo</u>				
Demo Existing stair to be replaced	1	LS	6,500.00	6,500
FOUNDATIONS	12,150			177,419
Existing Foundations				-
Removal/replacement of extg basement slab on grade - assume 6" (30%)	1,142	SF		<i>For reference only</i>
Chop/remove extg slab	1,142	SF	12.00	13,702
Pour new reinforced 6" slab	1,142	SF	15.00	17,127
Below grade foundation walls	274	LF		<i>For reference only</i>
Perimeter grout injection	2,740	SF	40.00	109,600
Furring - 2.5" stud, 1 layer drywall	2,740	SF	8.50	23,290
5" open cell spray foam	2,740	SF	5.00	13,700
SUPERSTRUCTURE	12,150			123,270
Steel Reinforcement of concrete beams per structural sketch and for floor rebuild- beam weight assumed 30lbs/lf (premium \$/ton for small qty)	4	TONS	10,000.00	36,000
Demo spalled concrete per sketch	440	SF	18.00	7,920
Temporary shoring - allowance	1	LS	12,000.00	12,000
Concrete floor - metal deck with concrete	440	SF	15.00	6,600
Misc. structural allowance for repairs	12,150	SF	5.00	60,750
INTERIOR CONSTRUCTION	12,150			197,500
Core & shell interior construction allowance	12,150	SF	10.00	121,500
Code Required Fire Rated GWB at underside of Second floor and roof joists	8,000	SF	9.50	76,000
STAIRWAYS	12,150			39,000
<u>New Stair</u>				-
New metal pan stair with resilient tread over concrete inlay, painted metal handrail/guardrail, painted metal stringers	2	FLTS	15,000.00	30,000
- Wall mounted painted handrail	50	LF	180.00	9,000
CONVEYING SYSTEMS	12,150			161,000

TRADE	QTY	UNIT	RATE	TOTAL
Roped hydraulic elevator	2	STOPS	50,000.00	100,000
Hung elevator pit	1	LS	30,000.00	30,000
Elevator shaft - remove 1 wythe brick, patch	240	SF	25.00	6,000
Elevator supplemental steel requirements	1	LS	25,000.00	25,000
FURNISHINGS	12,150			15,188
Accessibility Signage - allowance	12,150	SF	0.75	9,113
Wayfinding Signage & Departmental Graphics	12,150	SF	0.50	6,075
PROJECT REQUIREMENTS	12,150			44,666
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	893,314	44,666
TOTAL DIRECT COSTS				937,980
ALLOCATIONS				408,909
General Conditions	6.0	28,024	wks	168,147
Permits	0.0 %			-
Insurances	2.6 %			32,660
Design Contingency	11.0 %			103,178
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			46,852
Bond	1.5 %			18,842
Fee	3.0 %			39,230
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				1,346,889

TRADE	QTY	UNIT	RATE	TOTAL
EXTERIOR ENCLOSURE	12,150			1,481,023
<u>Scaffolding - assume scaffolding @ entire enclosure</u>	10,419	SF		<i>For reference only</i>
Scaffolding	10,419	SF	18.00	187,545
Scrim	10,419	SF	5.00	52,096
Misc. setup/tear down	20	MD	800.00	16,000
<u>Window Replacement</u>				-
Remove extg windows/temp weatherproofing @ openings	44	LOC	650.00	28,600
Masonry opening repairs	44	LOC	800.00	35,200
Waterproofing	44	LOC	275.00	12,100
Grouting/insulation	44	LOC	185.00	8,140
New windows - aluminum, frame within frame, triple glazed	943	SF	180.00	169,740
<u>Re-open extg infilled masonry window openings</u>				-
Create new openings	3	LOC	1,500.00	4,500
Grouting/insulation	3	LOC	250.00	750
New windows - aluminum, triple galzed	36	SF	200.00	7,200
Masonry repairs	3	LOC	1,200.00	3,600
Waterproofing	3	LOC	300.00	900
<u>Masonry Restoration</u>				-
100% masonry cleaning - brick	10,419	SF	5.00	52,096
100% Repointing at all brick and granit facades	10,419	SF	35.00	364,670
20% Efflorescence treatment	60	SF	10.00	600
20% Veg Removal	820	SF	8.00	6,560
Chimney coping	29	LF	100.00	2,900
Chimney masonry rebuild	120	SF	60.00	7,200
Crack repair	6	LF	125.00	750
New Granite Base to Match Extg	209	SF	250.00	52,250
Paint removal area	1	LOC	1,440.00	1,440
Rebuild corner corbel	1	LOC	5,000.00	5,000
Rust jacking	2	LOC	750.00	1,500
Single brick replacement	120	BRICKS	70.00	8,400
Remove abandoned anchors and fill holes	120	EA	200.00	24,000
Remove grey sealant	1	LS	180.00	180
Replace faux stone string courses w/ copper	212	LF	700.00	148,400
Scrape, prime & paint fire escape	1	LS	10,000.00	10,000
Replace fire escape footing	1	LS	3,500.00	3,500
Misc. sealants allowance	12,150	SF	2.00	24,300
<u>New Façade/Entrances</u>				-
HM Doors/Frames	4	EA	2,500.00	10,000
New entrance storefront	338	SF	150.00	50,700
New entrance glass doors - single	1	LOC	10,000.00	10,000
Automatic door openers	1	LOC	3,500.00	3,500
<u>Interior Side</u>				-
Furring - 2.5" stud, 1 layer drywall	10,419	SF	11.00	114,611
5" open cell spray foam	10,419	SF	5.00	52,096
ROOFING	12,150			298,811
<u>Roofing Replacement</u>				-
<u>Flat Roof replacement</u>				-
Remove/replace extg roofing system - membrane	3,613	SF	40.00	144,520
- Repitch tower roof to center per narrative	1	LS	1,800.00	1,800

TRADE	QTY	UNIT	RATE	TOTAL
- Add roof drain and internal drain leader/overflow	1	LS	4,000.00	4,000
Closed cell spray foam between rafters	3,613	SF	10.00	36,130
<u>Replace low roof</u>				-
Remove/replace extg asphalt roof w/ metal @ rear of building: rigid foam insulation (R-14) and standing seam powder-coated metal roof system with self adhered air barrier membrane over sheathing	892	SF	69.00	61,520
Closed cell with ignition barrier low GWP spray foam insulation between rafters below deck, achieve R-24	892	SF	15.00	13,374
Allowance - 20% Deck replacement	178	SF	20.00	3,566
Misc				-
New gutters - powder coated aluminum	100	LF	40.00	4,000
New downspouts	92	LF	40.00	3,680
New copings/flashings	437	LF	60.00	26,220
PROJECT REQUIREMENTS	12,150			88,992
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,779,833.65	88,992
TOTAL DIRECT COSTS				1,868,825
ALLOCATIONS				755,981
General Conditions	10.0	28,024	wks	280,244
Permits	0.0 %			-
Insurances	2.6 %			63,648
Design Contingency	11.0 %			205,571
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			93,348
Bond	1.5 %			36,720
Fee	3.0 %			76,451
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				2,624,807

TRADE	QTY	UNIT	RATE	TOTAL
SITE PREP	5,380			28,914
Site Perimeter Fence	438	LF	30.00	13,140
Silt Barrier and Erosion protection - allowance	4,728	SF	0.25	1,182
Site demolition	4,728	SF	1.50	7,092
Construction Vehicle access/wheel wash	1	EA	7,500.00	7,500
SITE IMPROVEMENTS	5,380			230,341
<u>Grading</u>				-
Fine grading	4,728	SF	1.00	4,728
<u>Stairs & Walls</u>			Excluded, none assumed	-
<u>Hardscape</u>				-
Pedestrian Sidewalks/Curbs - Brushed concrete CIP, sloped to permeable pavers at curb area	2,033	SF	30.00	60,975
Permeable plaza pavers along curb with underdrains	678	SF	65.00	44,038
Permeable pavers at entry and north side - assumed	1,160	SF	55.00	63,800
<u>Landscaping & Plantings</u>				-
Trees, allowance	5	EA	1,200.00	6,000
Softscape, bioretention - 75% of landscape areas - inclusive of 24" soil media and 12" crushed stone reservoir	900	SF	40.00	36,000
Sod cover around bioretention areas	300	SF	4.00	1,200
Irrigation - reuse of storm water per nitsch narrative	1,200	SF	3.00	3,600
<u>Misc. Site Furnishings</u>	1	LS	10,000.00	10,000
SITE CIVIL / MECHANICAL	5,380			71,096
<u>Storm Water Management</u>				-
Site stormwater management - allowance for new infrastructure (pipes,grates,structures)	4,728	SF	7.00	33,096
Rainwater storage & reuse - allow				-
Rainwater treatment skid				With Plumbing
Exterior storage tank - 5000Gal	1	LS	15,000.00	15,000
<u>Incoming utility services</u>				-
6" Fire Service - length assumed	40	LF	150.00	6,000
- Excavation and backfill	22	CY	120.00	2,667
2" Water Service - length assumed	40	LF	100.00	4,000
- Excavation and backfill	22	CY	120.00	2,667
Replace Sewer Service - length assumed	40	LF	125.00	5,000
- Excavation and backfill	22	CY	120.00	2,667
SITE ELECTRICAL	5,380			23,000
Site Electrical - allowance	1	LS	18,000.00	18,000
<u>Electrical Service</u>				-
Incoming electrical ductbank			Excluded, assume ETR	-
Concrete pad for transformer	1	LS	5,000.00	5,000
PROJECT REQUIREMENTS	5,380			17,668
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	353,351	17,668

TRADE	QTY	UNIT	RATE	TOTAL
TOTAL DIRECT COSTS				371,018
ALLOCATIONS				150,527
General Conditions	2.0	28,024	wks	56,049
Permits	0.0 %			-
Insurances	2.6 %			12,647
Design Contingency	11.0 %			40,812
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			18,532
Bond	1.5 %			7,296
Fee	3.0 %			15,191
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				521,545

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	12,150			85,050
LOBBY/RECEPTION	450	SF	7.00	3,150
TEEN CENTER	3,600	SF	7.00	25,200
FOOD PANTRY	1,800	SF	7.00	12,600
RESTROOMS	250	SF	7.00	1,750
CIRCULATION	975	SF	7.00	6,825
BOH/BALANCE	5,075	SF	7.00	35,525
INTERIOR CONSTRUCTION	12,150			230,475
LOBBY/RECEPTION	450	SF	18.00	8,100
TEEN CENTER	3,600	SF	20.00	72,000
FOOD PANTRY	1,800	SF	20.00	36,000
RESTROOMS	250	SF	75.00	18,750
CIRCULATION	975	SF	20.00	19,500
BOH/BALANCE	5,075	SF	15.00	76,125
INTERIOR FINISHES	12,150			321,000
LOBBY/RECEPTION	450	SF	40.00	18,000
TEEN CENTER	3,600	SF	35.00	126,000
FOOD PANTRY	1,800	SF	30.00	54,000
RESTROOMS	250	SF	90.00	22,500
CIRCULATION	975	SF	25.00	24,375
BOH/BALANCE	5,075	SF	15.00	76,125
PLUMBING	12,150			80,850
LOBBY/RECEPTION	450	SF	0.00	-
TEEN CENTER	3,600	SF	3.00	10,800
RESTROOMS	250	SF	150.00	37,500
CIRCULATION	975	SF	3.00	2,925
BOH/BALANCE	5,075	SF	3.00	15,225
HVAC	12,150			509,000
LOBBY/RECEPTION	450	SF	50.00	22,500
TEEN CENTER	3,600	SF	50.00	180,000
FOOD PANTRY	1,800	SF	45.00	81,000
RESTROOMS	250	SF	55.00	13,750
CIRCULATION	975	SF	35.00	34,125
BOH/BALANCE	5,075	SF	35.00	177,625
FIRE PROTECTION	12,150			53,675
LOBBY/RECEPTION	450	SF	4.00	1,800
TEEN CENTER	3,600	SF	4.00	14,400
FOOD PANTRY	1,800	SF	4.00	7,200
RESTROOMS	250	SF	4.00	1,000
CIRCULATION	975	SF	4.00	3,900
BOH/BALANCE	5,075	SF	5.00	25,375
ELECTRICAL	12,150			405,250
LOBBY/RECEPTION	450	SF	45.00	20,250
TEEN CENTER	3,600	SF	45.00	162,000
FOOD PANTRY	1,800	SF	35.00	63,000
RESTROOMS	250	SF	35.00	8,750
CIRCULATION	975	SF	25.00	24,375
BOH/BALANCE	5,075	SF	25.00	126,875

TRADE	QTY	UNIT	RATE	TOTAL
EQUIPMENT	12,150			15,525
LOBBY/RECEPTION	450	SF	10.00	4,500
FOOD PANTRY	1,800	SF	3.00	5,400
RESTROOMS	250	SF	3.00	750
CIRCULATION	975	SF	5.00	4,875
FURNISHINGS	12,150			57,250
LOBBY/RECEPTION	450	SF	5.00	2,250
TEEN CENTER	3,600	SF	5.00	18,000
FOOD PANTRY	1,800	SF	15.00	27,000
RESTROOMS	250	SF	40.00	10,000
PROJECT REQUIREMENTS	12,150			87,904
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,758,075	87,904
TOTAL DIRECT COSTS				1,845,979
ALLOCATIONS				617,509
General Conditions	12.0	wks	13,024	156,293
Permits	0.0 %			-
Insurances	2.6 %			59,736
Design Contingency	11.0 %			203,058
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			92,207
Bond	1.5 %			34,463
Fee	3.0 %			71,752
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				2,463,487

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	PLUM ALT #1: DEDUCT REUSE OF RAINWATER FOR FLUSHING <i>Deduct reuse of rainwater for flushing</i>				(55,471)
	Deduct rainwater reuse for flushing allowance	(1)	LS	44,600.00	(44,600)
	<u>Total Direct Costs</u>				(44,600)
	<u>Allocations</u>				(10,871)
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			(1,345)
	Design Contingency	11.0 %			(4,906)
	Phasing Allowance	0.0 %			-
	Construction Contingency	4.5 %			(2,228)
	Bond	1.5 %			(776)
	Fee	3.0 %			(1,616)
	Escalation	Excluded			-

GENERAL CONDITIONS CORE & SHELL
CROSS ST CENTER REHAB

SOMERVILLE MP - 165 BROADWAY
28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 6.5	DAYS - X 20 130	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%	130	7	\$ 1,500	\$ 195,000
Sr. Project Manager	100%	130	7	\$ 1,500	\$ 195,000
Project Manager	100%	130	7	\$ 1,200	\$ 156,000
Assistant Project Manager	50%	65	3	\$ 900	\$ 58,500
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	39	2	\$ 1,500	\$ 58,500
Purchasing	5%	7	0	\$ 1,500	\$ 9,750
MEP Coordinator	15%	20	1	\$ 1,300	\$ 25,350
Safety	10%	14	1	\$ 1,800	\$ 24,556
Project Accountant	2%	3	0	\$ 700	\$ 1,820
Project Administration	2%	3	0	\$ 500	\$ 1,300
Project Expeditor	2%	3	0	\$ 1,100	\$ 2,860
TOTALS					\$ 728,636

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 3	DAYS - X 20 60	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%	15	1	\$ 1,500	\$ 22,500
Project Manager	100%	60	3	\$ 1,200	\$ 72,000
Assistant Project Manager	50%	30	2	\$ 900	\$ 27,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	5%	3	0	\$ 1,500	\$ 4,500
Purchasing	5%	3	0	\$ 1,500	\$ 4,500
MEP Coordinator	15%	9	0	\$ 1,300	\$ 11,700
Safety	10%	6	0	\$ 1,800	\$ 11,333
Project Accountant	2%	1	0	\$ 700	\$ 840
Project Administration	2%	1	0	\$ 500	\$ 600
Project Expeditor	2%	1	0	\$ 1,100	\$ 1,320
TOTALS					\$ 156,293



SOMERVILLE MP - ARMORY CAPITAL IMPROVEMENTS
ARMORY BUILDING RENOVATION
October 28, 2021

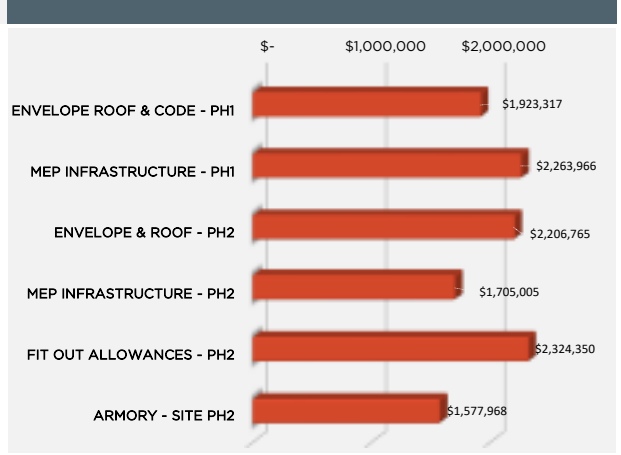


ONE BEACON STREET
FLOOR 15
BOSTON, 12108

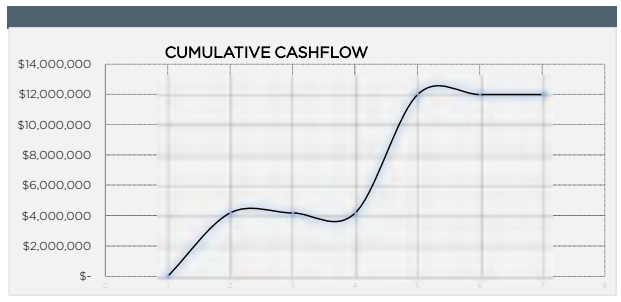
CONSTRUCTION COST
& RISK CONSULTANTS

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE ARMORY BUILDING RENOVATION. THE MODEL SHOWS ALL APPLICABLE RENOVATION PHASES OF CONSTRUCTION :MEP INFRASTRUCTURE REPLACEMENT, CORE RENOVATION, AND SITE IMPROVEMENTS. THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN. ESCALATION HAS BEEN EXCLUDED FROM THIS MODEL.

CONSTRUCTION COSTS \$ (ESCALATION EXCLUDED)					
COST ELEMENT	GSF	\$/SF	CONST \$ (NOT ESCALATED)	PROJECT \$ (NOT ESCALATED)	
ENVELOPE ROOF & CODE - PH1	34,100	\$ 56	\$ 1,923,317	\$ 1,923,317	
MEP INFRASTRUCTURE - PH1	34,100	\$ 66	\$ 2,263,966	\$ 2,263,966	
PHASE 1 TOTAL	34,100	\$ 123	\$ 4,187,283	\$ 4,187,283	
ENVELOPE & ROOF - PH2	34,100	\$ 65	\$ 2,206,765	\$ 2,206,765	
MEP INFRASTRUCTURE - PH2	34,100	\$ 50	\$ 1,705,005	\$ 1,705,005	
FIT OUT ALLOWANCES - PH2	34,100	\$ 68	\$ 2,324,350	\$ 2,324,350	
ARMORY - SITE PH2	27,805	\$ 57	\$ 1,577,968	\$ 1,577,968	
PHASE 2 TOTAL	34,100	\$ 229	\$ 7,814,088	\$ 7,814,088	
TOTAL CONSTRUCTION COSTS	34,100	\$352	\$ 12,001,370	\$ 12,001,370	
SOFT COSTS		0%	\$ -	EXCLUDED	
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED	
TOTAL CAPITAL EXPENDITURE			\$ 12,001,370	\$ 12,001,370	



BUILDINGS CASHFLOW FORECAST - PHASED PROJECT HYPOTHETICAL			
SPEND TOTALS		ANNUAL	CUMULATIVE
2021	\$	-	\$ -
2022	\$	4,187,283	\$ 4,187,283
2023	\$	-	\$ 4,187,283
2024	\$	-	\$ 4,187,283
2025	\$	7,814,088	\$ 12,001,370
2026	\$	-	\$ 12,001,370
2027+	\$	-	\$ 12,001,370



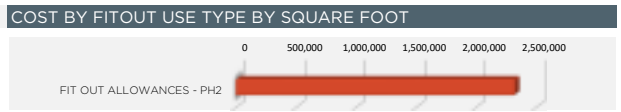
ALTS & BREAKOUTS	\$	\$/SF

CONTINGENCY & ESCALATION SUMMARY

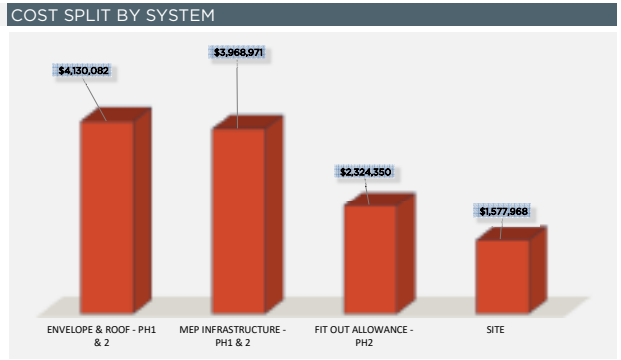
ALTERNATES (CONSTRUCTION COST VALUES)	
ALT #1	

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	EXCLUDED
Project labor assumptions	Union

FITOUT BY PHASE - COST TOTAL \$	% MIX	CONST \$
FIT OUT ALLOWANCES - PH2	100%	2,324,350



BLENDED COSTS BY SYSTEM	\$/SF	CONST \$
ENVELOPE & ROOF - PH1 & 2	\$ 121	\$ 4,130,082
MEP INFRASTRUCTURE - PH1 & 2	\$ 116	\$ 3,968,971
FIT OUT ALLOWANCE - PH2	\$ 68	\$ 2,324,350
SITE	\$ 57	\$ 1,577,968



EXCLUSIONS & ASSUMPTIONS

- 1 Escalation has been EXCLUDED from this model as project schedule is not yet known. WE have updated our escalation outlook as of Q3 2021 based on recent bid submissions, on going supply chain issues, and a strong pipeline through 2022 of active construction.

The following multipliers reflect our best projections for escalation moving forward, Due to the continued volatility in the market, these should be reviewed on a regular basis before finalizing project schedules, budgets, and scopes. Beyond 2024 we recommend carrying the typical 10-year rolling average of 4.5% for the purpose of this study.

YR	Projected Escalation %	Compounded %	Compounded Escalation Multiplier
2021	8%	1.3%	1.013 (to end of 2021)
2022	5.0%	6%	1.06
2023	4.0%	11%	1.11
2024	4.5%	16%	1.16
2025	4.5%	21%	1.21
2026	4.5%	26%	1.26
2027	4.5%	32%	1.32
2028	4.5%	38%	1.38
2029	4.5%	44%	1.44

- 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
- 12 All work is priced on regular hours, OT allowances are excluded presently

BASIS OF ESTIMATE

- 1 04_2875 CoS CSA MP - PSR Cost Estimating Narrative
- 2 Armory_EX-1 to EX-3 Existing Plans_2021-08-13
- 3 Armory_EX-4 Existing Elevations with Estimating Markups_2021-10-18
- 4 Armory_Existing Site Plan_20210813
- 5 Armory_Nitsch Phase 2 Proposed Site & Utilities Concept Sketch_20211015
- 6 HBM Survey Rpt Armory 100121

Systems Assumptions

General

Please see estimate backup for additional assumptions, qualifications & exclusions

Foundations/Basement Construction

Existing foundations and below grade walls are assumed to be sufficient. No scope is included in this estimate

Superstructure

Per the narrative, all scope for improvements to the superstructure are EXCLUDED.

Exterior Enclosure

PHASE 1

Scaffolding is assumed to be required for the whole building to complete envelope repairs.

All percentages of assumed repointing, stucco, and full depth rebuild are based on provided assumptions from the elevation drawings.

Interior insulation of the envelope for improved thermal performance is included as part of phase 2.

Full re-stuccoing and/or recoating is EXCLUDED at this stage per the narrative recommendation. This assumption is pending further investigation of the existing conditions.

We have included walkable skylights at the basement lightwells within Phase 1. Improvements to entrances and egress doors is EXCLUDED from the Phase 1 this estimate as no scope was identified on the drawings or narrative.

PHASE 2

Scaffolding is assumed to be required for the whole building to complete the window replacements and provide access to the roof

Interior insulation of the envelope for improved thermal performance is included in this phase.

Window replacements are assumed to be frame-in-frame aluminum, triple glazed. This estimate excludes any extensive rework of the window openings beyond what was identified in the narrative.

Phase 2 includes the removal of the basement egress exit. Associated costs with the infill of the remaining wall are included.

Roofing

PHASE 1

Phase 1 scope is limited to specific repairs and replacements of soffits, eaves, coping, and flashing per the scope indicated on the elevations.

PHASE 2

Phase 2 includes the replacement of all asphalt shingles and the outer membrane of the low slope membrane roof.

Skylights are assumed to be replaced in PH2 with the replacement of the new roof. Triple glazed, aluminum frame assumed

Interior Construction/Finishes

Small allowances in each C&S phase are included to cover incidental scope incurred by the MEP improvements and envelope scope.

We have assumed a rated GWB ceiling will be required at all wood structure. We have carried this at \$15/SF on the GFA of the building in PH1 C&S as well as an allowance for protecting existing finishes in space.

Fit out costs are modeled and are included to cover minor repairs and improvements for PH2. Incidental work incurred by the MEP improvements in PH1 are included within the MEP infrastructure tab. Significant changes in layout, program type, and code considerations are EXCLUDED from the modeled costs and considered to be outside this estimate scope.

Stairways/Conveying

Allowances are included for the replacement of handrails and guardrails where specified on the drawings.

The removal of the basement egress stair and associated backfill is included.

Conveying scope is EXCLUDED per the narrative.

Services

PHASE 1

Phase 1 includes upgrading the mechanical systems at the performance space only.

Mechanical equipment has been included with the MEP infrastructure tab per the narrative sizing info.

Terminal units and branch piping are modeled within the fit out \$/SF rate and includes the change over to the 4-pipe system.

Per the narrative, the existing duct is assumed to largely be reused and provide sufficient supply and air volumes to the space as no change is planned for program use.

Fire protection and plumbing is assumed to be existing to remain. Small allowances are included in the fit out model rates to cover select replacement of plumbing fixtures or relocation of sprinkler heads. More extensive improvements are assumed to be out of scope.

Electrical scope is limited to energy metering and providing rooftop PVs and associated infrastructure. Lighting improvements and controls are included within the modeled fit-out \$/SF Rates.

Per the narrative, receptacle power, AV, Fire alarm, Teledata, and Security are all ETR. No scope is included within the estimate for these low voltage systems.

PHASE 2

Phase 2 includes upgrading the mechanical systems at the remaining tenet/office spaces

Mechanical equipment has been included with the MEP infrastructure tab per the narrative sizing info.

Terminal units and branch piping are modeled within the fit out \$/SF rate and includes the change over to the 4-pipe system.

Per the narrative, the existing duct is assumed to largely be reused and provide sufficient supply and air volumes to the space as no change is planned for program use.

Fire protection and plumbing is assumed to be existing to remain. Small allowances are included in the fit out model rates to cover select replacement of plumbing fixtures or relocation of sprinkler heads. More extensive improvements are assumed to be out of scope.

Electrical scope is limited to upsizing the switchboard to 2500A and providing a battery in an enclosure for the PV array to achieve SMART requirements. Lighting improvements and controls are included within the modeled fit-out \$/SF Rates.

Per the narrative, receptacle power, AV, Fire alarm, Teledata, and Security are all ETR. No scope is included within the estimate for these low voltage systems.

Furnishings/Equipment

Minor allowances are included within the fitout model for furnishings and equipment

Demolition & Abatement

Hazmat removal is included per Axiom's report assumed to be completed during the PH1 C&S work. Any abatement scope beyond the report is presently EXCLUDED in this estimate.

Site Improvements

Contaminated soil disposal is excluded

Landscaping and hardscaping are assumed per the site sketch and narrative detail provided.

Site Mechanical Utilities

On site storm water mitigation is included per Nitsch narrative and suggested sizing.

Allowances of 5OLF have been included for incoming service connections.

Stormwater reuse systems for flushing fixtures and greywater systems are EXCLUDED, not noted in narrative.

Site Electrical Utilities

We have included a 20k allowance for site lighting.

Utilities are carried in the site file

DIVISION SUMMARY		34,100 GFA		28-Oct-21
			\$/SF	\$ TOTAL
Project Requirements			11.89	405,353
PROJECT REQUIREMENTS			11.89	405,353
A10.	Foundations		0.00	0
A20.	Basement Construction		0.00	0
A. SUBSTRUCTURE			0.00	0
B10.	Superstructure		0.00	0
B20.	Exterior Enclosure		47.99	1,636,560
B30.	Roofing		11.84	403,650
B. SHELL			59.83	2,040,210
C10.	Interior Construction		16.73	570,600
C30.	Interior Finishes		12.75	434,775
C. INTERIORS			29.48	1,005,375
C20.	Stairways		0.96	32,700
D10.	Conveying Systems		0.00	0
VERTICAL TRANSPORTATION			0.96	32,700
D20.	Plumbing Systems		2.23	76,150
D30.	Heating, Ventilating & Air Conditioning		85.03	2,899,666
D40.	Fire Protection Systems		1.73	59,100
D50.	Electric Lighting, Power & Communications		26.53	904,634
D. SERVICES			115.53	3,939,550
E10.	Equipment		0.50	17,050
E20.	Furnishings		4.00	136,400
E. EQUIPMENT AND FURNISHINGS			4.50	153,450
F10.	Special Construction (Sustainability allowance)		0.00	0
F20.	Selective Demolition		14.48	493,935
F. SPECIAL CONSTRUCTION AND DEMOLITION			14.48	493,935
TOTAL BUILDING CONSTRUCTION			236.67	8,070,573
G10.	Site Preparation		1.32	45,000
G20.	Site Improvements		16.59	565,750
G30.	Site Civil/Mechanical Utilities		4.24	144,750
G40.	Site Electrical Utilities		0.59	20,000
G90.	Other Site Construction		0.00	0
TOTAL SITE CONSTRUCTION			22.74	775,500
TOTAL TRADE COSTS			259.42	8,846,073
a. Design Contingency		11.0%	28.54	973,068
b. Phasing Allowance		0.0%	0.00	0
c. Construction Contingency		4.5%	12.96	441,861
d. General Conditions		9.08%	27.33	931,904
SUBTOTAL			328.24	11,192,907
e. Permits		0.0%	0.00	0
f. Insurances		2.6%	8.53	291,016
g. Bond		1.5%	4.92	167,894
h. Fee		3.0%	10.25	349,554
TOTAL COST TODAY			351.95	12,001,370
i. Escalation		EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST			\$352	12,001,370

DIVISION SUMMARY	34,100 GFA		28-Oct-21
		\$/SF	\$ TOTAL
Project Requirements		4.33	147,664
PROJECT REQUIREMENTS		4.33	147,664
A10. Foundations		0.00	0
A20. Basement Construction		0.00	0
A. SUBSTRUCTURE		0.00	0
B10. Superstructure		0.00	0
B20. Exterior Enclosure		21.37	728,710
B30. Roofing		1.26	42,900
B. SHELL		22.63	771,610
C10. Interior Construction		12.23	417,150
C30. Interior Finishes		2.25	76,725
C. INTERIORS		14.48	493,875
C20. Stairways		0.37	12,700
D10. Conveying Systems		0.00	0
VERTICAL TRANSPORTATION		0.37	12,700
D20. Plumbing Systems		0.00	0
D30. Heating, Ventilating & Air Conditioning		41.58	1,417,930
D40. Fire Protection Systems		0.00	0
D50. Electric Lighting, Power & Communications		3.71	126,481
D. SERVICES		45.29	1,544,410
E10. Equipment		0.00	0
E20. Furnishings		0.00	0
E. EQUIPMENT AND FURNISHINGS		0.00	0
F10. Special Construction (Sustainability allowance)		0.00	0
F20. Selective Demolition		3.83	130,685
F. SPECIAL CONSTRUCTION AND DEMOLITION		3.83	130,685
TOTAL BUILDING CONSTRUCTION		90.94	3,100,944
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
TOTAL SITE CONSTRUCTION		0.00	0
TOTAL TRADE COSTS		90.94	3,100,944
a. Design Contingency	11.0%	10.00	341,104
b. Phasing Allowance	0.0%	0.00	0
c. Construction Contingency	4.5%	4.54	154,892
d. General Conditions	8.57%	9.04	308,269
SUBTOTAL		114.52	3,905,209
e. Permits	0.0%	0.00	0
f. Insurances	2.6%	2.98	101,535
g. Bond	1.5%	1.72	58,578
h. Fee	3.0%	3.58	121,960
TOTAL COST TODAY		122.79	4,187,283
i. Escalation	EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST		\$123	4,187,283

DIVISION SUMMARY	34,100 GFA		28-Oct-21
		\$/SF	\$ TOTAL
Project Requirements		7.56	257,689
PROJECT REQUIREMENTS		7.56	257,689
A10. Foundations		0.00	0
A20. Basement Construction		0.00	0
A. SUBSTRUCTURE		0.00	0
B10. Superstructure		0.00	0
B20. Exterior Enclosure		26.62	907,850
B30. Roofing		10.58	360,750
B. SHELL		37.20	1,268,600
C10. Interior Construction		4.50	153,450
C30. Interior Finishes		10.50	358,050
C. INTERIORS		15.00	511,500
C20. Stairways		0.59	20,000
D10. Conveying Systems		0.00	0
VERTICAL TRANSPORTATION		0.59	20,000
D20. Plumbing Systems		2.23	76,150
D30. Heating, Ventilating & Air Conditioning		43.45	1,481,737
D40. Fire Protection Systems		1.73	59,100
D50. Electric Lighting, Power & Communications		22.82	778,153
D. SERVICES		70.24	2,395,139
E10. Equipment		0.50	17,050
E20. Furnishings		4.00	136,400
E. EQUIPMENT AND FURNISHINGS		4.50	153,450
F10. Special Construction (Sustainability allowance)		0.00	0
F20. Selective Demolition		10.65	363,250
F. SPECIAL CONSTRUCTION AND DEMOLITION		10.65	363,250
TOTAL BUILDING CONSTRUCTION		145.74	4,969,628
G10. Site Preparation		1.32	45,000
G20. Site Improvements		16.59	565,750
G30. Site Civil/Mechanical Utilities		4.24	144,750
G40. Site Electrical Utilities		0.59	20,000
G90. Other Site Construction		0.00	0
TOTAL SITE CONSTRUCTION		22.74	775,500
TOTAL TRADE COSTS		168.48	5,745,128
a. Design Contingency	11.0%	18.53	631,964
b. Phasing Allowance	0.0%	0.00	0
c. Construction Contingency	4.5%	8.42	286,969
d. General Conditions	9.36%	18.29	623,636
SUBTOTAL		213.72	7,287,697
e. Permits	0.0%	0.00	0
f. Insurances	2.6%	5.56	189,480
g. Bond	1.5%	3.21	109,315
h. Fee	3.0%	6.67	227,595
TOTAL COST TODAY		229.15	7,814,088
i. Escalation	EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST		\$229	7,814,088

SUMMARY BY PROGRAM

TRADE	34,100				GFA				34,100		34,100			
									PHASE 1 C&S					
	CORE & SHELL		/ SF		COMBINED FIT-OUT PROJECTS		/ SF		TOTALS		/ SF		ENVELOPE ROOF & CODE - PH1	MEP INFRASTRUCTURE - PH1
DEMOLITION/ENABLING	\$ 476,885	\$ 13.98	\$ 17,050	\$ 0.50	\$ 493,935	\$ 14.48	\$ 122,160	\$ 3.58	\$ 8,525	\$ 0.25				
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
EXTERIOR ENCLOSURE	\$ 1,636,560	\$ 47.99	\$ -	\$ -	\$ 1,636,560	\$ 47.99	\$ 728,710	\$ 21.37	\$ -	\$ -				
ROOFING	\$ 403,650	\$ 11.84	\$ -	\$ -	\$ 403,650	\$ 11.84	\$ 42,900	\$ 1.26	\$ -	\$ -				
INTERIOR CONSTRUCTION	\$ 485,350	\$ 14.23	\$ 85,250	\$ 2.50	\$ 570,600	\$ 16.73	\$ 400,100	\$ 11.73	\$ 17,050	\$ 1				
INTERIOR FINISHES	\$ 161,975	\$ 4.75	\$ 272,800	\$ 8.00	\$ 434,775	\$ 12.75	\$ 51,150	\$ 1.50	\$ 25,575	\$ 1				
STAIRWAYS	\$ 32,700	\$ 0.96	\$ -	\$ -	\$ 32,700	\$ 0.96	\$ 12,700	\$ 0.37	\$ -	\$ -				
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
PLUMBING	\$ 25,000	\$ 0.73	\$ 51,150	\$ 1.50	\$ 76,150	\$ 2.23	\$ -	\$ -	\$ -	\$ -				
HVAC	\$ 2,217,666	\$ 65.03	\$ 682,000	\$ 20.00	\$ 2,899,666	\$ 85.03	\$ -	\$ -	\$ 1,417,930	\$ 41.58				
FIRE PROTECTION	\$ 25,000	\$ 0.73	\$ 34,100	\$ 1.00	\$ 59,100	\$ 1.73	\$ -	\$ -	\$ -	\$ -				
ELECTRICAL	\$ 393,134	\$ 11.53	\$ 511,500	\$ 15.00	\$ 904,634	\$ 26.53	\$ -	\$ -	\$ 126,481	\$ 3.71				
EQUIPMENT	\$ -	\$ -	\$ 17,050	\$ 0.50	\$ 17,050	\$ 0.50	\$ -	\$ -	\$ -	\$ -				
FURNISHINGS	\$ 102,300	\$ 3.00	\$ 34,100	\$ 1.00	\$ 136,400	\$ 4.00	\$ -	\$ -	\$ -	\$ -				
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
SITE PREP	\$ 45,000	\$ 1.32	\$ -	\$ -	\$ 45,000	\$ 1.32	\$ -	\$ -	\$ -	\$ -				
SITE IMPROVEMENTS	\$ 565,750	\$ 16.59	\$ -	\$ -	\$ 565,750	\$ 16.59	\$ -	\$ -	\$ -	\$ -				
SITE CIVIL / MECHANICAL	\$ 144,750	\$ 4.24	\$ -	\$ -	\$ 144,750	\$ 4.24	\$ -	\$ -	\$ -	\$ -				
SITE ELECTRICAL	\$ 20,000	\$ 0.59	\$ -	\$ -	\$ 20,000	\$ 0.59	\$ -	\$ -	\$ -	\$ -				
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
TOTAL DIRECT COSTS	\$ 6,735,720	\$ 197.53	\$ 1,705,000	\$ 50.00	\$ 8,440,720	\$ 247.53	\$ 1,357,720	\$ 39.82	\$ 1,595,560	\$ 46.79				
Design Contingency	11.00%	\$ 776,141	\$ 22.76	\$ 196,928	\$ 5.78	\$ 973,068	\$ 28.54	\$ 156,817	\$ 4.60	\$ 184,287	\$ 5.40			
Phasing Allowance	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
Construction Contingency	4.50%	\$ 352,438	\$ 10.34	\$ 89,423	\$ 2.62	\$ 441,861	\$ 12.96	\$ 71,209	\$ 2.09	\$ 83,683	\$ 2.45			
General Conditions	9.08%	\$ 840,733	\$ 24.65	\$ 91,171	\$ 2.67	\$ 931,904	\$ 27.33	\$ 140,122	\$ 4.11	\$ 168,147	\$ 4.93			
Project Requirements	4.80%	\$ 320,103	\$ 9.39	\$ 85,250	\$ 2.50	\$ 405,353	\$ 11.89	\$ 67,886	\$ 1.99	\$ 79,778	\$ 2.34			
SUBTOTAL	\$ 9,025,135	\$ 264.67	\$ 2,167,772	\$ 63.57	\$ 11,192,907	\$ 328.24	\$ 1,793,754	\$ 52.60	\$ 2,111,456	\$ 61.92				
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
GL Insurance & Subguard	2.60%	\$ 234,654	\$ 6.88	\$ 56,362	\$ 1.65	\$ 291,016	\$ 8.53	\$ 46,638	\$ 1.37	\$ 54,898	\$ 1.61			
Bond	1.50%	\$ 135,377	\$ 3.97	\$ 32,517	\$ 0.95	\$ 167,894	\$ 4.92	\$ 26,906	\$ 0.79	\$ 31,672	\$ 0.93			
CM Fee	3.00%	\$ 281,855	\$ 8.27	\$ 67,700	\$ 1.99	\$ 349,554	\$ 10.25	\$ 56,019	\$ 1.64	\$ 65,941	\$ 1.93			
SUBTOTAL	\$ 9,677,021	\$ 283.78	\$ 2,324,350	\$ 68.16	\$ 12,001,370	\$ 351.95	\$ 1,923,317	\$ 56.40	\$ 2,263,966	\$ 66.39				
Escalation	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -				
TOTAL	\$ 9,677,021	\$ 283.78	\$ 2,324,350	\$ 68.16	\$ 12,001,370	\$ 351.95	\$ 1,923,317	\$ 56.40	\$ 2,263,966	\$ 66.39				

ESTIMATE SUMMARY
ARMORY BUILDING RENOVATION

SOMERVILLE MP - ARMORY CAPITAL IMPROVEMENTS

28-Oct-21

SUMMARY BY PROGRAM

DHARAM CONSULTING	34,100		34,100		27,805		34,100	
	PHASE 2 C&S				SITE - PH2		RENO FIT-OUT	
	ENVELOPE & ROOF - PH2		MEP INFRASTRUCTURE - PH2		ARMORY - SITE PH2		FIT OUT ALLOWANCES - PH2	
TRADE	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 12,540	\$ 0.37	\$ -	\$ -	\$ 333,660	\$ 12.00	\$ 17,050	\$ 0.50
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ 907,850	\$ 26.62	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ 360,750	\$ 10.58	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 68,200	\$ 2.00	\$ -	\$ -	\$ -	\$ -	\$ 85,250	\$ 2.50
INTERIOR FINISHES	\$ 85,250	\$ 2.50	\$ -	\$ -	\$ -	\$ -	\$ 272,800	\$ 8.00
STAIRWAYS	\$ 20,000	\$ 0.59	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ -	\$ -	\$ 25,000	\$ 0.73	\$ -	\$ -	\$ 51,150	\$ 1.50
HVAC	\$ -	\$ -	\$ 799,737	\$ 23.45	\$ -	\$ -	\$ 682,000	\$ 20.00
FIRE PROTECTION	\$ -	\$ -	\$ 25,000	\$ 0.73	\$ -	\$ -	\$ 34,100	\$ 1.00
ELECTRICAL	\$ -	\$ -	\$ 266,653	\$ 7.82	\$ -	\$ -	\$ 511,500	\$ 15.00
EQUIPMENT	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 17,050	\$ 0.50
FURNISHINGS	\$ 51,150	\$ 1.50	\$ 51,150	\$ 1.50	\$ -	\$ -	\$ 34,100	\$ 1.00
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ 45,000	\$ 1.62	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ 565,750	\$ 20.35	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ 144,750	\$ 5.21	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ 20,000	\$ 0.72	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 1,505,740	\$ 44.16	\$ 1,167,539	\$ 34.24	\$ 1,109,160	\$ 39.89	\$ 1,705,000	\$ 50.00
Design Contingency	\$ 173,913	\$ 5.10	\$ 134,851	\$ 3.95	\$ 126,273	\$ 4.54	\$ 196,928	\$ 5.78
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 78,972	\$ 2.32	\$ 61,235	\$ 1.80	\$ 57,339	\$ 2	\$ 89,423	\$ 2.62
General Conditions	\$ 224,196	\$ 6.57	\$ 168,147	\$ 4.93	\$ 140,122	\$ 5	\$ 91,171	\$ 2.67
Project Requirements	\$ 75,287	\$ 2.21	\$ 58,377	\$ 1.71	\$ 38,775	\$ 1	\$ 85,250	\$ 2.50
SUBTOTAL	\$ 2,058,108	\$ 60.36	\$ 1,590,148	\$ 46.63	\$ 1,471,669.43	\$ 52.93	\$ 2,167,772	\$ 63.57
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 53,511	\$ 1.57	\$ 41,344	\$ 1.21	\$ 38,263	\$ 1.38	\$ 56,362	\$ 1.65
Bond	\$ 30,872	\$ 0.91	\$ 23,852	\$ 0.70	\$ 22,075	\$ 0.79	\$ 32,517	\$ 0.95
CM Fee	\$ 64,275	\$ 1.88	\$ 49,660	\$ 1.46	\$ 45,960	\$ 1.65	\$ 67,700	\$ 1.99
SUBTOTAL	\$ 2,206,765	\$ 64.71	\$ 1,705,005	\$ 50.00	\$ 1,577,968	\$ 57	\$ 2,324,350	\$ 68.16
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 2,206,765	\$ 64.71	\$ 1,705,005	\$ 50.00	\$ 1,577,968	\$ 57	\$ 2,324,350	\$ 68.16

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	34,100			122,160
<u>HAZMAT Abatement - Per Axiom Report</u>				-
Remnant Asphaltic Sealant (on brick wall and 3rd floor window frame)	16	LF	31.25	500
Asphaltic damp proofing on foundations	1	LS	100,000.00	100,000
Buried pipes				TBD
Concealed sealants				TBD
Concealed piping insulation				TBD
Thin set w/ ceramic and quarry tile	1,500	SF	5.00	7,500
Misc Hazardous Building Materials	1	LS	4,000.00	4,000
5.5% Contingency (4.5% carried below the line)	1	LS	6,160.00	6,160
Bid and Monitoring fee	1	LS	4,000.00	4,000
EXTERIOR ENCLOSURE	34,100			728,710
<u>Scaffolding - assume scaffolding @ entire enclosure for stucco scope</u>	12,000	SF		<i>For reference only</i>
Scaffolding	12,000	SF	18.00	216,000
Scrim	12,000	SF	5.00	60,000
Misc. setup/tear down	80	MD	800.00	64,000
<u>Facade Demo:</u>				-
Remove existing stucco where 100% new stucco is indicated	3,473	SF	6.00	20,838
Sandblast and prep at re-stucco locations - allow for 20% removal of stucco at re-stucco locations to enable repointing of brick per note 2 of elevation drawings	1,148	SF	1.25	1,435
Demo outer wythe of masonry	230	SF	25.00	5,740
Demo full depth masonry - (4) locations	222	SF	18.00	3,996
Remove Metal Cladding at towers where identified in the narrative	90	SF	25.00	2,250
Demo stucco and full depth masonry - 10% of surface area behind metal cladding at towers	710	SF	8.00	5,680
Demo stucco for repoint of masonry - 20% of surface area behind metal cladding at towers	71	SF	31.00	2,201
Remove existing corrugated metal at basement skylights	142	SF	25.00	3,550
Remove 2 Grilles at lower level	150	SF	7.50	1,125
	2	EA	150.00	300
<u>Masonry Repairs and Rebuild</u>				-
Full depth masonry wall - rebuild (4) locations, CMU Reinforced wall	90	SF	85.00	7,650
Full depth masonry wall at towers	71	SF	85.00	6,035
20% Repoint of tower masonry assumed	142	SF	35.00	4,970
20% Repoint of masonry ahead of re-stucco scope per note 2 of elevation drawings	142	SF	35.00	4,970
Replace 1 wythe base brick, 15 separate locations	222	SF	35.00	7,770
<u>Repair Stucco</u>				-
100% New Stucco - full depth new stucco build up	3,090	SF	45.00	139,050
100% New Stucco where rebuild of back up masonry is required	161	SF	45.00	7,245

TRADE	QTY	UNIT	RATE	TOTAL
10% New Stucco where rebuild of outer masonry wythe is assumed to be required (15 separate areas, premium for small qty at each location)	222	SF	50.00	11,100
New Stucco at masonry repoint locations	372	SF	50.00	18,580
100% Re-stucco - added finish layer and coating	431	SF	20.00	8,620
10% Re-stucco of walls per note 1 on elevations (assumed anywhere a different approach was not specified)	717	SF	20.00	14,340
Patch stucco where grilles were removed	2	LOC	300.00	600
General Stucco coating removal or recoating				EXCLUDED
New Pre-Patina'd Copper Coping at top of restucco's sections per updated narrative	180	LF	200.00	36,000
Basement Skylights at Grade				-
New Walkable glass skylights - (4) skylights, un-insulated	150	SF	200.00	30,000
Vent section	4	EA	300.00	1,200
Window Scope PH1				-
Window Grille - Refinish in situ	26	LOC		-
- Strip existing window grilles at all ground floor windows	26	LOC	225.00	5,850
- Apply rust inhibitor and primer	26	LOC	130.00	3,380
- Final paint	26	LOC	160.00	4,160
Allowance - Hardware/Operation adjustments	1	LS	4,500.00	4,500
Misc. sealants, finishes, etc.	34,100	SF	0.75	25,575
Entrances & Egress doors				Excluded, assumed ETR
Interior Side - Insulation of existing envelope				See PH2
ROOFING	34,100			42,900
Fascia and Soffit - North & South Elevation				-
Remove existing soffit & aluminum fascia at eave	1	LS	3,000.00	3,000
Replace wood soffit in kind	220	SF	45.00	9,900
Replace powder coated aluminum fascia cladding	220	SF	90.00	19,800
Fascia and Soffit - West Elevation				-
Remove existing wood raked eave trim and aluminum drip edge	40	LF	15.00	600
Replace wood raked eave trim and aluminum drip in kind to match existing	40	LF	75.00	3,000
Gutters				-
Replace gutters where specified and tie into existing	30	LF	15.00	450
Coping & Flashings				-
Copper low slope roof and coping to match previous	2	LOC	1,500.00	3,000
Copper step flashing where specified	35	LF	90.00	3,150
Replace Roof Shingles and Membrane				Completed with PH2

TRADE	QTY	UNIT	RATE	TOTAL
INTERIOR CONSTRUCTION	34,100			400,100
Interior Construction - allowance for incidental scope triggered by full depth rebuilds, MEP penetrations, riser access, etc.	34,100	SF	1.50	51,150
Rated GWB Ceiling assumed required - wood structure assumed throughout	34,100	SF	9.50	323,950
- Protection of existing in place during ceiling install	1	LS	25,000.00	25,000
INTERIOR FINISHES	34,100			51,150
Interior finishes - allowance for incidental scope triggered by full depth rebuilds, MEP penetrations, riser access, etc.	34,100	SF	1.50	51,150
STAIRWAYS	34,100			12,700
Handrails and Guardrails				-
Replace handrails where specified	38	LF	150.00	5,700
Replace Guardrail at steps	25	LF	280.00	7,000
PROJECT REQUIREMENTS	34,100			67,886
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,357,720.00	67,886
TOTAL DIRECT COSTS				1,425,606
ALLOCATIONS				497,711
General Conditions	5.0	28,024	wks	140,122
Permits	0.0 %			-
Insurances	2.6 %			46,638
Design Contingency	11.0 %			156,817
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			71,209
Bond	1.5 %			26,906
Fee	3.0 %			56,019
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				1,923,317

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	34,100			8,525
Rate matrix detail, LIGHT (1)	34,100	SF	0.25	8,525
INTERIOR CONSTRUCTION	34,100			17,050
Rate matrix detail, LIGHT (1)	34,100	SF	0.50	17,050
INTERIOR FINISHES	34,100			25,575
Rate matrix detail, LIGHT (1)	34,100	SF	0.75	25,575
PLUMBING	34,100			-
Plumbing infrastructure	34,100	SF		ETR
HVAC	34,100			1,417,930
<u>HVAC Infrastructure</u>				
<u>HVAC Demo</u>				
Remove existing single zone DX/Gas fired carrier unit serving performance space	10	EA	1,600.00	16,000
Remove existing equipment and duct connections	1	LS	12,800.00	12,800
<u>Heating/cooling equipment</u>				
ASHP - 30 TON (size assumed)	3	EA	80,000.00	240,000
HX - plate frame allowances	2	EA	40,000.00	80,000
Buffer Tanks - allowance	2	EA	5,500.00	11,000
Primary/secondary pumps - allow	8	EA	15,000.00	120,000
Condensate return pumps and sumps	3	EA	4,500.00	13,500
Expansion, air separation, shot feed, pressurization, filtration (assumed)	1	EA	25,000.00	25,000
<u>Heat Recovery Systems</u>				
New glycol system/ feed	1	LS	20,000.00	20,000
<u>Air Distribution</u>				
DOAS - 5,000 CFM, dual enthalpy and desiccant Wheel heat recovery, MERV filters, supply and exhaust ECM fan arrays, CHW cooling coil, located on room of new addition	5,000	CFM	18.00	90,000
<u>Exhaust</u>				
General exhaust - allow	1	LS	5,000.00	5,000
<u>Smoke extract</u>				
			Excluded, assume not required	
<u>Energy Performance</u>				
Variable Frequency Drives				-
DOAS	2	EA	7,500.00	15,000
Pumps	8	EA	3,500.00	28,000
VFD's for exhaust fans, allow	4	EA	1,500.00	6,000
Energy Metering Allowance	1	LS	30,000.00	30,000
<u>Terminal Units - 4 pipe blower units</u>	10	EA	3,500.00	35,000
<u>Pipe, Valves & Connections</u>				
<u>Steam Piping</u>				
			Excluded, assume not required	
<u>Heating/Cooling piping - performance space only</u>				
				-

TRADE	QTY	UNIT	RATE	TOTAL
- CHW/HW mains & risers, runouts to equipment	450	LF	80.00	35,977
- Piping on floor loops	1,395	LF	40.00	55,794
- Branch piping and final terminal unit connections for 4-pipe system	1,000	LF	32.00	32,000
Control valves on main equipment	14	EA	3,500.00	49,000
<u>Sheetmetal & Accessories</u>				-
Primary ductwork galvanized sheetmetal tying DOAS into existing duct distribution per narrative - duct allowance	1,500	LBS	15.50	23,250
Duct to terminal units - assumes 50 lbs/box to be replaced	500	LBS	15.50	7,750
General exhaust ductwork to equipment, existing duct largely to remain and be reused - allowance	500	LBS	15.50	7,750
<u>Accessories</u>				-
Fire dampers for main supply extract risers			Excluded ETR assumed	
Volume dampers, control dampers & access Panels	1	LS	5,812.50	5,813
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	1,845	LF	11.00	20,290
Ductwork insulation	1,154	SF	6.00	6,923
<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	40	PTS	1,200.00	48,000
Pumps	32	PTS	1,200.00	38,400
DOAS - assume 30pts ea. average	50	PTS	1,200.00	60,000
Fans	4	PTS	1,200.00	4,800
Terminal Units - 4 pipe system	60	PTS	800.00	48,000
Testing, balancing & commissioning support	1	LS	36,367.40	36,367
Co-ordination, rigging, CAD, Sub-trade temp	1	LS	140,515.54	140,516
FIRE PROTECTION	34,100			-
Fire protection infrastructure	34,100	SF		ETR
ELECTRICAL	34,100			126,481
<u>Normal Service Distribution</u>			ETR, assumes existing capacity is sufficient	
<u>ATS Switches</u>				ETR
<u>Energy Metering</u>				-
Energy meters	6	EA	3,500.00	21,000

TRADE	QTY	UNIT	RATE	TOTAL
Normal Feeders				ETR
Emergency Power Distribution				ETR
Mechanical / Equipment Power	32	EA	800.00	25,600
Lighting, inclusive of conduit, fitting and wiring			Upgrades considered part of PH2	
Lighting controls			Upgrades considered part of PH2	
Receptacle power				ETR
Fire Alarm				ETR
BDA				No Scope
Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)				No Scope
Audio visual				No Scope
Security systems allowance (head-end and backbone)				No Scope
Lightning protection				ETR
Rooftop PV (40 kW per narrative) - including mounting system, etc.	40	kW	800.00	32,000
PV infrastructure allowance	1	LS	28,000	28,000
Testing & bonding	1	LS	5,330.00	5,330
Sub-trade temps/ gcs	1	LS	14,550.90	14,551
PROJECT REQUIREMENTS	34,100			79,778
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	1,595,560	79,778
TOTAL DIRECT COSTS				1,675,338
ALLOCATIONS				588,627
General Conditions	6.0	28,024	wks	168,147
Permits	0.0 %			-
Insurances	2.6 %			54,898
Design Contingency	11.0 %			184,287
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			83,683
Bond	1.5 %			31,672
Fee	3.0 %			65,941
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				2,263,966

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	34,100			12,540
Demo of exit doors, associated roof, and SOG at East side per note on elevation - See Site for infill	1,045	CF	12.00	12,540
EXTERIOR ENCLOSURE	34,100			907,850
<u>Scaffolding - assume scaffolding @ entire enclosure for window required scope and for roof access for replacement</u>	12,000	SF		<i>For reference only</i>
Scaffolding	12,000	SF	18.00	216,000
Scrim	12,000	SF	5.00	60,000
Misc. setup/tear down	80	MD	800.00	64,000
<u>Infill wall at removed basement egress exit</u>				
Infill wall where egress was demolished, assume masonry infill allowance and stucco covering to match surrounding	100	SF	75.00	7,500
<u>Full Window Replacement - PH2</u>	87	EA		Ref Only
Removal of existing windows	87	EA	180.00	15,660
New Windows - frame-within-frame inserts, aluminum cladding, triple glazed IGUs with modified low e coating and half height screens at operable windows				-
- Non Operable Windows at performance space and towers (37 each)	600	SF	135.00	81,000
- Operable Windows (50 Ea.)	550	SF	190.00	104,500
- Full perimeter AVB at each window M.O.	1,380	LF	15.00	20,700
- Epoxy restoration of sills - 80%	70	EA	100.00	7,000
- Replacement of sills - 20%	17	EA	250.00	4,250
Allowance - Select patching at stucco and drywall window surrounds	87	LOC	200.00	17,400
<u>Interior Side - Below Grade Walls/Basement</u>	6,000	SF		-
Furring - 2.5" stud, 1 layer drywall with continuous smart vapor permeable retarder	6,000	SF	11.00	66,000
3" closed cell spray foam	6,000	SF	7.50	45,000
Allowance - detailing around wood joists/beams	6,000	SF	2.00	12,000
<u>Interior Side - Above Grade Walls/ L1 & 2</u>		SF		-
Furring - 2.5" stud, 1 layer drywall with continuous smart vapor permeable retarder	10,380	SF	11.00	114,180
5" open cell spray foam	10,380	SF	5.00	51,900
Allowance - detailing around wood joists/beams	10,380	SF	2.00	20,760
ROOFING	34,100			360,750
<u>100% Replacement of membrane roofs</u>				-
Remove outer membrane (insulation to remain)	2,300	SF	5.00	11,500
Allowance - minor patching or insulation/select repairs not yet known	2,300	SF	1.50	3,450
New EPDM Membrane	2,300	SF	15.00	34,500

TRADE	QTY	UNIT	RATE	TOTAL
Flashing and copings - allowance	2,300	SF	3.00	6,900
100% Replacement of Asphalt Shingled Roof				-
Remove all shingles at existing sloped roof	10,400	SF	5.00	52,000
Allowance - minor patching or insulation/select repairs not yet known	10,400	SF	1.50	15,600
New Asphalt Shingles	10,400	SF	18.00	187,200
Edge condition allowance at drip edges	1	LS	5,000.00	5,000
Flashing and copings - allowance	10,400	SF	2.00	20,800
Skylight Replacement - assumed				-
Allow for replacement of 4 skylights during roof replacement	4	EA	2,200.00	8,800
Gutter Replacement				-
Allowance - Replacement of aluminum gutters	1	LS	15,000.00	15,000
Replace existing skylights			Excluded, assumed not req.	
INTERIOR CONSTRUCTION	34,100			68,200
Allowance - interior construction required by MEP upgrades/and incidental scope	34,100	SF	2.00	68,200
INTERIOR FINISHES	34,100			85,250
Allowance - repair of existing finishes required by MEP upgrades/and incidental scope	34,100	SF	2.50	85,250
STAIRWAYS	34,100			20,000
Remove basement egress stair - backfill to match grade	1	LS	20,000.00	20,000
PROJECT REQUIREMENTS	34,100			75,287
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	1,505,740	75,287
TOTAL DIRECT COSTS				1,581,027
ALLOCATIONS				625,738
General Conditions	8.0	28,024	wks	224,196
Permits	0.0 %			-
Insurances	2.6 %			53,511
Design Contingency	11.0 %			173,913
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			78,972
Bond	1.5 %			30,872
Fee	3.0 %			64,275
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				2,206,765

TRADE	QTY	UNIT	RATE	TOTAL
PLUMBING	34,100			25,000
Allowance for minor scope	1	LS	25,000.00	25,000
HVAC	34,100			799,737
<u>HVAC Infrastructure</u>				
<u>HVAC Demo</u>				
Decommission perimeter heading, existing DX units throughout, boilers	44	MD	880.00	38,720
<u>Heating/cooling equipment</u>				-
ASHP - 30 TON	3	EA	40,000.00	120,000
HX -Installed with PH1				PH1 Scope
Primary/secondary pumps - allow				PH1 Scope
Condensate return pumps for ASHP				PH1 Scope
Expansion, air separation , shot feed, pressurization, filtration (assumed)				PH1 Scope
<u>Heat Recovery Systems</u>				-
New glycol system/ feed				PH1 Scope
<u>Air Distribution</u>				ETR, no scope identified in narrative
<u>Exhaust</u>				-
General exhaust - allow	1	LS	5,000.00	5,000
<u>Smoke extract</u>				Excluded, assume not required
<u>Energy Performance</u>				-
Variable Frequency Drives				-
ASHP	6	EA	5,000.00	30,000
Pumps	4	EA	3,500.00	14,000
VFD's for exhaust fans, allow	4	EA	1,500.00	6,000
Energy Metering Allowance	1	LS	10,000.00	10,000
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves & Connections</u>				-
<u>Steam Piping</u>				Excluded, assume not required
<u>Heating/Cooling piping</u>				-
- CHW/HW mains & risers, runouts to equipment	779	LF	80.00	62,304
- Piping on floor loops	3,115	LF	40.00	124,608
Control valves on main equipment	8	EA	3,500.00	PH1 Scope
<u>Sheetmetal & Accessories</u>				-
Primary ductwork galvanized sheetmetal most of existing duct to be reused per narrative - allowance for select replacement/rework	3,000	LBS	15.50	46,500
General bathroom & exhaust ductwork	1,500	LBS	15.50	23,250
<u>Accessories</u>				-
Fire dampers for main supply extract risers (Assume)	4	EA	2,250.00	9,000
Volume dampers, control dampers & access Panels	1	LS	29,371.25	29,371
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	3,894	LF	11.00	42,834
Ductwork insulation	2,700	SF	6.00	16,200
<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>				-

TRADE	QTY	UNIT	RATE	TOTAL
Head end allowance	1	LS	35,000.00	35,000
ASHP	30	PTS	1,200.00	36,000
Pumps				PH1 Scope
AHUs - assume 30pts ea average				PH1 Scope
Fans	4	PTS	1,200.00	4,800
Misc.	15	PTS	1,200.00	18,000
Testing, balancing & commissioning support	1	LS	27,463.48	27,463
Co-ordination, rigging, CAD, Sub-trade temp requirements	1	LS	85,686.05	85,686
FIRE PROTECTION	34,100			25,000
Allowance for minor scope	1	LS	25,000.00	25,000
ELECTRICAL	34,100			266,653
<u>Normal Service Distribution</u>				ETR, assumes existing capacity is sufficient
Pad mounted xfmr				ETR
2500A swbd, CT cab	1	LS	87,500.00	87,500
Allowance - additional upgrade for upsizing	1	LS	40,000.00	40,000
<u>ATS Switches</u>				-
ATS-LS for batter power PV assumed	1	EA	20,000.00	20,000
<u>Energy Metering</u>				-
Energy meters	2	EA	3,500.00	7,000
<u>Normal Feeders - allowance for select replacement for increased power demand</u>	1	LS	15,000.00	15,000
<u>Emergency Power Distribution</u>				ETR
<u>Emergency Distribution Panels - allow</u>				ETR
<u>Emergency Feeders</u>				ETR
<u>Mechanical / Equipment Power</u>	3	EA	800.00	2,400
<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>				No Scope
<u>BDA</u>				Excluded, assume not required
<u>Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)</u>				No Scope
<u>Audio visual</u>				w/ fitout
<u>Security systems allowance (head-end and backbone)</u>				No Scope
<u>Lightning protection</u>				No Scope
<u>Battery Storage - Enclosure</u>	1	LS	25,000.00	25,000
<u>Battery</u>	1	LS	30,000	30,000
Testing & bonding	1	LS	9,076.00	9,076
Sub-trade temps/ gcs	1	LS	30,676.88	30,677

TRADE	QTY	UNIT	RATE	TOTAL
PROJECT REQUIREMENTS	34,100			58,377
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,167,539	58,377
TOTAL DIRECT COSTS				1,225,916
ALLOCATIONS				479,088
General Conditions	6.0	28,024	wks	168,147
Permits	0.0 %			-
Insurances	2.6 %			41,344
Design Contingency	11.0 %			134,851
Phasing Allowance	0.0 %			-
Construction Contingency	4.5 %			61,235
Bond	1.5 %			23,852
Fee	3.0 %			49,660
Escalation	Excluded			-
TOTAL CONSTRUCTION COST				1,705,005

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	27,805			333,660
HAZMAT - Included Separately	27,805	SF	12.00	333,660
SITE PREP	27,805			45,000
Scrape and Demo existing parking lot per narrative	15,000	SF	2.50	37,500
Scrape and Demo driveway per narrative	3,000	SF	2.50	7,500
SITE IMPROVEMENTS	27,805			565,750
<u>Grading</u>				-
Fine grading	27,000	SF	0.50	13,500
Excavation for site features - allowance	30	CY	75.00	2,250
<u>Hardscape</u>				-
Concrete pedestrian pavement sloped to permeable paver strip along curb	1,600	SF	35.00	56,000
Permeable paver with underdrains at curb	400	SF	65.00	26,000
- Curb replacement	150	LF	60.00	9,000
Replace asphalt vehicular pavement - drains to bio retention areas	18,700	SF	12.00	224,400
<u>Landscaping & Plantings</u>				-
Shade Trees- allowance	8	EA	1,200.00	9,600
Bioretention at parking lot and side of building per updated sketch: inclusive of 24" soil media and 12" stone	2,000	SF	35.00	70,000
- Curb surrounds at parking lot bioretention	500	LF	60.00	30,000
Softscape, assume mix of Native Shrubs & Perennials at feature planting areas that are drought resistant with sod at remainder- allowance 50%	5,000	SF	13.00	65,000
Irrigation - reuse of storm water per Nitsch narrative	5,000	SF	4.00	20,000
<u>Misc. Site Furnishings</u>				-
Allowance - General Site furnishing & Signage	1	LS	40,000.00	40,000
SITE CIVIL / MECHANICAL	27,805			144,750
<u>Storm Water Management</u>				-
12,000 gal detention tanks for storm water and rainwater reuse system	1	LS	50,000.00	50,000
Subgrade drainage infrastructure (pipes, structures, grates) - allowance	1	LS	65,000.00	65,000
<u>Incoming utility services</u>				-
8" Sewer Service - length assumed	50	LF	175.00	8,750
- Excavation and backfill	28	CY	120.00	3,333
3" Fire Service Service - length assumed	50	LF	110.00	5,500
- Excavation and backfill	28	CY	120.00	3,333
3" Water Service - length assumed	50	LF	110.00	5,500
- Excavation and backfill	28	CY	120.00	3,333

TRADE	QTY	UNIT	RATE	TOTAL
SITE ELECTRICAL				20,000
Site Electrical & lighting - allowance for modification to existing <u>Electrical Service</u>	1	LS	20,000.00	20,000
Incoming electrical ductbank			Excluded, assume ETR	-
PROJECT REQUIREMENTS	27,805			38,775
General project requirements - renovation	5.0%	TOTAL	775,500.00	38,775
TOTAL DIRECT COSTS				1,147,935
ALLOCATIONS				430,033
General Conditions	5.0	28,024	wks	140,122
Permits	0.0 %			-
GL Insurance	2.6 %			38,263
Design Contingency	11.0 %			126,273
Design build fee	0.0 %			-
Construction Contingency	4.5 %			57,339
Bond	1.5 %			22,075
Fee	3.0 %			45,960
Escalation	Excluded		45,658.00	-
TOTAL CONSTRUCTION COST				1,577,968

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	34,100			17,050
FIT OUT ALLOWANCES - PH2	34,100	SF	0.50	17,050
INTERIOR CONSTRUCTION	34,100			85,250
FIT OUT ALLOWANCES - PH2	34,100	SF	2.50	85,250
INTERIOR FINISHES	34,100			272,800
FIT OUT ALLOWANCES - PH2	34,100	SF	8.00	272,800
PLUMBING	34,100			51,150
FIT OUT ALLOWANCES - PH2	34,100	SF	1.50	51,150
HVAC	34,100			682,000
FIT OUT ALLOWANCES - PH2	34,100	SF	20.00	682,000
FIRE PROTECTION	34,100			34,100
FIT OUT ALLOWANCES - PH2	34,100	SF	1.00	34,100
ELECTRICAL	34,100			511,500
FIT OUT ALLOWANCES - PH2	34,100	SF	15.00	511,500
FURNISHINGS	34,100			34,100
FIT OUT ALLOWANCES - PH2	34,100	SF	1.00	34,100
PROJECT REQUIREMENTS	34,100			85,250
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,705,000	85,250
TOTAL DIRECT COSTS				1,790,250
ALLOCATIONS				534,100
General Conditions	7.0	wks	13,024	91,171
Permits	0.0 %			-
GL Insurance	2.6 %			56,362
Design Contingency	11.0 %			196,928
Phasing Contingency	0.0 %			-
Construction Contingency	4.5 %			89,423
Bond	1.5 %			32,517
Fee	3.0 %			67,700
Escalation	Excluded		1/1/2025	-
TOTAL CONSTRUCTION COST				2,324,350

ALTERNATE DETAILS
 SOMERVILLE MP - ARMORY CAPITAL IMPROVEMENTS
 BBB
 ARMORY BUILDING RENOVATION

44,497

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	ALT #1				831,572
	<i>PH1: Replace Switchgear and Upgrade incoming Service</i>				
	<u>Incoming Service - Upgrade</u>				
	750KVA pad mounted xfmr - assumed req	1	LS	82,500.00	82,500
	1200 A Incoming service to replace existing 1000 A, assumed feed through existing duct	1,200	AMP	420.00	504,000
	Testing, balancing & commissioning support	1	LS	23,460.00	23,460
	Co-ordination, rigging, CAD, Sub-trade temp requirements	1	LS	58,650.00	58,650
	<u>Total Direct Costs</u>				668,610
	<u>Allocations</u>				162,962
	General Conditions				Included in base
	Permits	0.0 %			-
	Insurances	2.6 %			20,164
	Design Contingency	11.0 %			73,547
	Phasing Allowance	0.0 %			-
	Construction Contingency	4.5 %			33,397
	Bond	1.5 %			11,633
	Fee	3.0 %			24,221
	Escalation	Excluded			-

GENERAL CONDITIONS CORE & SHELL
ARMORY BUILDING RENOVATION

SOMERVILLE MP - ARMORY CAPITAL IMPROVEMENTS

28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 7.5	DAYS - X 20 150	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%	150	8	\$ 1,500	\$ 225,000
Sr. Project Manager	100%	150	8	\$ 1,500	\$ 225,000
Project Manager	100%	150	8	\$ 1,200	\$ 180,000
Assistant Project Manager	50%	75	4	\$ 900	\$ 67,500
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	45	2	\$ 1,500	\$ 67,500
Purchasing	5%	8	0	\$ 1,500	\$ 11,250
MEP Coordinator	15%	23	1	\$ 1,300	\$ 29,250
Safety	10%	16	1	\$ 1,800	\$ 28,333
Project Accountant	2%	3	0	\$ 700	\$ 2,100
Project Administration	2%	3	0	\$ 500	\$ 1,500
Project Expeditor	2%	3	0	\$ 1,100	\$ 3,300
TOTALS					\$ 840,733

GENERAL CONDITIONS FIT-OUT
ARMORY BUILDING RENOVATION

SOMERVILLE MP - ARMORY CAPITAL IMPROVEMENTS

28-Oct-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 1.75	DAYS - X 20 35	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%	9	0	\$ 1,500	\$ -	13,125
Project Manager	100%	35	2	\$ 1,200	\$ -	42,000
Assistant Project Manager	50%	18	1	\$ 900	\$ -	15,750
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -	-
Senior Estimator	5%	2	0	\$ 1,500	\$ -	2,625
Purchasing	5%	2	0	\$ 1,500	\$ -	2,625
MEP Coordinator	15%	5	0	\$ 1,300	\$ -	6,825
Safety	10%	4	0	\$ 1,800	\$ -	6,611
Project Accountant	2%	1	0	\$ 700	\$ -	490
Project Administration	2%	1	0	\$ 500	\$ -	350
Project Expeditor	2%	1	0	\$ 1,100	\$ -	770
TOTALS					\$	91,171

Building Material Price Trends

Q2 2021

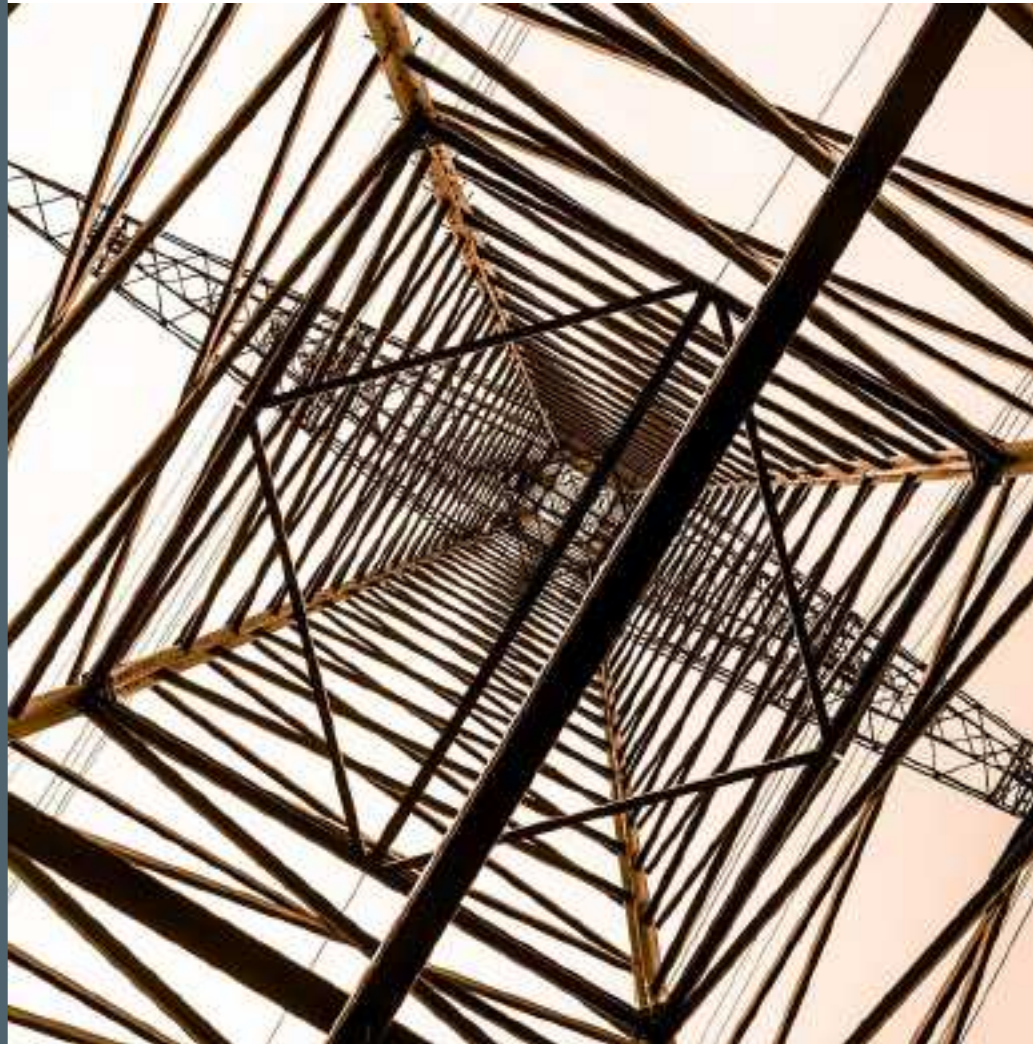
BRIEFING NOTE

April 2021

The US economy continues to recover from the historic 2020 pandemic-plunge, with the strength of the rebound depending on a number of factors, including the expansion of the vaccination program and the effectiveness of the \$1.9 trillion fiscal aid program to support labor markets, business confidence and consumer spending.

Construction activity ramped up since the second half of 2020 as lockdowns were lifted, and has been firm so far this year. However, market trends point to another eventful year for the industry.

In particular, the construction supply chain is facing significant building material price increases and price volatility, which is impacting project costs, schedules and cash flows of clients, contractors and sub-contractors.



Global Commodity PRICE TRENDS

Commodity prices have collectively seen significant increases in recent months. The WTI benchmark oil price climbed to \$62.6/ bbl in March 2021, reaching levels last seen in early 2019. The rise in copper prices has been even more substantial. Global copper prices passed the \$9,000/ ton mark in March, rising 15% so far this year and up 75% compared to a year ago (chart 1). Current copper prices are the highest in a decade, impacting the cost of many construction materials, most notably MEP products.

On the demand side, a rebound in global manufacturing activity, unprecedented state intervention and accommodating monetary policies, as well as a weaker US Dollar have all helped push up prices. Supply-chains are still feeling the repercussions of the pandemic-fallout in Spring 2020. Production capacity is reaching pre-pandemic levels, but some product markets are still dealing with disruptions which is impacting order backlogs, delivery times and prices. Conditions continue to improve, but these supply-side issues are likely to add to the volatility of the market this year.

The continuation of price increases will depend on how quickly supply-side bottlenecks are resolved. Overall available capacity in most industries is judged to be sufficient to meet projected demand in the near to medium term once operating rates improve. The IHS forecasts a stabilization in global commodity prices over the course of 2021 as supply and demand balance. It sees pricing risks on the downside pointing to a potential shift in investor sentiment, which could start a downward trend in prices.

US Building MATERIAL PRICES

Average local material prices have also recorded significant increases since the second half of last year, with the index for building material inputs to the construction industries now well above pre-pandemic crisis levels. In the three months to February, the index was up 4.9% year-on-year. Building materials are recording price rises across the board, but steel and lumber have by far seen the greatest price hikes since summer 2020 (chart 2).

Softwood lumber prices have been particularly volatile, with prices for the benchmark CME Random Length Lumber Futures ranging between \$260 and \$1,040 (per '000 sft) between March 2020 and March 2021 (chart 4). After an initial slowdown during the height of the pandemic, residential housing activity has been strong, fueling demand for lumber, which has led to scarcity, longer lead times and delivery delays, and mills taking advantage of market conditions raising prices. Some easing in the market can be expected, but prices are likely to stay high putting pressure on the cost of residential construction.

Other building materials, such as plastics products, gypsum and glass products have also seen price increases, but not to the extent of lumber and steel.

CHART 1: OIL AND COPPER PRICES

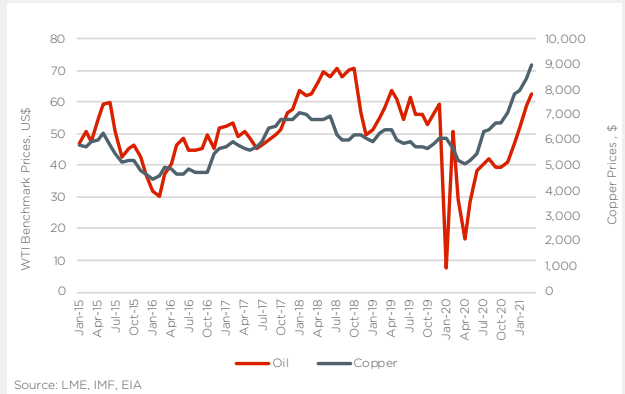


CHART 2: US BUILDING MATERIALS INFLATION

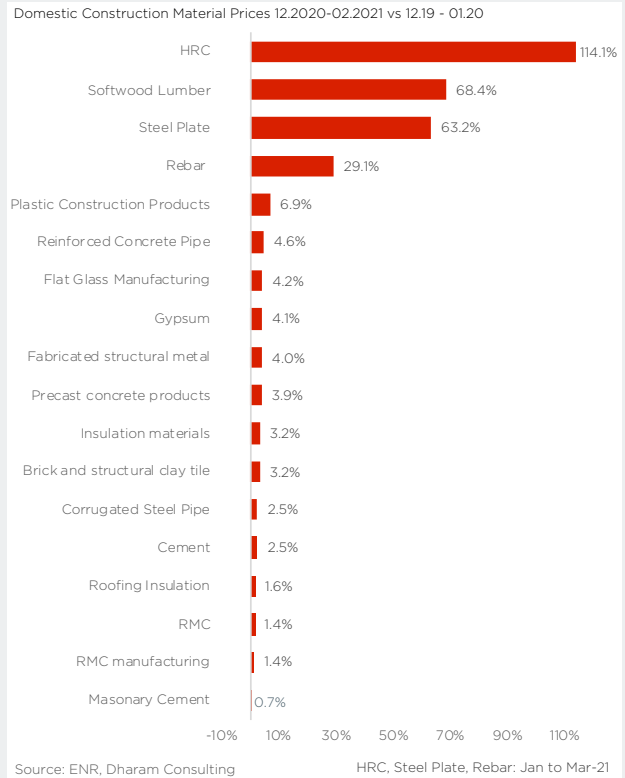
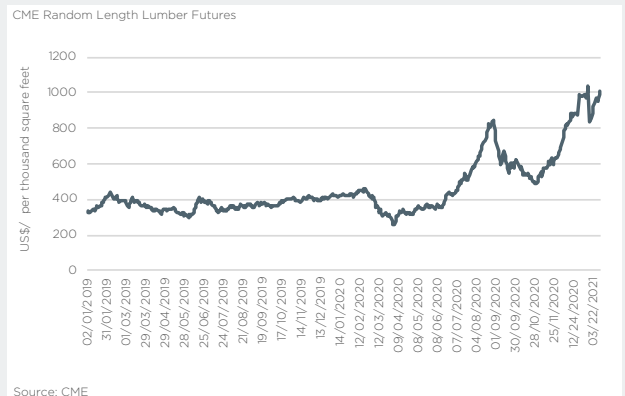


CHART 3: LUMBER PRICES



STEEL Prices

Current Trends

Steel prices for major product groups have rallied globally since Summer 2020, though the increase has been especially prominent in the US where mills have repeatedly pushed up prices over the past 9 months (chart 4).

Sheet, tube and plate prices have seen the largest gains. Hot-rolled coil prices averaged \$582/ ton in pre-Covid-19 February 2020. After plunging to \$489 in April 2020, prices started to rise and stood at \$1,300/ ton in March 2021, and an all-time high. Tube prices have followed domestic HRC price increases, with mills having announced more than 10 price increases since late summer 2020. Similarly, steel plate prices increased by over 60% to \$1,200/ ton over the same period. Rebar prices also increased, though not to the same extent, rising from \$560/ ton in summer 2020 to over \$860 per ton in March 2021 (chart 5). The rise in semi-finished good prices has fed through to finished steel producer prices for product groups across the board.

Supply-side factors are the main reason for the rapid increase in prices. The large amount of steelmaking capacity idled during the heights of the pandemic could not be restarted quickly enough to meet the stronger-than-expected rebound in steel demand, leading to supply tightness in the market. Inventories were driven to low levels, as a lack of supply left service centers unable to restock, prompting prices to skyrocket. In addition, increases in input costs, such as scrap, as well as higher truck and rail transportation costs have pushed up prices for finished steel, such as steel pipe and tube, steel wire, hot rolled steel bars, plates and structural shapes.

Despite lower international prices, imports have not increased materially so far, as high import costs (tariffs and transportation) has deterred buyers. Should domestic prices continue to rise, imports may become increasingly attractive to U.S. buyers, even factoring in tariffs and transport costs.

On the back of firm demand, tight domestic supply and limited availability of imported material, delivery times have lengthened significantly. According to Farwest Steel Corporation, in March lead times for hot rolled sheet ranged between 9-12 weeks for delivery from the Midwest, while lead times for HSS tube ranged between 5-7 weeks, rebar 4-6 weeks and for beams 7-9 weeks.

Outlook

Until steel production increases significantly, inventories are restocked or demand softens, steel prices will remain high. Steel demand is set to strengthen further this year, albeit coming from a low level in 2020 as production levels are yet to make up the losses sustained during the first half of 2020. Overall, we do not see demand across a broad range of steel-consuming sectors increase excessively above pre-pandemic levels.

Steel mills have now restarted and US steel production and mill utilization at 75.3% in March 2021 is nearly at par with pre-pandemic levels of 77% on average in 2019.

Given current price levels, steel mills will have a strong financial incentive to continue to increase production so that we can expect a further increase in utilization rates.

This has prompted expectations that the market will soon reach a tipping point and prices will start to level out. Overall steel-making capacity – if online – is generally sufficient to meet demand however, views are currently divided whether prices will be maintained at this level or are going to start to retreat in the near term.

Whilst there are questions about the sustainability of the current high steel price levels, given the current lead times, limited inventory levels, and healthy underlying demand we share the view that the market will support high price levels for much of this year. Substantial capacity increases are likely to start easing some of the pressure, which could cause prices to start retreating before year-end.

Across the economy, sectors will continue to deal with the repercussions of the Covid-19 pandemic impacting demand and supply, as well as producers and consumers alike, which is likely to sustain pricing uncertainty and volatility in the construction market.

CHART 4: GLOBAL HOT-ROLLED COIL PRICES

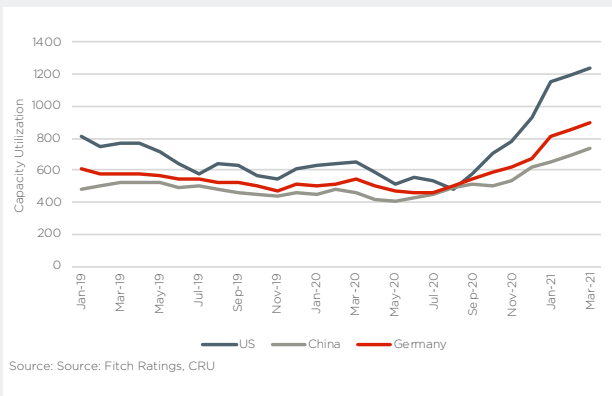
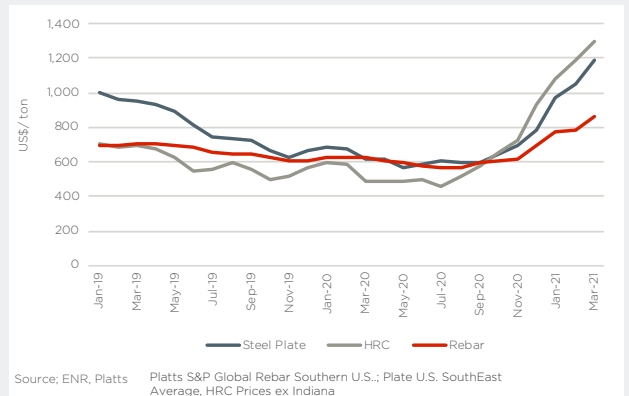


CHART 5: US DOMESTIC STEEL PRICES



Impact on Construction PROJECTS

Sharply higher prices coupled with long lead times for many steel products has created difficult market conditions across the construction supply chain, impacting project costs and supply chain relations.

Construction Cost and Bid Submission Prices

US building material price spikes are exerting significant upward pressure on construction cost. The ENR building material price index recorded a 4.6% year-on-year increase in the first quarter of 2021 (chart 6). Labor costs are relatively flat, with skilled labor and common labor recording a 1.6% and 0.8% increase, respectively in 1Q 2021 compared to a year earlier (chart 7).

Consequently, the rise in building costs is almost entirely driven by material prices, with the sub-index up 9.2% year-on-year over the same period. In March, the rate of price increase accelerated, with the index rising 2% compared to February and 11% year-on-year. The rise in steel prices (together with lumber) is the main driver behind the increase.

Construction starts dropped overall in 2020 and many projects that were expected to enter the bidding market were put on hold.

The bid environment was expected to firm up over the course of 2021 and so far, the rebound in projects being put onto the market has been stronger than we had anticipated in late 2020.

In fact, a strong bidding environment is already putting pressure on bid submission price inflation this year.

In this environment, contractors who have more choice of projects will seek to pass on the higher cost of material prices fully through the supply chain. Depending on the building type (and location), steel costs are a major component of building cost. We estimate that if fully passed down, the current rise in steel prices could add up to 2% to project bid submission prices in 2021 alone.

CHART 6: BUILDING COST INDEX

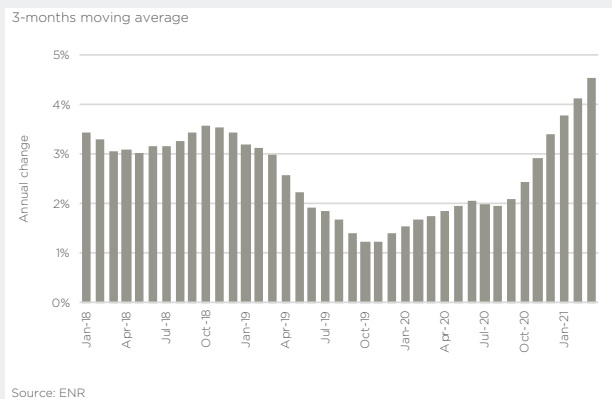
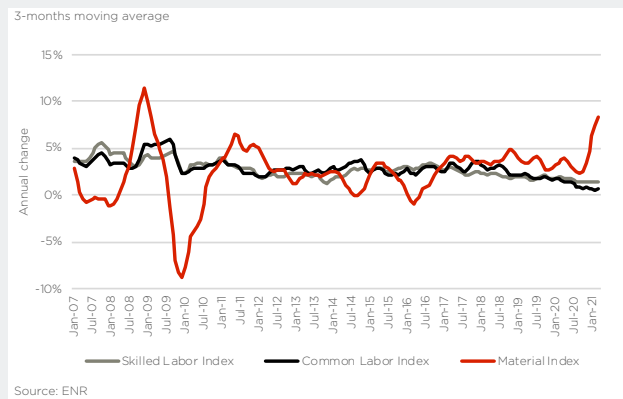


CHART 7: BUILDING COST INDEX



Availability

Extended lead times make on-time availability of steel products currently a major issue for many purchasers and projects. Material substitution is often a limited option. Given that near-term steel prices are expected to remain high, buyers may face difficulties in maintaining a wait-and-see approach and could be forced to lock in these higher prices for the remainder of the year in order to secure materials.

Construction activity

Higher steel prices at a time of generally rising materials costs and in combination with labor shortages could slow construction activity unless project financials can absorb these increases.

Contractual relations

Whilst contractors will seek to pass on the cost of material price increases to protect their cash-flows and margins, clients will want to protect themselves and their project financial viability. Clear contractual clauses around contingencies for material cost increases should be included upfront to reduce later disputes and achieve mutually beneficial outcomes.

Shorter bid times

In addition to raising prices, in busy local markets (sub)contractors are likely to shorten the time that their bids remain valid in anticipation of rising prices to mitigate their risk.

Dharam Consulting is an Independent Construction Consultancy specializing in providing proactive and value adding Cost and Risk Services that contribute towards successful outcomes for our clients and their projects. (A registered MBE company)

DHARAM
CONSULTING

ABOUT US

We are an experienced independent construction consultancy and we concentrate on doing what we do best – providing an intelligent, objective perspective which goes beyond measuring and pricing – delivering the highest quality pre-construction services, cost and budget management, risk, schedule, logistics, and procurement advice to clients.

Project benchmarking, market intelligence and data analytics support our services. We are a certified Minority Business Enterprise.

Our services are based upon strong relationships and trust, and our professional advice is grounded in a fundamental understanding of what matters to the project owner, architect and other stakeholders on a high-quality federal or publicly funded project, enabling our clients to deliver their vision.

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REVIEW OF MARKET - PAST 18 MONTHS

Beginning in Q3 of 2020 and continuing through Q2 2021, the market saw a drastic shift in escalation approaching an overall market rate increase of 8-10% on bid price submissions in the local Boston market. This drastic rise in escalation to date is due in large part to a continued mis-balance between supply capacity and demand as manufacturing and supply chains ramp back up from reduced production. While supply chains continue to normalize, the backlog from the past 9 months will continue to place upward pressure on material pricing. Local pipeline looks to be down in early 2021 from 2020, so we anticipate seeing near flat escalation, with a possibility of brief periods of negative inflation for the remainder of the year. Pipeline is scheduled to increase on the back half of 2022 and we anticipate a return to increased bid pricing heading into the back half of 2022.

Steel

Steel pricing across all major product groups increased drastically from mid 2020 to July 2021. Jumping from ~\$590/ton to \$1,300/ton by February. Commodities pricing continued to increase through July, we have seen a leveling off to the rate of increase we do not anticipate bid submission pricing to become more competitive until a few months of commodity price drops are observed. The steel rate has impacted structural steel packages, rebar for concrete packages, sheet metal, and piping.

Lumber

Lumber prices peaked in May with material pricing jumping over 100% from pre-pandemic levels. This increase was driven by a surge in demand particularly within the residential market which diminished available stock. This demand surge was compounded by lumber mills operating well below capacity during the pandemic. Tariffs and supply chain logistic challenges from lumber imported from Canada further limited available supplies. Raw lumber costs have dropped drastically in the past three months although savings have yet to be fully realized within the market.

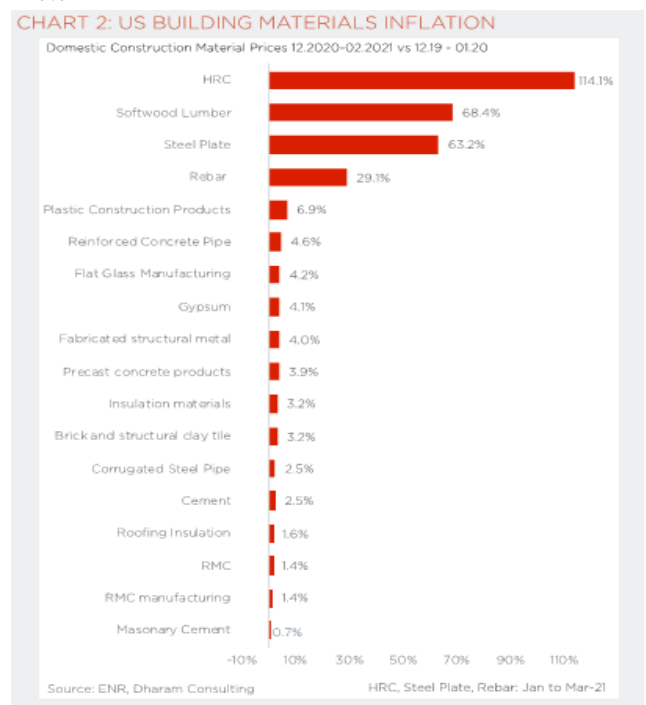
Plastics, Resin & Insulation

Similar to lumber, plastics and insulation have increased due to manufacturing and fabrication plant shut downs. While supply chains are normalizing, we do not anticipate pricing to return to pre pandemic levels.

Equipment

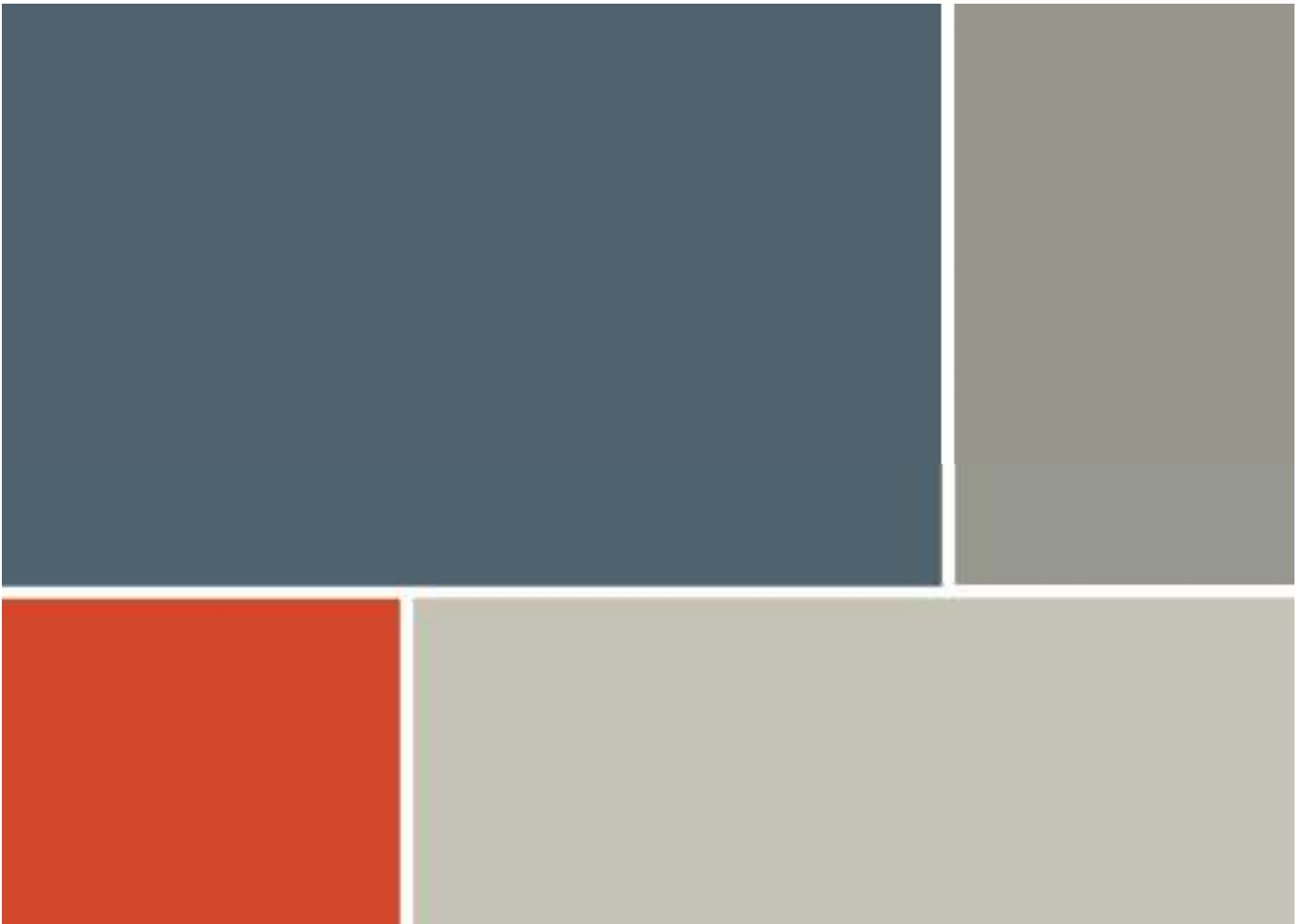
Manufacturers continue to raise the price of key equipment pieces as raw material costs, increased labor requirements, and transportation costs all surged. Most manufacturers have announced publicly that their products will increase anywhere from 3-9%.

Table from Dharam's Q2 Building Material Price Trends Briefing Note





SOMERVILLE MASTER PLAN - 24 CROSS STREET RENO & ADDITION
24 CROSS STREET EAST
August 12, 2021



ONE BEACON STREET
FLOOR 15
BOSTON, 12108

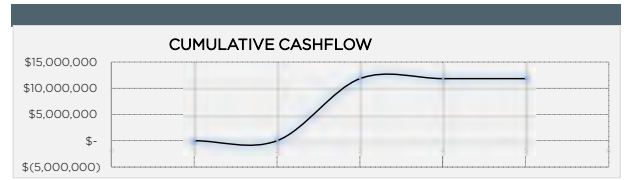
CONSTRUCTION COST
& RISK CONSULTANTS

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE 24 CROSS STREET EAST RENOVATION AND ADDITION. THE MODEL SHOWS ALL APPLICABLE RENOVATION AND NEW CONSTRUCTION :MEP INFRASTRUCTURE REPLACEMENT, CORE RENOVATION, ENVELOPE REPAIRS, AND NEW BUILD WORK . THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN.

CONSTRUCTION COSTS \$ (NOT ESCALATED)				
COST ELEMENT	GSF	\$/SF	CONST \$ (NOT ESCALATED)	PROJECT \$ (NOT ESCALATED)
EXISTING ENVELOPE	6,000	\$ 312	\$ 1,874,928	\$ 1,874,928
MEP INFRASTRUCTURE	14,000	\$ 249	\$ 3,489,037	\$ 3,489,037
EXISTING CORE & SHELL	6,100	\$ 164	\$ 998,332	\$ 998,332
ADDITION CORE & SHELL	7,900	\$ 649	\$ 5,123,406	\$ 5,123,406
EXISTING RENO FITOUT	6,100	\$ 182	\$ 1,112,203	\$ 1,112,203
ADDITION FIT OUT	7,900	\$ 269	\$ 2,122,016	\$ 2,122,016
SITE & LANDSCAPE	14,000	\$ 43	\$ 608,586	\$ 608,586
TOTAL CONSTRUCTION COSTS	14,000	\$1,095	\$ 15,328,508	\$ 15,328,508
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
TOTAL CAPITAL EXPENDITURE			\$ 15,328,508	\$ 15,328,508



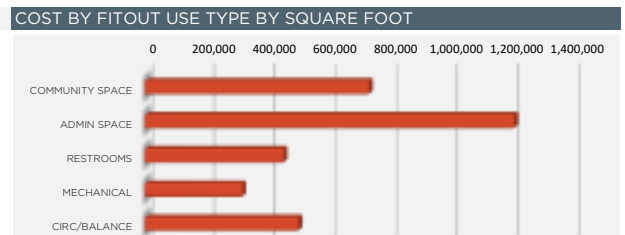
BUILDINGS CASHFLOW FORECAST			
SPEND TOTALS	ANNUAL	CUMULATIVE	
2023	\$ -	\$ -	
2024	\$ -	\$ -	
2025	\$ 11,839,471	\$ 11,839,471	
2026	\$ -	\$ 11,839,471	
2027+	\$ -	\$ 11,839,471	



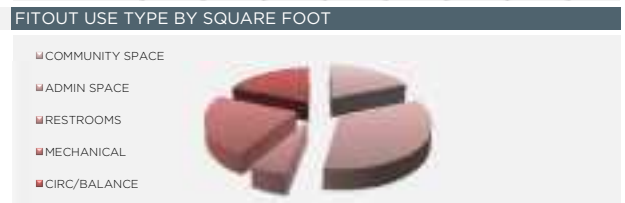
ALTS & BREAKOUTS	\$	\$/SF
ALTERNATES (CONSTRUCTION COST VALUES)		
ALT #1 - STRUCTURAL UPGRADES	\$205,559	\$14.68

CONTINGENCY & ESCALATION SUMMARY	
Design contingency	12.0%
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	EXCLUDED
Project labor assumptions	Union

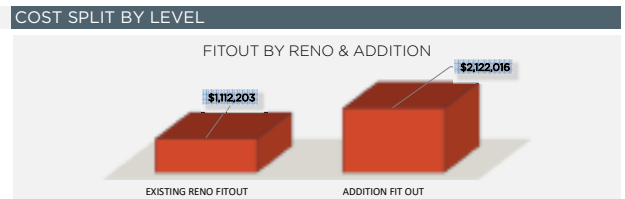
FITOUT USE TYPE BY COST	TOTAL \$	% MIX	CONST \$
COMMUNITY SPACE		23%	737,629
ADMIN SPACE		50%	1,215,019
RESTROOMS		19%	455,632
MECHANICAL		13%	320,820
CIRC/BALANCE		21%	505,120



FITOUT USE TYPE BY SQUARE FOOT	% MIX OF TYPE	AREAS SF
COMMUNITY SPACE	19%	2,600
ADMIN SPACE	34%	4,800
RESTROOMS	6%	800
MECHANICAL	23%	3,200
CIRC/BALANCE	19%	2,600



BUILDING FIT-OUT COST \$	% MIX	CONST \$
EXISTING RENO FITOUT	34%	\$ 1,112,203
ADDITION FIT OUT	66%	\$ 2,122,016



EXCLUSIONS & ASSUMPTIONS

- Escalation has been EXCLUDED from this model as project schedule is not yet known. Refer to the Memo provided with the masterplan study on 'Escalation to Date' for the first half of 2021 and more key indicators driving future projections.

The following multipliers reflect our best projections for escalation moving forward, Due to the continued volatility in the market, these should be reviewed on a regular basis before finalizing project schedules, budgets, and scopes. Beyond 2024 we recommend carrying the typical 10-year rolling average of 4.5% for the purpose of this study.

YR	Projected Escalation %	Compounded	Compounded Escalation Multiplier
2021	1.0%	1%	1.01 (to end of 2021)
2022	3.5%	4%	1.04
2023	6.0%	10%	1.10
2024	5.0%	16%	1.16
2025	4.5%	21%	1.21
2026	4.5%	26%	1.26
2027	4.5%	32%	1.32
2028	4.5%	38%	1.38
2029	4.5%	44%	1.44

- We have excluded any cost for phasing of the project.
- We have included 12% design contingency on trade costs
- We have included 4.5% construction contingency on trade costs + design contingency
- We have included 2.6% for GL & Subguard Insurance on cost of work (trade + contingencies + general conditions)
- We have included 1.5% for a bond on cost of work (trade + contingencies + general conditions)
- We have included a 3% CM Fee
- We have excluded permit costs, assumed covered by City
- General project requirements are carried at 5% of trade costs
- General conditions are costed per provided project schedule construction durations provided by PMA. See GC staffing sheet at back of the report for assumed staffing.
- Soft costs, FFE & owner's contingency have been excluded
- All work is priced on regular hours, OT allowances are excluded presently

BASIS OF ESTIMATE

- 24 Cross Street East Exploratory Base Drawings_020210726
- 24 Cross ST East Combo Rehab-Addition Test-Fit_20210730
- 2875 CoS CSA MP - PDP Cost Estimating Narrative
- 2021.0811CSA Summary Schedules

Systems Assumptions

General

Please see estimate backup for additional assumptions, qualifications & exclusions

Foundations/Basement Construction

Cost are included for new footings to support the addition.
Costs are included for replacement of the foundation slab on grade per the narrative

Superstructure

Allowances for rebuilding of the wood joists and sub floor at portions of the existing community space are included
Allowances for sistering and select replacement of wood joists are included.
The addition is priced as a Steel structure per the provided narrative.
An allowance has been carried for integrating the addition and renovated building together for lateral bracing.
A 125k Allowance is included for the ornamental steel topping of the tower.

Exterior Enclosure

This assumes full scaffolding of the existing building in order to complete façade restoration scope
Full window replacement is included, including reinstating infilled openings as indicated in the narratives
Removal of the aluminum gable façade and reinstatement of the half timber and stucco façade is included
Masonry repairs and select rebuilding of sections are included per the elevation drawings and notes.
The envelope of the addition is assumed to be glazing system and flat seam metal panels with windows.

Roofing

Green roof is EXCLUDED. PV costs are included w/ electrical infrastructure.
Costs are included for replacing the pitched shingle roof with flat metal seam roof

Interior Construction/Finishes

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

Stairways/Conveying

Costs associated with the new stairs at the addition are included
A new elevator with front and back stops at the ground floor is included

Services

Estimate assumes full replacement of all MEP systems with one system to serve both the existing building and addition.
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

An allowance of \$12.5/SF has been included for HAZMAT abatement

Site Improvements

Contaminated soil disposal is excluded
Site detail has been assumed and based on the narrative descriptions as no site drawings were available.

Site Mechanical Utilities

On site storm water mitigation is included per Nitsch narrative and suggested sizing.
Allowances of 75LF have been included for incoming service connections.

Site Electrical Utilities

We have included a 20k allowance for site lighting.
Utilities are carried in the site file

DIVISION SUMMARY		14,000 GFA		12-Aug-21
			\$/SF	\$ TOTAL
Project Requirements			37.64	527,029
PROJECT REQUIREMENTS			37.64	527,029
A10.	Foundations		48.41	677,670
A20.	Basement Construction			0
A. SUBSTRUCTURE			48.41	677,670
B10.	Superstructure		43.64	611,008
B20.	Exterior Enclosure		199.57	2,794,030
B30.	Roofing		28.83	403,655
B. SHELL			272.05	3,808,693
C10.	Interior Construction		26.41	369,700
C30.	Interior Finishes		37.89	530,500
C. INTERIORS			64.30	900,200
C20.	Stairways		9.54	133,560
D10.	Conveying Systems		12.50	175,000
VERTICAL TRANSPORTATION			22.04	308,560
D20.	Plumbing Systems		40.54	567,600
D30.	Heating, Ventilating & Air Conditioning		138.45	1,938,284
D40.	Fire Protection Systems		7.82	109,500
D50.	Electric Lighting, Power & Communications		85.64	1,198,938
D. SERVICES			272.45	3,814,321
E10.	Equipment		3.61	50,600
E20.	Furnishings		9.07	127,000
E. EQUIPMENT AND FURNISHINGS			12.69	177,600
F10.	Special Construction (Sustainability allowance)		0.00	0
F20.	Selective Demolition		28.55	399,756
F. SPECIAL CONSTRUCTION AND DEMOLITION			28.55	399,756
TOTAL BUILDING CONSTRUCTION			758.13	10,613,829
G10.	Site Preparation		4.31	60,325
G20.	Site Improvements		19.58	274,073
G30.	Site Civil/Mechanical Utilities		7.10	99,375
G40.	Site Electrical Utilities		1.43	20,000
G90.	Other Site Construction		0.00	0
TOTAL SITE CONSTRUCTION			32.41	453,773
TOTAL TRADE COSTS			790.54	11,067,601
a. Design Contingency		12.0%	94.87	1,328,112
b. Phasing Allowance		0.0%	0.00	0
c. Construction Contingency		4.5%	39.84	557,807
d. General Conditions		10.36%	95.89	1,342,393
SUBTOTAL			1,021.14	14,295,914
e. Permits		0.0%	0.00	0
f. Insurances		2.6%	26.55	371,694
g. Bond		1.5%	15.32	214,439
h. Fee		3.0%	31.89	446,461
TOTAL COST TODAY			1,094.89	15,328,508
i. Escalation		EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST			\$1,095	15,328,508

ESTIMATE SUMMARY
24 CROSS STREET EAST

SOMERVILLE MASTER PLAN - 24 CROSS STREET RENO & ADDITION

12-Aug-21

SUMMARY BY PROGRAM

14,000

GFA

DHARAM
CONSULTING

TRADE		CORE & SHELL	/ SF	COMBINED FIT-OUT PROJECTS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING		\$ 357,656	\$ 25.55	\$ 42,100	\$ 3.01	\$ 399,756	\$ 28.55
FOUNDATIONS		\$ 677,670	\$ 48.41	\$ -	\$ -	\$ 677,670	\$ 48.41
BASEMENT CONSTRUCTION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE		\$ 611,008	\$ 43.64	\$ -	\$ -	\$ 611,008	\$ 43.64
EXTERIOR ENCLOSURE		\$ 2,794,030	\$ 199.57	\$ -	\$ -	\$ 2,794,030	\$ 199.57
ROOFING		\$ 403,655	\$ 28.83	\$ -	\$ -	\$ 403,655	\$ 28.83
INTERIOR CONSTRUCTION		\$ 140,000	\$ 10.00	\$ 229,700	\$ 16.41	\$ 369,700	\$ 26.41
INTERIOR FINISHES		\$ 39,500	\$ 2.82	\$ 491,000	\$ 35.07	\$ 530,500	\$ 37.89
STAIRWAYS		\$ 133,560	\$ 9.54	\$ -	\$ -	\$ 133,560	\$ 9.54
CONVEYING SYSTEMS		\$ 175,000	\$ 12.50	\$ -	\$ -	\$ 175,000	\$ 12.50
PLUMBING		\$ 293,000	\$ 20.93	\$ 274,600	\$ 19.61	\$ 567,600	\$ 40.54
HVAC		\$ 1,384,284	\$ 98.88	\$ 554,000	\$ 39.57	\$ 1,938,284	\$ 138.45
FIRE PROTECTION		\$ 56,000	\$ 4.00	\$ 53,500	\$ 3.82	\$ 109,500	\$ 7.82
ELECTRICAL		\$ 726,138	\$ 51.87	\$ 472,800	\$ 33.77	\$ 1,198,938	\$ 85.64
EQUIPMENT		\$ -	\$ -	\$ 50,600	\$ 3.61	\$ 50,600	\$ 3.61
FURNISHINGS		\$ 21,000	\$ 1.50	\$ 106,000	\$ 7.57	\$ 127,000	\$ 9.07
SUSTAINABILITY ALLOWANCE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP		\$ 60,325	\$ 4.31	\$ -	\$ -	\$ 60,325	\$ 4.31
SITE IMPROVEMENTS		\$ 274,073	\$ 19.58	\$ -	\$ -	\$ 274,073	\$ 19.58
SITE CIVIL / MECHANICAL		\$ 99,375	\$ 7.10	\$ -	\$ -	\$ 99,375	\$ 7.10
SITE ELECTRICAL		\$ 20,000	\$ 1.43	\$ -	\$ -	\$ 20,000	\$ 1.43
OTHER SITE		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS		\$ 8,266,273	\$ 590.45	\$ 2,274,300	\$ 162.45	\$ 10,540,573	\$ 752.90
Design Contingency	12.00%	\$ 1,041,550	\$ 74.40	\$ 286,562	\$ 20.47	\$ 1,328,112	\$ 94.87
Phasing Allowance	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	4.50%	\$ 437,451	\$ 31.25	\$ 120,356	\$ 8.60	\$ 557,807	\$ 39.84
General Conditions	10.36%	\$ 1,120,978	\$ 80.07	\$ 221,416	\$ 15.82	\$ 1,342,393	\$ 95.89
Project Requirements	5.00%	\$ 413,314	\$ 29.52	\$ 113,715	\$ 8.12	\$ 527,029	\$ 37.64
SUBTOTAL		\$ 11,279,566	\$ 805.68	\$ 3,016,348	\$ 215.45	\$ 14,295,914	\$ 1,021.14
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	2.60%	\$ 293,269	\$ 20.95	\$ 78,425	\$ 5.60	\$ 371,694	\$ 26.55
Bond	1.50%	\$ 169,193	\$ 12.09	\$ 45,245	\$ 3.23	\$ 214,439	\$ 15.32
CM Fee	3.00%	\$ 352,261	\$ 25.16	\$ 94,201	\$ 6.73	\$ 446,461	\$ 31.89
SUBTOTAL		\$ 12,094,289	\$ 863.88	\$ 3,234,219	\$ 231.02	\$ 15,328,508	\$ 1,094.89
Escalation	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL		\$ 12,094,289	\$ 863.88	\$ 3,234,219	\$ 231.02	\$ 15,328,508	\$ 1,094.89

SUMMARY BY PROGRAM

TRADE	14,000		6,000		6,100		7,900		14,000	
	MEP INFRA		RENOVATION C&S				ADDITION C&S		SITE	
	MEP INFRASTRUCTURE		EXISTING ENVELOPE		EXISTING CORE & SHELL		ADDITION CORE & SHELL		SITE & LANDSCAPE	
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 18,000	\$ 1.29	\$ -	\$ -	\$ 339,656	\$ 55.68	\$ -	\$ -	\$ -	\$ -
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ 191,119	\$ 31.33	\$ 486,552	\$ 61.59	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ 125,000	\$ 20.83	\$ 65,500	\$ 10.74	\$ 420,508	\$ 53.23	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ 861,895	\$ 143.65	\$ -	\$ -	\$ 1,932,136	\$ 244.57	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ 321,980	\$ 53.66	\$ -	\$ -	\$ 81,675	\$ 10.34	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ 61,000	\$ 10.00	\$ 79,000	\$ 10.00	\$ -	\$ -
INTERIOR FINISHES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 39,500	\$ 5.00	\$ -	\$ -
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 133,560	\$ 16.91	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 175,000	\$ 22.15	\$ -	\$ -
PLUMBING	\$ 281,000	\$ 20.07	\$ -	\$ -	\$ -	\$ -	\$ 12,000	\$ 1.52	\$ -	\$ -
HVAC	\$ 1,384,284	\$ 98.88	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FIRE PROTECTION	\$ 56,000	\$ 4.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ELECTRICAL	\$ 726,138	\$ 51.87	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EQUIPMENT	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FURNISHINGS	\$ -	\$ -	\$ -	\$ -	\$ 9,150	\$ 1.50	\$ 11,850	\$ 1.50	\$ -	\$ -
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 60,325	\$ 7.64	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 274,073	\$ 19.58
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 99,375	\$ 7.10
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 20,000	\$ 1.43
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 2,465,421	\$ 176.10	\$ 1,308,875	\$ 218.15	\$ 666,424	\$ 109.25	\$ 3,432,105	\$ 434.44	\$ 393,448	\$ 28.10
Design Contingency	\$ 310,643	\$ 22.19	\$ 164,918	\$ 27.49	\$ 83,969	\$ 13.77	\$ 432,445	\$ 54.74	\$ 49,574	\$ 3.54
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 130,470	\$ 9.32	\$ 69,266	\$ 11.54	\$ 35,267	\$ 5.78	\$ 181,627	\$ 22.99	\$ 20,821	\$ 1
General Conditions	\$ 224,196	\$ 16.01	\$ 140,122	\$ 23.35	\$ 112,098	\$ 18.38	\$ 560,489	\$ 70.95	\$ 84,073	\$ 6
Project Requirements	\$ 123,271	\$ 8.81	\$ 65,444	\$ 10.91	\$ 33,321	\$ 5.46	\$ 171,605	\$ 21.72	\$ 19,672	\$ 1
SUBTOTAL	\$ 3,254,001	\$ 232.43	\$ 1,748,625	\$ 291.44	\$ 931,080	\$ 152.64	\$ 4,778,271	\$ 604.84	\$ 567,588.84	\$ 40.54
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 84,604	\$ 6.04	\$ 45,464	\$ 7.58	\$ 24,208	\$ 3.97	\$ 124,235	\$ 15.73	\$ 14,757	\$ 1.05
Bond	\$ 48,810	\$ 3.49	\$ 26,229	\$ 4.37	\$ 13,966	\$ 2.29	\$ 71,674	\$ 9.07	\$ 8,514	\$ 0.61
CM Fee	\$ 101,622	\$ 7.26	\$ 54,610	\$ 9.10	\$ 29,078	\$ 4.77	\$ 149,225	\$ 18.89	\$ 17,726	\$ 1.27
SUBTOTAL	\$ 3,489,037	\$ 249.22	\$ 1,874,928	\$ 312.49	\$ 998,332	\$ 163.66	\$ 5,123,406	\$ 648.53	\$ 608,586	\$ 43
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 3,489,037	\$ 249.22	\$ 1,874,928	\$ 312.49	\$ 998,332	\$ 163.66	\$ 5,123,406	\$ 648.53	\$ 608,586	\$ 43

SUMMARY BY PROGRAM

TRADE	2,600		4,800		800		3,200		2,600	
	RENOVATION FIT-OUT MODEL									
	COMMUNITY SPACE		ADMIN SPACE		RESTROOMS		MECHANICAL		CIRC/BALANCE	
	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 18,200	\$ 7.00	\$ -	\$ -	\$ -	\$ -	\$ 22,400	\$ 7.00	\$ 1,500	\$ 0.58
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 39,000	\$ 15.00	\$ 96,000	\$ 20.00	\$ 40,000	\$ 50.00	\$ 25,600	\$ 8.00	\$ 29,100	\$ 11.19
INTERIOR FINISHES	\$ 104,000	\$ 40.00	\$ 192,000	\$ 40.00	\$ 72,000	\$ 90.00	\$ 48,000	\$ 15.00	\$ 75,000	\$ 28.85
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 52,000	\$ 20.00	\$ 96,000	\$ 20.00	\$ 104,000	\$ 130.00	\$ 9,600	\$ 3.00	\$ 13,000	\$ 5.00
HVAC	\$ 130,000	\$ 50.00	\$ 216,000	\$ 45.00	\$ 40,000	\$ 50.00	\$ 64,000	\$ 20.00	\$ 104,000	\$ 40.00
FIRE PROTECTION	\$ 6,500	\$ 2.50	\$ 24,000	\$ 5.00	\$ 2,000	\$ 2.50	\$ 8,000	\$ 2.50	\$ 13,000	\$ 5.00
ELECTRICAL	\$ 130,000	\$ 50.00	\$ 168,000	\$ 35.00	\$ 28,000	\$ 35.00	\$ 48,000	\$ 15.00	\$ 98,800	\$ 38.00
EQUIPMENT	\$ 26,000	\$ 10.00	\$ 14,400	\$ 3.00	\$ 2,400	\$ 3.00	\$ -	\$ -	\$ 7,800	\$ 3.00
FURNISHINGS	\$ 13,000	\$ 5.00	\$ 48,000	\$ 10.00	\$ 32,000	\$ 40.00	\$ -	\$ -	\$ 13,000	\$ 5.00
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 518,700	\$ 199.50	\$ 854,400	\$ 178.00	\$ 320,400	\$ 400.50	\$ 225,600	\$ 70.50	\$ 355,200	\$ 136.62
Design Contingency	\$ 65,356	\$ 25.14	\$ 107,654	\$ 22.43	\$ 40,370	\$ 50.46	\$ 28,426	\$ 8.88	\$ 44,755	\$ 17.21
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 27,450	\$ 10.56	\$ 45,215	\$ 9.42	\$ 16,956	\$ 21.19	\$ 11,939	\$ 3.73	\$ 18,797	\$ 7.23
General Conditions	\$ 39,073	\$ 15.03	\$ 78,147	\$ 16.28	\$ 52,098	\$ 65.12	\$ 26,049	\$ 8.14	\$ 26,049	\$ 10.02
Project Requirements	\$ 25,935	\$ 9.98	\$ 42,720	\$ 8.90	\$ 16,020	\$ 20.03	\$ 11,280	\$ 3.53	\$ 17,760	\$ 6.83
SUBTOTAL	\$ 676,514	\$ 260.20	\$ 1,128,136	\$ 235.03	\$ 445,844	\$ 557.30	\$ 303,293	\$ 94.78	\$ 462,561	\$ 177.91
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 17,589	\$ 6.77	\$ 29,332	\$ 6.11	\$ 11,592	\$ 14.49	\$ 7,886	\$ 2.46	\$ 12,027	\$ 4.63
Bond	\$ 10,148	\$ 3.90	\$ 16,922	\$ 3.53	\$ 6,688	\$ 8.36	\$ 4,549	\$ 1.42	\$ 6,938	\$ 2.67
CM Fee	\$ 21,128	\$ 8.13	\$ 35,232	\$ 7.34	\$ 13,924	\$ 17.40	\$ 9,472	\$ 2.96	\$ 14,446	\$ 5.56
SUBTOTAL	\$ 725,379	\$ 278.99	\$ 1,209,621	\$ 252.00	\$ 478,047	\$ 597.56	\$ 325,200	\$ 101.63	\$ 495,972	\$ 190.76
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 725,379	\$ 278.99	\$ 1,209,621	\$ 252.00	\$ 478,047	\$ 597.56	\$ 325,200	\$ 101.63	\$ 495,972	\$ 190.76

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	14,000			\$ 18,000
Demolition of extg MEP systems	6,000	SF	3.00	\$ 18,000
PLUMBING	14,000			\$ 281,000
Plumbing infrastructure	14,000	SF	6.50	\$ 91,000
Greywater system				-
Greywater treatment system - allowance	1	LS	60,000.00	\$ 60,000
Rainwater storage & reuse - allow				-
Rainwater treatment skid	1	LS	40,000.00	\$ 40,000
Exterior storage tank - 5000Gal	1	LS	15,000.00	\$ 15,000
Makeup water connection w/ backflow preventer	1	LS	10,000.00	\$ 10,000
Piping and connections - allow	1	LS	40,000.00	\$ 40,000
Misc. harvesting scope required	1	LS	25,000.00	\$ 25,000
HVAC	14,000			\$ 1,384,284
<u>HVAC Infrastructure</u>			Option 1 Included as Base	
<u>Heating/cooling equipment</u>				-
ASHP - 30 TON	4	EA	40,000.00	160,000
HX - allow	1	LS	40,000.00	40,000
Primary/secondary pumps - allow	4	EA	20,000.00	80,000
Condensate return pumps for ASHP	4	EA	4,500.00	18,000
Expansion, air separation, shot feed, pressurization, filtration (assumed)	1	EA	25,000.00	25,000
<u>Heat Recovery Systems</u>				-
New glycol system/ feed	1	LS	20,000.00	20,000
<u>Air Distribution</u>				-
AHU - 4,000 CFM, 100% OA, dual core heat recovery, MERV filters, supply and exhaust ECM fan arrays, CHW cooling coil, located on room of new addition	4,000	CFM	16.00	64,000
AHU - 2,000 CFM for community space, 100% OA, dual core heat recovery, MERV filters, supply and exhaust ECM fan arrays, CHW cooling coil, located on room of new addition	2,000	CFM	16.00	32,000
<u>Exhaust</u>				-
General exhaust - allow	1	LS	5,000.00	5,000
<u>Smoke extract</u>			Excluded, assume not required	
<u>Energy Performance</u>				-
Variable Frequency Drives				-
AHUs	4	EA	6,500.00	26,000
ASHP	4	EA	4,500.00	18,000
Pumps	4	EA	3,000.00	12,000
VFD's for exhaust fans, allow	4	EA	1,500.00	6,000
Energy Metering Allowance	1	LS	10,000.00	10,000
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves & Connections</u>				-
<u>Steam Piping</u>			Excluded, assume not required	
<u>Heating/Cooling piping</u>				-
- CHW/HW mains & risers, runouts to equipment	875	LF	80.00	70,000
- Piping on floor loops	3,786	LF	40.00	151,452
Control valves on main equipment	10	EA	3,500.00	35,000
<u>Sheetmetal & Accessories</u>				-
Primary ductwork galvanized sheetmetal tying	5,400	LBS	14.50	78,300
General bathroom & exhaust ductwork	2,083	LBS	14.50	30,208

TRADE	QTY	UNIT	RATE	TOTAL
<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	17,626.25	17,626
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	4,661	LF	10.00	46,613
Ductwork insulation	4,154	SF	5.00	20,769
<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	30,000.00	30,000
ASHP	40	PTS	1,200.00	48,000
Pumps	16	PTS	1,200.00	19,200
AHUs - assume 30pts ea average	60	PTS	1,200.00	72,000
Fans	4	PTS	1,200.00	4,800
Allowance - Window sensor tie ins	20	PTS	1,200.00	24,000
Misc.	10	PTS	1,200.00	12,000
Testing, balancing & commissioning support	1	LS	35,999.05	35,999
Co-ordination, rigging, CAD, Sub-trade temp	1	LS	148,316.09	148,316
FIRE PROTECTION	14,000			\$ 56,000
Fire protection infrastructure	14,000	SF	4.00	\$ 56,000
ELECTRICAL	14,000			\$ 726,138
<u>Normal Service Distribution</u>				-
500KVA pad mounted xfmr	1	LS	55,000.00	\$ 55,000
800A swbd, CT cab	1	LS	28,000.00	\$ 28,000
45kva step down xfmr	2	EA	5,000.00	\$ 10,000
150A power panel - 84 ckts	4	EA	7,650.00	\$ 30,600
100A site lighting panel - size assumed	1	EA	3,000.00	\$ 3,000
100A lighting panels - 1 per floor	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	15	EA	3,500.00	\$ 52,500
<u>Normal Feeders</u>	14,000	SF	3.00	\$ 42,000
<u>Emergency Power Distribution</u>				Excluded - not called for in narrative
<u>Mechanical / Equipment Power</u>	14,000	SF	2.50	\$ 35,000
<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	14,000	SF	7.00	\$ 98,000
Temp fire alarm	14,000	SF	1.50	\$ 21,000
<u>BDA</u>				Excluded, assume not required
<u>Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)</u>	14,000	SF	3.00	\$ 42,000
<u>Audio visual</u>				w/ fitout
<u>Security systems allowance (head-end and backbone)</u>	14,000	SF	2.00	\$ 28,000
<u>Lightning protection</u>	14,000	SF	0.85	\$ 11,900

TRADE	QTY	UNIT	RATE	TOTAL
Rooftop PV (60 kW per narrative) - including mounting system, etc.	60	kW	800.00	\$ 48,000
PV infrastructure allowance	1	LS	63,000	\$ 63,000
Testing & bonding	1	LS	17,625.00	\$ 17,625
Sub-trade temps/ gcs	1	LS	66,012.50	\$ 66,013
PROJECT REQUIREMENTS	14,000			\$ 123,271
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	2,465,421	\$ 123,271
TOTAL DIRECT COSTS				\$ 2,588,692
ALLOCATIONS				\$ 900,345
General Conditions	8.0	28,024	wks	\$ 224,196
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 84,604
Design Contingency	12.0 %			\$ 310,643
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 130,470
Bond	1.5 %			\$ 48,810
Fee	3.0 %			\$ 101,622
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 3,489,037

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	6,000			\$ -
Demo of existing building to be removed				
SUPERSTRUCTURE	6,000			\$ 125,000
Allowance - new painted steel, open-frame ornamental metal installation to recall the original tower height and design. 20' H x 13' W x 13L	1	LS	125,000.00	\$ 125,000
EXTERIOR ENCLOSURE	6,000			\$ 861,895
<u>Scaffolding - assume scaffolding @ entire enclosure</u>	6,000	SF		<i>For reference only</i>
Scaffolding	6,000	SF	18.00	\$ 108,000
Scrim	6,000	SF	5.00	\$ 30,000
Misc. setup/tear down	30	MD	800.00	\$ 24,000
<u>Masonry Cleaning and Paint Stripping</u>				-
100% masonry cleaning - brick to remain	3,570	SF	5.00	\$ 17,850
Remove Paint from brick face to remain	10	SF	45.00	\$ 450
Remove vegetation - assumed 25% of north	275	SF	30.00	\$ 8,250
Remove atmospheric/Drainage staining due to bad gutter at existing brick to remain	50	SF	20.00	\$ 1,000
<u>Masonry Repoint, Repair, Refinish</u>				-
100% repointing per narrative - less rebuild sections	3,000	SF	35.00	\$ 105,000
100% Repoint of ashlar masonry on exterior	570	SF	30.00	\$ 17,100
100% repoint at all surrounds, limestone water table, and buttress drip edges and caps	500	LF	30.00	\$ 15,000
5% Brick replacement - per narrative (8" x 3" brick assumed)	909	EA	45.00	\$ 40,909
Brick masonry full rebuild at return, north side	9	SF	110.00	\$ 990
Rebuild three wythes below north monumental window with salvaged bricks	20	SF	120.00	\$ 2,400
<u>New Brick Masonry</u>				-
Infill at garage door to restore original condition, water struck brick with size and color to match, 4 wythe assumed	32	SF	130.00	\$ 4,160
<u>Ashlar Masonry Scope</u>				-
100% Ashlar Replacement behind loading dock	45	SF	70.00	\$ 3,150
50% Stone Ashlar Replacement	193	SF	70.00	\$ 13,475
Rebuild ashlar per elevations	15	SF	90.00	\$ 1,350
<u>Gables - Restoration</u>				-
Removed existing aluminum siding	630	SF	12.00	\$ 7,560
Restoration of half-timbering/stucco finish	630	SF	60.00	\$ 37,800
- Replacement of 50% sheathing	315	SF	8.50	\$ 2,678
<u>Masonry Rebuild at Corners</u>				-
Rebuild Masonry parapets at corner towers (assume full depth rebuild)	270	SF		For Ref Only
- 25% brick replacement to match existing	409	EA	35.00	\$ 14,318
- Full rebuild of highlighted area inclusive of rebuilding historic crenellation detail	270	SF	90.00	\$ 24,300
- 100% replacement new stone copings	65	LF	115.00	\$ 7,475
- new flashings	65	LF	80.00	\$ 5,200
<u>Limestone Water Table</u>				-
Limestone Water Table Repairs				-
- Repair full cracks at water table - pin & patch	8	EA	500.00	\$ 4,000
- Patches at water table	18	EA	250.00	\$ 4,500

TRADE	QTY	UNIT	RATE	TOTAL
New water table stone at loading dock and East face	37	LF	90.00	\$ 3,330
- Remove bollards and bumper guards	1	LS	600.00	\$ 600
- Patches at water table adjacent	4	EA	250.00	\$ 1,000
Misc. Stone scope				-
Install 10 LF of new Split face granite stone sill at removed garage door location	10	LF	125.00	\$ 1,250
Rebuild eave soffits 2x4 LF	4	EA	960.00	\$ 3,840
Window sill replacement on south	30	LF	120.00	\$ 3,600
Reset window sill at north monumental window	15	LF	50.00	\$ 750
Window Reinstatement				-
Remove extg infills @ openings	14	LOC		Ref only
- Medium Windows	8	LOC	800.00	\$ 6,400
- Large Windows	3	LOC	1,500.00	\$ 4,500
- Monumental Windows	3	LOC	3,000.00	\$ 9,000
Allowance - Temporary Shoring at Monumental Openings in Masonry	3	LOC	2,500.00	\$ 7,500
Masonry Opening repairs - 50% of perimeter, full depth of masonry	150	LF	120.00	\$ 18,000
Waterproofing	300	LF	40.00	\$ 12,000
Grouting/insulation	300	LF	20.00	\$ 6,000
New windows - thermally broken aluminum, triple pane, Glass up to M.O. arches. Non operable.	667	SF		Ref only
- Medium Windows (6 SF each)	48	SF	200.00	\$ 9,600
- Large Windows (19-53 SF each)	91	SF	220.00	\$ 20,020
- Monumental Windows (-175 SF each) - custom large pane assumed, premium	528	SF	275.00	\$ 145,200
Store Front Entrances				-
Remove infill at original entrance	75	SF	30.00	\$ 2,250
Allowance - Repair to masonry opening surround	30	LF	50.00	\$ 1,500
New Storefront	33	SF	110.00	\$ 3,630
New Double Doors - integrated into storefront	2	LVS	2,800.00	\$ 5,600
Automatic door openers - Assumed	2	LOC	3,500.00	\$ 7,000
Replace gutters and Downspouts				-
New Copper Gutters with down spouts/leaders	198	LF	95.00	\$ 18,810
New Cast iron boots	6	EA	350.00	\$ 2,100
Interior Side				-
Furring - 2.5" stud, 1 layer drywall	4,500	SF	8.50	\$ 38,250
5" open cell spray foam	4,500	SF	5.00	\$ 22,500
Allowance - detailing around wood joists/beams	4,500	SF	1.50	\$ 6,750
ROOFING	6,000			\$ 321,980
Pitched Roof Replacement				-
Remove roofing down to sheathing	4,500	SF	6.00	\$ 27,000
Replace 20% of deck	900	SF	15.00	\$ 13,500
Standing seam metal roof	4,500	SF	40.00	\$ 180,000
Insulation: R-14 rigid foam	4,500	SF	6.50	\$ 29,250
Allowance - interior closed cell low GWP spray form insulation between rafters below deck to meet R-24	4,500	SF	8.00	\$ 36,000

TRADE	QTY	UNIT	RATE	TOTAL
Allowance - Caping, Coping, Flashings	4,500	SF	3.50	\$ 15,750
Low Sloped Roof Replacement at Corner Towers				
New metal Deck	360	SF	14.00	\$ 5,040
Rigid insulation R-38	360	SF	7.00	\$ 2,520
EPDM roofing	360	SF	22.00	\$ 7,920
Drains, leaders, & Scuppers - allowance	1	LS	5,000.00	\$ 5,000
PROJECT REQUIREMENTS	6,000			\$ 65,444
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,308,874.77	\$ 65,444
TOTAL DIRECT COSTS				\$ 1,374,319
ALLOCATIONS				\$ 500,609
General Conditions	5.0	28,024	wks	\$ 140,122
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 45,464
Design Contingency	12.0 %			\$ 164,918
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 69,266
Bond	1.5 %			\$ 26,229
Fee	3.0 %			\$ 54,610
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 1,874,928

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	6,100			\$ 339,656
HAZMAT Abatement - allowance for wings to be removed	6,790	SF	12.50	\$ 84,875
HAZMAT Abatement - allowance for renovated space to remain	6,100	SF	12.50	\$ 76,250
Demo existing buildings per exploratory drawings	67,900	CF	1.50	\$ 101,850
Demo portion of main pitched roof over west wing	520	SF	50.00	\$ 25,981
Demo (2) Chimney's down to adjacent masonry wall	720	SF	10.00	\$ 7,200
Demo stair/conveyor to infill mezzanine in existing space to remain	1	LS	2,000.00	\$ 2,000
Demo non-original dance hall mezzanine	2,600	SF	8.00	\$ 20,800
Demo partitions with the exception of masonry load bearing walls	1,850	SF	6.00	\$ 11,100
Demo Loading Dock and Apron	1	LS	5,000.00	\$ 5,000
Demo Garage Door	1	LS	1,100.00	\$ 1,100
Remove existing stair and stoop at north elevation	1	LS	3,500.00	\$ 3,500
FOUNDATIONS	6,100			\$ 191,119
Existing Foundations to be Removed				-
Remove foundations of wood framed portion to be demolished	2,500	SF		Ref only
Chop/remove footings (concrete spread footing assumed)	2,500	SF	15.00	\$ 37,500
Haul and dispose	93	CY	65.00	\$ 6,019
Existing Foundations Improvements				-
Remove and replace 100% of SOG at building to remain	3,000	SF		Ref only
Chop/remove footings (concrete spread footing assumed)	3,000	SF	15.00	\$ 45,000
New SOG, 12" Assumed	3,000	CY	20.00	\$ 60,000
Grout injection at basement to remain - height allowance 4' up basement wall	880	SF	20.00	\$ 17,600
Allowance - temp shoring and stabilization/monitoring allowance	1	LS	25,000.00	\$ 25,000
SUPERSTRUCTURE	6,100			\$ 65,500
Partial Rebuild Ground Floor Wood Structure				-
Replace ~ 500 SF of wood joist structure and subfloor at northeast and southeast corners of ground floor	500	SF		Ref only
- Remove existing floor structure	500	SF	5.00	\$ 2,500
- New wood joists	500	SF	25.00	\$ 12,500
- Wood subfloor	500	SF	6.00	\$ 3,000
Sistering - 50% of rafters in area assumed	250	SF	30.00	\$ 7,500
Replacement - 50% of rafters assumed	250	SF	60.00	\$ 15,000
Masonry Scope				-
Allowance - modifications of masonry walls for connection to addition	1	LS	25,000.00	\$ 25,000
INTERIOR CONSTRUCTION	6,100			\$ 61,000
Core & shell interior construction allowance	6,100	SF	10.00	\$ 61,000
- Reinstate original ceiling per existing plan notes				Incl above

TRADE	QTY	UNIT	RATE	TOTAL
FURNISHINGS	6,100			\$ 9,150
Accessibility Signage - allowance	6,100	SF	1.00	\$ 6,100
Wayfinding Signage & Departmental Graphics	6,100	SF	0.50	\$ 3,050
PROJECT REQUIREMENTS	6,100			\$ 33,321
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	666,424	\$ 33,321
TOTAL DIRECT COSTS				\$ 699,745
ALLOCATIONS				\$ 298,586
General Conditions	4.0	28,024	wks	\$ 112,098
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 24,208
Design Contingency	12.0 %			\$ 83,969
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 35,267
Bond	1.5 %			\$ 13,966
Fee	3.0 %			\$ 29,078
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 998,332

TRADE	QTY	UNIT	RATE	TOTAL
FOUNDATIONS	7,900			\$ 486,552
<u>Excavation Prep - Allowance</u>				-
Support existing building to remain near removal of wood structure	1	LS	15,000.00	\$ 15,000
Ongoing monitoring of existing structure	1	LS	25,000.00	\$ 25,000
<u>New Building Foundations</u>				-
Dewatering - allowance	1,815	SF	5.00	\$ 9,075
Excavation for SOG and subbase	101	CY	60.00	\$ 6,050
Gravel subbase - assume 12"	67	CY	60.00	\$ 4,033
Excavation for underslab MEPs	1,815	SF	3.00	\$ 5,445
Rough grading	1,815	SF	2.00	\$ 3,630
Fine grading	1,815	SF	2.00	\$ 3,630
Footing and frost wall excavation	204	CY	75.00	\$ 15,333
Basement deep excavation	597	CY	50.00	\$ 29,871
Backfill - assume imported backfill	96	CY	75.00	\$ 7,163
Dispose of excess material (Excludes contamination)	706	CY	160.00	\$ 113,020
Strip Footing - assume 6'x1.5'	77	CY	750.00	\$ 57,500
Spread Footing - allow 1 per 500 SF - assume 5'x5'	7	CY	850.00	\$ 5,714
Frost Wall/Grade Beam - assume 3'H x 1' W	26	CY	950.00	\$ 24,278
High foundation wall at basement	77	CY	1,200.00	\$ 92,000
Structural SOG - assume 12"	1,815	SF	20.00	\$ 36,300
Excavate for elevator pit	30	CY	85.00	\$ 2,550
Elevator pit walls	7	CY	1,200.00	\$ 8,400
Elevator pit slab and sump	100	SF	30.00	\$ 3,000
Elevator Pit Waterproofing	200	SF	15.00	\$ 3,000
Closed Cell SPF insulation at basement walls	2,070	SF	8.00	\$ 16,560
SUPERSTRUCTURE	7,900			\$ 420,508
Structural Steel Floor Framing Including Beams, Columns and Bracing - allow 12PSF for floors per narrative	22	TONS	6,800.00	\$ 148,104
Structural Steel Roof Framing Including Beams, Columns and Bracing - allow 12PSF for roof	11	TONS	6,800.00	\$ 74,052
Connections - allow 10%	3	TONS	6,800.00	\$ 22,216
Shear studs - allow 20ea per 100sf	1,089	EA	4.00	\$ 4,356
Metal Floor Deck - 2" Gage composite	3,630	SF	5.00	\$ 18,150
Metal Roof Deck	1,815	SF	4.00	\$ 7,260
Concrete fill on metal floor deck - 3 1/4" lightweight concrete	3,630	SF	5.00	\$ 18,150
Misc. concrete requirements - allowance	7,900	SF	0.50	\$ 3,950
Spray on fireproofing at exposed steel	3,630	SF	4.00	\$ 14,520
Misc. metals allowance	7,900	SF	2.50	\$ 19,750
Allowance for lateral structural integration into existing structure	1	LS	50,000.00	\$ 50,000
Dunnage for Mech Equipment - Allowance	1	LS	40,000.00	\$ 40,000
EXTERIOR ENCLOSURE	7,900			\$ 1,932,136
LGMF & FURR OF EXTERIOR	8,044	SF	12.00	\$ 96,531
Insulation	8,044	SF	5.00	\$ 40,221
Vapor Barrier	8,044	SF	3.75	\$ 30,166
Facade System 2 - Metal Panel	6,324	SF	100.00	\$ 632,385
Windows	2,018	SF	210.00	\$ 423,833
Storefront/Curtainwall - Exterior Glazing	3,393	SF	200.00	\$ 678,500
Entrances - allow integrated into exterior glazing	2	EA	10,000.00	\$ 20,000
ADO - at all entry doors	3	EA	3,500.00	\$ 10,500

TRADE	QTY	UNIT	RATE	TOTAL
ROOFING	7,900			\$ 81,675
Roofing System Complete	1,815	SF	45.00	\$ 81,675
INTERIOR CONSTRUCTION	7,900			\$ 79,000
Interior Construction - 8" CMU walls at stairs and elevator	7,900	SF	10.00	\$ 79,000 Incl. Above
INTERIOR FINISHES	7,900			\$ 39,500
Interior Finishes	7,900	SF	5.00	\$ 39,500
STAIRWAYS	7,900			\$ 133,560
Egress stairs - metal pan stair with concrete tread infill	12	FLIGHTS	10,000.00	\$ 120,000
Terrazzo communicating stair at ground floor - 8' w risers	48	LRF	95.00	\$ 4,560
Premium handrails at communicating stair	20	LF	450.00	\$ 9,000
CONVEYING SYSTEMS	7,900			\$ 175,000
Elevators - Front and back opening at ground floor, 1 stop all other floors	5	STOPS	35,000.00	\$ 175,000
PLUMBING	7,900			\$ 12,000
Sewer Grease Trap for Cafeteria	1	EA	12,000.00	\$ 12,000
FURNISHINGS	7,900			\$ 11,850
Accessibility Signage - allowance	7,900	SF	1.00	\$ 7,900
Wayfinding Signage & Departmental Graphics	7,900	SF	0.50	\$ 3,950
SITE PREP	7,900			\$ 60,325
Site Perimeter Fence	300	LF	75.00	\$ 22,500
Silt Barrier and Erosion protection - allowance	7,900	SF	0.25	\$ 1,975
Allowance - existing tree protection, 10 assumed	5	EA	800.00	\$ 4,000
Site demolition	7,900	SF	1.50	\$ 11,850
Construction Vehicle access/wheel wash - one location assumed	1	EA	20,000.00	\$ 20,000
Site Improvement Scope				See Site Breakout
PROJECT REQUIREMENTS	7,900			\$ 171,605
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	3,432,105	\$ 171,605
TOTAL DIRECT COSTS				\$ 3,603,710
ALLOCATIONS				\$ 1,519,696
General Conditions	20.0	28,024	wks	\$ 560,489
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 124,235
Design Contingency	12.0 %			\$ 432,445
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 181,627
Bond	1.5 %			\$ 71,674
Fee	3.0 %			\$ 149,225
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 5,123,406

TRADE	QTY	UNIT	RATE	TOTAL
SITE IMPROVEMENTS	14,000			\$ 274,073
<u>Grading</u>				-
Fine grading	12,145	SF	0.50	\$ 6,073
Excavation for site features - allowance	30	CY	75.00	\$ 2,250
<u>Granite Steps and Entries</u>				-
100% Granite Stairs - 5'W Risers, 6 Steps, 1 Landing, Cheek walls	50	SF	250.00	\$ 12,500
- painted metal guardrail	20	LF	250.00	\$ 5,000
100% Granite Stairs - 12'W Risers, 6 Steps, 1 Landing, Cheek walls	108	SF	250.00	\$ 27,000
- painted metal guardrail	25	LF	250.00	\$ 6,250
<u>Hardscape</u>				-
Pedestrian Sidewalks/Curbs - Brushed concrete CIP assumed	290	SF	30.00	\$ 8,700
Reset curb	80	LF	40.00	\$ 3,200
Permeable Pavers at entries and rear- locally sourced	260	SF	45.00	\$ 11,700
Walkways with Pavers	995	SF	40.00	\$ 39,800
<u>Landscaping & Plantings</u>				-
Trees- allowance	6	EA	1,200.00	\$ 7,200
Native Shrubs & Perennials at planted softscape	1,225	SF	20.00	\$ 24,500
Irrigation - reuse of storm water per Nitsch narrative	1,225	SF	4.00	\$ 4,900
<u>Misc. Site Furnishings</u>				-
New Painted metal ornamental fence 6' H at back of lot	100	LF	500.00	\$ 50,000
Chain-link metal fence	200	LF	25.00	\$ 5,000
Allowance - General Site furnishings	1	LS	60,000.00	\$ 60,000
SITE CIVIL / MECHANICAL	14,000			\$ 99,375
<u>Storm Water Management</u>				-
5,000 gal detention tanks for storm water and rainwater reuse system	1	LS	20,000.00	\$ 20,000
Subgrade drainage infrastructure (pipes, structures, grates) - allowance	1	LS	25,000.00	\$ 25,000
Storm Water Reuse system to plumbing flush fixtures				W/ Plumbing
Reconstitute areaway with drainage	1	LS	7,500.00	\$ 7,500
<u>Incoming utility services</u>				-
8" Sewer Service - length assumed	75	LF	175.00	\$ 13,125
- Excavation and backfill	42	CY	120.00	\$ 5,000
6" Fire Service - length assumed	75	LF	160.00	\$ 12,000
- Excavation and backfill	42	CY	120.00	\$ 5,000
2" Water Service - length assumed	75	LF	90.00	\$ 6,750
- Excavation and backfill	42	CY	120.00	\$ 5,000
SITE ELECTRICAL	14,000			\$ 20,000
Site Electrical & lighting - allowance	1	LS	20,000.00	\$ 20,000
<u>Electrical Service</u>				-
Incoming electrical duct bank				Excluded, assume ETR
PROJECT REQUIREMENTS	14,000			\$ 19,672
General project requirements - renovation	5.0%	TOTAL	393,447.50	\$ 19,672
TOTAL DIRECT COSTS				\$ 413,120

TRADE	QTY	UNIT	RATE	TOTAL
ALLOCATIONS				\$ 195,466
General Conditions	3.0	28,024	wks	\$ 84,073
Permits	0.0 %			\$ -
GL Insurance	2.6 %			\$ 14,757
Design Contingency	12.0 %			\$ 49,574
Design build fee	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 20,821
Bond	1.5 %			\$ 8,514
Fee	3.0 %			\$ 17,726
Escalation	Excluded		45,717.00	\$ -
TOTAL CONSTRUCTION COST				\$ 608,586

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION/ENABLING	6,100			\$ 42,100
COMMUNITY SPACE	2,600	SF	7.00	\$ 18,200
MECHANICAL	3,200	SF	7.00	\$ 22,400
CIRC/BALANCE	300	SF	5.00	\$ 1,500
INTERIOR CONSTRUCTION	6,100			\$ 66,100
COMMUNITY SPACE	2,600	SF	15.00	\$ 39,000
MECHANICAL	3,200	SF	8.00	\$ 25,600
CIRC/BALANCE	300	SF	5.00	\$ 1,500
INTERIOR FINISHES	6,100			\$ 158,000
COMMUNITY SPACE	2,600	SF	40.00	\$ 104,000
MECHANICAL	3,200	SF	15.00	\$ 48,000
CIRC/BALANCE	300	SF	20.00	\$ 6,000
PLUMBING	6,100			\$ 63,100
COMMUNITY SPACE	2,600	SF	20.00	\$ 52,000
MECHANICAL	3,200	SF	3.00	\$ 9,600
CIRC/BALANCE	300	SF	5.00	\$ 1,500
HVAC	6,100			\$ 206,000
COMMUNITY SPACE	2,600	SF	50.00	\$ 130,000
MECHANICAL	3,200	SF	20.00	\$ 64,000
CIRC/BALANCE	300	SF	40.00	\$ 12,000
FIRE PROTECTION	6,100			\$ 16,000
COMMUNITY SPACE	2,600	SF	2.50	\$ 6,500
MECHANICAL	3,200	SF	2.50	\$ 8,000
CIRC/BALANCE	300	SF	5.00	\$ 1,500
ELECTRICAL	6,100			\$ 189,400
COMMUNITY SPACE	2,600	SF	50.00	\$ 130,000
MECHANICAL	3,200	SF	15.00	\$ 48,000
CIRC/BALANCE	300	SF	38.00	\$ 11,400
EQUIPMENT	6,100			\$ 26,900
COMMUNITY SPACE	2,600	SF	10.00	\$ 26,000
CIRC/BALANCE	300	SF	3.00	\$ 900
FURNISHINGS	6,100			\$ 14,500
COMMUNITY SPACE	2,600	SF	5.00	\$ 13,000
CIRC/BALANCE	300	SF	5.00	\$ 1,500
PROJECT REQUIREMENTS	6,100			\$ 39,105
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	782,100	\$ 39,105
TOTAL DIRECT COSTS				\$ 821,205
ALLOCATIONS				\$ 290,998
General Conditions	5.8	wks	13,024	\$ 76,142
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 26,969
Design Contingency	12.0 %			\$ 98,545
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 41,389
Bond	1.5 %			\$ 15,559
Fee	3.0 %			\$ 32,394
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 1,112,203

ADDITION FIT OUT
24 CROSS STREET EAST

SOMERVILLE MASTER PLAN - 24 CROSS STREET RENO & ADDITION
12-Aug-21

TRADE	QTY	UNIT	RATE	TOTAL
INTERIOR CONSTRUCTION	7,900			\$ 163,600
ADMIN SPACE	4,800	SF	20.00	\$ 96,000
RESTROOMS	800	SF	50.00	\$ 40,000
CIRC/BALANCE	2,300	SF	12.00	\$ 27,600
INTERIOR FINISHES	7,900			\$ 333,000
ADMIN SPACE	4,800	SF	40.00	\$ 192,000
RESTROOMS	800	SF	90.00	\$ 72,000
CIRC/BALANCE	2,300	SF	30.00	\$ 69,000
PLUMBING	7,900			\$ 211,500
ADMIN SPACE	4,800	SF	20.00	\$ 96,000
RESTROOMS	800	SF	130.00	\$ 104,000
CIRC/BALANCE	2,300	SF	5.00	\$ 11,500
HVAC	7,900			\$ 348,000
ADMIN SPACE	4,800	SF	45.00	\$ 216,000
RESTROOMS	800	SF	50.00	\$ 40,000
CIRC/BALANCE	2,300	SF	40.00	\$ 92,000
FIRE PROTECTION	7,900			\$ 37,500
ADMIN SPACE	4,800	SF	5.00	\$ 24,000
RESTROOMS	800	SF	2.50	\$ 2,000
CIRC/BALANCE	2,300	SF	5.00	\$ 11,500
ELECTRICAL	7,900			\$ 283,400
ADMIN SPACE	4,800	SF	35.00	\$ 168,000
RESTROOMS	800	SF	35.00	\$ 28,000
CIRC/BALANCE	2,300	SF	38.00	\$ 87,400
EQUIPMENT	7,900			\$ 23,700
ADMIN SPACE	4,800	SF	3.00	\$ 14,400
RESTROOMS	800	SF	3.00	\$ 2,400
CIRC/BALANCE	2,300	SF	3.00	\$ 6,900
FURNISHINGS	7,900			\$ 91,500
ADMIN SPACE	4,800	SF	10.00	\$ 48,000
RESTROOMS	800	SF	40.00	\$ 32,000
CIRC/BALANCE	2,300	SF	5.00	\$ 11,500
PROJECT REQUIREMENTS	7,900			\$ 74,610
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	1,492,200	\$ 74,610
TOTAL DIRECT COSTS				\$ 1,566,810
ALLOCATIONS				\$ 555,206
General Conditions	11.2	wks	13,024	\$ 145,274
Permits	0.0 %			\$ -
GL Insurance	2.6 %			\$ 51,456
Design Contingency	12.0 %			\$ 188,017
Phasing Contingency	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 78,967
Bond	1.5 %			\$ 29,686
Fee	3.0 %			\$ 61,806
Escalation	Excluded		3/1/2025	\$ -
TOTAL CONSTRUCTION COST				\$ 2,122,016

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	ALT #1 - STRUCTURAL UPGRADES <i>improved structural support</i>				\$ 205,559
	<u>Additional roof scope</u>				
	Sistering of existing joists	2,600	SF	30.00	\$ 78,000
	Replace (4) Existing steel columns and footings	4	EA		Ref only
	- Steel Columns - 35 LF assumed	140	LF	150.00	\$ 21,000
	- Replace Foundations	4	EA	5,000.00	\$ 20,000
	- Removal of existing steel and foundations	4	EA	2,500.00	\$ 10,000
	Reinforcing of existing east-west steel beams supporting 1st floor structure	50	LF	150.00	\$ 7,500
	Misc. connections - allowance	1	LS	27,300.00	\$ 27,300
	<u>Total Direct Costs</u>				\$ 163,800
	<u>Allocations</u>				\$ 41,759
	General Conditions				Included in base
	Permits	0.0 %			\$ -
	Insurances	2.6 %			\$ 4,984
	Design Contingency	12.0 %			\$ 19,656
	Phasing Allowance	0.0 %			\$ -
	Construction Contingency	4.5 %			\$ 8,256
	Bond	1.5 %			\$ 2,876
	Fee	3.0 %			\$ 5,987
	Escalation	Excluded			\$ -

GENERAL CONDITIONS CORE & SHELL
24 CROSS STREET EAST

SOMERVILLE MASTER PLAN - 24 CROSS STREET RENO & ADDITION
12-Aug-21

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 10	DAYS - X 20 200	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%	200	10	\$ 1,500	\$ 300,000
Sr. Project Manager	100%	200	10	\$ 1,500	\$ 300,000
Project Manager	100%	200	10	\$ 1,200	\$ 240,000
Assistant Project Manager	50%	100	5	\$ 900	\$ 90,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	60	3	\$ 1,500	\$ 90,000
Purchasing	5%	10	1	\$ 1,500	\$ 15,000
MEP Coordinator	15%	30	2	\$ 1,300	\$ 39,000
Safety	10%	21	1	\$ 1,800	\$ 37,778
Project Accountant	2%	4	0	\$ 700	\$ 2,800
Project Administration	2%	4	0	\$ 500	\$ 2,000
Project Expeditor	2%	4	0	\$ 1,100	\$ 4,400
TOTALS					\$ 1,120,978

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 4.25	DAYS - X 20 85	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%	21	1	\$ 1,500	\$ 31,875
Project Manager	100%	85	4	\$ 1,200	\$ 102,000
Assistant Project Manager	50%	43	2	\$ 900	\$ 38,250
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	5%	4	0	\$ 1,500	\$ 6,375
Purchasing	5%	4	0	\$ 1,500	\$ 6,375
MEP Coordinator	15%	13	1	\$ 1,300	\$ 16,575
Safety	10%	9	0	\$ 1,800	\$ 16,056
Project Accountant	2%	2	0	\$ 700	\$ 1,190
Project Administration	2%	2	0	\$ 500	\$ 850
Project Expeditor	2%	2	0	\$ 1,100	\$ 1,870
TOTALS					\$ 221,416



SOMERVILLE MASTER PLAN - COMMUNITY CENTER
45 COLLEGE AVE
August 12, 2021



ONE BEACON STREET
FLOOR 15
BOSTON, 12108

CONSTRUCTION COST
& RISK CONSULTANTS

EXECUTIVE SUMMARY

SOMERVILLE MASTER PLAN - COMMUNITY CENTER

BUDGET MODEL - 45 COLLEGE AVE NEW BUILD

12-Aug-21

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE 45 COLLEGE AVE NEW BUILD COMMUNITY CENTER AND OFFICE BUILDING. THE MODEL SHOWS ALL APPLICABLE NEW CONSTRUCTION: NEW CORE & SHELL, MEP INFRASTRUCTURE, AND PROGRAM FIT OUT. THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN. ESCALATION IS EXCLUDED FROM THIS COST MODEL.

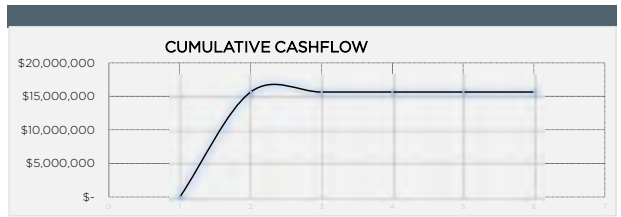
CONSTRUCTION COSTS \$ (NOT ESCALATED)

COST ELEMENT	GSF	\$/SF	CONST \$ (NOT ESCALATED)	PROJECT \$ (NOT ESCALATED)
MEP INFRASTRUCTURE	20,900	\$ 194	\$ 4,044,227	\$ 4,044,227
NEW CORE & SHELL	20,900	\$ 484	\$ 10,124,453	\$ 10,124,453
45 COLLEGE AVE FIT OUT	20,900	\$ 237	\$ 4,945,346	\$ 4,945,346
SITE & LANDSCAPE	20,900	\$ 27	\$ 567,944	\$ 567,944
TOTAL CONSTRUCTION COSTS	20,900	\$942	\$ 19,681,969	\$ 19,681,969
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
TOTAL CAPITAL EXPENDITURE			\$ 19,681,969	\$ 19,681,969



BUILDINGS CASHFLOW FORECAST

SPEND TOTALS	ANNUAL	CUMULATIVE
2022	\$ -	\$ -
2023	\$ 15,637,742	\$ 15,637,742
2024	\$ -	\$ 15,637,742
2025	\$ -	\$ 15,637,742
2026	\$ -	\$ 15,637,742
2027+	\$ -	\$ 15,637,742



ALTS & BREAKOUTS

ALTERNATES (CONSTRUCTION COST VALUES)	\$	\$/SF
ALT #1 - STEEL ILO CLT SUPERSTRUCTURE	(\$883,020)	(\$42.25)

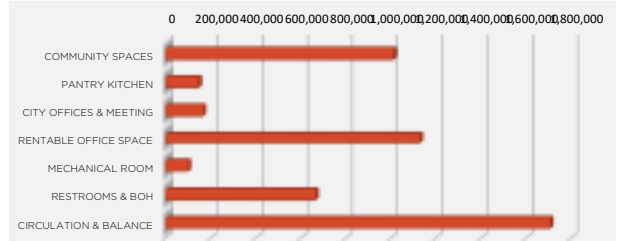
CONTINGENCY & ESCALATION SUMMARY

Design contingency	12.0%
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	EXCLUDED
Project labor assumptions	Union

FITOUT USE TYPE BY COST

TOTAL \$	% MIX	CONST \$
COMMUNITY SPACES	21%	1,013,944
PANTRY KITCHEN	3%	148,246
CITY OFFICES & MEETING	3%	169,194
RENTABLE OFFICE SPACE	23%	1,131,916
MECHANICAL ROOM	2%	102,110
RESTROOMS & BOH	14%	668,153
CIRCULATION & BALANCE	35%	1,711,783

COST BY FITOUT USE TYPE BY SQUARE FOOT



FITOUT USE TYPE BY SQUARE FOOT

% MIX OF TYPE	AREAS SF
COMMUNITY SPACES	17%
PANTRY KITCHEN	2%
CITY OFFICES & MEETING	3%
RENTABLE OFFICE SPACE	25%
MECHANICAL ROOM	3%
RESTROOMS & BOH	6%
CIRCULATION & BALANCE	44%

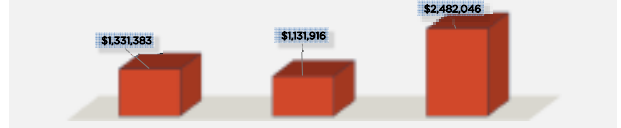
FITOUT USE TYPE BY SQUARE FOOT



BUILDING FIT-OUT COST \$

% MIX	CONST \$
COMMUNITY & MUNICIPAL SPACES	22% \$ 1,331,383
RENTABLE SPACE	25% \$ 1,131,916
RESTROOMS, CIRC, & BOH	53% \$ 2,482,046

COST SPLIT BY PROGRAM USER



EXCLUSIONS & ASSUMPTIONS

- 1 Escalation has been EXCLUDED from this model as project schedule is not yet known. Refer to the Memo provided with the masterplan study on 'Escalation to Date' for the first half of 2021 and more key indicators driving future projections.

The following multipliers reflect our best projections for escalation moving forward, Due to the continued volatility in the market, these should be reviewed on a regular basis before finalizing project schedules, budgets, and scopes. Beyond 2024 we recommend carrying the typical 10-year rolling average of 4.5% for the purpose of this study.

YR	Projected Escalation %	Compounded	Compounded Escalation Multiplier
2021	1.0%	1%	1.01 (to end of 2021)
2022	3.5%	4%	1.04
2023	6.0%	10%	1.10
2024	5.0%	16%	1.16
2025	4.5%	21%	1.21
2026	4.5%	26%	1.26
2027	4.5%	32%	1.32
2028	4.5%	38%	1.38
2029	4.5%	44%	1.44

- 2 We have excluded any cost for phasing of the project.
- 3 We have included 12% 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 45 College Ave New Build Test Fit_20210726
- 2 2875 CoS CSA MP - PDP Cost Estimating Narrative
- 3 2021.08.11CSA Summary Schedules

Systems Assumptions

General

Please see estimate backup for additional assumptions, qualifications & exclusions

Foundations/Basement Construction

Cost assumes spread footings and basement retaining wall. Piles and deep foundation systems are EXCLUDED SOG construction is carried as 5" per narrative

Superstructure

Base estimate prices a typical CLT structural framing system per the narrative.
An allowance of 7.5% of structural member costs are included for connections requirements
Deduct alternate for steel is priced within the alternates schedule.

Exterior Enclosure

Enclosure is assumed to be glazing and metal panel system per narrative
Operable windows for natural ventilation are priced within the \$/SFCA rate for glazing.

Roofing

Costs are included for to replace the existing roofing system, including extensive green roof as called for by the narrative. PV costs are included w/ electrical infrastructure
A pedestal paver system is included for 70% of the amenity deck.
An allowance for railing at the amenity deck is included.

Interior Construction/Finishes

An allowance of \$12/SF has been carried for C&S interior construction requirements
Fitout costs are modeled based on provided narrative. A premium \$/SF is included at the community space to account for the movable partitions.

Stairways/Conveying

Costs for egress stairs and circulation stairs are included. BOD: metal pan stairs with concrete treads and painted handrails/guardrails.
A 5 stop elevator is included. Standard cab finishes are assumed in pricing.

Services

Estimate assumes MEP systems per the narrative for C&S with system separations as indicated between community space and rental space
Fitout MEPFP costs are modeled

Furnishings/Equipment

The furnishing and equipment costs carried in this model included fixed furnishings and window treatments. Workstations are excluded and assumed part of tenant responsibility.

Demolition & Abatement

An allowance for demo of the existing building on site is included. Abatement for the existing building demo is included at 12.5 \$/ SF

Site Improvements

Contaminated soil disposal is excluded

Site Mechanical Utilities

On site storm water mitigation is included per Nitsch narrative and suggested sizing. Allowances have been included for incoming service connections.

Site Electrical Utilities

We have included a 20k allowance for site lighting. Utilities are carried in the site file

DIVISION SUMMARY		20,900 GFA	\$/SF	12-Aug-21
				\$ TOTAL
Project Requirements			32.78	685,092
PROJECT REQUIREMENTS			32.78	685,092
A10.	Foundations		31.53	658,933
A20.	Basement Construction			0
A. SUBSTRUCTURE			31.53	658,933
B10.	Superstructure		132.63	2,771,911
B20.	Exterior Enclosure		122.66	2,563,525
B30.	Roofing		10.70	223,725
B. SHELL			265.99	5,559,161
C10.	Interior Construction		28.02	585,685
C30.	Interior Finishes		48.60	1,015,655
C. INTERIORS			76.62	1,601,340
C20.	Stairways		6.84	143,000
D10.	Conveying Systems		8.37	175,000
VERTICAL TRANSPORTATION			15.22	318,000
D20.	Plumbing Systems		24.59	514,030
D30.	Heating, Ventilating & Air Conditioning		113.41	2,370,290
D40.	Fire Protection Systems		8.05	168,253
D50.	Electric Lighting, Power & Communications		75.39	1,575,687
D. SERVICES			221.45	4,628,259
E10.	Equipment		3.86	80,665
E20.	Furnishings		10.73	224,325
E. EQUIPMENT AND FURNISHINGS			14.59	304,990
F10.	Special Construction (Sustainability allowance)		0.99	20,640
F20.	Selective Demolition		10.07	210,450
F. SPECIAL CONSTRUCTION AND DEMOLITION			11.06	231,090
TOTAL BUILDING CONSTRUCTION			669.23	13,986,865
G10.	Site Preparation		3.97	83,075
G20.	Site Improvements		9.36	195,663
G30.	Site Civil/Mechanical Utilities		3.89	81,333
G40.	Site Electrical Utilities		1.91	40,000
G90.	Other Site Construction		0.00	0
TOTAL SITE CONSTRUCTION			19.14	400,071
TOTAL TRADE COSTS			688.37	14,386,936
a. Design Contingency		12.0%	82.60	1,726,432
b. Phasing Allowance		0.0%	0.00	0
c. Construction Contingency		4.5%	34.69	725,102
d. General Conditions		9.01%	72.61	1,517,638
SUBTOTAL			878.28	18,356,108
e. Permits		0.0%	0.00	0
f. Insurances		2.6%	22.84	477,259
g. Bond		1.5%	13.17	275,342
h. Fee		3.0%	27.43	573,261
TOTAL COST TODAY			941.72	19,681,969
i. Escalation		EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST			\$942	19,681,969

SUMMARY BY PROGRAM

TRADE	20,900 GFA							20,900		20,900		20,900	
	CORE & SHELL		COMBINED FIT-OUT PROJECTS		TOTALS		MEP INFRA		ADDITION C&S		SITE		
	/ SF	/ SF	/ SF	/ SF	/ SF	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	
DEMOLITION/ENABLING	\$ 210,450	\$ 10.07	\$ -	\$ -	\$ 210,450	\$ 10.07	\$ -	\$ -	\$ 210,450	\$ 10.07	\$ -	\$ -	
FOUNDATIONS	\$ 658,933	\$ 31.53	\$ -	\$ -	\$ 658,933	\$ 31.53	\$ -	\$ -	\$ 658,933	\$ 31.53	\$ -	\$ -	
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUPERSTRUCTURE	\$ 2,771,911	\$ 132.63	\$ -	\$ -	\$ 2,771,911	\$ 132.63	\$ -	\$ -	\$ 2,771,911	\$ 132.63	\$ -	\$ -	
EXTERIOR ENCLOSURE	\$ 2,563,525	\$ 122.66	\$ -	\$ -	\$ 2,563,525	\$ 122.66	\$ -	\$ -	\$ 2,563,525	\$ 122.66	\$ -	\$ -	
ROOFING	\$ 223,725	\$ 10.70	\$ -	\$ -	\$ 223,725	\$ 10.70	\$ -	\$ -	\$ 223,725	\$ 10.70	\$ -	\$ -	
INTERIOR CONSTRUCTION	\$ 209,000	\$ 10.00	\$ 376,685	\$ 18.02	\$ 585,685	\$ 28.02	\$ -	\$ -	\$ 209,000	\$ 10.00	\$ -	\$ -	
INTERIOR FINISHES	\$ -	\$ -	\$ 1,015,655	\$ 48.60	\$ 1,015,655	\$ 48.60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
STAIRWAYS	\$ 143,000	\$ 6.84	\$ -	\$ -	\$ 143,000	\$ 6.84	\$ -	\$ -	\$ 143,000	\$ 6.84	\$ -	\$ -	
CONVEYING SYSTEMS	\$ 175,000	\$ 8.37	\$ -	\$ -	\$ 175,000	\$ 8.37	\$ -	\$ -	\$ 175,000	\$ 8.37	\$ -	\$ -	
PLUMBING	\$ 300,500	\$ 14.38	\$ 213,530	\$ 10.22	\$ 514,030	\$ 24.59	\$ 300,500	\$ 14.38	\$ -	\$ -	\$ -	\$ -	
HVAC	\$ 1,514,040	\$ 72.44	\$ 856,250	\$ 40.97	\$ 2,370,290	\$ 113.41	\$ 1,514,040	\$ 72.44	\$ -	\$ -	\$ -	\$ -	
FIRE PROTECTION	\$ 83,600	\$ 4.00	\$ 84,653	\$ 4.05	\$ 168,253	\$ 8.05	\$ 83,600	\$ 4.00	\$ -	\$ -	\$ -	\$ -	
ELECTRICAL	\$ 897,402	\$ 42.94	\$ 678,285	\$ 32.45	\$ 1,575,687	\$ 75.39	\$ 897,402	\$ 42.94	\$ -	\$ -	\$ -	\$ -	
EQUIPMENT	\$ -	\$ -	\$ 80,665	\$ 3.86	\$ 80,665	\$ 3.86	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
FURNISHINGS	\$ 31,350	\$ 1.50	\$ 192,975	\$ 9.23	\$ 224,325	\$ 10.73	\$ -	\$ -	\$ 31,350	\$ 1.50	\$ -	\$ -	
SUSTAINABILITY ALLOWANCE	\$ 20,640	\$ 0.99	\$ -	\$ -	\$ 20,640	\$ 0.99	\$ -	\$ -	\$ 20,640	\$ 0.99	\$ -	\$ -	
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE PREP	\$ 83,075	\$ 3.97	\$ -	\$ -	\$ 83,075	\$ 3.97	\$ -	\$ -	\$ 83,075	\$ 3.97	\$ -	\$ -	
SITE IMPROVEMENTS	\$ 195,663	\$ 9.36	\$ -	\$ -	\$ 195,663	\$ 9.36	\$ -	\$ -	\$ -	\$ -	\$ 195,663	\$ 9.36	
SITE CIVIL / MECHANICAL	\$ 81,333	\$ 3.89	\$ -	\$ -	\$ 81,333	\$ 3.89	\$ -	\$ -	\$ -	\$ -	\$ 81,333	\$ 3.89	
SITE ELECTRICAL	\$ 40,000	\$ 1.91	\$ -	\$ -	\$ 40,000	\$ 1.91	\$ -	\$ -	\$ -	\$ -	\$ 40,000	\$ 1.91	
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTAL DIRECT COSTS	\$ 10,203,146	\$ 488.19	\$ 3,498,698	\$ 167.40	\$ 13,701,844	\$ 655.59	\$ 2,795,542	\$ 133.76	\$ 7,090,609	\$ 339.26	\$ 316,996	\$ 15.17	
Design Contingency	12.00%	\$ 1,285,596	\$ 61.51	\$ 440,836	\$ 21.09	\$ 1,726,432	\$ 82.60	\$ 352,238	\$ 16.85	\$ 893,417	\$ 42.75	\$ 39,941	\$ 1.91
Phasing Allowance	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	4.50%	\$ 539,951	\$ 25.83	\$ 185,151	\$ 8.86	\$ 725,102	\$ 34.69	\$ 147,940	\$ 7.08	\$ 375,235	\$ 17.95	\$ 16,775	\$ 1
General Conditions	9.01%	\$ 1,205,051	\$ 57.66	\$ 312,587	\$ 14.96	\$ 1,517,638	\$ 72.61	\$ 336,293	\$ 16.09	\$ 728,636	\$ 34.86	\$ 140,122	\$ 7
Project Requirements	5.00%	\$ 510,157	\$ 24.41	\$ 174,935	\$ 8.37	\$ 685,092	\$ 32.78	\$ 139,777	\$ 6.69	\$ 354,530	\$ 16.96	\$ 15,850	\$ 1
SUBTOTAL	\$ 13,743,902	\$ 657.60	\$ 4,612,206	\$ 220.68	\$ 18,356,108	\$ 878.28	\$ 3,771,791	\$ 180.47	\$ 9,442,426	\$ 451.79	\$ 529,684.74	\$ 25.34	
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
GL Insurance & Subguard	2.60%	\$ 357,341	\$ 17.10	\$ 119,917	\$ 5.74	\$ 477,259	\$ 22.84	\$ 98,067	\$ 4.69	\$ 245,503	\$ 11.75	\$ 13,772	\$ 0.66
Bond	1.50%	\$ 206,159	\$ 9.86	\$ 69,183	\$ 3.31	\$ 275,342	\$ 13.17	\$ 56,577	\$ 2.71	\$ 141,636	\$ 6.78	\$ 7,945	\$ 0.38
CM Fee	3.00%	\$ 429,222	\$ 20.54	\$ 144,039	\$ 6.89	\$ 573,261	\$ 27.43	\$ 117,793	\$ 5.64	\$ 294,887	\$ 14.11	\$ 16,542	\$ 0.79
SUBTOTAL	\$ 14,736,624	\$ 705.10	\$ 4,945,346	\$ 236.62	\$ 19,681,969	\$ 941.72	\$ 4,044,227	\$ 193.50	\$ 10,124,453	\$ 484.42	\$ 567,944	\$ 27	
Escalation	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTAL	\$ 14,736,624	\$ 705.10	\$ 4,945,346	\$ 236.62	\$ 19,681,969	\$ 941.72	\$ 4,044,227	\$ 193.50	\$ 10,124,453	\$ 484.42	\$ 567,944	\$ 27	

SUMMARY BY PROGRAM

	3,525		460		630		5,200		645		1,160		9,280	
	RENOVATION FIT-OUT MODEL													
	COMMUNITY SPACES		PANTRY KITCHEN		CITY OFFICES & MEETING		RENTABLE OFFICE SPACE		MECHANICAL ROOM		RESTROOMS & BOH		CIRCULATION & BALANCE	
TRADE	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 52,875	\$ 15.00	\$ 19,320	\$ 42.00	\$ 15,750	\$ 25.00	\$ 78,000	\$ 15.00	\$ 7,740	\$ 12.00	\$ 63,800	\$ 55.00	\$ 139,200	\$ 15.00
INTERIOR FINISHES	\$ 282,000	\$ 80.00	\$ 31,280	\$ 68.00	\$ 34,650	\$ 55.00	\$ 234,000	\$ 45.00	\$ 16,125	\$ 25.00	\$ 92,800	\$ 80.00	\$ 324,800	\$ 35.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 17,625	\$ 5.00	\$ 8,280	\$ 18.00	\$ -	\$ -	\$ 10,400	\$ 2.00	\$ 3,225	\$ 5.00	\$ 150,800	\$ 130.00	\$ 23,200	\$ 2.50
HVAC	\$ 169,200	\$ 48.00	\$ 16,100	\$ 35.00	\$ 28,350	\$ 45.00	\$ 234,000	\$ 45.00	\$ 25,800	\$ 40.00	\$ 58,000	\$ 50.00	\$ 324,800	\$ 35.00
FIRE PROTECTION	\$ 12,338	\$ 3.50	\$ 2,300	\$ 5.00	\$ 1,890	\$ 3.00	\$ 15,600	\$ 3.00	\$ 3,225	\$ 5.00	\$ 2,900	\$ 2.50	\$ 46,400	\$ 5.00
ELECTRICAL	\$ 112,800	\$ 32.00	\$ 16,100	\$ 35.00	\$ 26,460	\$ 42.00	\$ 182,000	\$ 35.00	\$ 16,125	\$ 25.00	\$ 46,400	\$ 40.00	\$ 278,400	\$ 30.00
EQUIPMENT	\$ 17,625	\$ 5.00	\$ 6,900	\$ 15.00	\$ 6,300	\$ 10.00	\$ 10,400	\$ 2.00	\$ -	\$ -	\$ 11,600	\$ 10.00	\$ 27,840	\$ 3.00
FURNISHINGS	\$ 52,875	\$ 15.00	\$ 4,600	\$ 10.00	\$ 6,300	\$ 10.00	\$ 36,400	\$ 7.00	\$ -	\$ -	\$ 46,400	\$ 40.00	\$ 46,400	\$ 5.00
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 717,338	\$ 203.50	\$ 104,880	\$ 228.00	\$ 119,700	\$ 190.00	\$ 800,800	\$ 154.00	\$ 72,240	\$ 112.00	\$ 472,700	\$ 407.50	\$ 1,211,040	\$ 130.50
Design Contingency	\$ 90,385	\$ 25.64	\$ 13,215	\$ 28.73	\$ 15,082	\$ 23.94	\$ 100,901	\$ 19.40	\$ 9,102	\$ 14.11	\$ 59,560	\$ 51.35	\$ 152,591	\$ 16.44
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 37,962	\$ 10.77	\$ 5,550	\$ 12.07	\$ 6,335	\$ 10.05	\$ 42,378	\$ 8.15	\$ 3,823	\$ 5.93	\$ 25,015	\$ 21.56	\$ 64,088	\$ 6.91
General Conditions	\$ 91,171	\$ 25.86	\$ 13,024	\$ 28.31	\$ 13,024	\$ 20.67	\$ 65,122	\$ 12.52	\$ 13,024	\$ 20.19	\$ 52,098	\$ 44.91	\$ 65,122	\$ 7.02
Project Requirements	\$ 35,867	\$ 10.18	\$ 5,244	\$ 11.40	\$ 5,985	\$ 9.50	\$ 40,040	\$ 7.70	\$ 3,612	\$ 5.60	\$ 23,635	\$ 20.38	\$ 60,552	\$ 6.53
SUBTOTAL	\$ 972,722	\$ 275.95	\$ 141,914	\$ 308.51	\$ 160,126	\$ 254.17	\$ 1,049,241	\$ 201.78	\$ 101,802	\$ 157.83	\$ 633,008	\$ 545.70	\$ 1,553,393	\$ 167.39
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 25,291	\$ 7.17	\$ 3,690	\$ 8.02	\$ 4,163	\$ 6.61	\$ 27,280	\$ 5.25	\$ 2,647	\$ 4.10	\$ 16,458	\$ 14.19	\$ 40,388	\$ 4.35
Bond	\$ 14,591	\$ 4.14	\$ 2,129	\$ 4.63	\$ 2,402	\$ 3.81	\$ 15,739	\$ 3.03	\$ 1,527	\$ 2.37	\$ 9,495	\$ 8.19	\$ 23,301	\$ 2.51
CM Fee	\$ 30,378	\$ 8.62	\$ 4,432	\$ 9.63	\$ 5,001	\$ 7.94	\$ 32,768	\$ 6.30	\$ 3,179	\$ 4.93	\$ 19,769	\$ 17.04	\$ 48,512	\$ 5.23
SUBTOTAL	\$ 1,042,981	\$ 295.88	\$ 152,164	\$ 330.79	\$ 171,692	\$ 272.53	\$ 1,125,028	\$ 216.35	\$ 109,155	\$ 169.23	\$ 678,730	\$ 585.11	\$ 1,665,595	\$ 179.48
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 1,042,981	\$ 295.88	\$ 152,164	\$ 330.79	\$ 171,692	\$ 272.53	\$ 1,125,028	\$ 216.35	\$ 109,155	\$ 169.23	\$ 678,730	\$ 585.11	\$ 1,665,595	\$ 179.48

TRADE	QTY	UNIT	RATE	TOTAL
PLUMBING	20,900			\$ 300,500
Plumbing infrastructure	20,900	SF	5.00	\$ 104,500
- Water Heaters: Duplex air source heat pump, 5kW with 50 Gallon tanks for L1 & L2, (2) assumed for redundancy	2	EA	3,500.00	\$ 7,000
- Point of use water heaters, L3 & L4	2	EA	2,000.00	\$ 4,000
Greywater system				-
Greywater treatment system - allowance	1	LS	60,000.00	\$ 60,000
Rainwater storage & reuse - allow				-
Rainwater treatment skid	1	LS	40,000.00	\$ 40,000
Exterior storage tank - 5000Gal	1	LS	15,000.00	See Site
Makeup water connection w/ backflow preventer	1	LS	10,000.00	\$ 10,000
Piping and connections - allow	1	LS	50,000.00	\$ 50,000
Misc. harvesting scope required	1	LS	25,000.00	\$ 25,000
HVAC	20,900			\$ 1,514,040
<u>HVAC Infrastructure</u>			Option 1 Included as Base	
<u>Heating/cooling equipment</u>				-
ASHP - 30 TON, 4 EA	4	EA	40,000.00	160,000
HX - allow	1	LS	38,000.00	38,000
Primary/secondary pumps - allow	4	EA	22,000.00	88,000
Condensate return pumps for ASHP	4	EA	4,000.00	16,000
Expansion, air separation, shot feed, pressurization, filtration (assumed)	1	EA	25,000.00	25,000
<u>Heat Recovery Systems</u>				-
New glycol system/ feed	1	LS	20,000.00	20,000
<u>Air Distribution</u>				-
AHU - 3,500 CFM, 100% OA, semi-custom, dual core heat recovery, MERV filters, supply and exhaust ECM fan arrays, CHW cooling coil, located in basement mechanical room w/ ducted inlet chase and exhaust areaway	3,500	CFM	16.00	56,000
ERV (2) distributed per floor on levels 3 & 4, 750 CFM each, units ducted to exterior louvers or roof goosenecks, located in mechanical closets	3,000	CFM	11.00	33,000
<u>Exhaust</u>				-
Kitchen Exhaust Fan (1) 300 CFM fans	1	EA	1,200.00	1,200
General exhaust - allow	1	LS	5,000.00	5,000
<u>Smoke extract</u>			Excluded, assume not required	
<u>Energy Performance</u>				-
Variable Frequency Drives				-
AHUs	4	EA	6,500.00	26,000
ERVs - 1 per unit	4	EA	3,000.00	12,000
ASHP - 2 per unit	8	EA	4,500.00	36,000
Pumps	4	EA	3,000.00	12,000
VFD's for exhaust fans, allow	1	EA	1,500.00	1,500
Energy Metering Allowance	1	LS	10,000.00	10,000
<u>Terminal Units</u>				w/ Fitout
<u>Pipe, Valves & Connections</u>				-
<u>Steam Piping</u>			Excluded, assume not required	
<u>Heating/Cooling piping - 4 pipe system</u>				-
- CHW/HW mains & risers, runouts to equipment	1,742	LF	80.00	139,331
- Piping on floor loops	2,544	LF	40.00	101,776

TRADE	QTY	UNIT	RATE	TOTAL
Control valves on main equipment	10	EA	3,500.00	35,000
<u>Sheetmetal & Accessories</u>				-
Primary ductwork galvanized sheetmetal tying	5,850	LBS	14.50	84,825
Plenums, intake ducts, and exhaust ducts to area ways - allowance	2,000	LBS	14.50	29,000
General bathroom & exhaust ductwork	2,583	LBS	14.50	37,458
<u>Accessories</u>				-
Fire dampers for main supply extract risers (Assumed 2 per floor)	10	EA	2,250.00	22,500
Volume dampers, control dampers & access Panels	1	LS	26,067.50	26,068
Exhaust intake actuators for smoke				Excluded
Ductwork for smoke/atrium exhaust systems				Excluded
<u>Insulation</u>				-
Piping insulation	4,286	LF	10.00	42,860
Ductwork insulation	6,038	SF	5.00	30,192
<u>Fuel Systems</u>				Excluded, assume not required
Data/IDF room cooling - allowance	1	LS	10,000.00	10,000
<u>Building Management System</u>				-
Head end allowance	1	LS	30,000.00	30,000
ASHP	40	PTS	1,200.00	48,000
Pumps	16	PTS	1,200.00	19,200
AHUs - assume 30pts ea average	30	PTS	1,200.00	36,000
ERVs- assume 12 pts ea	48	PTS	1,200.00	57,600
Fans	2	PTS	1,200.00	2,400
Window interlock and dewpoint sensor - allowance 8 pts per floor	32	PTS	1,200.00	38,400
Misc.	5	PTS	1,200.00	6,000
Testing, balancing & commissioning support	1	LS	40,089.33	40,089
Co-ordination, rigging, CAD, Sub-trade temp	1	LS	137,640.03	137,640
FIRE PROTECTION	20,900			\$ 83,600
Fire protection infrastructure	20,900	SF	4.00	\$ 83,600
ELECTRICAL	20,900			\$ 897,402
<u>Normal Service Distribution</u>				-
750KVA pad mounted xfmr	1	LS	82,500.00	\$ 82,500
1200A swbd, CT cab	1	LS	42,000.00	\$ 42,000
45kva step down xfmr	6	EA	5,000.00	\$ 30,000
150A power panel - 84 ckts	5	EA	7,650.00	\$ 38,250
100A site lighting panel - size assumed	1	EA	3,000.00	\$ 3,000
100A lighting panels - 1 per floor	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
<u>ATS Switches</u>				Excluded
<u>Energy Metering</u>				-
Energy meters	4	EA	3,500.00	\$ 14,000
<u>Normal Feeders</u>	20,900	SF	3.00	\$ 62,700
<u>Emergency Power Distribution</u>				-
Generator				Excluded
Panel/connections	1	LS	15,000.00	\$ 15,000
Manual transfer switch	1	EA	3,500.00	\$ 3,500
<u>Emergency Distribution Panels</u>				Excluded
<u>Emergency Feeders</u>				Excluded

TRADE	QTY	UNIT	RATE	TOTAL
Mechanical / Equipment Power	20,900	SF	2.50	\$ 52,250
Lighting, inclusive of conduit, fitting and wiring				w/ fitout
Lighting controls				w/ fitout
Receptacle power				w/ fitout
Fire Alarm				-
Fire Alarm - complete system	20,900	SF	7.00	\$ 146,300
Temp fire alarm	20,900	SF	1.50	\$ 31,350
BDA			Excluded, assume not required	
Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)	20,900	SF	3.00	\$ 62,700
Audio visual				w/ fitout
Security systems allowance (head-end and backbone)	20,900	SF	2.00	\$ 41,800
Lightning protection	20,900	SF	0.85	\$ 17,765
Rooftop PV (60 kW per narrative) - including mounting system, etc.	60	kW	800.00	\$ 48,000
PV infrastructure allowance	1	LS	69,000	\$ 69,000
Testing & bonding	1	LS	28,204.60	\$ 28,205
Sub-trade temps/ gcs	1	LS	81,581.96	\$ 81,582
PROJECT REQUIREMENTS	20,900			\$ 139,777
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	2,795,542	\$ 139,777
TOTAL DIRECT COSTS				\$ 2,935,319
ALLOCATIONS				\$ 1,108,908
General Conditions	12.0	28,024	wks	\$ 336,293
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 98,067
Design Contingency	12.0 %			\$ 352,238
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 147,940
Bond	1.5 %			\$ 56,577
Fee	3.0 %			\$ 117,793
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 4,044,227

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	20,900			\$ 210,450
Demo of existing building on site - Allowance per provided volume	89,100	CF	1.50	\$ 133,650
- Abatement of Existing Building Demo'd materials, assumes 2 story building	6,144	SF	12.50	\$ 76,800
FOUNDATIONS	20,900			\$ 658,933
<u>New Building Foundations & Basement Walls</u>				-
Dewatering - allowance	4,350	SF	5.00	\$ 21,750
Excavation for SOG and subbase	242	CY	60.00	\$ 14,500
Gravel subbase - assume 12"	161	CY	60.00	\$ 9,667
Excavation for underslab MEPs	4,350	SF	3.00	\$ 13,050
Rough grading	4,350	SF	2.00	\$ 8,700
Fine grading	4,350	SF	2.00	\$ 8,700
Footing and frost wall excavation	267	CY	75.00	\$ 20,000
Basement deep excavation	1,923	CY	50.00	\$ 96,173
Backfill - assume imported backfill	117	CY	75.00	\$ 8,792
Dispose of excess material (Excludes contamination)	2,073	CY	60.00	\$ 124,374
Strip Footing - assume 6'x1.5'	100	CY	750.00	\$ 75,000
Spread Footing - allow 1 per 500 SF - assume 5'x5'x2'	16	CY	850.00	\$ 13,694
Frost Wall/Grade Beam - assume 3'H x 1' W	33	CY	950.00	\$ 31,667
High foundation wall at basement	109	CY	1,200.00	\$ 130,667
Structural SOG - assume 5"	4,350	SF	15.00	\$ 65,250
Excavate for elevator pit	30	CY	85.00	\$ 2,550
Elevator pit walls	7	CY	1,200.00	\$ 8,400
Elevator pit slab and sump	100	SF	30.00	\$ 3,000
Elevator Pit Waterproofing	200	SF	15.00	\$ 3,000
SUPERSTRUCTURE	20,900			\$ 2,771,911
Misc. metals allowance	20,900	SF	2.50	\$ 52,250
<u>Concrete Cores at Elevator and Stairs</u>				-
Concrete Cores, assumed 12" Thick Shear Walls	299	CY	1,400.00	\$ 417,926
<u>CLT & Heavy Timber Structure</u>				-
Columns - 20x20 o.c. heavy timber grid, 2'x2' assumed	5,496	CF	110.00	\$ 604,560
21" Primary Glu-lam Girders @ 20' O.C.	3,461	CF	110.00	\$ 380,669
18" Purlin Floor Bracing	5,085	CF	110.00	\$ 559,350
CLT 3-ply Floor Spans	16,550	SF	30.00	\$ 496,500
Connections & misc. requirements - 7.5%	1	LS	153,080.91	\$ 153,081
2" Topping Slab - NW Concrete Assumed	16,550	SF	6.50	\$ 107,575
EXTERIOR ENCLOSURE	20,900			\$ 2,563,525
Glazing - 80% First Floor, 40% upper floors	7,440	SF	180.00	\$ 1,339,200
Glazing - assumed at perimeter of areaway in basement	440	SF	180.00	\$ 79,200
Metal Panel - 20% First floor, 60% upper floors	6,960	SF	130.00	\$ 904,800
Metal Panel - assumed at perimeter of areaway in basement	130	SF	130.00	\$ 16,900
LGMF & Furr of Basement Foundation Wall	2,940	SF	12.00	\$ 35,280
- Insulation - closed cell SPF	2,940	SF	5.00	\$ 14,700
- Vapor Barrier	2,940	SF	3.75	\$ 11,025
LGMR & Furr of Metal Panel Walls	6,960	SF	12.00	\$ 83,520
- Insulation	6,960	SF	5.00	\$ 34,800
- Vapor Barrier	6,960	SF	3.75	\$ 26,100

TRADE	QTY	UNIT	RATE	TOTAL
Entrances - allow for 1, glass entry integrated into glazing systems	1	EA	18,000.00	\$ 18,000
ROOFING	20,900			\$ 223,725
Roofing System Complete	4,350	SF	36.00	\$ 156,600
Amenity Roof Deck - Pedestal Pavers assumed 70%	578	SF	50.00	\$ 28,875
Intensive green roof areas				See Sustainability
Guard rail at amenity roof - allowance	90	LF	425.00	\$ 38,250
INTERIOR CONSTRUCTION	20,900			\$ 209,000
Interior Construction	20,900	SF	10.00	\$ 209,000
INTERIOR FINISHES	20,900			\$ -
Interior Finishes	20,900	SF	0.00	\$ -
STAIRWAYS	20,900			\$ 143,000
Connecting Stair - Metal Pan Stair w' concrete steps, painted metal handrail & guardrail	22	FLIGHTS	6,500.00	\$ 143,000
CONVEYING SYSTEMS	20,900			\$ 175,000
Elevator - New MRL elevator, 3500 LBS, 200 FPM, s	5	STOPS	35,000.00	\$ 175,000
FURNISHINGS	20,900			\$ 31,350
Accessibility Signage - allowance	20,900	SF	1.00	\$ 20,900
Wayfinding Signage & Departmental Graphics	20,900	SF	0.50	\$ 10,450
SUSTAINABILITY ALLOWANCE	20,900			\$ 20,640
Amenity Deck - 30% Intensive Green Roof assumed, 12" Media Depth	258	SF	80.00	\$ 20,640
SITE PREP	20,900			\$ 83,075
Site Perimeter Fence	300	LF	75.00	\$ 22,500
Silt Barrier and Erosion protection - allowance	20,900	SF	0.25	\$ 5,225
Allowance - existing tree protection, 10 assumed	5	EA	800.00	\$ 4,000
Site demolition	20,900	SF	1.50	\$ 31,350
Construction Vehicle access/wheel wash - one location assumed	1	EA	20,000.00	\$ 20,000
Site Improvement Scope				See Site Breakout
PROJECT REQUIREMENTS	20,900			\$ 354,530
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	7,090,609	\$ 354,530
TOTAL DIRECT COSTS				\$ 7,445,139
ALLOCATIONS				\$ 2,679,314
General Conditions	26.0	28,024	wks	\$ 728,636
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 245,503
Design Contingency	12.0 %			\$ 893,417
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 375,235
Bond	1.5 %			\$ 141,636
Fee	3.0 %			\$ 294,887
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 10,124,453

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	20,900			\$ -
SITE IMPROVEMENTS	20,900			\$ 195,663
<u>Grading</u>				-
Rough grading	3,325	SF	1.50	\$ 4,988
Fine grading	3,325	SF	1.00	\$ 3,325
Excavation for site features - allowance	30	CY	75.00	\$ 2,250
<u>Site feature retaining walls</u>			Excluded, assumed not required	
<u>Hardscape</u>				-
Rebuild of pedestrian sidewalk, tied into entry way to building - permeable pavers per narrative	1,925	SF	40.00	\$ 77,000
Curb - allowance for precast concrete	190	LF	90.00	\$ 17,100
ADA curb access - allowance	1	EA	1,500.00	\$ 1,500
<u>Landscaping & Plantings</u>				-
Trees- allowance	10	EA	1,200.00	\$ 12,000
Native Shrubs & Perennials at feature planting areas that are drought resistant - allowance 50%	1,400	SF	20.00	\$ 28,000
Bioretention with underdrains - allowance 50% of softscape per narrative	700	SF	30.00	\$ 21,000
Irrigation - reuse of storm water per Nitsch narrative	1,400	SF	5.00	\$ 7,000
<u>Misc. Site Furnishings</u>				-
Seating, tables, benches - allowance	1	LS	10,000.00	\$ 10,000
Bike Rack - allowance	1	EA	3,500.00	\$ 3,500
Misc. Planters and fixed furnishings for community use - allowance	1	LS	8,000.00	\$ 8,000
SITE CIVIL / MECHANICAL	20,900			\$ 81,333
<u>Storm Water Management</u>				-
5,500 gal detention tanks for storm water and rainwater reuse system	1	LS	20,000.00	\$ 20,000
Subgrade drainage infrastructure (pipes, structures, grates) - allowance	1	LS	25,000.00	\$ 25,000
Storm Water Reuse system to plumbing flush fixtures				W/ Plumbing
<u>Incoming utility services</u>				-
8" Sewer Service - length assumed	50	LF	175.00	\$ 8,750
- Excavation and backfill	37	CY	120.00	\$ 4,444
8" Fire Service - length assumed	50	LF	175.00	\$ 8,750
- Excavation and backfill	37	CY	120.00	\$ 4,444
3" Water Service - length assumed	50	LF	110.00	\$ 5,500
- Excavation and backfill	37	CY	120.00	\$ 4,444
SITE ELECTRICAL	20,900			\$ 40,000
Site Electrical & lighting - allowance	1	LS	20,000.00	\$ 20,000
<u>Electrical Service</u>				-
Incoming electrical duct bank - Allowance	50	LF	400.00	\$ 20,000
PROJECT REQUIREMENTS	20,900			\$ 15,850
General project requirements - renovation	5.0%	TOTAL	316,995.83	\$ 15,850
TOTAL DIRECT COSTS				\$ 332,846

TRADE	QTY	UNIT	RATE	TOTAL
ALLOCATIONS				\$ 235,098
General Conditions	5.0	28,024	wks	\$ 140,122
Permits	0.0 %			\$ -
GL Insurance	2.6 %			\$ 13,772
Design Contingency	12.0 %			\$ 39,941
Design build fee	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 16,775
Bond	1.5 %			\$ 7,945
Fee	3.0 %			\$ 16,542
Escalation	Excluded		44,927.00	\$ -
TOTAL CONSTRUCTION COST				\$ 567,944

TRADE	QTY	UNIT	RATE	TOTAL
INTERIOR CONSTRUCTION	20,900			\$ 376,685
COMMUNITY SPACES	3,525	SF	15.00	\$ 52,875
PANTRY KITCHEN	460	SF	42.00	\$ 19,320
CITY OFFICES & MEETING	630	SF	25.00	\$ 15,750
RENTABLE OFFICE SPACE	5,200	SF	15.00	\$ 78,000
MECHANICAL ROOM	645	SF	12.00	\$ 7,740
RESTROOMS & BOH	1,160	SF	55.00	\$ 63,800
CIRCULATION & BALANCE	9,280	SF	15.00	\$ 139,200
INTERIOR FINISHES	20,900			\$ 1,015,655
COMMUNITY SPACES	3,525	SF	80.00	\$ 282,000
PANTRY KITCHEN	460	SF	68.00	\$ 31,280
CITY OFFICES & MEETING	630	SF	55.00	\$ 34,650
RENTABLE OFFICE SPACE	5,200	SF	45.00	\$ 234,000
MECHANICAL ROOM	645	SF	25.00	\$ 16,125
RESTROOMS & BOH	1,160	SF	80.00	\$ 92,800
CIRCULATION & BALANCE	9,280	SF	35.00	\$ 324,800
PLUMBING	20,900			\$ 213,530
COMMUNITY SPACES	3,525	SF	5.00	\$ 17,625
PANTRY KITCHEN	460	SF	18.00	\$ 8,280
RENTABLE OFFICE SPACE	5,200	SF	2.00	\$ 10,400
MECHANICAL ROOM	645	SF	5.00	\$ 3,225
RESTROOMS & BOH	1,160	SF	130.00	\$ 150,800
CIRCULATION & BALANCE	9,280	SF	2.50	\$ 23,200
HVAC	20,900			\$ 856,250
COMMUNITY SPACES	3,525	SF	48.00	\$ 169,200
PANTRY KITCHEN	460	SF	35.00	\$ 16,100
CITY OFFICES & MEETING	630	SF	45.00	\$ 28,350
RENTABLE OFFICE SPACE	5,200	SF	45.00	\$ 234,000
MECHANICAL ROOM	645	SF	40.00	\$ 25,800
RESTROOMS & BOH	1,160	SF	50.00	\$ 58,000
CIRCULATION & BALANCE	9,280	SF	35.00	\$ 324,800
FIRE PROTECTION	20,900			\$ 84,653
COMMUNITY SPACES	3,525	SF	3.50	\$ 12,338
PANTRY KITCHEN	460	SF	5.00	\$ 2,300
CITY OFFICES & MEETING	630	SF	3.00	\$ 1,890
RENTABLE OFFICE SPACE	5,200	SF	3.00	\$ 15,600
MECHANICAL ROOM	645	SF	5.00	\$ 3,225
RESTROOMS & BOH	1,160	SF	2.50	\$ 2,900
CIRCULATION & BALANCE	9,280	SF	5.00	\$ 46,400
ELECTRICAL	20,900			\$ 678,285
COMMUNITY SPACES	3,525	SF	32.00	\$ 112,800
PANTRY KITCHEN	460	SF	35.00	\$ 16,100
CITY OFFICES & MEETING	630	SF	42.00	\$ 26,460
RENTABLE OFFICE SPACE	5,200	SF	35.00	\$ 182,000
MECHANICAL ROOM	645	SF	25.00	\$ 16,125
RESTROOMS & BOH	1,160	SF	40.00	\$ 46,400
CIRCULATION & BALANCE	9,280	SF	30.00	\$ 278,400
EQUIPMENT	20,900			\$ 80,665
COMMUNITY SPACES	3,525	SF	5.00	\$ 17,625
PANTRY KITCHEN	460	SF	15.00	\$ 6,900

TRADE	QTY	UNIT	RATE	TOTAL
CITY OFFICES & MEETING	630	SF	10.00	\$ 6,300
RENTABLE OFFICE SPACE	5,200	SF	2.00	\$ 10,400
RESTROOMS & BOH	1,160	SF	10.00	\$ 11,600
CIRCULATION & BALANCE	9,280	SF	3.00	\$ 27,840
FURNISHINGS	20,900			\$ 192,975
COMMUNITY SPACES	3,525	SF	15.00	\$ 52,875
PANTRY KITCHEN	460	SF	10.00	\$ 4,600
CITY OFFICES & MEETING	630	SF	10.00	\$ 6,300
RENTABLE OFFICE SPACE	5,200	SF	7.00	\$ 36,400
RESTROOMS & BOH	1,160	SF	40.00	\$ 46,400
CIRCULATION & BALANCE	9,280	SF	5.00	\$ 46,400
PROJECT REQUIREMENTS	20,900			\$ 174,935
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	3,498,698	\$ 174,935
TOTAL DIRECT COSTS				\$ 3,673,632
ALLOCATIONS				\$ 1,271,713
General Conditions	24.0	wks	13,024	\$ 312,587
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 119,917
Design Contingency	12.0 %			\$ 440,836
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 185,151
Bond	1.5 %			\$ 69,183
Fee	3.0 %			\$ 144,039
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 4,945,346

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	ALT #1 - STEEL ILO CLT SUPERSTRUCTURE <i>Replace CLT structure with Steel Superstructure</i>				\$ (883,020)
	Deduct CLT costs	(1)	LS	2,301,735	\$ (2,301,735)
	<u>Structural Steel</u>				
	Steel Framing - 12psf per narrative	125	TON	7,200.00	\$ 902,880
	Connections, pour stops, & Misc. requirement	1	LS	180,576.00	\$ 180,576
	2" 18 Gage metal deck	20,900	SF	8.00	\$ 167,200
	5 1/4" composite deck - concrete	17,400	SF		-
	- LW concrete, 3 1/4"	175	CY	300.00	\$ 52,361
	- Reinforcement	17,454	LBS	1.90	\$ 33,162
	6 1/2" composite deck - concrete	3,500	SF		-
	- LW concrete, 4 1/2"	49	CY	300.00	\$ 14,583
	- Reinforcement	4,861	LBS	1.90	\$ 9,236
	Vibration & Seismic requirements	1	LS	50,000.00	\$ 50,000
	Spray Fireproofing - allowance	20,900	SF	4.00	\$ 83,600
	Additional Ceiling finish costs (minimal ceiling finish requirements in CLT base option)	20,900	SF	5.00	\$ 104,500
	<u>Total Direct Costs</u>				\$ (703,636)
	<u>Allocations</u>				\$ (179,384)
	General Conditions				Included in base
	Permits	0.0 %			\$ -
	Insurances	2.6 %			\$ (21,412)
	Design Contingency	12.0 %			\$ (84,436)
	Phasing Allowance	0.0 %			\$ -
	Construction Contingency	4.5 %			\$ (35,463)
	Bond	1.5 %			\$ (12,353)
	Fee	3.0 %			\$ (25,719)
	Escalation	Excluded			\$ -

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 10.75	DAYS - X 20 215	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%	215	11	\$ 1,500	\$ 322,500
Sr. Project Manager	100%	215	11	\$ 1,500	\$ 322,500
Project Manager	100%	215	11	\$ 1,200	\$ 258,000
Assistant Project Manager	50%	108	5	\$ 900	\$ 96,750
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	65	3	\$ 1,500	\$ 96,750
Purchasing	5%	11	1	\$ 1,500	\$ 16,125
MEP Coordinator	15%	32	2	\$ 1,300	\$ 41,925
Safety	10%	23	1	\$ 1,800	\$ 40,611
Project Accountant	2%	4	0	\$ 700	\$ 3,010
Project Administration	2%	4	0	\$ 500	\$ 2,150
Project Expeditor	2%	4	0	\$ 1,100	\$ 4,730
TOTALS					\$ 1,205,051

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 6	DAYS - X 20 120	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%	30	2	\$ 1,500	\$ 45,000
Project Manager	100%	120	6	\$ 1,200	\$ 144,000
Assistant Project Manager	50%	60	3	\$ 900	\$ 54,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	5%	6	0	\$ 1,500	\$ 9,000
Purchasing	5%	6	0	\$ 1,500	\$ 9,000
MEP Coordinator	15%	18	1	\$ 1,300	\$ 23,400
Safety	10%	13	1	\$ 1,800	\$ 22,667
Project Accountant	2%	2	0	\$ 700	\$ 1,680
Project Administration	2%	2	0	\$ 500	\$ 1,200
Project Expeditor	2%	2	0	\$ 1,100	\$ 2,640
TOTALS					\$ 312,587



SOMERVILLE MASTER PLAN - 115 BROADWAY

115 BROADWAY

August 12, 2021



ONE BEACON STREET
FLOOR 15
BOSTON, 12108

CONSTRUCTION COST
& RISK CONSULTANTS

THE FOLLOWING IS THE MASTER PLAN COST MODEL FOR THE CITY OF SOMERVILLE 115 BROADWAY NEW BUILD LIBRARY & RESIDENTIAL BUILDING. THE MODEL SHOWS ALL APPLICABLE NEW CONSTRUCTION: NEW CORE & SHELL, MEP INFRASTRUCTURE, AND PROGRAM FIT OUT. THIS MODEL PREDICTS ALLOWANCES FOR FITOUT TO BUILDINGS BASED ON APPROXIMATE PROGRAM ANTICIPATED AND IS SUBJECT TO THE FINAL MASTERPLAN. ESCALATION IS PRESENTLY EXCLUDED FROM THIS MODEL.

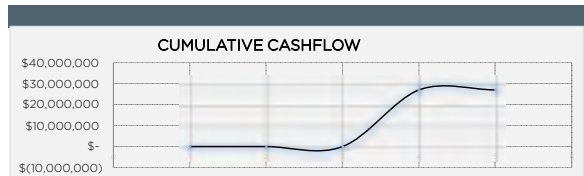
CONSTRUCTION COSTS \$ (NOT ESCALATED)

COST ELEMENT	GSF	\$/SF	CONST \$ (ESCALATED)	PROJECT \$ (ESCALATED)
MEP INFRASTRUCTURE	37,100	\$ 147	\$ 5,440,300	\$ 5,440,300
NEW CORE & SHELL	37,100	\$ 332	\$ 12,321,492	\$ 12,321,492
115 BROADWAY FIT OUT	37,100	\$ 236	\$ 8,758,000	\$ 8,758,000
SITE & LANDSCAPE	37,100	\$ 13	\$ 494,785	\$ 494,785
TOTAL CONSTRUCTION COSTS	37,100	\$728	\$ 27,014,577	\$ 27,014,577
SOFT COSTS		0%	\$ -	EXCLUDED
OWNERS CONTINGENCY		0%	\$ -	EXCLUDED
TOTAL CAPITAL EXPENDITURE			\$ 27,014,577	\$ 27,014,577



BUILDINGS CASHFLOW FORECAST

SPEND TOTALS	ANNUAL	CUMULATIVE
2023	\$ -	\$ -
2024	\$ -	\$ -
2025	\$ -	\$ -
2026	\$ 27,014,577	\$ 27,014,577
2027+	\$ -	\$ 27,014,577



ALTS & BREAKOUTS

	\$	\$/SF
ALTERNATES (CONSTRUCTION COST VALUES)		
ADD ALT #1 - CLT ILO STEEL/TIMBER	\$2,196,312	\$59.20
ALT #2 - 3 STORIES ONLY	(\$2,253,917)	(\$60.75)

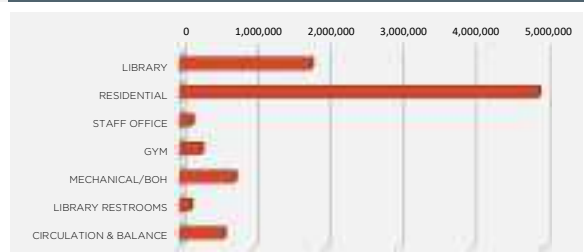
CONTINGENCY & ESCALATION SUMMARY

Design contingency	12.0%
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	EXCLUDED
Project labor assumptions	Union

FITOUT USE TYPE BY COST TOTAL \$

	% MIX	CONST \$
LIBRARY	21%	1,813,425
RESIDENTIAL	56%	4,938,681
STAFF OFFICE	2%	172,062
GYM	3%	304,767
MECHANICAL/BOH	9%	764,598
LIBRARY RESTROOMS	2%	156,128
CIRCULATION & BALANCE	7%	608,339

COST BY FITOUT USE TYPE BY SQUARE FOOT



FITOUT USE TYPE BY SQUARE FOOT

	% MIX OF TYPE	AREAS SF
LIBRARY	15%	5,527
RESIDENTIAL	57%	21,100
STAFF OFFICE	2%	650
GYM	3%	1,250
MECHANICAL/BOH	13%	4,900
LIBRARY RESTROOMS	1%	275
CIRCULATION & BALANCE	9%	3,398

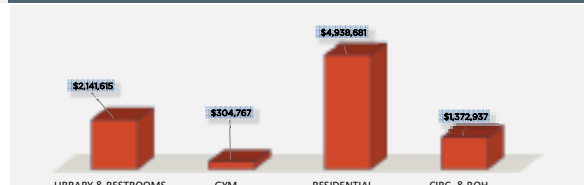
FITOUT USE TYPE BY SQUARE FOOT



BUILDING FIT-OUT COST \$

	% MIX	CONST \$
LIBRARY & RESTROOMS	17%	\$ 2,141,615
GYM	3%	\$ 304,767
RESIDENTIAL	57%	\$ 4,938,681
CIRC. & BOH	22%	\$ 1,372,937

COST SPLIT BY PROGRAM USER



EXCLUSIONS & ASSUMPTIONS

- Escalation has been EXCLUDED from this model as project schedule is not yet known. Refer to the Memo provided with the masterplan study on 'Escalation to Date' for the first half of 2021 and more key indicators driving future projections.

The following multipliers reflect our best projections for escalation moving forward, Due to the continued volatility in the market, these should be reviewed on a regular basis before finalizing project schedules, budgets, and scopes. Beyond 2024 we recommend carrying the typical 10-year rolling average of 4.5% for the purpose of this study.

YR	Projected Escalation %	Compounded %	Compounded Escalation Multiplier
2021	1.0%	1%	1.01 (to end of 2021)
2022	3.5%	4%	1.04
2023	6.0%	10%	1.10
2024	5.0%	16%	1.16
2025	4.5%	21%	1.21
2026	4.5%	26%	1.26
2027	4.5%	32%	1.32
2028	4.5%	38%	1.38
2029	4.5%	44%	1.44

- We have excluded any cost for phasing of the project.
- We have included 12% design contingency on trade costs
- We have included 4.5% construction contingency on trade costs + design contingency
- We have included 2.6% for GL & Subguard Insurance on cost of work (trade + contingencies + general conditions)
- We have included 1.5% for a bond on cost of work (trade + contingencies + general conditions)
- We have included a 3% CM Fee
- We have excluded permit costs, assumed covered by City
- General project requirements are carried at 5% of trade costs
- General conditions are costed per construction project schedule durations provided by PMA. See GC staffing sheet at back of the report for assumed staffing
- Soft costs, FFE & owner's contingency have been excluded
- All work is priced on regular hours, OT allowances are excluded presently

BASIS OF ESTIMATE

- 115 Broadway New Build Test-Fit_Updated 8/10/2021
- 2875 CoS CSA MP - PDP Cost Estimating Narrative
- 2021.08.11CSA Summary Schedules

Systems Assumptions

General

Please see estimate backup for additional assumptions, qualifications & exclusions
Per discussions with the team, the floor to floor heights were reduced from the previous base. Refer to latest info from the latestest test fit update.

Foundations/Basement Construction

Cost assumes spread footings and basement retaining wall. Piles and deep foundation systems are EXCLUDED
SOG construction is carried as 5" per narrative

Superstructure

Base estimate prices a steel and concrete podium with wood framing at the residential levels. Adjustment to the An allowance of 7.5% of structural member costs are included for connections requirements
An add alt showing the CLT structure is included for reference.

Exterior Enclosure

Enclosure is assumed to be glazing and metal panel system per narrative

Roofing

Costs are included for to replace the existing roofing system, including extensive green roof at the 4th floor terrace per discussion with the design team. PV costs are included w/ electrical infrastructure

Interior Construction/Finishes

An allowance of \$12/SF has been carried for C&S interior construction requirements
Fitout costs are modeled based on provided narrative

Stairways/Conveying

Costs for egress stairs and circulation stairs are included. BOD: metal pan stairs with concrete treads and painted handrails/guardrails.

A 5 stop elevator is included. Standard cab finishes are assumed in pricing.

Services

Estimate assumes MEP systems per the narrative for C&S with system separations as indicated between community space and rental space

Fitout MEPFP costs are modeled

Furnishings/Equipment

The furnishing and equipment costs carried in this model included fixed furnishings and window treatments.

Demolition & Abatement

An allowance for demo of the existing building on site is included - listed volume of the building is an approximation and subject to review. Abatement for the existing building demo is included at \$12.5/SF

Site Improvements

Contaminated soil disposal is excluded

Site Mechanical Utilities

On site storm water mitigation is included per Nitsch narrative and suggested sizing.

Costs assume connection to existing sanitary sewer utilities

Allowances have been included for incoming service connections.

Site Electrical Utilities

We have included a 25k allowance for site lighting.

Utilities are carried in the site file

DIVISION SUMMARY		37,100 GFA		12-Aug-21
			\$/SF	\$ TOTAL
Project Requirements			26.16	970,574
PROJECT REQUIREMENTS			26.16	970,574
A10.	Foundations		28.27	1,048,907
A20.	Basement Construction			0
A. SUBSTRUCTURE			28.27	1,048,907
B10.	Superstructure		84.94	3,151,406
B20.	Exterior Enclosure		85.71	3,179,994
B30.	Roofing		9.79	363,250
B. SHELL			180.45	6,694,649
C10.	Interior Construction		41.43	1,537,040
C30.	Interior Finishes		38.56	1,430,590
C. INTERIORS			79.99	2,967,630
C20.	Stairways		3.80	140,800
D10.	Conveying Systems		4.72	175,000
VERTICAL TRANSPORTATION			8.51	315,800
D20.	Plumbing Systems		29.69	1,101,380
D30.	Heating, Ventilating & Air Conditioning		96.30	3,572,550
D40.	Fire Protection Systems		7.33	272,126
D50.	Electric Lighting, Power & Communications		61.75	2,291,097
D. SERVICES			195.07	7,237,153
E10.	Equipment		3.04	112,879
E20.	Furnishings		10.59	392,795
E. EQUIPMENT AND FURNISHINGS			13.63	505,674
F10.	Special Construction (Sustainability allowance)		2.81	104,400
F20.	Selective Demolition		2.79	103,500
F. SPECIAL CONSTRUCTION AND DEMOLITION			5.60	207,900
TOTAL BUILDING CONSTRUCTION			537.69	19,948,288
G10.	Site Preparation		3.41	126,675
G20.	Site Improvements		4.33	160,750
G30.	Site Civil/Mechanical Utilities		2.19	81,333
G40.	Site Electrical Utilities		1.75	65,000
G90.	Other Site Construction		0.00	0
TOTAL SITE CONSTRUCTION			11.69	433,758
TOTAL TRADE COSTS			549.38	20,382,046
a. Design Contingency		12.0%	65.93	2,445,846
b. Phasing Allowance		0.0%	0.00	0
c. Construction Contingency		4.5%	27.69	1,027,255
d. General Conditions		5.62%	36.11	1,339,613
SUBTOTAL			679.10	25,194,760
e. Permits		0.0%	0.00	0
f. Insurances		2.6%	17.66	655,064
g. Bond		1.5%	10.19	377,921
h. Fee		3.0%	21.21	786,832
TOTAL COST TODAY			728.16	27,014,577
i. Escalation		EXCLUDED	0.00	0
TOTAL ANTICIPATED CONSTRUCTION COST			\$728	27,014,577

SUMMARY BY PROGRAM

TRADE	37,100		GFA		37,100		37,100		37,100		37,100		
							MEP INFRA		ADDITION C&S		SITE		
							MEP INFRASTRUCTURE		NEW CORE & SHELL		SITE & LANDSCAPE		
		CORE & SHELL	/ SF	COMBINED FIT-OUT PROJECTS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ 103,500	\$ 2.79	\$ -	\$ -	\$ 103,500	\$ 2.79	\$ -	\$ -	\$ 103,500	\$ 2.79	\$ -	\$ -	
FOUNDATIONS	\$ 1,048,907	\$ 28.27	\$ -	\$ -	\$ 1,048,907	\$ 28.27	\$ -	\$ -	\$ 1,048,907	\$ 28.27	\$ -	\$ -	
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SUPERSTRUCTURE	\$ 3,151,406	\$ 84.94	\$ -	\$ -	\$ 3,151,406	\$ 84.94	\$ -	\$ -	\$ 3,151,406	\$ 84.94	\$ -	\$ -	
EXTERIOR ENCLOSURE	\$ 3,179,994	\$ 85.71	\$ -	\$ -	\$ 3,179,994	\$ 85.71	\$ -	\$ -	\$ 3,179,994	\$ 85.71	\$ -	\$ -	
ROOFING	\$ 363,250	\$ 9.79	\$ -	\$ -	\$ 363,250	\$ 9.79	\$ -	\$ -	\$ 363,250	\$ 9.79	\$ -	\$ -	
INTERIOR CONSTRUCTION	\$ 445,200	\$ 12.00	\$ 1,091,840	\$ 29.43	\$ 1,537,040	\$ 41.43	\$ -	\$ -	\$ 445,200	\$ 12.00	\$ -	\$ -	
INTERIOR FINISHES	\$ -	\$ -	\$ 1,430,590	\$ 38.56	\$ 1,430,590	\$ 38.56	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
STAIRWAYS	\$ 140,800	\$ 3.80	\$ -	\$ -	\$ 140,800	\$ 3.80	\$ -	\$ -	\$ 140,800	\$ 3.80	\$ -	\$ -	
CONVEYING SYSTEMS	\$ 175,000	\$ 4.72	\$ -	\$ -	\$ 175,000	\$ 4.72	\$ -	\$ -	\$ 175,000	\$ 4.72	\$ -	\$ -	
PLUMBING	\$ 530,800	\$ 14.31	\$ 570,580	\$ 15.38	\$ 1,101,380	\$ 29.69	\$ 530,800	\$ 14.31	\$ -	\$ -	\$ -	\$ -	
HVAC	\$ 1,964,000	\$ 52.94	\$ 1,608,550	\$ 43.36	\$ 3,572,550	\$ 96.30	\$ 1,964,000	\$ 52.94	\$ -	\$ -	\$ -	\$ -	
FIRE PROTECTION	\$ 148,400	\$ 4.00	\$ 123,726	\$ 3.33	\$ 272,126	\$ 7.33	\$ 148,400	\$ 4.00	\$ -	\$ -	\$ -	\$ -	
ELECTRICAL	\$ 1,280,243	\$ 34.51	\$ 1,010,854	\$ 27.25	\$ 2,291,097	\$ 61.75	\$ 1,280,243	\$ 34.51	\$ -	\$ -	\$ -	\$ -	
EQUIPMENT	\$ -	\$ -	\$ 112,879	\$ 3.04	\$ 112,879	\$ 3.04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
FURNISHINGS	\$ 55,650	\$ 1.50	\$ 337,145	\$ 9.09	\$ 392,795	\$ 10.59	\$ -	\$ -	\$ 55,650	\$ 1.50	\$ -	\$ -	
SUSTAINABILITY ALLOWANCE	\$ 104,400	\$ 2.81	\$ -	\$ -	\$ 104,400	\$ 2.81	\$ -	\$ -	\$ 104,400	\$ 2.81	\$ -	\$ -	
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
SITE PREP	\$ 126,675	\$ 3.41	\$ -	\$ -	\$ 126,675	\$ 3.41	\$ -	\$ -	\$ 126,675	\$ 3.41	\$ -	\$ -	
SITE IMPROVEMENTS	\$ 160,750	\$ 4.33	\$ -	\$ -	\$ 160,750	\$ 4.33	\$ -	\$ -	\$ -	\$ -	\$ 160,750	\$ 4.33	
SITE CIVIL / MECHANICAL	\$ 81,333	\$ 2.19	\$ -	\$ -	\$ 81,333	\$ 2.19	\$ -	\$ -	\$ -	\$ -	\$ 81,333	\$ 2.19	
SITE ELECTRICAL	\$ 65,000	\$ 1.75	\$ -	\$ -	\$ 65,000	\$ 1.75	\$ -	\$ -	\$ -	\$ -	\$ 65,000	\$ 1.75	
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTAL DIRECT COSTS	\$ 13,125,308	\$ 353.78	\$ 6,286,164	\$ 169.44	\$ 19,411,472	\$ 523.22	\$ 3,923,443	\$ 105.75	\$ 8,894,782	\$ 239.75	\$ 307,083	\$ 8.28	
Design Contingency	12.00%	\$ 1,653,789	\$ 44.58	\$ 792,057	\$ 21.35	\$ 2,445,846	\$ 65.93	\$ 494,354	\$ 13.32	\$ 1,120,742	\$ 30.21	\$ 38,693	\$ 1.04
Phasing Allowance	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Construction Contingency	4.50%	\$ 694,591	\$ 18.72	\$ 332,664	\$ 8.97	\$ 1,027,255	\$ 27.69	\$ 207,629	\$ 5.60	\$ 470,712	\$ 12.69	\$ 16,251	\$ 0.46
General Conditions	5.62%	\$ 896,782	\$ 24.17	\$ 442,831	\$ 11.94	\$ 1,339,613	\$ 36.11	\$ 252,220	\$ 6.80	\$ 560,489	\$ 15.11	\$ 84,073	\$ 2.36
Project Requirements	5.00%	\$ 656,265	\$ 17.69	\$ 314,308	\$ 8.47	\$ 970,574	\$ 26.16	\$ 196,172	\$ 5.29	\$ 444,739	\$ 11.99	\$ 15,354	\$ 0.44
SUBTOTAL	\$ 17,026,736	\$ 458.94	\$ 8,168,024	\$ 220.16	\$ 25,194,760	\$ 679.10	\$ 5,073,818	\$ 136.76	\$ 11,491,464	\$ 309.74	\$ 461,454.18	\$ 12.44	
Permits	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
GL Insurance & Subguard	2.60%	\$ 442,695	\$ 11.93	\$ 212,369	\$ 5.72	\$ 655,064	\$ 17.66	\$ 131,919	\$ 3.56	\$ 298,778	\$ 8.05	\$ 11,998	\$ 0.32
Bond	1.50%	\$ 255,401	\$ 6.88	\$ 122,520	\$ 3.30	\$ 377,921	\$ 10.19	\$ 76,107	\$ 2.05	\$ 172,372	\$ 4.65	\$ 6,922	\$ 0.19
CM Fee	3.00%	\$ 531,745	\$ 14.33	\$ 255,087	\$ 6.88	\$ 786,832	\$ 21.21	\$ 158,455	\$ 4.27	\$ 358,878	\$ 9.67	\$ 14,411	\$ 0.39
SUBTOTAL	\$ 18,256,577	\$ 492.09	\$ 8,758,000	\$ 236.06	\$ 27,014,577	\$ 728.16	\$ 5,440,300	\$ 146.64	\$ 12,321,492	\$ 332.12	\$ 494,785	\$ 13	
Escalation	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTAL	\$ 18,256,577	\$ 492.09	\$ 8,758,000	\$ 236.06	\$ 27,014,577	\$ 728.16	\$ 5,440,300	\$ 146.64	\$ 12,321,492	\$ 332.12	\$ 494,785	\$ 13	

SUMMARY BY PROGRAM

	5,527		21,100		650		1,250		4,900		275		3,398	
	RENOVATION FIT-OUT MODEL													
	LIBRARY		RESIDENTIAL		STAFF OFFICE		GYM		MECHANICAL/BOH		LIBRARY RESTROOMS		CIRCULATION & BALANCE	
TRADE	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF	TOTALS	/ SF
DEMOLITION/ENABLING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FOUNDATIONS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BASEMENT CONSTRUCTION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUPERSTRUCTURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXTERIOR ENCLOSURE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROOFING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INTERIOR CONSTRUCTION	\$ 193,445	\$ 35.00	\$ 738,500	\$ 35.00	\$ 16,250	\$ 25.00	\$ 18,750	\$ 15.00	\$ 58,800	\$ 12.00	\$ 15,125	\$ 55.00	\$ 50,970	\$ 15.00
INTERIOR FINISHES	\$ 442,160	\$ 80.00	\$ 633,000	\$ 30.00	\$ 35,750	\$ 55.00	\$ 56,250	\$ 45.00	\$ 122,500	\$ 25.00	\$ 22,000	\$ 80.00	\$ 118,930	\$ 35.00
STAIRWAYS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONVEYING SYSTEMS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLUMBING	\$ 27,635	\$ 5.00	\$ 464,200	\$ 22.00	\$ -	\$ -	\$ 10,000	\$ 8.00	\$ 24,500	\$ 5.00	\$ 35,750	\$ 130.00	\$ 8,495	\$ 2.50
HVAC	\$ 331,620	\$ 60.00	\$ 844,000	\$ 40.00	\$ 29,250	\$ 45.00	\$ 75,000	\$ 60.00	\$ 196,000	\$ 40.00	\$ 13,750	\$ 50.00	\$ 118,930	\$ 35.00
FIRE PROTECTION	\$ 19,345	\$ 3.50	\$ 63,300	\$ 3.00	\$ 1,950	\$ 3.00	\$ 3,750	\$ 3.00	\$ 24,500	\$ 5.00	\$ 688	\$ 2.50	\$ 10,194	\$ 3.00
ELECTRICAL	\$ 176,864	\$ 32.00	\$ 527,500	\$ 25.00	\$ 27,300	\$ 42.00	\$ 43,750	\$ 35.00	\$ 122,500	\$ 25.00	\$ 11,000	\$ 40.00	\$ 101,940	\$ 30.00
EQUIPMENT	\$ 27,635	\$ 5.00	\$ 63,300	\$ 3.00	\$ 6,500	\$ 10.00	\$ 2,500	\$ 2.00	\$ -	\$ -	\$ 2,750	\$ 10.00	\$ 10,194	\$ 3.00
FURNISHINGS	\$ 82,905	\$ 15.00	\$ 211,000	\$ 10.00	\$ 6,500	\$ 10.00	\$ 8,750	\$ 7.00	\$ -	\$ -	\$ 11,000	\$ 40.00	\$ 16,990	\$ 5.00
SUSTAINABILITY ALLOWANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SELECTIVE DEMOLITION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE PREP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE IMPROVEMENTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE CIVIL / MECHANICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SITE ELECTRICAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER SITE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL DIRECT COSTS	\$ 1,301,609	\$ 235.50	\$ 3,544,800	\$ 168.00	\$ 123,500	\$ 190.00	\$ 218,750	\$ 175.00	\$ 548,800	\$ 112.00	\$ 112,063	\$ 407.50	\$ 436,643	\$ 128.50
Design Contingency	\$ 164,003	\$ 29.67	\$ 446,645	\$ 21.17	\$ 15,561	\$ 23.94	\$ 27,563	\$ 22.05	\$ 69,149	\$ 14.11	\$ 14,120	\$ 51.35	\$ 55,017	\$ 16.19
Phasing Allowance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction Contingency	\$ 68,881	\$ 12.46	\$ 187,591	\$ 8.89	\$ 6,536	\$ 10.05	\$ 11,576	\$ 9.26	\$ 29,042	\$ 5.93	\$ 5,930	\$ 21.56	\$ 23,107	\$ 6.80
General Conditions	\$ 104,196	\$ 18.85	\$ 208,391	\$ 9.88	\$ 13,024	\$ 20.04	\$ 26,049	\$ 20.84	\$ 39,073	\$ 7.97	\$ 26,049	\$ 94.72	\$ 26,049	\$ 7.67
Project Requirements	\$ 65,080	\$ 11.78	\$ 177,240	\$ 8.40	\$ 6,175	\$ 9.50	\$ 10,938	\$ 8.75	\$ 27,440	\$ 5.60	\$ 5,603	\$ 20.38	\$ 21,832	\$ 6.43
SUBTOTAL	\$ 1,703,768	\$ 308.26	\$ 4,564,667	\$ 216.33	\$ 164,796	\$ 253.53	\$ 294,875	\$ 235.90	\$ 713,505	\$ 145.61	\$ 163,765	\$ 595.51	\$ 562,648	\$ 165.58
Permits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GL Insurance & Subguard	\$ 44,298	\$ 8.01	\$ 118,681	\$ 5.62	\$ 4,285	\$ 6.59	\$ 7,667	\$ 6.13	\$ 18,551	\$ 3.79	\$ 4,258	\$ 15.48	\$ 14,629	\$ 4.31
Bond	\$ 25,557	\$ 4.62	\$ 68,470	\$ 3.25	\$ 2,472	\$ 3.80	\$ 4,423	\$ 3.54	\$ 10,703	\$ 2.18	\$ 2,456	\$ 8.93	\$ 8,440	\$ 2.48
CM Fee	\$ 53,209	\$ 9.63	\$ 142,555	\$ 6.76	\$ 5,147	\$ 7.92	\$ 9,209	\$ 7.37	\$ 22,283	\$ 4.55	\$ 5,114	\$ 18.60	\$ 17,572	\$ 5.17
SUBTOTAL	\$ 1,826,831	\$ 330.53	\$ 4,894,373	\$ 231.96	\$ 176,699	\$ 271.85	\$ 316,174	\$ 252.94	\$ 765,041	\$ 156.13	\$ 175,593	\$ 638.52	\$ 603,288	\$ 177.54
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL	\$ 1,826,831	\$ 330.53	\$ 4,894,373	\$ 231.96	\$ 176,699	\$ 271.85	\$ 316,174	\$ 252.94	\$ 765,041	\$ 156.13	\$ 175,593	\$ 638.52	\$ 603,288	\$ 177.54

TRADE	QTY	UNIT	RATE	TOTAL
PLUMBING	37,100			\$ 530,800
Plumbing infrastructure	37,100	SF	8.00	\$ 296,800
- Water Heaters: Air source heat pump, 150gal tanks	3	EA	15,000.00	\$ 45,000
- Point of use water heaters	2	EA	2,000.00	\$ 4,000
Greywater system				-
Greywater treatment system - allowance	1	LS	60,000.00	\$ 60,000
Rainwater storage & reuse - allow				-
Rainwater treatment skid	1	LS	40,000.00	\$ 40,000
Exterior storage tank - 5500Gal	1	LS	15,000.00	See Site
Makeup water connection w/ backflow preventer	1	LS	10,000.00	\$ 10,000
Piping and connections - allow	1	LS	50,000.00	\$ 50,000
Misc. harvesting scope required	1	LS	25,000.00	\$ 25,000
HVAC	37,100			\$ 1,964,000
<u>HVAC Infrastructure - Commercial</u>	16,000	SF	70.00	1,120,000
<u>HVAC Infrastructure - Residential</u>	21,100	SF	40.00	844,000
FIRE PROTECTION	37,100			\$ 148,400
Fire protection infrastructure	37,100	SF	4.00	\$ 148,400
ELECTRICAL	37,100			\$ 1,280,243
<u>Normal Service Distribution</u>				-
750KVA pad mounted xfmr	1	LS	82,500.00	\$ 82,500
1200A swbd, CT cab	1	LS	42,000.00	\$ 42,000
45kva step down xfmr	6	EA	5,000.00	\$ 30,000
150A power panel - 84 ckts	5	EA	7,650.00	\$ 38,250
100A site lighting panel - size assumed	1	EA	3,000.00	\$ 3,000
100A lighting panels - 1 per floor	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
<u>ATS Switches</u>				Excluded
<u>Energy Metering</u>				-
Energy meters	4	EA	3,500.00	\$ 14,000
<u>Normal Feeders</u>	37,100	SF	3.00	\$ 111,300
<u>Emergency Power Distribution</u>				-
Generator				Excluded
Panel/connections	1	LS	15,000.00	\$ 15,000
Manual transfer switch	1	EA	3,500.00	\$ 3,500
<u>Emergency Distribution Panels</u>				Excluded
<u>Emergency Feeders</u>				Excluded
<u>Mechanical / Equipment Power</u>	37,100	SF	2.50	\$ 92,750
<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	37,100	SF	7.00	\$ 259,700
Temp fire alarm	37,100	SF	1.50	\$ 55,650
<u>BDA</u>				Excluded, assume not required
<u>Tel/Data, inclusive of rough-in and Cat 6 (allow for shell and core)</u>	37,100	SF	3.00	\$ 111,300
<u>Audio visual</u>				w/ fitout
<u>Security systems allowance (head-end and backbone)</u>	37,100	SF	2.00	\$ 74,200
<u>Lightning protection</u>	37,100	SF	0.85	\$ 31,535

TRADE	QTY	UNIT	RATE	TOTAL
<u>Rooftop PV (60 kW per narrative) - including mounting system, etc.</u>	60	kW	800.00	\$ 48,000
<u>PV infrastructure - allowance including battery storage for SMART system (pricing based on recent comps. pending further design and system info)</u>	1	LS	72,000	\$ 72,000
Testing & bonding	1	LS	41,187.40	\$ 41,187
Sub-trade temps/ gcs	1	LS	126,870.96	\$ 126,871
PROJECT REQUIREMENTS	37,100			\$ 196,172
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	3,923,443	\$ 196,172
TOTAL DIRECT COSTS				\$ 4,119,616
ALLOCATIONS				\$ 1,320,684
General Conditions	9.0	28,024	wks	\$ 252,220
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 131,919
Design Contingency	12.0 %			\$ 494,354
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 207,629
Bond	1.5 %			\$ 76,107
Fee	3.0 %			\$ 158,455
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 5,440,300

TRADE	QTY	UNIT	RATE	TOTAL
DEMOLITION	37,100			\$ 103,500
Demo of existing building on site - Allowance 3000 SF footprint, 15 ft H	45,000	CF	1.50	\$ 67,500
Allowance -Abatement of Existing Building Demo'd materials	3,000	SF	12.00	\$ 36,000
FOUNDATIONS	37,100			\$ 1,048,907
<u>New Building Foundations & Basement Walls</u>				-
Dewatering - allowance	8,000	SF	5.00	\$ 40,000
Excavation for SOG and subbase	444	CY	60.00	\$ 26,667
Gravel subbase - assume 12"	296	CY	60.00	\$ 17,778
Excavation for underslab MEPs	8,000	SF	3.00	\$ 24,000
Rough grading	8,000	SF	2.00	\$ 16,000
Fine grading	8,000	SF	2.00	\$ 16,000
Footing and frost wall excavation	356	CY	75.00	\$ 26,667
Basement deep excavation	3,098	CY	50.00	\$ 154,897
Backfill - assume imported backfill	148	CY	75.00	\$ 11,111
Dispose of excess material (Excludes contamination)	5,619	TONS	40.00	\$ 224,764
Strip Footing - assume 6'x1.5'	133	CY	750.00	\$ 100,000
Spread Footing - allow 1 per 500 SF - assume 5'x5'x2'	30	CY	850.00	\$ 25,185
Frost Wall/Grade Beam - assume 3'H x 1' W	44	CY	950.00	\$ 42,222
High foundation wall at basement	156	CY	1,200.00	\$ 186,667
Structural SOG - assume 5"	8,000	SF	15.00	\$ 120,000
Excavate for elevator pit	30	CY	85.00	\$ 2,550
Elevator pit walls	7	CY	1,200.00	\$ 8,400
Elevator pit slab and sump	100	SF	30.00	\$ 3,000
Elevator Pit Waterproofing	200	SF	15.00	\$ 3,000
SUPERSTRUCTURE	37,100			\$ 3,151,406
<u>Concrete Cores at Elevator and Stairs - L0 & L1</u>				-
Concrete Cores, assumed 12" Thick	128	CY	550.00	\$ 70,176
<u>Lateral Cores at L2-5</u>				-
Masonry CMU walls at Core	2,079	SF	35.00	\$ 72,765
<u>Structural Steel</u>				-
Steel Framing - 15psf per narrative from basement to 2nd Floor podium.	177	TON	7,200.00	\$ 1,275,210
Connections, pour stops, & Misc requirement	1	LS	255,042.00	\$ 255,042
<u>Wood Structure L2 -5</u>				-
Wood Load Bearing Wall System with Truss to support floors and roof	13,485	SF	35.00	\$ 471,975
Wood floor sub base - plywood, 3 ply assumed with 2" topping slab	13,485	SF	15.50	\$ 209,018
Misc. Connections & elements for reinforcement	1	LS	70,796.25	\$ 70,796
<u>Composite Metal Deck</u>				-
2" 18 Gage metal deck	37,100	SF	9.00	\$ 333,900
- 3 1/4" LW Concrete at Ground Floor	78	CY	400.00	\$ 31,196
- 4 1/2" LW Concrete at L2 Podium Floor Plate	110	CY	400.00	\$ 44,000

TRADE	QTY	UNIT	RATE	TOTAL
- rebar	18,799	LBS	2.00	\$ 37,598
Vibration & Seismic requirements	1	LS	50,000.00	\$ 50,000
Spray Fireproofing - allowance at basement, L1	15,695	SF	4.00	\$ 62,780
Misc. metals allowance	37,100	SF	2.00	\$ 74,200
EXTERIOR ENCLOSURE	37,100			\$ 3,179,994
Glazing - 80% First Floor, 40% upper floors	9,950	SF	175.00	\$ 1,741,250
Metal Panel - 20% First floor, 60% upper floors	8,525	SF	130.00	\$ 1,108,250
LGMF & Furr of Basement Foundation Wall	4,800	SF	12.00	\$ 57,600
- Insulation - closed cell SPF	4,800	SF	5.00	\$ 24,000
- Vapor Barrier	4,800	SF	3.75	\$ 18,000
LGMR & Furr of Metal Panel Walls	8,525	SF	12.00	\$ 102,300
- Insulation	8,525	SF	5.00	\$ 42,625
- Vapor Barrier	8,525	SF	3.75	\$ 31,969
Entrances - allow for 3, glass entry integrated into glazing systems	3	EA	18,000.00	\$ 54,000
ROOFING	37,100			\$ 363,250
Roofing System Complete	8,000	SF	36.00	\$ 288,000
Extensive green roof areas				See Sustainability
Guard rail at green roof - allowance for painted metal rail, no tenant access	350	LF	215.00	\$ 75,250
INTERIOR CONSTRUCTION	37,100			\$ 445,200
Interior Construction	37,100	SF	12.00	\$ 445,200
STAIRWAYS	37,100			\$ 140,800
Connecting Stair - Metal Pan Stair w' concrete steps, painted metal handrail & guardrail	22	FLIGHTS	6,400.00	\$ 140,800
CONVEYING SYSTEMS	37,100			\$ 175,000
Elevator - New MRL elevator, 3500 LBS, 200 FPM, s	5	STOPS	35,000.00	\$ 175,000
FURNISHINGS	37,100			\$ 55,650
Accessibility Signage - allowance	37,100	SF	1.00	\$ 37,100
Wayfinding Signage & Departmental Graphics	37,100	SF	0.50	\$ 18,550
SUSTAINABILITY ALLOWANCE	37,100			\$ 104,400
Fourth Floor amenity Deck - extensive Green Roof Assumed, 6" Media Depth	2,320	SF	45.00	\$ 104,400
SITE PREP	37,100			\$ 126,675
Site Perimeter Fence	450	LF	75.00	\$ 33,750
Silt Barrier and Erosion protection - allowance	37,100	SF	0.25	\$ 9,275
Allowance - existing tree protection, 10 assumed	10	EA	800.00	\$ 8,000
Site demolition	37,100	SF	1.50	\$ 55,650
Construction Vehicle access/wheel wash - one location assumed	1	EA	20,000.00	\$ 20,000
Site Improvement Scope				See Site Breakout
PROJECT REQUIREMENTS	37,100			\$ 444,739
Trade overtime allowance				Excluded
General project requirements	5.0%	TOTAL	8,894,782	\$ 444,739
TOTAL DIRECT COSTS				\$ 9,339,521
ALLOCATIONS				\$ 2,981,972
General Conditions	20.0	28,024	wks	\$ 560,489
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 298,778
Design Contingency	12.0 %			\$ 1,120,742
Phasing Allowance	0.0 %			\$ -

TRADE	QTY	UNIT	RATE	TOTAL
Construction Contingency	4.5 %			\$ 470,712
Bond	1.5 %			\$ 172,372
Fee	3.0 %			\$ 358,878
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 12,321,492

TRADE	QTY	UNIT	RATE	TOTAL
SITE IMPROVEMENTS	37,100			\$ 160,750
<u>Grading</u>				-
Rough grading	3,250	SF	1.50	\$ 4,875
Fine grading	3,250	SF	1.00	\$ 3,250
Excavation for site features - allowance	30	CY	75.00	\$ 2,250
<u>Site feature retaining walls</u>			Excluded, assumed not required	
<u>Hardscape</u>				-
Hardscape allowance - assume 50% of site area	1,625	SF	45.00	\$ 73,125
<u>Landscaping & Plantings</u>				-
Landscape allowance - assume 50% of site area	1,625	SF	30.00	\$ 48,750
<u>Misc. Site Furnishings</u>				-
Seating, tables, benches, site furnishings - allowance	1	LS	25,000.00	\$ 25,000
Bike Rack - allowance	1	EA	3,500.00	\$ 3,500
SITE CIVIL / MECHANICAL	37,100			\$ 81,333
<u>Storm Water Management</u>				-
5,500 gal detention tanks for storm water and rainwater reuse system	1	LS	20,000.00	\$ 20,000
Subgrade drainage infrastructure (pipes, structures, grates) - allowance	1	LS	25,000.00	\$ 25,000
Storm Water Reuse system to plumbing fluxh fixtures				W/ Plumbing
<u>Incoming utility services</u>				-
8" Sewer Service - length assumed	50	LF	175.00	\$ 8,750
- Excavation and backfill	37	CY	120.00	\$ 4,444
8" Fire Service - length assumed	50	LF	175.00	\$ 8,750
- Excavation and backfill	37	CY	120.00	\$ 4,444
3" Water Service - length assumed	50	LF	110.00	\$ 5,500
- Excavation and backfill	37	CY	120.00	\$ 4,444
SITE ELECTRICAL	37,100			\$ 65,000
Site Electrical & lighting - allowance	1	LS	25,000.00	\$ 25,000
<u>Electrical Service</u>				-
Incoming electrical/tc ductbank - Allowance	100	LF	400.00	\$ 40,000
PROJECT REQUIREMENTS	37,100			\$ 15,354
General project requirements	5.0%	TOTAL	307,083.33	\$ 15,354
TOTAL DIRECT COSTS				\$ 322,438
ALLOCATIONS				\$ 172,348
General Conditions	3.0	28,024	wks	\$ 84,073
Permits	0.0 %			\$ -
GL Insurance	2.6 %			\$ 11,998
Design Contingency	12.0 %			\$ 38,693
Design build fee	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 16,251
Bond	1.5 %			\$ 6,922
Fee	3.0 %			\$ 14,411
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 494,785

TRADE	QTY	UNIT	RATE	TOTAL
INTERIOR CONSTRUCTION	37,100			\$ 1,091,840
LIBRARY	5,527	SF	35.00	\$ 193,445
RESIDENTIAL	21,100	SF	35.00	\$ 738,500
STAFF OFFICE	650	SF	25.00	\$ 16,250
GYM	1,250	SF	15.00	\$ 18,750
MECHANICAL/BOH	4,900	SF	12.00	\$ 58,800
LIBRARY RESTROOMS	275	SF	55.00	\$ 15,125
CIRCULATION & BALANCE	3,398	SF	15.00	\$ 50,970
INTERIOR FINISHES	37,100			\$ 1,430,590
LIBRARY	5,527	SF	80.00	\$ 442,160
RESIDENTIAL	21,100	SF	30.00	\$ 633,000
STAFF OFFICE	650	SF	55.00	\$ 35,750
GYM	1,250	SF	45.00	\$ 56,250
MECHANICAL/BOH	4,900	SF	25.00	\$ 122,500
LIBRARY RESTROOMS	275	SF	80.00	\$ 22,000
CIRCULATION & BALANCE	3,398	SF	35.00	\$ 118,930
PLUMBING	37,100			\$ 570,580
LIBRARY	5,527	SF	5.00	\$ 27,635
RESIDENTIAL	21,100	SF	22.00	\$ 464,200
GYM	1,250	SF	8.00	\$ 10,000
MECHANICAL/BOH	4,900	SF	5.00	\$ 24,500
LIBRARY RESTROOMS	275	SF	130.00	\$ 35,750
CIRCULATION & BALANCE	3,398	SF	2.50	\$ 8,495
HVAC	37,100			\$ 1,608,550
LIBRARY	5,527	SF	60.00	\$ 331,620
RESIDENTIAL	21,100	SF	40.00	\$ 844,000
STAFF OFFICE	650	SF	45.00	\$ 29,250
GYM	1,250	SF	60.00	\$ 75,000
MECHANICAL/BOH	4,900	SF	40.00	\$ 196,000
LIBRARY RESTROOMS	275	SF	50.00	\$ 13,750
CIRCULATION & BALANCE	3,398	SF	35.00	\$ 118,930
FIRE PROTECTION	37,100			\$ 123,726
LIBRARY	5,527	SF	3.50	\$ 19,345
RESIDENTIAL	21,100	SF	3.00	\$ 63,300
STAFF OFFICE	650	SF	3.00	\$ 1,950
GYM	1,250	SF	3.00	\$ 3,750
MECHANICAL/BOH	4,900	SF	5.00	\$ 24,500
LIBRARY RESTROOMS	275	SF	2.50	\$ 688
CIRCULATION & BALANCE	3,398	SF	3.00	\$ 10,194
ELECTRICAL	37,100			\$ 1,010,854
LIBRARY	5,527	SF	32.00	\$ 176,864
RESIDENTIAL	21,100	SF	25.00	\$ 527,500
STAFF OFFICE	650	SF	42.00	\$ 27,300
GYM	1,250	SF	35.00	\$ 43,750
MECHANICAL/BOH	4,900	SF	25.00	\$ 122,500
LIBRARY RESTROOMS	275	SF	40.00	\$ 11,000
CIRCULATION & BALANCE	3,398	SF	30.00	\$ 101,940
EQUIPMENT	37,100			\$ 112,879
LIBRARY	5,527	SF	5.00	\$ 27,635
RESIDENTIAL	21,100	SF	3.00	\$ 63,300

TRADE	QTY	UNIT	RATE	TOTAL
STAFF OFFICE	650	SF	10.00	\$ 6,500
GYM	1,250	SF	2.00	\$ 2,500
LIBRARY RESTROOMS	275	SF	10.00	\$ 2,750
CIRCULATION & BALANCE	3,398	SF	3.00	\$ 10,194
FURNISHINGS	37,100			\$ 337,145
LIBRARY	5,527	SF	15.00	\$ 82,905
RESIDENTIAL	21,100	SF	10.00	\$ 211,000
STAFF OFFICE	650	SF	10.00	\$ 6,500
GYM	1,250	SF	7.00	\$ 8,750
LIBRARY RESTROOMS	275	SF	40.00	\$ 11,000
CIRCULATION & BALANCE	3,398	SF	5.00	\$ 16,990
PROJECT REQUIREMENTS	37,100			\$ 314,308
Trade overtime allowance				Excluded
General project requirements - renovation	5.0%	TOTAL	6,286,164	\$ 314,308
TOTAL DIRECT COSTS				\$ 6,600,472
ALLOCATIONS				\$ 2,157,528
General Conditions	34.0	wks	13,024	\$ 442,831
Permits	0.0 %			\$ -
Insurances	2.6 %			\$ 212,369
Design Contingency	12.0 %			\$ 792,057
Phasing Allowance	0.0 %			\$ -
Construction Contingency	4.5 %			\$ 332,664
Bond	1.5 %			\$ 122,520
Fee	3.0 %			\$ 255,087
Escalation	Excluded			\$ -
TOTAL CONSTRUCTION COST				\$ 8,758,000

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
1	ADD ALT #1 - CLT ILO STEEL/TIMBER				\$ 2,196,312
	<i>Add alt#1: CLT heavy timber structure in place of conventional steel/wood podium superstructure</i>				
	Deduct Steel structure	(1)	LS	2,914,280	\$ (2,914,280)
	Deduct CMU Core	(1)	LS	28,070	\$ (28,070)
	<u>Concrete Cores at Elevator and Stairs</u>				-
	Concrete Cores, assumed 12" Thick	318	CY	550.00	\$ 174,778
	<u>CLT& Heavy Timber Structure</u>				-
	Columns - 20x20 o.c. heavy timber grid, 2'x2' assumed	10,195	CF	110.00	\$ 1,121,459
	21" Primary Glu-lam Girders @ 20' O.C.	6,419	CF	110.00	\$ 706,141
	18" Purlin Floor Bracing	9,433	CF	110.00	\$ 1,037,594
	CLT 3-ply Floor/Roof Spans	37,100	SF	30.00	\$ 1,113,000
	Connections & misc. requirements - 7.5%	1	LS	298,364.52	\$ 298,365
	2" Topping Slab - NW Concrete Assumed - Roof Included	37,100	SF	6.50	\$ 241,150
	<u>Total Direct Costs</u>				\$ 1,750,136
	<u>Allocations</u>				\$ 446,176
	General Conditions				Included in base
	Permits	0.0 %			\$ -
	Insurances	2.6 %			\$ 53,257
	Design Contingency	12.0 %			\$ 210,016
	Phasing Allowance	0.0 %			\$ -
	Construction Contingency	4.5 %			\$ 88,207
	Bond	1.5 %			\$ 30,725
	Fee	3.0 %			\$ 63,970
	Escalation	Excluded			\$ -

#	ALTERNATE	QTY	UNIT	RATE	TOTAL
2	ALT #2 - 3 STORIES ONLY				\$ (2,253,917)
	<i>Deduct alt #2: Three stories only, no setback, roof still mech equipment and PV array</i>				
	<u>Deduct Timber Structure</u>				\$ -
	Deduct Flooring	(5,100)	SF	15.50	\$ (79,050)
	Deduct Timber Structure	(1)	LS	84,813	\$ (84,813)
	Deduct Envelop Costs	(1)	LS	279,379.80	\$ (279,380)
	Deduct Residential Program Cost	(5,100)	SF	168.00	\$ (856,800)
	Deduct Green Roof	(1)	LS	104,400.00	\$ (104,400)
	Deduct Allowance for MEPFP Infrastructure Savings	(1)	LS	250,000.00	\$ (250,000)
	<u>Total Direct Costs</u>				\$ (1,654,443)
	<u>Allocations</u>				\$ (599,474)
	General Conditions				Included in base
	Permits	(6.00)	WKS	28,024.44	\$ (168,147)
	Insurances	2.6 %			\$ (54,717)
	Design Contingency	12.0 %			\$ (198,533)
	Phasing Allowance	0.0 %			\$ -
	Construction Contingency	4.5 %			\$ (83,384)
	Bond	1.5 %			\$ (29,045)
	Fee	3.0 %			\$ (65,648)
	Escalation	Excluded			\$ -

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 8	DAYS - X 20 160	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%	160	8	\$ 1,500	\$ 240,000
Sr. Project Manager	100%	160	8	\$ 1,500	\$ 240,000
Project Manager	100%	160	8	\$ 1,200	\$ 192,000
Assistant Project Manager	50%	80	4	\$ 900	\$ 72,000
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	30%	48	2	\$ 1,500	\$ 72,000
Purchasing	5%	8	0	\$ 1,500	\$ 12,000
MEP Coordinator	15%	24	1	\$ 1,300	\$ 31,200
Safety	10%	17	1	\$ 1,800	\$ 30,222
Project Accountant	2%	3	0	\$ 700	\$ 2,240
Project Administration	2%	3	0	\$ 500	\$ 1,600
Project Expeditor	2%	3	0	\$ 1,100	\$ 3,520
TOTALS					\$ 896,782

CONSTRUCTION SCHEDULE DURATIONS:	MONTHS 8.5	DAYS - X 20 170	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%	43	2	\$ 1,500	\$ 63,750
Project Manager	100%	170	9	\$ 1,200	\$ 204,000
Assistant Project Manager	50%	85	4	\$ 900	\$ 76,500
Assistant Superintendent	0%	0	0	\$ 1,100	\$ -
Senior Estimator	5%	9	0	\$ 1,500	\$ 12,750
Purchasing	5%	9	0	\$ 1,500	\$ 12,750
MEP Coordinator	15%	26	1	\$ 1,300	\$ 33,150
Safety	10%	18	1	\$ 1,800	\$ 32,111
Project Accountant	2%	3	0	\$ 700	\$ 2,380
Project Administration	2%	3	0	\$ 500	\$ 1,700
Project Expeditor	2%	3	0	\$ 1,100	\$ 3,740
TOTALS					\$ 442,831

PROJECT:	Somerville Community Services and Activities Master Plan
BBB REF#	2875
DATE:	October 2021
SUBJECT:	Preferred Schematic Report – Cost Estimate Narrative

List of Options/Alternate Sets

165 Broadway – Cross Street Center/Firehouse (Rehab Only)

- **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)

Somerville Amory (Limited Upgrades Only)

- “Phase 1” Work: Limited to near-term lifecycle replacements of Event Space HVAC
- “Phase 2” Work: Deep Energy Retrofit with existing uses maintained.

45 College Avenue (New Build Only)

- No updates since PDP – there will be no PSR Cost Estimating effort

115 Broadway – East Branch Library (New Build Only)

- No updates since PDP – there will be no PSR Cost Estimating effort

24 Cross Street East – General Insulation Site (Rehab and Partial Rebuild Only)

- No updates since PDP – there will be no PSR Cost Estimating effort

Sustainability & Net Zero Energy – Scope for CSA Overall

Overview

- Projects within the Community Services and Activities (CSA) Master Plan which are selected to move forward into design and construction will be constructed/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 CSA Master Plan 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 buildings within the master plan will be designed to be **all-electric Net Zero Emissions buildings** in which all emissions from energy used in each

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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

- o The targets for site design are to enhance the ecological function of the sites, filter water on-site, minimize urban heat island effect, minimize light pollution, and create a comfortable outdoor microclimate. Site landscaping that promotes sustainable land development and management practices will also be considered.
 - o Reduce existing impervious hardscape surfaces and prioritize the use of light-colored, high-albedo paving materials.
 - o Where landscaping is replanted, the design will use native and drought-resistant vegetation to preserve natural habitat, promote biodiversity, and mitigate the need for irrigation water
 - o 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
 - o Specify locally sourced pavers and hardscape materials
 - o Design exterior lighting to minimize light trespass from the site boundary while providing sufficient lighting for security

Stormwater Management / Water Efficiency

- The site designs 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.
- Each building will include subsurface bio-retention and on-site stormwater collection cisterns sized to manage 100% of the stormwater runoff for the 90th 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.
- Conservation of potable water is an important criterion that will be prioritized by selecting low flow plumbing fixtures and through the reuse of stormwater for flushing (base scope, vs. PLUM Alternate 1).

High Performance Envelope

- A high-performance envelope is critical to meeting the project's energy efficiency and Net Zero Emissions goals. As such, existing buildings with comprehensive retrofits will insulate existing exterior walls to reduce infiltration of outside air and provide a well-insulated envelope. 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 for each building.
- New construction will target Passive House performance requirements with R-35 above grade walls, R-50 roofs, and R-20 slab-on grade floors. Glazing assemblies will be triple-pane with low-

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e coatings and thermally broken frames to achieve a target assembly U-value of 0.20 Btu/hr-ft²-°F. Lastly, the design will achieve a **maximum** infiltration rate of 0.08 CFM/ft² of gross envelope area at 75 Pa through a combination of façade design, air sealing, and envelope commissioning. The infiltration rate will be verified by a whole-building test.

Energy Efficiency

- The renovation of the CSA buildings 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 projects will dramatically reduce the amount of energy spent on heating, cooling, ventilation, domestic hot water, fans, and pumping. Each building will include decoupled mechanical systems served by dedicated outdoor air systems with enthalpy heat recovery. Chilled water and heating hot water will be generated by all-electric heat pumps. Intent is zero onsite fossil fuel combustion. Please refer to the *Mechanical Infrastructure/Systems* section for additional detail about the proposed mechanical systems for each building.
- Renewable energy will be generated through a combination of **roof mounted PV, where feasible, as well as the purchase of off-site renewable energy credits** due to site limitations. Please refer to the *Electrical Infrastructure* section for additional information for each building.
- To guarantee that the design intent of the project is being met, the project's 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, each 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 classrooms, offices, break rooms, and meeting rooms

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- 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 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, when practical, is the foremost strategy to reduce the overall embodied carbon of a project. When specifying new materials for project renovations or new construction, 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 CO₂e/m². This criterion is aligned with the ILFI Zero Carbon certification requirements.

165 Broadway – Cross Street/Firehouse REHAB

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

Hazardous Materials Removal

- Axiom report provided to Dharam via email, 10/19/21

Other Construction Considerations

- None.

Site Improvements (Nitsch & BBB)

Utilities / Civil Infrastructure

- 5,000 gallon storage tank for rainwater reuse system (See Sustainability and Plumbing Sections) including new irrigation lines for establishing landscape plants, investigate reusing rainwater at neighboring park
- All new subgrade drainage infrastructure (pipes, structures, grates)
- New building laterals for water and sewer as noted on plan

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- Softscape buffer to include 75% of landscape areas bioretention with underdrains, including educational signage; bioretention basins shall include 24" soil media and 12" crushed stone reservoir, as noted on plan.
- 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. Vehicular pavement routed to bioretention via trench drains

Landscape & Hardscape (BBB)

- Refer to Nitsch site plan sketch.

Shell Improvements (BBB)

Existing Building Envelope & Roof Upgrades

- Basement foundation slab
 - Replace 30% of Basement Slab-on-Grade
- Below-Grade walls (unfinished basement)
 - Existing rubble foundations
 - Provide perimeter grout injection at all foundation walls, allow for 7 feet of vertical height
 - Provide 3" of low-GWP closed-cell spray-foam insulation; furring at exterior walls to be single 5/8" layer mold-resistant greenboard GWB on 16" OC, 20-ga, 2.5" studs. Set interior face of drywall 5" from interior face of masonry.
 - Allowance for detailing around wood joists/beams to prevent wood decay from reduced temperature/higher moisture content.
- Above-Grade Walls (Floors 1-2)
 - Existing multi-wythe load-bearing brick masonry
 - 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.
 - Allowance for detailing around wood joists/beams to make insulation more continuous and prevent wood decay from insulation
- Windows
 - See elevations for count, dimensions; *exclude four former garage bay openings on first floor south façade (3 - arched) and west façade (1- rectangular); for these see Storefronts*
 - BBB assumes existing windows are aluminum frame-within-frame with some concealed wood still extant beneath from original wood windows
 - Provide frame-within-frame wood window inserts with aluminum cladding (Pella-type):
 - Double-hung sash style, triple-glazed IGUs with modified low-e coating, half-height screens.
 - Provide full perimeter AVB at each window masonry opening; fill void between window frame and M.O. with spray-foam insulation

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- At all windows, allow for restoration of blind stops and sills and replacement of brick mold
- New Storefronts – in former garage bays, three on South Façade, one on west
 - See elevations for dimensions, shapes
 - Allow for aluminum exterior glazing system with two operable sashes per opening
 - Allow for door in center bay, south façade, and door in west façade opening.
- Existing Roof Areas
 - Main Roof:
 - Existing main roof is low-slope membrane roof on tapered insulation with copper gutters along north edge, connecting to two downspouts
 - Allow for removal of existing assembly down to deck, replace assembly in kind with insulation to R-14
 - Also allow for installation of closed-cell low-GWP spray foam insulation between rafters below deck, achieving additional R-24 (height of existing parapet coping does not permit additional rigid insulation above deck beyond what exists)
 - **Allow for 20% replacement of deck**
 - Assume all new flashing at parapet coping
 - See rehab scope for gutters, leaders, downspouts
 - Tower Roof
 - Assume same scope as for Main Roof; **however, include re-pitch to center and add internal drainage leader/overflow**
 - Pitched and hipped asphalt shingle roof with eaves (over 1 story areas at the rear) – Replace with metal roof:
 - Fully remove existing shingle layer(s) down to sheathing and replace with build-up of rigid foam insulation (R-14) and standing seam powder-coated metal roof system; **self-adhered air barrier membrane over the sheathing.**
 - Allow for 20% replacement of deck
 - Allow for installation of low-GWP spray foam insulation (**closed cell with ignition barrier**) between rafters below deck, achieving additional R-24
 - See rehab scope for gutters, leaders, downspouts and flashing

Envelope Restoration / Rehabilitation of Existing

- *All facades*
 - **100% repoint at all facades at brick masonry and granite**
 - General masonry light restoration cleaning, unless otherwise noted
 - See elevations for localized notes and markups for brick cracking and stitching
- *South elevation*
 - Brick Masonry
 - Replace 30 bricks main elevation in misc areas (not including brick stitching); another 10 bricks on tower (misc areas)
 - 20 abandoned anchors to be removed and holes patched

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- Clean soiling on tower from drainage; see elevation (non-hydrochloric or hydrofluoric acid, provide allowance for cleaning trials to identify gentlest and most effective cleaning product(s) and methods).
- Granite base 100% repoint
- Existing wood storefronts/entry in original M.O. arched bay openings:
 - Remove, see notes on new storefront above under Upgrades
- Stone Parapet coping – replace per elevations
- *West elevation*
 - Brick Masonry
 - Replace 40 bricks (10 at rear wing, 10 at intermediate, 20 at front)
 - 80 abandoned anchors on west facade to be removed and holes patched
 - Remove 10 LF of goopy grey sealant above stair egress door (allowance for abatement for potential ACM?)
 - Granite base (present at front wing only) is 100% repoint
 - At intermediate and rear sections, where no granite present, remove outer wythe of brick to height of granite adjacent and provide with new granite matching existing details (see elevations)
 - Faux wood infill – remove, see notes on new storefront above under Upgrades
- *North elevation (both upper and lower stories with setback)*
 - Brick Masonry
 - Brick replacement – replace 20 bricks
 - Allow for 10 SF paint removal
 - Granite Base – sim to west façade, provide new granite base replacing outer brick wythe
 - One-story CMU exterior block wall at NE corner (existing not original)
 - Paint with appropriate paint product
- *East elevation*
 - Brick Masonry
 - Replace 30 bricks
 - Rebuilt top 24 brick courses of exterior chimney and coping/flushing; new cap
 - Allow for 6 SF of paint removal
 - Allow for 20% vegetation removal in front area as indicated on elevation
 - 20 abandoned anchors; remove and patch
 - Granite base (present at front wing only) is 100% repoint
 - At intermediate and rear sections, where no granite present, remove outer wythe of brick to height of granite adjacent and provide with new granite matching existing details
- *Misc Metalwork – all elevations*
 - Existing galvanized metal faux stone string courses (E, S, and W elevations):
 - Replace with copper shaped to existing profile; see elevations
 - Existing painted steel fire escape
 - Scrap prime and pant. Replace concrete pad that fire escape lands on.
 - Existing copper signage

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- Restore existing “18. Fire . Station . 95 .” copper signage; see elevations
- Entries – all elevations
 - See storefront section in Upgrades which includes one entry door in storefront at west elevation, one entry door in storefront at south elevation
 - Other entries to remain - scope:
 - Exit door first floor west elevation, replace metal door and frame and replace all the non-original brick infill within historic M.O. (see elevation)
 - Exit door to fire escape north elevation, replace metal door and frame and assume new galvanized metal lintel
- Gutters, Leaders, Downspouts – all elevations
 - All new gutters and downspouts; powder-coated aluminum. Provide new cast-iron boots from 3’ above grade down into grade to integrate into civil scope for rainwater
 - For basement hatch, repaint Bilco hatch doors and sealant at joints

Core Improvements (Multiple)

Structure Upgrades or Modifications (BBB, with Silman)

- General structural system
 - Overall structural system is unknown but is assumed to be a mixture of wood spanning structure (above grade) to exterior masonry bearing walls and potentially steel spanning members. The ground floor structure is reinforced concrete beams and slabs, and is likely a replacement of what would have been a wood framed floor prior to the changeover to mechanized fire apparatus.
 - There are no anticipated layout changes to the upper levels that appear to warrant structural work.
- New elevator shaft
 - New MRL elevator proposed for tower; allow for removal of one wythe of brick from partial north wall of tower for 2.5 stories, and supplemental steel plate reinforcement
- Basement slab reinforcement
 - There has been some localized damage to the floor slabs and beams, exposing rebar with potential significant section loss; refer to markup provided for allowance. Further investigation and analysis will be required to determine how extensive the material loss is. As the current occupancy load rating requirement is significantly lower than it would have been during its usage as a fire station, it is possible that no reinforcement is required. However, for pricing allow for repairs / reinforcement as indicated in the structural drawing markup.

Life Safety & Accessibility Improvements (BBB)

- Existing wood stairwell Floor 1-2
 - **As indicated in plans, allow for demolition of existing stair and construction of new stair**
 - **New Stair:**
 - **Metal pan stair with resilient tread over concrete inlay**

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- **Painted metal stringer, handrail/guardrail**
- **Provide wall-mounted painted metal handrail**
- ~~Assume full over-surfacing of treads, risers, landings with resilient tread/riser material (e.g. Tarkett stairwell management)~~
- ~~Provide wall-mounted painted steel handrail~~
- ~~At wood guardrail, assume 20% picket replacement and reinforcement of all newel posts~~
 - New lighting, graphics, signage, etc.
 - Construct 1HR rated partitions around existing stairwell
- Existing concrete stairwell B to 1
 - Demolish concrete stair and replace with metal pan stair, handrails, guardrails, etc.

Vertical Conveyance Systems

- See plans for new elevator:
 - Elevator: New roped hydraulic elevator, 2100# each, 100 feet per minute (FPM), front opening with two stops (first and second floors). Hung pit; No landing at basement due to underpinning that would be required. Cab and landing finishes to be selected from 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.
- Air-side system
 - (1) 5,000 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 on roof or in basement, if feasible, with intake areaway or louvered chase.
 - All zones to have decoupled hydronic terminal units, either ducted or cassette style 4-pipe fan coil units depending on individual zoning requirements.
 - Provide desk fans for all multi-occupant work areas
 - Provide CO₂-based demand control ventilation in community spaces and multi-occupant offices
 - Provide occupancy-based ventilation in single-occupant spaces
 - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
 - (1) Medium pressure supply and exhaust duct riser. Plenum return via (1) VAV return box per floor.
 - Assumes no dedicated perimeter heating system
- Water-side system – hot water (110F) and chilled water (44F) distribution

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- Air-to-water heat pump
 - 4-pipe ASHP consisting of (3) 30 ton (nominal) modules, similar to Multistack ARA-30.
 - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX
 - Provide (2) 150 gpm plate and frame HX
 - Provide (2) 300 gal buffer tanks

Primary secondary pumping with lead and standby pump per loop

- Provide (2) 3 hp HW primary pumps,
- Provide (2) 5 hp HW secondary pumps
- Provide (2) 3 hp CHW primary pumps
- Provide (2) 5 hp CHW secondary pumps
- Heat pumps shall be located on roof with hydronic pumps and accessories located in basement mechanical room or mechanical doghouse.

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

- Electrical:
 - Provide 500 KVA pad mounted utility transformer located on the site. Transformer shall feed 800A 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. Emergency lighting on battery.
- 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.

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- Renewable energy:
 - Provide infrastructure to support 40 kW on-site PV array, consisting roof panels. Provide central inverters with DC optimizers. 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**

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.
- New 2 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 5kW with 50 gallon tanks)
- 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, with BR+A)

- TECH/COMM
 - Combined IDF/MDF in basement with (2) 4" conduits
 - Wiring Assumption: Cat6
 - Data Drops/Wireless – allow on SF basis for office and community use
 - Other Communications: Phone drop for elevator cab
- Security
 - Provide Siemens-type or similar Keycard Access Control System for building entries, IDF/MDF rooms
 - Provide ethernet surveillance camera drops at each entry door; video intercom/remote buzzer at main entry

Fit-Out (BBB)

General Fit-Out Notes

- Walls
 - Typical partition construction is 5/8" GWB on metal stud
- Ceilings
 - Provide rated GWB ceiling at underside of second floor and roof joist assemblies; all systems go below this layer and are either exposed (and painted out) or concealed behind ACT ceiling
- Other Finish Notes:

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- \$ for environmental graphics, slightly nicer details at entry lobby and key common spaces
- Allow for room-darkening shading at all windows

Fit Out Space Types and Scope Allowances

- TOILET ROOMS
 - Typical office/institutional (high durability) fixtures and finishes
- PROGRAM/COMMUNITY SPACE (on both levels)
 - Engineered wood flooring with high durability finish
 - Hard ceiling
- FOOD PANTRY
 - Linoleum tile product for flooring
 - Food service-level ACT ceiling with integrated systems
- OFFICES/COUNSELING ROOMS/TBD (all remaining space on second floor)
 - Carpet tile and ACT Ceiling
- LOBBIES/CORRIDORS/CIRCULATION
 - Flooring: precast terrazzo tile with base
 - Lighting: Decorative pendants and decorative wall lighting, also allow for track monopoints along one side of walls
- BOH/STORAGE/MECH (As indicated)
- Unfinished basement: sealed concrete slab, exposed systems, no other finishes apart from exterior furring

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Armory – Surgical Capital Improvements

Existing Conditions, Demolition, & Logistics (BBB)

Hazardous Materials Removal

- Axiom report provided to Dharam via email, 10/19/21

Other Construction Considerations

- None.

Site Improvements (Nitsch & BBB)

Utilities / Civil / Landscape & Hardscape – Phase 2

- **PHASE 1:** No work.
- **PHASE 2:**
 - 12,000 gallon storage tank for rainwater reuse system (See Sustainability and Plumbing Sections) including new irrigation lines for establishing landscape plants
 - All new subgrade drainage infrastructure (pipes, structures, grates) including parking lot
 - New building laterals for water and sewer
 - 50% of landscape areas bioretention with underdrains, including educational signage; bioretention basins shall include 24" soil media and 12" crushed stone reservoir, as noted on plan.
 - Non-vehicular pavement to be permeable pavers or 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.
 - Remove/replace entire parking area (15,000 sf / approx. 52 spaces) and driveway
 - Convert 10-20% of pavement area to landscape (or bioretention landscape) with shade trees; vehicular pavement routed to bioretention
 - Along Highland Ave sidewalk, regrade landscape strip to bring flush with pavement

Landscape & Hardscape (Nitsch/BBB)

- **PHASE 1:** No work.
- **PHASE 2:** Replace hardscape (parking area and access drives) per Site Improvements above. See Nitsch's site plan sketch.

Shell Improvements (BBB)

Existing Building Envelope & Roof Upgrades

- **PHASE 2:** Below-Grade walls
 - Provide 3" of 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 interior face of drywall 5" from interior face of masonry.
 - Allowance for detailing around wood joists/beams to make insulation more continuous and prevent wood decay from insulation
- **PHASE 2:** Above-Grade Walls (Floors 1-2)
 - Existing multi-wythe load-bearing brick masonry

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- 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
- Windows **PHASES AS INDICATED:**
 - See elevations for count, dimensions
 - **PHASE 1:** Scrape, prime and paint existing windows. Allow for hardware/operations adjustment to ensure windows open and close properly
 - **PHASE 2:** Provide frame-within-frame wood window inserts with aluminum cladding (Pella-type):
 - Double-hung sash style, triple-glazed IGUs with modified low-e coating, half-height screens.
 - Provide full perimeter AVB at each window masonry opening; fill void between window frame and M.O. with spray-foam insulation
 - At all windows, allow for restoration of blind stops
 - All window sills need restoration work with epoxy, apart from 20% which need full replacement
- Roof Areas **PHASES AS INDICATED:**
 - Existing roof areas consist of:
 - Pitched roofs with asphalt shingles, eaves, and aluminum gutters
 - Low-slope membrane roofs with tapered insulation (roof additions)
 - Occupiable roof terraces at third floor (circa 2009)
 - **Phase 1** Roof Scope
 - Fascia and soffit work/gutter work as noted on drawings
 - **Phase 2** Roof Scope
 - Replace 100% of asphalt shingled roof areas (allow for associated work at drip edges, etc.)
 - Replace 100% of membrane roofs; surface only, retain insulation (if found to be dry and serviceable) and internal drainage

Envelope Restoration / Rehabilitation of Existing

- *All facades*
 - **See elevations sheet for notes on façade rehabilitation**
 - **Areas noted for re-stucco to include new coping along tops of walls (BOD: pre-patinaed copper or ALT: pre-finished powder-coated aluminum with copper patina color)**
 - Existing condition is stucco with paint coating over multi-wythe brick masonry bearing walls
 - ***Current investigations ongoing to confirm (1) appropriateness of existing coating and its breathability for masonry substrate; and (2) cause of yellow staining on stucco, particularly on south facade. Overall stucco coating***

removal or recoating is currently excluded from this estimate, as is global parapet cap replacement, until more information is gathered.

Core Improvements (Multiple)

Structure Upgrades or Modifications (BBB, with Silman)

- No known issues to be addressed.

Life Safety & Accessibility Improvements (BBB)

- Immediate-term life safety issues are noted in the Existing Conditions Report and should be addressed in the short term. They are outside the scope of this pricing exercise.

Vertical Conveyance Systems

- No new systems proposed.

Mechanical Infrastructure/Systems (BR+A)

- Scope below defined for phased approach. Phase 1 will convert performance space to all-electric. Phase 2 will expand to whole building all-electric.
- **PHASE 1:** install modular air-to-water heat pumps and convert performance hall
 - Replace (10) existing single-zone DX/gas-fired carrier units serving performance space with equal quantity of high static hydronic 4-pipe blower coil units. Re-use existing ductwork. Add discharge sound attenuators in existing ductwork. Control to multiple zones within space. Provide condensate sump and pump.
 - Install (1) 5,000 cfm DOAS. Unit to include dual enthalpy + desiccant wheel heat recovery similar to Semco Pinnacle. Components include MERV-8/MERV-14 combination filter rack, supply and exhaust ECM fan arrays, glycol preheat coil, chilled water cooling coil, supply and exhaust sound attenuators (pending acoustical analysis). Provide bypass dampers for cooling coil. Unit to be located at grade behind building, displacing existing condensing units in that location. Duct supply and exhaust to performance space to match existing.
 - Install modular 4-pipe air-to-water heat pump. Initial condition is (3) 30 ton (nominal) Multistack ARA-30.
 - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX. Provide (2) plate and frame HX. Provide (2) buffer tanks
 - Primary secondary pumping with lead and standby pump per loop
 - Provide (2) primary HWP
 - Provide (2) secondary HWP
 - Provide (2) primary CHWP
 - Provide (2) secondary CHWP
 - Heat pumps shall be located at grade, displacing existing condensing units. Pumps and accessories located in basement mechanical room.
 - Size headers and pumps for future expansion of additional modules.
- **PHASE 2 (LONG-TERM):** Extend chilled water infrastructure throughout existing building.
 - Add (3) additional 30 ton (nominal) ARA-30 heat pump modules

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- Replace existing DX units throughout building in kind with 4-pipe hydronic fan coil units or blower coil units. Decommission perimeter heating system, assuming Deep Energy Retrofit of envelope.
- Extend chilled water piping throughout building.
- Connect existing hot water piping to heat pump system. Decommission boiler(s).
- Install distributed ERVs in all tenant areas similar to Zehnder or Renewaire

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

- Electrical:
 - **PHASE 1:** Existing electrical infrastructure to remain. Assumes Phase 1 does not exceed existing transformer and switch capacity.
 - **PHASE 2:** Increase service capacity and main switchgear to 2,500A to support additional electrification
 - **ALTERNATE:**
 - Phase 1: Replace existing 208V switchgear with 480V to support new mechanical systems. Upgrade to 1,200A service. Back-feed existing 208V system.
 - Phase 2: no additional work needed
- Fire alarm:
 - Assumes existing to remain
- Renewable energy
 - **Phase 1** - Provide infrastructure to support 40 kW on-site PV array, consisting roof panels. Provide central inverters with DC optimizers. The panel board breaker fed from the PV array shall be individually metered.
 - **Phase 2** - 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)

- No scope currently proposed.

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

- TECH/COMM
 - No scope currently proposed.
- Security
 - No scope currently proposed.

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45 College Avenue – NEW BUILD

- No updates since August – there will be no second Cost Estimating effort

115 Broadway – Library/Residential – NEW BUILD

- No updates since August – there will be no second Cost Estimating effort

24 Cross Street East (Gen. Insulation) REHAB Plus NEW Construction At West Wing

- Building/project omitted from scope - there is to be no second Cost Estimating effort

PROJECT:	Somerville Community Services and Activities Master Plan
BBB REF#	2875
DATE:	Aug 2021
SUBJECT:	Preliminary Design Program – Cost Estimate Narrative

List of Options/Alternate Sets

45 College Avenue (New Build Only)

- Deduct-Alt #1: Conventional steel superstructure in place of CLT heavy timber superstructure.

115 Broadway – East Branch Library (New Build Only)

- Add-Alt #1: CLT timber superstructure ILO Steel & Wood hybrid podium
- Deduct-Alt #2: Three stories only (assume no setbacks; roof is still mech equip and PV array)

24 Cross Street East – General Insulation Site (Rehab and Partial Rebuild Only)

- Add-Alt #1: additional structural upgrades (sistering framing, 4 existing steel columns and footings to be replaced, reinforcing of existing steel beams at basement ceiling); see narrative

Sustainability & Net Zero Energy – Scope for CSA Overall

Overview

- The projects within the Community Services and Activities (CSA) Master Plan 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 CSA Master Plan 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 buildings within the master plan will be designed to be **all-electric Net Zero Emissions buildings** in which all emissions from energy used in each 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

- o The targets for site design are to enhance the ecological function of the sites, infiltrate water on-site, minimize urban heat island effect, minimize light pollution, and create a comfortable outdoor microclimate. Site landscaping that promotes sustainable land development and management practices will also be considered.

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- Reduce existing impervious hardscape surfaces and prioritize the use of light-colored, high-albedo paving materials.
- Where landscaping is replanted, the design will 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 designs 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.
- Each building will include subsurface bio-retention and on-site stormwater collection cisterns sized to manage 100% of the stormwater runoff for the 90th 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.
- 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, existing buildings with comprehensive retrofits will insulate existing exterior walls to reduce infiltration of outside air and provide a well-insulated envelope. 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 for each building.
- New construction will target Passive House performance requirements with R-35 above grade walls, R-50 roofs, and R-20 slab-on grade floors. Glazing assemblies will be triple-pane with low-e coatings and thermally broken frames to achieve a target assembly U-value of 0.20 Btu/hr-ft²-°F. Lastly, the design will achieve an infiltration rate of 0.08 CFM/ft² of gross envelope area at 75 Pa through a combination of façade design, air sealing, and envelope commissioning. The infiltration rate will be verified by a whole-building test.

Energy Efficiency

- The renovation of the CSA buildings 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 projects will dramatically reduce the amount of energy spent on heating, cooling, ventilation, domestic hot

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water, fans, and pumping. Each building will include decoupled mechanical systems served by dedicated outdoor air systems with enthalpy heat recovery. Chilled water and heating hot water will be generated by all-electric heat pumps. Intent is zero onsite fossil fuel combustion. Please refer to the *Mechanical Infrastructure/Systems* section for additional detail about the proposed mechanical systems for each building.

- Renewable energy will be generated through a combination of **roof mounted PV, where feasible, as well as the purchase of off-site renewable energy credits** due to site limitations. Please refer to the *Electrical Infrastructure* section for additional information for each building.
- To guarantee that the design intent of the project is being met, the project's 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, each 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 classrooms, 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

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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 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, when practical, is the foremost strategy to reduce the overall embodied carbon of a project. When specifying new materials for project renovations or new construction, 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 CO₂e/m². This criterion is aligned with the ILFI Zero Carbon certification requirements.

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45 College Avenue – NEW BUILD

Existing Conditions, Demolition, & Logistics (BBB)

Hazardous Materials Removal

- No information. No sampling has yet been conducted as part of the City's Building Master Plan.

Other Construction Considerations

- None.

Site Improvements (Nitsch & BBB)

Utilities / Civil Infrastructure

- 5,500 gallon detention tank for stormwater detention and rainwater reuse system (See Sustainability and Plumbing Sections) incl. new irrigation lines for establishing landscape plants
- All new subgrade drainage infrastructure (pipes, structures, grates)
- New building laterals for water and sewer
- 50% of landscape areas bioretention with underdrains, including educational signage
- Non-vehicular pavement to be permeable pavers
- 50% of new rooftop area to be intensive green roof (assume 12" media depth)

Landscape & Hardscape (BBB)

- Refer to floor plan for site improvements

Shell (BBB)

Shell: New Build

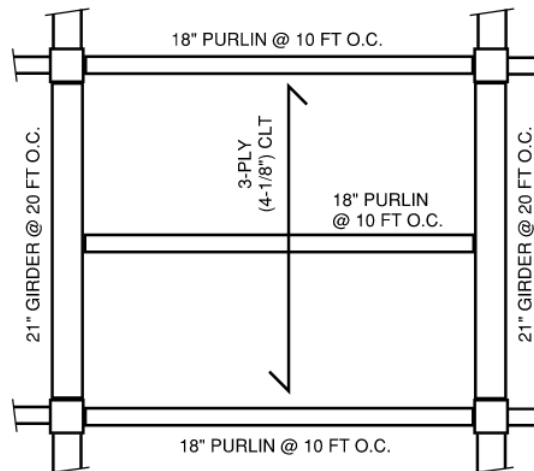
- Exterior Enclosure– below-grade
 - Concrete foundation walls with closed-cell SPF insulation; see Core Description; Consider Nexcem-type R-21 system for low embodied carbon/material toxicity.
- Exterior Enclosure – above grade
 - Assume first story is 80% glazing, floors above 40% glazing with metal panel
 - Assume superior insulation and air-tightness values at envelope to meet Passive House standard, per Sustainability goals
- Roof
 - EPDM low-slope membrane roof on tapered insulation with interior area drains/leaders;
 - Roof will carry some combination of air-source heat pump condensers and photovoltaics;
 - See Electrical narrative for size of photovoltaic array
 - Fourth floor includes amenity roof terrace with combination of pavers and intensive green roof assembly
- Entry Systems
 - Integrated into exterior glazing system; ADOs at all entry doors

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Core Improvements (Multiple)

Structure Upgrades or Modifications (BBB, with Silman)

- General structural system – **Base**
 - It is anticipated that the new building will be a heavy timber frame construction supporting cross laminated timber (CLT) floors. For pricing allow for the following:
 - 20 foot o.c. heavy timber column grid supporting primary glu-laminated timber girders. (see sketch)
 - Glu-laminated timber purlins spanning to columns / girders (see sketch)
 - 3-ply CLT floor plate spanning over purlins (see sketch)
 - For pricing assume a central cast-in-place concrete shear core around stairs / elevator core from basement to roof.



- General structural system - **Deduct Alternate 1**
 - As an alternate replace heavy timber frame and central shear core noted above with a standard steel frame construction supporting concrete on metal deck floors. For pricing allow for the following:
 - 12 psf of steel framing – includes floor members, columns and braced frame construction.
 - 3-¼" light-weight concrete on 2" 18 gage composite floor deck (5-¼" total slab thickness) for all floors.
 - 4-½" normal weight concrete on 2" 18 gage composite floor deck (6-½" total slab thickness) at the roof.
- Foundations (for both options) have been assumed to be standard spread footings, and the basement slab has been assumed to be a standard 5" normal weight concrete slab on grade reinforced with welded wire fabric.
- Foundation walls (for both options) will be standard two-sided formed cast-in-place concrete walls, reinforced with 10 psf of reinforcing steel.

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Life Safety & Accessibility Features (BBB)

- For rear egress stair, assume typical finish egress stairs, painted metal pan stairs with cast infill concrete treads, painted metal wall mounted handrails
- For main egress stair, assume higher level of finish, e.g. precast terrazzo stair treads

Vertical Conveyance Systems

- See plans for new elevator:
 - Elevator: New MRL elevator, e.g. Otis Gen2 MRL or equal; 3500# each, 200 feet per minute (FPM), front openings 5 landings total. Cab and landing finishes to be selected from 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.
- Air-side system
 - For levels 1 and 2 (public program), provide (1) 3,500 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 basement mechanical room with ducted inlet chase and exhaust areaway.
 - For levels 3 and 4 (leasable floors), provide (2) distributed ERVs per floor, 750 cfm each, similar to Tempeff RGSP-1800. Units shall be ducted to exterior louvers or roof goosenecks. Units shall be located in mechanical closets.
 - Provide (1) 300 cfm kitchen exhaust fan
 - All zones to have decoupled hydronic terminal units, either ducted or cassette style 4-pipe fan coil units depending on individual zoning requirements.
 - Provide desk fans for all multi-occupant work areas
 - Provide CO₂-based demand control ventilation in community spaces and multi-occupant offices
 - Provide occupancy-based ventilation in single-occupant spaces
 - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
 - Assumes no dedicated perimeter heating system
- Water-side systems – hot water (110F) and chilled water (44F) distribution
 - Air-to-water heat pump
 - 4-pipe ASHP consisting of (4) 30 ton (nominal) modules, similar to Multistack ARA-30.
 - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX

- Primary secondary pumping with lead and standby pump per loop
- Heat pumps shall be located on roof with hydronic pumps and accessories located in basement mechanical room or mechanical doghouse.

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

- Electrical:
 - Provide 750 KVA pad mounted utility transformer located on the site. Transformer shall feed 1200A 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 capability to meter level 3 and 4 tenants separately.
 - 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 connection for roll-up generator and manual transfer switch.
- 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 60 kW on-site PV array, consisting roof panels, canopies, window awnings, and site-mounted arrays. Provide central inverters with DC optimizers. 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**

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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 5kW with 50 gallon tanks for levels 1 and 2 program; point-of-use electric water heaters for lavatory sinks on levels 3 and 4.
- 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.
- Greywater system: Separate sanitary and waste pipe systems dividing toilet waste and hand washing sink waste to different systems. Greywater treated onsite and used for irrigation only.

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

- TECH/COMM
 - Combined IDF/MDF in basement with (2) 4" conduits
 - IDF: One closet on upper floor
 - Wiring Assumption: Cat6
 - Data Drops and Wireless: Typ office allowance
 - Other Communications: Phone drop for elevator cab
- Security
 - Provide Siemens-type or similar Keycard Access Control System for building entries, IDF/MDF rooms
 - Provide ethernet surveillance camera drops at each entry door; video intercom/remote buzzer at main entry
 - Intrusion detection system TBD

Fit-Out (BBB)

General Fit-Out Notes

- Walls
 - Typical partition construction is 5/8" GWB on metal stud
- Ceilings
 - Open office areas are to be exposed ceiling **clouds** with CLT structure, assume higher finish for MEP services in exposed ceiling areas; for DEDUCT ALT conventional steel structure, assume ACT ceiling (no steel exposed).
 - Higher-finish ACT ceilings with integrated services in other program areas
- Other Finish Notes:
 - \$ for environmental graphics, slightly nicer details at entry lobby and key common spaces
 - Allow for room-darkening shading at all meeting and multi-purpose rooms; allow for motorized solar shading systems at windows in open office areas tied into Lutron-type daylighting system

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Fit Out Space Types and Scope Allowances

- TOILET ROOMS
 - Typical office level of finish
- MULTI-PURPOSE COMMUNITY ROOMS AND SUPPORT SPACES
 - Exposed ceiling with CLT structure visible, assume higher finish for MEP services and ceiling clouds; same for Deduct Alt
 - Allow for engineered wood floor with high durability coating
 - See plan notes for flexible partition system locations; assume higher quality acoustic/aesthetics
 - As per plans, kitchen spaces are warming kitchens only, assume built-ins and basic level of equipment.
- OFFICES
 - For tenant office space, assume all finishes provided but no built-ins
 - Exposed ceiling (see ceiling notes)
 - Carpet tile flooring
- LOBBIES/CORRIDORS/CIRCULATION
 - Flooring: precast terrazzo tile and base
 - Lighting: Nicer (medium)
- BOH/STORAGE/MECH (As indicated)
 - Floors: At basement level, floor finish to be sealed concrete foundation slab; on upper floors, provide sheet-good resilient floor
 - Exposed ceiling structure

BEYER BLINDER BELLE

115 Broadway – East Branch Library/Residential – NEW BUILD

Existing Conditions, Demolition, & Logistics (BBB)

Hazardous Materials Removal

- No information. No sampling has yet been conducted as part of the City's Building Master Plan.

Other Construction Considerations

- None.

Site Improvements (Nitsch & BBB)

Utilities / Civil Infrastructure

- 5,500 gallon detention tank for stormwater detention and rainwater reuse system (See Sustainability and Plumbing Sections) incl. new irrigation lines for establishing landscape plants
- All new subgrade drainage infrastructure (pipes, structures, grates)
- New building laterals for water and sewer
- 50% of landscape areas bioretention with underdrains, including educational signage
- Non-vehicular pavement to be permeable pavers
- 50% of new rooftop area to be intensive green roof (assume 12" media depth)

Landscape & Hardscape (BBB)

- Refer to floor plan for site improvements

Shell (BBB)

Shell: New Build

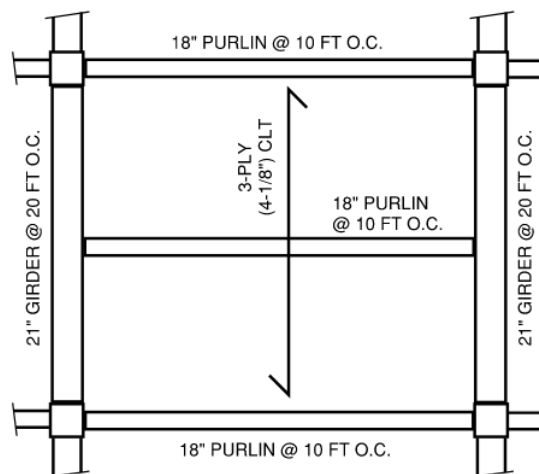
- Exterior Enclosure– below-grade
 - Concrete foundation walls with closed-cell SPF insulation; see Core Description
 - Consider Nexcem-type R-21 system for low embodied carbon/material toxicity.
- Exterior Enclosure – above grade
 - Assume first story is 80% glazing, floors above 40% glazing with metal panel
 - Assume superior insulation and air-tightness values at envelope to meet Passive House standard, per Sustainability goals
- Roof
 - EPDM low-slope membrane roof on tapered insulation with interior area drains/leaders;
 - Roof will carry some combination of air-source heat pump condensers and photovoltaics;
 - See Electrical narrative for size of photovoltaic array
 - Fourth floor includes amenity roof terrace with combination of pavers and green roof assembly, 40% green roof, 60% pedestal pavers
- Entry Systems
 - Integrated into exterior glazing system; ADOs at all entry doors

BEYER BLINDER BELLE

Core Improvements (Multiple)

Structure Upgrades or Modifications (BBB, with Silman)

- General structural system - **Base**
 - Steel and wood hybrid podium structure as follows:
 - 15 psf of steel framing – includes floor members and columns from basement to level 2 podium.
 - 3-¼" light-weight concrete on 2" 18 gage composite floor deck (5-¼" total slab thickness) at ground floor over basement.
 - 4-½" normal weight concrete on 2" 18 gage composite floor deck (6-½" total slab thickness) at Level 2 podium
 - Wood bearing wall structure supporting wood truss-joists floors / roof plates above the podium level.
 - Lateral cores around stairs / elevators to consist of the following:
 - Cast in place concrete from basement to podium
 - 8" concrete masonry above podium
- General structural system – **Add-Alternate**
 - As an alternate replace steel and wood hybrid podium above with heavy timber frame and central shear core; timber frame construction supporting cross laminated timber (CLT) floors. For pricing allow for the following:
 - 20 foot o.c. heavy timber column grid supporting primary glu-laminated timber girders. (see sketch)
 - Glu-laminated timber purlins spanning to columns / girders (see sketch)
 - 3-ply CLT floor plate spanning over purlins (see sketch)
 - For pricing assume a central cast-in-place concrete shear core around stairs / elevator core from basement to roof.



- Foundations (for both options) have been assumed to be standard spread footings, and the basement slab has been assumed to be a standard 5" normal weight concrete slab on grade reinforced with welded wire fabric.

BEYER BLINDER BELLE

- Foundation walls (for both options) will be standard two-sided formed cast-in-place concrete walls, reinforced with 10 psf of reinforcing steel.

Life Safety & Accessibility Features (BBB)

- Assume typical finish egress stairs, painted metal pan stairs with cast infill concrete treads, painted metal wall mounted handrails

Vertical Conveyance Systems

- See plans for new elevator:
 - Elevator: New MRL elevator, e.g. Otis Gen2 MRL or equal; 3500# each, 200 feet per minute (FPM), front openings 5 landings total. Cab and landing finishes to be selected from 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.
- Air-side system
 - For level 1 public program, provide (1) 3,000 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), DX cooling with hot gas reheat, supply and exhaust sound attenuators (pending acoustical analysis). Provide bypass dampers for DX coil. Unit shall be located on the roof or at grade behind building on dunnage.
 - For levels 2 and 3 (residential), provide (1) ERV per unit, similar to Zehnder ComfoAir. Duct supply to bedroom and living area (or living area only for studios), and exhaust from bathroom and kitchen area.
 - All zones to have VRF heating and cooling, using a combination of ducted units and cassettes as appropriate by space type.
 - Provide multi-zone VRF system capable of simultaneous heating and cooling and low-ambient heating
 - Provide one VRF system per floor. VRF outdoor units located at grade. Provide snow stand and wind guards.
 - Duct ventilation separately to spaces or to knock-out in cassettes.
 - Provide desk fans for all multi-occupant work areas
 - Provide CO2-based demand control ventilation in main library and multi-occupant offices
 - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
 - Assumes no dedicated perimeter heating system
- Water-side systems – n/a (VRF)

BEYER BLINDER BELLE

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

- Electrical:
 - Provide 750 KVA pad mounted utility transformer located on the site. Transformer shall feed 1200A 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 capability to meter each residential unit separately.
 - 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 to serve library receptacle loads.
 - Provide a 100A panel in each residential unit to serve receptacles, appliances, and VRF indoor unit.
 - 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.
- 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 60 kW on-site PV array, consisting roof panels, canopies, window awnings, and site-mounted arrays. Provide central inverters with DC optimizers. 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**

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.

BEYER BLINDER BELLE

- New 3 inch water service to the building complete with backflow preventer and meter for building and separate backflow for irrigation.
- Water heaters: Air source heat pump using CO2 refrigerant with (3) 150 gallon storage tanks in cascading arrangement. Point-of-use electric water heaters for library lavatories.
- 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.
- Greywater system: Separate sanitary and waste pipe systems dividing toilet waste and hand washing sink waste to different systems. Greywater treated onsite and used for irrigation only.

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

- TECH/COMM
 - Combined IDF/MDF in basement with (2) 4" conduits
 - IDF: One closet on upper floor
 - Wiring Assumption: Cat6
 - Data Drops and Wireless: Typ office allowance
 - Other Communications: Phone drop for elevator cab
- Security
 - Provide Siemens-type or similar Keycard Access Control System for building entries, IDF/MDF rooms
 - Provide ethernet surveillance camera drops at each entry door; video intercom/remote buzzer at main entry
 - Intrusion detection system TBD

Fit-Out (BBB)

General Fit-Out Notes

- Walls
 - Typical partition construction is 5/8" GWB on metal stud
- Ceilings
 - Open office areas are to be exposed ceiling with CLT structure, assume higher finish for MEP services in exposed ceiling areas; for DEDUCT ALT conventional steel structure, assume ACT ceiling (no steel exposed).
 - Higher-finish ACT ceilings with integrated services in other program areas
- Other Finish Notes:
 - \$ for environmental graphics, slightly nicer details at entry lobby and key common spaces
 - Allow for room-darkening shading at all meeting and multi-purpose rooms; allow for motorized solar shading systems at windows in open office areas tied into Lutron-type daylighting system

Fit Out Space Types and Scope Allowances

- TOILET ROOMS
 - Typical office level of finish

BEYER BLINDER BELLE

- MULTI-PURPOSE COMMUNITY ROOMS AND SUPPORT SPACES
 - Exposed ceiling with CLT structure visible, assume higher finish for MEP services and ceiling clouds; same for Deduct Alt
 - Allow for engineered wood floor with high durability coating
 - See plan notes for flexible partition system locations; assume higher quality acoustic/aesthetics
 - As per plans, kitchen spaces are warming kitchens only, assume built-ins and basic level of equipment.
- TENANT RESIDENTIAL
 - Market assumption is mid-level, leased units.
- LOBBIES/CORRIDORS/CIRCULATION
 - Flooring: precast terrazzo tile and base
 - Lighting: Nicer (medium)
- BOH/STORAGE/MECH (As indicated)
 - Floors: At basement level, floor finish to be sealed concrete foundation slab; on upper floors, provide sheet-good resilient floor
 - Exposed ceiling structure

24 Cross Street East REHAB Plus New Construction Addition

Existing Conditions, Demolition, & Logistics (BBB)

Hazardous Materials Removal

- No information. No sampling has yet been conducted as part of the City's Building Master Plan.

Other Construction Considerations

- Best access for west wing demolition is from rear, across abutting neighbor's parking lot

Site Improvements (Nitsch & BBB)

Utilities / Civil Infrastructure

- 5,000 gallon detention tank for stormwater detention and rainwater reuse system (See Sustainability and Plumbing Sections)
- All new subgrade drainage infrastructure (pipes, structures, grates)
- New building laterals for water and sewer
- 50% of landscape areas bioretention with underdrains, including educational signage
- Non-vehicular pavement to be permeable pavers

Landscape & Hardscape (BBB)

- Refer to floor plan for site improvements

Shell Improvements (BBB)

*NOTE: Brick masonry portion of existing building to remain; wood-framed portion to be demolished and replaced with 3-story New Build addition, including foundations. See Exploratory plans and elevations for extents

Existing Building Envelope & Roof Upgrades – EXISTING PORTION OF BUILDING TO REMAIN

- Below-Grade walls (unfinished basement)
 - Existing ashlar/rubble foundation walls
 - Provide perimeter grout injection at all foundation walls, allow for 4 feet of vertical height; see above-grade for thermal improvements
- Basement foundation slab
 - Replace 100% slab on grade of building portion to remain
- Above-Grade Walls (Essentially start at basement; top out at existing masonry to remain)
 - Existing multi-wythe load-bearing brick masonry above ashlar foundation
 - 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.
 - Allowance for detailing around wood joists/beams to make insulation more continuous and prevent wood decay from insulation
- Windows
 - See elevations for count, size/dimensions

BEYER BLINDER BELLE

- Allow for M.O. reconstruction (full depth of multi-wythe brick masonry wall) for 50% of linear length of openings
- Provide exterior steel and glass enclosure system in existing openings, some of which are monumental; see elevations
 - Triple-glazed system to be thermally broken; no operability required
- Existing Roof Areas
 - Pitched asphalt shingle roof with multiple planes – Replace with metal roof
 - Fully remove existing shingle layer(s) down to sheathing and replace with build-up of rigid foam insulation (R-14) and standing seam powder-coated metal roof system
 - Allow for 20% replacement of deck
 - Allow for installation of closed-cell low-GWP spray foam insulation between rafters below deck, achieving additional R-24
 - See rehab scope for gutters, leaders, downspouts and flashing
 - Low-slope roofs at two brick masonry towers, east façade
 - 100% new assembly including metal deck to bear on existing masonry, rigid insulation to R-38, and EPDM roofing with internal drains and leaders; scuppers

Envelope Restoration / Rehabilitation of Existing Building

- *Fencing*
 - Provide new ornamental painted metal fence to six foot height, full width of lot at rear
- *All facades*
 - Brick
 - 100% repoint of all brick
 - Allow for brick unit replacement equivalent to 5% of all brick units on the existing wall planes (inclusive of new bricks required for brick stitching) in a number of discrete areas; see elevations
 - Stonework
 - 100% repoint of all stonework
 - Stonework comprises ashlar foundation, window sills and surrounds, limestone water table at stone ashlar/brick interface, buttress drip edges/caps
 - General masonry light to medium restoration cleaning, unless otherwise noted
- *Entry Systems*
 - See description above under Upgrades>Windows; only one entry returning to existing building: new pair of doors integrated into storefront system infill at arched south tower opening, east facade
- *Chimneys*
 - Two existing chimneys to be cut down to match elevation at top of adjacent masonry; see elevations and general masonry notes.
- *Gutters, Leaders, Downspouts*
 - All new gutters and downspouts; copper. Provide new cast-iron boots from 2' above grade down into grade to integrate into civil scope for rainwater

BEYER BLINDER BELLE

Shell: New Build

- Exterior Enclosure– below-grade
 - Concrete foundation walls with closed-cell SPF insulation; see Core Description
 - Consider Nexcem-type R-21 system for low embodied carbon/material toxicity.
- Exterior Enclosure – above grade
 - Assume first story is 80% glazing, floors above 40% glazing with metal panel
 - Assume superior insulation and air-tightness values at envelope to meet Passive House standard, per Sustainability goals
- Roof
 - EPDM low-slope membrane roof on tapered insulation with interior area drains/leaders;
 - Roof will carry some combination of air-source heat pump condensers and photovoltaics;
 - See Electrical narrative for size of photovoltaic array
 - Fourth floor includes amenity roof terrace with combination of pavers and intensive green roof assembly
- Entry Systems
 - Integrated into exterior glazing system; ADOs at all entry doors

Core Improvements – Existing Building and New Addition

Structure Upgrades or Modifications (BBB, with Silman)

- General structural system Existing to Remain – masonry exterior bearing walls with wood joist floor construction (first floor) supported on exterior foundation walls and two lines of interior bearing lines (steel beams / posts). For pricing assume the following the following as the base condition:
 - Replacement of approximately 500 square feet of wood joist structure and subfloor at the northeast and southeast corners of the ground floor.
 - Allow for 500 square of roof rafter sistering / replacement.
 - As an add alternate allow for the following structural upgrades: **ADD-ALTERNATE 1**
 - 2,600 square feet of sistered framing to existing joists
 - Up to (4) existing steel columns and concrete footings to be replaced.
 - Reinforcing of existing east-west steel beams supporting 1st floor structure with new steel plates / WT sections – approximately 50 linear feet
- New Construction (three stories plus basement)
 - Assume new cast-in-place concrete foundations walls and slab on grade. New footings to align with existing foundations to avoid underpinning.
 - Structure above grade to consist of 12 psf of steel framing per floor / roof supporting 3-¼" light weight concrete slabs on 2" metal deck. Steel tonnage includes all floor beams, girders and columns.
 - Proposed stair and elevator shafts to be constructed out of 8" concrete masonry walls.
 - It is assumed buildings will be tied together laterally, and that a construction joint will not be required.

BEYER BLINDER BELLE

Life Safety & Accessibility Improvements (BBB)

- Existing stairwells – none to remain
- For rear egress stair, assume typical finish egress stairs, painted metal pan stairs with cast infill concrete treads, painted metal wall mounted handrails
- For main egress stair and communicating stair between entry grade and first floor, assume higher level of finish, e.g. precast terrazzo stair treads

Vertical Conveyance Systems

- See plans for new elevator:
 - Elevator: New MRL elevator, e.g. Otis Gen2 MRL or equal; 3500# each, 200 feet per minute (FPM), front-and-back openings (5 landings total). Cab and landing finishes to be selected from manufacturer's standard finishes.

Mechanical Infrastructure/Systems (BR+A)

- NOTE: All existing MEP systems in General Insulation building are decommissioned and beyond their service life. Scope includes all new MEP systems regardless of rehab vs new build. Rehab scenario assumes single-tenant occupancy by the City.
- 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.
- Air-side system
 - (1) 4,000 cfm semi-custom 100% outside air AHU serving all spaces other than community room. Unit to include 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 on roof or in basement, if feasible, with intake areaway or louvered chase.
 - (1) 2,000 cfm semi-custom 100% outside air AHU, similar to above, serving community space.
 - All zones to have decoupled hydronic terminal units, either ducted or cassette style 4-pipe fan coil units depending on individual zoning requirements. Utilize 4-pipe blower coil unit for community space if necessary based on load.
 - Provide desk fans for all multi-occupant work areas
 - Provide CO₂-based demand control ventilation in community spaces and multi-occupant offices
 - Provide occupancy-based ventilation in single-occupant spaces
 - Provide window sensors with HVAC interlock and dewpoint sensor for all operable windows
 - (1) Medium pressure supply and exhaust duct riser. Plenum return via (1) VAV return box per floor.

BEYER BLINDER BELLE

- Assumes no dedicated perimeter heating system
- Water-side system – hot water (110F) and chilled water (44F) distribution
 - Air-to-water heat pump
 - 4-pipe ASHP consisting of (3) 30 ton (nominal) modules, similar to Multistack ARA-30.
 - Heat pump shall contain glycol and be separated from hydronic distribution loops with HX
 - Primary secondary pumping with lead and standby pump per loop
 - Heat pumps shall be located on roof with hydronic pumps and accessories located in basement mechanical room or mechanical doghouse.

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

- Electrical:
 - Provide 500 KVA pad mounted utility transformer located on the site. Transformer shall feed 800A 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 manual transfer switch and connection for roll-up generator.
- 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:

BEYER BLINDER BELLE

- Provide infrastructure to support 60 kW on-site PV array, consisting roof panels. Provide central inverters with DC optimizers. 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**

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.
- New 2 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 5kW with 50 gallon tanks)
- 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.
- Greywater system: Separate sanitary and waste pipe systems dividing toilet waste and hand washing sink waste to different systems. Greywater treated onsite and used for irrigation only.

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

- TECH/COMM
 - Combined IDF/MDF in basement with (2) 4" conduits
 - Wiring Assumption: Cat6
 - Data Drops/Wireless – allow on SF basis for office and community use
 - Other Communications: Phone drop for elevator cab
- Security
 - Provide Siemens-type or similar Keycard Access Control System for building entries, IDF/MDF rooms
 - Provide ethernet surveillance camera drops at each entry door; video intercom/remote buzzer at main entry
 - Intrusion detection system TBD

Fit-Out (BBB)

General Fit-Out Notes

- Walls
 - Typical partition construction is 5/8" GWB on metal stud
- Ceilings
 - Provide rated GWB ceiling at underside of second floor and roof joist assemblies; all systems go below this layer and are either exposed (and painted out) or concealed behind ACT ceiling
- Other Finish Notes:

BEYER BLINDER BELLE

- \$ for environmental graphics, slightly nicer details at entry lobby and key common spaces
- Allow for room-darkening shading at all windows

Fit Out Space Types and Scope Allowances

- TOILET ROOMS
 - Typical office level of finish
- MULTI-PURPOSE COMMUNITY ROOMS AND SUPPORT SPACES
 - Exposed ceiling with CLT structure visible, assume higher finish for MEP services and ceiling clouds; same for Deduct Alt
 - Allow for engineered wood floor with high durability coating
 - See plan notes for flexible partition system locations; assume higher quality acoustic/aesthetics
 - As per plans, kitchen spaces are warming kitchens only, assume built-ins and basic level of equipment.
- OFFICES
 - Price similar to approach for 1895 Building in base scope
 - Exposed ceiling (see ceiling notes)
 - Carpet tile flooring
- LOBBIES/CORRIDORS/CIRCULATION
 - Flooring: precast terrazzo tile and base
 - Lighting: Nicer (medium)
- BOH/STORAGE/MECH (As indicated)

Floors: At basement level, floor finish to be sealed concrete foundation slab; on upper floors, provide sheet-good resilient floor, exposed ceiling structure

Bioretention landscape area

Replace sewer line, location to be confirmed

Locate underdrains throughout bioretention and permeable paving. Connection locations to mains to be determined.

Replace domestic water and fire protection lines, location to be determined

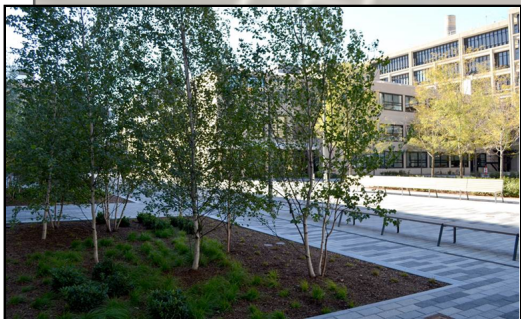
Landscape area

5,000 gallon rainwater reuse tank

3,629.95 sf



Precedent Image - City of Boston
Conventional concrete sidewalk pitches to permeable paver strip with underdrains



Precedent Image - MIT Campus
Bioretention landscape retains stormwater subgrade, instead of ponding at the surface; landscape grade is even with surrounding area

Pedestrian pavement pitched to permeable paver strip along curb (see image above)

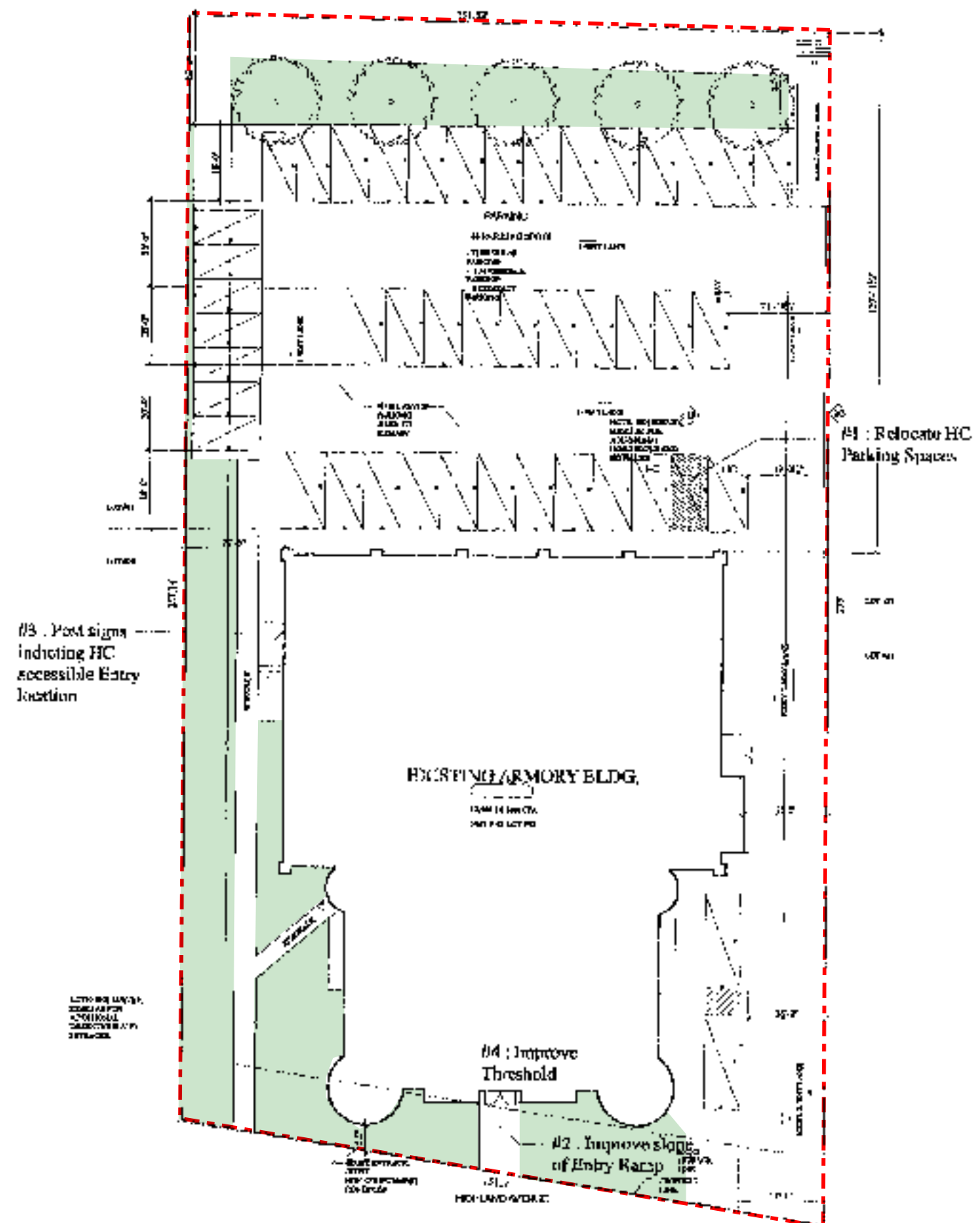
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

165 Broadway
Somerville, MA

Conceptual Site Plan Sketch
165 Broadway
Prepared by Nitsch Engineering
10/13/21

0 30 60 Feet





Markups by BBB dated Aug 2021
 Note: Sheet is not to defined scale

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 RECEIVED
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 PLANNING DEPT.

NOTES

PROJECT
 191 Highland Ave,
 Sooterville, MA

OWNER
 Mr. Joseph Slat



DATE
 15 July 2012

ARCHITECT
 WILLIAM SCHAEFFER
 & ASSOCIATES
 15 BAY STREET
 CAMBRIDGE, MA
 02142-1752

SHEET CONTENTS
 Site Plan

S.1

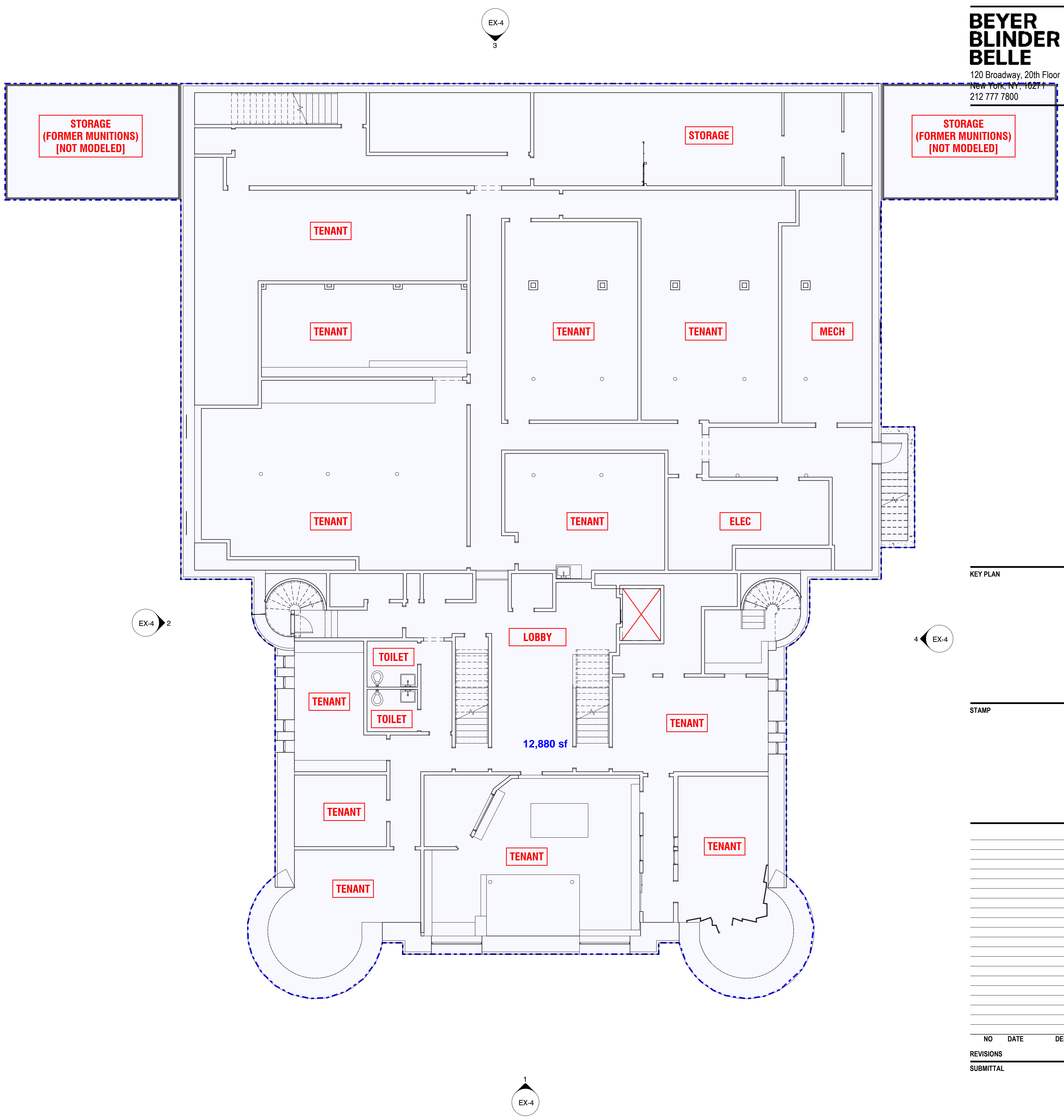
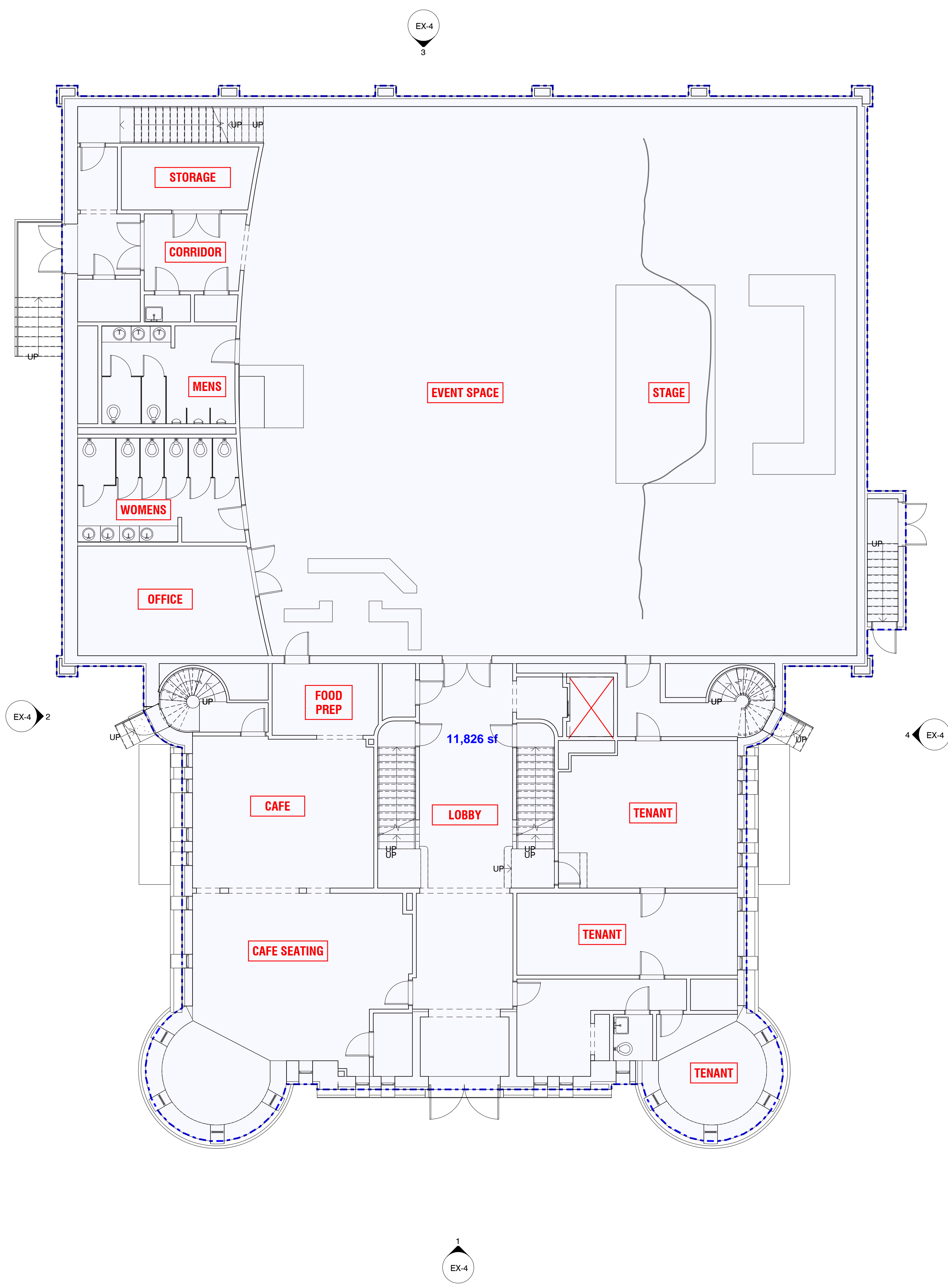
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The Armory
191 Highland Avenue
Somerville, MA

**BEYER
BLINDER
BELLE**

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



KEY PLAN

STAMP

NO.	DATE	DESCRIPTION

REVISIONS
SUBMITTAL

Exploratory
NOT FOR CONSTRUCTION

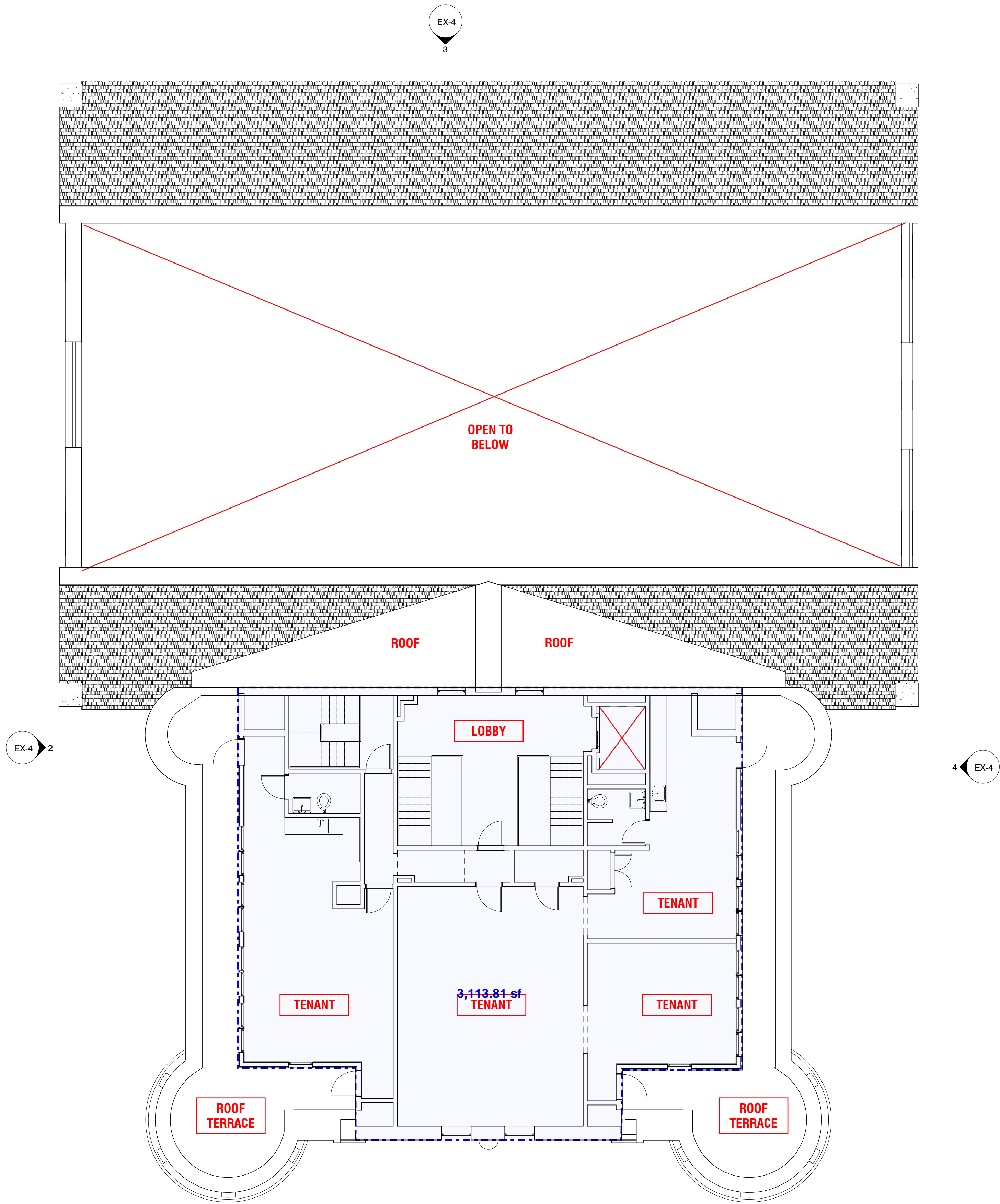
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Existing Basement and First Floor Plans

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PROJECT NUMBER	2875
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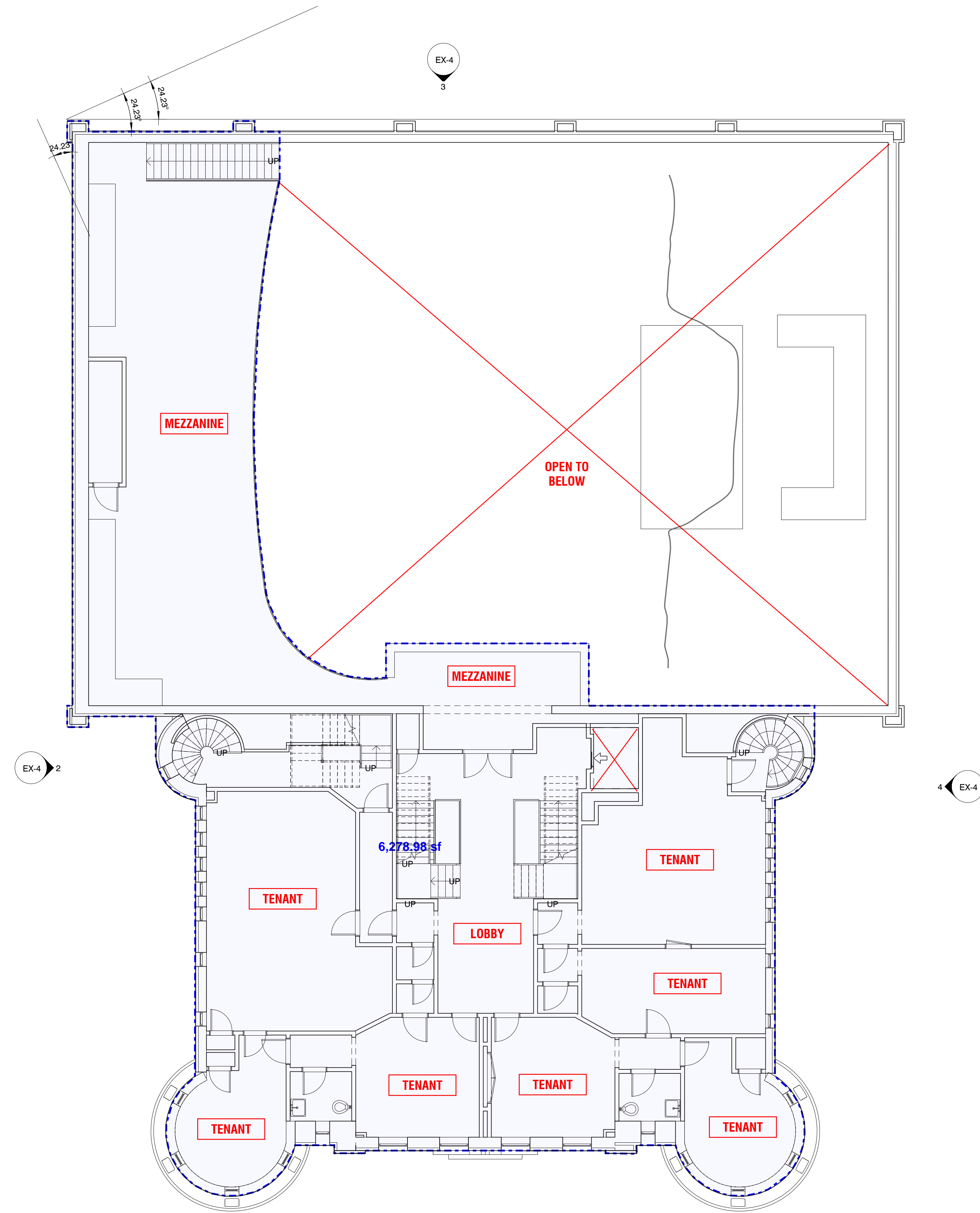
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NOTE: IF THIS SHEET IS NOT 30"W x 42"L, THEN IT IS NOT THE INTENDED SIZE. IN ALL CASES, WORK TO FIGURED DIMENSIONS.

8/20/21 9:23:03 AM BM 100.000(2075) Somerville MA Somerville Armory E-02.rvt



2 Level 03 Third Floor
EX-2 1/8" = 1'-0"



1 Level 02 Second Floor
EX-2 1/8" = 1'-0"

The Armory
191 Highland Avenue
Somerville, MA

BEYER
BLINDER
BELLE
120 Broadway, 20th Floor
New York, NY, 10271
212 777 7800

KEY PLAN

STAMP

NO.	DATE	DESCRIPTION

Exploratory
NOT FOR CONSTRUCTION

DRAWING TITLE

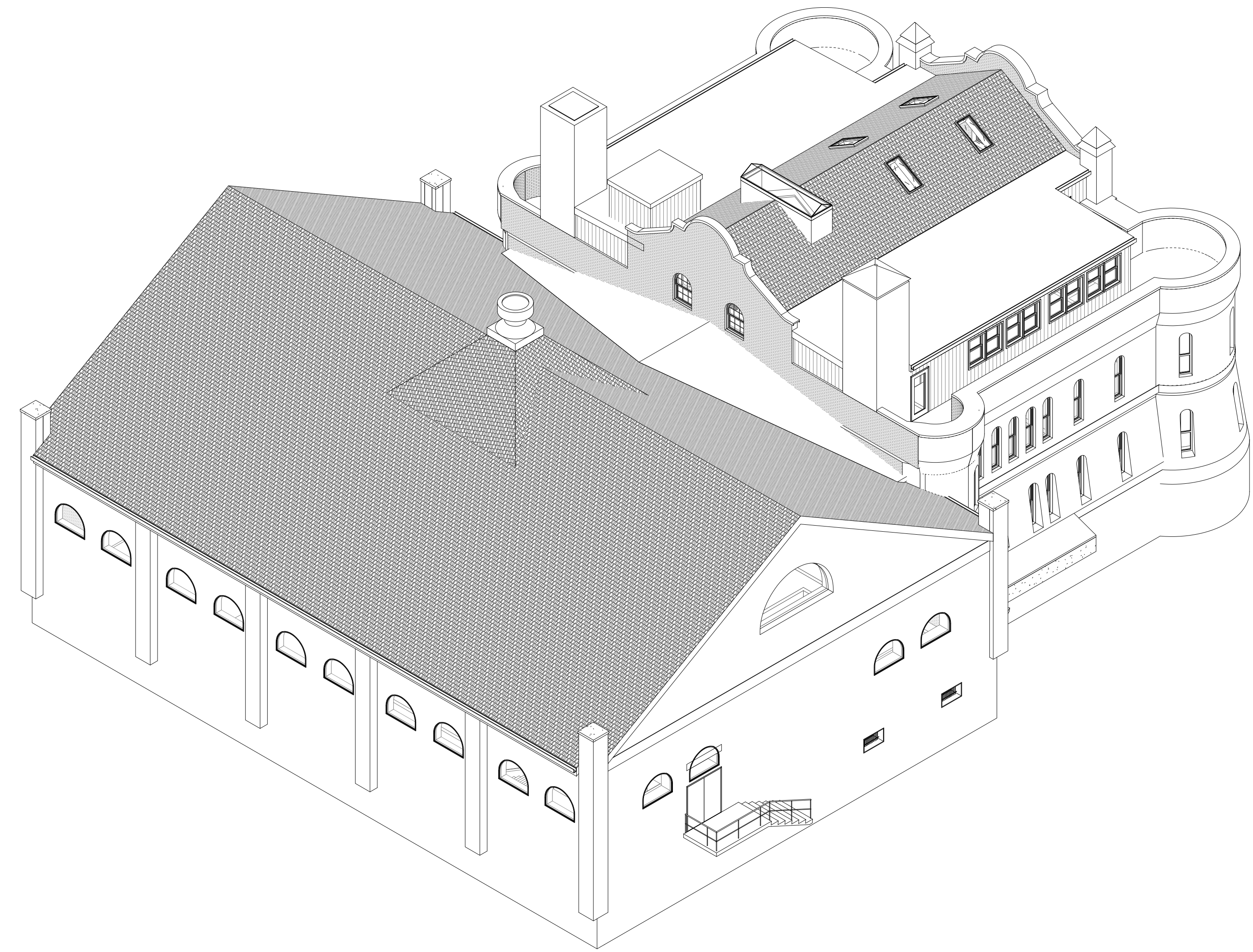
Existing Second and Third Floor
Plans

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DATE	08/05/21
PROJECT NUMBER	2875
DRAWING NUMBER	

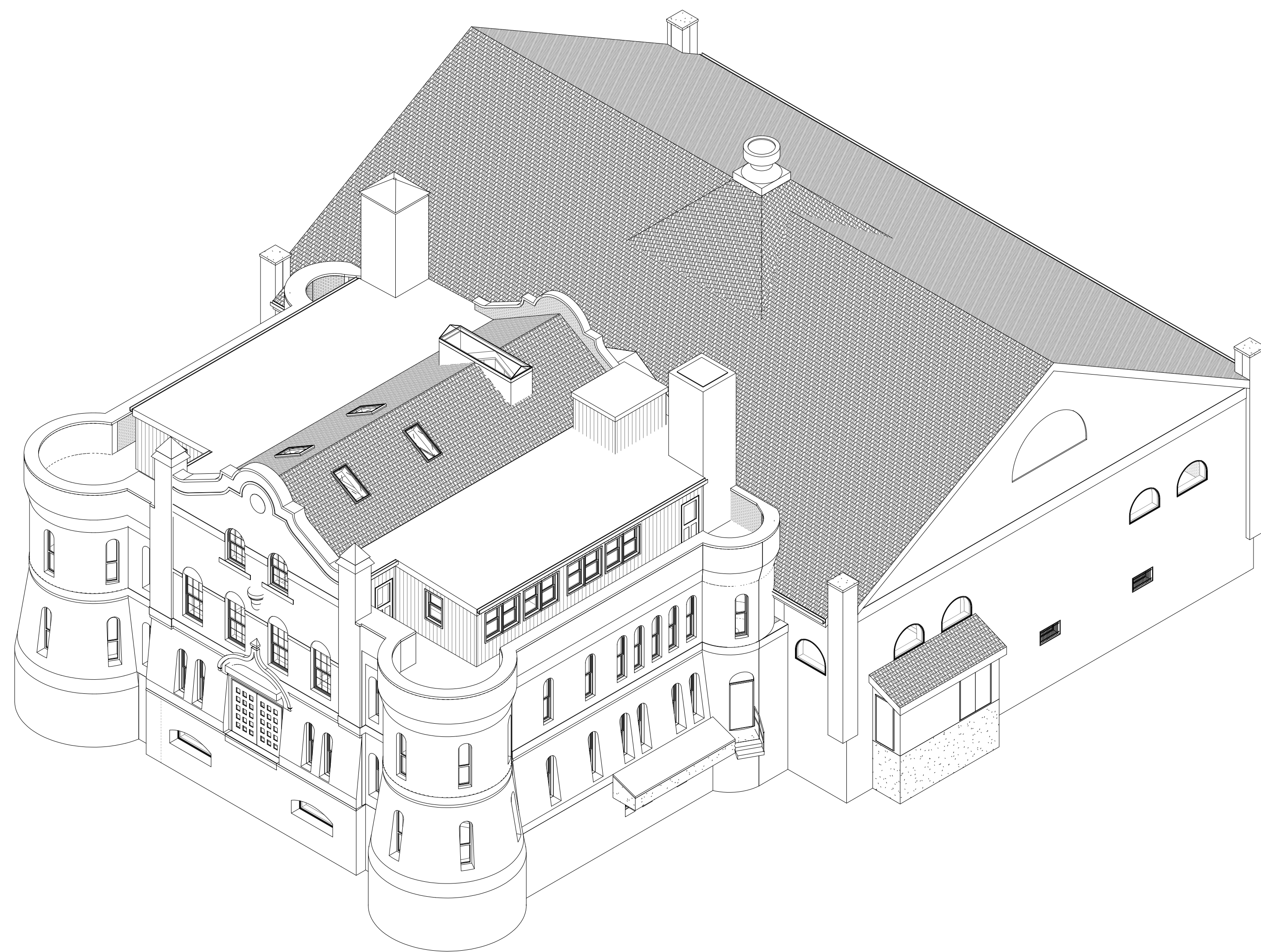
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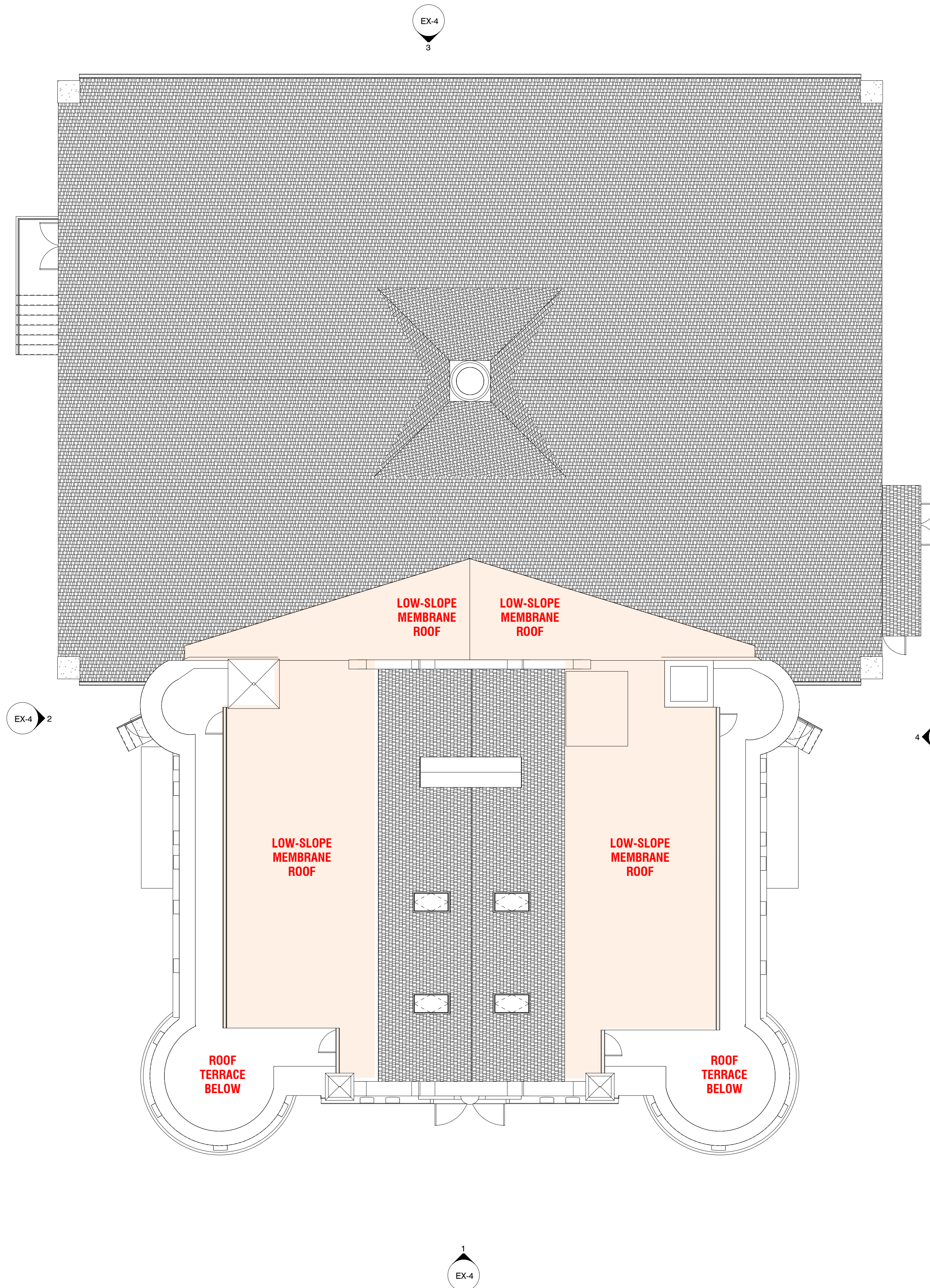
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BM 100.02763 Somerville MA Somerville Army Eng 821.rvt



3 Axon_from NW
EX-3



2 Axon_from SE
EX-3



1 Level 04 Roof
EX-3 1/8" = 1'-0"

The Armory
191 Highland Avenue
Somerville, MA

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BELLE**
120 Broadway, 20th Floor
New York, NY, 10271
212 777 7800

KEY PLAN

STAMP

NO DATE DESCRIPTION

REVISIONS

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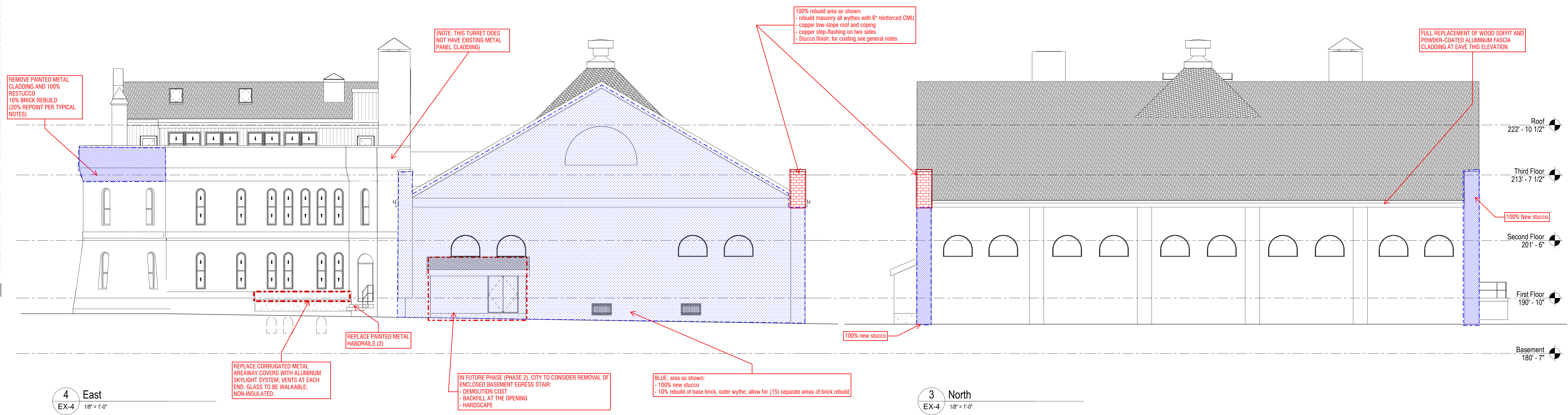
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Existing Roof Plan and
Axonometrics

SCALE 1/8" = 1'-0"
DATE 08/05/21
PROJECT NUMBER 2875
DRAWING NUMBER

EX-3

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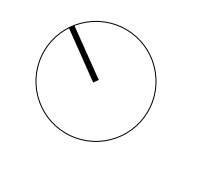
4 East
EX-4
1/8" = 1'-0"

3 North
EX-4
1/8" = 1'-0"

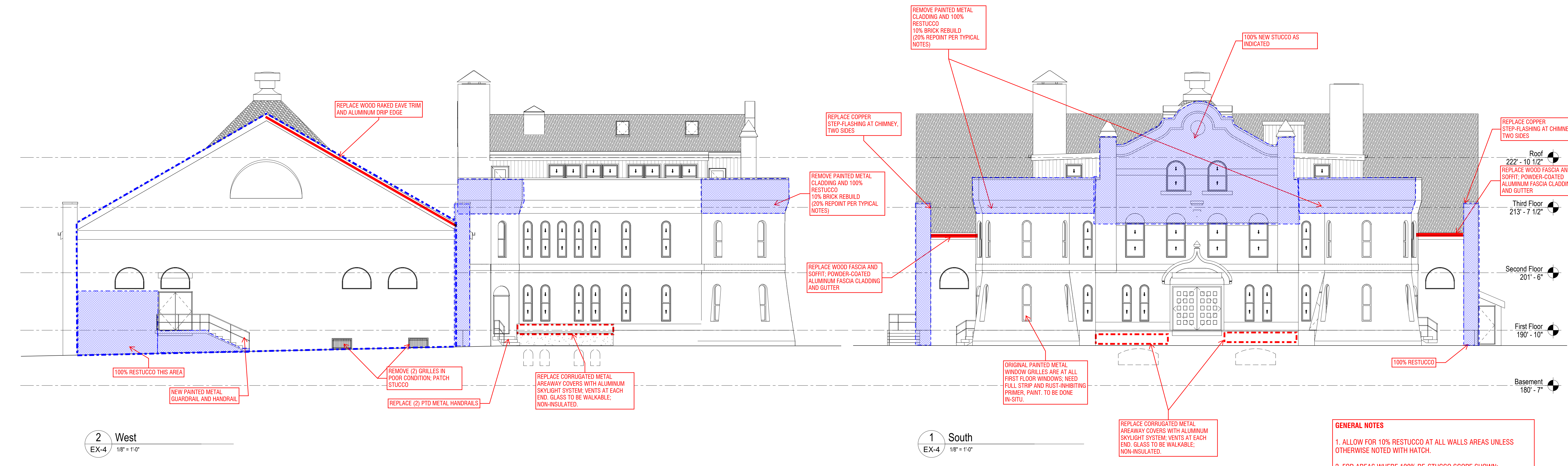
The Armory
191 Highland Avenue
Somerville, MA

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BLINDER
BELLE**
120 Broadway, 20th Floor
New York, NY, 10271
212 777 7800

KEY PLAN



STAMP



2 West
EX-4
1/8" = 1'-0"

1 South
EX-4
1/8" = 1'-0"

NO	DATE	DESCRIPTION

DRAWING TITLE

Exploratory
NOT FOR CONSTRUCTION

Existing Elevations

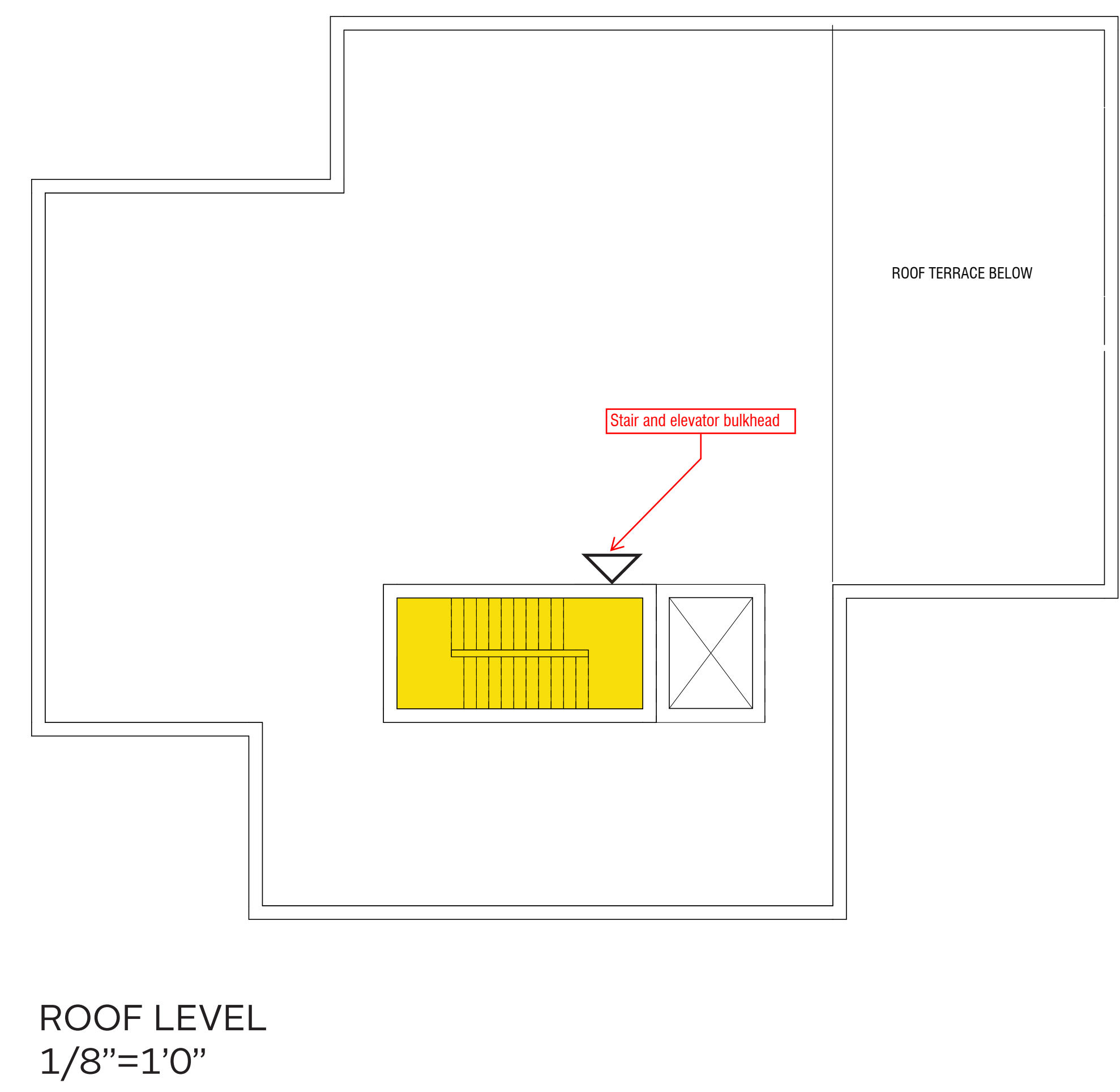
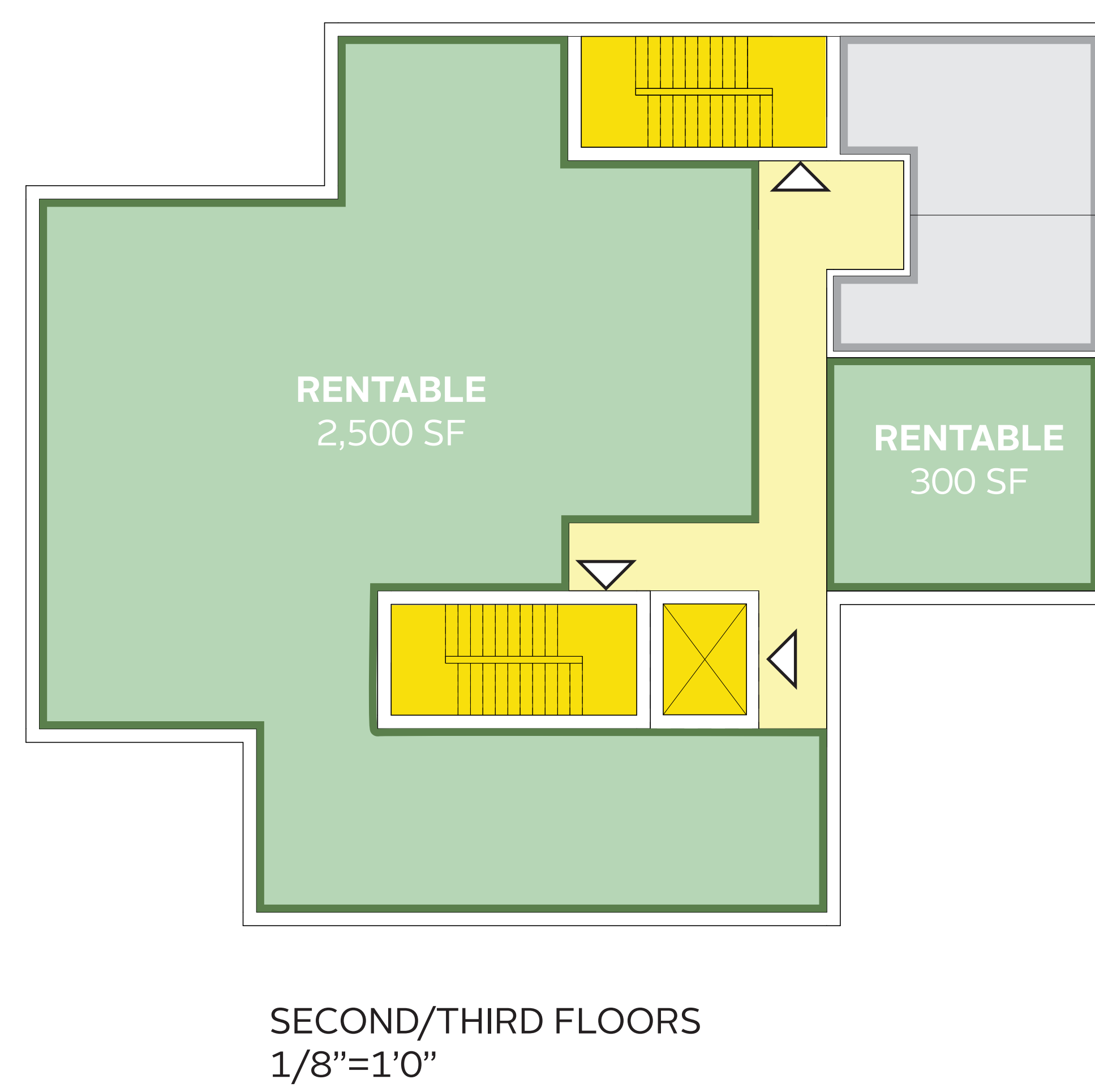
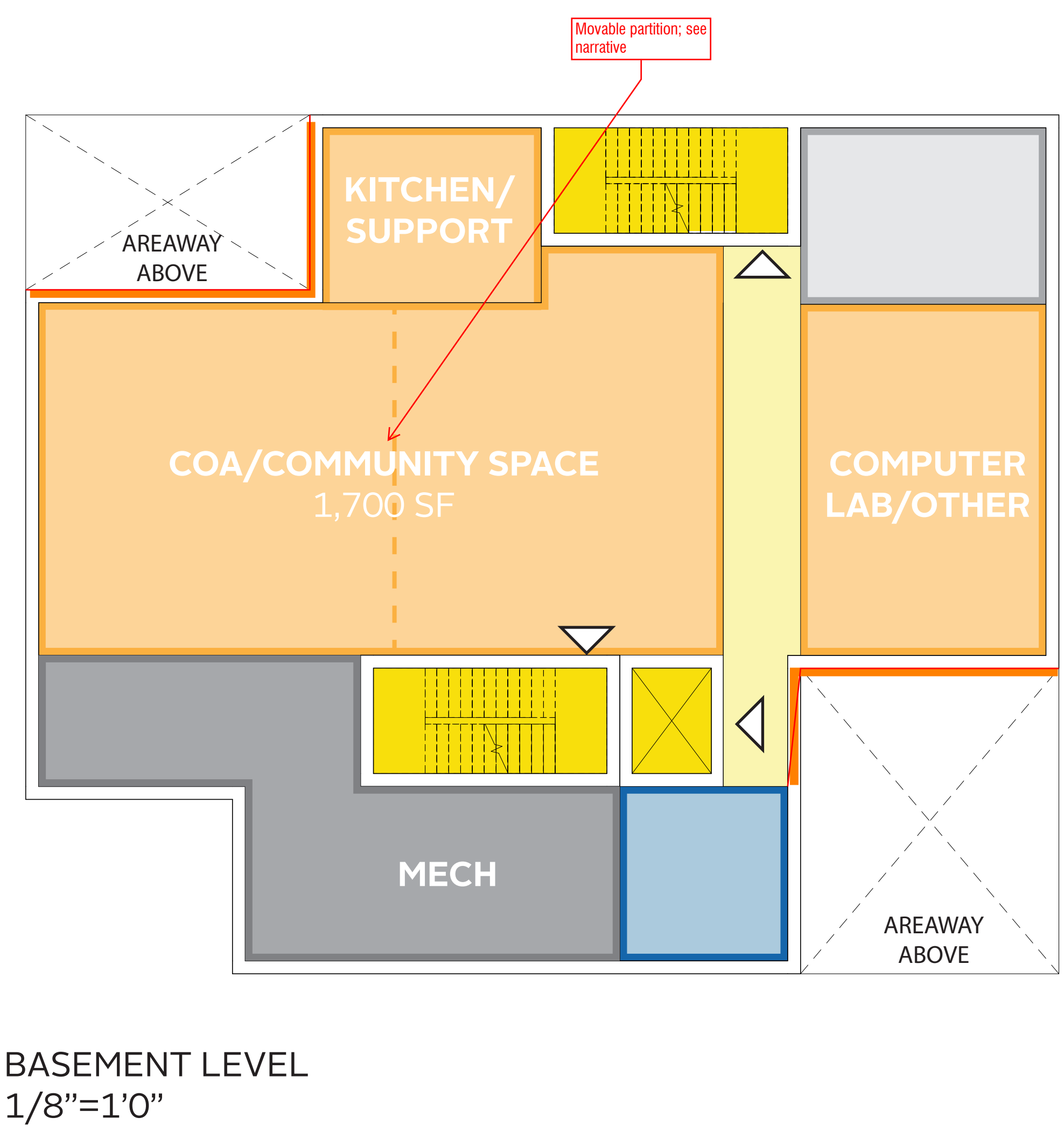
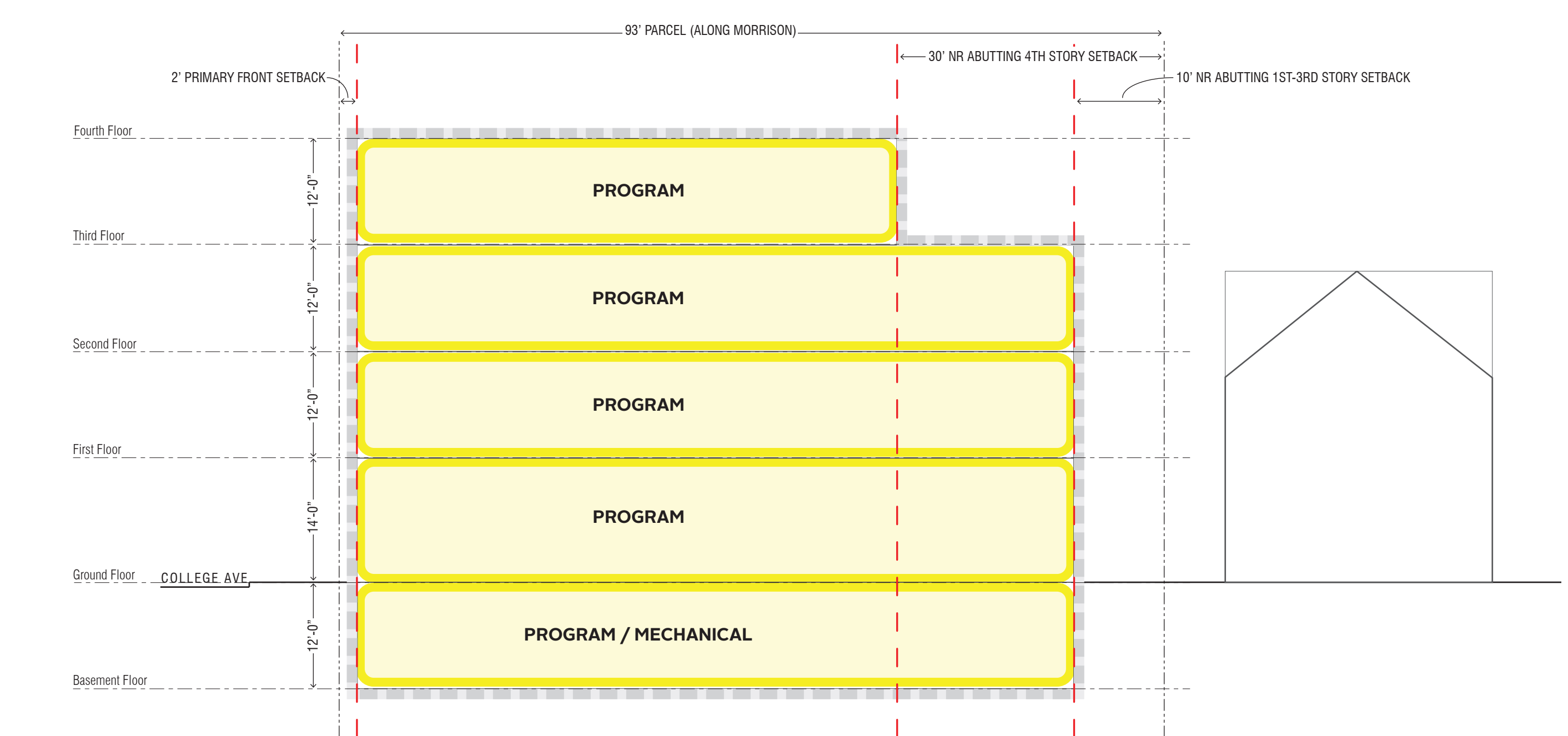
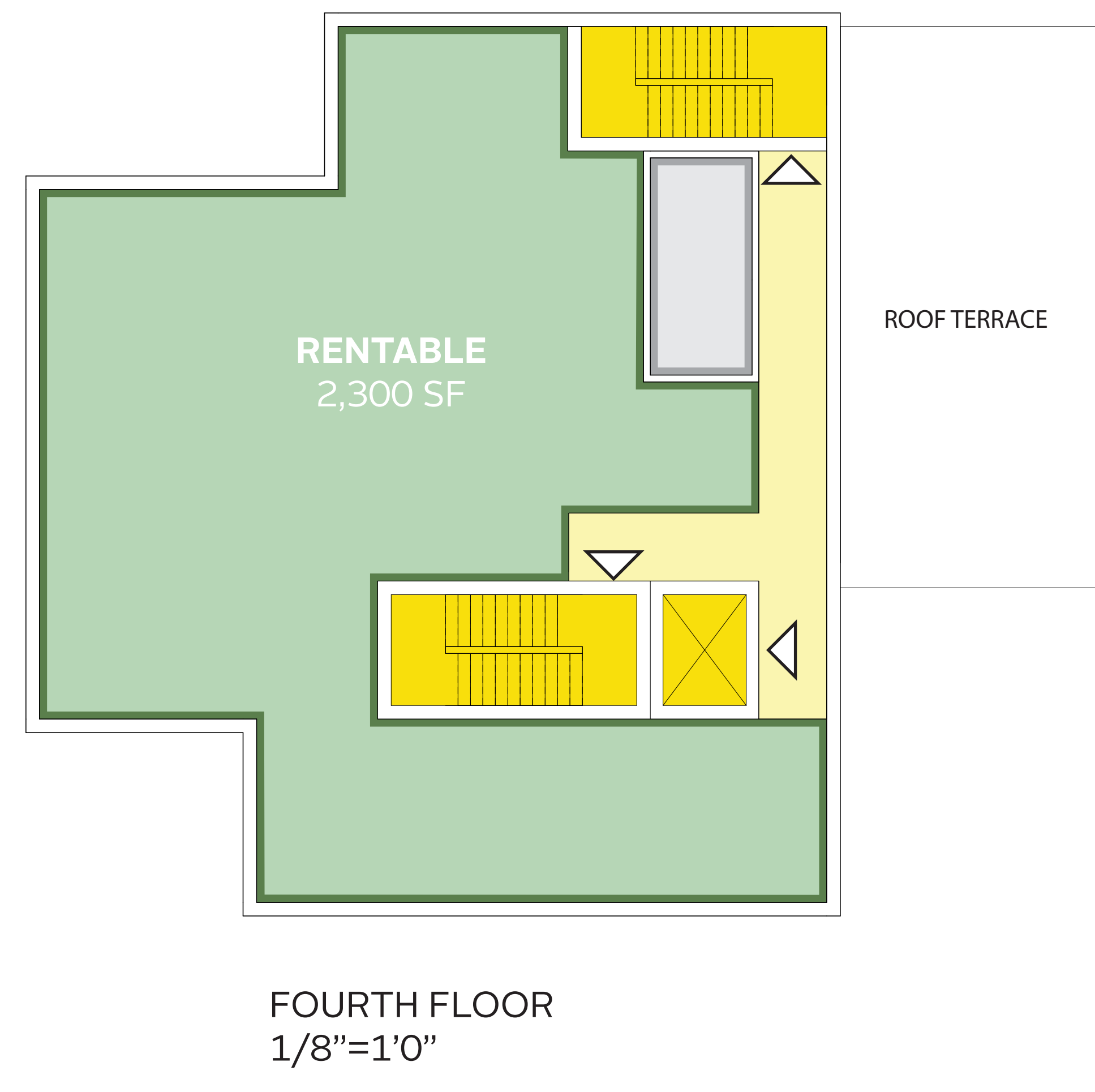
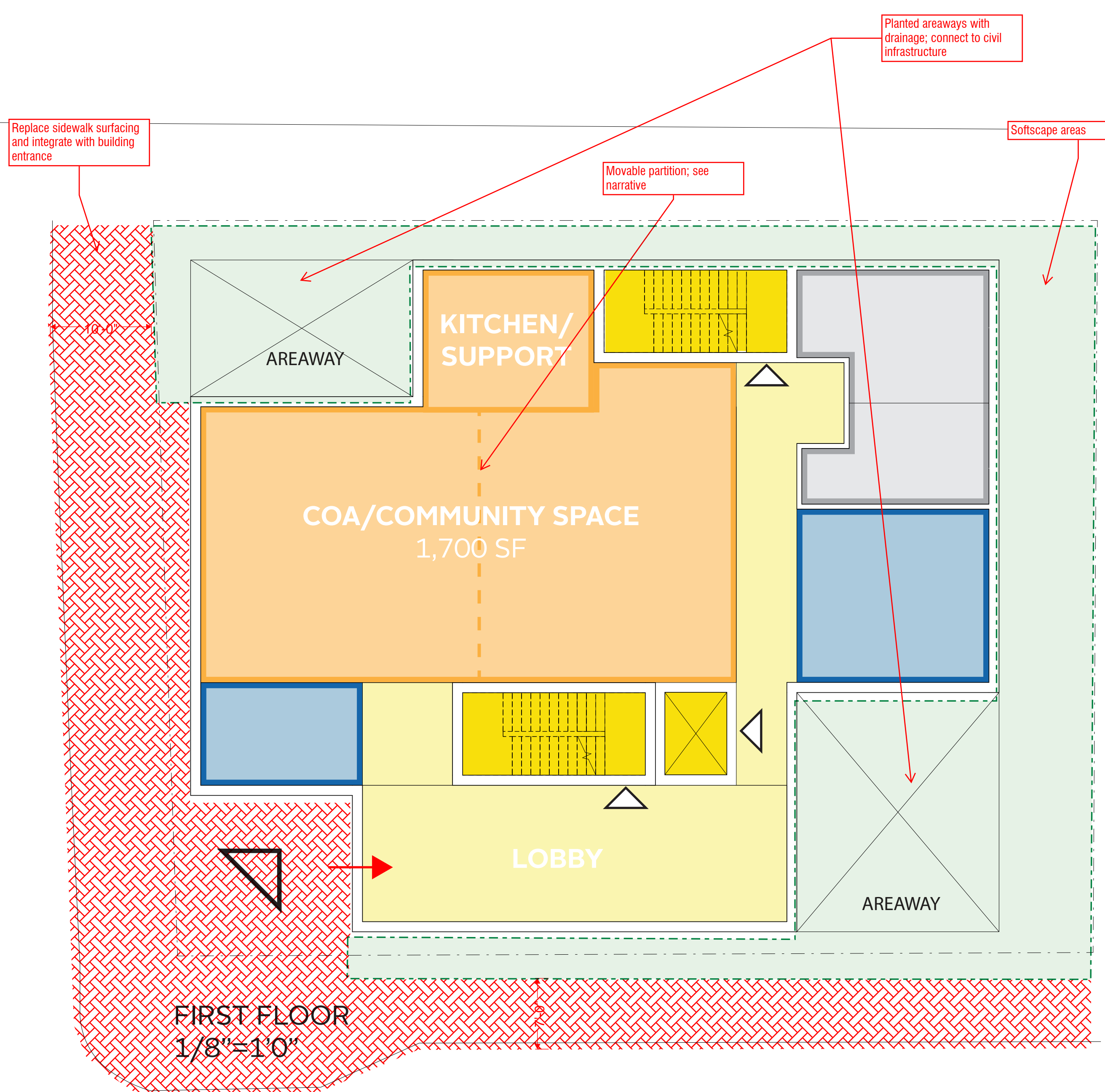
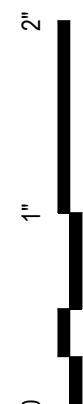
SCALE: 1/8" = 1'-0"
DATE: 08/05/21
PROJECT NUMBER: 2875
DRAWING NUMBER:

- GENERAL NOTES**
1. ALLOW FOR 10% RESTUCCO AT ALL WALLS AREAS UNLESS OTHERWISE NOTED WITH HATCH.
 2. FOR AREAS WHERE 100% RE-STUCCO SCOPE SHOWN: - SEE NARRATIVE GENERAL NOTES FOR INFORMATION ON COATINGS - ASSUME 20% REPOINT OF BRICK SUBSTRATE
 3. SEE NARRATIVE FOR WINDOW SCOPE AND PARAPETS/ROOFS

EX-4

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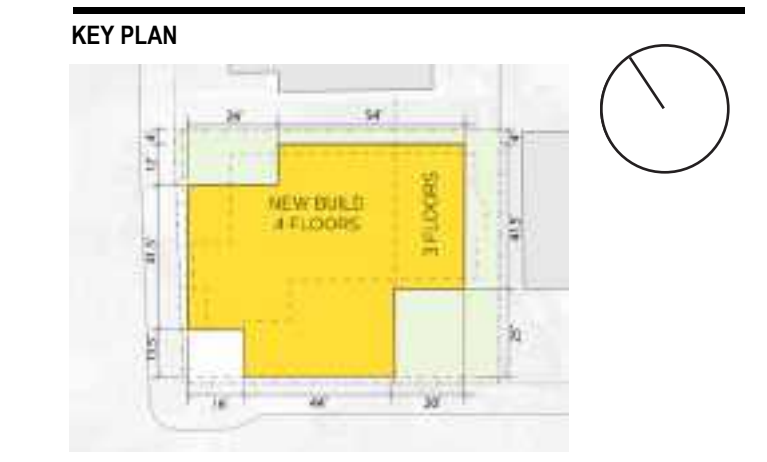
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- PROGRAM KEY**
- TOILETS / BOH
 - MECHANICAL
 - CIRCULATION
 - VERTICAL CIRCULATION
 - CITY OFFICE / MTG / SUPPORT
 - PROGRAM / COMMUNITY SPACE
 - RENTABLE OFFICE SPACE
 - FOOD PANTRY

45 College - Council on Aging / Office Space
Sommerville, MA 02144

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New York, NY, 10271
212 777 7800



STAMP

NO	DATE	DESCRIPTION

REVISIONS

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Preliminary Design Program
NOT FOR CONSTRUCTION

DRAWING TITLE: Test-Fit Floor Plans

SCALE: _____

DATE: 07/21/21

PROJECT NUMBER: 0000.00

DRAWING NUMBER: _____

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PROGRAM KEY

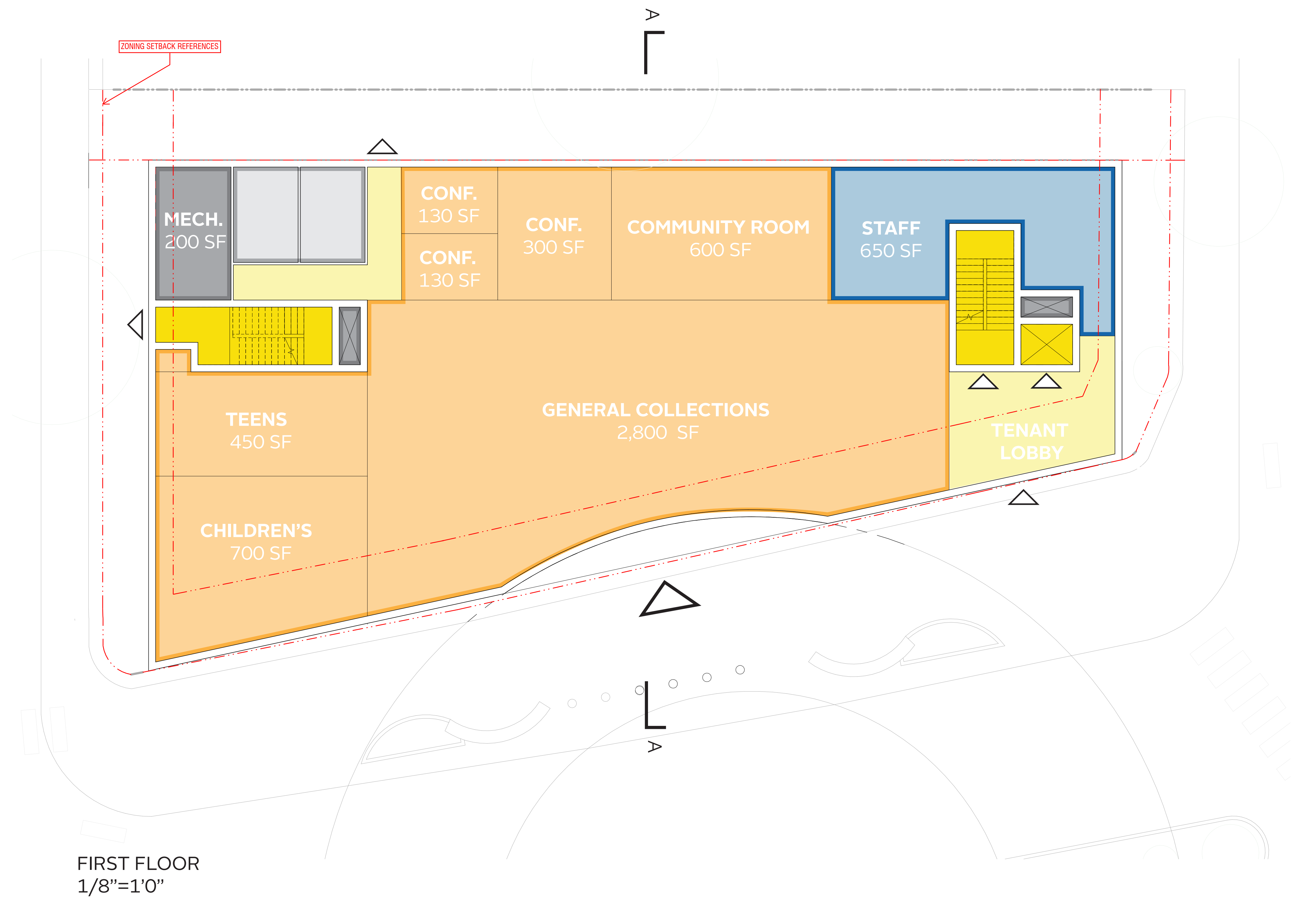
- TOILETS / BOH
- MECHANICAL
- CIRCULATION
- VERTICAL CIRCULATION
- CITY OFFICE / MTG / SUPPORT
- PROGRAM / COMMUNITY SPACE

RESIDENTIAL LEGEND

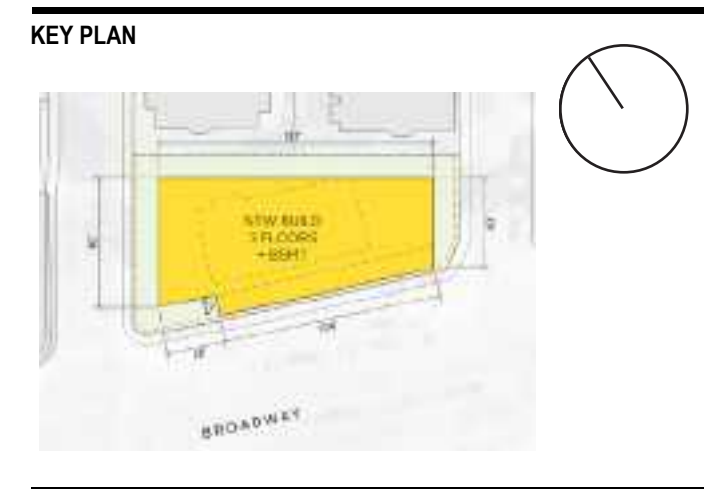
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- 2 BEDROOM
- 1 BEDROOM
- STUDIO

115 Broadway
Somerville, MA 02145

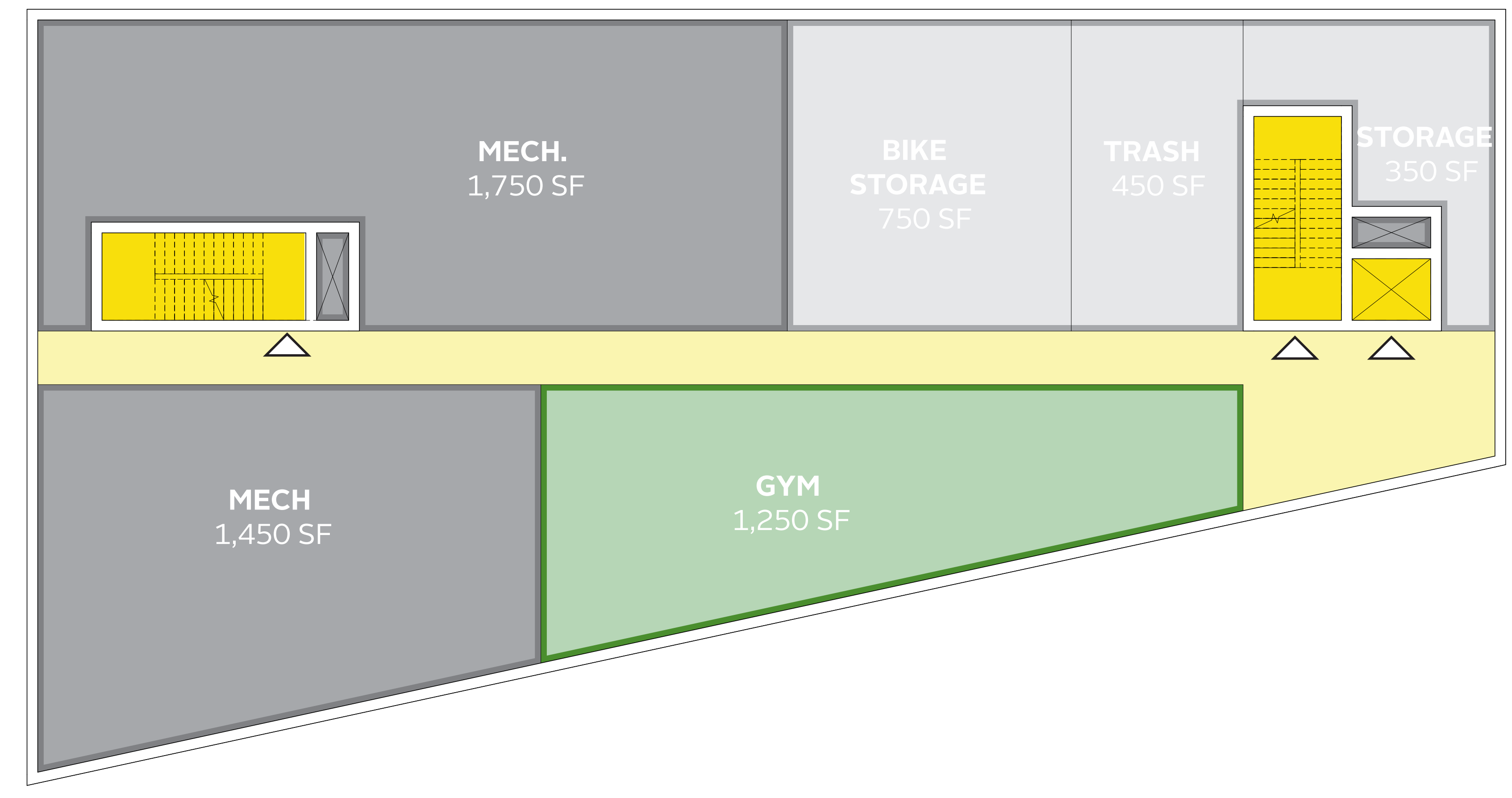
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120 Broadway, 20th Floor
New York, NY, 10271
212.777.7800



FIRST FLOOR
1/8"=1'0"



STAMP



BASEMENT FLOOR
1/8"=1'0"

NO	DATE	DESCRIPTION

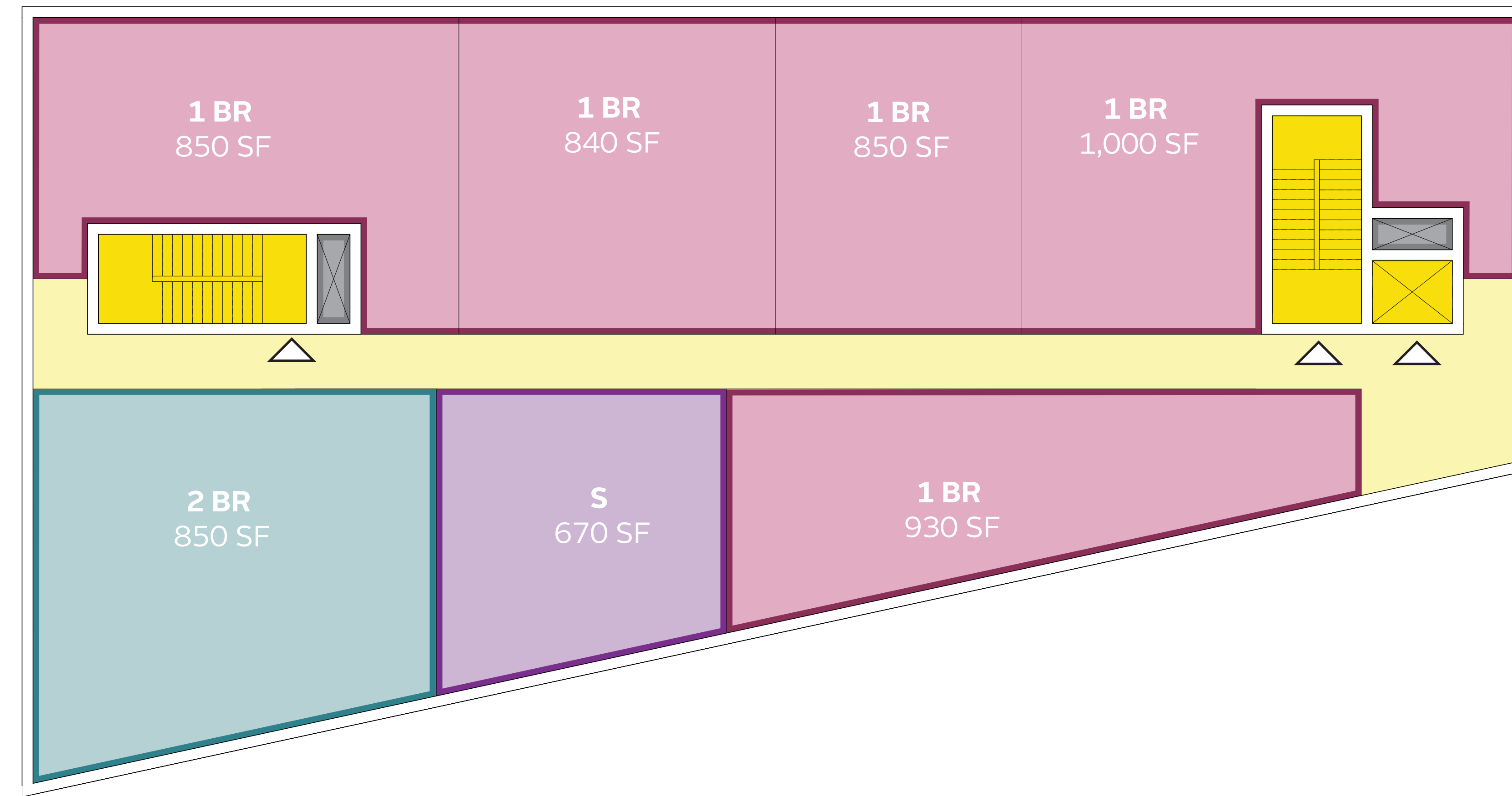
REVISIONS SUBMITTAL

Preliminary Design Program
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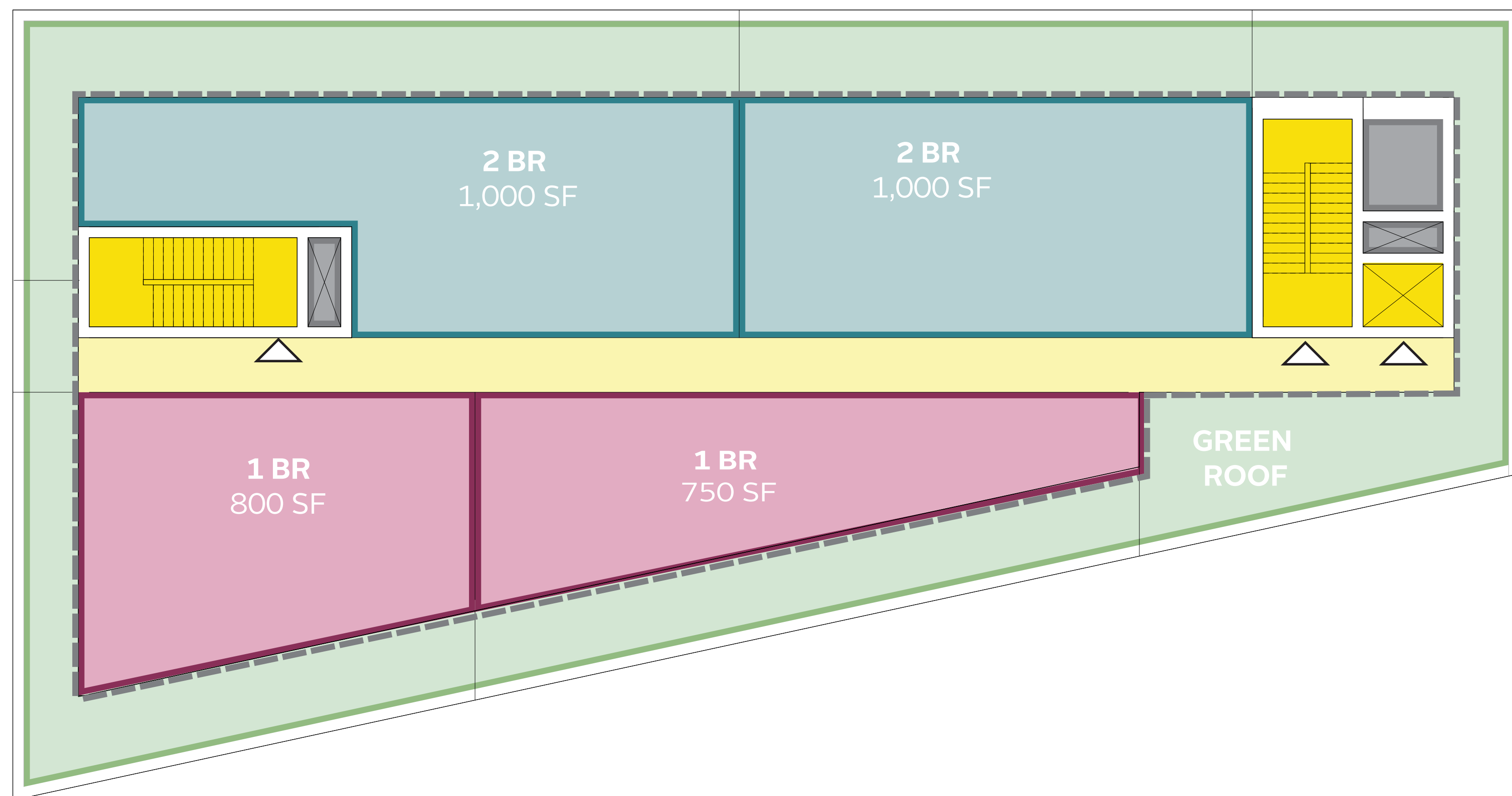
DRAWING TITLE: **Test-Fit Floor Plans**

SCALE: _____
DATE: 07/21/21
PROJECT NUMBER: 0000.00
DRAWING NUMBER: _____

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SECOND, THIRD & FLOORS
1/8"=1'0"



FOURTH FLOOR
1/8"=1'0"

PROGRAM KEY

- TOILETS / BOH
- MECHANICAL
- CIRCULATION
- VERTICAL CIRCULATION
- CITY OFFICE / MTG / SUPPORT
- PROGRAM / COMMUNITY SPACE

RESIDENTIAL LEGEND

- GREEN ROOF
- 2 BEDROOM
- 1 BEDROOM
- STUDIO

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KEY PLAN



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Program**
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Test-Fit Floor Plans

SCALE

DATE 07/21/21

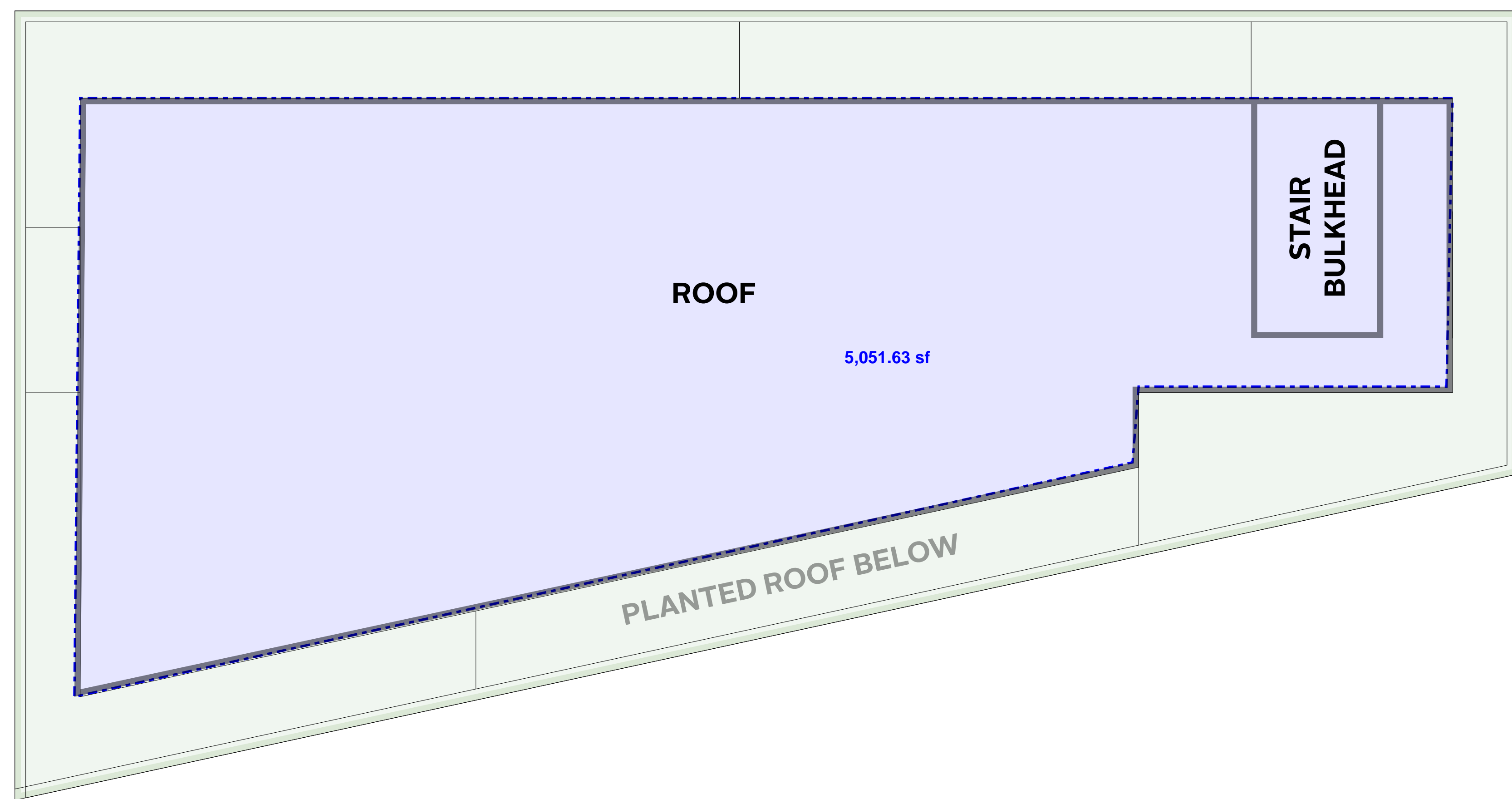
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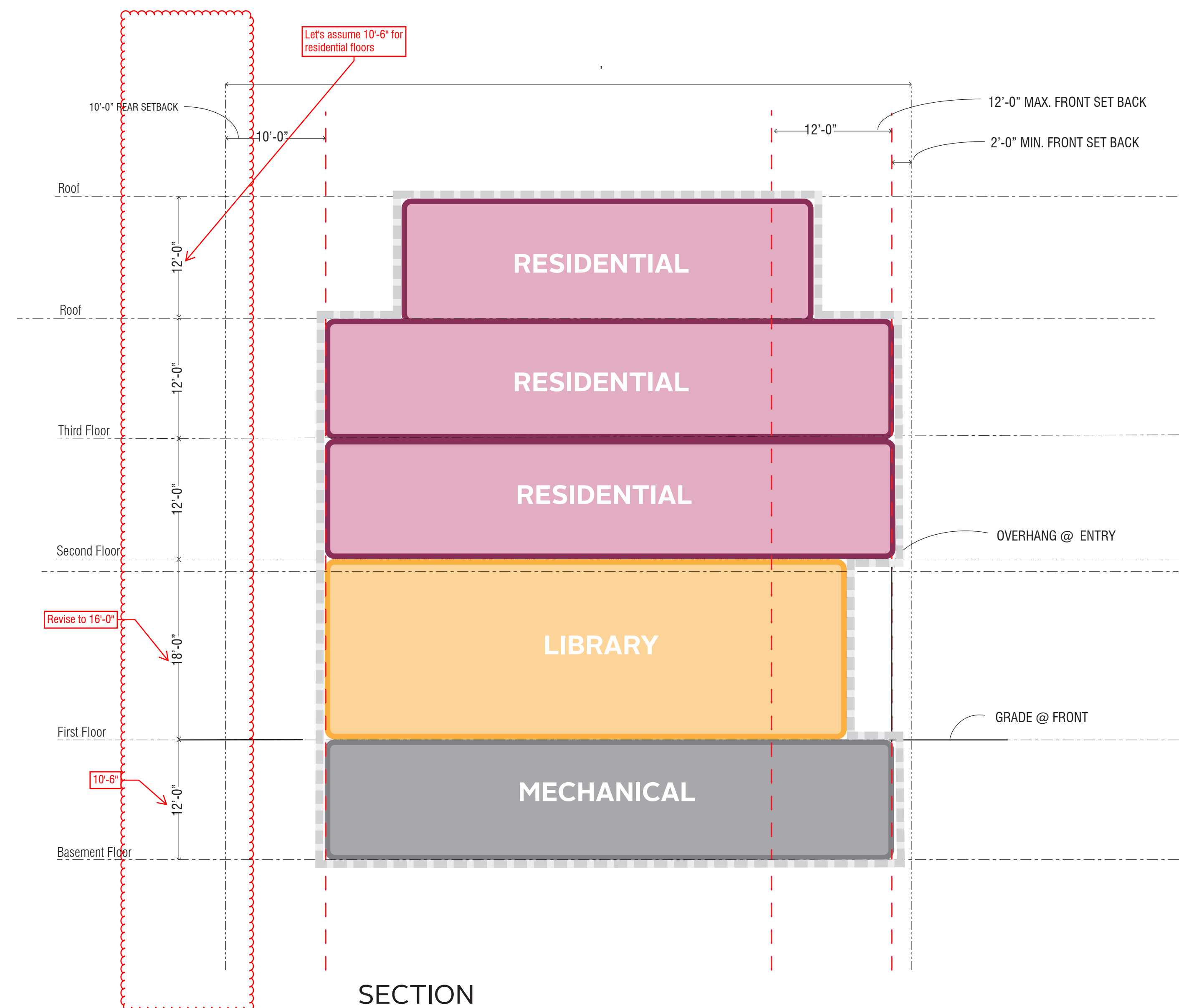
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ROOF
1/8"=1'0"



SECTION
1/8"=1'0"

115 Broadway
Somerville, MA 02145

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BELLE**
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New York, NY, 10271
212.777.7800

KEY PLAN



STAMP

NO.	DATE	DESCRIPTION

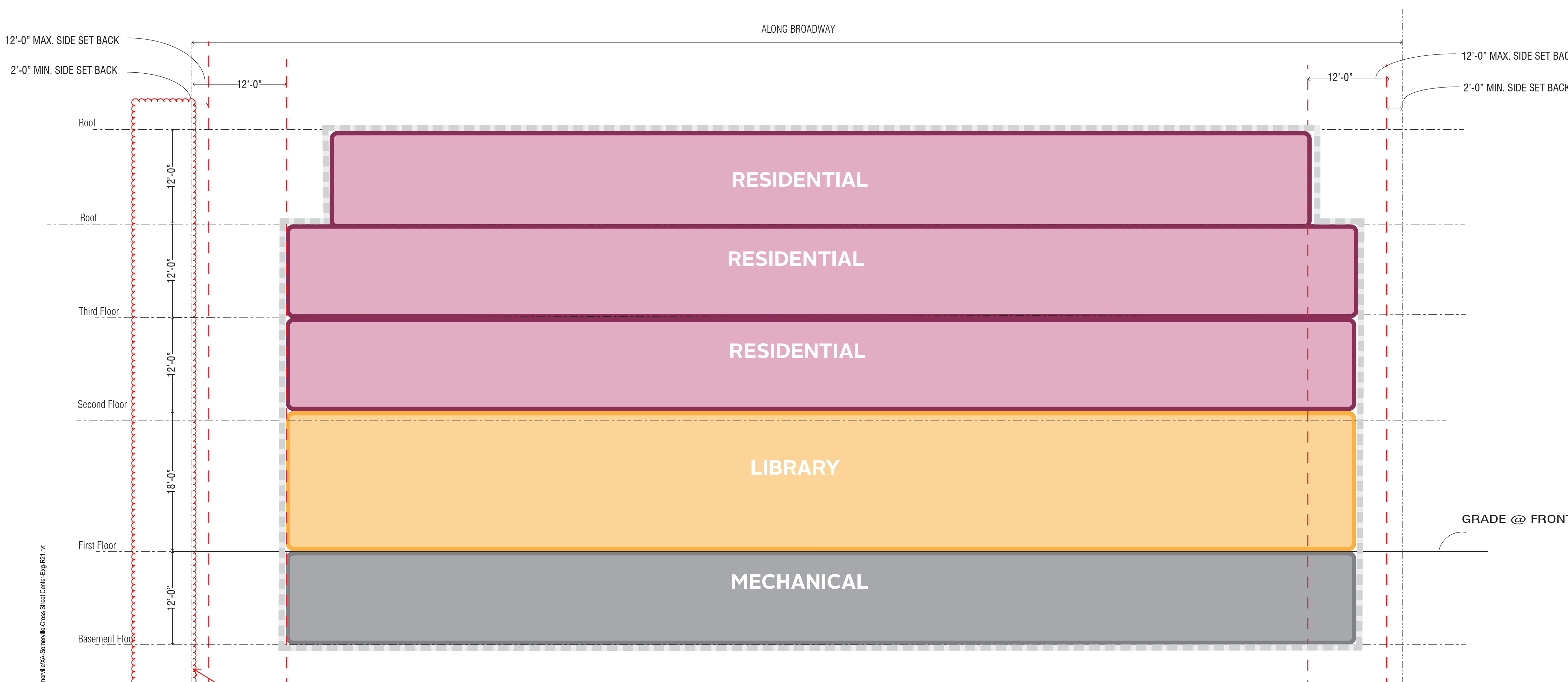
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SUBMITTAL

**Preliminary Design
Program**
NOT FOR CONSTRUCTION

DRAWING TITLE
Test-Fit Floor Plans

SCALE
DATE 07/21/21
PROJECT NUMBER 0000.00
DRAWING NUMBER

A-3



SECTION
1/8"=1'0"

PROGRAM KEY

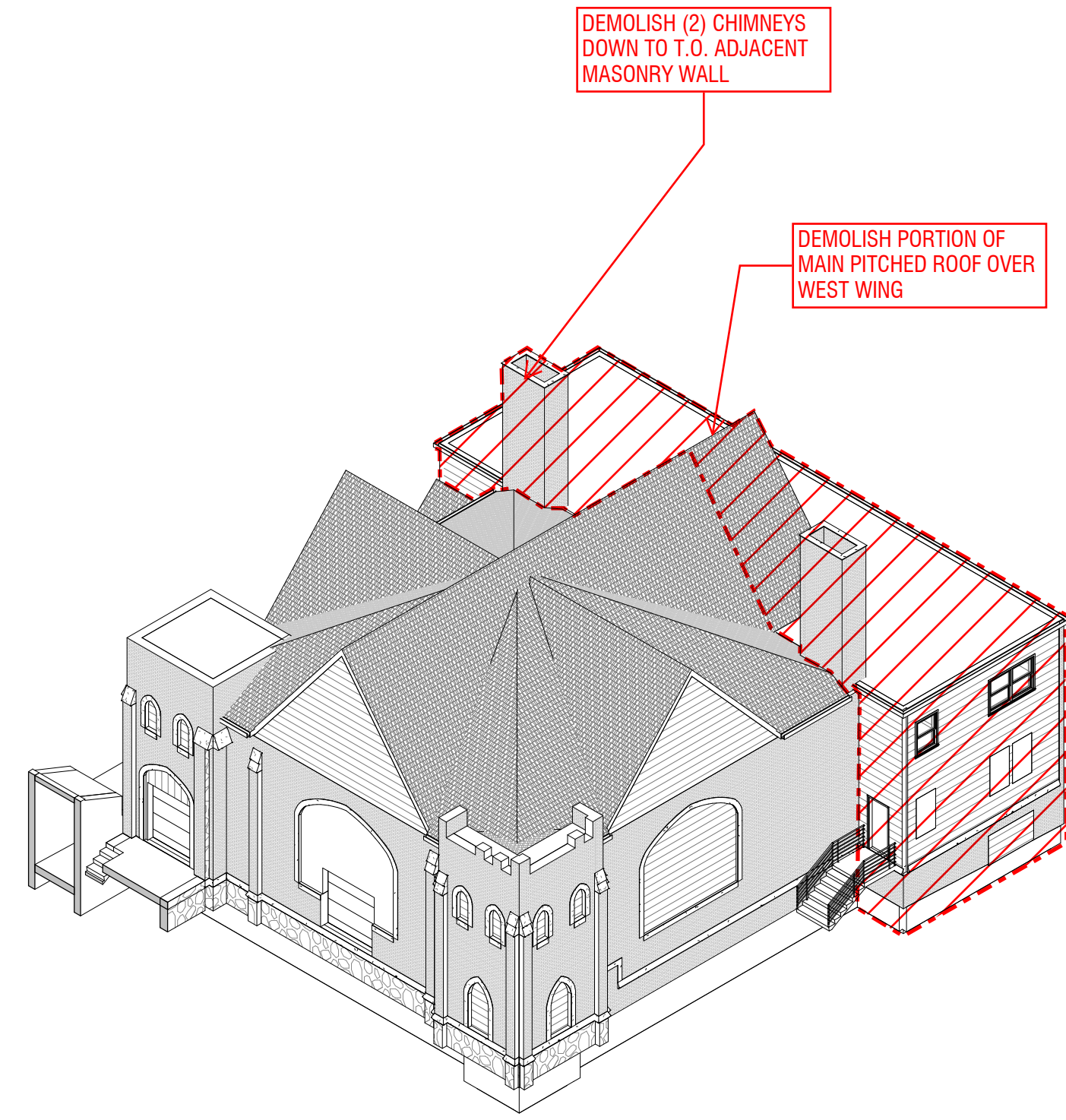
- TOILETS / BOH
- MECHANICAL
- CIRCULATION
- VERTICAL CIRCULATION
- CITY OFFICE / MTG / SUPPORT
- PROGRAM / COMMUNITY SPACE

RESIDENTIAL LEGEND

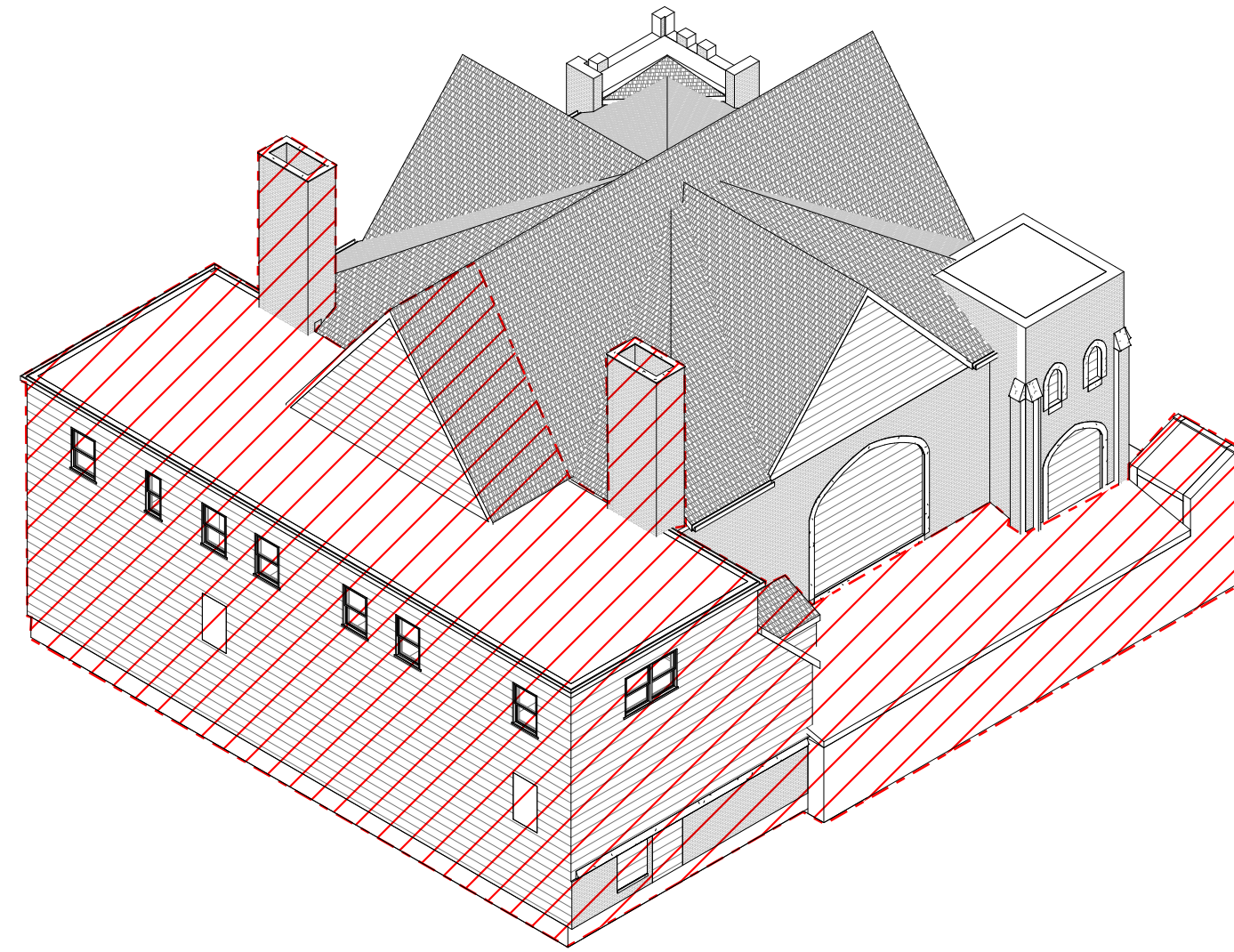
- GREEN ROOF
- 2 BEDROOM
- 1 BEDROOM
- STUDIO

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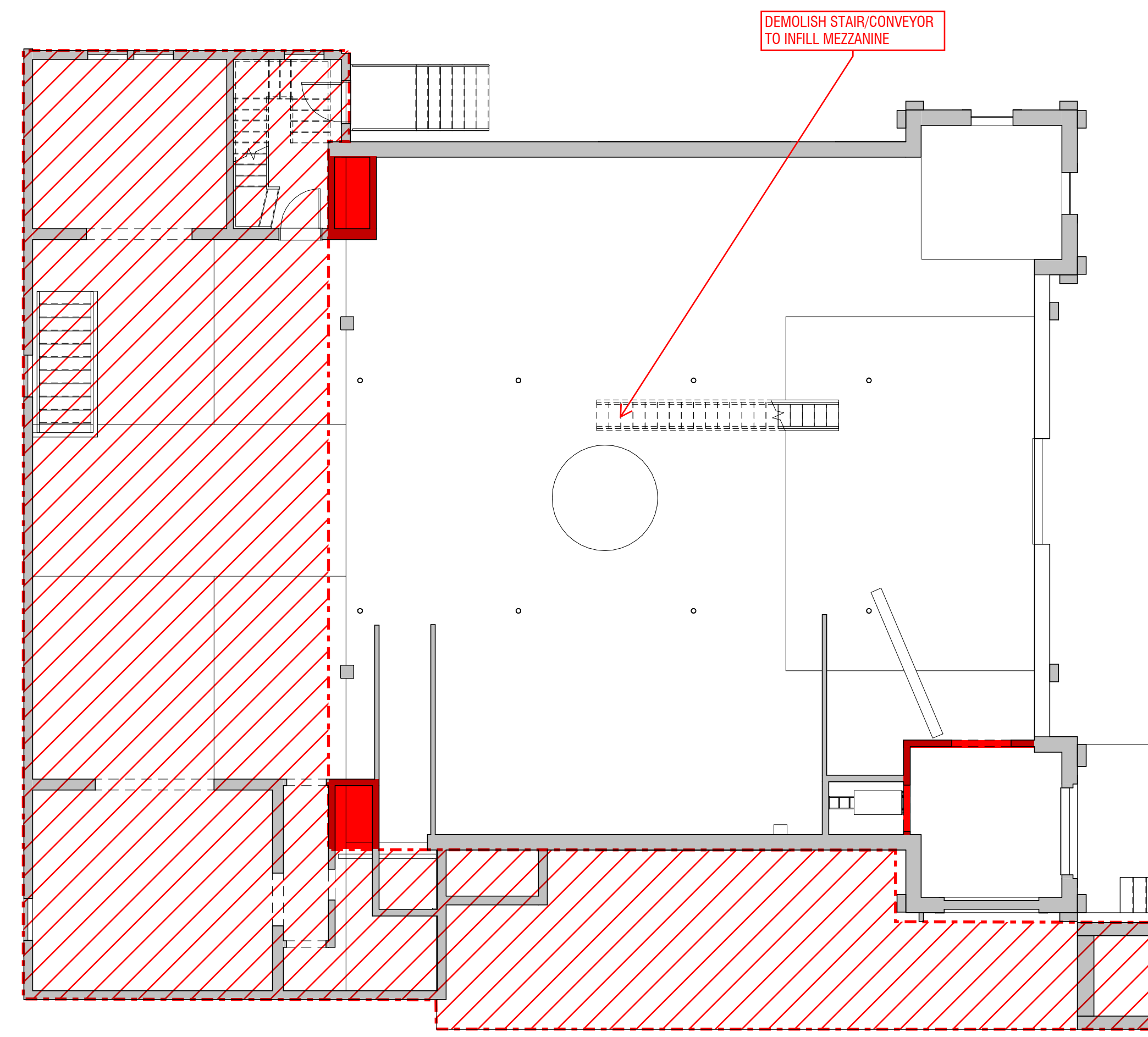
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5 Axon_NE Corner
A-1



4 Axon_SW Corner
A-1

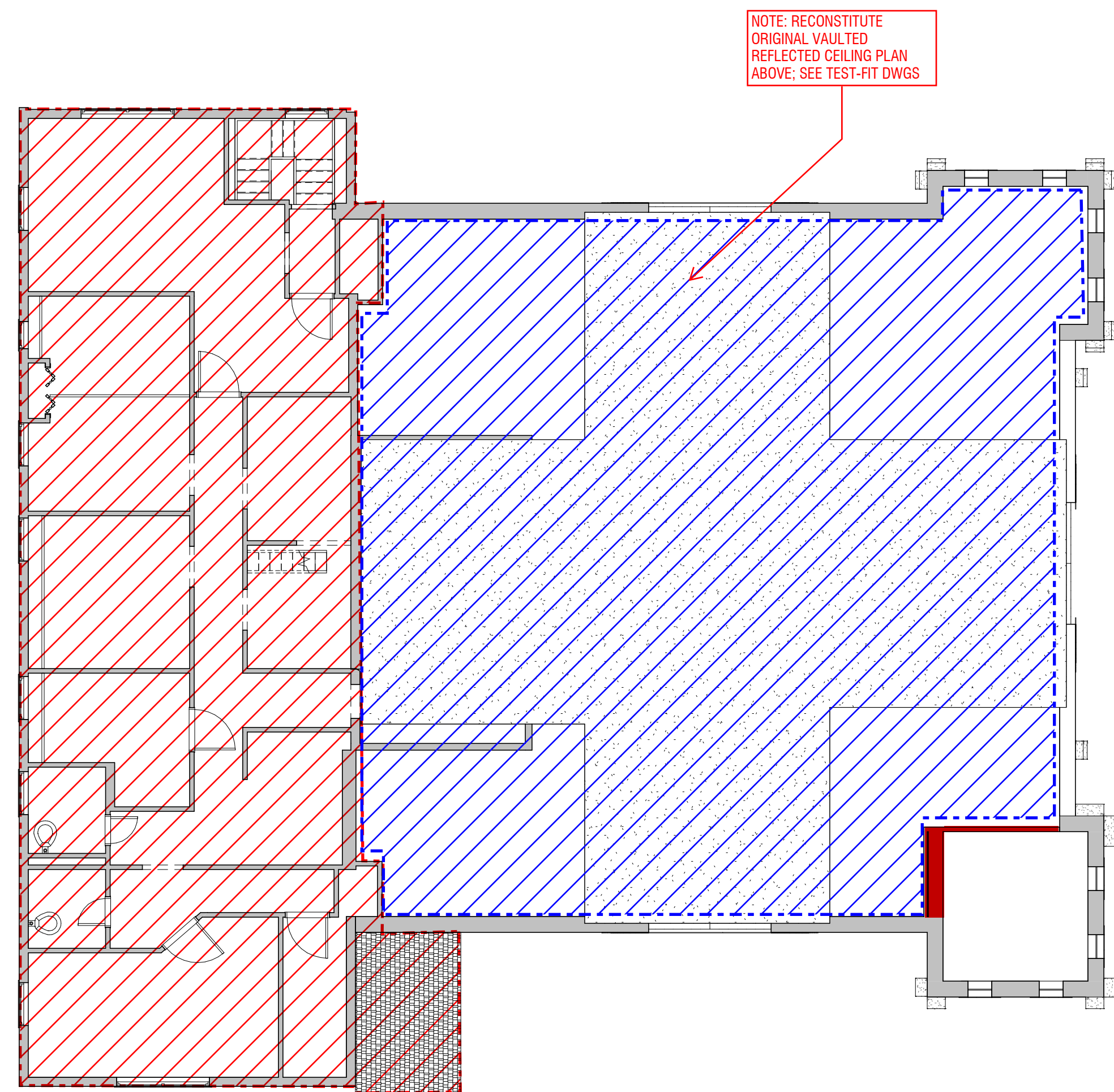


2 First Floor Plan
A-1 1/8" = 1'-0"

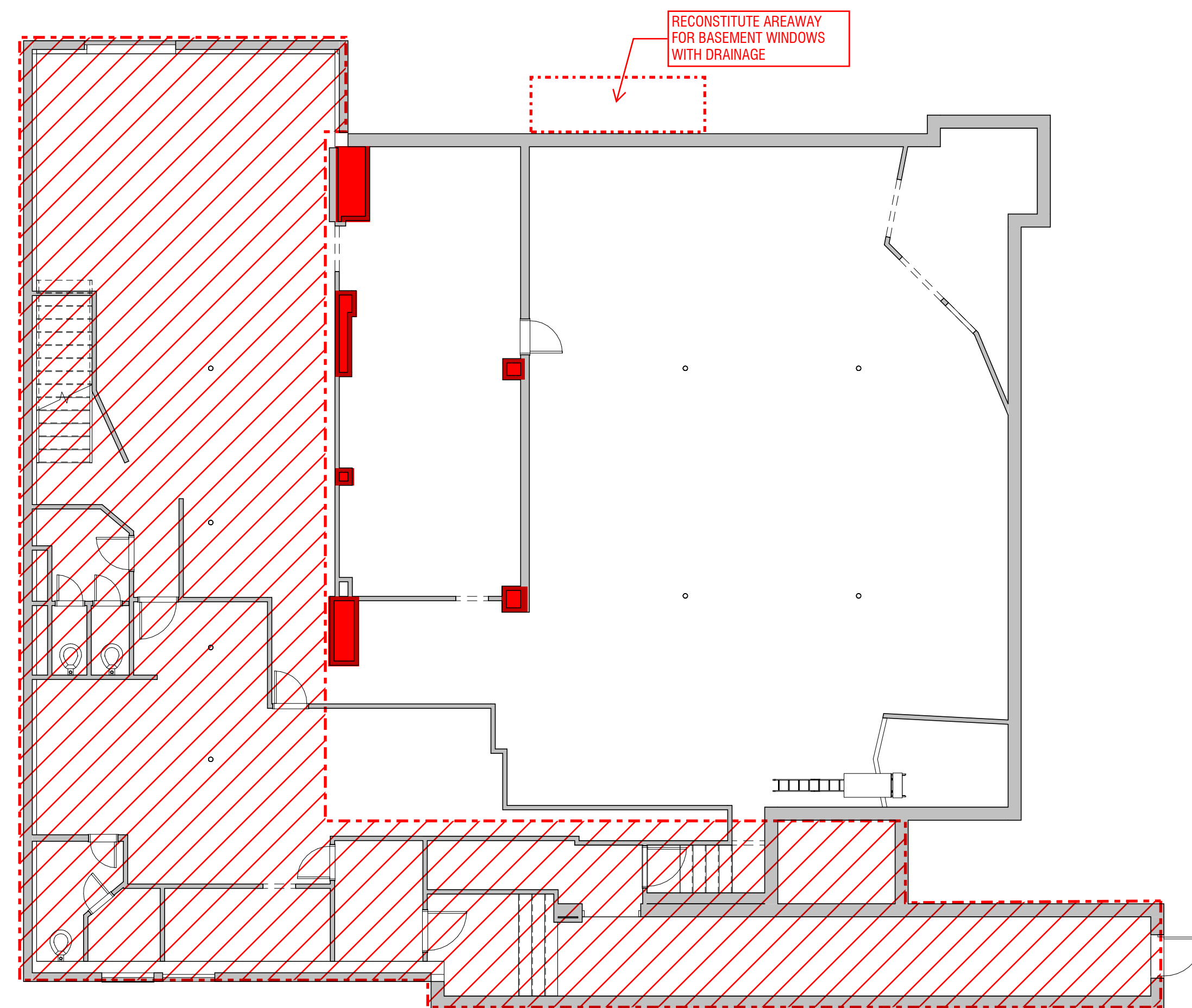
24 Cross St East
24 Cross St East
Somerville, MA 02145

**BEYER
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120 Broadway, 20th Floor
New York, NY, 10271
212 777 7800

- DEMOLISH EXISTING WEST WING AND SOUTH PASSAGE WING CONSTRUCTION INCLUSIVE OF ALL ROOFS, FOUNDATIONS
- DEMOLISH TWO CHIMNEYS DOWN TO TOP OF ADJACENT MASONRY WALL
- DEMOLISH NON-ORIGINAL "DANCEFLOOR" MEZZANINE INFILL CONSTRUCTION IN MAIN SPACE
- EXISTING INTERIOR MASONRY BEARING WALLS TO REMAIN; ALL OTHER INTERIOR PARTITIONS TO BE DEMOLISHED



3 Second Floor Plan
A-1 1/8" = 1'-0"



1 Basement Floor Plan
A-1 1/8" = 1'-0"

KEY PLAN

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NO.	DATE	DESCRIPTION

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DRAWING TITLE

Existing Floor Plans

SCALE 1/8" = 1'-0"
DATE 07/20/21
PROJECT NUMBER 2875.00
DRAWING NUMBER

A-1

CITY OF SOMERVILLE – CROSS STREET CENTER CODE COMPLIANCE APPROACH REPORT

Schematic Design



JENSEN HUGHES

Advancing the Science of Safety

PREPARED FOR

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

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

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1.0 Executive Summary

The proposed renovations to the existing Cross Street Center at 165 Broadway 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 51 feet (measured from grade plane to average of highest roof surface)¹
- + Number of Stories: 2 stories above grade plane, 1 story (basement) below grade
- + High-rise: Yes No
- + Area: Approximately 10,900 gross square feet (not more than 4,000 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:

<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 type="checkbox"/> S-1
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<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.

¹ Building was once a fire station. The measurement is taken to the top of the hose-drying tower, which is not occupied space. Further evaluation is required to determine if the hose-drying tower is part of the roof or considered to be a rooftop structure.

2.0 Introduction

The proposed renovations to the existing Cross Street Center at 165 Broadway in Somerville, MA include alterations to accommodate the proposed tenant improvements.

The existing building contains approximately 10,900 gross square feet of space (3,400 square feet on the Basement Level, 4,000 square feet on the First Floor, and 3,500 square feet on the Second Floor) on 2 stories above grade². The building is a community center and food pantry consisting of activity rooms, learning areas, offices, food storage, and supporting storage/MEP space. While preliminary designs included an option for a potential change to more moderate-hazard storage instead of the current low-hazard storage of food and food products, that option is no longer intended, and the project will maintain the building as a community center and food pantry per discussions with Beyer Blinder Belle. The existing uses, however, will be better served as a result of the proposed renovations.

The building's existing structural members consist of brick and concrete block exterior loadbearing walls, wood encased steel columns and beams supporting wood floors and roof, and plaster and lath over other wood framing. The existing building is equipped with a fire alarm system and is not 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 10/18/2021.
- + Site inspection conducted on 06/29/2021.
- + 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.

² Based on the assumption that the basement level is not considered a story above grade (780 CMR §202).

- + 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	Assembly spaces \geq 50 persons or \geq 750 square feet
Group B, Business	Offices, assembly spaces < 50 persons or < 750 square feet
Group S-2 Storage	Low-hazard storage, food storage

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) 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 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
	Other Primary Structural Frame Supporting Floors	0
	Other Primary Structural Frame Supporting Roofs Only	0

Structural Element		Hours
Bearing Walls	Exterior ³	2
	Interior – Supporting Floors	0
	Interior – Supporting Roofs Only	0
Nonbearing Exterior Walls (FSD = Fire Separation Distance in feet)	FSD < 5	1
	$5 \leq \text{FSD} < 10$	1
	$10 \leq \text{FSD} < 30$	1
	FSD ≥ 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
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 ⁴

³ Not less than fire-resistance rating required based on fire separation distance for non-load bearing exterior walls.

⁴ 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.

Room or Space	Code Reference	Enclosure Fire Resistance
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 ⁵
- 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 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

⁵ 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).

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	Exit Enclosures and Exit Passageways	Corridors	Rooms and Enclosed Spaces
Group B, Business	Class A or B	Class A, B or C	Class A, B or C
Group 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/cm² 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 ² 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 First Floor will be provided with four exits (exterior doors): two at the West side, one at the South side, and one at the East side of the building. One of the West side exits is through the interior exit stair enclosure. The exits, based on the clear width of each exterior door, provide a total egress capacity of 680 persons for the First Floor.

The Second Floor of the building is served by an interior exit stairway and a fire escape. The exit stair will have a calculated exit capacity of 146-people, limited by the 44-inch stair width. The existing fire escape provides a calculated exit capacity of 140-people, limited by the 42-inch stair width. Per 780 CMR §1005.5, the overall egress capacity from the Second Floor is limited by the fire escape; therefore, the total egress capacity is 280 persons for the Second Floor.

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-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 First Floor of the building is provided with exterior exit doors providing direct access to the outside. The Second Floor is served by a single enclosed interior exit stairway that discharges directly to the exterior (Cross Street) at the First Floor as well as a fire escape that discharges facing Cross Street.

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

Occupancy	Maximum Travel Distance (ft)
Groups A-3	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

Occupancy	Maximum Common Path of Travel (ft)
Group A-3	75
Groups B, 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

Occupancy	Maximum Dead End (ft)
Group A-3	20
Groups B, 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).

A new exit stairway and enclosure will be provided to replace the existing interior stair serving the Second Floor and Basement level.

11.10 FIRE ESCAPES

One of the means of egress from the Second Floor is a fire escape on the north end of the building, which discharges facing Cross Street. Occupants must be provided with unobstructed access to the fire escape without having to pass through a room subject to locking. The fire escape must also meet the requirements of 780 CMR 34 §805.3.1.2.1 through §805.3.1.2.3.

A structural inspection for the fire escape should be conducted to ensure the fire escape is in good structural condition.

11.11 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).

11.12 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 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 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.

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. It appears as though select appliances and devices have been replaced or upgraded; however, due to the overall condition and apparent age of some system 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.

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:

- + 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 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 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.⁶

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.

⁶ 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.

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.

LEED v4 for New Construction

Somerville Masterplan - 165 Broadway

Achievability			
high	med	low	NP
75	20	11	6

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.

81 Projected Points

1	0	0	0	Integrative Process		Standard
1				IP Credit 1	v4.1 Integrative Process	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.
9	5	2	1	Location & Transportation		Standard
			16	LT Credit 1	LEED for Neighborhood Development Location	Locate the project in within a development certified under LEED for Neighborhood Development.
1				LT Credit 2	Sensitive Land Protection	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	High Priority Site	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).
4	1			LT Credit 4	Surrounding Density and Diverse Uses	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	v4.1 Access to Quality Transit	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	v4.1 Bicycle Facilities	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	v4.1 Reduced Parking Footprint	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	v4.1 Green Vehicles	Provide preferred parking for Green Vehicles for 5% of all parking spaces, and electric vehicle charging or alternative fuel facility for 2%
5	3	0	2	Sustainable Sites		Standard
Y				SS Prereq 1	Construction Activity Pollution Prevention	Create and implement erosion control plan that meets the 2012 EPA Construction General Permit.
1				SS Credit 1	Site Assessment	Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
1			1	SS Credit 2	Protect or Restore Habitat	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	Open Space	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	v4.1 Rainwater Management	Manage runoff for the 95th percentile (2pt) or 98th percentile (+1pt) using low-impact development (LID) and green infrastructure.
2				SS Credit 5	Heat Island Reduction	Meet high albedo requirements for roof and site (2pts) - OR - place a minimum of 75% parking under cover (1pt).
1				SS Credit 6	Light Pollution Reduction	Meet uplight and light trespass requirements, and do not exceed exterior signage luminance requirements.
9	0	0	3	Water Efficiency		Standard
Y				WE Prereq 1	Outdoor Water Use Reduction: 30%	Reduce outdoor water use by 30% compared to the LEED baseline.
Y				WE Prereq 2	Indoor Water Use Reduction: 20%	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	Building-Level Water Metering	Install permanent water meters for building and grounds, and commit to share data with USGBC for 5 years.
2				WE Credit 1	Outdoor Water Use Reduction: 50% Reduction / No Potable Water Use	Reduce potable water used for irrigation by 50% (1pt) - AND - use no potable water for irrigation (1pt).
6				WE Credit 2	Indoor Water Use Reduction: 25% / 30% / 35% / 40% / 45% / 50%	Reduce indoor water use compared to the LEED baseline.
			3	WE Credit 3	Cooling tower water use	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	Water Metering	Install permanent water meters for two or more water subsystems.
24	5	4	0	Energy & Atmosphere		Standard
Y				EA Prereq 1	Fundamental Commissioning and Verification	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	Minimum Energy Performance	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	Building-Level Energy Metering	Install meters to provide data on total energy consumption, and commit to share data with USGBC for 5 years.
Y				EA Prereq 4	Fundamental Refrigerant Management	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	Enhanced Commissioning	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	Optimize Energy Performance: 6% / 8% / 10% / 12% / 14% / 16%	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
6				EA Credit 2	Optimize Energy Performance: 18% / 20% / 22% / 24% / 26% / 29%	Reduce building energy cost by 18% / 20% / 22% compared to ASHRAE 90.1-2010, Appendix G.
	3	3		EA Credit 2	Optimize Energy Performance: 32% / 35% / 38% / 42% / 46% / 50%	Reduce building energy cost by 32% / 35% / 38% compared to ASHRAE 90.1-2010, Appendix G.
1				EA Credit 3	Advanced Energy Metering	Install energy metering for whole building energy and individual energy end uses representing 10% of more of total consumption.
	1	1		EA Credit 4	v4.1 Grid Harmonization	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	v4.1 Renewable Energy	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	Enhanced Refrigerant Management	Select refrigerants with low global warming potential and ozone depletion potential.
8	4	1	0	Materials & Resources		Standard
Y				MR Prereq 1	Storage & Collection of Recyclables	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	Construction and Demolition Waste Management Planning	Develop and implement a construction and demolition waste management plan.
3	2			MR Credit 1	v4.1 Building Life-Cycle Impact Reduction	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	v4.1 Building Product Disclosure & Optimization: Environmental Product Declarations	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	v4.1 Building Product Disclosure & Optimization: Sourcing of Raw Materials	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	v4.1 Building Product Disclosure & Optimization: Material Ingredients	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	v4.1 Construction & Demolition Waste Management: 50% / 75%	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	Indoor Environmental Quality		Standard
Y				EQ Prereq 1	Minimum IAQ Performance	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	Environmental Tobacco Smoke (ETS) Control	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	Enhanced Air Quality Strategies	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	v4.1 Low-Emitting Materials: 2 / 3 / 4 / 5 categories	Achieve the threshold level of compliance with VOC emissions and content standards for 2, 3, 4, or 5 product categories.

1				EQ Credit 3	Construction IAQ Management Plan	Develop an IAQ plan for construction and preoccupancy phases that meets SMACNA IAQ Guidelines for Occupied Buildings Under Construction.
2				EQ Credit 4	Indoor Air Quality Assessment	Perform pre-occupancy building flush out (1pt) or air quality testing (2pts).
1				EQ Credit 5	Thermal Comfort	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	Interior Lighting	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	v4.1 Daylight: 40% / 55% / 75%	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	Quality Views	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	Acoustic Performance	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.
6	0	0	0	Innovation		Standard
1				IN Credit 1.1	Innovation, TBD	Pending GBCI review and comment.
1				IN Credit 1.2	Innovation, TBD	Pending GBCI review and comment.
1				IN Credit 1.3	Innovation, TBD	Pending GBCI review and comment.
1				IN Credit 1.4	Innovation, TBD	Pending GBCI review and comment.
1				IN Credit 1.5	Innovation, TBD	Pending GBCI review and comment.
1				IN Credit 2	LEED™ Accredited Professional	LEED Accredited Professional on design team.
3	1	0	0	Regional Priority		Standard
	1			RP Credit 1.1	Regional Priority, SSc4 Rainwater Management	Achieve at least 2 points for SSc4 Rainwater Management
1				RP Credit 1.2	Regional Priority, EAc2 Optimize Energy Performance	Achieve at least 8 points for EAc2 Optimize Energy Performance
1				RP Credit 1.3	Regional Priority, WEc2 Indoor Water Use Reduction	Achieve at least 4 points for WEc2 Indoor Water Use Reduction
1				RP Credit 1.4	Regional Priority, MRc1 Building Life-Cycle Impact Reduction	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

24 September 2021
File No. 0200460-001

TO: Beyer Blinder Belle Architects & Planners LLP
Mr. Aaron Lamport, AIA, LEED AP Principal

FROM: Haley & Aldrich, Inc.
Al Varshoj, P.Eng. (ON)
Damian R. Siebert, PE (MA)

SUBJECT: Preliminary Geotechnical Evaluations
45 College Avenue
Somerville, Massachusetts

This memorandum presents our preliminary evaluations of available subsurface information and provides preliminary geotechnical recommendations to aid in early planning for the proposed construction at 45 College Avenue, Somerville, Massachusetts. Haley & Aldrich's scope of work is outlined in our proposal dated 5 August 2021 and your subsequent authorization.

PROPOSED CONSTRUCTION

Based on the information provided by Beyer Blinder Belle Architects & Planners LLP (BBB), the City of Somerville is considering replacing the existing building at 45 College Avenue with a new three- to four-story building with one level of below-grade space. The details of the proposed development are based on plans titled "CS Preliminary Scenarios," dated 24 June 2021. The below-grade space is anticipated to be finished at a depth of approximately 12 ft below existing site grades.

SUBSURFACE CONDITIONS

Subsurface data for the site is extrapolated based on information from the recent renovation work at 40 College Avenue. The available subsurface information, in the form of a Geotechnical Report¹ and a Geotechnical Letter², was provided to us by BBB. It should be noted that site-specific subsurface explorations should be advanced within the new building footprint prior to final design.

¹ *Geotechnical Engineering Report, Proposed Addition – Somerville west Branch Public Library, 40 College Avenue, Somerville, MA*, prepared by GZA GeoEnvironmental, Inc., dated 18 January 2016.

² *Geotechnical Letter, Supplement Subsurface Explorations, Proposed Addition – Somerville West Branch Public Library, 40 College Avenue, Somerville, MA*, prepared by GZA GeoEnvironmental, Inc., dated 16 August 2016.

The subsurface conditions are anticipated to generally consist of surficial layers of topsoil and fill underlain by a deposit of sand. The sand overlies a silt and/or clay stratum over weathered bedrock. The overall thickness of topsoil and fill is estimated to range from 6 to 8 ft. The sand layer is estimated to range in thickness from 2 to 5 ft, with a relative density of medium-dense to very dense. The silt and/or clay layer is estimated to be approximately 3 ft thick with medium stiff to stiff consistency. The depth to the weathered bedrock layer is estimated to be on the order of 14 to 16 ft.

Groundwater was not encountered in the test pits and could not be determined in the test borings at the neighboring site. Based on the depth of the test pits, groundwater is estimated to be deeper than approximately 8.5 ft below ground surface.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The recommendations below are intended for use in the development of a preliminary foundation design and site-specific geotechnical explorations will need to be performed prior to final design to confirm subsurface conditions. Building foundation design and construction must conform to the applicable provisions of the current Massachusetts State Building Code (Building Code). The recommendations herein are intended to be consistent with the 9th Edition of the Building Code.

Foundation Type

Conventional reinforced concrete spread footings with a soil-supported slab-on-grade for the lowest floor is the most economical foundation system for most low- to medium-height buildings, if a suitable inorganic soil or bedrock bearing stratum exists at a shallow depth and predicted building settlements are acceptable. Based on the anticipated subsurface conditions and the depth of the below-grade space (12 ft), we recommend that the new building columns and exterior walls be founded on conventional spread footings with a nominally reinforced slab-on-grade on the natural soils. A settlement and bearing capacity evaluation should be performed during final design. For preliminary planning, an allowable bearing pressure of 4 kips per square foot may be assumed. During final design, after collection of site-specific subsurface information, this value will be confirmed or adjusted.

Permanent Foundation Drainage

Depth to groundwater is currently unknown. For planning purposes, consideration should be given to including a permanent underslab and perimeter drainage system to collect and remove any encountered water. Below-grade walls should be drained for planning purposes. We recommend that a moisture vapor retarder (e.g., 10-mil high-density polyethylene membrane) be provided below the drained slab. Discharge from the drainage systems should be directed to a reliable gravity outlet. If gravity discharge is not possible, effluent should be directed to a sump system having redundant pumps.

Lateral Earth Pressures

Basement walls or foundation walls serving as retaining walls should be designed to resist lateral earth pressures for the permanent condition due to:

- **Soil Pressure:** Calculate using an equivalent unit weight of retained earth equal to 60 pounds per cubic foot (pcf) with a triangular distribution from site grades to the base of the below-grade wall.
- **Surcharges:** Calculate based on a uniform lateral pressure equal to 0.5 times the vertical surcharge pressure acting on the backfilled side of the wall and applied over the full height of the wall.

PRELIMINARY CONSTRUCTION CONSIDERATIONS

Excavation and Temporary Support of Excavation

The proposed construction will require excavations in soils for the basement, building foundations, utilities, and other features. Given the current site use, remnants of existing structures including slabs, foundations elements (walls and footings), utilities, rubble fill, and other buried structures and oversize materials may be encountered during construction.

We anticipate that foundation and utility excavations can be conducted using conventional, mechanized earth-moving equipment and methods unless bedrock is encountered.

We recommend that a lateral excavation support system consisting of a cantilevered soldier pile and lagging be used around the perimeter of the below-grade excavation to limit the extent of excavation and protect adjacent structures.

Excavated Soil Management

We anticipate that the site development will generate excess soil that requires off-site disposal, the management of the excess soils must be performed in accordance with all applicable federal, state, and local laws and regulations, including the requirements of the Massachusetts Contingency Plan (MCP, 310 CMR 40.000). Excess soil designated for off-site disposal will require analytical testing. If reportable concentrations of contaminants are detected in the soils, regulatory compliance may be required in accordance with the timelines established in the MCP. We recommend a soil precharacterization program be performed prior to final design to assist with this evaluation.

CLOSURE

We trust this information is adequate for your current needs. Should you have any questions or require additional information, please do not hesitate to contact our office.

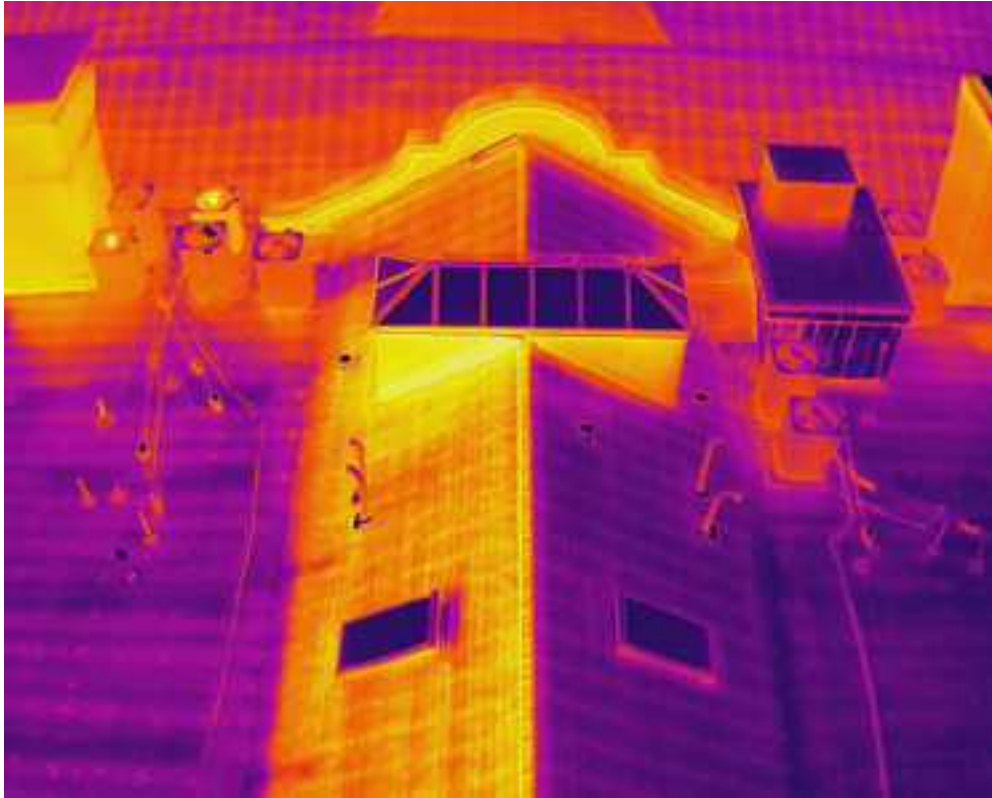
Attachment:

CSA Preliminary Scenarios



Somerville Master Plan

Infrared Drone Survey



August 2, 2021
WJE No. 2020.6134

PREPARED FOR:

BEYER BLINDER BELLE ARCHITECTS & PLANNERS LLP
120 Broadway, 20th Floor
New York, New York 10271

PREPARED BY:

Wiss, Janney, Elstner Associates, Inc.
311 Summer Street, Suite 300
Boston, Massachusetts 02210
617.946.3400 tel



Somerville Master Plan

Infrared Drone Survey

David Fagan
Project Associate, Level 1 sUAS Thermographer

Anita Simon, AIA
Project Manager



August 2, 2021
WJE No. 2020.6134

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INFRARED THERMOGRAPHY (IR) SURVEY

On July 24, 2021, David Fagan and Erin Murphy (WJE) visited four buildings in Somerville, Massachusetts:

- 24 Cross Street East (former church and storage for General Insulation) (Figure 1)
- 165 Broadway (former fire station, now known as the Cross Street Center) (Figure 2)
- 191 Highland Avenue (Armory) (Figure 3)
- 115 Broadway (Library East Branch) (Figure 4)

Qualitative infrared (IR) thermography surveys were completed of all extant roofing systems. The purpose of the surveys was to identify potential areas of entrapped moisture within the roofing systems. The IR surveys were performed in general conformance with ASTM C1153-10, *Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging*.

Prior to performing the IR surveys, visible light photographic surveys were performed to provide context and capture reference images of the roof surfaces before sunset. The weather conditions during the surveys at all buildings were as follows:

-
- | | |
|--|------------------------------------|
| ▪ Partly Cloudy | ▪ Dew Point: 59 degrees Fahrenheit |
| ▪ Air Temperature: 72 degrees Fahrenheit | ▪ Wind: SSE at 7 miles per hour |
| ▪ Humidity: 64% | |
-

Methodology of Infrared Survey (ASTM C1153-10)

IR thermography scanning is a non-invasive method that can be used to locate possible anomalies within a structure. IR, or heat energy, are light waves that are not visible to the human eye. These light waves are the portion of the electromagnetic spectrum between 0.75 to 13 micrometers. An IR camera detects heat energy that is emitted and reflected from an object or material. Different objects or materials will absorb, conduct, or emit heat energy differently. Additionally, materials resist thermal energy to varying degrees. When imaging a surface, the IR camera assigns a relative temperature reading based on emitted heat energy from each object or material.

Moisture laden roof components have a larger thermal mass and retain heat longer than adjacent dry roof components. After the sun sets and the roof begins to discharge heat to the environment, the moisture laden roof components rate of temperature reduction is slower than that of the dry roof components. Subsequently, the wet components remain warmer for a longer period of time which results in thermal differences, which are graphically depicted by the IR camera by different colors in the IR image. The temperature differential will gradually dissipate as both wet and dry components reach a new equilibrium temperature equal to the ambient air temperature. The time between sunset and when both wet and dry components reach equilibrium temperature is the time in which this scan was completed. Images that show differential temperatures were captured in the evening hours following sunset to maximize the temperature differences between wet and dry roof insulation.

The equipment utilized in the scans were:

- An aerial drone, DJI Mavic 2 Enterprise Advanced (Serial Number 4GCCJ5HR0A0ABQ/FAA Certificate Number FA34LNTP7R) was used to perform the infrared thermography surveys at all four buildings.
- An aerial drone, DJI Mavic 2 Zoom (Serial Number 0M6DFA30019J28/FAA Certificate Number FA3RX4KHLY) was used to perform the visible light photography at all four buildings.

24 CROSS STREET EAST (GENERAL INSULATION BUILDING)

The General Insulation Building is a two-story (above-grade) mass masonry brick structure that is generally square in plan with a cruciform steep-slope roof system. A rectangular addition is present at the rear of the building with a low-slope roof system. The original portion of the building roof is covered with composite asphaltic shingles. The addition is covered with an aggregate ballast. Both roofs slope to gutters. The building is vacant, and it is our understanding that there is no functional mechanical system in operation.

The IR survey at the General Insulation Building occurred between 8:47 PM and 8:52 PM.

The following thermal anomalies were noted at the General Insulation Building:

- Location 1: There is a thermal anomaly (approximately 60 square feet) at the north corner tower (Figure 5). Roofing in this location is comprised of a low-slope deck covered with an EPDM membrane. The membrane is torn in multiple locations and the underlying insulation is exposed to the elements.
- Location 2: There is a thermal anomaly (approximately 144 square feet) at the south corner tower (Figure 6). Roofing in this location is comprised of a low-slope deck covered with remnants of a built-up roofing system and an EPDM membrane. The EPDM membrane is displaced, wrinkled, and wrapped among itself at a corner of the tower. Portions of the underlying wood roof deck and framing are exposed to the elements
- Location 3: There are thermal anomalies throughout the cruciform roof where shingles are missing. Areas of missing shingles range in size from approximately 4 square feet up to approximately 150 square feet (Figure 7). Shingles are missing in varying quantities on each slope of the cruciform roof.
- Location 4: There are thermal anomalies throughout the addition at low-slope roof assembly (Figure 8). Areas of displaced ballast are approximately 25 square feet. The thermal anomaly extends beyond the area of displaced roofing.

165 BROADWAY (CROSS STREET CENTER)

The Cross Street Center is a two-story mass masonry brick structure that is generally rectangular in plan and oriented in a north/south direction. There are three roof levels consisting of the main roof covering the majority of the building, the former hose-drying tower at the southwest corner of the building, and a narrow roof spanning the majority of the north facade. The central and tower roofs are covered with a low-slope EPDM roofing system and the north sloped roof has composite asphaltic shingles. With exception of the tower roof, the roofs slope to the rear of the building to continuous gutters with downspouts. Edge metal is installed at the tower with no drain or gutters.

The IR survey at the Cross Street Center occurred between 8:55 PM and 9:00 PM.

The following thermal anomalies were noted at the Cross Street Center:

- Location 1 - There is an area of thermal anomaly (approximately 75 square feet) at the south end of the main roof adjacent to the parapet (Figure 9). The EPDM adjacent to the tower is wrinkled.

191 HIGHLAND AVENUE (ARMORY)

The Armory borders Highland Avenue on its south facade and consists of a square structure with and a rectangular structure at the north end of the building. The square structure includes a combination of a steep slope composite asphalt shingles spanning the center of a monitor-type roof and flanked by two levels of low-slope roofs. The lower roof is covered with planks for occupant access spanning between the north and south turrets. The northern steep-sloped roof abuts the square structure with a cricket covered with EPDM.

The IR survey at the Armory occurred between 8:28 PM and 8:33 PM.

The following thermal anomalies were noted at the Armory:

- Location 1 - There is an area of thermal anomaly at the intermediate EPDM roof of the square structure, at the north end of the east roof adjacent to a chimney and air conditioner penetration (Figure 10).

115 BROADWAY (LIBRARY EAST BRANCH)

The Library is rectangular one-story building with a low-slope roof system. The roof is covered with a white TPO or PVC membrane and includes a chimney at the northwest corner. Internal drains are located at each corner of the building. The perimeter of the roof is formed of a low parapet or curb that is also covered with roofing.

The IR survey at the Library occurred between 9:05 PM and 9:08 PM.

- No thermal anomalies were noted at the Library. Refer to Figure 11 for overall photos of the roof.

DISCUSSION/RECOMMENDATIONS

No probes were made at any of the identified areas of thermal anomalies during WJE's site visit on July 24, 2021. Probes at each thermal anomaly are recommended to confirm the condition of the roofing assembly and to determine if there are roofing components with elevated moisture contents. While making inspection probes, the roofing can be reviewed, and an attempt made to find the cause and origin of leakage that caused the elevated moisture content of roofing materials.

- Prior to July 24, 2021, the last days with recorded precipitation in Somerville, Massachusetts was July 18 and 19, 2021 totaling 0.47 inches. In addition, approximately 1 inch of rain occurred on July 13, 2021. Prior to these days, quick-passing storms with rainfall totaling 2 inches occurred on July 2, 4, and 10, 2021. This precipitation is generally sufficient to increase the effectiveness of the IR scans to present a relative quantity of water that would become trapped within the insulation if conditions allow. Wind speeds were below the levels that would otherwise contribute to conditions that reduce to the apparent presence of slight thermal anomalies.

FIGURES



Figure 1. 24 Cross Street East (former church and storage for General Insulation)



Figure 2. 165 Broadway (former fire station, now known as the Cross Street Center)



Figure 3. 191 Highland Avenue (Armory)



Figure 4. 115 Broadway (Library East Branch)



Figure 5. IR image (left) and visual light reference image (right) of thermal anomaly at north corner tower (dashed white area)

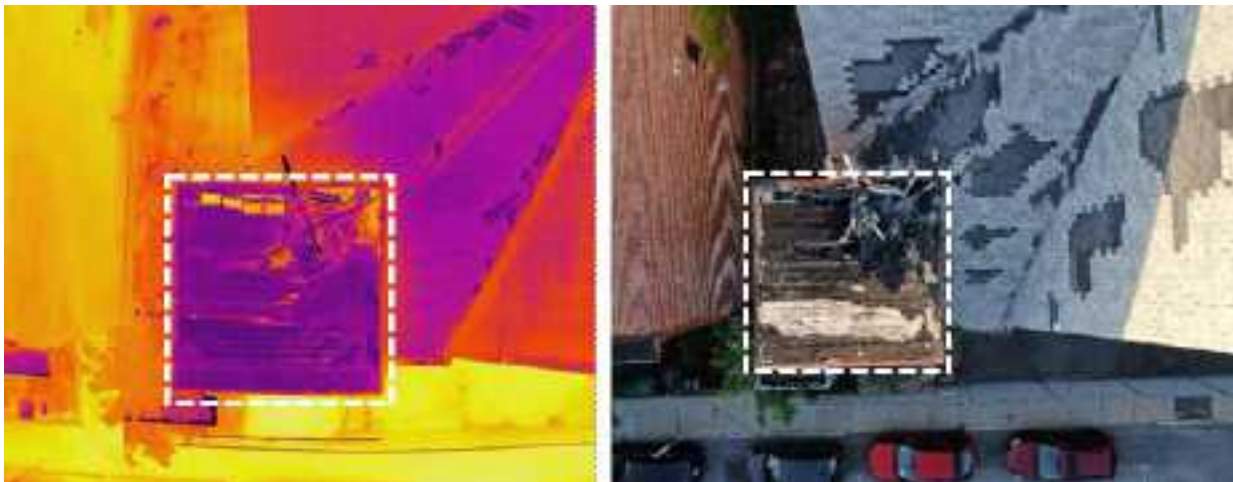


Figure 6. IR image (left) and visual light reference image (right) of thermal anomaly at south corner tower (dashed white area)

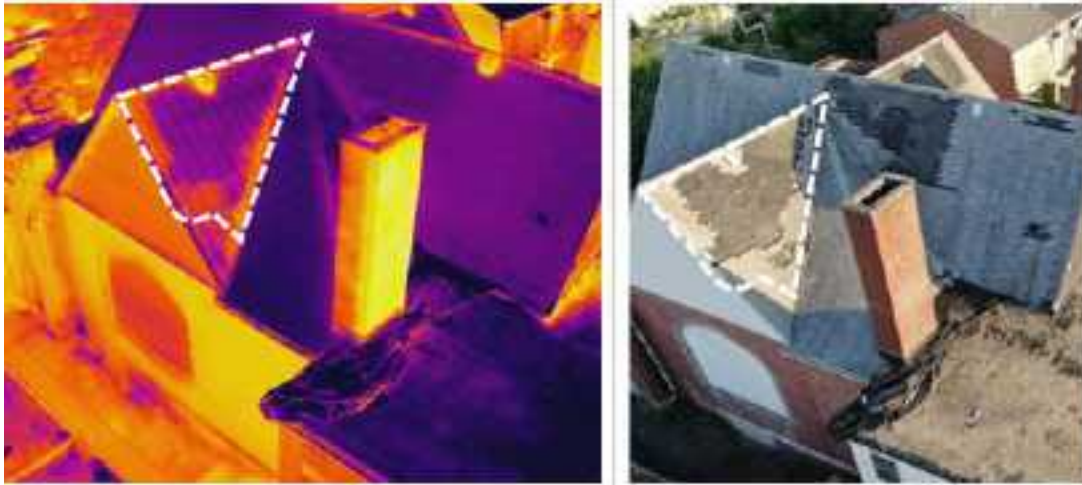


Figure 7. IR image (left) and visual light reference image (right) of thermal anomaly at field of roof (dashed white area). Note similar thermal anomalies are present at adjacent areas of missing shingles.

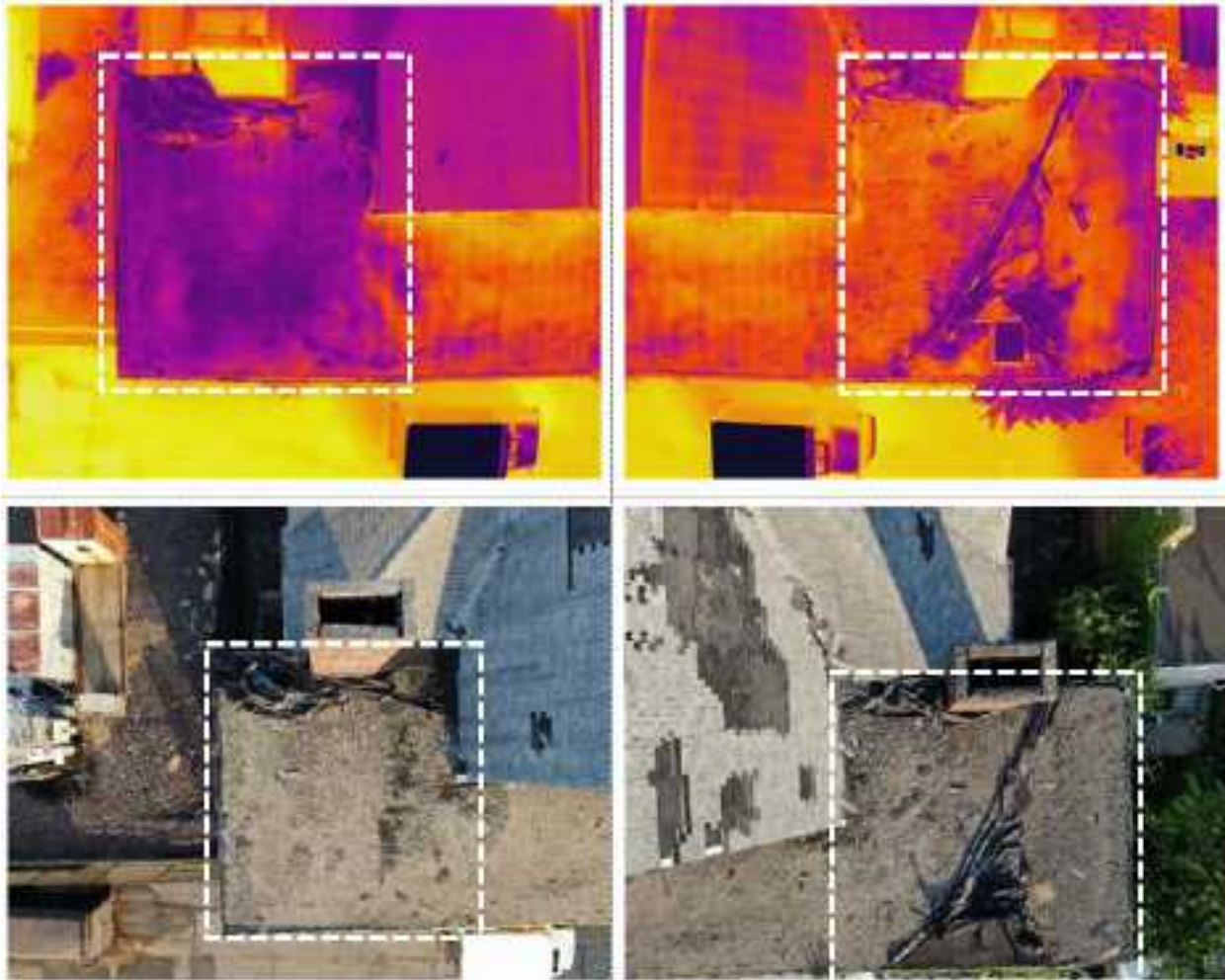


Figure 8. IR images (above) and visual light reference image (below) of thermal anomalies at field of roof (dashed white area)

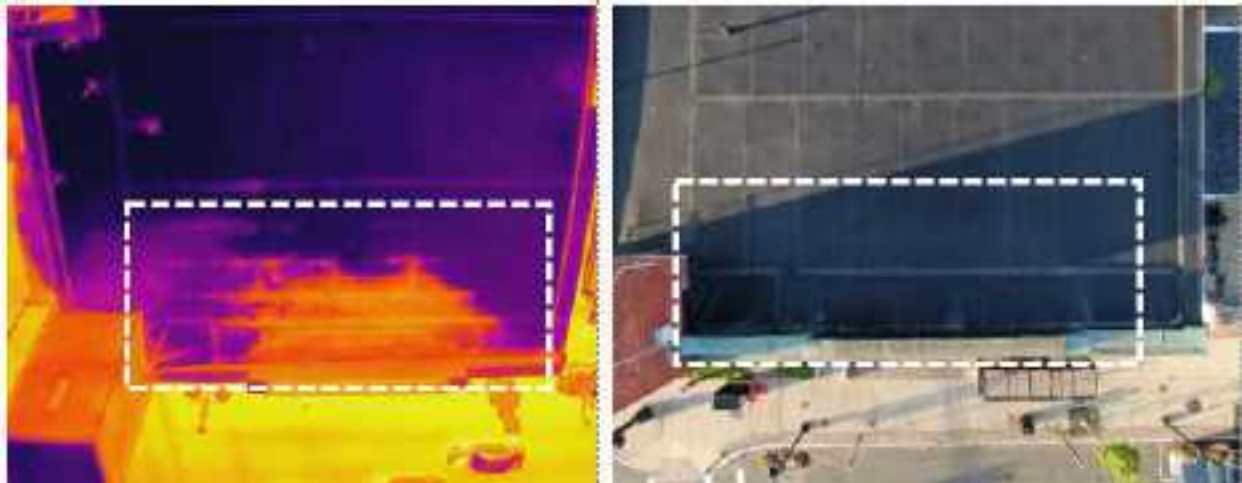


Figure 9. IR images (left) and visual light reference image (right) of thermal anomalies at field of roof (dashed white area)

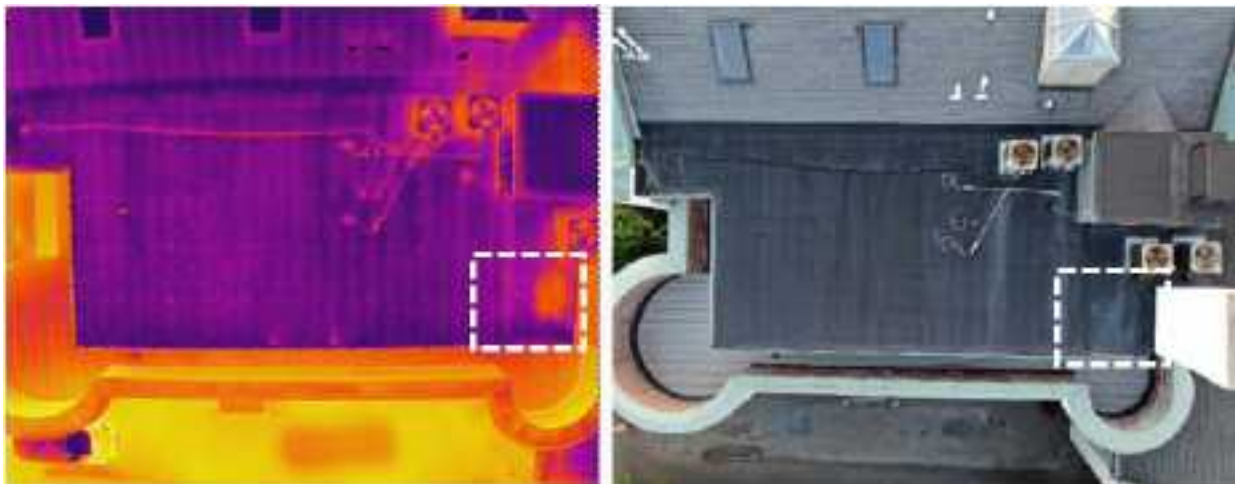


Figure 10. IR images (left) and visual light reference image (right) of thermal anomalies at field of roof (dashed white area)

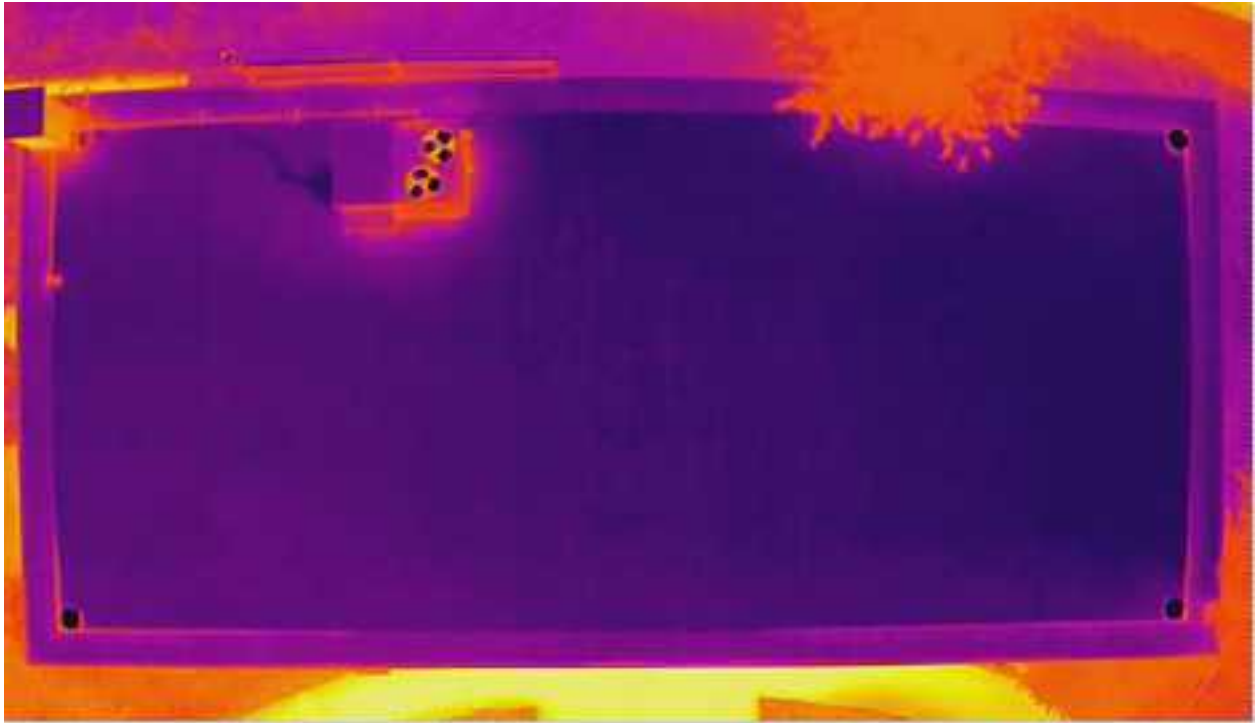


Figure 11. Overall view of IR image (above) and visual light reference image (below)

**HAZARDOUS BUILDING MATERIALS SURVEY REPORT
ARMORY BUILDING
191 HIGHLAND AVENUE, SOMERVILLE, MA**



PREPARED FOR:

**HALEY & ALDRICH, INC.
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PREPARED BY:

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OCTOBER 1, 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 1st day of October 2021

Prepared by:



Geoff Gerace
Asbestos Inspector/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 planned property 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 45,000 square feet. The building is occupied by multiple commercial and residential tenants. The floors are designated as basement, first floor, second floor and third floor. The building was constructed in 1903 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 retail tenants, residential tenants, stage area, café, storage rooms, bathrooms, hallways, and mechanical rooms. The exterior walls brick over concrete and CMU. Interior walls are a combination of concrete and painted drywall. The vast majority of the floors have hardwood flooring and vinyl flooring as well as some ceramic and quarry floor tile coverings. The majority of spaces have drywall walls and ceilings covering wood decking. The building has a flat rubber roof system on the East and West sides, and asphaltic shingles on the North and South sides.

3.0 INSPECTION PERSONNEL, METHODS AND LABORATORY

3.1 Inspection Personnel and Process

3.1.1 Inspection Personnel

The investigative survey was conducted on September 2, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Geoff Gerace (Massachusetts Asbestos Inspector License Number AI034620).

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. 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 ¹	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.

¹ 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: The following areas were not inspected by AXIOM; Unit B-1, B-2, B-3, B-4, B-6, 1A, Unit 3, Suite 2B, and Unit 205. AXIOM could not survey because it was either non-accessible or 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.

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/cm²). This unit can measure the concentration of LCP on surfaces as little as 0.01 mg of lead/cm².

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
ARMORY BUILDING, 191 HIGHLAND AVE, SOMERVILLE, MA

Sample Reference	Sample Description	Sample Location	Estimated Quantity ²	Results
092121-57-15A&B	Remnant Asphaltic Sealant (on brick wall and 3 rd Floor Window Frame)	Exterior Rear Side of Building	16 LF	10% 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
Thin Set w/ Ceramic & Quarry Floor Tile	Bathrooms and Cafe	1500 SF	Friable

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 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 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).

² SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos; CRO = Crocidolite Asbestos

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 HUD³ lead paint standard classifies Lead Based Paint (LBP) as paint having $\geq 1.0 \text{ mg/cm}^2$ 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.

AXIOM performed testing of paints for the presence of lead at the building. Representative testing of painted surfaces for the presence of lead was performed on accessible painted surfaces. The testing was performed via bulk paint chip sample analysis. AXIOM collected four (4) paint chips for lead analysis from representative paint at the building.

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 PAINT CHIP SAMPLE RESULTS

Description	Location	XRF Reading (mg/cm ²)
White Window Sash	Exterior	1.8
Yellow Metal I beam	Basement Mechanical Room	2.3
Beige Wainscotting	1 st Floor Hallway	1.14
Beige Wainscotting	2 nd Floor Hallway	1.13

Based on analytical results, four of the paint samples contained lead in detectable quantities.

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.

³ U.S. Department of Housing and Urban Development

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. TCLP⁴ 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.

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 applicable⁵ and since the disposal cost is not significant, AXIOM recommends disposing of DEHP-containing ballasts similarly.

4.3.2 Transformers

AXIOM did observe one dry-type transformer on the site.

4.3.3 Mercury-Containing Items

⁴ Toxicity Characteristic Leachate Procedure (TCLP)

⁵ 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.

There are approximately one hundred twenty (120) fluorescent light bulbs associated with actual light fixtures at the subject building. Also, four (4) mercury thermostats were located in the mezzanine of the stage area. 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 nine (9) rooftop air conditioner unit located on the roof. Also, twelve (12) pad mounted air conditioners in the rear of the building. 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 ⁶
PCB-01	Exterior Window Caulking	Exterior Front Side of Building	ND

Laboratory results are reported in micrograms per kilograms ($\mu\text{g}/\text{kg}$) 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 results of this investigation, **none** of the caulking samples are considered to be PCB bulk products.

⁶ 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.

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 paints. 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; and
 - remnant window and door caulking that have been replaced or in-filled.
- The following areas were not inspected by AXIOM; Unit B-1, B-2, B-3, B-4, B-6, 1A, Unit 3, Suite 2B, and Unit 205. These areas either had locked doors or were not accessible at the time of the site visit.

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 HUD⁷ 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.

⁷ US Department of Housing and Urban Development

APPENDIX A

Asbestos Bulk and PCB Bulk Sample Results



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EMSL Order: 132107141

Customer ID: AXIO80

Customer PO:

Project ID:

Attention: Geoff Gerace
Axiom Partners, Inc.
50B Salem Street, Suite 103
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Fax: (781) 213-6992

Received Date: 09/22/2021 10:50 AM

Analysis Date: 09/28/2021

Collected Date: 09/21/2021

Project: 01164.117 - City of Somerville; Armory; 191 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
092121-57-01A <small>132107141-0001</small>	1st Floor NE - White Exterior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-01B <small>132107141-0002</small>	2nd Floor SW - White Exterior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-02A <small>132107141-0003</small>	1st Floor West Side - White Exterior Textured Paint	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-02B <small>132107141-0004</small>	1st Floor East Side - White Exterior Textured Paint	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-03A <small>132107141-0005</small>	Unit 2A Closet - Gypsum Wallboard	Gray Fibrous Homogeneous	2% Glass	98% Non-fibrous (Other)	None Detected
092121-57-03B <small>132107141-0006</small>	2nd Floor Hallway - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
092121-57-03C <small>132107141-0007</small>	1st Floor Hallway - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
092121-57-03D <small>132107141-0008</small>	Performance Center Back Room - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
092121-57-03E <small>132107141-0009</small>	3rd Floor Vacant Unit - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
092121-57-03F <small>132107141-0010</small>	3rd Floor Hallway - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
092121-57-03G <small>132107141-0011</small>	Basement Unit 2B - Gypsum Wallboard	Gray Fibrous Homogeneous	2% Glass	98% Non-fibrous (Other)	None Detected
092121-57-04A <small>132107141-0012</small>	Unit 2A Closet - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-04B <small>132107141-0013</small>	2nd Floor Hallway - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-04C <small>132107141-0014</small>	1st Floor Hallway - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-04D <small>132107141-0015</small>	Performance Center Back Room - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/28/2021 12:23:06



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EMSL Order: 132107141

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
092121-57-04E <small>132107141-0016</small>	3rd Floor Vacant Unit - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-04F <small>132107141-0017</small>	3rd Floor Hallway - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-04G <small>132107141-0018</small>	Basement Unit 2B - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-06A <small>132107141-0019</small>	Unit 2A Bedroom - Hardwood Floor Moisture Barrier	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-06B <small>132107141-0020</small>	Unit 2A Bedroom - Hardwood Floor Moisture Barrier	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-07A <small>132107141-0021</small>	Unit 2A Bath - 12"x12" Beige/Brown Ceramic Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-07B <small>132107141-0022</small>	Basement Lobby Closet - 12"x12" Beige/Brown Ceramic Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-09A <small>132107141-0023</small>	Unit 2A Bath - 4"x4" Black/White Ceramic Wall Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-09B <small>132107141-0024</small>	Rooted Café Bath - 4"x4" Black/White Ceramic Wall Tile Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-11A <small>132107141-0025</small>	Elevator Room Basement - Textured Wall Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-11B <small>132107141-0026</small>	Electrical Room Basement - Textured Wall Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-12A <small>132107141-0027</small>	Basement B9 - 4" Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-12B <small>132107141-0028</small>	1st Floor Food Storage - 4" Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-13A <small>132107141-0029</small>	Café Kitchen Area - Red Quarry Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-13B <small>132107141-0030</small>	Café Kitchen Area - Red Quarry Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-15A <small>132107141-0031</small>	3rd Floor Hallway - Roof Cement on Arch Windows	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
092121-57-15B <small>132107141-0032</small>	3rd Floor Near Elevator - Roof Cement on Arch Windows				Positive Stop (Not Analyzed)

Initial report from: 09/28/2021 12:23:06



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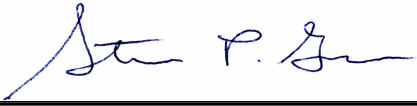
<http://www.EMSL.com> / bostonlab@emsl.com

EMSL Order: 132107141
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
092121-57-16A <small>132107141-0033</small>	Rubber Roof West - Black Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-16B <small>132107141-0034</small>	Rubber Roof East - Black Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-17A <small>132107141-0035</small>	Roof North - Gray Asphalt Shingle	Gray/Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
092121-57-17B <small>132107141-0036</small>	Roof South - Gray Asphalt Shingle	Gray/Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
092121-57-18A <small>132107141-0037</small>	Rubber Roof West - 1/2" Fiberboard Insulation	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
092121-57-18B <small>132107141-0038</small>	Rubber Roof East - 1/2" Fiberboard Insulation	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
092121-57-19A <small>132107141-0039</small>	Rubber Roof West - Pipe Penetration Caulking	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-19B <small>132107141-0040</small>	Rubber Roof East - Pipe Penetration Caulking	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-20A <small>132107141-0041</small>	Roof West Side - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-20B <small>132107141-0042</small>	3rd Floor Hallway - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
092121-57-21A <small>132107141-0043</small>	Roof North - Tar Paper Assoc. w/ Gray Asphalt Shingles	Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
092121-57-21B <small>132107141-0044</small>	Roof South - Tar Paper Assoc. w/ Gray Asphalt Shingles	Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
092121-57-20C <small>132107141-0045</small>	Basement SW Corner - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)
Kevin Pine (44)



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: 09/28/2021 12:23:06



AXIOM PARTNERS
 ONE PLEASURE ISLAND RD
 WAKEFIELD, MA 01880
 PHONE: 781.213.9198

EMSL LABORATORY ORDER #:
132107141
 Sample(s) received in good condition? [Y] [N]
 Discernable field blank submitted? [Y] [N]

Asbestos Analysis - Chain of Custody Form

Sampled by:	Geoff Gerace	Date Collected:	9/21/2021
Project Name:	Asbestos-Containing Materials Survey-City of Somerville-Armory		
Project Site:	191 Highland Ave Somerville, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	Positive Stop, E-Mail Results to ggerace@axiomenv.com		

TURNAROUND TIME - If turn around time is not chosen standard turnaround time applies (6 + Days)

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 2 Hours	<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input checked="" type="checkbox"/> 4 Days	<input type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
----------------------------------	----------------------------------	----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------	--	---------------------------------	------------------------------------

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"/> EPA 600/R-93/116 <input type="checkbox"/> California Air Resource Board (CARB) 435 <input type="checkbox"/> NY Stratified Point Count <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"/> Standard Addition Point Count	SOILS <input type="checkbox"/> EPA Protocol Qualitative <input type="checkbox"/> EPA Protocol Quantitative <input type="checkbox"/> EMSL MSD 9000 Method fibers/gram <input type="checkbox"/> Superfund EPA 540-R097-028 (dust generation) TEM AIR <input type="checkbox"/> AHERA 40 CFR, Part 763 Subpart E <input type="checkbox"/> NIOSH 7402 Issue 2 <input type="checkbox"/> EPA Level II TEM WIPE <input type="checkbox"/> ASTM D-6480-99 <input type="checkbox"/> Qualitative	TEM MICROVAC <input type="checkbox"/> ASTM D 5755-95 (Quantitative) TEM BULK <input type="checkbox"/> Drop Mount (Qualitative) <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"/> NYS 198.2 <input type="checkbox"/> Other: Page 1 of 3
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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
092121-57-01A	White Exterior Window Caulking	1 st Floor NE
092121-57-01B	White Exterior Window Caulking	2 nd Floor SW
092121-57-02A	White Exterior Textured Paint	1 st Floor West Side
092121-57-02B	White Exterior Textured Paint	1 st Floor East Side
092121-57-03A	Gypsum Wall Board	Unit 2A Closet
092121-57-03B	Gypsum Wall Board	2 nd Floor Hallway
092021-57-03C	Gypsum Wall Board	1 st Floor Hallway
092021-57-03D	Gypsum Wall Board	Performance Center Back Room
092021-57-03E	Gypsum Wall Board	3 rd Floor Vacant Unit
092021-57-03F	Gypsum Wall Board	3 rd Floor Hallway
092021-57-03G	Gypsum Wall Board	Basement Unit 2B
092021-57-04A	Joint Compound a/w Gypsum Wall Board	Unit 2A Closet
092021-57-04B	Joint Compound a/w Gypsum Wall Board	2 nd Floor Hallway
092021-57-04C	Joint Compound a/w Gypsum Wall Board	1 st Floor Hallway

RECD
 ENGL-BUS-ET
 SEP 22 2021
 11 AM



AXIOM PARTNERS
ONE PLEASURE ISLAND RD
WAKEFIELD, MA 01880
PHONE: 781.213.9198

EMSL LABORATORY ORDER #:

132107141

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
092121-57-04D	Joint Compound a/w Gypsum Wall Board	Performance Center Back Room
092121-57-04E	Joint Compound a/w Gypsum Wall Board	3 rd Floor Vacant Unit
092121-57-04F	Joint Compound a/w Gypsum Wall Board	3 rd Floor Hallway
092121-57-04G	Joint Compound a/w Gypsum Wall Board	Basement Unit 2B
092121-57-06A	Hardwood Floor Moisture Barrier	Unit 2A Bedroom
092121-57-06B	Hardwood Floor Moisture Barrier	Unit 2A Bedroom
092121-57-07A	12" x 12" Beige/Brown Ceramic Tile Grout	Unit 2A Bath
092121-57-07B	12" x 12" Beige/Brown Ceramic Tile Grout	Basement Lobby Closet
092121-57-09A	4" x 4" Black/White Ceramic Wall Tile Grout	Unit 2A Bath
092121-57-09B	4" x 4" Black/White Ceramic Wall Tile Grout	Rooted Café Bath
092121-57-11A	Textured Wall Coating	Elevator Room Basement
092121-57-11B	Textured Wall Coating	Electrical Room Basement
092121-57-12A	4" Covebase Mastic	Basement B9
092121-57-12B	4" Covebase Mastic	1 st Floor Food Storage
092121-57-13A	Red Quarry Tile Grout	Café Kitchen Area
092121-57-13B	Red Quarry Tile Grout	Café Kitchen Area
092121-57-15A	Roof Cement on Arch Windows	3 rd Floor Hallway
092121-57-15B	Roof Cement on Arch Windows	3 rd Floor Near Elevator
092121-57-16A	Black Seam Sealant	Rubber Roof West
092121-57-16B	Black Seam Sealant	Rubber Roof East
092121-57-17A	Gray Asphalt Shingle	Roof North
092121-57-17B	Gray Asphalt Shingle	Roof South
092121-57-18A	½" Fiberboard Insulation	Rubber Roof West
092121-57-18B	½" Fiberboard Insulation	Rubber Roof East
092121-57-19A	Pipe Penetration Caulking	Rubber Roof West
092121-57-19B	Pipe Penetration Caulking	Rubber Roof East
092121-57-20A	Red Brick Mortar	Roof West Side
092121-57-20B	Red Brick Mortar	3 rd Floor Hallway

REC'D
EMSL-BOSTON
SEP 27 2021



AXIOM PARTNERS
ONE PLEASURE ISLAND RD
WAKEFIELD, MA 01880
PHONE: 781.213.9198

EMSL LABORATORY ORDER #:
132107141
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
092121-57-21A	Tar Paper associated with Gray Asphalt Shingles	Roof North
092121-57-21B	Tar Paper associated with Gray Asphalt Shingles	Roof South

Relinquished: Geoff Gerace Date: 9-22-21 Time: 9:00
 Received: _____ Date: _____ Time: _____

092121-57-20C Red Brick Mortar - Basement SW corner

REC'D
EMSL-BOSTON
SEP 22 2021



ANALYTICAL REPORT

Lab Number:	L2151184
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY OF SOMERVILLE-ARMORY
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



Project Name: CITY OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
Report Date: 09/28/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2151184-01	PCB-01	SOLID	191 HIGHLAND AVE.	09/22/21 13:46	09/22/21

Project Name: CITY OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
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.

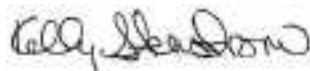
Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

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-ARMORY**Lab Number:** L2151184**Project Number:** 01164.117**Report Date:** 09/28/21**SAMPLE RESULTS**

Lab ID: L2151184-01
 Client ID: PCB-01
 Sample Location: 191 HIGHLAND AVE.

Date Collected: 09/22/21 13:46
 Date Received: 09/22/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid
 Analytical Method: 1,8082A
 Analytical Date: 09/28/21 10:51
 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
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	529	--	1	A
Aroclor 1221	ND		ug/kg	529	--	1	A
Aroclor 1232	ND		ug/kg	529	--	1	A
Aroclor 1242	ND		ug/kg	264	--	1	A
Aroclor 1248	ND		ug/kg	529	--	1	A
Aroclor 1254	ND		ug/kg	529	--	1	A
Aroclor 1260	ND		ug/kg	529	--	1	A
Aroclor 1262	ND		ug/kg	529	--	1	A
Aroclor 1268	ND		ug/kg	264	--	1	A
PCBs, Total	ND		ug/kg	264	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	44		30-150	A
Decachlorobiphenyl	40		30-150	A
2,4,5,6-Tetrachloro-m-xylene	44		30-150	B
Decachlorobiphenyl	38		30-150	B

Project Name: CITY OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
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 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-ARMORY
Project Number: 01164.117

Lab Number: L2151184
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 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-ARMORY

Project Number: 01164.117

Serial_No:09282120:47

Lab Number: L2151184

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

Container ID **Container Type**

L2151184-01A Glass 120ml/4oz unpreserved

Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
A	NA		2.7	Y	Absent		PCB-8082-CAULK(365)

Project Name: CITY OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
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-ARMORY
Project Number: 01164.117

Lab Number: L2151184
Report Date: 09/28/21

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 OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
Report Date: 09/28/21

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 OF SOMERVILLE-ARMORY
Project Number: 01164.117

Lab Number: L2151184
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, NO2, NO3.

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

6 Wakeup Drive
Westboro, MA 01581
Tel: 508-858-9020

320 Forbes Blvd
Marzfield, MA 02048
Tel: 508-622-8888

Date Rec'd in Lab: **9/22/21**

ALPHA Job #: **L2151184**

Client Information
 Client: **AXIOM**
 Address: **50B SALEM ST, Suite 103
LYNNFIELD, MA**
 Phone: **978 995-5101**
 Email: **gggerace@axiomenv.com**

Project Information
 Project Name: **City of Somerville - Arroyo**
 Project Location: **191 HIGHLAND AVE**
 Project #: **01164.117**
 Project Manager: **GEOFF GERACE**
 ALPHA Quote #:

Report Information - Data Deliverables
 ADEX EMAIL

Billing Information
 Same as Client info PO #:

Turn-Around Time
 Standard RUSH (only confirmed if pre-approved)
 Date Due:

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 _____

ANALYSIS	SAMPLE INFO
VOC: <input type="checkbox"/> 6260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do
SVOC: <input type="checkbox"/> ABRN <input type="checkbox"/> PAH	Preservation <input type="checkbox"/> Lab to do
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	
METALS: <input type="checkbox"/> RCRA6 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPH2	
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	
VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	
4-PCB <input type="checkbox"/> PEST 508/10124	
TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Refrigerant	
	Sample Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
57184-4	PCB-01	9/22/21	1:46	BULK	GG

- 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= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NH₄SO₄
 H= Na₂S₂O₈
 I= Ascorbic Acid
 J= HCl
 K= Zn Acetate
 O= Other

Relinquished By: *[Signature]* Date/Time: **9/22/21 4:00 PM**

Received By: *[Signature]* Date/Time: **9/22/21 13:55**

Container Type: **A**
 Preservative: **N**

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 21, 2021
191 Highland Avenue, Somerville, MA

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm ²)	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	
Exterior	Wall	Concrete	1	0.00	White
"	Wall	Concrete	1	0.00	White
"	Wall	Concrete	1	0.00	White
"	Wall	Concrete	1	0.00	White
"	Lintel	M	1	0.13	Beige
"	Door	W	1	0.00	White
"	Door Frame	W	1	0.00	White
"	Railing	M	3	0.00	Black
"	Security Bars	M	4	0.30	Black
"	Window Frame	W	3	0.8	White
"	Window Sash	W	3	1.8	White
"	Gutter Downspout	M	1	0.0	Green
"	Basement Window Frame	M	1	0.10	White
Unit 2A	Window Frame	W	1	0.3	Beige
"	Window Sash	W	1	0.00	Beige
"	Wall	G	1	0.00	Beige
"	Baseboard	W	1	0.01	Beige
Unit B-9	Wall	G	1	0.00	White
"	Door Frame	W	1	0.06	Beige
"	Door	W	1	0.00	Beige

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
September 21, 2021
191 Highland Avenue, Somerville, MA

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm ²)	Color/ Comments
"	Floor	C	1	0.00	Blue
Unit B-7	Column	C	1	0.06	Blue
"	Floor	C	1	0.01	Blue
"	Wall	P	1	0.00	White
"	Brick	C	1	0.40	Gray
Unit B-5	Wall	G	1	0.00	Purple
Unit B-10	Wall	G	1	0.08	White
Mechanical Room	Wall	B	1	0.00	White
"	Foundation	C	1	0.00	White
"	Floor	C	1	0.00	Blue
"	I-beam	M	3	2.3	Yellow
"	Wall	B	1	0.05	White
Unit B-8	Wall	G	1	0.00	Beige
"	Floor	C	1	0.0	Blue
"	Wall	B	1	0.30	Tan
Electrical Room	Door	W	1	0.09	Black
"	Door Frame	M	1	0.00	Black
Mechanical Room	Wall	B	3	0.03	Light Green
"	Column	M	1	0.4	Black
Basement Hallway	Wainscotting	W	1	0.3	Beige
2 nd Floor Hallway	Newel Post	W	1	0.3	Beige
"	Railing	W	1	0.40	Beige
"	Rails	W	1	0.3	Beige
"	Stair tread Riser	W	1	0.19	Beige
"	Wainscotting	W	1	1.13	Beige
1 st Floor Hallway	Wainscotting	W	1	1.14	Beige
1 st Floor Performance Center	Wall	G	1	0.00	White
Cafe	Wall	G	1	0.00	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 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
September 21, 2021
191 Highland Avenue, Somerville, MA

Location	Sample Code	Substrate Type	Paint Condition	XRF Reading (mg/cm ²)	Color/ Comments
Unit 2A	Wall	G	1	0.01	White
"	Wall	G	1	0.01	White
"	Base board	W	1	0.0	White
3 rd Floor Vacant Unit	Wall	G	1	0.00	White
"	Wall	G	1	0.00	White
"	Base board	W	1	0.0	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

CFC, PCB AND Hg INVENTORY

Building Name: Armory Building
 Location Address: 191 Highland Ave, Somerville, MA

Bulbs & Ballasts

Description	Location	Mfg./Model	Quantity	PCB Content (Y/N/U)
Compact Fluorescent Bulbs	Throughout	NA	48	U*
Sodium Halide Bulbs	Exterior	NA	16	U*
4', 2 Fluorescent Bulbs	Throughout	NA	56	U*
4', 2 Fluorescent Ballast	Throughout	NA	28	U*

* = Unknown means the ballasts are assumed to contain PCBs

* NA = Not Applicable

HVAC Units

Description/Location	HVAC Manufacturer	Number of Units	Amount/Type of RCFCs
Air Conditioners /Pad Mounted Units/Exterior	ARI	12	~3-5 lbs. / R-410A
Refrigerators / 1 st Floor Cafe	Unknown	4	~1-2 lbs. / Freon
Walk In Cooler/Cafe	Trane	1	~3-5 lbs. / R-410A

Mercury-Containing Units

Description/Location	HVAC Manufacturer	Number of Units
Thermostat / Performance Center Mezzanine	Honeywell	4

Miscellaneous Items

Description	Location	Size	Quantity
Batteries associated with Exit Lighting	Throughout	NA*	6
Batteries associated with Emergency Lighting	"	NA	2
Fire Extinguishers	"	NA	4
Computer Monitors	"	NA	6
Dry Type Transformers	Exterior	NA	1
Cleaning Supplies	Throughout	Various	48
Paint Cans	"	1 & 5 gallon	56

APPENDIX D
Non-ACMs Tables

Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
092121-57-01A&B	White Exterior Window Caulking	Windows Throughout
092121-57-02A&B	White Exterior Textured Paint	Exterior Walls
092021-57-03A-03G	Gypsum Wall Board	Throughout
092021-57-04A-04G	Joint Compound a/w Gypsum Wall Board	Throughout
092121-57-06A&B	Hardwood Floor Moisture Barrier	Throughout
092121-57-07A&B	12" x 12" Beige/Brown Ceramic Tile Grout	Bathrooms Throughout
092121-57-09A&B	4" x 4" Black/White Ceramic Wall Tile Grout	Bathrooms Throughout
092121-57-11A&B	Textured Wall Coating	Elevator Room and Electrical Room
092121-57-12A&B	4" Covebase Mastic	Throughout
092121-57-13A&B	Red Quarry Tile Grout	Café Kitchen Area
092121-57-16A&B	Black Seam Sealant	Rubber Roof East and West
092121-57-17A&B	Gray Asphalt Shingle	Roof North and South
092121-57-18A&B	½" Fiberboard Insulation	Rubber Roof East and West
092121-57-19A&B	Pipe Penetration Caulking	Rubber Roof East and West
092121-57-20A&B	Red Brick Mortar	Throughout
092121-57-21A&B	Tar Paper associated with Gray Asphalt Shingles	Roof North and South
092321-95-03A&03B	Tar Paper/Mastic	Bottom Layer Floor Cores

APPENDIX E

Photographs



Photo 1

View of Asbestos-Containing Remnant
Asphaltic Sealant (on brick wall and window),
Exterior 3rd Floor Rear Side of Building

APPENDIX F

Asbestos and Hazardous Building Materials Abatement Cost Estimate

Asbestos & Hazardous Building Materials Abatement Cost Estimate
Armory Building
191 Highland Ave, Somerville, MA

Asbestos Removal, ACMs

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Remnant Asphaltic Sealant (on brick wall and 3 rd Floor Window Frame)	Exterior Rear Side of Building	16 LF	\$500
Subtotal, Asbestos Removal (Confirmed ACMs)			\$ 500

Asbestos Removal, PACMs

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	TBD	\$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	TBD	NA*
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall & Ceiling Surfaces	Various Areas Building's Interiors	TBD	NA*
Thin Set w/ Ceramic and Quarry Tile	Bathrooms Throughout, Cafe	1,500 SF	\$7,500
Subtotal, PACM Removal (Recommended Allowance)			\$ 107,500

*N/A – Not applicable at this time

Abatement Cost Estimate Summary

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 500
Asbestos Removal, Presumed ACMs	\$ 107,500
Miscellaneous Hazardous Building Materials	\$ 4,000
~10% Contingency	\$ 11,200
Estimated Abatement Design/Bid & Monitoring Fee	\$ 4,000
Total Hazardous Building Materials Abatement	\$ 127,200

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.



Asbestos & Hazardous Building Materials Abatement Cost Estimate
Armory Building
191 Highland Ave, Somerville, MA

- 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
FORMER CHURCH BUILDING
45 COLLEGE 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 27, 2021



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APPENDICES

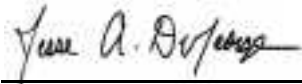
Appendix A	Asbestos Bulk and PCB Bulk Sample Results
Appendix B	Lead Paint Testing Results
Appendix C	Hazardous Building Materials Tables
Appendix D	Non-ACMs Tables
Appendix E	Photographs
Appendix F	Hazardous Building Materials Abatement Cost Estimate

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 28th day of September 2021

Prepared by:



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 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 small basement and a footprint of approximately 5,400 square feet. The building was formerly occupied by a church. The floors are designated as basement, first, second and third floor. The building was constructed in 1885 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 main church area, a kitchen, a boiler room, storage rooms, bathrooms, offices, hallways and mechanical rooms. The exterior walls are wood clapboard siding. 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 pitched slate roof system with the front entryway roof constructed of asphalt shingles.

3.0 INSPECTION PERSONNEL, METHODS AND LABORATORY

3.1 Inspection Personnel and Process

3.1.1 Inspection Personnel

The investigative survey was conducted on September 17, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Jesse A. DeGeorge (Massachusetts Asbestos Inspector License Number 1031684).

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. 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 ¹	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.
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:

¹ Per homogeneous material or area

- 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 Cupola area and the slate portion of 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 performed testing of paints for the presence of lead at the building. Representative testing of painted surfaces for the presence of lead was performed on accessible painted surfaces. The testing was performed via bulk paint chip sample analysis. The HUD² lead paint standard classifies lead-containing paint (LCP) as paint having ≥ 1.0 mg/cm² as measured by the Portable X-Ray Fluorescence (XRF) Analyzer or $\geq 0.5\%$ of lead by weight as analyzed by Atomic Absorption. With respect to demolition work, OSHA defines LCP as any paint containing detectable amounts of lead.

3.4.3 Bulk Sampling Procedures

AXIOM collected eight (8) paint chips for lead analysis from representative paint at the building. The samples were collected using hand tools and were immediately placed in leak tight containers which were labeled with a unique sample number. A chain-of-custody form was used to ensure sample integrity.

The bulk paint chip samples were hand delivered to EMSL Analytical, Inc. (EMSL) located in Woburn, Massachusetts for analysis. EMSL is fully accredited for lead bulk sample analysis under the Environmental Lead Proficiency Analytical Testing (ELPAT) Program administered by the American Industrial Hygiene Association (AIHA). The bulk paint chip samples were analyzed for lead content using Atomic Absorption Spectrophotometry (AAS) under EPA Method SW846-7420/3051. Results of paint chip sample collection are summarized in the table below.

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 U.S. Department of Housing and Urban Development

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
FORMER CHURCH BUILDING, 45 COLLEGE AVENUE, SOMERVILLE, MA**

**Hazardous Building Materials Survey Report
Former Church Building
45 College Avenue, Somerville, MA**

Axiom Partners, Inc.

Sample Reference	Sample Description	Sample Location	Estimated Quantity ³	Results
091721-95-19A – 19C	Pipe Insulation (0-6 O.D.)	1 st Floor, Rear Storage Room Closet & Rear Stairwell	25 LF	25% CHR
Not Sampled	Debris Assoc. w/ Pipe Insulation	1 st Floor, Rear Storage Room Closet	100 SF	Not Applicable

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
Roofing Materials Assoc. w/ Slate Roof System	Main Roof Field & Flashing	TBD	TBD
Miscellaneous Materials Assoc. w/ Cupola	Cupola	TBD	TBD
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace under Building*	Various Areas Building's Interiors	TBD	Friable
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	Friable

* = Crawlspace (w/ dirt floor) observed from the boiler room in the basement and a mechanical room on first floor by front entryway. AXIOM did not observe any pipe/fitting insulation and/or other suspect ACMs in the crawlspaces; however, the full extent of the crawlspaces 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.

³ SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos



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 HUD⁴ lead paint standard classifies Lead Based Paint (LBP) as paint having ≥ 1.0 mg/cm² 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.

AXIOM performed testing of paints for the presence of lead at the building. Representative testing of painted surfaces for the presence of lead was performed on accessible painted surfaces. The testing was performed via bulk paint chip sample analysis. AXIOM collected eight (8) paint chips for lead analysis from representative paint at the building.

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 PAINT CHIP SAMPLE RESULTS**

Sample # / Location / Component	Color	Lead Content by AAS Percent of Lead by Weight
PC-01 / Exterior, Left Side of Building / Paint on Wood Windowsill	White	15.0
PC-02 / Exterior, Left Side of Building / Paint on Wood Clapboard Siding (behind vinyl siding)	White	11.0
PC-03 / Exterior, Front Side of Building / Paint on Brick Foundation Wall	Red	0.020
PC-04 / Interior, 1st Floor Main Function Room / Paint on Plaster Ceiling	Gray	0.014

⁴ U.S. Department of Housing and Urban Development

PC-05 / Interior, 2nd Floor Main Church Room / Paint on Plaster Wall	White	0.12
PC-06 / Interior, 2nd Floor Main Church Room / Paint on Wood Window Casing & Sill	White	24.0
PC-07 / Interior, 3rd Floor Office, Pink Paint on Gypsum Wallboard	Pink	6.0
PC-08 / Interior, 3rd Floor Office / Paint on Wood Door Casing	White	2.9

Based on analytical results, all the paint chip samples contained lead in detectable quantities. The most elevated levels of lead were detected in the exterior wood windowsill, the original wood clapboard siding, the interior wood window casing/sill, the interior wood door casing, and the gypsum wallboard in various areas of the basement. 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. TCLP⁵ 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 one (1) 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

⁵ Toxicity Characteristic Leachate Procedure (TCLP)

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 applicable⁶ 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 fifty (50) 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 window mounted air conditioner 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.

⁶ 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.

TABLE 4
SUMMARY OF PCBs IN CAULKING COMPOUND RESULTS

Sample Number	Description	Location	Analysis Results ⁷
PCB-01	Exterior Window Glazing Compound (w/ wood double hung window)	Exterior Front Side of Building	ND

Laboratory results are reported in micrograms per kilograms ($\mu\text{g}/\text{kg}$) 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, the window glazing material is **not** considered to be 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 above-ground storage tanks. 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.

⁷ 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.

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 slate roof system;
- miscellaneous materials associated with the Cupola; 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 HUD⁸ or state accredited/licensed Lead Inspector which is often required for residential structures where children under the age of six live.

⁸ US Department of Housing and Urban Development

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.

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

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107096

Customer ID: AXIO80

Customer PO:

Project ID:

Attention: Jesse A DeGeorge
Axiom Partners, Inc.
50B Salem Street, Suite 103
Lynnfield, MA 01940

Phone: (603) 970-1135

Fax: (781) 213-6992

Received Date: 09/21/2021 3:30 PM

Analysis Date: 09/25/2021

Collected Date: 09/17/2021

Project: 01164.117 / Church Building, 45 College 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
091721-95-01A <small>132107096-0001</small>	Exterior Left Side of Bldg. - Exterior Window Glazing Compound (w/Wood Dble. Hung Windows)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-01B <small>132107096-0002</small>	Exterior Front Side of Bldg. - Exterior Window Glazing Compound (w/Wood Dble. Hung Windows)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-02A <small>132107096-0003</small>	Exterior Front Side of Bldg. - Exterior Sealant w/Storm Windows (Behind Screws)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-02B <small>132107096-0004</small>	Exterior Right Side of Bldg. - Exterior Sealant w/Storm Windows (Behind Screws)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-03A <small>132107096-0005</small>	Exterior Left Side of Bldg. - Silver Vapor Barrier Paper (Behind Vinyl Siding)	Tan/Silver Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
091721-95-03B <small>132107096-0006</small>	Exterior Right Side of Bldg. - Silver Vapor Barrier Paper (Behind Vinyl Siding)	Tan/Silver Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-04A <small>132107096-0007</small>	Side Entryway Roof - 3-Tab Asphaltic Shingles (on Wood Deck)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-04B <small>132107096-0008</small>	Side Entryway Roof - 3-Tab Asphaltic Shingles (on Wood Deck)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-05A <small>132107096-0009</small>	Side Entryway Roof - Tar Paper (Under Asphaltic Shingles)	Black Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected
091721-95-05B <small>132107096-0010</small>	Side Entryway Roof - Tar Paper (Under Asphaltic Shingles)	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
091721-95-06A <small>132107096-0011</small>	Side Entryway Roof - Asphaltic Sealant	Black Non-Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
091721-95-07A <small>132107096-0012</small>	1st Fl Main Function Room - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected

Initial report from: 09/25/2021 16:54:43



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: 132107096

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
091721-95-07B 132107096-0013	1st FI Kitchen Storage Room - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-07C 132107096-0014	2nd FI Front Stairwell - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-07D 132107096-0015	2nd FI Main Church Room - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-07E 132107096-0016	3rd FI Storage Room - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-07F 132107096-0017	3rd FI Main Observation Room - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-07G 132107096-0018	2nd to 3rd FI Stairwell - Plaster Walls & Ceilings (on Wood Lath)	Gray Fibrous Homogeneous	5% Hair	95% Non-fibrous (Other)	None Detected
091721-95-08A 132107096-0019	1st FI Kitchen - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
091721-95-08B 132107096-0020	2nd FI Main Church Area - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
091721-95-08C 132107096-0021	3rd FI Office - Gypsum Wallboard	Tan/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
091721-95-09A 132107096-0022	1st FI Kitchen - Joint Compound w/Sample #08A	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-09B 132107096-0023	2nd FI Main Church Area - Joint Compound w/Sample #08B	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-09C 132107096-0024	3rd FI Office - Joint Compound w/Sample #08C	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-10A 132107096-0025	1st FI Main Function Room - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
091721-95-10B 132107096-0026	3rd FI Main Observation Room - 2'x4' Suspended Ceiling Tile	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
091721-95-11A 132107096-0027	1st FI Kitchen Storage Room - Maroon Vinyl Sheet Floor (on Wood)	Brown/Black Non-Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
091721-95-11B 132107096-0028	1st FI Kitchen - Maroon Vinyl Sheet Floor (on Wood)	Brown/Black Non-Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected

Initial report from: 09/25/2021 16:54:43



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: 132107096

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
091721-95-12A <small>132107096-0029</small>	1st Fl Kitchen Storage Room - Mastic w/Sample #11A	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-12B <small>132107096-0030</small>	1st Fl Kitchen - Mastic w/Sample #11B	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-13A <small>132107096-0031</small>	1st Fl Kitchen - 12"x12" Beige Ceramic Floor Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-13B <small>132107096-0032</small>	1st Fl Bathroom - 12"x12" Beige Ceramic Floor Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-14A <small>132107096-0033</small>	1st Fl Kitchen - 12"x12" Beige Ceramic Floor Tile Thinset	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-14B <small>132107096-0034</small>	1st Fl Bathroom - 12"x12" Beige Ceramic Floor Tile Thinset	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-15A <small>132107096-0035</small>	1st Fl Men's Bathroom - 4"x4" Blue/Pink Ceramic Wall Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-15B <small>132107096-0036</small>	1st Fl Women's Bathroom - 4"x4" Blue/Pink Ceramic Wall Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-16A <small>132107096-0037</small>	1st Fl Men's Bathroom - 4"x4" Blue/Pink Ceramic Wall Tile Thinset	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-16B <small>132107096-0038</small>	1st Fl Women's Bathroom - 4"x4" Blue/Pink Ceramic Wall Tile Thinset	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-17A <small>132107096-0039</small>	1st Fl Front Entryway - 12"x12" Gray Mottled Vinyl Floor Tile (on Wood)	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-17B <small>132107096-0040</small>	1st Fl Rear Stairwell Landing - 12"x12" Gray Mottled Vinyl Floor Tile (on Wood)	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-18A <small>132107096-0041</small>	1st Fl Front Entryway - Mastic w/Sample #17A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-18B <small>132107096-0042</small>	1st Fl Rear Stairwell Landing - Mastic w/Sample #17B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-19A <small>132107096-0043</small>	1st Fl Rear Storage Room Closet - Pipe Insulation (0-6 O.D.)	White Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
091721-95-19B <small>132107096-0044</small>	1st Fl Rear Storage Room Closet - Pipe Insulation (0-6 O.D.)				Positive Stop (Not Analyzed)

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EMSL Order: 132107096

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
091721-95-19C <small>132107096-0045</small>	1st Fl Rear Stairwell - Pipe Insulation (0-6 O.D.)				Positive Stop (Not Analyzed)
091721-95-20A <small>132107096-0046</small>	1st Fl Rear Storage Room - Textured Skim Coat on Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-20B <small>132107096-0047</small>	1st Fl Rear Storage Room - Textured Skim Coat on Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-20C <small>132107096-0048</small>	1st Fl Rear Storage Room - Textured Skim Coat on Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-21A <small>132107096-0049</small>	1st Fl Rear Storage Room - Black w/Gold Flecks Vinyl Sheet Floor (Under Carpet & on Wood)	Black Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
091721-95-21B <small>132107096-0050</small>	1st Fl Rear Storage Room - Black w/Gold Flecks Vinyl Sheet Floor (Under Carpet & on Wood)	Black Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
091721-95-22A <small>132107096-0051</small>	1st Fl Rear Storage Room - Mastic wSample #21A	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-22B <small>132107096-0052</small>	1st Fl Rear Storage Room - Mastic wSample #21B	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-23A <small>132107096-0053</small>	1st Fl Main Function Area - Paper Behind Steam Radiator	Black/Silver Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
091721-95-23B <small>132107096-0054</small>	1st Fl Main Function Area - Paper Behind Steam Radiator	Black/Silver Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
091721-95-24A <small>132107096-0055</small>	1st Fl Front Entryway - 4" White Covebase Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-24B <small>132107096-0056</small>	1st Fl Front Entryway - 4" White Covebase Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-25A <small>132107096-0057</small>	1st Fl Rear Stairwell Landing - White Vinyl Floor Tile - Middle Layer	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-25B <small>132107096-0058</small>	1st Fl Rear Stairwell Landing - White Vinyl Floor Tile - Middle Layer	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-26A <small>132107096-0059</small>	1st Fl Rear Stairwell Landing - Mastic w/Sample #25A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-26B <small>132107096-0060</small>	1st Fl Rear Stairwell Landing - Mastic w/Sample #25B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-27A <small>132107096-0061</small>	1st Fl Rear Stairwell Landing - Beige Vinyl Floor Tile (on Wood) - Bottom Layer	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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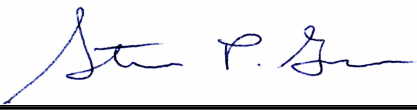
<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132107096
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
091721-95-27B 132107096-0062	1st Fl Rear Stairwell Landing - Beige Vinyl Floor Tile (on Wood) - Bottom Layer	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-28A 132107096-0063	1st Fl Rear Stairwell Landing - Mastic w/Sample #27A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-28B 132107096-0064	1st Fl Rear Stairwell Landing - Mastic w/Sample #27B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-29A 132107096-0065	1st to 2nd Fl Side Stairwell - Textured Skim Coat on Ceiling (Swirl Pattern)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-29B 132107096-0066	1st to 2nd Fl Side Stairwell - Textured Skim Coat on Ceiling (Swirl Pattern)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-29C 132107096-0067	1st to 2nd Fl Side Stairwell - Textured Skim Coat on Ceiling (Swirl Pattern)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091721-95-30A 132107096-0068	1st Fl Main Function Room - Paper Under Hardwood Plank Floor	Tan Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
091721-95-30B 132107096-0069	1st Fl Main Function Room - Paper Under Hardwood Plank Floor	Tan Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected

Analyst(s)
Kevin Pine (67)



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: 09/25/2021 16:54:43



AXIOM PARTNERS
 50B SALEM STREET, STE 103
 LYNNFIELD, MA 01490
 PHONE: 781.213.9198
 Fax: 781.213.6692

LABORATORY ORDER #:
132107096
 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: 09-17-21
 Project Name: Church Building
 Project Site: 45 College Ave., Somerville, MA
 Project ID/Number: 01164.117
 Special Lab Instructions: **POSITIVE RESULT** email results to gperace@axiomenv.com and jesse.degeorge@gmail.com

TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (5 + 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
091721-95-01A	Exterior Window Glazing Compound (w/ wood dble. hung windows)	Exterior Left Side of Bldg.	
091721-95-01B	.	Exterior Front Side of Bldg.	
091721-95-02A	Exterior Sealant w/ Storm Windows (behind screens)	Exterior Front Side of Bldg.	
091721-95-02B	.	Exterior Right Side of Bldg.	
091721-95-03A	Silver Vapor Barrier Paper (behind vinyl siding)	Exterior Left Side of Bldg.	
091721-95-03B	.	Exterior Right Side of Bldg.	
091721-95-04A	3-Tab Asphaltic Shingles (on wood deck)	Side Entryway Roof	
091721-95-04B	.	.	
091721-95-05A	Tar Paper (under asphaltic shingles)	Side Entryway Roof	
091721-95-05B	.	.	
091721-95-06A	Asphaltic Sealant	Side Entryway Roof	
091721-95-07A	Plaster Walls & Ceilings (on wood lath)	1 st Fl., Main Function Room	
091721-95-07B	.	1 st Fl., Kitchen Storage Room	
091721-95-07C	.	2 nd Fl., Front Stairwell	
091721-95-07D	.	2 nd Fl., Main Church Room	
091721-95-07E	.	3 rd Fl., Storage Room	
091721-95-07F	.	3 rd Fl., Main Observation Room	
091721-95-07G	.	2 nd to 3 rd Fl., Stairwell	
091721-95-08A	Gypsum Wallboard	1 st Fl., Kitchen	

Released: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-21-21 Time: 3:30

Received: _____ Date: _____ Time: _____

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 ENVIRONMENTAL
 SEP 21 2021
[Handwritten signatures]



AXIOM PARTNERS
 50B SALEM STREET, STE 103
 LYNNFIELD, MA 01490
 PHONE: 781.213.9198
 FAX: 781.213.6992

LABORATORY ORDER #
132107096
 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: 09-17-21
 Project Name: Church Building
 Project Site: 45 College Ave., Scitersville, MA
 Project ID/Number: 01164.117
 Special Lab Instructions: **POSITIVE STOP** email results to jgeorge@axiomenv.com and jesse.degeorge@gmail.com

TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (5 + 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
091721-95-08B	.	2 nd Fl. Main Church Area	
091721-95-08C	.	3 rd Fl. Office	
091721-95-08A	Joint Compound w/ Sample #08A	1 st Fl. Kitchen	
091721-95-09B	Joint Compound w/ Sample #09B	2 nd Fl. Main Church Area	
091721-95-09C	Joint Compound w/ Sample #09C	3 rd Fl. Office	
091721-95-10A	2' x 4' Suspended Ceiling Tile	1 st Fl. Main Function Room	
091721-95-10B	.	3 rd Fl. Main Observation Room	
091721-95-11A	Maroon Vinyl Sheet Floor (on wood)	1 st Fl. Kitchen Storage Room	
091721-95-11B	.	1 st Fl. Kitchen	
091721-95-12A	Mastic w/ Sample #11A	1 st Fl. Kitchen Storage Room	
091721-95-12B	Mastic w/ Sample #11B	1 st Fl. Kitchen	
091721-95-13A	12' x 12' Beige Ceramic Floor Tile - Grout	1 st Fl. Kitchen	
091721-95-13B	.	1 st Fl. Bathroom	
091721-95-14A	12' x 12' Beige Ceramic Floor Tile - Thin Set	1 st Fl. Kitchen	
091721-95-14B	.	1 st Fl. Bathroom	
091721-95-15A	4' x 4' Blue/Pink Ceramic Wall Tile - Grout	1 st Fl. Men's Bathroom	
091721-95-15B	.	1 st Fl. Women's Bathroom	
091721-95-16A	4' x 4' Blue/Pink Ceramic Wall Tile - Adhesive	1 st Fl. Men's Bathroom	
091721-95-16B	.	1 st Fl. Women's Bathroom	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-21-21 Time: -
 Received: _____ Date: _____ Time: _____

RECEIVED
 CHAIN OF CUSTODY
 SEP 21 2021



AXIOM PARTNERS
 50B SALEM STREET, STE 103
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 PHONE: 781.213.9198
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LABORATORY ORDER #:
132107096
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Asbestos Analysis - Chain of Custody Form

Sampled by: Jesse A. DeGeorge Date Collected: 09-17-21
 Project Name: Church Building
 Project Site: 45 College Ave., Scitoville, MA
 Project ID/Number: 01164.117
 Special Lab Instructions: **POSITIVE STOP** email results to ggeorge@axiomenv.com and jesse.degeorge@gmail.com

TURNAROUND TIME - If turnaround time is not chosen standard turnaround time applies (5 + 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
091721-95-17A	12' x 12" Gray Mottled Vinyl Floor Tile (on wood)	1 st Fl., Front Entryway	
091721-95-17B	.	1 st Fl., Rear Stairwell Landing	
091721-95-18A	Mastic w/ Sample #17A	1 st Fl., Front Entryway	
091721-95-18B	Mastic w/ Sample #17B	1 st Fl., Rear Stairwell Landing	
091721-95-19A	Pipe Insulation (0-6 O.D.)	1 st Fl., Rear Storage Room Closet	
091721-95-19B	.	.	
091721-95-19C	.	1 st Fl., Rear Stairwell	
091721-95-20A	Textured Skim Coat on Ceiling	1 st Fl., Rear Storage Room	
091721-95-20B	.	.	
091721-95-20C	.	.	
091721-95-21A	Black w/ Gold Flecks Vinyl Sheet Floor (under carpet & on wood)	1 st Fl., Rear Storage Room	
091721-95-21B	.	.	
091721-95-22A	Mastic w/ Sample #21A	1 st Fl., Rear Storage Room	
091721-95-22B	Mastic w/ Sample #21B	.	
091721-95-23A	Paper behind Steam Radiator	1 st Fl., Main Function Area	
091721-95-23B	.	.	
091721-95-24A	4" White Cove Base Mastic	1 st Fl., Front Entryway	
091721-95-24B	.	.	
091721-95-25A	White Vinyl Floor Tile - Middle Layer	1 st Fl., Rear Stairwell Landing	

Submittal: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-21-21 Time: -
 Received: _____ Date: _____ Time: _____

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SEP 21 2021



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 LYNNFIELD, MA 01490
 PHONE: 781.213.9196
 FAX: 781.213.6992

LABORATORY ORDER #
132107096
 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: 09-17-21
 Project Name: Church Building
 Project Site: 45 College Ave., Somerville, MA
 Project ID/Number: 01164.117
 Special Lab Instructions: **POSITIVE** email results to gperace@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-93-11:

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE LOCATION	COMMENTS
091721-95-25B	.	.	
091721-95-25A	Mastic w/ Sample #25A	1 st Fl., Rear Stairwell Landing	
091721-95-26B	Mastic w/ Sample #26B	.	
091721-95-27A	Beige Vinyl Floor Tile (on wood) - Bottom Layer	1 st Fl., Rear Stairwell Landing	
091721-95-27B	.	.	
091721-95-28A	Mastic w/ Sample #27A	1 st Fl., Rear Stairwell Landing	
091721-95-28B	Mastic w/ Sample #27B	.	
091721-95-29A	Textured Skim Coat on Ceiling ("swirl pattern")	1 st to 2 nd Fl., Side Stairwell	
091721-95-29B	.	.	
091721-95-29C	.	.	
091721-95-30A	Paper under Hardwood Plank Floor	1 st Fl., Main Function Room	
091721-95-30B	.	.	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-21-21 Time: -
 Received: _____ Date: _____ Time: _____

SM
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 SEP 21 2021



ANALYTICAL REPORT

Lab Number:	L2150361
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	FORMER CHURCH
Project Number:	01164.117
Report Date:	09/24/21

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



Project Name: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2150361-01	PCB-01 EXT.WINDOW GLAZING COMPOUND(W/WOOD)	SOLID	45 COLLEGE AVE, SOMERVILLE, MA	09/17/21 09:30	09/17/21

Project Name: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

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:

Tiffani Morrissey - Tiffani Morrissey

Title: Technical Director/Representative

Date: 09/24/21

ORGANICS

PCBS

Project Name: FORMER CHURCH**Lab Number:** L2150361**Project Number:** 01164.117**Report Date:** 09/24/21**SAMPLE RESULTS**

Lab ID: L2150361-01
 Client ID: PCB-01 EXT.WINDOW GLAZING
 Sample Location: COMPOUND(W/WOOD)
 45 COLLEGE AVE, SOMERVILLE, MA

Date Collected: 09/17/21 09:30
 Date Received: 09/17/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid
 Analytical Method: 1,8082A
 Analytical Date: 09/23/21 19:27
 Analyst: CW
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
 Extraction Date: 09/22/21 11:05
 Cleanup Method: EPA 3630
 Cleanup Date: 09/23/21
 Cleanup Method: EPA 3665A
 Cleanup Date: 09/23/21
 Cleanup Method: EPA 3660B
 Cleanup Date: 09/23/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	560	--	1	A
Aroclor 1221	ND		ug/kg	560	--	1	A
Aroclor 1232	ND		ug/kg	560	--	1	A
Aroclor 1242	ND		ug/kg	280	--	1	A
Aroclor 1248	ND		ug/kg	560	--	1	A
Aroclor 1254	ND		ug/kg	560	--	1	A
Aroclor 1260	ND		ug/kg	560	--	1	A
Aroclor 1262	ND		ug/kg	560	--	1	A
Aroclor 1268	ND		ug/kg	280	--	1	A
PCBs, Total	ND		ug/kg	280	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	89		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	94		30-150	B

Project Name: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 09/23/21 09:35
Analyst: CW

Extraction Method: EPA 3540C
Extraction Date: 09/22/21 02:25
Cleanup Method: EPA 3630
Cleanup Date: 09/23/21
Cleanup Method: EPA 3665A
Cleanup Date: 09/23/21
Cleanup Method: EPA 3660B
Cleanup Date: 09/23/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1549147-1						
Aroclor 1016	ND		ug/kg	590	--	A
Aroclor 1221	ND		ug/kg	590	--	A
Aroclor 1232	ND		ug/kg	590	--	A
Aroclor 1242	ND		ug/kg	295	--	A
Aroclor 1248	ND		ug/kg	590	--	A
Aroclor 1254	ND		ug/kg	590	--	A
Aroclor 1260	ND		ug/kg	590	--	A
Aroclor 1262	ND		ug/kg	590	--	A
Aroclor 1268	ND		ug/kg	295	--	A
PCBs, Total	ND		ug/kg	295	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	A
Decachlorobiphenyl	75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	77		30-150	B
Decachlorobiphenyl	76		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: FORMER CHURCH

Project Number: 01164.117

Lab Number: L2150361

Report Date: 09/24/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1549147-2 WG1549147-3									
Aroclor 1016	81		70		40-140	15		50	A
Aroclor 1260	85		73		40-140	15		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		65		30-150	A
Decachlorobiphenyl	78		64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	81		70		30-150	B
Decachlorobiphenyl	85		73		30-150	B

Project Name: FORMER CHURCH**Lab Number:** L2150361**Project Number:** 01164.117**Report Date:** 09/24/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information**Container ID** **Container Type**

L2150361-01A Glass 120ml/4oz unpreserved

Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
A	NA		2.0	Y	Absent		PCB-8082-CAULK(365)

Project Name: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

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: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

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: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

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: FORMER CHURCH
Project Number: 01164.117

Lab Number: L2150361
Report Date: 09/24/21

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, NO₂, NO₃.

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: 9/17/21

ALPHA Job #: L2150361

8 Welles Drive
Westboro, MA 01581
Tel: 508-698-8220

320 Forbes Blvd
Methuen, MA 02846
Tel: 508-622-9300

Project Information

Project Name: Former Church

Project Location: 45 College Ave, Somerville, MA

Project #: 01164.117

Project Manager: Geoff Gevace

ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Client Information

Client: AXIOM Partners, LLC

Address: 50B Galena St, STE 103
Lynnfield, MA

Phone: 7803-970-1135

Email: jette.degeorge@gmail.com

Additional Project Information:

E-mail results to Geoff Gevace & Jette DeGeorge

Turn-Around Time

Standard RUSH (only ordered if pre-approved)

Date Due:

Regulatory Requirements & Project Information Requirements

- Yes No MA MCP 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 NPOES RGP
- Other State/Fed Program _____ Criteria _____

ANALYSIS		SAMPLE INFO	
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 604 <input type="checkbox"/> 8242	SVOC: <input type="checkbox"/> ARN <input type="checkbox"/> PAH	Filtration	<input type="checkbox"/> Field
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	METALS: <input type="checkbox"/> CRAS <input type="checkbox"/> CRAR <input type="checkbox"/> CRP 13	Preservation	<input type="checkbox"/> Lab to do
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	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint		
<p><i>Handwritten notes:</i> X PCBs vial Soxhlet X Pests vial Soxhlet</p>			

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
5036101	PCB-01, Ext. Window Glazing compound (w/wood dble hung)	9-17-21	0930	↔	JAD

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - S= Sarcose
 - D= BDD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO3
 - D= H2SO4
 - E= NaOH
 - F= MeOH
 - G= NaHSO4
 - H= Na2S2O8
 - I= Ascorbic Acid
 - J= NH4Cl
 - K= Zn Acetate
 - O= Other

Container Type	A
Preservative	O

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Jette DeGeorge</i>	9-17-21	<i>Alvin...</i>	9/17/21 1327
<i>[Signature]</i>	9/17/21 1811	<i>[Signature]</i>	9/17/21

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01401 (rev. 12-Mar-2012)

APPENDIX B
Lead Paint Testing Results



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

EMSL Order: 132107093

CustomerID: AXIO80

CustomerPO:

ProjectID:

Attn: **Jesse A DeGeorge**
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: 9/17/2021

Project: **01164.117 / Church Building / 45 College Ave. 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: Exterior, Left Side of Bldg Desc: White Paint on Wood Window Sill	132107093-0001	9/17/2021	9/24/2021	0.2516 g	15 % wt
PC-02 Site: Exterior, Left Side of Bldg Desc: White Paint on Wood Clapboard Siding (Behind Vinyl Siding)	132107093-0002	9/17/2021	9/24/2021	0.249 g	11 % wt
PC-03 Site: Exterior, Front Side of Bldg Desc: Red Paint on Brick Foundation Wall	132107093-0003	9/17/2021	9/24/2021	0.2496 g	0.020 % wt
PC-04 Site: Interior, 1st Fl. Main Function Room Desc: Gray Paint on Plaster Ceiling	132107093-0004	9/17/2021	9/24/2021	0.2503 g	0.014 % wt
PC-05 Site: Interior, 2nd Fl. Main Church Room Desc: White Paint on Plaster Wall	132107093-0005	9/17/2021	9/24/2021	0.2512 g	0.12 % wt
PC-06 Site: Interior, 2nd Fl. Main Church Room Desc: White Paint on Wood Window Casing & Sill	132107093-0006	9/17/2021	9/24/2021	0.2485 g	24 % wt
PC-07 Site: Interior 3rd Fl. Office Desc: Pink Paint on Gypsum Wallboard	132107093-0007	9/17/2021	9/24/2021	0.2499 g	6.0 % wt
PC-08 Site: Interior 3rd Fl. Office Desc: White Paint on Wood Door Casing	132107093-0008	9/17/2021	9/24/2021	0.2524 g	2.9 % 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 19:44:19

ProSciencē Analytical Services, Inc.
Chemistry Chain of Custody Record

132107093

LABORATORY/HEADQUARTERS
 22 Cummings Park, Woburn, MA 01801
 781-938-3242 F/781-932-8857
 Client

www.proscience.net
 general@proscience.net

AXIOM Partners, Inc.

Address Street 808 Salem St., Ste #103

Town Lynnfield, MA

Shunchi 01960

Project Site Line 1 Church Building

Project Number 01184117

Line 2

PC

Client 46 College Ave., Somerville, MA

Jesse A. DeGeorge

Phone FAX Alltags

MELAC analysis

TYPE OF ANALYSIS (order)		SOI	SOI
DIRT	SWEEP	11.5L	11.5L
AIR	TRP	10.0L	11.5L
TRP	TRP	11.5L	11.5L

Please use a separate form for each matrix.

ASTM E172

FOR LABORATORY USE ONLY

CATCH NUMBER

Run/48 Hours

Same Day

Next Day

2 Day

Turn Around Time Requested (per client)

5 SEP 21 11:11 AM

Date and Time Sampled	Field ID	Sample Description/Location	Air Sampling Information		Vials		Filter		ANALYSIS	LABORATORY USE ONLY
			Start Time	End Time	Flow Rate (L/min)	Volume (L)	Filter Type	Filter ID		
9/17/21	PC-01	Exterior, Left Side of Bldg., White Paint on Wood Window Sill								
9/17/21	PC-02	Exterior, Left Side of Bldg., White Paint on Wood Clapboard Siding (behind vinyl siding)								
9/17/21	PC-03	Exterior, Front Side of Bldg., Red Paint on Brick Foundation Wall								
9/17/21	PC-04	Interior, 1st Fl. Main Function Room, Gray Paint on Plaster Ceiling								
9/17/21	PC-05	Interior, 2nd Fl. Main Church Room, White Paint on Plaster Wall								
9/17/21	PC-06	Interior, 2nd Fl. Main Church Room, White Paint on Wood Window Casings & Sill								
9/17/21	PC-07	Interior, 3rd Fl. Office, Pink Paint on Gypsum Wallboard								
9/17/21	PC-08	Interior, 3rd Fl. Office, White Paint on Wood Door Casings								

Requested by
 Collected by

Jesse A. DeGeorge

Jesse A. DeGeorge

Date 9/21/2021

Date

Time

Time

RECEIVED
 ENVIRONMENTAL SERVICES
 SEP 21 11:11 AM
 J. DeGeorge

Email results to Geoff Garcke at ggarcke@axiomenv.com & Jesse DeGeorge at jesse.degeorge@gmail.com

APPENDIX C
Hazardous Building Materials
Summary Tables

CFC, PCB AND Hg INVENTORY

Building Name: Former Church Building
Location Address: 45 College Ave., Somerville, MA

Bulbs & Ballasts

Description	Location	Mfg./Model	Quantity	PCB Content (Y/N/U)
4', 2 Fluorescent Bulbs	1 st – 3 rd Floor Throughout	NA	25	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 (window mounted) / 2 nd & 3 rd Floor Throughout	Unknown	8	~3-5 lbs. / R-410A

Miscellaneous Items

Description	Location	Size	Quantity
Batteries associated with Exit Lighting	1 st – 3 rd Floor Throughout	NA*	8
Batteries associated with Emergency Lighting	1 st – 3 rd Floor Throughout	NA	10
Fire Extinguishers	1 st – 3 rd Floor Throughout	NA	8
Above-Ground Storage Tank (275-gallon w/ fuel oil) [assumed full of oil each]	Basement, Boiler Room	275-gallon	2

* NA = Not Applicable

APPENDIX D
Non-ACMs Tables

**FORMER CHURCH BUILDING
45 COLLEGE AVENUE, SOMERVILLE, MA**

CONFIRMED NON-ACMS

Sample Reference	Material	Location(s)
091721-95-01A & 01B	Exterior Window Glazing Compound (w/ wood dble. hung windows)	Exterior All Sides of Building
091721-95-02A & 02B	Exterior Sealant w/ Storm Windows (behind screws)	Exterior All Sides of Building
091721-95-03A & 03B	Silver Vapor Barrier Paper (behind vinyl siding)	Exterior All Sides of Building
091721-95-04A & 04B	3-Tab Asphaltic Shingles (on wood deck)	Side Entryway Roof
091721-95-05A & 05B	Tar Paper (under asphaltic shingles)	Side Entryway Roof
091721-95-06A	Asphaltic Sealant	Side Entryway Roof
091721-95-07A – 07G	Plaster Walls & Ceilings (on wood lath)	1 st – 3 rd Floor Throughout
091721-95-08A - 08C	Gypsum Wallboard	1 st – 3 rd Floor Throughout
091721-95-09A – 09C	Joint Compound w/ Gypsum Wallboard	1 st – 3 rd Floor Throughout
091721-95-10A & 10B	2' x 4' Suspended Ceiling Tile	1 st – 3 rd Floor Throughout
091721-95-11A & 11B	Maroon Vinyl Sheet Floor (on wood)	1 st Floor, Kitchen & Storage Room
091721-95-12A & 12B	Mastic w/ Maroon Vinyl Sheet Floor	1 st Floor, Kitchen Storage Room
091721-95-13A & 13B	12" x 12" Beige Ceramic Floor Tile – Grout	1 st Floor, Kitchen & Bathrooms
091721-95-14A & 14B	12" x 12" Beige Ceramic Floor Tile – Thin Set	1 st Floor, Kitchen & Bathrooms
091721-95-15A & 15B	4" x 4" Blue/Pink Ceramic Wall Tile – Grout	1 st Floor, Bathrooms
091721-95-16A & 16B	4" x 4" Blue/Pink Ceramic Wall Tile – Adhesive	1 st Floor, Bathrooms
091721-95-17A & 17B	12" x 12" Gray Mottled Vinyl Floor Tile (on wood)	1 st Floor, Front Entryway & Rear Stairwell Landing
091721-95-18A & 18B	Mastic w/ 12" x 12" Gray Mottled Vinyl Floor Tile	1 st Floor, Front Entryway & Rear Stairwell Landing
091721-95-20A – 20C	Textured Skim Coat on Ceiling	1 st Floor, Rear Storage Room
091721-95-21A & 21B	Black w/ Gold Flecks Vinyl Sheet Floor (under carpet & on wood)	1 st Floor, Rear Storage Room

Sample Reference	Material	Location(s)
091721-95-22A & 22B	Mastic w/ Black w/ Gold Flecks Vinyl Sheet Floor	1 st Floor, Rear Storage Room
091721-95-23A & 23B	Paper behind Steam Radiator	1 st Floor, Main Function Area
091721-95-24A & 24B	4" White Cove Base Mastic	1 st Floor Throughout
091721-95-25A & 25B	White Vinyl Floor Tile – Middle Layer	1 st Floor, Rear Stairwell Landing
091721-95-26A & 26B	Mastic w/ White Vinyl Floor Tile – Middle Layer	1 st Floor, Rear Stairwell Landing
091721-95-27A & 2&B	Beige Vinyl Floor Tile (on wood) – Bottom Layer	1 st Floor, Rear Stairwell Landing
091721-95-28A & 28B	Mastic w/ Beige Vinyl Floor Tile	1 st Floor, Rear Stairwell Landing
091721-95-29A – 29C	Textured Skim Coat on Ceiling (“swirl pattern”)	1 st to 2 nd Floor, Side Stairwell
091721-95-30A & 30B	Paper under Hardwood Plank Floor	1 st – 3 rd Floor Throughout

APPENDIX E

Photographs



Photo 1

View of Presumed Asbestos-Containing Roofing Materials w/ Slate Roof System, Main Roof Fields & Flashings



Photo 2

View of Presumed Asbestos-Containing Miscellaneous Materials w/ Cupola, Main Roof Field (front portion of building)



Photo 3

View of Asbestos-Containing Pipe Insulation, 1st Floor Rear Storage Room Closet & Rear Stairwell



Photo 4

Another View of Asbestos-Containing Pipe Insulation, 1st Floor Rear Stairwell

APPENDIX F

Asbestos and Hazardous Building Materials Abatement Cost Estimate

Asbestos & Hazardous Building Materials Abatement Cost Estimate
Former Church Building
45 College Avenue, Somerville, MA

Asbestos Removal, ACMs

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Pipe Insulation (0-6 O.D.)	1 st Floor, Rear Storage Room Closet & Rear Stairwell	25 LF	\$1,000
Debris Assoc. w/ Pipe Insulation	1 st Floor, Rear Storage Room Closet	100 SF	\$1,000
Subtotal, Asbestos Removal (Confirmed ACMs)			\$ 2,000

Asbestos Removal, PACMs

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	TBD	\$150,000
Buried Pipes	Beneath Building or at Site	TBD	NA*
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	TBD	NA*
Roofing Materials Assoc. w/ Slate Roof System	Main Roof Field & Flashing	TBD	\$100,000
Miscellaneous Materials Assoc. w/ Cupola	Cupola	TBD	NA*
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall/Ceiling Surfaces & Inaccessible Crawlspace under Building	Various Areas Building's Interiors	TBD	NA*
Interior Components w/ Boiler Unit	Basement, Boiler Room	TBD	NA*
Subtotal, PACM Removal (Recommended Allowance)			\$ 250,000

*N/A – Not applicable at this time

Abatement Cost Estimate Summary

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 2,000
Asbestos Removal, Presumed ACMs	\$ 250,000
Miscellaneous Hazardous Building Materials	\$ 10,000
~10% Contingency	\$ 26,200
Estimated Abatement Design/Bid & Monitoring Fee	\$ 10,000
Total Hazardous Building Materials Abatement	\$ 298,200

**Asbestos & Hazardous Building Materials Abatement Cost Estimate
Former Church Building
45 College Avenue, Somerville, MA**

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
CROSS STREET CENTER BUILDING
165 BROADWAY, 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 24, 2021



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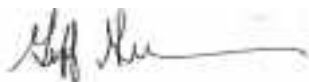
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CERTIFICATION OF RESULTS

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 24th day of September 2021

Prepared by:



Geoff Gerace
Asbestos Inspector/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 two-story building with a basement and a footprint of approximately 8,940 square feet. The building is occupied by the Somerville's city municipal offices, youth center, and soup kitchen. The floors are designated as basement, first floor, and second 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 offices, kitchens, electrical rooms, bathrooms, break rooms, activities rooms, storage areas, hallways, and mechanical rooms. The exterior walls are brick over concrete and CMU. Interior walls are a combination of CMU, plaster, and painted drywall. The floors have carpeting and ceramic flooring as well as vinyl floor coverings. The majority of spaces have plaster and/or drywall walls and ceilings and some suspended ceiling tiles covering wood decking. The building has a multi-elevation flat roof system. The building has a former steam radiator heat system, which is no longer in service, as the building is currently heated by newer boiler units.

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 30, 2021, by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Geoff Gerace (Massachusetts Asbestos Inspector License Number AI036420).

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 ¹	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.

¹ 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.
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/cm²). This unit can measure the concentration of LCP on surfaces as little as 0.01 mg of lead/cm².

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
CROSS STREET CENTER BUILDING, 165 BROADWAY AVENUE, SOMERVILLE, MA**

Sample Reference	Sample Description	Sample Location	Estimated Quantity ²	Results
083021-57-01A – 01B	Exterior Window Caulking	Exterior All Sides of Building	57 EA	7% CHR
083021-57-02A – 02B	Exterior Window Glazing (w/ wood double hung window)	Exterior All Sides of Building (1 st – 2 nd Floors)	57 EA	5% CHR
083021-57-06A – 06B	Roof Cement on Brick Wall	Exterior N and West Side	10 LF	12% CHR
083021-57-18A – 18B	Black Sink Mastic	Kitchen 1 st and 2 nd Floor	2 EA	10% CHR
083021-57-18A – 18B	6" Pipe Insulation	Basement and Pipe Chases	480 LF	30% 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/ Ceramic Wall & Floor Tiles	Various Areas Building's Interiors	TBD	Friable
Pipe Elbow Insulation	Basement and Pipe Chases	28 Each	Friable

4.1.3 Non-Asbestos-Containing Materials

² SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos; CRO = Crocidolite Asbestos

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 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 HUD³ lead paint standard classifies Lead Based Paint (LBP) as paint having ≥ 1.0 mg/cm² 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 none of the 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.

³ U.S. Department of Housing and Urban Development

**TABLE 3
SUMMARY OF LBPs**

Description	Location	XRF Reading (mg/cm ²)
Window Trim	Exterior	0.0
Window Frame	“	0.0
Window Sash	“	0.0
Door	“	0.0
Paneling	“	0.0
Wall	1 st Floor	0.00
Door Trim	“	0.0
Door Casing	“	0.0
Door	“	0.0
Base Board	“	0.05
Window Casing	2 nd Floor	0.21
Windowsill	“	0.28
Window Sash	“	0.0
Door	“	0.0
Door Casing	“	0.0

Based on testing performed by AXIOM, several paints were found to contain detectable lead; however, none of the paints listed in Table 3 have significant lead levels and are therefore not 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. TCLP⁴ 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.

⁴ Toxicity Characteristic Leachate Procedure (TCLP)

4.3 Polychlorinated Biphenyls (PCBs) and Mercury in Electrical Equipment

4.3.1 *Fluorescent Light Fixtures*

AXIOM identified two (2) 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 applicable⁵ 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 on the subject property. The label indicated "dry type" transformer. A summary of transformers is provided in Appendix C.

4.3.3 *Mercury-Containing Items*

There are approximately one hundred eighty-four (184) 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

⁵ 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 ⁶
PCB-01	Exterior Window Caulking (w/ wood fixed window)	Exterior Entire Building	ND
PCB-02	Exterior Door Caulking	Exterior Entire Building	ND

Laboratory results are reported in micrograms per kilograms ($\mu\text{g}/\text{kg}$) 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 results of this investigation, **none** of the caulking samples are PCB bulk products.

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 a walk-in cooler. 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 HUD⁷ 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.

⁷ US Department of Housing and Urban Development

APPENDIX A

Asbestos Bulk and PCB Bulk Sample Results





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Received Date: 09/02/2021 9:45 AM

Analysis Date: 09/10/2021 - 09/11/2021

Collected Date: 08/30/2021

Project: 01164.117 - City of Somerville; Cross Street Building; 165 Broadway; 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
083021-57-01A <small>132106604-0001</small>	South Side Exterior - Exterior Window Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-01B <small>132106604-0002</small>	West Side Exterior - Exterior Window Caulking	Gray Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile
083021-57-02A <small>132106604-0003</small>	South Side Exterior - Exterior Window Glazing Compound	Black Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
083021-57-02B <small>132106604-0004</small>	West Side Exterior - Exterior Window Glazing Compound				Positive Stop (Not Analyzed)
083021-57-03A <small>132106604-0005</small>	South Side Exterior - Exterior Door Caulking	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-03B <small>132106604-0006</small>	West Side Exterior - Exterior Door Caulking	White/Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-04A <small>132106604-0007</small>	Exterior NE Corner - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-04B <small>132106604-0008</small>	Exterior South Side - Red Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-05A <small>132106604-0009</small>	Exterior South Side - Stone Mortar Assoc. w/ Stone Foundation	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-05B <small>132106604-0010</small>	Exterior North Side - Stone Mortar Assoc. w/ Stone Foundation	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-06A <small>132106604-0011</small>	Exterior North Side - Roof Cement on Brick	Black Fibrous Homogeneous		88% Non-fibrous (Other)	12% Chrysotile
083021-57-06B <small>132106604-0012</small>	Exterior West Side - Roof Cement on Brick				Positive Stop (Not Analyzed)
083021-57-07A <small>132106604-0013</small>	1st Floor Pantry - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
083021-57-07B <small>132106604-0014</small>	1st Floor Stairwell - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
083021-57-07C <small>132106604-0015</small>	2nd Floor Office 1 - Gypsum Wallboard	Gray/Tan Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
083021-57-08A <small>132106604-0016</small>	1st Floor Pantry - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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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
083021-57-08B <small>132106604-0017</small>	1st Floor Stairwell - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-08C <small>132106604-0018</small>	2nd Floor Office 1 - Joint Compound Assoc. w/ Gypsum Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-09A <small>132106604-0019</small>	1st Floor Food Pantry Storage - 4" Vinyl Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-09B <small>132106604-0020</small>	2nd Floor Bath 2 - 4" Vinyl Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-10A <small>132106604-0021</small>	1st Floor Food Pantry - FRP Paneling Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-10B <small>132106604-0022</small>	Room 105 - Kitchen - FRP Paneling Mastic	Blue/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-11A <small>132106604-0023</small>	Food Storage Area - 12"x12" Blue Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-11B <small>132106604-0024</small>	Front Entrance - 12"x12" Blue Floor Tile	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-12A <small>132106604-0025</small>	Food Storage Area - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-12B <small>132106604-0026</small>	Front Entrance - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-13A <small>132106604-0027</small>	Room 105 - Kitchen NE - 4"x4" Tan Ceramic Wall Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-13B <small>132106604-0028</small>	Room 105 - Kitchen NW - 4"x4" Tan Ceramic Wall Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-14A <small>132106604-0029</small>	Room 105 - Kitchen NE - 4"x4" Tan Ceramic Wall Tile Adhesive	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-14B <small>132106604-0030</small>	Room 105 - Kitchen NW - 4"x4" Tan Ceramic Wall Tile Adhesive	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-15A <small>132106604-0031</small>	Room 105 - Kitchen NE - 1"x1" Tan/Brown Ceramic Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-15B <small>132106604-0032</small>	Room 105 - Kitchen NW - 1"x1" Tan/Brown Ceramic Tile Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-16A <small>132106604-0033</small>	Room 105 - Kitchen NE - 1"x1" Tan/Brown Ceramic Tile Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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EMSL Order: 132106604
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
083021-57-16B <small>132106604-0034</small>	Room 105 - Kitchen NW - 1"x1" Tan/Brown Ceramic Tile Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-17A <small>132106604-0035</small>	2nd Floor Bath - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
083021-57-17B <small>132106604-0036</small>	2nd Floor Activities Office 2 - 2'x4' White Fissured Ceiling Tile	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
083021-57-18A <small>132106604-0037</small>	Room 105 - Kitchen NW - Black Sink Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
083021-57-18B <small>132106604-0038</small>	2nd Floor Kitchen Area - Black Sink Mastic				Positive Stop (Not Analyzed)
083021-57-19A <small>132106604-0039</small>	Front Entrance Bottom Layer - 12"x12" Tan Floor Tile	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-19B <small>132106604-0040</small>	2nd Floor Office 1 - 12"x12" Tan Floor Tile	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-20A <small>132106604-0041</small>	Front Entrance Bottom Layer - 12"x12" Tan Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-20B <small>132106604-0042</small>	2nd Floor Office 1 - 12"x12" Tan Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-22A <small>132106604-0043</small>	Office 103 - Carpet Adhesive Assoc. w/ Blue Carpet	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-22B <small>132106604-0044</small>	2nd Floor Exit - Carpet Adhesive Assoc. w/ Blue Carpet	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-23A <small>132106604-0045</small>	Room 102 - Cross Street Center - Gray Duct Mastic	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-23B <small>132106604-0046</small>	2nd Floor Activities Room - Gray Duct Mastic	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-24A <small>132106604-0047</small>	Men's Room - 4"x4" White Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-24B <small>132106604-0048</small>	Women's Room - 4"x4" White Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-26A <small>132106604-0049</small>	Men's Room - 2"x2" White Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-26B <small>132106604-0050</small>	Women's Room - 2"x2" White Ceramic Tile Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-28A <small>132106604-0051</small>	Stairwell 1st Floor - Tan Stair Tread	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
083021-57-28B <small>132106604-0052</small>	Stairwell 2nd Floor - Tan Stair Tread	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-29A <small>132106604-0053</small>	Stairwell 1st Floor - Tan Stair Tread Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-29B <small>132106604-0054</small>	Stairwell 2nd Floor - Tan Stair Tread Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-32A <small>132106604-0055</small>	Stairwell 2nd Floor - 2'x2' White Ceiling Tile	Gray Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
083021-57-32B <small>132106604-0056</small>	Stairwell 2nd Floor - 2'x2' White Ceiling Tile	Gray Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
083021-57-33A <small>132106604-0057</small>	Stairwell 2nd Floor - 12"x12" Gray Mottled Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-33B <small>132106604-0058</small>	Activities Room 2 - 12"x12" Gray Mottled Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-34A <small>132106604-0059</small>	Stairwell 2nd Floor - 12"x12" Gray Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-34B <small>132106604-0060</small>	Activities Room 2 - 12"x12" Gray Mottled Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-35A <small>132106604-0061</small>	2nd Floor Office 1 NE - Textured Ceiling Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-35B <small>132106604-0062</small>	2nd Floor Office 1 SW - Textured Ceiling Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-35C <small>132106604-0063</small>	2nd Floor Exit - Textured Ceiling Coating	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-36A <small>132106604-0064</small>	2nd Floor Foyer - 12"x12" Beige Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-36B <small>132106604-0065</small>	2nd Floor Office 2 - 12"x12" Beige Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-37A <small>132106604-0066</small>	2nd Floor Foyer - 12"x12" Beige Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-37B <small>132106604-0067</small>	2nd Floor Office 2 - 12"x12" Beige Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-38A <small>132106604-0068</small>	2nd Floor Exit Door - Exterior Door Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-38B <small>132106604-0069</small>	2nd Floor Exit Door - Exterior Door Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-39A <small>132106604-0070</small>	Bathroom 1, 2nd Floor - 12"x12" Blue Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/11/2021 13:29:19



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: 132106604
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
083021-57-39B <small>132106604-0071</small>	Bathroom 2, 2nd Floor - 12"x12" Blue Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-40A <small>132106604-0072</small>	Bathroom 1, 2nd Floor - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-40B <small>132106604-0073</small>	Bathroom 2, 2nd Floor - 12"x12" Blue Floor Tile Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-41A <small>132106604-0074</small>	Basement E - 6" Pipe Insulation	White Fibrous Homogeneous	50% Cellulose	20% Non-fibrous (Other)	30% Chrysotile
083021-57-41B <small>132106604-0075</small>	Basement Middle - 6" Pipe Insulation				Positive Stop (Not Analyzed)
083021-57-41C <small>132106604-0076</small>	Basement S - 6" Pipe Insulation				Positive Stop (Not Analyzed)
083021-57-43A <small>132106604-0077</small>	Basement Middle - Boiler Insulation	Gray Fibrous Homogeneous	20% Min. Wool	80% Non-fibrous (Other)	None Detected
083021-57-43B <small>132106604-0078</small>	Basement Middle - Boiler Insulation	Gray Fibrous Homogeneous	20% Min. Wool	80% Non-fibrous (Other)	None Detected
083021-57-43C <small>132106604-0079</small>	Basement Middle - Boiler Insulation	Gray Fibrous Homogeneous	20% Min. Wool	80% Non-fibrous (Other)	None Detected
083021-57-44A <small>132106604-0080</small>	Basement Middle - Boiler Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-44B <small>132106604-0081</small>	Basement Middle - Boiler Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-44C <small>132106604-0082</small>	Basement Middle - Boiler Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-45A <small>132106604-0083</small>	Basement NE - End Cap Sealant	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-45B <small>132106604-0084</small>	Basement SE - End Cap Sealant	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-45C <small>132106604-0085</small>	Basement Middle - End Cap Sealant				Not Submitted

Initial report from: 09/11/2021 13:29:19



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: 132106604

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Kevin McKenzie (16)

Kevin Pine (63)

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: 09/11/2021 13:29:19



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: 132106309

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: 08/30/2021 1:27 PM

Analysis Date: 08/31/2021

Collected Date: 08/30/2021

Project: 01164.117 - City of Somerville; Cross Street Building

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
083021-57-21A <small>132106309-0001</small>	1st Floor Pantry - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-21B <small>132106309-0002</small>	Cross Street Center Room 102 - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-21C <small>132106309-0003</small>	Office 103 - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-30A <small>132106309-0004</small>	Stairwell Basement - Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-30B <small>132106309-0005</small>	Stairwell 1st Floor - Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-30C <small>132106309-0006</small>	Stairwell 2nd Floor - Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-30D <small>132106309-0007</small>	Office 3, 2nd Floor - Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-30E <small>132106309-0008</small>	Basement NE Corner - Skim Coat Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083021-57-31A <small>132106309-0009</small>	Stairwell Basement - Base Coat Plaster	Gray Non-Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
083021-57-31B <small>132106309-0010</small>	Stairwell 1st Floor - Base Coat Plaster	Gray Non-Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
083021-57-31C <small>132106309-0011</small>	Stairwell 2nd Floor - Base Coat Plaster	Gray Non-Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
083021-57-31D <small>132106309-0012</small>	Office 3, 2nd Floor - Base Coat Plaster	Gray Non-Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
083021-57-31E <small>132106309-0013</small>	Basement NE Corner - Base Coat Plaster	Gray Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected

Initial report from: 08/31/2021 17:15:16



EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

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<http://www.EMSL.com> / bostonlab@emsl.com

EMSL Order: 132106309

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

John McCarthy (13)

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: 08/31/2021 17:15:16

Asbestos Bulk Building Materials - Chain of Custody

EMSL Analytical, Inc.
5A Constitution Way
Woburn, MA 01801



EMSL Order Number / Lab Use Only

132106309

PHONE: (781) 933-8411
EMAIL: info@emsl.com

EMSL ANALYTICAL, INC.
TESTING LABORATORIES - TRAINED

Customer Information		Billing Information	
Customer ID		Billing ID	
Company Name	AXION Partners	Company Name	
Contact Name	GEOFF GERACE	Billing Contact	Same as
Street Address	503 Salem St	Street Address	
City, State, Zip	Lynnfield, MA	City, State, Zip	
Phone	978-995-5101	Phone	
Email(s) for Report	ggerace@axionenv.com	Email(s) for Invoice	

Project Information

Project Name: City of Souverville, Cross St Bldg. 01164, 117 Purchase Order

EMSL LIMS Project ID: (if applicable, EMSL will provide)

US State where samples collected: MA Commercial (Taxable) Residential (Non-Taxable)

State of Connecticut (CT) must select project location:

Sampled By Name: GEOFF GERACE Sampled By Signature: *[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 8 hours or less. *32 hour TAT available for select tests only, samples must be submitted by 11:59am.

Test Selection

PLM - Bulk (reporting limit)

PLM EPA 800R-83/118 (<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 (Verminable SM-V)

TEM - Bulk

TEM EPA NOB
 NYS NOB 198.4 (Non-Friable-NY)
 TEM EPA 800R-83/118 w Milling Prep (0.1%)

Other Tests (please specify)

Positive Stop - Clearly Identified Homogeneous Areas (HA)

Sample Number	HA Number	Sample Location	Material Description
083021-57-	21A	1 st FL Pantry	Ceiling PLASTER
	21B	Cross St Center Room 102	↓
	21C	OFFICE 103	↓
	30A	Stairwell Basement	SKINCOAT PLASTER
	30B	" 1 st FL	↓
	30C	" 2 nd FL	↓
	30D	OFFICE 3, 2 nd FL	↓
	30E	Basement NE Corner	↓
	31A	Stairwell Basement	BASE COAT PLASTER
	31B	Stairwell 1 st FL	↓

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.):

Hand Delivered

Method of Shipment: *[Signature]*

Relinquished by: *[Signature]* Date/Time: 8/30/21 2:00

Sample Condition Upon Receipt: *[Signature]*

Received by: RECI *[Signature]* #13:27 WI Date/Time: AUG 30 2021

Relinquished by: Date/Time: Received by: EMSL-BOSTON Date/Time: _____

Consent Document - 000-01 Asbestos Bulk PB 010002 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: 132107030

Customer ID: AXIO80

Customer PO:

Project ID:

Attention: Matt Buccella
Axiom Partners, Inc.
50B Salem Street, Suite 103
Lynnfield, MA 01940

Phone: (617) 549-2579

Fax: (781) 213-6992

Received Date: 09/16/2021 11:15 AM

Analysis Date: 09/23/2021

Collected Date: 09/08/2021

Project: 01164.117 - City of Somerville; Municipal Building; 165 Broadway; 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
090821-06-50A <small>132107030-0001</small>	165 Broadway; Somerville, MA - Lower Roof - Asphalt Shingle	Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
090821-06-50B <small>132107030-0002</small>	165 Broadway; Somerville, MA - Lower Roof - Asphalt Shingle	Black Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
090821-06-51A <small>132107030-0003</small>	165 Broadway; Somerville, MA - Roof - Test Cut #1 - Main Roofing Field	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
090821-06-51B <small>132107030-0004</small>	165 Broadway; Somerville, MA - Roof - Test Cut #2 - Main Roofing Field	Black Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
090821-06-52A <small>132107030-0005</small>	165 Broadway; Somerville, MA - Roof - Test Cut #3 - Flashing Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090821-06-52B <small>132107030-0006</small>	165 Broadway; Somerville, MA - Roof - Test Cut #4 - Flashing Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090821-06-53A <small>132107030-0007</small>	165 Broadway; Somerville, MA - Roof - Test Cut #1 - Insulation Fastener Adhesive	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090821-06-53B <small>132107030-0008</small>	165 Broadway; Somerville, MA - Roof - Test Cut #2 - Insulation Fastener Adhesive	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/23/2021 14:55:00



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: 132107030

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

Kevin Pine (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: 09/23/2021 14:55:00



AXIOM PARTNERS
 ONE PLEASURE ISLAND ROAD
 SUITE 2C
 WAKEFIELD, MA 01880
 PHONE: 781.213.9198
 FAX: 781.213.6992

LABORATORY ORDER #:
132107030
 Sample(s) received in good condition? [Y] [N]
 Discernable field blank submitted? [Y] [N]

Asbestos Analysis - Chain of Custody Form

Sampled by: *Matthew Buccella* Date Collected: *09/10/21*

Project Name: *City of Somerville - Municipal Building*

Project Site: *165 Broadway, Somerville, Massachusetts*

Project ID/Number: *01164.117*

Special Lab Instructions: *NO POSITIVE STOP; email results to mbuccella@axiomenv.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 NUMBER	SAMPLE LOCATION	SAMPLE DESCRIPTION
09081-06-50A	165 Broadway, Somerville, MA - Lower Roof	Asphalt Shingle
09081-06-50B	165 Broadway, Somerville, MA - Lower Roof	Asphalt Shingle
09081-06-51A	165 Broadway, Somerville, MA - Roof - Test Cut #1	Main Roofing Field
09081-06-51B	165 Broadway, Somerville, MA - Roof - Test Cut #2	Main Roofing Field
09081-06-52A	165 Broadway, Somerville, MA - Roof - Test Cut #3	Flashing Sealant
09081-06-52B	165 Broadway, Somerville, MA - Roof - Test Cut #4	Flashing Sealant
09081-06-53A	165 Broadway, Somerville, MA - Roof - Test Cut #1	Insulation Fastener Adhesive
09081-06-53B	165 Broadway, Somerville, MA - Roof - Test Cut #2	Insulation Fastener Adhesive

REC'D
 EMSI RECTOR
 SEP 16 2021
AM 1115
us mail (1/2)

Relinquished: *[Signature]* Date: *09/14/21* Time: _____

Received: _____ Date: _____ Time: _____



ANALYTICAL REPORT

Lab Number:	L2146627
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	CITY OF SOMERVILLE
Project Number:	01164.117
Report Date:	09/08/21

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



Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2146627-01	PCB-01	SOLID	165 BROADWAY ST	08/30/21 15:00	08/31/21
L2146627-02	PCB-02	SOLID	165 BROADWAY ST	08/30/21 15:00	08/31/21

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

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.

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

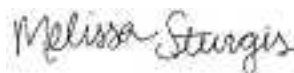
Case Narrative (continued)

PCBs

The surrogate recoveries for the WG1541784-1 Method Blank, associated with L2146627-01 and -02, are below the acceptance criteria for 2,4,5,6-tetrachloro-m-xylene (15%,16%). The associated samples are non-detect and have acceptable surrogate recoveries; therefore, no further actions were taken.

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

Title: Technical Director/Representative

Date: 09/08/21

ORGANICS

PCBS

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

SAMPLE RESULTS

Lab ID: L2146627-01
 Client ID: PCB-01
 Sample Location: 165 BROADWAY ST

Date Collected: 08/30/21 15:00
 Date Received: 08/31/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid
 Analytical Method: 1,8082A
 Analytical Date: 09/03/21 12:52
 Analyst: JAW
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
 Extraction Date: 09/01/21 13:55
 Cleanup Method: EPA 3630
 Cleanup Date: 09/02/21
 Cleanup Method: EPA 3665A
 Cleanup Date: 09/03/21
 Cleanup Method: EPA 3660B
 Cleanup Date: 09/03/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	575	--	1	A
Aroclor 1221	ND		ug/kg	575	--	1	A
Aroclor 1232	ND		ug/kg	575	--	1	A
Aroclor 1242	ND		ug/kg	287	--	1	A
Aroclor 1248	ND		ug/kg	575	--	1	A
Aroclor 1254	ND		ug/kg	575	--	1	A
Aroclor 1260	ND		ug/kg	575	--	1	A
Aroclor 1262	ND		ug/kg	575	--	1	A
Aroclor 1268	ND		ug/kg	287	--	1	A
PCBs, Total	ND		ug/kg	287	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		30-150	A
Decachlorobiphenyl	62		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	58		30-150	B

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

SAMPLE RESULTS

Lab ID: L2146627-02
 Client ID: PCB-02
 Sample Location: 165 BROADWAY ST

Date Collected: 08/30/21 15:00
 Date Received: 08/31/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid
 Analytical Method: 1,8082A
 Analytical Date: 09/03/21 12:45
 Analyst: JAW
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
 Extraction Date: 09/01/21 13:55
 Cleanup Method: EPA 3630
 Cleanup Date: 09/02/21
 Cleanup Method: EPA 3665A
 Cleanup Date: 09/03/21
 Cleanup Method: EPA 3660B
 Cleanup Date: 09/03/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	586	--	1	A
Aroclor 1221	ND		ug/kg	586	--	1	A
Aroclor 1232	ND		ug/kg	586	--	1	A
Aroclor 1242	ND		ug/kg	293	--	1	A
Aroclor 1248	ND		ug/kg	586	--	1	A
Aroclor 1254	ND		ug/kg	586	--	1	A
Aroclor 1260	ND		ug/kg	586	--	1	A
Aroclor 1262	ND		ug/kg	586	--	1	A
Aroclor 1268	ND		ug/kg	293	--	1	A
PCBs, Total	ND		ug/kg	293	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	70		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	62		30-150	B

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 09/04/21 10:42
Analyst: JAW

Extraction Method: EPA 3540C
Extraction Date: 09/01/21 13:55
Cleanup Method: EPA 3630
Cleanup Date: 09/03/21
Cleanup Method: EPA 3665A
Cleanup Date: 09/03/21
Cleanup Method: EPA 3660B
Cleanup Date: 09/03/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-02 Batch: WG1541784-1						
Aroclor 1016	ND		ug/kg	528	--	A
Aroclor 1221	ND		ug/kg	528	--	A
Aroclor 1232	ND		ug/kg	528	--	A
Aroclor 1242	ND		ug/kg	264	--	A
Aroclor 1248	ND		ug/kg	528	--	A
Aroclor 1254	ND		ug/kg	528	--	A
Aroclor 1260	ND		ug/kg	528	--	A
Aroclor 1262	ND		ug/kg	528	--	A
Aroclor 1268	ND		ug/kg	264	--	A
PCBs, Total	ND		ug/kg	264	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	15	Q	30-150	A
Decachlorobiphenyl	89		30-150	A
2,4,5,6-Tetrachloro-m-xylene	16	Q	30-150	B
Decachlorobiphenyl	88		30-150	B

Lab Control Sample Analysis Batch Quality Control

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

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: WG1541784-2 WG1541784-3									
Aroclor 1016	70		69		40-140	1		50	A
Aroclor 1260	72		70		40-140	3		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		55		30-150	A
Decachlorobiphenyl	68		73		30-150	A
2,4,5,6-Tetrachloro-m-xylene	64		53		30-150	B
Decachlorobiphenyl	71		66		30-150	B

Project Name: CITY OF SOMERVILLE

Project Number: 01164.117

Serial_No:09082115:14

Lab Number: L2146627

Report Date: 09/08/21

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler **Custody Seal**

A Absent

Container Information

Container ID **Container Type**

Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
A	NA		4.7	Y	Absent		PCB-8082-CAULK(365)
A	NA		4.7	Y	Absent		PCB-8082-CAULK(365)

Project Name: CITY OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

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
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

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 OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
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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 OF SOMERVILLE
Project Number: 01164.117

Lab Number: L2146627
Report Date: 09/08/21

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, NO₂, NO₃.

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: 8/31/21 ALPHA Job #: L2148627

Project Information

Project Name: City of Somerville
 Project Location: 165 Broadway St
 Project #: 01164.117
 Project Manager: Geoff Gervase
 ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Client Information

Client: AXIOM Partners
 Address: 50B Salem St, 103
Lynnfield, MA
 Phone: 978-995-5101
 Email: ggervase@axiomenv.com

Turn-Around Time

Standard RUSH (subject to contract & availability)
 Date Due:

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

Additional Project Information:
165 Broadway
Somerville, MA
Cross St. Center Building

ANALYSIS	SAMPLE INFO
VOC: <input type="checkbox"/> B260 <input type="checkbox"/> 624 <input type="checkbox"/> 624.2	Filtration
SVOC: <input type="checkbox"/> A51 <input type="checkbox"/> PAH	<input type="checkbox"/> Field
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15	<input type="checkbox"/> Lab to do
METALS: <input type="checkbox"/> RORAS <input type="checkbox"/> RORAS	Preservation
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> Lab to do
VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	
TPH: <input type="checkbox"/> PEST <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	
<u>PCB-1/PCB-2 PCB Sample</u>	
Sample Comments	

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
<u>466274</u>	<u>PCB-01</u>	<u>8/30</u>	<u>3:00</u>	<u>Bulk</u>	<u>GG</u>
<u>-02</u>	<u>PCB-02</u>	<u>8/30</u>	<u>3:00</u>	<u>↓</u>	<u>↓</u>

- Container Type**
 P= Plastic
 A= Amber glass
 V= Vial
 B= Beakers cup
 C= Cube
 O= Other
 E= Ennore
 D= BOD Bottle
- Preservative**
 A= None
 B= HCl
 C= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NaHSO₄
 H= Na₂S₂O₈
 I= Ascorbic Acid
 J= NH₄Cl
 K= Zn Acetate
 O= Other

Container Type	<u>A</u>
Preservative	<u>N</u>

Relinquished By:	Date/Time	Received By:	Date/Time
<u>T. Field</u>	<u>8/30/21</u>	<u>J. Hudson</u>	<u>8/31/21 11:20</u>
	<u>8/31/21 12:25</u>		<u>8/31/21 12:25</u>

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: Cross Street Center

Location Address: 33 Cross Street, Somerville MA

Location	Description	Substrate	Paint Condition	XRF Reading	Color/ Comments
Exterior	Window Trim	Wood	Good	0.0	Brown
"	Window Frame	Metal	Good	0.0	Brown
"	Window Sash	Metal	Good	0.0	Brown
"	Door	Wood	Good	0.0	Black
"	Paneling	Wood	Good	0.0	Red
"	Stair	Metal	Good	0.0	Rust
"	Railing	Metal	Good	0.0	Rust
1 st Floor	Wall	Gypsum	Good	0.00	Beige
"	Door Trim	Wood	Good	0.0	Stain
"	Door Casing	Metal	Good	0.0	Stain
"	Door	Wood	Good	0.0	Stain
"	Base Board	Wood	Good	0.05	Blue
"	Wall	Plaster	Good	0.4	Beige
"	Window Sill	Wood	Good	0.01	Stain
"	Window Sash	Wood	Good	0.0	Stain
"	Window Casing	Wood	Good	0.0	Stain
"	Door Casing	Metal	Fair	0.0	Blue
"	Door	Wood	Good	0.0	Beige
"	Door	Metal	Good	0.0	Beige
"	Radiator	Metal	Good	0.04	Blue
"	Paneling	Wood	Good	0.01	Beige
"	Door	Metal	Good	0.0	Red
"	Door Casing	Wood	Good	0.0	Beige
"	Floor	Concrete	Good	0.02	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; 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: Cross Street Center

Location Address: 33 Cross Street, Somerville MA

Location	Description	Substrate	Paint Condition	XRF Reading	Color/ Comments
"	Ceiling	Wood	Good	0.27	Beige
"	Railing	Metal	Good	0.00	Black
"	Former Siding	Wood	Good	0.12	Beige
"	Former Trim Board	Wood	Good	0.07	White
Stairwell	Wall	Plaster	Fair	0.0	Green
"	Paneling	Wood	Fair	0.0	Green
"	Base Board	Wood	Fair	0.0	White
"	Stair Riser	Wood	Fair	0.30	Purple
"	Newel Post	Wood	Fair	0.06	Purple
"	Stair Trim	Wood	Fair	0.20	Pink
2 nd Floor	Window Casing	Wood	Good	0.21	White
"	Window Sill	Wood	Good	0.28	White
"	Window Sash	Metal	Good	0.0	Brown
"	Door	Wood	Good	0.0	Beige
"	Door Casing	Wood	Good	0.0	Beige
"	Wall	Gypsum	Good	0.0	Blue/Green
"	Wall	Plaster	Good	0.0	Blue/Green
"	Base Board	Wood	Good	0.0	Beige
"	Column	Wood	Good	0.02	Beige
"	Radiator	Metal	Good	0.16	Silver
"	Window Casing	Wood	Good	0.10	Beige
"	Window Sill	Wood	Good	0.11	Beige
"	Window Sash	Metal	Good	0.0	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; 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

SITE NAME Cross Street Center
ADDRESS 33 Cross St, Somerville, MA

Bulbs & Ballasts

Description	Location	Mfg./Model	Quantity	PCB Content (Y/N/U)
4' Fluorescent Bulbs	Throughout	NA	122	U
4' Fluorescent Ballast	Throughout	NA	46	U
2' Fluorescent Bulbs	Throughout	NA	14	U
2' Fluorescent Ballast	Throughout	NA	7	U

HVAC Units

Description/Location	HVAC Manufacturer	Number of Units	Amount/Type of RCFCs
Roof Top Units	R410A	2 Roof Top Units	NA
Window Mount Units	Various	2 Units	NA
Walk In Cooler Units	Sanyo	1 Unit	NA

Thermostats

Location	Manufacturer	Number of Units
Front Entrance	Honeywell	1

Misc. Items

Description	Location	Size	Quantity
Batteries associated with Exit Lighting	Throughout	NA	8
Batteries associated with Emergency Lighting	Throughout	NA	8
Freon associated with Refrigerators	Throughout	NA	3
Television	Office Area	NA	1
Dry Type Transformer	Front of Building	NA	1
Fire Extinguishers	Throughout	NA	8

Description	Location	Size	Quantity
Paint Cans	Throughout	1 & 5 gallon	16
McNeil Oil Boiler Units	Basement	NA	2
Above Ground Oil Tanks	Basement	275 gallons	2

APPENDIX D
Non-ACMs Tables

Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
083021-57-03A&B	Exterior Door Caulking	Exterior
083021-57-04A&B	Red Brick Mortar	Exterior Throughout
083021-57-05A&B	Stone Mortar a/w Stone Foundation	Exterior Foundation
083021-57-07A-07C	Gypsum Wallboard	Throughout
083021-57-08A-08C	Joint Compound a/w Gypsum Wallboard	Throughout
083021-57-09A&B	4" Vinyl Cove Base Mastic	Throughout
083021-57-10A&10B	FRP Paneling Mastic	1 st Floor Food Pantry and Kitchen
083021-57-11A&11B	12" x 12" Blue Floor Tile	Food Storage Area, Front Entrance
083021-57-12A&12B	12" x 12" Blue Floor Tile Mastic	Food Storage Area, Front Entrance
083021-57-13A&13B	4" x 4" Tan Ceramic Wall Tile Grout	Room 105-Kitchen
083021-57-14A&14B	4" x 4" Tan Ceramic Wall Tile Adhesive	Room 105-Kitchen
083021-57-15A&15B	1" x 1" Tan/Brown Ceramic Tile Grout	Room 105-Kitchen
083021-57-16A&16B	1" x 1" Tan/Brown Ceramic Tile Mortar	Room 105-Kitchen
083021-57-17A&17B	2' x 4' White Fissured Ceiling Tile	2 nd Floor Throughout, 1 st Floor Kitchen
083021-57-19A&19B	12" x 12" Tan Floor Tile	Front Entrance Bottom Layer, 2 nd Floor Offices
083021-57-20A&20B	12" x 12" Tan Floor Tile Mastic	Front Entrance Bottom Layer, 2 nd Floor Offices
083021-57-22A&22B	Carpet Adhesive a/w Blue Carpet	Office 103 , 2 nd Floor Exit
083021-57-23A&23B	Gray Duct Mastic	Room 102-Cross St Center, 2 nd Floor Activities Room
083021-57-24A&24B	4" x 4" White Ceramic Tile Grout	Men's Room, Women's Room
083021-57-26A726B	2" x 2" White Ceramic Tile Grout	Men's Room, Women's Room
083021-57-28A&28B	Tan Stair tread	Stairwell
083021-57-29A&29B	Tan Stair tread Mastic	Stairwell
083021-57-32A732B	2' x 2' White Ceiling Tile	Stairwell 2 nd Floor

Non-ACM Table

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION
083021-57-33A&33B	12" x 12" Gray Mottled Floor Tile	Stairwell 2 nd Floor, Activities Room 2 nd Floor
083021-57-34A&34B	12" x 12" Gray Mottled Floor Tile Mastic	Stairwell 2 nd Floor, Activities Room 2 nd Floor
083021-57-35A-35C	Textured Ceiling Coating	2 nd Floor Office, and 2 nd Floor Exit Area
083021-57-36A&36B	12" x 12" Beige Floor Tile	2 nd Floor Foyer, 2 nd Floor Office 2
083021-57-37A&37B	12" x 12" Beige Floor Tile Mastic	2 nd Floor Foyer, 2 nd Floor Office 2
083021-57-38A&38B	Exterior Door Caulking	2 nd Floor Exit Door
083021-57-39A&39B	12" x 12" Blue Floor Tile	Bathroom 1 2 nd Floor
083021-57-40A&40B	12" x 12" Blue Floor Tile Mastic	Bathroom 1 2 nd Floor
083021-57-43A-43C	Boiler Insulation	Basement Middle
083021-57-44A-44C	Boiler Brick	Basement Middle
083021-57-45A-45C	End Cap Sealant	Basement
091721-12-01A&01B	Roof Tar Mop Down Layer	Roof Throughout
091721-12-02A02B	Roof Tar Mop Down Layer	Roof Flashing Throughout
091721-12-03A&03B	Pipe Penetration Flashing	Roof
091721-12-04A&04B	Chimney Cap Waterproofing	Roof

APPENDIX E

Photographs



Photo 1

View of Asbestos-Containing Window Caulking and Glazing (on brick wall), Exterior of Building



Photo 2

View of Asbestos-Containing Roof Cement



Photo 3

View of Asbestos-Containing Sink Mastic



Photo 4

View of Asbestos-Containing Pipe/Fitting Insulation, Basement



Photo 5

View of Presumed Asbestos-Containing
Ceramic Tile Adhesives-Bathrooms



Photo 6

View of Presumed Asbestos-Containing Pipe Elbow
Insulation

APPENDIX F

Asbestos and Hazardous Building Materials Abatement Cost Estimate



**Asbestos & Hazardous Building Materials Abatement Cost Estimate
Cross Street Center Building
165 Broadway, Somerville, MA**

Asbestos Removal, ACMs

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Exterior Window Caulking	Exterior All Sides of Building	57 EA	\$7,125
Exterior Window Glazing (w/ wood double hung window)	Exterior All Sides of Building (1 st – 2nd Floors)	57 EA	Included Above
Roof Cement on Brick Wall	Exterior N and West Side	10 LF	\$300
6" Pipe Insulation	Basement and Pipe Chases	480 LF	\$7,500
Black Sink Mastic	Kitchen 1 st and 2 nd Floor	2 EA	\$200
Subtotal, Asbestos Removal (Confirmed ACMs)			\$ 15,125

Asbestos Removal, PACMs

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	TBD	\$80,000
Buried Pipes/Steam Tunnels	Beneath Building or at Site	TBD	\$50,000
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	TBD	NA*
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall & Ceiling Surfaces	Various Areas Building's Interiors	TBD	NA*
Grouts/Thin Sets w/ Ceramic Wall & Floor Tiles	Various Areas Building's Interiors	TBD	NA*
Pipe Elbow Insulation	Basement and Pipe Chases	TBD	\$1,000
Subtotal, PACM Removal (Recommended Allowance)			\$ 131,000

*N/A – Not applicable at this time

Abatement Cost Estimate Summary

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 15,125
Asbestos Removal, Presumed ACMs	\$ 131,000
Miscellaneous Hazardous Building Materials	\$ 5,000

*



Asbestos & Hazardous Building Materials Abatement Cost Estimate
Cross Street Center Building
165 Broadway, Somerville, MA

Description	Estimated Removal Cost
~10% Contingency	\$ 15,115
Estimated Abatement Design/Bid & Monitoring Fee	\$ 14,000
Total Hazardous Building Materials Abatement	\$ 180,240

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
EAST BRANCH LIBRARY BUILDING
115 BROADWAY, SOMERVILLE, MA**



PREPARED FOR:

**HALEY & ALDRICH, INC.
465 MEDFORD STREET, SUITE 2200
BOSTON, MA 02129**

PREPARED BY:

**AXIOM PARTNERS, INC.
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LYNNFIELD, MA 01490**

SEPTEMBER 24, 2021



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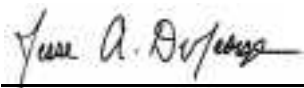
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CERTIFICATION OF RESULTS

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 24th day of September 2021

Prepared by:



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 planned property 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 one-story building with a small basement and a footprint of approximately 4,000 square feet. The building is occupied by the Somerville's East Branch Library. The floors are designated as basement and first floor. The building was constructed in 1906 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 the main library area, a break room, storage rooms, bathrooms, hallways and mechanical rooms. The exterior walls brick over concrete and CMU. Interior walls are a combination of concrete, plaster and painted drywall. The vast majority of the floors have carpeting and vinyl flooring as well as some quarry 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 on September 2, 2021 by experienced and Massachusetts Department of Labor Standards (DLS) licensed Asbestos Inspector, Jesse A. DeGeorge (Massachusetts Asbestos Inspector License Number 1031684).

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 ¹	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.
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:

¹ Per homogeneous material or area

- 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: 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.

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 performed testing of paints for the presence of lead at the building. Representative testing of painted surfaces for the presence of lead was performed on accessible painted surfaces. The testing was performed via bulk paint chip sample analysis. The HUD² lead paint standard classifies lead-containing paint (LCP) as paint having ≥ 1.0 mg/cm² as measured by the Portable X-Ray Fluorescence (XRF) Analyzer or $\geq 0.5\%$ of lead by weight as analyzed by Atomic Absorption. With respect to demolition work, OSHA defines LCP as any paint containing detectable amounts of lead.

3.4.3 Bulk Sampling Procedures

AXIOM collected four (4) paint chips for lead analysis from representative paint at the building. The samples were collected using hand tools and were immediately placed in leak tight containers which were labeled with a unique sample number. A chain-of-custody form was used to ensure sample integrity.

The bulk paint chip samples were hand delivered to EMSL Analytical, Inc. (EMSL) located in Woburn, Massachusetts for analysis. EMSL is fully accredited for lead bulk sample analysis under the Environmental Lead Proficiency Analytical Testing (ELPAT) Program administered by the American Industrial Hygiene Association (AIHA). The bulk paint chip samples were analyzed for lead content using Atomic Absorption Spectrophotometry (AAS) under EPA Method SW846-7420/3051. Results of paint chip sample collection are summarized in the table below.

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.

² U.S. Department of Housing and Urban Development

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
EAST BRANCH LIBRARY BUILDING, 115 BROADWAY, SOMERVILLE, MA

Sample Reference	Sample Description	Sample Location	Estimated Quantity ³	Results
090221-95-04A	Remnant Asphaltic Sealant (on brick wall)	Exterior Rear Side of Building	10 LF	14% CHR
090221-95-14A	Gray Sink Undercoating	1 st Floor Break Room	1 EA	3% CHR
091021-06-102A	Flashing Sealant (@ Chimney & Front Right Roof Drain)	Main Roof Field (@ Chimney & Front Right Roof Drain)	260 LF	10% CHR
NS ⁴	Pipe/Fitting Insulation w/ Abandoned Heating System	Basement Pipe Tunnel & Wall Chases	200 LF	Assumed

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
Thin Set w/ Quarry Floor Tile	1 st Floor Front Entryway	TBD	Friable

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.

³ SF = Square Feet; LF = Linear Feet; EA = Each; TR= Trace Asbestos (<1%); CHR = Chrysotile Asbestos; CRO = Crocidolite Asbestos

⁴ This ACM was not sampled but observed to be in a pipe tunnel in the basement. For the purposes of this report, AXIOM has included it in the ACMs table.

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 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 HUD⁵ lead paint standard classifies Lead Based Paint (LBP) as paint having ≥ 1.0 mg/cm² 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.

AXIOM performed testing of paints for the presence of lead at the building. Representative testing of painted surfaces for the presence of lead was performed on accessible painted surfaces. The testing was performed via bulk paint chip sample analysis. AXIOM collected four (4) paint chips for lead analysis from representative paint at the building.

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 PAINT CHIP SAMPLE RESULTS**

Sample # / Location / Component	Color	Lead Content by AAS Percent of Lead by Weight
PC-01 / Exterior, Front Side of Building / Paint on Wood Decorative Structural Support Columns	White	0.011
PC-02 / Interior, 1 st Floor Main Library Area (left wall) / Paint on Gypsum Wallboard	White	<0.0085

⁵ U.S. Department of Housing and Urban Development

PC-03 / Interior, 1st Floor Main Library Area (right wall) / Paint on Plaster Wall	White	<0.019
PC-04 / Interior, 1st Floor Break Room / Paint on Wood Door Casing	Gray	<0.020

Based on analytical results, **none** of the paint chip samples contained lead in detectable quantities.

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. TCLP⁶ 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.

4.3 Polychlorinated Biphenyls (PCBs) and Mercury in Electrical Equipment

4.3.1 Fluorescent Light Fixtures

AXIOM identified two (2) 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

⁶ Toxicity Characteristic Leachate Procedure (TCLP)

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 applicable⁷ 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 thirty-four (34) fluorescent light bulbs associated with actual light fixtures and two (2) thermostats 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 one (1) rooftop air conditioner unit located on the roof. A refrigerator was 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.

⁷ 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.

TABLE 4
SUMMARY OF PCBs IN CAULKING COMPOUND RESULTS

Sample Number	Description	Location	Analysis Results ⁸
PCB-01	Exterior Door Caulking	Exterior Front Side of Building	ND
PCB-02	Exterior Window Caulking (w/ wood double hung window)	Exterior Rear Side of Building	ND
PCB-03	Exterior Seam Caulking (@ wood structural support columns)	Exterior Front Side of Building	ND

Laboratory results are reported in micrograms per kilograms ($\mu\text{g}/\text{kg}$) 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 results of this investigation, **none** of the caulking samples are considered to be PCB bulk products.

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 a water fountain. 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

⁸ 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.

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; 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 HUD⁹ or state accredited/licensed Lead Inspector which is often required for residential structures where children under the age of six live.

⁹ US Department of Housing and Urban Development

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.

APPENDIX A

Asbestos Bulk and PCB Bulk Sample Results



EMSL Analytical, Inc.

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Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 132106620

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: 09/02/2021 3:30 PM

Analysis Date: 09/13/2021

Collected Date: 09/02/2021

Project: 01164.117 - Library Building; 115 Broadway; Somerville

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
090221-95-01A 132106620-0001	Exterior Front Side of Building - Exterior Door Caulking (Man Door)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-01B 132106620-0002	Exterior Front Side of Building - Exterior Door Caulking (Man Door)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-02A 132106620-0003	Exterior Rear Side of Building - Exterior Window Caulking (w/ Vinyl Windows)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-02B 132106620-0004	Exterior Front Side of Building - Exterior Window Caulking (w/ Vinyl Windows)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-03A 132106620-0005	Exterior Front Side of Building - Exterior Seam Caulking at Wood STCs	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-03B 132106620-0006	Exterior Front Side of Building - Exterior Seam Caulking at Wood STCs	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-04A 132106620-0007	Exterior Rear Side of Building - Remnant Asphaltic Sealant (on Brick Wall)	Black Non-Fibrous Homogeneous		86% Non-fibrous (Other)	14% Chrysotile
090221-95-05A 132106620-0008	1st Floor, Break Room - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-05B 132106620-0009	1st Floor, Main Library Area (Rear Wall) - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-05C 132106620-0010	1st Floor, Main Library Area (Right Wall) - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-05D 132106620-0011	1st Floor, Main Library Area (Left Wall) - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-05E 132106620-0012	1st Floor, Break Room - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-05F 132106620-0013	1st Floor, Break Room - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected

Initial report from: 09/13/2021 15:01:41



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: 132106620
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
090221-95-05G <small>132106620-0014</small>	1st Floor, Main Library Area (Front Wall) - Plaster Walls & Ceilings	Gray/White Fibrous Homogeneous	2% Hair	98% Non-fibrous (Other)	None Detected
090221-95-06A <small>132106620-0015</small>	1st Floor, Break Room - Gypsum Wallboard	Brown/Gray Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
090221-95-06B <small>132106620-0016</small>	1st Floor, Main Area (Left Wall) - Gypsum Wallboard	Brown/Gray Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
090221-95-06C <small>132106620-0017</small>	1st Floor, Main Area (Rear Wall) - Gypsum Wallboard	Brown/Gray Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
090221-95-07A <small>132106620-0018</small>	1st Floor, Break Room - Joint Compound w/ Sample 06A	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-07B <small>132106620-0019</small>	1st Floor, Main Library Area (Left Wall) - Joint Compound w/ Sample 06B	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-07C <small>132106620-0020</small>	1st Floor, Main Library Area (Rear Wall) - Joint Compound w/ Sample 06C	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-08A <small>132106620-0021</small>	1st Floor, Break Room - 4" Black Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-08B <small>132106620-0022</small>	1st Floor, Break Room - 4" Black Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-09A <small>132106620-0023</small>	1st Floor, Break Room - 4" Gray Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-09B <small>132106620-0024</small>	1st Floor, Electrical Closet - 4" Gray Cove Base Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-10A <small>132106620-0025</small>	1st Floor, Break Room - 12"x12" Gray Mottled Vinyl Floor Tile (on Concrete)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-10B <small>132106620-0026</small>	1st Floor, Hall by Bathroom - 12"x12" Gray Mottled Vinyl Floor Tile (on Concrete)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-11A <small>132106620-0027</small>	1st Floor, Break Room - Mastic w/ Sample 10A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-11B <small>132106620-0028</small>	1st Floor, Hall by Bathroom - Mastic w/ Sample 10B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/13/2021 15:01:41



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5 Constitution Way, Unit A Woburn, MA 01801

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EMSL Order: 132106620

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
090221-95-12A 132106620-0029	1st Floor, Break Room - 12"x12" Gray w/ White Streaks Vinyl Floor Tile (on Concrete)	Gray Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-12B 132106620-0030	1st Floor, Electrical Closet - 12"x12" Gray w/ White Streaks Vinyl Floor Tile (on Concrete)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-13A 132106620-0031	1st Floor, Break Room - Mastic w/ Sample 12A	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-13B 132106620-0032	1st Floor, Electrical Closet - Mastic w/ Sample 12B	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-14A 132106620-0033	1st Floor, Break Room - Gray Sink Undercoating	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
090221-95-15A 132106620-0034	1st Floor, Main Library Area (Left) - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-15B 132106620-0035	1st Floor, Main Library Area (Right) - Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-16A 132106620-0036	1st Floor, Main Library Area (Left) - Gray Floor Leveling Material	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-16B 132106620-0037	1st Floor, Main Library Area (Right) - Gray Floor Leveling Material	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-17A 132106620-0038	1st Floor, Main Library Area (Left) - Remnant Black Tile Mastic (Under Carpet)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-17B 132106620-0039	1st Floor, Main Library Area (Right) - Remnant Black Tile Mastic (Under Carpet)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-18A 132106620-0040	1st Floor, Main Library Area (Front) - Interior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-18B 132106620-0041	1st Floor, Main Library Area (Front) - Interior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-19A 132106620-0042	1st Floor, Front Entryway - 6"x6" Red Quarry Vinyl Floor Tile - Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
090221-95-19B 132106620-0043	1st Floor, Front Entryway - 6"x6" Red Quarry Vinyl Floor Tile - Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 09/13/2021 15:01:41



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: 132106620

Customer ID: AXIO80

Customer PO:

Project ID:

Analyst(s)

John McCarthy (43)

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: 09/13/2021 15:01:41



AXIOM PARTNERS
 50B SALEM STREET, STE 103
 LYNNFIELD, MA 01490
 PHONE: 781.213.9198
 FAX: 781.213.6992

LABORATORY ORDER #
132106620
 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:	09-02-21
Project Name:	Library Building		
Project Site:	115 Broadway, Somerville, MA		
Project ID/Number:	01164.117		
Special Lab Instructions:	POSITIVE STOP <i>positive stop</i> 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 checked="" 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
090221-95-01A	Exterior Door Caulking (man door)	Exterior Front Side of Bldg.	
090221-95-01B	.	.	
090221-95-02A	Exterior Window Caulking (w/ vinyl windows)	Exterior Rear Side of Bldg.	
090221-95-02B	.	Exterior Front Side of Bldg.	
090221-95-03A	Exterior Seam Caulking @ Wood STCs	Exterior Front Side of Bldg.	
090221-95-03B	.	.	
090221-95-04A	Remnant Asphaltic Sealant (on brick wall)	Exterior Rear Side of Bldg.	
090221-95-05A	Plaster Walls & Ceilings	1 st Fl., Break Room	
090221-95-05B	.	1 st Fl., Main Library Area (rear wall)	
090221-95-05C	.	1 st Fl., Main Library Area (right wall)	
090221-95-05D	.	1 st Fl., Main Library Area (left wall)	
090221-95-05E	.	1 st Fl., Break Room	
090221-95-05F	.	1 st Fl., Break Room	
090221-95-05G	.	1 st Fl., Main Library Area (front wall)	
090221-95-06A	Gypsum Wallboard	1 st Fl., Break Room	
090221-95-06B	.	1 st Fl., Main Library Area (left wall)	
090221-95-06C	.	1 st Fl., Main Library Area (rear wall)	
090221-95-07A	Joint Compound w/ Sample #06A	1 st Fl., Break Room	
090221-95-07B	Joint Compound w/ Sample #06B	1 st Fl., Main Library Area (left wall)	

Relinquished: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 09-02-21 Time: -

Received: _____ Date: _____ Time: _____

REC'D
 EMSL-BOSTON
 SEP 02 2021
 11:41 AM



AXIOM PARTNERS
 50B SALEM STREET, STE 103
 LYNNFIELD, MA 01490
 PHONE: 781.213.9198
 FAX: 781.213.6992

LABORATORY ORDER # **132106620**
 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:	09-02-21
Project Name:	Library Building		
Project Site:	115 Broadway, 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)

<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 checked="" 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
090221-95-07C	Joint Compound w/ Sample #06C	1 st Fl., Main Library Area (rear wall)	
090221-95-08A	4" Black Cove Base Mastic	1 st Fl. Break Room	
090221-95-06B	.	.	
090221-95-09A	4" Gray Cove Base Mastic	1 st Fl. Break Room	
090221-95-09B	.	1 st Fl. Electrical Closet	
090221-95-10A	12" x 12" Gray Mottled Vinyl Floor Tile (on concrete)	1 st Fl. Break Room	
090221-95-10B	.	1 st Fl. Hall by Bathroom	
090221-95-11A	Mastic w/ Sample #10A	1 st Fl. Break Room	
090221-95-11B	Mastic w/ Sample #10B	1 st Fl. Hall by Bathroom	
090221-95-12A	12" x 12" Gray w/ White Streaks Vinyl Floor Tile (on concrete)	1 st Fl. Break Room	
090221-95-12B	.	1 st Fl. Electrical Closet	
090221-95-13A	Mastic w/ Sample #12A	1 st Fl. Break Room	
090221-95-13B	Mastic w/ Sample #12B	1 st Fl. Electrical Closet	
090221-95-14A	Gray Sink Undercoating	1 st Fl. Break Room	
090221-95-15A	Carpet Mastic	1 st Fl., Main Library Area (left)	
090221-95-15B	.	1 st Fl., Main Library Area (right)	
090221-95-16A	Gray Floor Leveling Material	1 st Fl., Main Library Area (left)	
090221-95-16B	.	1 st Fl., Main Library Area (right)	
090221-95-17A	Remnant Black Tile Mastic (under carpet)	1 st Fl., Main Library Area (left)	

Relinquished:	<u>Jesse A. DeGeorge</u> <i>Jesse A. DeGeorge</i>	Date:	09-02-21	Time:	-
Received:	_____	Date:	_____	Time:	_____

REC'D EMSL-BOSTON
SEP 02 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: 132107029

Customer ID: AXIO80

Customer PO:

Project ID:

Attention: Matt Buccella
Axiom Partners, Inc.
50B Salem Street, Suite 103
Lynnfield, MA 01940

Phone: (617) 549-2579

Fax: (781) 213-6992

Received Date: 09/16/2021 11:15 AM

Analysis Date: 09/23/2021

Collected Date: 09/10/2021

Project: 01164.117 - City of Somerville; Library; 115 Broadway; 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
091021-06-100A <small>132107029-0001</small>	115 Broadway; Somerville, MA - Roof - Test Cut #1 - Main Roofing Field	Brown Fibrous Homogeneous	90% Cellulose 5% Glass	5% Non-fibrous (Other)	None Detected
091021-06-100B <small>132107029-0002</small>	115 Broadway; Somerville, MA - Roof - Test Cut #2 - Main Roofing Field	Brown Fibrous Homogeneous	90% Cellulose 5% Glass	5% Non-fibrous (Other)	None Detected
091021-06-101A <small>132107029-0003</small>	115 Broadway; Somerville, MA - Roof - Chimney - Termination Bar Caulking (at Chimney)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-06-101B <small>132107029-0004</small>	115 Broadway; Somerville, MA - Roof - Chimney - Termination Bar Caulking (at Chimney)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
091021-06-102A <small>132107029-0005</small>	115 Broadway; Somerville, MA - Roof - Flashing Sealant (at Chimney)	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
091021-06-102B <small>132107029-0006</small>	115 Broadway; Somerville, MA - Roof - Flashing Sealant (at Front Right Roof Drain)	Brown/White Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected

Analyst(s)

Kevin Pine (6)

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: 09/23/2021 14:29:33



AXIOM PARTNERS
 ONE PLEASURE ISLAND ROAD
 SUITE 2C
 WAKEFIELD, MA 01880
 PHONE: 781.213.9198
 FAX: 781.213.6992

LABORATORY ORDER #:
132107030
 Sample(s) received in good condition? [Y] [N]
 Discernable field blank submitted? [Y] [N]

Asbestos Analysis - Chain of Custody Form

Sampled by: *Matthew Buccella* Date Collected: *09/10/21*

Project Name: *City of Somerville - Municipal Building*

Project Site: *165 Broadway, Somerville, Massachusetts*

Project ID/Number: *01164.117*

Special Lab Instructions: *NO POSITIVE STOP; email results to mbuccella@axiomenv.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 NUMBER	SAMPLE LOCATION	SAMPLE DESCRIPTION
09081-06-50A	165 Broadway, Somerville, MA - Lower Roof	Asphalt Shingle
09081-06-50B	165 Broadway, Somerville, MA - Lower Roof	Asphalt Shingle
09081-06-51A	165 Broadway, Somerville, MA - Roof - Test Cut #1	Main Roofing Field
09081-06-51B	165 Broadway, Somerville, MA - Roof - Test Cut #2	Main Roofing Field
09081-06-52A	165 Broadway, Somerville, MA - Roof - Test Cut #3	Flashing Sealant
09081-06-52B	165 Broadway, Somerville, MA - Roof - Test Cut #4	Flashing Sealant
09081-06-53A	165 Broadway, Somerville, MA - Roof - Test Cut #1	Insulation Fastener Adhesive
09081-06-53B	165 Broadway, Somerville, MA - Roof - Test Cut #2	Insulation Fastener Adhesive

REC'D
 EMSI RECTOR
 SEP 16 2021
AM 1115
us mail (1/2)

Relinquished: *[Signature]* Date: *09/14/21* Time: _____

Received: _____ Date: _____ Time: _____



ANALYTICAL REPORT

Lab Number:	L2147230
Client:	Axiom Partners, Inc. 50B Salem St Lynnfield, MA 01940
ATTN:	Geoff Gerace
Phone:	(781) 995-5101
Project Name:	EAST BRANCH LIBRARY
Project Number:	01164.117
Report Date:	09/10/21

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



Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2147230-01	PCB-01, EXTERIOR DOOR CAULKING	SOLID	115 SOMERVILLE, SOMERVILLE, MA	09/02/21 09:50	09/02/21
L2147230-02	PCB-02, EXTERIOR WINDOW CAULKING	SOLID	115 SOMERVILLE, SOMERVILLE, MA	09/02/21 09:55	09/02/21
L2147230-03	PCB-03, EXTERIOR SEAM CAULKING @ WOOD STCS	SOLID	115 SOMERVILLE, SOMERVILLE, MA	09/02/21 10:03	09/02/21

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

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:

 Cristin Walker

Title: Technical Director/Representative

Date: 09/10/21

ORGANICS

PCBS

Project Name: EAST BRANCH LIBRARY**Lab Number:** L2147230**Project Number:** 01164.117**Report Date:** 09/10/21**SAMPLE RESULTS**

Lab ID: L2147230-01
 Client ID: PCB-01, EXTERIOR DOOR CAULKING
 Sample Location: 115 SOMERVILLE, SOMERVILLE, MA

Date Collected: 09/02/21 09:50
 Date Received: 09/02/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Solid
 Analytical Method: 1,8082A
 Analytical Date: 09/07/21 10:54
 Analyst: AD
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
 Extraction Date: 09/04/21 15:05
 Cleanup Method: EPA 3630
 Cleanup Date: 09/05/21
 Cleanup Method: EPA 3665A
 Cleanup Date: 09/06/21
 Cleanup Method: EPA 3660B
 Cleanup Date: 09/06/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	625	--	1	A
Aroclor 1221	ND		ug/kg	625	--	1	A
Aroclor 1232	ND		ug/kg	625	--	1	A
Aroclor 1242	ND		ug/kg	312	--	1	A
Aroclor 1248	ND		ug/kg	625	--	1	A
Aroclor 1254	ND		ug/kg	625	--	1	A
Aroclor 1260	ND		ug/kg	625	--	1	A
Aroclor 1262	ND		ug/kg	625	--	1	A
Aroclor 1268	ND		ug/kg	312	--	1	A
PCBs, Total	ND		ug/kg	312	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	93		30-150	A
Decachlorobiphenyl	90		30-150	A
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	111		30-150	B

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

SAMPLE RESULTS

Lab ID: L2147230-02
Client ID: PCB-02, EXTERIOR WINDOW CAULKING
Sample Location: 115 SOMERVILLE, SOMERVILLE, MA

Date Collected: 09/02/21 09:55
Date Received: 09/02/21
Field Prep: Not Specified

Sample Depth:

Matrix: Solid
Analytical Method: 1,8082A
Analytical Date: 09/07/21 11:02
Analyst: AD
Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
Extraction Date: 09/04/21 15:05
Cleanup Method: EPA 3630
Cleanup Date: 09/05/21
Cleanup Method: EPA 3665A
Cleanup Date: 09/06/21
Cleanup Method: EPA 3660B
Cleanup Date: 09/06/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	554	--	1	A
Aroclor 1221	ND		ug/kg	554	--	1	A
Aroclor 1232	ND		ug/kg	554	--	1	A
Aroclor 1242	ND		ug/kg	277	--	1	A
Aroclor 1248	ND		ug/kg	554	--	1	A
Aroclor 1254	ND		ug/kg	554	--	1	A
Aroclor 1260	ND		ug/kg	554	--	1	A
Aroclor 1262	ND		ug/kg	554	--	1	A
Aroclor 1268	ND		ug/kg	277	--	1	A
PCBs, Total	ND		ug/kg	277	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		30-150	A
Decachlorobiphenyl	80		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	83		30-150	B

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

SAMPLE RESULTS

Lab ID: L2147230-03
Client ID: PCB-03, EXTERIOR SEAM CAULKING @ WOOD STCS
Sample Location: 115 SOMERVILLE, SOMERVILLE, MA

Date Collected: 09/02/21 10:03
Date Received: 09/02/21
Field Prep: Not Specified

Sample Depth:

Matrix: Solid
Analytical Method: 1,8082A
Analytical Date: 09/07/21 11:09
Analyst: AD
Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3540C
Extraction Date: 09/04/21 15:05
Cleanup Method: EPA 3630
Cleanup Date: 09/05/21
Cleanup Method: EPA 3665A
Cleanup Date: 09/06/21
Cleanup Method: EPA 3660B
Cleanup Date: 09/06/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	610	--	1	A
Aroclor 1221	ND		ug/kg	610	--	1	A
Aroclor 1232	ND		ug/kg	610	--	1	A
Aroclor 1242	ND		ug/kg	305	--	1	A
Aroclor 1248	ND		ug/kg	610	--	1	A
Aroclor 1254	ND		ug/kg	610	--	1	A
Aroclor 1260	ND		ug/kg	610	--	1	A
Aroclor 1262	ND		ug/kg	610	--	1	A
Aroclor 1268	ND		ug/kg	305	--	1	A
PCBs, Total	ND		ug/kg	305	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	85		30-150	A
2,4,5,6-Tetrachloro-m-xylene	87		30-150	B
Decachlorobiphenyl	91		30-150	B

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 09/07/21 10:01
Analyst: CW

Extraction Method: EPA 3540C
Extraction Date: 09/04/21 15:05
Cleanup Method: EPA 3630
Cleanup Date: 09/05/21
Cleanup Method: EPA 3665A
Cleanup Date: 09/06/21
Cleanup Method: EPA 3660B
Cleanup Date: 09/06/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-03 Batch: WG1543096-1						
Aroclor 1016	ND		ug/kg	588	--	A
Aroclor 1221	ND		ug/kg	588	--	A
Aroclor 1232	ND		ug/kg	588	--	A
Aroclor 1242	ND		ug/kg	294	--	A
Aroclor 1248	ND		ug/kg	588	--	A
Aroclor 1254	ND		ug/kg	588	--	A
Aroclor 1260	ND		ug/kg	588	--	A
Aroclor 1262	ND		ug/kg	588	--	A
Aroclor 1268	ND		ug/kg	294	--	A
PCBs, Total	ND		ug/kg	294	--	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	63		30-150	B
Decachlorobiphenyl	62		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: EAST BRANCH LIBRARY

Project Number: 01164.117

Lab Number: L2147230

Report Date: 09/10/21

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: WG1543096-2 WG1543096-3									
Aroclor 1016	74		74		40-140	0		50	A
Aroclor 1260	69		70		40-140	1		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	76		73		30-150	A
Decachlorobiphenyl	67		69		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		74		30-150	B
Decachlorobiphenyl	73		74		30-150	B

Project Name: EAST BRANCH LIBRARY

Project Number: 01164.117

Serial_No:09102113:48

Lab Number: L2147230

Report Date: 09/10/21

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2147230-01A	Glass 120ml/4oz unpreserved	A	NA		4.7	Y	Absent		PCB-8082-CAULK(365)
L2147230-02A	Glass 120ml/4oz unpreserved	A	NA		4.7	Y	Absent		PCB-8082-CAULK(365)
L2147230-03A	Glass 120ml/4oz unpreserved	A	NA		4.7	Y	Absent		PCB-8082-CAULK(365)

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

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: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

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: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

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.

Project Name: EAST BRANCH LIBRARY
Project Number: 01164.117

Lab Number: L2147230
Report Date: 09/10/21

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, NO₂, NO₃.

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: 9/2/21

ALPHA Job #: L2147230

8 Walkup Drive
Westford, MA 02151
Tel: 938-958-9320

330 Forbes Blvd
Warefield, MA 02045
Tel: 938-922-9300

Project Information

Project Name: East Branch Library
Project Location: 115 Broadway, Somerville, MA
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 Partners, Inc.
Address: 50B Salem St., Ste 103
Lynnfield, MA 01490
Phone: 603-970-1135
Email: jesse.degeorge@gmail.com

Turn-Around Time

Standard RUSH (only confirmed if pre-arranged)
Date Due:

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 _____

Additional Project Information:

Email results to Geoff Gerace & Jesse DeGeorge

ANALYSIS		SAMPLE INFO Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do
VOC: <input type="checkbox"/> 5250 <input type="checkbox"/> 624 <input type="checkbox"/> 5242		
SVOC: <input type="checkbox"/> ARN <input type="checkbox"/> PAN		
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15		
EPH: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA6 <input type="checkbox"/> PPI3		
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only		
TPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only		
TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Reporting		
PCBs via Soxhlet		
Sample Comments		

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials		
		Date	Time				
47230-1	PCB-01, Exterior Door Caulking	9-2-21	0950	S	JAD		X
02	PCB-02, Exterior Window Caulking	9-2-21	0955	S	JAR		X
03	PCB-03, Exterior Seam Caulking @ Wood StCs	9-2-21	1003	S	JAD		X

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOO Bottle

Preservative
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₈
I= Acetic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type	A
Preservative	O

Relinquished By:	Date/Time	Received By:	Date/Time
Jesse DeGeorge	9-2-21 11:00	Geoff Gerace	9/2 11:00
Virginia Smith MCL	9/2 17:58	Meghan Murphy	9/2 17:58

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



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

EMSL Order: 132106583
CustomerID: AXIO80
CustomerPO:
ProjectID:

Attn: **Jesse A DeGeorge**
Axiom Partners, Inc.
50B Salem Street, Suite 103
Lynnfield, MA 01940

Phone: (781) 213-9198
Fax: (781) 213-6992
Received: 9/2/2021 03:30 PM
Collected:

Project: **01164.117 - Library Building; 115 Broadway; 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: Exterior, Front of Building Desc: White Paint on Wood Decorative Structural Support Columns	132106583-0001	9/10/2021		0.2496 g	0.011 % wt
PC-02 Site: Interior, 1st Floor Main Library Area (Left Wall) Desc: White Paint on Gypsum Wallboard	132106583-0002	9/10/2021		0.2353 g	<0.0085 % wt
PC-03 Site: Interior, 1st Floor Main Library Area (Right Wall) Desc: White Paint on Plaster Wall	132106583-0003	9/10/2021		0.1052 g	<0.019 % wt
PC-04 Site: Interior, 1st Floor Break Room Desc: Gray Paint on Wood Door Casing	132106583-0004	9/10/2021		0.0986 g	<0.020 % 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 09/10/2021 15:37:37

ProScience Analytical Services, Inc.
Chemistry Chain of Custody Record

LABORATORY/HEADQUARTERS
 22 Cummings Park, Woburn, MA 01801
 T:781-935-3212 F:781-932-4857

www.proscience.net
 general@proscience.net

132106583

Rush < 6 Hours Turn Around Time Requested (circle)
 Same Day Next Day 2 Day 3 Day 5 Days

Client: **AXIOM Partners, Inc.**

Address: Street **50B Salem St., Ste #103**
 Town **Lynnfield, MA** State/Zip **01940**

Project Site Line 1 **Library Building** Project Number **01164.117**
 Line 2 **115 Broadway, Somerville, MA** PO

Contact: **Jesse A. DeGeorge** Phone _____ FAX _____
 A/Paper _____

NELAC analysis

TYPE OF ANALYSIS (circle)

DUST WIPES	<input checked="" type="checkbox"/>	SOIL (1g)
AIR	TSP	TCLP (100g)
(sw)	PM10	Other

Element gravimetric

Cd Cr As
 Se Ag Ba Hg

Other (please specify under Comments):

For Laboratory Use

BATCH NUMBER **C**

OC

Please use a separate form for each matrix.

ASTM E1792 FOR LABORATORY USE ONLY

Date and Time Sampled	Field I.D.	Sample Description/Location	Air Sampling Information					Wiped area			ANALYSIS			Lab I.D.		
			Start Time	End Time	Start Flowrate	End Flowrate	Volume (liters)	length (inch)	width (inch)	Area (sq. in.)	Weight (grams)	AA Dfn	AA Reading		RESULT	
9/2/21	PC-01	Exterior, Front Side of Bldg., White Paint on Wood Decorative Structural Support Columns														
9/2/21	PC-02	Interior, 1st Fl. Main Library Area (left wall), White Paint on Gypsum Wallboard														
9/2/21	PC-03	Interior, 1st Fl. Main Library Area (right wall), White Paint on Plaster Wall														
9/2/21	PC-04	Interior, 1st Fl. Break Room, Gray Paint on Wood Door Casing														

REC'D EMSL-BOSTON
 SEP 9 2 2021
 [Handwritten signature]

Relinquished By: Jesse A. DeGeorge *Jesse A. DeGeorge* Date: 9/2/2021 Time: _____
 Received By: _____ Date: _____ Time: _____

Comments: Email results to Geoff Geraci at ggeraci@axiomenv.com & Jesse DeGeorge at jesse.degeorge@gmail.com

Order 5.2

Order ID: 132106583

Page 1 of 1

APPENDIX C
Hazardous Building Materials
Summary Tables

CFC, PCB AND Hg INVENTORY

Building Name: East Branch Library Building
 Location Address: 115 Broadway, Somerville, MA

Bulbs & Ballasts

Description	Location	Mfg./Model	Quantity	PCB Content (Y/N/U)
2', 2 Fluorescent Bulbs	1 st Floor Throughout	NA	15	U*
4', 2 Fluorescent Bulbs	Basement Former Boiler Room	NA	2	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	Trane	1	~3-5 lbs. / R-410A
Refrigerators / 1 st Floor Break Room	Unknown	1	~1-2 lbs. / Freon

Mercury-Containing Units

Description/Location	HVAC Manufacturer	Number of Units
Thermostat / 1 st Floor Main Library Area	Honeywell	2

Miscellaneous Items

Description	Location	Size	Quantity
Batteries associated with Exit Lighting	1 st Floor Throughout	NA*	2
Batteries associated with Emergency Lighting	"	NA	2
Fire Extinguishers	"	NA	4
Computer Monitors	"	NA	6
Water Fountain	"	NA	1
Fire Extinguishers	Basement Former Boiler Room	NA	2
Hot Water Tank	"	NA	1

* NA = Not Applicable

APPENDIX D
Non-ACMs Tables

**EAST BRANCH LIBRARY BUILDING
115 BROADWAY, SOMERVILLE, MA**

CONFIRMED NON-ACMS

Sample Reference	Material	Location(s)
090221-95-01A & 01B	Exterior Door Caulking (man door)	Exterior Front Side of Building
090221-95-02A & 02B	Exterior Window Caulking (w/ vinyl windows)	Exterior All Sides of Building
090221-95-03A & 03B	Exterior Seam Caulking @ Wood STCs	Exterior Front Side of Building
090221-95-05A – 05G	Plaster Walls & Ceilings	Basement & 1 st Floor Throughout
090221-95-06A – 06C	Gypsum Wallboard	Basement & 1 st Floor Throughout
090221-95-07A – 07C	Joint Compound w/ Gypsum Wallboard	Basement & 1 st Floor Throughout
090221-95-08A & 08B	4" Black Cove Base Mastic	1 st Floor Break Room
090221-95-09A & 09B	4" Gray Cove Base Mastic	1 st Floor Throughout
090221-95-10A & 10B	12" x 12" Gray Mottled Vinyl Floor Tile (on concrete)	1 st Floor Break Room & Bathroom
090221-95-11A & 11B	Mastic w/ 12" x 12" Gray Mottled Vinyl Floor Tile	1 st Floor Break Room & Bathroom
090221-95-12A & 12B	12" x 12" Gray w/ White Streaks Vinyl Floor Tile (on concrete)	1 st Floor Break Room & Electrical Closet
090221-95-13A & 13B	Mastic w/ 12" x 12" Gray w/ White Streaks Vinyl Floor Tile	1 st Floor Break Room & Electrical Closet
090221-95-15A & 15B	Carpet Mastic	1 st Floor Throughout
090221-95-16A & 16B	Gray Floor Leveling Material	1 st Floor Throughout
090221-95-17A & 17B	Remnant Black Tile Mastic (under carpet)	1 st Floor, Main Library Area
090221-95-18A & 18B	Interior Window Caulking	1 st Floor, Main Library Area
090221-95-19A & 19B	6" x 6" Red Quarry Vinyl Floor Tile - Grout	1 st Floor Front Entryway
091021-06-100A & 100B	Main Roofing Field	Main Roof Field (Test Cut #1 & 2)
091021-06-101A & 101B	Termination Bar Caulking (@ Chimney)	Main Roof Field (@ Chimney)

APPENDIX E

Photographs



Photo 1

View of Asbestos-Containing Remnant Asphaltic Sealant (on brick wall), Exterior Rear Side of Building



Photo 2

View of Presumed Asbestos-Containing Pipe/Fitting Insulation, Basement Pipe Tunnel & Wall Chases



Photo 3

View of Presumed Asbestos-Containing Thin Set w/ 6" x 6 Red Quarry Floor Tile, 1st Floor Front Entryway



Photo 4

View of Asbestos-Containing Roof Flashing

APPENDIX F

Asbestos and Hazardous Building Materials Abatement Cost Estimate

**Asbestos & Hazardous Building Materials Abatement Cost Estimate
East Branch Library Building
115 Broadway, Somerville, MA**

Asbestos Removal, ACMs

Material	Location(s)	Estimated Quantity	Estimated Removal Cost
Remnant Asphaltic Sealant (on brick wall)	Exterior Rear Side of Building	10 LF	\$500
Flashing Sealant (@ Chimney & Front Right Roof Drain)	Main Roof Field (@ Chimney & Front Right Roof Drain)	260 LF	\$2,600
Gray Sink Undercoating	1 st Floor Break Room	1 EA	\$250
Pipe/Fitting Insulation w/ Abandoned Heating System	Basement Pipe Tunnel & Wall Chases	200 LF	\$5,000
Subtotal, Asbestos Removal (Confirmed ACMs)			\$ 8,350

Asbestos Removal, PACMs

Material	Location	Quantity	Removal Cost
Asphaltic Damp Proofing	On Foundations, Footings	TBD	\$150,000
Buried Pipes	Beneath Building or at Site	TBD	NA*
Concealed Caulking & Sealants Behind Vinyl or Aluminum Window Frames	Various Areas Building's Exteriors	TBD	NA*
Concealed Pipe/Fitting Insulation Behind and/or Above Hard Wall & Ceiling Surfaces	Various Areas Building's Interiors	TBD	NA*
Thin Set w/ Quarry Floor Tile	1 st Floor Front Entryway	TBD	NA*
Subtotal, PACM Removal (Recommended Allowance)			\$ 150,000

*N/A – Not applicable at this time

Abatement Cost Estimate Summary

Description	Estimated Removal Cost
Asbestos Removal, Confirmed ACMs	\$ 8,350
Asbestos Removal, Presumed ACMs	\$ 150,000
Miscellaneous Hazardous Building Materials	\$ 5,000
~10% Contingency	\$ 16,075
Estimated Abatement Design/Bid & Monitoring Fee	\$ 10,000
Total Hazardous Building Materials Abatement	\$ 189,425

**Asbestos & Hazardous Building Materials Abatement Cost Estimate
East Branch Library Building
115 Broadway, Somerville, MA**

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.

INVESTIGATIVE SURVEY REPORT FOR ASBESTOS AND OTHER HAZARDOUS MATERIALS

24 CROSS STREET EAST
SOMERVILLE, MA 02145

PREPARED FOR:

CITY OF SOMERVILLE
93 HIGHLAND AVENUE
SOMERVILLE, MA 02143

PREPARED BY:



2 LIBERTY SQUARE, 6TH FLOOR
BOSTON, MA 02109
(617) 350-6022
FAX: (617) 350-3443

REPORT SUBMITTED: APRIL 18, 2017

TRC PROJECT NUMBER: 228540.0000.0000

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APPENDICES

Appendix A	Inspector Accreditations
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Appendix C	Lead-Containing Paint Laboratory Analytical Report
Appendix D	PCB Laboratory Analytical Report

1.0 PROJECT OUTLINE

Project Address: **24 Cross Street East
Somerville, MA 02143**

TRC Project No.: **228540.0000.0000**

TRC Project Manager: **Scott Buchanan**

Asbestos Inspectors: **David J. Gavin (AI054270)**

Building/Construction Type: **The approximately 0.17-acre Site is located at 24 Cross Street East, Somerville, Middlesex County, MA, in a mixed commercial/residential area. The Site is described by the Somerville tax assessor as Map 89, Block L and Lot 2, is zoned as industrial warehouse, and is currently owned by Marc E Smith Trustees. Currently the 2-story building (with a basement level) is vacant and the property is enclosed by a fence. The basement level is below grade where the boiler room is located. Exterior walls are primarily brick with concrete block surrounding building / window openings. The roof system consists of multiple types of installations on a wood structure. The interior primarily consists of manufacturing and office areas.**

Construction Date(s): **Circa 1900**

No. Floors: **Two with a Basement level below grade.**

Asbestos Identified: **Yes**

Lead-Containing Paint Identified: **Yes**

Polychlorinated Biphenyls (Bulk Product) **No PCB's identified in exterior caulking and window glazing compound.**

Additional Hazardous / Regulated Materials: **Yes**

2.0 BUILDING SURVEY INSPECTION, SAMPLING, RESULTS, AND RECOMMENDATIONS

TRC Environmental Corporation (TRC) conducted an investigative survey for asbestos and other hazardous / regulated materials during multiple site visits between March 3, 2017 and April 5, 2017 at 24 Cross Street East, Somerville, MA 02143 (the "Site").

The purpose of this assessment was to evaluate the presence of asbestos-containing materials (ACM), lead-containing paint (LCP), polychlorinated biphenyls (PCBs) and other hazardous/regulated materials throughout the building that will require remediation and disposal prior to future construction activities. Following identification, TRC inventoried and quantified these materials to assist in developing specification for abatement.

The approximately 0.17-acre Site is located at 24 Cross Street East, Somerville, Middlesex County, MA, in a mixed commercial/residential area. The Site is described by the Somerville tax assessor as Map 89, Block L and Lot 2, is zoned as industrial warehouse, and is currently owned by Marc E Smith Trustees. Currently the 2-story building (with a basement level) is vacant and the property is enclosed by a fence.

The asbestos survey was performed in accordance with the United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763 Subpart E) sampling guidelines; Occupational Safety and Health Administration (OSHA) Asbestos Standards; Massachusetts Department of Environmental Protection (MassDEP), and the Massachusetts Department of Labor Standards (DLS) requirements. Destructive means were utilized to attempt to gain access to hidden or inaccessible areas such as pipe chases, wall voids, sub floors or ceiling cavities within the Site buildings.

Reasonable measures were taken to sample normally suspect ACM within the inspection areas. The survey is representative only of items present as of the date of the survey. The survey did not include hazardous materials associated with potential underground contamination or structures, underground storage tanks/vaults or oil/water separators, utilities, etc.

This investigative survey has revealed the presence of building materials containing asbestos and other hazardous/regulated materials throughout the building. TRC's survey findings are presented in the following subsections.

2.1 Asbestos-Containing Materials (ACM)

Where feasible, TRC collected bulk samples of suspect ACM that were submitted for laboratory analysis in order to determine asbestos content. Note that multiple bulk samples are collected from each homogenous area of suspect ACM observed. In accordance with U.S. EPA guidelines, a minimum number of samples were collected from each homogenous area of suspect materials, depending on the type and quantity of material. If one or more samples within a homogenous area of suspect ACM are positive for asbestos, then all of the suspect ACM must be treated as asbestos-containing material. TRC collected a total of one hundred sixty-eight (168) bulk samples, One hundred forty-one (141) of which were analyzed.

The samples were delivered under proper chain of custody to TRC's laboratory located in Windsor, CT. TRC is a National Voluntary Laboratory Accreditation Program (NVLAP) certified laboratory (NVLAP code # 101781-0) and a Massachusetts DLS certified laboratory (certification #AA000052).

Bulk samples were analyzed by polarized light microscopy (PLM) utilizing the EPA's Test Methods: Methods for the Determination of Asbestos in Bulk Building Materials (EPA 600/R-93/116).

Analytical results revealed the presence of asbestos in numerous building materials throughout the Site building. The condition of ACM observed within the Site building ranged from good to poor condition. A summary of all identified ACM's quantities and conditions are provided in Tables 1 and the summary of suspect materials reported as non-asbestos containing (<1%) are listed in Table 2. Copies of the asbestos inspector accreditations are provided in Appendix B. A copy of the asbestos analytical data report is provided in Appendix C.

2.1.1 Recommendations

TRC recommends the following:

1. Prior to the start of any renovation/demolition activities, a MADLS certified Project Designer should prepare a work plan/specification for abatement of all ACM that may be disturbed by renovation or demolition activities.
2. In accordance with USEPA Regulation 40 CFR 61.145 (*Standard for Demolition and Renovation*), all regulated ACM must be removed from a facility prior to the start of renovation or demolition activities if the materials may be disturbed by these activities. A licensed asbestos removal contractor should remove identified ACM from the building prior to renovation/demolition activities in accordance with OSHA, USEPA, DLS and MassDEP standards for asbestos abatement/disposal.
3. Additional ACM may be present in inaccessible areas such as below grade on the foundation, utilities, etc. If additional suspect ACM is encountered during building construction activities, precautions should be taken to prevent disturbance of the material and bulk sampling and laboratory analysis should be performed to determine if asbestos is present in these materials.

2.2 Lead-Containing Paint (LCP)

TRC collected fifteen (15) paint chip samples to determine the presence/absence of LCP. Various painted surfaces were observed on the interior and exterior of the Site buildings. The paint samples were submitted to Con-Test Analytical Laboratory in East Longmeadow, MA for analysis by atomic absorption spectrometry (AAS) to determine the percentage of lead in these paints.

The paints sampled were determined to contain lead concentrations ranging from below the analytical reporting limit and 190000 mg/Kg. Other paints may exist at this site that were not sampled that may also be LCP. A summary of LCP results can be found in Table 3. A copy of the lead paint analytical data report is provided in Appendix D.

2.2.1 Recommendations

Based on the paint sample results, all paint coated surfaces should be assumed to contain some lead and treated accordingly during demolition. All contractors involved with demolition and debris handling should comply with the requirements cited in OSHA's Lead in Construction Standard 29 CFR 1926.62. Additionally the contractors need to comply with applicable federal and state requirements for demolition and disposal of lead paint coated building materials.

2.3 Polychlorinated Biphenyls (PCBs)

TRC conducted a visual inspection, physical assessment, and bulk sampling of suspect PCB-containing caulking and window glazing compounds on exterior building components. Bulk samples were collected following a sample strategy similar to the EPA's simplified sampling scheme for ACM and submitted to Con-Test Analytical Laboratory in East Longmeadow, MA for PCB analysis via EPA method 8082, with EPA Method 3540c, Soxhlet Extraction. Laboratory results for the caulking and glazing compound samples did not identify the presence of PCB's. Detailed results of the PCB sampling can be found in Table 4. A copy of the PCB analytical data report is provided in Appendix E.

2.3.1 Recommendations

Laboratory results for the caulking and glazing compound samples submitted for PCB analysis were <50 milligrams/Kilograms (mg/Kg). As such, none of the suspect PCB-containing caulking and glazing compounds analyzed during this survey meet the definition of *Bulk Product Waste* as defined by EPA under 40 CFR 761.62. Based on these results, no additional laboratory analysis is required to determine handling and disposal requirements.

2.5 Other Hazardous and Regulated Materials

TRC conducted a visual inspection to identify and quantify other potentially hazardous and regulated materials throughout the Site buildings that may require special handling prior to future demolition activities. Identified items included fluorescent bulbs (potentially containing mercury), fluorescent light fixture ballasts (potentially containing PCBs), thermostats containing mercury ampoules, electronic devices (i.e., televisions, printers, printed circuit boards, etc.), refrigerants, above ground waste oil storage tank, various containers of paints, cleaning products, commercial car wash products, and other containers of unknown materials.

Following inventory procedures, TRC categorized these items according to their potential hazard. A summary of hazardous and regulated materials identified during the survey is provided in Table 5.

2.5.1 Recommendations

TRC recommends the following:

1. All mercury-containing devices should be removed from the Site building prior to the start of renovation/demolition activities. Mercury containing devices such as mercury thermostats that are removed from the building should be treated by retort and distillation processes to recover and recycle the elemental mercury at a USEPA-permitted facility. Contractors removing thermostats from the Site buildings should use caution not to break the glass ampoules containing elemental mercury. In the event that mercury is released from a broken ampoule, access to the spill area should be restricted to an experienced mercury decontamination contractor.
2. Spent fluorescent lamps should be stored in containers specially designed for the intact storage of fluorescent lamps. Care should be taken not to break fluorescent lamps. Spent lamps should be disposed at an authorized lamp recycler, hazardous waste transporter, or other universal waste handler within one year of the date marked on the storage containers.
3. Fluorescent light fixture ballasts located throughout the building should be assumed to contain liquid PCBs and handled and disposed of in accordance with all federal, state and local regulations.
4. Above ground storage tank should drained of any free flowing product, cleaned and disposed of in accordance with applicable regulations.
5. All other hazardous and regulated materials including, but not limited to, paints, thinners, refrigerants, electronics and other listed hazardous/regulated wastes should be packaged by trained and licensed personnel and disposed of in accordance with all federal, state and local regulations.

3.0 CONCLUSIONS

Based upon the hazardous building materials inspection and sampling performed by TRC at 24 Cross Street East, Somerville, MA, ACM, LCP and OHM were identified throughout the interior and exterior of the Site buildings. Estimated quantities of ACM are provided in Table 2. Lead containing paint was identified at the Site based on representative sampling as identified in Table 3. Additionally other hazardous and regulated materials were identified on the interior and exterior of the Site are identified in Tables 5.

This survey provided by TRC was conducted by a certified professional, experienced in the inspection and survey for ACM, LCP and OHM in building structures and associated components thereof. If there are any questions concerning information contained in this report, you may contact the undersigned in TRC's Boston, MA office.

Sincerely,
TRC



David J. Gavin
Senior Project Manager



Paul J. Manna
Building Sciences, Practice Leader

Table 1: Summary of Identified Asbestos-Containing Materials ($\geq 1\%$) 24 Cross Street East Somerville, MA 02143			
Location	Material	Estimated Quantity	Condition
Basement			
West Corridor	9" x 9" Floor Tile (Blue & White Checkerboard): (Note 1)	450 SF	Poor
Stairwell – Basement & 1 st Floor	9" x 9" Floor Tile (Tan)	70 SF	Fair
East Open Area	9" x 9" Floor Tile (Red & White Checkerboard): (Note 2)	1,850 SF	Poor
Storage Room @ Workshop	12" x 12" Floor Tile (White w/ Brown) & Associated Mastic: (Note 3)	300 SF	Fair
East Open Area – North Wall	Pipe Insulation (< 6"): (Note 4)	80 LF	Poor
Workshop / Stair Landing	Cement Panels (Transite) @ Stairwell Landing & on Workbenches	120 SF	Fair
Storage Room @ Workshop	Pipe Insulation (< 6" – Aircell)	15 LF	Poor
First Floor			
Main Area	9" x 9" Floor Tile (Blue & White Checkerboard): (Note 1)	2,300 SF	Poor
Main Area	Cloth Wire Covering (Assumed): (Note 5)	40 LF	Fair
Second Floor			
Office Area	Mastic / Paper Under 12" x 12" Floor Tile (White): (Note 6)	410 SF	Fair
Office Area	9" x 9" Floor Tile (Brown): (Note 3)	1,150 SF	Fair

Table 1: Summary of Identified Asbestos-Containing Materials (≥1%) 24 Cross Street East Somerville, MA 02143			
Location	Material	Estimated Quantity	Condition
Exterior			
East Side @ Stairs / Covered Unit	Ext. Sealant Material (Black)	45 SF	Fair
East Side @ Covered Unit	Ext. Caulking Material	15 LF	Fair
East Side @ Stairs / Northeast Corner	Ext. Foundation Sealant	240 SF	Fair
Loading Dock	Door Caulking (Garage Door)	25 LF	Poor
	Door Caulking (Garage Door) Debris on Ground	20 SF	Poor
Large Covered Opening – South	Exterior Caulking	65 LF	Poor
	Exterior Caulking Debris on Sill	8 SF	Poor
East Side – Large Covered Opening / 2 Window Units	Exterior Caulking (Aluminum Siding)	80 LF	Poor
East Side – Large Covered Opening	Exterior Caulking (Aluminum Siding) Debris on Sill	15 LF	Poor
East Side – Large Covered Opening	Exterior Caulking – New (Aluminum Siding)	15 LF	Fair
Roof			
Lower Section – West	Roof Shingle Adhesive	500 SF	Poor
Lower Section – West	Flashing Mastic	60 SF	Poor
SE / SW Towers	Flashing Mastic	60 SF	Fair
Southeast Tower	Rolled Roofing Material	200 SF	Poor
Southwest Tower	Flashing	60 SF	Fair

Note 1: Material is present in an area where the structural integrity of the building is compromised.

Note 2: Material is present under miscellaneous debris and wooden pallets / platforms.

Note 3: Material is present under carpeting.

- Note 4: TRC observed this material to be present in an enclosed mechanical chase. Additional material may be present in enclosed mechanical chases in other areas of the building.
- Note 5: TRC assumed this material to be an ACM for the purposes of this report. TRC recommends that sampling of this material be conducted prior to disturbance upon confirmation that the electrical system has been properly locked / tagged out.
- Note 6: Material is present on a wood substrate. The wood substrate is considered to be contaminated.

Table 2: Summary of Suspect Materials Identified as No Asbestos Detected 24 Cross Street East Somerville, MA 02143	
Material	Location(s)
Plaster Base / Skim Coat (Smooth)	1 st Floor Main Area / 2 nd Floor Office Area
Mastic Associated w/ 9" x 9" Floor Tile (Blue)	1 st Floor Main Area / Bsmt. West Corridor
Mastic Associated w/ 9" x 9" Floor Tile (Off-White)	1 st Floor Main Area / Bsmt. West Corridor
Paper Under 9" x 9" Floor Tile	1 st Floor Main Area
Paper Under Wood Flooring	1 st Floor Main Area
Stair Tread & Associated Adhesive	Stairwell Between 1 st & 2 nd Floor
Mastic Associated w/ 9" x 9" Floor Tile (Tan)	Stairwell Between Bsmt. & 1 st Floor
Textured Plaster Base Coat (Unfinished)	Bsmt., 1 st Floor South Section, 2 nd Floor Open Area (South)
2' x 2' Ceiling Tile (Random Pattern)	2 nd Floor Office Area
1' x 1' Ceiling Tile (Spline)	2 nd Floor Office Area
12" x 12" Floor Tile (White)	2 nd Floor Office Area
Mastic Associated w/ 9" x 9" Floor Tile (Brown) (Note 1)	2 nd Floor Office Area
Paper Under 9" x 9" Floor Tile (Brown)	2 nd Floor Office Area
Gypsum Board	Bsmt. Storage Room @ Workshop, 2 nd Floor Office Area
Joint Compound (Note 1)	Bsmt. Storage Room @ Workshop, 2 nd Floor Office Area
Carpet Adhesive	Bsmt. Storage Room @ Workshop, 2 nd Floor Office Area
Vinyl Cove Base Adhesive	2 nd Floor Office Area
Floor Leveling Compound	Bsmt. Storage Room @ Workshop, 2 nd Floor Office Area
HVAC Duct Sealant (Gray)	2 nd Floor Office Area
Gypsum Board / Textured Application	Bsmt. Storage Room @ West Hallway, Bsmt. Foyer @ West Hallway
Plaster Base / Skim Coat (Textured)	Bsmt. Restroom @ Northwest Corner
Mastic Associated w/ 9" x 9" Floor Tile (Red)	Bsmt. East Open Area

Table 2: Summary of Suspect Materials Identified as No Asbestos Detected 24 Cross Street East Somerville, MA 02143	
Material	Location(s)
Mastic Associated w/ 9" x 9" Floor Tile (White)	Bsmt. East Open Area
Cementitious Plaster Application	Bsmt. West Hallway
Particle Board	Bsmt. Workshop, Restroom @ Workshop, Hallway @ Boiler Room
Window Glazing (Wood Frame Units)	1 st Floor
Window Glazing (Metal Frame Units)	1 st Floor
Ext. Window Caulking (Vinyl Window Units)	2 nd Floor Office Area
Window Glazing (Lg. Wood Decorative Units)	2 nd Floor Open Area
Particle Board (Decorative Tile Pattern) & Associated Adhesive	Bsmt. East Open Area @ Corner Room
Boiler Breeching Insulation	Bsmt. Boiler Room
Fire Brick / Mortar	Bsmt. Boiler Room
Paper Under Aluminum Siding	Exterior
Tar Paper Under Aluminum Siding @ Foundation	Exterior
Exterior Door Caulking	Exterior – Southwest Entrance
Rubber Bump Stop	Exterior – Loading Dock
Roof Shingle	Roof – Lower Section (West)
Roof Paper Under Shingle	Roof – Lower Section (West)
Roof Shingle	Lower Roof, Upper Roof
Roof Paper Under Shingle	Lower Roof, Upper Roof
Rolled Roofing Material	Roof – Southwest Tower
Paper Under Tin Roof	Roof – Southeast Tower
Built-up Roofing Material	Roof – North Section (Addition)

Note 1 – The mastic associated with the brown 9" x 9" floor tile present in the 2nd floor office area and the joint compound associated with gypsum wallboard in the basement storage room adjacent to the workshop were determined via laboratory analysis to contain trace (< 1%) asbestos. Materials that contain trace asbestos, although not fully regulated ACM, are still subject to various requirements in OSHA regulations for work practices and in MassDEP regulations for handling and disposal.

Table 3: Summary of Lead-Containing Paint Results 24 Cross Street East Somerville, MA 02143			
Sample Number	Sample Location	Color / Substrate	Lead Concentration (mg/Kg)
1	1 st Floor – Wall @ Main Entrance	White / Plaster	8800
2	1 st Floor – Stairs @ Main Entrance	Gray / Wood	3400
3	1 st Floor – Stair Railing @ Main Entrance	Blue / Wood	590
4	1 st Floor – Main Area – East Wall	Pink / Plaster	5000
5	1 st Floor – West Storage Room – North Wall	Brown / Plaster	130000
6	Exterior Door Frame @ Main Entrance	White / Wood	190000
7	Exterior Door Frame @ Main Entrance	Gray / Wood	87000
8	2 nd Floor – Office Area Wall	White / Wood Panel	<RL
9	2 nd Floor – South Open Area - Ceiling	Blue / Plaster	2900
10	Basement – Storage Area Adjacent to Workshop – Ceiling	Off-White / Plaster	550
11	Basement – Storage Area Adjacent to Workshop – Wall	White / Gypsum Board	130
12	Basement – East Open Area – Ceiling Beam	Gray / Plaster	19000
13	Basement – East Open Area – Wall	Yellow / Particle Board	43000
14	Basement – East Open Area – Wall	Brown / Wood	12000
15	Exterior Garage Door Frame – South	Pink / Wood	790

RL = Reporting Limit (25 mg/Kg)

Table 4: Summary of Suspect PCB Containing Material Results 24 Cross Street East Somerville, MA 02143				
Sample No.	General Location	Material Type	Total PCB (mg/Kg)	Reporting Limit (mg/Kg)
1	Exterior – Large Covered Opening – South	Caulking	1.4	<1.0
2	Exterior – Loading Dock Door – South	Caulking	ND	<1.0
3	Exterior – Entrance Door – Southwest	Caulking	ND	<1.0
4	2 nd Floor – South Open Area	Window Glazing	0.97	<1.0
5	Exterior – Small Covered Opening – East	Caulking	2.55	<1.0
6	Exterior – Large Covered Opening – East	Caulking	ND	<1.0

ND = Not Detected

Table 5: Summary of Other Hazardous/Regulated Materials 24 Cross Street East Somerville, MA 02143	
Item	Approximate Quantity
Basement	
Fluorescent Lamp	1 (8' x 2 Bulbs)
	2 (4' x 2 Bulbs)
	3 (4' x 1 Bulb)
Fluorescent Lamp Ballast	6 Each
Fluorescent Lamp (Stockpiled)	18 (4' Bulbs)
	2 (8' Bulbs)
Emergency Light(s)	1 Each
Small Motor(s)	3 Each
Thermostat(s)	2 Each
Sm. Fan Unit Motor	1 Each
Boiler Unit (Heating Oil)	1 Each
Misc. Coating Materials (Stockpiled)	3 - 5 Gallon Plastic Pails
First Floor	
Fluorescent Lamp	12 (8' x 2 Bulbs)
	1 (4' x 2 Bulbs)
	1 (4' x 1 Bulbs)
	1 (2' x 2 Bulbs)
Fluorescent Lamp Ballast(s)	4 Each
Small Motor(s)	1 Each
Emergency Light(s)	1 Each
Smoke Detector(s)	2 Each
Overhead Heating Unit(s) (Electric)	2 Each
Thermostats	2 Each
Second Floor	
Fluorescent Lamp	12 (8' x 2 Bulbs)
	22 (4' x 4 Bulbs)
Fluorescent Lamp Ballast(s)	34 Each

Table 5: Summary of Other Hazardous/Regulated Materials 24 Cross Street East Somerville, MA 02143	
Item	Approximate Quantity
Small Motor(s)	1 Each
Emergency Light(s)	1 Each
Smoke Detector(s)	2 Each
Thermostats	1 Each
Fire Alarm Strobe Light	1 Each
AC Unit (Carrier – R-22))	1 Each
Misc. White Good(s) - VCR's (Stockpiled)	2 Each
Misc. White Good(s) - Server	1 Each
Attic	
Emergency Light(s)	3 Each
Smoke Detector(s)	3 Each
Lg. Fan Unit Motor	2 Each

APPENDIX A
INSPECTOR ACCREDITATIONS

Commonwealth of Massachusetts
Department of Labor Standards

William D. McKinney, Director
Asbestos Inspector



DAVID J. GAVIN

Eff. Date 05/06/16

Exp. Date 05/06/17

AI054270

Member of CONES

WBR: VVB-RENEW

17





This is to certify that

David J Gavin

*has completed the requisite training, and has passed an examination for
reaccreditation as:*

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

Course Location

Institute for Environmental Education, Inc.
16 Upton Drive Wilmington, MA 01887

March 27, 2017

Course Dates

17-0374-106-400793

Certificate Number

March 27, 2017

Examination Date

March 27, 2018

Expiration Date

Training Director

16 Upton Drive, Wilmington, MA 01887

Telephone 978-558-5272

www.ieetrains.com

INSTITUTE FOR ENVIRONMENTAL EDUCATION

APPENDIX B

POLARIZED LIGHT MICROSCOPY (PLM) LABORATORY ANALYTICAL DATA

BULK ASBESTOS ANALYSIS REPORT

CLIENT: City of Somerville

Lab Log #: 0050177
 Project #: 228540.0000.0000
 Date Received: 03/21/2017
 Date Analyzed: 03/23/2017

Site: Somerville Brownfields, Somerville, MA

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
01A	Light Grey (base coat)	Yes	No	--	5% horse hair	ND	None
01B	Light Grey (base coat)	Yes	No	--	5% horse hair	ND	None
01C	Light Grey (base coat)	Yes	No	--	5% horse hair	ND	None
02A	White (skim coat)	Yes	No	--	---	ND	None
02B	White (skim coat)	Yes	No	--	---	ND	None
02C	White (skim coat)	Yes	No	--	---	ND	None
03A	Blue-Green (tile)	Yes	No	--	---	10%	Chrysotile
03B	--	--	--	--	--	NA/PS	--
04A	Black (mastic)	Yes	No	--	10% cellulose	ND	None
04B	Black (mastic)	Yes	No	--	10% cellulose	ND	None
05A	Off-White (tile)	Yes	No	--	---	10%	Chrysotile
05B	--	--	--	--	--	NA/PS	--
06A	Black (mastic)	Yes	No	--	---	ND	None
06B	Black (mastic)	Yes	No	--	---	ND	None
07A	Black (paper)	Yes	No	--	60% cellulose	ND	None
07B	Black (paper)	Yes	No	--	60% cellulose	ND	None
08A	Brown (paper)	Yes	No	--	99% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVEAP Lab Code 101424-0 ABIA-LAP,LLC #100122 CT #PH-0426 ME LA-0075, LB-0071 MA #AA000052 NY #10980 WV #E1000411
 RI #AAE-007 TX #300154 VT #AI/014538 LA#05011 VA #3333 000283 AZ #A20944 HI #L-09-004 NJ #CT004 CA #2987
 CO#AL-15020 PHIL# 461 PA#68-03387

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
08B	Brown (paper)	Yes	No	--	99% cellulose	ND	None
08C	Brown (paper)	Yes	No	--	99% cellulose	ND	None
08D	Brown (paper)	Yes	No	--	99% cellulose	ND	None
08E	Brown (paper)	Yes	No	--	99% cellulose	ND	None
09A	Black (stair tread)	Yes	No	--	---	ND	None
09B	Black (stair tread)	Yes	No	--	---	ND	None
10A	Brown (adhesive)	Yes	No	--	---	ND	None
10B	Brown (adhesive)	Yes	No	--	---	ND	None
11A	Tan (tile)	Yes	No	--	---	10%	Chrysotile
11B	--	--	--	--	--	N/A/PS	--
12A	Black (mastic)	Yes	No	--	---	ND	None
12B	Black (mastic)	Yes	No	--	---	ND	None
13A	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13B	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13C	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13D	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13E	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13F	Grey (base coat)	Yes	No	--	5% horse hair	ND	None
13G	Grey (base coat)	Yes	No	--	---	ND	None
14A	White/Grey (ceiling tile)	Yes	No	--	20% cellulose 60% mineral wool	ND	None
14B	White/Grey (ceiling tile)	Yes	No	--	20% cellulose 60% mineral wool	ND	None
15A	White/Orange (ceiling tile)	Yes	No	--	99% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0
 RI #AAL-007 TX #000354
 CO# AL-15020

AHIA-LAP,LLC #100122 CT #PIH-0426
 VT #ALD14538 LA#05011 VA #3333 000283
 PHIL# 461 PA#068-03387

ME LA-0075, LB-0071 MA #AA000052
 AZ #A20944 HI #L-00-004

NY #10980 WV# LT000411
 NJ #CT004 CA #2907

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
15B	White/Orange (ceiling tile)	Yes	No	--	99% cellulose	ND	None
16A	White (tile)	Yes	No	--	---	ND	None
16B	White (tile)	Yes	No	--	---	ND	None
17A	Black (mastic)	Yes	No	--	---	5%	Chrysotile
17B	--	--	--	--	--	NA/PS	--
18A	Black (paper/mastic)	Yes	No	--	60% cellulose	3%	Chrysotile
18B	--	--	--	--	--	NA/PS	--
19A	Brown (tile)	Yes	No	--	---	5%	Chrysotile
19B	--	--	--	--	--	NA/PS	--
20A	Black (mastic)	Yes	No	--	30% cellulose	Trace	Chrysotile
20B	Black (mastic)	Yes	No	--	30% cellulose	Trace	Chrysotile
21A	Black (paper)	Yes	No	--	60% cellulose	ND	None
21B	Black (paper)	Yes	No	--	60% cellulose	ND	None
22A	White (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
22B	White (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
22C	Light Grey (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
23A	White (joint compound)	Yes	No	--	---	ND	None
23B	White (joint compound)	Yes	No	--	---	ND	None
23C	Beige (joint compound)	Yes	No	--	---	Trace	Chrysotile
24A	Dark Yellow (carpet adhesive)	Yes	No	--	---	ND	None
24B	Dark Yellow (carpet adhesive)	Yes	No	--	---	ND	None
25A	Yellow (cove base adhesive)	Yes	No	--	---	ND	None
25B	Yellow (cove base adhesive)	Yes	No	--	---	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NV LAP Lab Code 101424-0 AHA-LAP,LLC 0100122 CT #PH-0426 ME LA-0075, LB-0071 MA CAA000052 NY #10980 WV PEL000411
 RI PAAL-007 TX P300354 VT #AL014538 LA905011 VA #3333 000283 AZ #A20944 HI #L-09-004 NJ PCT904 CA #2907
 COV AL-15020 PHIL# 461 PA468-03387

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
26A	White (leveling compound)	Yes	No	--	---	ND	None
26B	White (leveling compound)	Yes	No	--	---	ND	None
27A	Grey (duct sealant)	Yes	No	--	---	ND	None
27B	Grey (duct sealant)	Yes	No	--	---	ND	None
28A	White (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
28B	White (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
28C	Light Beige (gypsum wallboard)	Yes	No	--	2% cellulose	ND	None
29A	White (textured application)	Yes	No	--	---	ND	None
29B	White (textured application)	Yes	No	--	---	ND	None
29C	White (textured application)	Yes	No	--	---	ND	None
30A	Light Grey (base coat)	Yes	No	--	2% horse hair	ND	None
30B	Light Grey (base coat)	Yes	No	--	2% horse hair	ND	None
30C	Light Grey (base coat)	Yes	No	--	2% horse hair	ND	None
31A	White (skim coat)	Yes	No	--	---	ND	None
31B	White (skim coat)	Yes	No	--	---	ND	None
31C	White (skim coat)	Yes	No	--	---	ND	None
32A	Red (tile)	Yes	No	--	---	5%	Chrysotile
32B	--	--	--	--	--	NA/PS	--
33A	Black (mastic)	Yes	No	--	---	ND	None
33B	Black (mastic)	Yes	No	--	---	ND	None
34A	White (tile)	Yes	No	--	---	5%	Chrysotile
34B	--	--	--	--	--	NA/PS	--
35A	Black (mastic)	Yes	No	--	---	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NY/LAP Lab Code 101424-0 AHERA-LAP,LLC #100122 CT #PH-0126 ME LA-0975,LIB-0071 MA RAA000052 NY #10980 WV #LT000411
 HI #AAL-047 TX #360,354 VT #AL014538 LA #05011 VA #3333 000283 AZ #A30944 HI #L-09-004 NJ #CT004 CA #2907
 CO# AL-15020 PHIL# 461 PA#65-03307

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
35B	Black (mastic)	Yes	No	--	---	ND	None
36A	Grey (cementitious plaster)	Yes	No	--	---	ND	None
36B	Grey (cementitious plaster)	Yes	No	--	---	ND	None
36C	Grey (cementitious plaster)	Yes	No	--	---	ND	None
37A	Tan (particle board)	Yes	No	--	99% cellulose	ND	None
37B	Tan (particle board)	Yes	No	--	99% cellulose	ND	None
37C	Tan (particle board)	Yes	No	--	99% cellulose	ND	None
38A	Grey (window glazing)	Yes	No	--	---	ND	None
38B	Grey (window glazing)	Yes	No	--	---	ND	None
39A	Grey (window glazing)	Yes	No	--	---	ND	None
39B	Grey (window glazing)	Yes	No	--	---	ND	None
40A	Black/White (window caulk)	Yes	No	--	---	ND	None
40B	Black/White (window caulk)	Yes	No	--	---	ND	None
41A	Beige (window glazing)	Yes	No	--	---	ND	None
41B	Beige (window glazing)	Yes	No	--	---	ND	None
42A	White/Brown (tile)	Yes	No	--	---	5%	Chrysotile
42B	--	--	--	--	--	NA/PS	--
43A	Black (mastic)	Yes	No	--	---	5%	Chrysotile
43B	--	--	--	--	--	NA/PS	--
44A	Dark Brown (particle board)	Yes	No	--	99% cellulose	ND	None
44B	Dark Brown (particle board)	Yes	No	--	99% cellulose	ND	None
45A	Grey (adhesive)	Yes	No	--	10% cellulose	ND	None
45B	Grey (adhesive)	Yes	No	--	10% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NY/IAI Lab Code 101424-0	AHHA-LAP,LLC #100122	CT #PH-0426	ME LA-0075, LB-0071	MA #AA000052	NY #10980	WV #1, T000411
RI #AAL-007	TX #300354	VT #AL014538 LA#05011	VA #3333 000283	AZ #A20944	HI #1-09-004	NJ #C7004 CA #2907
CO# AL-15020	PHIL# 461	PA#68-03387				

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
46A	White (pipe insulation)	Yes	No	--	10% cellulose	10%	Chrysotile
46B	--	--	--	--	--	NA/PS	--
46C	--	--	--	--	--	NA/PS	--
47A	Grey (boiler breeching insulation)	Yes	No	--	60% mineral wool	ND	None
47B	Grey (boiler breeching insulation)	Yes	No	--	60% mineral wool	ND	None
48A	Tan (fire brick)	Yes	No	--	---	ND	None
48B	Tan (fire brick)	Yes	No	--	---	ND	None
49A	White (fire brick mortar)	Yes	No	--	---	ND	None
49B	White (fire brick mortar)	Yes	No	--	---	ND	None
50A	Black (sealant)	Yes	No	--	---	20%	Chrysotile
50B	--	--	--	--	--	NA/PS	--
51A	Grey (caulk material)	Yes	No	--	---	5%	Chrysotile
51B	--	--	--	--	--	NA/PS	--
52A	Black (sealant)	Yes	No	--	---	10%	Chrysotile
52B	--	--	--	--	--	NA/PS	--
53A	Black/Silver (paper)	Yes	No	--	80% cellulose	ND	None
53B	Black/Silver (paper)	Yes	No	--	80% cellulose	ND	None
54A	Black (tar paper)	Yes	No	--	80% cellulose	ND	None
54B	Black (tar paper)	Yes	No	--	80% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0 AHA-LAP, LLC #105122 CT #PH-0426 ME LA-0075, LB-0071 MA #AA000052 NY #10980 WV #LT000411
 IL #AAL-097 TX #380354 VT #AL014538 LA #05011 VA #3333 000283 AZ #A28944 HI #L-09-004 NJ #CT004 CA #2907
 CO# AL-15020 PHIL# 461 PA#68-03387

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
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Reporting limit- asbestos present at 1%

ND - asbestos was not detected

Trace - asbestos was observed at level of less than 1%

NA/PS - Not Analyzed / Positive Stop

SNA- Sample Not Analyzed- See Chain of Custody for details

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation 1982 (EPA 600/4-82-010) Bulk Analysis Code 18/A01 and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials July 1993, H.L. Perkins and H.W. Harvey, (EPA/600/R-93/116) Bulk Analysis Code 18/A03, which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2017. TRC is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene Program (IHLAP) for PLM effective through October 1, 2018. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

This report shall not be reproduced, except in full, without the written approval of TRC. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

Analyzed by: K. Williamson
 Kathleen Williamson, Laboratory Manager

Reviewed by: Cathryn Lemire
 Cathryn Lemire, Approved Signatory

Date Issued
 03/23/2017

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code: 101424-0 AIHA-LAP, LLC #100122 CT #PH-0426 ME LA-0075, LB-0071 MA 0AA000052 NY #10980 WV #1, P000411
 HI #AAL-007 TX #300354 VT #AL014538, LA #05011 VA #X31 000203 AZ #A20944 HI #L-09-004 NJ #C1004 CA #2907
 CO# AL-15020 PHIL# 461 PA#65-03387

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID # **50177**

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		PARAMETERS					TURNAROUND TIME										
		INSPECTOR David J. Gavin		PLM EPA 600/93/116 (POSITIVE STOP)	PLM EPA 600/93/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (F > 1% & < 1%)	TEM NY N98-184 (PLM SERIES NEG)	PLM:	8hr	24hr	48hr	3day	5day					
FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	PLM EPA 600/93/116 (POSITIVE STOP)	PLM EPA 600/93/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (F > 1% & < 1%)	TEM NY N98-184 (PLM SERIES NEG)	MATERIAL								
			# COM	# CRA							Plaster Base Coat (Smooth)	Plaster Base Coat (Smooth)	Plaster Base Coat (Smooth)	Plaster Skim Coat (Smooth)	Plaster Skim Coat (Smooth)	Plaster Skim Coat (Smooth)			
01A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X											
01B	3/6 & 3/7		X		1 st Floor - Main Area - East	X		X											
01C	3/6 & 3/7		X		2 nd Floor - Office Area	X		X											
02A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X											
02B	3/6 & 3/7		X		1 st Floor - Main Area - East	X		X											
02C	3/6 & 3/7		X		2 nd Floor - Office Area	X		X											

Requisitioned by: (Signature)  (Printed) David J. Gavin	Date: 3-20-17	Received by: (Signature)  (Printed) 1000	Date: 3/20/17	Received by: (Signature) (Printed)	Received by: (Signature)
	Time: 0900	Time: 0900	(Printed)	(Printed)	(Printed)
Remarks: Condition of Samples Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					Page 1 of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER
228540.0000.0000

PROJECT NAME
City of Somerville

LAB ID #. 50177

PLM:	TURNAROUND TIME			
	8hr	24hr	48hr	3day
TEM:	8hr	24hr	48hr	3day

FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	PARAMETERS					MATERIAL	
			CONF	GRAB		PLM EPA 600/R3/116 (POSITIVE STOP)	PLM EPA 600/R3/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	PMT CO/NT (P < 1% & 10%)	TEM NY N08 1984 (IF PM SERIES NEG)		
03A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X				9" x 9" Floor Tile (Blue)
03B	3/6 & 3/7		X		1 st Floor - Main Area - South	X		X				9" x 9" Floor Tile (Blue)
04A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X				Mastic Associated w/ 03A
04B	3/6 & 3/7		X		1 st Floor - Main Area - South	X		X				Mastic Associated w/ 03B
05A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X				9" x 9" Floor Tile (Off-White)
05B	3/6 & 3/7		X		1 st Floor - Main Area - South	X		X				9" x 9" Floor Tile (Off-White)
06A	3/6 & 3/7		X		1 st Floor - Main Area - North	X		X				Mastic Associated w/ 05A
06B	3/6 & 3/7		X		1 st Floor - Main Area - South	X		X				Mastic Associated w/ 05B

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/20/17	Received by: (Signature)	Date:	Received by: (Signature)
(Printed) David J. Gavin	Time: 0900	(Printed) 1000	(Printed) 1000	(Printed)	Time:	(Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page 2 of 13			

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540.0000.0000

PROJECT NAME

City of Somerville

SIGNATURE

David J. Gavin

INSPECTOR

David J. Gavin

LAB ID # 50177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	3day	5day
TEM:					

PARAMETERS

PLM EPA 600R9/16 (POSITIVE STOP)	
PLM EPA 600R9/16 (w/ gravimetric reduction) (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (P > 1% & < 10%)	
TEM (NOB 1984) (P PLM SERIES NEG)	

MATERIAL

SAMPLE LOCATION

TYPE
CONT
CANS

DATE

TIME

FIELD
SAMPLE
NUMBER

07A	3/6 & 3/7	X	1 st Floor - Main Area - North	X	Paper Under 9" x 9" Floor Tile (Black)
07B	3/6 & 3/7	X	1 st Floor - Main Area - South	X	Paper Under 9" x 9" Floor Tile (Black)
08A	3/6 & 3/7	X	1 st Floor - Main Area - North	X	Paper Under Wood Flooring
08B	3/6 & 3/7	X	1 st Floor - Main Area - Center	X	Paper Under Wood Flooring
08C	3/6 & 3/7	X	1 st Floor - Main Area - South	X	Paper Under Wood Flooring
08D	3/6 & 3/7	X	1 st Floor - Main Area - Center	X	Paper Under Wood Flooring
08E	3/6 & 3/7	X	1 st Floor - Main Area - South	X	Paper Under Wood Flooring
09A	3/6 & 3/7	X	Stairwell - 1 st & 2 nd Floor	X	Stair Tread
09B	3/6 & 3/7	X	Stairwell - 1 st & 2 nd Floor	X	Stair Tread
10A	3/6 & 3/7	X	Stairwell - 1 st & 2 nd Floor	X	Adhesive Associated w/ 09A
10B	3/6 & 3/7	X	Stairwell - 1 st & 2 nd Floor	X	Adhesive Associated w/ 09B

Relinquished by: (Signature)

Date:

3-20-17

Received by: (Signature)

3/20/17

Relinquished by: (Signature)

Date:

Received by: (Signature)

(Printed)

David J. Gavin

Remarks:

(Printed)

Time:

(Printed)

Time:

(Printed)

Condition of Samples:
Acceptable: Yes No
Comments:

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540.0000.0000

PROJECT NAME



City of Somerville

LAB ID #. 52177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	X	3day
TEM:	24hr	48hr	3day		5day

FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	PLM EPA 600/R3/16 (POSITIVE STOP)	PLM EPA 600/R3/16 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (IF > 1% & < 10%)	TEM N N08 1984 (IF PLM SERIES N08)	MATERIAL
			COMP	GRAB							
11A	3/6 & 3/7		X	X	Stairwell - Basement & 1 st Floor	X		X			9" x 9" Floor Tile (Tan)
11B	3/6 & 3/7		X	X	Stairwell - Basement & 1 st Floor	X		X			9" x 9" Floor Tile (Tan)
12A	3/6 & 3/7		X	X	Stairwell - Basement & 1 st Floor	X		X			Mastic Associated w/ 11A
12B	3/6 & 3/7		X	X	Stairwell - Basement & 1 st Floor	X		X			Mastic Associated w/ 11B
13A	3/6 & 3/7		X	X	1 st Fl. - South Section - S. Wall	X					Textured Plaster Base Coat (Unfinished)
13B	3/6 & 3/7		X	X	1 st Fl. - South Section - E. Wall	X					Textured Plaster Base Coat (Unfinished)
13C	3/6 & 3/7		X	X	1 st Fl. - South Section - W. Wall	X					Textured Plaster Base Coat (Unfinished)
13D	3/6 & 3/7		X	X	2 nd Fl. - Open Area - S. Wall	X					Textured Plaster Base Coat (Unfinished)
13E	3/6 & 3/7		X	X	2 nd Fl. - Open Area - E. Wall	X					Textured Plaster Base Coat (Unfinished)
13F	3/6 & 3/7		X	X	2 nd Fl. - Open Area - W. Wall	X					Textured Plaster Base Coat (Unfinished)
13G	3/6 & 3/7		X	X	Basement-Boiler Room-Ceiling	X					Textured Plaster Base Coat (Unfinished)

Relinquished by: (Signature)		Date: 3-20-17	Received by: (Signature)		Date: 3/20/17
(Printed)	David J. Gavin	Time: 0900	(Printed)	David J. Gavin	Time: 1000
Remarks:			Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page 4 of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID # 50177

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		PARAMETERS					TURNAROUND TIME									
				PLM EPA 600/R3/118 (POSITIVE STOP)	PLM EPA 600/R3/118 (% granulometric reduction)	ANALYZE BY LAYER	POINT COUNT (F > 1% & < 10%)	PLM SERIES (NEC) (PLM NY 1984)	PLM:	8hr	24hr	48hr	3day	5day				
FIELD SAMPLE NUMBER	DATE	TIME	TYPE	SAMPLE LOCATION	INSPECTOR					MATERIAL								
					David J. Gavin													
			COMP	GRAB														
14A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
14B	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
15A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
15B	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
16A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
16B	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
17A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
17B	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
18A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
18B	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												
19A	3/6 & 3/7		X	X	2 nd Floor - Office Area	X												


Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/20/17
(Printed) David J. Gavin	Time: 0900	(Printed) 	Time: 1000
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Received by: (Signature) 
			Page 5 of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #. 50177

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somersville		PARAMETERS					TURNAROUND TIME						
				PLM EPA 600/R3/116 (POSITIVE STOP)	PLM EPA 600/R3/116 (w/ quantitative reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEM NY N08 1984 (IF TEM SERIES NEG)	PLM:	8hr	24hr	48hr	3day	5day	
PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somersville		MATERIAL											
FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	PLM EPA 600/R3/116 (POSITIVE STOP)	PLM EPA 600/R3/116 (w/ quantitative reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEM NY N08 1984 (IF TEM SERIES NEG)	8hr	24hr	48hr	3day	5day
			COMP	GRAB											
SIGNATURE David J. Gavin		INSPECTOR David J. Gavin													
19B	3/6 & 3/7		X	X	2nd Floor - Office Area	X		X							
20A	3/6 & 3/7		X	X	2nd Floor - Office Area	X		X							
20B	3/6 & 3/7		X	X	2nd Floor - Office Area	X		X							
21A	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
21B	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
22A	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
22B	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
22C	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	X									
23A	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
23B	3/6 & 3/7		X	X	2nd Floor - Office Area	X									
23C	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	X									

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Relinquished by: (Signature)	Date:	Received by: (Signature)
(Printed) David J. Gavin	Time: 0900	(Printed) David J. Gavin	(Printed)	Time:	(Printed)
Remarks:	Completion of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page 6 of 13		

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

2285-40-0000-0000

PROJECT NAME

City of Somerville

SIGNATURE

David J. Gavin

INSPECTOR

David J. Gavin

LAB ID #. 50177

TURNAROUND TIME



PLAN:	8hr	24hr	48hr	3day	3day
TEM:	24hr	48hr	3day	5day	

PARAMETERS

PLM EPA 600/R9/116 (POSITIVE STOP)	
PLM EPA 600/R9/116 (w/ gravimetric reduction) (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (P > 1% & < 10%)	
TEM NY 808.1984 (BY PLM SEALS NEC)	

MATERIAL

FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	MATERIAL
			COMP	GRAB		
24A	3/6 & 3/7		X	X	2 nd Floor - Office Area	Carpet Adhesive
24B	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	Carpet Adhesive
25A	3/6 & 3/7		X	X	2 nd Floor - Office Area	Vinyl Cove Base Adhesive
25B	3/6 & 3/7		X	X	2 nd Floor - Office Area	Vinyl Cove Base Adhesive
26A	3/6 & 3/7		X	X	2 nd Floor - Office Area	Floor Leveling Compound
26B	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	Floor Leveling Compound
27A	3/6 & 3/7		X	X	2 nd Floor - Office Area	HVAC Duct Sealant (Gray)
27B	3/6 & 3/7		X	X	2 nd Floor - Office Area	HVAC Duct Sealant (Gray)
28A	3/6 & 3/7		X	X	Bsmt.- Storage Rm. @ W. Hall	Gypsum Wallboard (Textured)
28B	3/6 & 3/7		X	X	Bsmt. - Foyer. @ W. Hall	Gypsum Wallboard (Textured)
28C	3/6 & 3/7		X	X	Bsmt. - Foyer. @ W. Hall	Gypsum Wallboard (Textured)

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/21/17
(Printed) David J. Gavin	Time: 0900	(Printed) 1000	Time: (Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Received by: (Signature) Date: Time: (Printed)
			Page 7 of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540-0000-0000

PROJECT NAME

City of Somerville

SIGNATURE

David J. Gavin

INSPECTOR

David J. Gavin

LAB ID #. 50177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	3day
TEM:	24hr	48hr	3day	5day

PARAMETERS

PLM EPA 600/R3/16 (POSITIVE STOP)	
PLM EPA 600/R3/16 (w/ gravimetric reduction) (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (P > 1% & < 10%)	
TEM (N N01 1984 (IF PLM SERIES NEG))	

MATERIAL


SAMPLE LOCATION

TYPE
GRADE

TIME

FIELD
SAMPLE
NUMBER

29A	3/6 & 3/7	X	Bsmt. - Storage Rm. @ W. Hall	X	Textured Application Associated w/ 28A
29B	3/6 & 3/7	X	Bsmt. - Foyer. @ W. Hall	X	Textured Application Associated w/ 28B
29C	3/6 & 3/7	X	Bsmt. - Foyer. @ W. Hall	X	Textured Application Associated w/ 28C
30A	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Base Coat (Textured)
30B	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Base Coat (Textured)
30C	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Base Coat (Textured)
31A	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Skim Coat (Textured)
31B	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Skim Coat (Textured)
31C	3/6 & 3/7	X	Bsmt. - Restroom - NW Corner	X	Plaster Skim Coat (Textured)
32A	3/6 & 3/7	X	Basement - East Open Area	X	9" x 9" Floor Tile (Red)
32B	3/6 & 3/7	X	Basement - East Open Area	X	9" x 9" Floor Tile (Red)

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/24/17
(Printed) David J. Gavin	Time: 0900	(Printed) 1000	Time: (Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Received by: (Signature) Page 2 of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540.0000.0000

PROJECT NAME

City of Somersville

SIGNATURE

David J. Gavin

INSPECTOR

David J. Gavin

LAB ID #. 50177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	3day	3day
TEM:	24hr	48hr	3day	5day	5day

PARAMETERS

PLM EPA 600/R93/16 (POSITIVE STOP)	
(w/ gravimetric reduction)	
PLM EPA 600/R93/16 (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (IP > 1% & < 10%)	
TEM NY N984 (IP PLM SERIES NEG)	

MATERIAL

FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	PLM EPA 600/R93/16 (POSITIVE STOP)	PLM EPA 600/R93/16 (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (IP > 1% & < 10%)	TEM NY N984 (IP PLM SERIES NEG)	MATERIAL
			COMP	GRAB							
33A	3/6 & 3/7		X	X	Basement - East Open Area	X		X			Mastic Associated w/ 32A
33B	3/6 & 3/7		X	X	Basement - East Open Area	X		X			Mastic Associated w/ 32B
34A	3/6 & 3/7		X	X	Basement - East Open Area	X		X			9" x 9" Floor Tile (White)
34B	3/6 & 3/7		X	X	Basement - East Open Area	X		X			9" x 9" Floor Tile (White)
35A	3/6 & 3/7		X	X	Basement - East Open Area	X		X			Mastic Associated w/ 34A
35B	3/6 & 3/7		X	X	Basement - East Open Area	X		X			Mastic Associated w/ 34B
36A	3/6 & 3/7		X	X	Basement - W. Hall @ Entrance	X					Cementitious Plaster Application
36B	3/6 & 3/7		X	X	Basement - W. Hall @ Entrance	X					Cementitious Plaster Application
36C	3/6 & 3/7		X	X	Basement - W. Hall @ Entrance	X					Cementitious Plaster Application
37A	3/6 & 3/7		X	X	Basement - Workshop	X					Particle Board
37B	3/6 & 3/7		X	X	Basmt. - Restroom @ Workshop	X					Particle Board

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/20/17	Relinquished by: (Signature)	Date:	Received by: (Signature)
(Printed) David J. Gavin	Time: 0900	(Printed) David J. Gavin	Time: 1000	(Printed)	Time:	(Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page 7 of 13			

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #. 52177

PROJECT NUMBER 228540.0000.0000			PROJECT NAME City of Somerville			PARAMETERS PLM EPA 600/R3/116 (POSITIVE STOP) PLM EPA 600/R3/116 (POSITIVE STOP) (w/ gravimetric reduction) (POSITIVE STOP) ANALYZE BY LAYER POINT COUNT (P > 1% & < 10%) TEM NY N08 1984 (IF PLM SERIES NEG)										
			INSPECTOR David J. Gavin													
FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	MATERIAL	TURNAROUND TIME									
			COMP	GRAB			8hr	24hr	48hr	3day	48hr	X	3day	X	3day	5day
37C	3/6 & 3/7		X	X	Basement - Hall @ Boiler Room	Particle Board										
38A	3/6 & 3/7		X	X	1 st Floor - Main Entrance	Window Glazing (Wood Frame Units)										
38B	3/6 & 3/7		X	X	1 st Floor - N. @ Stairs to Bsmt.	Window Glazing (Wood Frame Units)										
39A	3/6 & 3/7		X	X	1 st Floor - East	Window Glazing (Metal Frame Units)										
39B	3/6 & 3/7		X	X	1 st Floor - West	Window Glazing (Metal Frame Units)										
40A	3/6 & 3/7		X	X	2 nd Floor - Office Area - North	Ext. Window Caulking (Vinyl Window Units)										
40B	3/6 & 3/7		X	X	2 nd Floor - Office Area - North	Ext. Window Caulking (Vinyl Window Units)										
41A	3/6 & 3/7		X	X	2 nd Floor - Open Area South	Window Glazing (Lg. Wood Decorative Units)										
41B	3/6 & 3/7		X	X	2 nd Floor - Open Area West	Window Glazing (Lg. Wood Decorative Units)										
42A	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	12" x 12" Floor Tile (White w/ Brown)					X					
42B	3/6 & 3/7		X	X	Bsmt.-Storage Rm. @ Workshop	12" x 12" Floor Tile (White w/ Brown)					X					



Relinquished by: (Signature)  (Printed) David J. Gavin	Date: 3-20-17	Received by: (Signature)  (Printed) David J. Gavin	Date: 3/21/17	Relinquished by: (Signature)  (Printed) David J. Gavin	Date: Time: 0900	Received by: (Signature)  (Printed) David J. Gavin
	Remarks:			Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments:		

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #. 50177

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		TURNAROUND TIME							
		PLM:	TEM:	8hr	24hr	48hr	3day	5day			
SIGNATURE David J. Gavin		INSPECTOR David J. Gavin		PARAMETERS		MATERIAL					
				PLM EPA 600/R9/16 (POSITIVE STOP)	POINT COUNT (IF > 1% & < 10%)			ANALYZE BY LAYER	TEAM NO. (NEC)		
FIELD SAMPLE NUMBER	DATE	TIME	TYPE	COMP	CRAB	SAMPLE LOCATION	PLM EPA 600/R9/16 (POSITIVE STOP)	PLM EPA 600/R9/16 (w/ granulometric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (IF > 1% & < 10%)	TEAM NO. (NEC)
43A	3/6 & 3/7		X			Bsmt.-Storage Rm. @ Workshop	X		X		
43B	3/6 & 3/7		X			Bsmt.-Storage Rm. @ Workshop	X		X		
44A	3/6 & 3/7		X			Bsmt.-E. Open Area-Corner Rm.	X		X		
44B	3/6 & 3/7		X			Bsmt.-E. Open Area-Corner Rm.	X		X		
45A	3/6 & 3/7		X			Bsmt.-E. Open Area-Corner Rm.	X		X		
45B	3/6 & 3/7		X			Bsmt.-E. Open Area-Corner Rm.	X		X		
46A	3/6 & 3/7		X			Bsmt. - E. Open Area-N. Wall	X		X		
46B	3/6 & 3/7		X			Bsmt. - E. Open Area-N. Wall	X		X		
46C	3/6 & 3/7		X			Bsmt. - E. Open Area-N. Wall	X		X		
47A	3/6 & 3/7		X			Basement - Boiler Room	X		X		
47B	3/6 & 3/7		X			Basement - Boiler Room	X		X		

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/24/19
(Printed) David J. Gavin	Time: 0900	(Printed) David J. Gavin	Time: 1000
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page // of 13

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540.0000.0000

PROJECT NAME

City of Somersville

LAB ID #

50177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	3day	5day
TEM:	24hr	48hr	3day		

PARAMETERS

PLM EPA 600/R3/16 (POSITIVE STOP)	
PLM EPA 600/R3/16 (w/ gravimetric reduction) (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (D > 1% & < 10%)	
TEM NY NGR 1984 (PLM SERIES NEG)	

MATERIAL

INSPECTOR

David J. Gavin

TYPE

COMP

GRAB

SAMPLE LOCATION

FIELD
SAMPLE
NUMBER

DATE

TIME

48A

3/6 & 3/7

X

Basement - Boiler Room

X

Fire Brick

48B

3/6 & 3/7

X

Basement - Boiler Room

X

Fire Brick

49A

3/6 & 3/7

X

Basement - Boiler Room

X

Fire Brick Mortar

49B

3/6 & 3/7

X

Basement - Boiler Room

X

Fire Brick Mortar

50A

3/6 & 3/7

X

Ext. - E. Side @ Stairs

X

Ext. Sealant Material (Black)

50B

3/6 & 3/7

X

Ext. - E. Side @ Covered Unit

X

Ext. Sealant Material (Black)

51A

3/6 & 3/7

X

Ext. - E. Side @ Covered Unit

X

Ext. Caulking Material

51B

3/6 & 3/7

X

Ext. - E. Side @ Covered Unit

X

Ext. Caulking Material

52A

3/6 & 3/7

X

Ext. - E. Side @ Stairs

X

Ext. Foundation Sealant

52B

3/6 & 3/7

X

Ext. - NE Corner

X

Ext. Foundation Sealant

53A

3/6 & 3/7

X

Ext. - NW Corner

X

Paper Under Aluminum Siding

Relinquished by: (Signature)



Date:

3-20-17

Received by: (Signature)



Relinquished by: (Signature)

Date:

Received by: (Signature)

(Printed)

David J. Gavin

Time:

0900

(Printed)



(Printed)

1000

Relinquished by: (Signature)

Date:

Time:

(Printed)

Remarks:

Condition of Samples:

Acceptable: Yes No

Comments:

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

PROJECT NUMBER

228540.0000.0000

PROJECT NAME

City of Somersville

LAB ID #. 50177

TURNAROUND TIME

PLM:	8hr	24hr	48hr	X	3 day
TEM:	24hr	48hr	3day		5day

PARAMETERS

PLM EPA 600/R9/16 (POSITIVE STOP)	
PLM EPA 600/R9/16 (w/ gravimetric reduction) (POSITIVE STOP)	
ANALYZE BY LAYER	
POINT COUNT (R > 1% & < 10%)	
TEM N N OH 1984 (IF PLM SERIES NCC)	

MATERIAL

INSPECTOR

David J. Gavin

SIGNATURE

David J. Gavin

FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION
			COMP	GRAB	
53B	3/6 & 3/7		X	X	Ext. - North Side - Center
54A	3/6 & 3/7		X	X	Ext. - North Side - Center
54B	3/6 & 3/7		X	X	Ext. - North Side - Center

Paper Under Aluminum Siding

Tar Paper Under Aluminum Siding @ Foundation

Tar Paper Under Aluminum Siding @ Foundation

Relinquished by: (Signature) 	Date: 3-20-17	Received by: (Signature) 	Date: 3/21/17
(Printed) David J. Gavin	Time: 0900	(Printed) 1000	Time: (Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Received by: (Signature) (Printed)
			Page 13 of 13

BULK ASBESTOS ANALYSIS REPORT

CLIENT: City of Somerville

Lab Log #: 0050211
 Project #: 228540.0000.0000
 Date Received: 03/27/2017
 Date Analyzed: 03/28/2017

Site: Somerville Brownfields, Somerville, MA

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
55A	Grey (caulk)	Yes	No	--	---	ND	None
55B	Grey (caulk)	Yes	No	--	---	ND	None
56A	Beige (caulk)	Yes	No	--	---	3%	Chrysotile
56B	--	--	--	--	--	NA/PS	--
57A	White (caulk)	Yes	No	--	---	3%	Chrysotile
57B	--	--	--	--	--	NA/PS	--
58A	White (caulk)	Yes	No	--	---	3%	Chrysotile
58B	--	--	--	--	--	NA/PS	--
59A	Grey (caulking)	Yes	No	--	---	3%	Chrysotile
59B	--	--	--	--	--	NA/PS	--
60A	Black (bump stop)	Yes	No	--	40% synthetic fiber	ND	None
60B	Black (bump stop)	Yes	No	--	40% synthetic fiber	ND	None
61A	Black/Grey (shingle)	Yes	No	--	20% cellulose	ND	None
61B	Black/Grey (shingle)	Yes	No	--	20% cellulose	ND	None
62A	Dark Brown (roof paper)	Yes	No	--	80% cellulose	ND	None
62B	Dark Brown (roof paper)	Yes	No	--	80% cellulose	ND	None
63A	Black (adhesive)	Yes	No	--	3% cellulose	20%	Chrysotile

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0 AHA-LAP,LLC #100122 CT #PH-0426 ME LA-0075, LB-0071 MA #AA000052 NY #10569 WY #1, T000411
 RI #AAL-007 TX #300354 VT #AL014538 LA #05011 VA #3333 000283 AZ #A20944 HI #L-09-004 NJ #CF004 CA #2907
 CO# AL-15020 PHIL# 461 PA#68-03387

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
63B	--	--	--	--	--	NA/PS	--
64A	Black (flashing)	Yes	No	--	10% fibrous glass	20%	Chrysotile
64B	--	--	--	--	--	NA/PS	--
65A	Black (shingle)	Yes	No	--	10% fibrous glass	ND	None
65B	Black (shingle)	Yes	No	--	10% fibrous glass	ND	None
66A	Dark Brown (roof paper)	Yes	No	--	80% cellulose	ND	None
66B	Dark Brown (roof paper)	Yes	No	--	80% cellulose	ND	None
67A	Black (flashing)	Yes	No	--	---	20%	Chrysotile
67B	--	--	--	--	--	NA/PS	--
68A	Black (rolled roofing)	Yes	No	--	3% cellulose	3%	Chrysotile
68B	--	--	--	--	--	NA/PS	--
69A	Black (rolled roofing)	Yes	No	--	10% cellulose	ND	None
69B	Black (rolled roofing)	Yes	No	--	10% cellulose	ND	None
70A	Dark Brown (paper)	Yes	No	--	90% cellulose	ND	None
70B	Dark Brown (paper)	Yes	No	--	90% cellulose	ND	None
71A	Black (flashing)	Yes	No	--	---	20%	Chrysotile
71B	--	--	--	--	--	NA/PS	--
72A	Black (built up roofing material)	Yes	No	--	3% cellulose	ND	None
72B	Black (built up roofing material)	Yes	No	--	3% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS



NVLAP Lab Code 101424-0 ARHA-LAP,LLC #100122 CT #1911-0426 ME LA-0075, LB-0071 MA 5AA000052 NY #10980 WV#LT000411
 RI #AAL-007 TX R300354 VT #A1.014538 LA#05011 VA #3333 000283 AZ #A20944 HI #L-09-004 NJ #CT004 CA #2907
 COM AL-15020 PHL# 461 PA#68-03387

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID # 50211

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		PARAMETERS					TURNAROUND TIME							
		INSPECTOR David J. Gavin		PLM EPA 600/893116 (POSITIVE STOP)	PLM EPA 600/893116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (F > 1% & > 10%)	TECH NY NOT 1984 (F PLM SERIES NEG)	PLM:	8hr	24hr	48hr	3day	5day		
FIELD SAMPLE NUMBER	DATE	TIME	TYPE	SAMPLE LOCATION	MATERIAL											
					COMP	GRAB	Exterior Door Caulking	Exterior Door Caulking	Exterior Door Caulking (Garage Door)	Exterior Door Caulking (Garage Door)	Exterior Caulking	Exterior Caulking	Exterior Caulking (Aluminum Siding)	Exterior Caulking (Aluminum Siding)	Exterior Caulking - New (Aluminum Siding)	Exterior Caulking - New (Aluminum Siding)
55A	3-21-17		X	Southwest Entrance	X											
55B	3-21-17		X	Southwest Entrance	X											
56A	3-21-17		X	Loading Dock	X											
56B	3-21-17		X	Loading Dock	X											
57A	3-21-17		X	South - Large Covered Opening	X											
57B	3-21-17		X	South - Large Covered Opening	X											
58A	3-21-17		X	East - Large Covered Opening	X											
58B	3-21-17		X	East - Covered Window Unit	X											
59A	3-21-17		X	East - Large Covered Opening	X											
59B	3-21-17		X	East - Large Covered Opening	X											
60A	3-21-17		X	Loading Dock	X											

Relinquished by: (Signature) 	Date: 3-23-17	Received by: (Signature) 	Date: 3/23/17	Relinquished by: (Signature)	Date:	Received by: (Signature)
(Printed) David J. Gavin	Time: 1500	(Printed) David J. Gavin	Time: 1100	(Printed)	Time:	(Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Comments:		Page / of 4	

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #. 50211

PROJECT NUMBER		PROJECT NAME		PARAMETERS					TURNAROUND TIME					
				PLM EPA 600/R93/116 (POSITIVE STOP)	PLM EPA 600/R93/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEST BY NIOSH 1584 (IF PLM SERIES NEG)	PLM:	8hr	24hr	48hr	3day	TEM:
228540.0000.0000		City of Somersville												
SIGNATURE		INSPECTOR												
David J. Gavin		David J. Gavin												
FIELD SAMPLE NUMBER	DATE	TIME	TYPE		SAMPLE LOCATION	MATERIAL								
			COMP	GRAB										
60B	3-21-17		X	X	Loading Deck	Rubber Bump Stop								
61A	3-21-17		X	X	Lower Roof - SW Corner	Roof Shingle								
61B	3-21-17		X	X	Lower Roof - SW Corner	Roof Shingle								
62A	3-21-17		X	X	Lower Roof - SW Corner	Roof Paper Under Shingle								
62B	3-21-17		X	X	Lower Roof - SW Corner	Roof Paper Under Shingle								
63A	3-21-17		X	X	Lower Roof - SW Corner	Roof Shingle Adhesive								
63B	3-21-17		X	X	Lower Roof - SW Corner	Roof Shingle Adhesive								
64A	3-21-17		X	X	Lower Roof - SW Corner	Flashing Mastic								
64B	3-21-17		X	X	Lower Roof - SW Corner	Flashing Mastic								
65A	3-21-17		X	X	Roof - SE Section	Roof Shingle								
65B	3-21-17		X	X	Roof - SW Section	Roof Shingle								



Relinquished by: (Signature) 	Date: 3-23-17	Received by: (Signature) 	Date: 3/23/17	Relinquished by: (Signature)	Date:	Received by: (Signature)
(Printed) David J. Gavin	Time: 1500	(Printed) David J. Gavin	Time: 1500	(Printed)	Time:	(Printed)
Remarks:		Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Comments:		Page 04 of 4

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #. 50211

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		PARAMETERS				TURNAROUND TIME								
				PLM EPA 600/R5716 (POSITIVE STOP)	PLM EPA 600/R5716 (wt gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEMIN N08 1984 (P PLM SERIES NEG)	PLM:	8hr	24hr	48hr	3day	5day		
SIGNATURE David J. Gavin		INSPECTOR David J. Gavin		MATERIAL												
FIELD SAMPLE NUMBER	DATE	TIME	TYPE	CONF	GRAB	SAMPLE LOCATION	PLM EPA 600/R5716 (POSITIVE STOP)	PLM EPA 600/R5716 (wt gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEMIN N08 1984 (P PLM SERIES NEG)	8hr	24hr	48hr	3day	5day
66A	3-21-17		X		X	Roof - SE Section	X									
66B	3-21-17		X		X	Roof - SW Section	X									
67A	3-21-17		X		X	Roof - SE Section @ Tower	X									
67B	3-21-17		X		X	Roof - SW Section @ Tower	X									
68A	3-21-17		X		X	Roof - SE Tower	X									
68B	3-21-17		X		X	Roof - SE Tower	X									
69A	3-21-17		X		X	Roof - SW Tower	X									
69B	3-21-17		X		X	Roof - SW Tower	X									
70A	3-21-17		X		X	Roof - SE Tower	X									
70B	3-21-17		X		X	Roof - SE Tower	X									
71A	3-21-17		X		X	Roof - SW Tower	X									



Relinquished by: (Signature) 	Date: 3-23-17	Received by: (Signature) 	Date: 3/22/17
(Printed) David J. Gavin	Time: 1500	(Printed) 1100	Time: (Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Received by: (Signature) (Printed)
			Page 3 of 4

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

LAB ID #: 50211

PROJECT NUMBER 228540.0000.0000		PROJECT NAME City of Somerville		TURNAROUND TIME				
		PLM:	TEM:	8hr	24hr	48hr	3day	5day
SIGNATURE David J. Gavin		INSPECTOR David J. Gavin		PARAMETERS				
				PLM EPA 600/93/16 (POSITIVE STOP)	PLM EPA 600/93/16 (wt gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (P > 1% & < 10%)	TEM NY NH 1984 (P PLM SERIES NEG)
71B	3-21-17	X	Roof - SW Tower	X	Flashing			
72A	3-21-17	X	Roof - NE Corner	X	Built-up Roofing Material			
72B	3-21-17	X	Roof - NE Corner	X	Built-up Roofing Material			

Relinquished by: (Signature) 	Date: 3-23-17	Received by: (Signature) 	Date:	Received by: (Signature)
	Time: 1500	(Printed) David J. Gavin	Time: 1100	(Printed)
Remarks:	Condition of Samples: Acceptable: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Page 4 of 4	

BULK ASBESTOS ANALYSIS REPORT

CLIENT: City of Somerville

Lab Log #: 0050340
 Project #: 228540.0000.0000
 Date Received: 04/11/2017
 Date Analyzed: 04/12/2017

Site: Somerville Brownfields, Somerville, MA

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
73A	Grey (cement panel)	Yes	No	--	---	20%	Chrysotile
73B	--	--	--	--	--	NA/PS	--
74A	Beige (aircell)	Yes	No	--	40% cellulose	40%	Chrysotile
74B	--	--	--	--	--	NA/PS	--
74C	--	--	--	--	--	NA/PS	--

Reporting limit- asbestos present at 1%

ND - asbestos was not detected

Trace - asbestos was observed at level of less than 1%

NA/PS - Not Analyzed / Positive Stop

SNA - Sample Not Analyzed. See Chain of Custody for details

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation 1982 (EPA 600/M4-82-020) Bulk Analysis Code 18/A01 and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials July 1993, R.L. Perkins and B.W. Harvey, (EPA/600/R-93/116) Bulk Analysis Code 18/A03, which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2017. TRC is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene Program (IHLAP) for PLM effective through October 1, 2018. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

This report shall not be reproduced, except in full, without the written approval of TRC. This report must not be used by the client to claim product enforcement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

Analyzed by: K. Williamson Reviewed by: Cathryn Lohre Date Issued: 04/12/2017
 Kathleen Williamson, Laboratory Manager Cathryn Lohre, Approved Signatory

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0 AIHA-LAP, LLC #100122 CT 0PH-0426 ME LA-0075, LB-0071 MA 0AA000052 NY #10980 WV 9LT000411
 RI #AAL-007 TX #300354 VT #AL014538 LA005011 VA #3333 000283 AZ #A20941 HI #I-09-004 NJ #CT004 CA #2907
 CO# AL-15020 19 IHL # 461 PA #68-03387

APPENDIX C

LEAD CONTAINING PAINT LABORATORY
ANALYTICAL DATA

March 29, 2017

Dave Gavin
TRC Environmental Corporation - Boston
2 Liberty Square, 6th Floor
Boston, MA 02109

Project Location: 24 Cross Street East
Client Job Number:
Project Number: 228540.0000.0000
Laboratory Work Order Number: 17C0740

Enclosed are results of analyses for samples received by the laboratory on March 21, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Meghan E. Kelley". The signature is written in a cursive style with a large, sweeping 'y' at the end.

Meghan E. Kelley
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

TRC Environmental Corporation - Boston
 2 Liberty Square, 6th Floor
 Boston, MA 02109
 ATTN: Dave Gavin

REPORT DATE: 3/29/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 228540.0000.0000

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17C0740

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 24 Cross Street East

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
01	17C0740-01	Paint	1st Wall @ Main Ent (WT)	-	
02	17C0740-02	Paint	1st Stairs @ Main Ent (GY)	-	
03	17C0740-03	Paint	1st Stairs Railing @ Main Ent. (BL)	-	
04	17C0740-04	Paint	1st Main Area-East Wall (PK)	-	
05	17C0740-05	Paint	1st -W. Storage Rm. Wall (BN)	-	
06	17C0740-06	Paint	Ext. Door Frame @ Main Ent. (WT)	-	
07	17C0740-07	Paint	Ext. Door Frame @ Main Ent. (GY)	-	
08	17C0740-08	Paint	2nd- Office Area Wall (WT)	-	
09	17C0740-09	Paint	2nd-S. Open Area Ceiling (BL)	-	
10	17C0740-10	Paint	10- BsmT.-Stg. Rm@ Workshop (OWT)	-	
11	17C0740-11	Paint	11- BsmT.-Stg. Rm@ Workshop (WT)	-	
12	17C0740-12	Paint	12 Bsmt.-E. Open Area-ceiling (GY)	-	
13	17C0740-13	Paint	13 Bsmt.-E. Open Area-Wall (YL)	-	
14	17C0740-14	Paint	14 Bsmt.-E. Open Area-Wall (BN)	-	
15	17C0740-15	Paint	15-South Ext. Garage Door (PK)	-	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

Qualifications:

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Lead

17C0740-13[13], B172936-MS1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 1st Wall @ Main Ent (WT)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 01

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-01

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	8800	25	mg/Kg	1		-	3/23/17	3/24/17 16:05	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 1st Stairs @ Main Ent (GY)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 02

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-02

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	3400	25	mg/Kg	1		-	3/23/17	3/24/17 16:10	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 1st Stairs Railing @ Main Ent. (BL)

Work Order: 17C0740

Date Received: 3/21/2017

Sampled: 3/7/2017 00:00

Field Sample #: 03

Sample ID: 17C0740-03

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	590	25	mg/Kg	1		-	3/23/17	3/24/17 16:15	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 1st Main Area-East Wall (PK)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 04

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-04

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	5000	25	mg/Kg	1		-	3/23/17	3/24/17 16:20	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 1st -W. Storage Rm. Wall (BN)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 05

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-05

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	130000	25	mg/Kg	1		-	3/23/17	3/27/17 21:37	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: Ext. Door Frame @ Main Ent. (WT)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 06

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-06

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	190000	25	mg/Kg	1		-	3/23/17	3/28/17 16:10	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: Ext. Door Frame @ Main Ent. (GY)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 07

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-07

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	87000	25	mg/Kg	1		-	3/23/17	3/28/17 16:16	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 2nd- Office Area Wall (WT)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 08

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-08

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	<25	25	mg/Kg	1		-	3/23/17	3/28/17 16:21	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 2nd-S. Open Area Ceiling (BL)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 09

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-09

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	2900	25	mg/Kg	1		-	3/23/17	3/28/17 16:26	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 10- BsmT.-Stg. Rm@ Workshop (OW)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 10

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-10

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	550	25	mg/Kg	1		-	3/23/17	3/28/17 16:32	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 11- BsmT.-Stg. Rm@ Workshop (WT)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 11

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-11

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	130	25	mg/Kg	1		-	3/23/17	3/28/17 16:52	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 12 Bsmt.-E. Open Area-ceiling (GY)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 12

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-12

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	19000	25	mg/Kg	1		-	3/23/17	3/28/17 16:57	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 13 Bsmt.-E. Open Area-Wall (YL)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 13

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-13

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	43000	25	mg/Kg	1	MS-19	-	3/23/17	3/27/17 21:32	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 14 Bsmt.-E. Open Area-Wall (BN)

Work Order: 17C0740

Date Received: 3/21/2017

Field Sample #: 14

Sampled: 3/7/2017 00:00

Sample ID: 17C0740-14

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	12000	25	mg/Kg	1		-	3/23/17	3/28/17 17:03	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: 15-South Ext. Garage Door (PK)

Work Order: 17C0740

Date Received: 3/21/2017

Sampled: 3/7/2017 00:00

Field Sample #: 15

Sample ID: 17C0740-15

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	790	25	mg/Kg	1		-	3/23/17	3/28/17 17:07	SHN

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data**Prep Method: SW-846 3050B--**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C0740-01 [01]	B172936	0.0500	25.0	03/23/17
17C0740-02 [02]	B172936	0.0501	25.0	03/23/17
17C0740-03 [03]	B172936	0.0499	25.0	03/23/17
17C0740-04 [04]	B172936	0.0505	25.0	03/23/17
17C0740-05 [05]	B172936	0.0500	25.0	03/23/17
17C0740-06 [06]	B172936	0.0504	25.0	03/23/17
17C0740-07 [07]	B172936	0.0505	25.0	03/23/17
17C0740-08 [08]	B172936	0.0493	25.0	03/23/17
17C0740-09 [09]	B172936	0.0501	25.0	03/23/17
17C0740-10 [10]	B172936	0.0495	25.0	03/23/17
17C0740-11 [11]	B172936	0.0496	25.0	03/23/17
17C0740-12 [12]	B172936	0.0502	25.0	03/23/17
17C0740-13 [13]	B172936	0.0505	25.0	03/23/17
17C0740-14 [14]	B172936	0.0502	25.0	03/23/17
17C0740-15 [15]	B172936	0.0500	25.0	03/23/17

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B172936 - SW-846 3050B										
Blank (B172936-BLK1)										
				Prepared: 03/23/17 Analyzed: 03/24/17						
Lead	ND	25	mg/Kg							
LCS (B172936-BS1)										
				Prepared: 03/23/17 Analyzed: 03/24/17						
Lead	85.3	25	mg/Kg	85.6		99.7	80-120			
LCS Dup (B172936-BSD1)										
				Prepared: 03/23/17 Analyzed: 03/24/17						
Lead	89.9	25	mg/Kg	85.6		105	80-120	5.19	25.6	
Duplicate (B172936-DUP1)										
				Source: 17C0740-13			Prepared: 03/23/17 Analyzed: 03/27/17			
Lead	42800	25	mg/Kg		43100			0.542	35	
MRL Check (B172936-MRL1)										
				Prepared: 03/23/17 Analyzed: 03/24/17						
Lead	27.0	25	mg/Kg	24.8		109	80-120			
Matrix Spike (B172936-MS1)										
				Source: 17C0740-13			Prepared: 03/23/17 Analyzed: 03/27/17			
Lead	42200	25	mg/Kg	1990	43100	-45.1 *	75-125			MS-19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
---------	----------------

- in Paint

Lead	AIHA,ME,CT,NY
------	---------------

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2017
CT	Connecticut Department of Public Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2017
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2017
FL	Florida Department of Health	E871027 NELAP	06/30/2017
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2017
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2017



Company Name: TIC Environmental Corporation
Address: 2 Liberty Square, 6th Floor
Phone: Boston, MA 02109
Project Name: City of Somerville
Project Location: 24 Cross Street East
Project Number: 2285-40-0000-0000
Project Manager: David J. Gavin
Con-Test Bid: David J. Gavin
Invoice Recipient: David J. Gavin
Sampled By: David J. Gavin

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	Matrix Code	Cole Code
1	01-1st-Wall @ Main Ent. (WT)	3/7/2017	3/7/2017	X	O	U	X
2	02-1st-Stairs @ Main Ent. (GY)	3/7/2017	3/7/2017	X	O	U	X
3	03-1st-Stair Railing @ Main Ent. (BL)	3/7/2017	3/7/2017	X	O	U	X
4	04-1st-Main Area-East Wall (PK)	3/7/2017	3/7/2017	X	O	U	X
5	05-1st-W. Storage Rm. Wall (BH)	3/7/2017	3/7/2017	X	O	U	X
6	06-Ext. Door Frame @ Main Ent. (WT)	3/7/2017	3/7/2017	X	O	U	X
7	07-Ext. Door Frame @ Main Ent. (GY)	3/7/2017	3/7/2017	X	O	U	X
8	08-2nd-Office Area Wall (WT)	3/7/2017	3/7/2017	X	O	U	X
9	09-2nd-5. Open Area Ceiling (BL)	3/7/2017	3/7/2017	X	O	U	X
10	10-Bunt.-Stg. Rm. @ Workshop (OWT)	3/7/2017	3/7/2017	X	O	U	X

Requested Turnaround Time: 7-Day 10-Day
Other: Rush-Approval Required 3-Day 4-Day
Formats: PDF EXCEL
Enhanced Data Package Required:

Matrix Codes:
 GW - Ground Water
 WW - Waste Water
 DW - Drinking Water
 A - Air
 S - Soil/Solid
 SL - Sludge
 O - Other (please define)
 Paint-Chip

Preservation Codes:
 I - Iced
 H - HCL
 M - Methanol
 N - Nitric Acid
 S - Sulfuric Acid
 B - Sodium Bisulfate
 X - Sodium Hydroxide
 T - Sodium Thiosulfate
 O - Other (please define)

Container Codes:
 A - Amber Glass
 G - Glass
 P - Plastic
 ST - Sterile
 V - Vial
 S - Summa Canister
 T - Tedlar Bag
 O - Other (please define)
 Plastic Bag

ANALYSIS REQUESTED

Program Information
 MCP Analytical Certification Form Required
 MCP Analysis Certification Form Required
 MA State DW Form Required
 PWSID # _____
 NELAC and AHA-LAP, LLC Accredited

Comments: Email results to dgavin@contestlabs.com

Turnaround Time (BUSINESS DAYS) STARTS AT 9:00 AM THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON THIS CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME CANNOT START UNTIL ALL QUESTIONS HAVE BEEN ANSWERED.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT



Company Name: ITC Environmental Corporation
Address: 2 Liberty Square, 6th Floor
 Boston, MA 02109
Project Name: City of Somerville
Project Location: 24 Cross Street East
Project Number: 228540.0000.0000
Project Manager: David J. Gavin
Con-Test Bid:
Invoice Recipient: David J. Gavin
Sampled By: David J. Gavin

Requested Turnaround Time
 7-Day 10-Day
 Other:
Rush Approval Required
 1-Day 3-Day
 2-Day 4-Day
Data Delivery
 Format: PDF EXCEL
 Other:
 Enhanced Data Package Required:
 Email To:
 Fax To #:

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Matrix Code	Cinic Code
11	11-Bsmt.-Stg. Rm. @ Workshop (WT)	3/7/2017	3/7/2017	X	0	U
12	12-Bsmt.-E. Open Area-Ceiling (GY)	3/7/2017	3/7/2017	X	0	U
13	13-Bsmt.-E. Open Area-Wall (YL)	3/7/2017	3/7/2017	X	0	U
14	14-Bsmt.-E. Open Area-Wall (BK)	3/7/2017	3/7/2017	X	0	U
15	15-South Ext. Garage Door (PK)	3/7/2017	3/7/2017	X	0	U

Comments: Email results to dgavin@trcsolutions.com

All samples are paint chips submitted for lead analysis

Relinquished by: (Signature)	Date/Time
David J. Gavin	3-20-17 / 0900
Received by: (Signature) <i>DP</i>	Date/Time: 3/20/17 9:34
Relinquished by: (Signature)	Date/Time:
Received by: (Signature)	Date/Time:
Relinquished by: (Signature)	Date/Time:
Received by: (Signature)	Date/Time:

Program Information
 MCP Analytical Certification Form Required
 RCP Analysts Certification Form Required
 MA State DW Form Required
 PWSD # _____
NELAC and AIHA-LAP, LLC Accredited
 TURNAROUND TIME (BUSINESS DAYS) STARTS AT 9:00 AM THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON THIS CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME CANNOT START UNTIL ALL QUESTIONS HAVE BEEN ANSWERED.



FedEx Tracking

778690461129

Ship date
Mon 3/20/2017

WOBURN, MA US



Delivered

Signed for by: R FAUST

Actual delivery:

Tue 3/21/2017 9:34 am

EAST LONGMEADOW, MA US

Travel History

Date/Time	Activity	Location
3/21/2017 - Tuesday		
9:34 am	Delivered	EAST LONGMEADOW, MA
8:15 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
8:02 am	At local FedEx facility	WINDSOR LOCKS, CT
7:00 am	At destination sort facility	EAST GRANBY, CT
4:05 am	Departed FedEx location	NEWARK, NJ
3/20/2017 - Monday		
11:29 pm	Arrived at FedEx location	NEWARK, NJ
8:05 pm	Left FedEx origin facility	BOSTON, MA
5:04 pm	Picked up	BOSTON, MA
11:57 am	Shipment information sent to FedEx	

Shipment Facts

Tracking number	778690461129	Service	FedEx Priority Overnight
Weight	0.6 lbs / 0.23 kgs	Delivered To	Shipping/Receiving
Total pieces	1	Total shipment weight	0.6 lbs / 0.23 kgs
Terms	Shipper	Shipper reference	228540.0000.0000.000001.500002
Packaging	FedEx Envelope	Special handling section	Deliver Weekday
Standard transit	3/21/2017 by 10:30 am		



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 East Longmeadow, MA. 01028
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Sample Receipt Checklist

CLIENT NAME: TRC Environmental Corporation RECEIVED BY: BA DATE: 03/01/17

- 1) Was the chain(s) of custody relinquished and signed? Yes No No COC Incl.
- 2) Does the chain agree with the samples? Yes No
- 3) Are all the samples in good condition? Yes No

4) How were the samples received:
 On Ice Direct from Sampling Ambient In Cooler(s)
 Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A
 Temperature °C by Temp blank Temperature °C by Temp gun 20.7°C ± 0.2

- 5) Are there Dissolved samples for the lab to filter? Yes No
- 6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

7) Location where samples are stored:
 Permission to subcontract samples? Yes No
 (Walk-in clients only) if not already approved
 Client Signature: _____

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		16 oz amber	
500 mL Amber		8 oz amber/clear jar	
250 mL Amber (8oz amber)		4 oz amber/clear jar	
1 Liter Plastic		2 oz amber/clear jar	
500 mL Plastic		Plastic Bag / Ziploc	15 (Pantclips)
250 mL plastic		SOC Kit	
40 mL Vial - type listed below		Perchlorate Kit	
Collsure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

40 mL vials: # HCl _____ # Methanol _____
 # Bisulfate _____ # DI Water _____
 # Thiosulfate _____ Unpreserved _____
 Time and Date Frozen: _____

Doc# 277
 Rev. 4 August 2013

Login Sample Receipt Checklist
 (Rejection Criteria Listing - Using Sample Acceptance Policy)
 Any False statement will be brought to the attention of Client

Question	Answer (True/False)		Comment
	T/F/NA		
1) The cooler's custody seal, if present, is intact.	NA		
2) The cooler or samples do not appear to have been compromised or tampered with.	T		
3) Samples were received on ice.	F		
4) Cooler Temperature is acceptable.	T		
5) Cooler Temperature is recorded.	T	20.7°C	fd
6) COC is filled out in ink and legible.	T		
7) COC is filled out with all pertinent information.	T		
8) Field Sampler's name present on COC.	T		
9) There are no discrepancies between the sample IDs on the container and the COC.	T		
10) Samples are received within Holding Time.	T		
11) Sample containers have legible labels.	T		
12) Containers are not broken or leaking.	T		
13) Air Cassettes are not broken/open.	NA		
14) Sample collection date/times are provided.	T	No Time	
15) Appropriate sample containers are used.	T		
16) Proper collection media used.	T		
17) No headspace sample bottles are completely filled.	NA		
18) There is sufficient volume for all requested analyses, including any requested MS/MSDs.	T		
19) Trip blanks provided if applicable.	NA		
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA		
21) Samples do not require splitting or compositing.	T		

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Who notified of False statements?
 Log-in Technician Initials: *BYA*

Date/Time:
 Date/Time: *03/24/17 9:34*

APPENDIX D

PCB LABORATORY ANALYTICAL DATA

March 28, 2017

Dave Gavin
TRC Environmental Corporation - Boston
2 Liberty Square, 6th Floor
Boston, MA 02109

Project Location: 24 Cross Street East
Client Job Number:
Project Number: 228540.0000.0000
Laboratory Work Order Number: 17C0889

Enclosed are results of analyses for samples received by the laboratory on March 23, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Meghan E. Kelley". The signature is written in a cursive style with a large, sweeping 'y' at the end.

Meghan E. Kelley
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

TRC Environmental Corporation - Boston
 2 Liberty Square, 6th Floor
 Boston, MA 02109
 ATTN: Dave Gavin

REPORT DATE: 3/28/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 228540.0000.0000

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17C0889

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 24 Cross Street East

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
01-Ext. Caulk	17C0889-01	Caulk	S Lg. Covered Opening	SW-846 8082A	
02-Ext. Caulk	17C0889-02	Caulk	S Loading Dock Door	SW-846 8082A	
03-Ext. Caulk	17C0889-03	Caulk	SW Entrance Door	SW-846 8082A	
04- Glazing	17C0889-04	Caulk	S Open Area - Window	SW-846 8082A	
05-Ext. Caulk	17C0889-05	Caulk	E Sm. Covered Opening	SW-846 8082A	
06-Ext. Caulk	17C0889-06	Caulk	E Lg. Covered Opening	SW-846 8082A	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 8082A

Qualifications:

O-32

A dilution was performed as part of the standard analytical procedure.

Analyte & Samples(s) Qualified:

17C0889-02[02-Ext. Caulk], 17C0889-03[03-Ext. Caulk], 17C0889-06[06-Ext. Caulk]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: S Lg. Covered Opening

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 01-Ext. Caulk

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-01

Sample Matrix: Caulk

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1221 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1232 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1242 [2]	1.4	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1248 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1254 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1260 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1262 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Aroclor-1268 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/27/17 23:58	KAL
Surrogates		% Recovery	Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]		71.3	30-150					3/27/17 23:58	
Decachlorobiphenyl [2]		85.1	30-150					3/27/17 23:58	
Tetrachloro-m-xylene [1]		81.0	30-150					3/27/17 23:58	
Tetrachloro-m-xylene [2]		94.1	30-150					3/27/17 23:58	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: S Loading Dock Door

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 02-Ext. Caulk

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-02

Sample Matrix: Caulk

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1221 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1232 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1242 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1248 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1254 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1260 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1262 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Aroclor-1268 [1]	ND	0.72	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:16	KAL
Surrogates		% Recovery	Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]		73.3	30-150					3/28/17 0:16	
Decachlorobiphenyl [2]		88.2	30-150					3/28/17 0:16	
Tetrachloro-m-xylene [1]		78.0	30-150					3/28/17 0:16	
Tetrachloro-m-xylene [2]		92.4	30-150					3/28/17 0:16	

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Project Location: 24 Cross Street East

Sample Description: SW Entrance Door

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 03-Ext. Caulk

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-03

Sample Matrix: Caulk

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1221 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1232 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1242 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1248 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1254 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1260 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1262 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Aroclor-1268 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:34	KAL
Surrogates		% Recovery	Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]		84.4	30-150					3/28/17 0:34	
Decachlorobiphenyl [2]		96.3	30-150					3/28/17 0:34	
Tetrachloro-m-xylene [1]		87.0	30-150					3/28/17 0:34	
Tetrachloro-m-xylene [2]		99.1	30-150					3/28/17 0:34	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: S Open Area - Window

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 04- Glazing

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-04

Sample Matrix: Caulk

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1221 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1232 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1242 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1248 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1254 [2]	0.97	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1260 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1262 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Aroclor-1268 [1]	ND	0.78	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 0:52	KAL
Surrogates		% Recovery	Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]		60.8	30-150					3/28/17 0:52	
Decachlorobiphenyl [2]		85.0	30-150					3/28/17 0:52	
Tetrachloro-m-xylene [1]		83.2	30-150					3/28/17 0:52	
Tetrachloro-m-xylene [2]		93.8	30-150					3/28/17 0:52	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: E Sm. Covered Opening

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 05-Ext. Caulk

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-05

Sample Matrix: Caulk

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1221 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1232 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1242 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1248 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1254 [2]	1.8	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1260 [2]	0.75	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1262 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Aroclor-1268 [1]	ND	0.69	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:09	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]	76.1		30-150				3/28/17 1:09		
Decachlorobiphenyl [2]	88.5		30-150				3/28/17 1:09		
Tetrachloro-m-xylene [1]	81.2		30-150				3/28/17 1:09		
Tetrachloro-m-xylene [2]	92.6		30-150				3/28/17 1:09		

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 24 Cross Street East

Sample Description: E Lg. Covered Opening

Work Order: 17C0889

Date Received: 3/23/2017

Field Sample #: 06-Ext. Caulk

Sampled: 3/21/2017 00:00

Sample ID: 17C0889-06

Sample Matrix: Caulk

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1221 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1232 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1242 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1248 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1254 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1260 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1262 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Aroclor-1268 [1]	ND	0.71	mg/Kg	4		SW-846 8082A	3/24/17	3/28/17 1:27	KAL
Surrogates		% Recovery	Recovery Limits		Flag/Qual				
Decachlorobiphenyl [1]		74.0	30-150					3/28/17 1:27	
Decachlorobiphenyl [2]		86.9	30-150					3/28/17 1:27	
Tetrachloro-m-xylene [1]		75.1	30-150					3/28/17 1:27	
Tetrachloro-m-xylene [2]		89.6	30-150					3/28/17 1:27	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C0889-01 [01-Ext. Caulk]	B173037	0.558	10.0	03/24/17
17C0889-02 [02-Ext. Caulk]	B173037	0.555	10.0	03/24/17
17C0889-03 [03-Ext. Caulk]	B173037	0.567	10.0	03/24/17
17C0889-04 [04- Glazing]	B173037	0.512	10.0	03/24/17
17C0889-05 [05-Ext. Caulk]	B173037	0.577	10.0	03/24/17
17C0889-06 [06-Ext. Caulk]	B173037	0.567	10.0	03/24/17

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B173037 - SW-846 3540C										
Blank (B173037-BLK1)										
Prepared: 03/24/17 Analyzed: 03/27/17										
Aroclor-1016	ND	0.19	mg/Kg							
Aroclor-1016 [2C]	ND	0.19	mg/Kg							
Aroclor-1221	ND	0.19	mg/Kg							
Aroclor-1221 [2C]	ND	0.19	mg/Kg							
Aroclor-1232	ND	0.19	mg/Kg							
Aroclor-1232 [2C]	ND	0.19	mg/Kg							
Aroclor-1242	ND	0.19	mg/Kg							
Aroclor-1242 [2C]	ND	0.19	mg/Kg							
Aroclor-1248	ND	0.19	mg/Kg							
Aroclor-1248 [2C]	ND	0.19	mg/Kg							
Aroclor-1254	ND	0.19	mg/Kg							
Aroclor-1254 [2C]	ND	0.19	mg/Kg							
Aroclor-1260	ND	0.19	mg/Kg							
Aroclor-1260 [2C]	ND	0.19	mg/Kg							
Aroclor-1262	ND	0.19	mg/Kg							
Aroclor-1262 [2C]	ND	0.19	mg/Kg							
Aroclor-1268	ND	0.19	mg/Kg							
Aroclor-1268 [2C]	ND	0.19	mg/Kg							
Surrogate: Decachlorobiphenyl	3.48		mg/Kg	3.87		90.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.87		mg/Kg	3.87		100	30-150			
Surrogate: Tetrachloro-m-xylene	3.37		mg/Kg	3.87		87.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.83		mg/Kg	3.87		99.1	30-150			
LCS (B173037-BS1)										
Prepared: 03/24/17 Analyzed: 03/27/17										
Aroclor-1016	2.8	0.18	mg/Kg	3.70		76.3	40-140			
Aroclor-1016 [2C]	3.0	0.18	mg/Kg	3.70		81.4	40-140			
Aroclor-1260	2.8	0.18	mg/Kg	3.70		75.7	40-140			
Aroclor-1260 [2C]	2.9	0.18	mg/Kg	3.70		79.7	40-140			
Surrogate: Decachlorobiphenyl	3.25		mg/Kg	3.70		87.8	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.64		mg/Kg	3.70		98.4	30-150			
Surrogate: Tetrachloro-m-xylene	3.18		mg/Kg	3.70		85.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.63		mg/Kg	3.70		98.1	30-150			
LCS Dup (B173037-BSD1)										
Prepared: 03/24/17 Analyzed: 03/27/17										
Aroclor-1016	2.7	0.18	mg/Kg	3.54		76.5	40-140	4.04	30	
Aroclor-1016 [2C]	2.9	0.18	mg/Kg	3.54		81.6	40-140	4.12	30	
Aroclor-1260	2.7	0.18	mg/Kg	3.54		75.5	40-140	4.61	30	
Aroclor-1260 [2C]	2.9	0.18	mg/Kg	3.54		81.6	40-140	2.06	30	
Surrogate: Decachlorobiphenyl	3.06		mg/Kg	3.54		86.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.43		mg/Kg	3.54		97.0	30-150			
Surrogate: Tetrachloro-m-xylene	2.94		mg/Kg	3.54		83.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.36		mg/Kg	3.54		94.9	30-150			

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES**

01-Ext. Caulk

SW-846 8082A

Lab Sample ID: 17C0889-01 Date(s) Analyzed: 03/27/2017 03/27/2017

Instrument ID (1): _____ Instrument ID (2): _____

GC Column (1): ID: _____ (mm) GC Column (2): ID: _____ (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1242	1	0.00	0.00	0.00	1.2	
	2	0.00	0.00	0.00	1.4	16.2

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES**
SW-846 8082A

05-Ext. Caulk

Lab Sample ID: 17C0889-05 Date(s) Analyzed: 03/28/2017 03/28/2017

Instrument ID (1): _____ Instrument ID (2): _____

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	1.8	
	2	0.00	0.00	0.00	1.8	1.1

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
O-32	A dilution was performed as part of the standard analytical procedure.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
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No certified Analyses included in this Report

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2017
CT	Connecticut Department of Public Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2017
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2017
FL	Florida Department of Health	E871027 NELAP	06/30/2017
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2017
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2017

1700889

Phone: 413-525-2332
Fax: 413-525-6405



Company Name: TBC Environmental Corporation
Address: 2 Liberty Square, 6th Floor
Boston, MA 02109
Projects Name: City of Somerville
Project Location: 24 Cross Street East
Project Number: 278540.0000.0000
Project Manager: David J. Gavin
Con-Test Biz: David J. Gavin
Invoice Recipient: David J. Gavin
Sampled By: David J. Gavin

Requested Turnaround Time
7-Day 10-Day
Other:
Rush-Approval Required
1-Day 3-Day
2-Day 4-Day
Data Delivery
Format: PDF EXCEL
Other:
Enhanced Data Package Required:
Email To: dgavin@tbc-solutions.com
Fax To #:

Con-Test Work Order#	Civil Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grid	Matrix Code	Conc Code
01	01-Ext. Caulk - S Lg. Covered Opening	3/21/2017	3/21/2017		X	O	U
02	02-Ext. Caulk - S Loading Dock Door	3/21/2017	3/21/2017		X	O	U
03	03-Ext. Caulk - SW Entrance Door	3/21/2017	3/21/2017		X	O	U
04	04-Glazing - S Open Area - Window	3/21/2017	3/21/2017		X	O	U
05	05-Ext. Caulk - E Sm. Covered Opening	3/21/2017	3/21/2017		X	O	U
06	06-Ext. Caulk - E Lg. Covered Opening	3/21/2017	3/21/2017		X	O	U

Comments: Samples are caulking / glazing material for PCB analysis.

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Please contact David J. Gavin @ 617-548-8506 with any questions.
Relinquished by: (signature) Date/Time: 3-23-17 / 1400
David J. Gavin
Received by: (signature) Date/Time: 3:20
David J. Gavin
Relinquished by: (signature) Date/Time: 5 PM
David J. Gavin
Received by: (signature) Date/Time: 3:17 PM
David J. Gavin
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:

Detection Limits Requirements
MA
CT
Other:

Program Information
 MCP Analytical Certification Form Required
 RCP Analytical Certification Form Required
 MA State DW Form Required
PWSD # _____
NELAC and AIHA-LAP, LLC Accredited

of Containers 6
Preservation Code 1
Container Code A
Disinfectant/Metallic Samples
 Field Filtered
 Lab to Filter
Orthophosphate Samples
 Field Filtered
 Lab to Filter

1 Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil/Solid
SL = Sludge
O = Other (please define)
Caulking / Glazing
2 Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)


3 Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

39 Spruce St.
 East Longmeadow, MA. 01028
 P: 413-525-2332
 F: 413-525-6405
 www.contestlabs.com



Sample Receipt Checklist

CLIENT NAME: TRC RECEIVED BY: PLF DATE: 3/23/17

- 1) Was the chain(s) of custody relinquished and signed? Yes No No COC Incl.
- 2) Does the chain agree with the samples? Yes No
 If not, explain:
- 3) Are all the samples in good condition? Yes No
 If not, explain:
- 4) How were the samples received:
 On Ice Direct from Sampling Ambient In Cooler(s)
 Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A
 Temperature °C by Temp blank _____ # _____ Temperature °C by Temp gun 3.1 °C # 2
- 5) Are there Dissolved samples for the lab to filter? Yes No
 Who was notified _____ Date _____ Time _____
- 6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No
 Who was notified _____ Date _____ Time _____
- 7) Location where samples are stored: 

Permission to subcontract samples? Yes No
 (Walk-in clients only) if not already approved
 Client Signature: _____
- 8) Do all samples have the proper Acid pH: Yes No N/A
- 9) Do all samples have the proper Base pH: Yes No N/A
- 10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No

Containers received at Con-Test

	# of containers				# of containers
1 Liter Amber			16 oz amber		
500 mL Amber			8 oz amber/clear jar		
250 mL Amber (8oz amber)			4 oz amber/clear jar		6
1 Liter Plastic			2 oz amber/clear jar		
500 mL Plastic			Plastic Bag / Ziploc		
250 mL plastic			SOC Kit		
40 mL Vial - type listed below			Perchlorate Kit		
Colisure / bacteria bottle			Flashpoint bottle		
Dissolved Oxygen bottle			Other glass jar		
Encore			Other		

40 mL vials: # HCl _____ # Methanol _____	Time and Date Frozen:
Dec# 277 # Bisulfate _____ # DI Water _____	
Rev. 4 August 2013 # Thiosulfate _____ Unpreserved _____	

Page 2 of 2

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False)	Comment
	T/F/NA	
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requested analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

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Who notified of False statements?
Log-In Technician Initials:Date/Time:
Date/Time:

RLF 3/23/17 1745