APPENDIX A

APPENDIX A: DRAWING LIST FOR MODEL CONSTRUCTION

The drawings and information listed below were received from Perkins+Will and were used to construct the scale model of the proposed MIT Kendall Square Initiative. Should there be any design changes that deviate from this list of drawings, the results may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
20150901_SITE 4_WIND STUDY MODEL.3dm	3D Model	09/03/15

SECTION D: Recommendations from Retail Consultant

GRAFFITO SP

One Broadway 14th FL, Cambridge, MA 02142
108 Lincoln Street, Loft 1A, Boston, MA 02111
info@graffitosp.com || graffitosp.com

October 25, 2015

Mr. John McQuaid
Massachusetts Institute of Technology
238 Main Street, Suite 200
Cambridge, MA 02142

RE: Retail Consultant Recommendations || Summary
MIT – Kendall Square SoMa,& NoMa Redevelopment (the "Project")

Dear John,

I am pleased to submit for your review the following overview of my team's recommendations related to SoMa and NoMa retail planning, development and ground floor activation. In doing so I stress that the City of Cambridge and MIT's insistence on a deliberate and thoughtful approach to the activation of the retail portions of the Project is a good thing for MIT, Kendall Square, Cambridge and the region generally.

Graffito SP ("GSP") has developed a retail approach for SoMa and NoMa that embraces the following general values and principles:

- In keeping with its commitments concerning local retailers, MIT shall actively recruit and prioritize deals with small, local, owner-operated businesses;
- Aggressively pursue retail tenants for the Project that offer services/uses that have been identified as missing from the neighborhood by community and CDD studies of past half-decade (*i.e.* pharmacy, grocery store, additional affordable restaurants, entertainment and certain soft goods);
- Deliver rentable premises within the Project of varying shapes and sizes in an effort to foster (i) texture on the ground floor and (ii) maximum flexibility in tenant recruitment;
- Think about ground floor activation as far more than just 'retail' by incorporating into planning and tenanting programmatic and cultural partners and collaborators;
- Embrace a new set of transactional norms for certain spaces that lowers the barriers of entry for start-up retailers; and
- Implement certain best practices from a design/architecture perspective that enhance the ground floor edge throughout the Project.

As suggested in last two bullets above, there are certain design and transactional standards/initiatives we recommend MIT embrace in the planning and execution of the retail portions of the Project. As follows is an overview of a handful of said standards in (A) design and (B) transactions:

(A) Embedded in MIT's architectural plans across the entire Project and for all buildings must be certain best practice design treatments, namely:

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- Dedicate maximum frontage along core pedestrian corridors for retail uses, thus eliminating oversized building lobbies and locating loading and egress functions to areas off Main Street;
- Bring all retail premises to grade along Main Street (currently not the case in Building 4);
- Deliver retail spaces with storefront features that enhance actual and visual permeability vis-à-vis the public realm;
- Design building facades that create visual cues that separate ground floor from rest of building (*i.e.* canopies, lighting, signage, color and material variation);
- Open space shall be designed and configured to include bike racks, trash receptacles, seating, charging stations, and pedestrian-scale lighting;
- Outdoor retail seating to be encouraged whenever and wherever possible;
- Centralized loading, trash and back-of-house functions that can be efficiently shared by multiple retail tenants within the respective Project buildings will be encouraged;
- Design unique, attractive and functional retail signage and way-finding (and combination thereof) ; and
- 15'+ floor-to-floor minimum dimension will be required for all new retail spaces.

(B) In addition to implementing the above design solutions, GSP recommends MIT embrace the following transactional strategies:

- Draft a standard form Letter of Intent that can be used for all retail deals (and is precursor to all lease negotiations) that (i) identifies all threshold business and economic terms to be include in lease document, (ii) is written in plain English that is easily understandable to tenants that may not have experience leasing space in mixed-use buildings or with institutional landlords, and (iii) provides sufficient details and tenant guidelines regarding design standards, municipal permitting, and outlines an allocation of responsibilities between landlord and tenant for retail construction;
- Provide all retailers with in-kind architectural services if needed prior to lease signing (but after LOI signing) in order to ensure smaller tenants have the support and guidance needed to identify infrastructure, design and permitting challenges;
- Develop a standard form lease and corresponding rules and regulations for the entire Project that requires tenants adhere to best practices in retail design and operations, including details on environmental sustainability (water usage, composting, recycling, etc.), minimum operating hours/days to ensure the neighborhood is more than just M-F/9-5, and signage standards;
- Provide tenant improvement allowances (or significant Landlord Work) for all retail premises;
- Waive all Base Rent during reasonable construction periods;
- Offer leasing options of varying durations: short-term leases to facilitate experimentation and long-term leases for tenants investing major resources into buildouts (i.e. restaurants and grocery use); and
- MIT hire a designated Retail Specialist to coordinate all SoMa and NoMa retail leasing transaction and provide a consistent and constant fixture for retail tenants

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from leasing through opening and into operations. Said Retail Specialist shall oversee all retail brokers, consultants, designers, general contractors and property managers involved in SoMa and NoMa retail.

The above thoughts and approaches are only a summary of GSP's recommendations and I look forward to continued conversation about SoMa and NoMa retail with MIT and City representatives going forward.

Lastly, I'd like to stress that the responsible development of the Project's retail will require a steadfast commitment to flexibility and learning. The retail landscape is changing rapidly with the explosion of online global retailing but, at the same time, GSP is seeing a whole new generation of local retail entrepreneurs embracing technology, sustainability and experimentation in new and inspiring ways. Kendall Square offers an ideal canvas for this next generation retail entrepreneur and by embracing the above values and standards MIT will play the role of enabler, developer and investor in a truly special collection of retail spaces and places at SoMa and NoMa.

Respectfully submitted,

J. Baerkahn

Jesse Baerkahn
President & Founder

SECTION E: MIT Kendall Project LEED Scorecards

NoMa Building 1

LEED v4 for New Construction - Kendall Square Building 1

last updated: June 1, 2015

Achievability			
hi	med	low	NP
59	23	24	4

Certified 40 to 49 points **Silver** 50 to 59 points **Gold** 60 to 79 points **Platinum** 80 or more points

Achievability rating: **Hi** = 90%, **Med** = 60%, **Low** = 10%, **NP** = not possible.

69 Projected Points

						Prerequisites	Standard
Y				SS	Prereq 1	**Construction Activity Pollution Prevention**	Create and implement erosion control plan that meets the 2003 EPA Construction General Permit.
Y				WE	Prereq 1	**Outdoor Water Use Reduction:** 30%	Reduce outdoor water use by 30% over the baseline specified in LEED.
Y				WE	Prereq 2	**Indoor Water Use Reduction:** 20%	Reduce indoor water use by 20% over the baseline specified in LEED and meet requirements for process water use.
Y				WE	Prereq 3	**Building-Level Water Metering**	Install permanent water meters for building and grounds
Y				EA	Prereq 1	**Fundamental Commissioning and Verification**	Engage commissioning agent, and develop and execute a commissioning plan. 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 the USGBC for 5 years
Y				EA	Prereq 4	**Fundamental Refrigerant Management**	Eliminate CFCs in building HVAC&R.
Y				MR	Prereq 1	**Storage & Collection of Recyclables**	Provide space for the collection and storage of paper, cardboard, glass, plastic, and metals.
Y				MR	Prereq 2	**Construction and Demolition Waste Management Planning**	Develop and implement a construction and demolition waste management plan
Y				IEQ	Prereq 1	**Minimum IAQ Performance**	Meet sections 4 through 7 of ASHRAE 62.1-2010.
Y				IEQ	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Prohibit smoking inside building, and locate exterior smoking areas at least 25 feet away from building.

1	0	0	0			Integrative Process	Standard
1				IP	Credit 1	**Integrative Process**	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.

13	1	2	0			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.
		2		LT	Credit 3	**High Priority Site**	Locate the project on a site where contaminated soil/groundwater remediation is required or in historic district/building.
5				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.
5				LT	Credit 5	**Access to Quality Transit**	Locate project within 1/2 mile of a rail station or ferry terminal or 1/4 mile of bus, streetcar or rideshare.
	1			LT	Credit 6	**Bicycle Facilities**	Access to bicycle network. Short term (2.5% peak visitors) and long term (5% all occupants) bike parking and FTE showers
1				LT	Credit 7	**Reduced Parking Footprint**	Preferred parking for carpools for 5% of the total parking spaces
1				LT	Credit 8	**Green Vehicles**	Preferred parking for Green Vehicles: 5% of all parking spaces and electric vehicle charging or alternative fuel facility for 2%

6	2	1	1			Sustainable Sites	Standard
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	**Site Development:** Protect or Restore Habitat	Protect 40% of greenfield and restore 30% of previously developed site (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).
3				SS	Credit 4	**Rainwater Management**	Manage runoff for the 95th percentile (2pt), 98th percentile (+1pt) with low-impact development (LID) and green infrastructure.
2				SS	Credit 5	**Heat Island Reduction**	Meet high albedo requirements for roof and site 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.

8	2	1	0			Water Efficiency	Standard
1				WE	Credit 1	**Outdoor Water Use Reduction:** 50% Reduction	Reduce potable water used for irrigation by 50%.
	1			WE	Credit 1	**Outdoor Water Use Reduction:** No Potable Water	No potable water use for irrigation.
3				WE	Credit 2	**Water Use Reduction:** 25% / 30% / 35%	Reduce building water use over LEED baseline .
1	1	1		WE	Credit 2	**Water Use Reduction:** 40% / 45% / 50%	Reduce building water use over LEED baseline .
2				WE	Credit 3	**Cooling Tower Water Use**	Conduct a water analysis to optimize cooling tower cycles. Maximizing cycles (1pt), >10 cycled or 20% non-potable water use (2pts).
1				WE	Credit 4	**Water Metering**	Install permanent water meters for two or more water subsystems.

12	5	15	1	Energy & Atmosphere		Standard
4		2		EA Credit 1	**Enhanced Commissioning**	CD review, post occupancy review, recommissioning manual (3pts) AND develop monitoring procedures (4pts) AND/OR envelope Cx (2pts)
3				EA Credit 2	**Optimize Energy Performance:** 6% / 8% / 10%	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
3				EA Credit 2	**Optimize Energy Performance:** 12% / 14% / 16%	Reduce building energy cost by 12% / 14% / 16% compared to ASHRAE 90.1-2010, Appendix G.
1	2			EA Credit 2	**Optimize Energy Performance:** 18% / 20% / 22%	Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2010, Appendix G.
	2	1		EA Credit 2	**Optimize Energy Performance:** 24% / 26% / 29%	Reduce building energy cost by 24% / 26% / 29% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 32% / 35% / 38%	Reduce building energy cost by 32%/ 35%/ 38% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 42% / 46% / 50%	Reduce building energy cost by 42%/ 46%/ 50% 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.
		2		EA Credit 4	**Demand Response**	Design building and equipment for participation in demand response programs through load shedding or shifting.
		2	1	EA Credit 5	**Renewable Energy Production:** 1% / 5% / 10%	Produce renewable energy on-site for 1% / 5% / 10% of building energy consumption, calculated by cost.
1				EA Credit 6	**Enhanced Refrigerant Management**	Select refrigerants with low global warming potential and ozone depletion potential.
		2		EA Credit 7	**Green Power and Carbon Offsets**	Engage a 5 year contract for at least 50% or 100% of the project's energy from green power, carbon offsets, or RECs

5	3	3	2	Materials & Resources		Standard
		3	2	MR Credit 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). Credit can also be earned for building and material reuse, or renovation of an abandoned building (2-5pts).
1	1			MR Credit 2	**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 , 50% by cost (1 pt)
1	1			MR Credit 3	**Building Product Disclosure & Optimization:** Sourcing of Raw Materials	Use 20 products sourced from five different manufacturers that have publicly released a report from their raw material suppliers (1pt) AND/OR products that meet responsible extraction criteria, 25% material cost (1pt)
1	1			MR Credit4	**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, 25% material cost (1pt)
2				MR Credit 5	**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)

8	6	2	0	Indoor Environmental Quality		Standard
2				IEQ Credit 1	**Enhanced Air Quality Strategies**	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) AND/OR prevent exterior contaminatior or increase ventilation or monitor CO2 (1pt).
1	1	1		IEQ Credit 2	**Low-Emitting Materials:** 2 / 4 / 5 categories	Achieve the threshold level of compliance with emissions and content standards for 2, 4 or 5 product categories
1				IEQ 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
1	1			IEQ Credit 4	**Indoor Air Quality Assessment**	Perform pre-occupancy building flush out (1pt) or testing (2pts).
1				IEQ Credit 5	**Thermal Comfort**	Meet ASHRAE 55-2010, Thermal Comfort Conditions for Human Occupancy.
2				IEQ Credit 6	**Interior Lighting**	Provide lighting controls for 90% of individuals AND/OR meet four of LEED's lighting quality requirements.
	2	1		IEQ Credit 7	**Daylight:** 55% / 75%	Demonstrate through annual simulations that daylight autonomy300/50% (sDA300/50%) is achieved (2/3pts)
	1			IEQ Credit 8	**Quality Views**	Provide direct views to the outside in 75% of regularly occupied spaces which meets 2 out of 4 LEED view criteria.
	1			IEQ Credit 9	**Acoustic Performance**	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.

4	2	0	0	Innovation in Design		Standard
1				ID Credit 1.1	**Innovation in Design**, Green Education	Pending GBCI review and comment.
1				ID Credit 1.2	**Innovation in Design**, Green Cleaning	Pending GBCI review and comment.
1				ID Credit 1.3	**Innovation in Design**, Low Mercury Lighting	Pending GBCI review and comment.
	1			ID Credit 1.4	**Innovation in Design**, Organic Landscape Management	Pending GBCI review and comment.
	1			ID Credit 1.5	**Innovation in Design**, Integrated Pest Management	Pending GBCI review and comment.
1				ID Credit 2	**LEED™ Accredited Professional**	LEED Accredited Professional on design team.

2	2	0	0	Regional Priority		Standard
1				RP Credit 1.1	**Regional Priority**, Indoor Water Use Reduction	Pursuant to USGBC determined zone-based regional priority credit (Up to 6 points, required pt threshold = 4)
1				RP Credit 1.2	**Regional Priority**, Optimize Energy Performance	Pursuant to USGBC determined zone-based regional priority credit (Up to 18 points, required pt threshold = 8)
	1			RP Credit 1.3	**Regional Priority**, High Priority Site	Pursuant to USGBC determined zone-based regional priority credit (2 points, required point threshold = 2)
	1			RP Credit 1.4	**Regional Priority**, Rainwater Management	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)
				RP Credit	**Regional Priority**, Renewable Energy Production	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)

SoMa Site and Buildings 2-6

LEED v4 - Kendall Master Site

last updated: April 23, 2015

Achievability			
hi	med	low	NP
29	6	4	0

Certified 40 to 49 points **Silver** 50 to 59 points **Gold** 60 to 79 points **Platinum** 80 or more points

Achievability rating: **Hi** = 90%, **Med** = 60%, **Low** = 10%, **NP** = not possible.

30 Projected Points

					Prerequisites	**Standard**
Y				SS Prereq 1	**Construction Activity Pollution Prevention**	Create and implement erosion control plan that meets the 2003 EPA Construction General Permit.
Y				WE Prereq 1	**Outdoor Water Use Reduction:** 30%	Reduce outdoor water use by 30% over the baseline specified in LEED.
Y				EA Prereq 4	**Fundamental Refrigerant Management**	Eliminate CFCs in building HVAC&R.
Y				MR Prereq 2	**Construction and Demolition Waste Management Planning**	Develop and implement a construction and demolition waste management plan
Y				IEQ Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Prohibit smoking inside building, and locate exterior smoking areas at least 25 feet away from building.
17	0	3	0		**Location & Transportation**	**Standard**
			20	LT Credit 1	**LEED for Neighborhood Development Location**	Locate the project in within a development certified under LEED for Neighborhood Development
2				LT Credit 2	**Sensitive Land Protection**	Locate the development footprint on land that has been previously developed.
		3		LT Credit 3	**High Priority Site**	Locate the project on a site where contaminated soil/groundwater remediation is required or in historic district/building.
6				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.
6				LT Credit 5	**Access to Quality Transit**	Locate project within 1/2 mile of a rail station or ferry terminal or 1/4 mile of bus, streetcar or rideshare.
1				LT Credit 6	**Bicycle Facilities**	Access to bicycle network. Short term (2.5% peak visitors) and long term (5% all occupants) bike parking and FTE showers
1				LT Credit 7	**Reduced Parking Footprint**	Preferred parking for carpools for 5% of the total parking spaces
1				LT Credit 8	**Green Vehicles**	Preferred parking for Green Vehicles: 5% of all parking spaces and electric vehicle charging or alternative fuel facility for 2%
6	3	1	0		**Sustainable Sites**	**Standard**
1				SS Credit 1	**Site Assessment**	Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
	2			SS Credit 2	**Site Development:** Protect or Restore Habitat	Protect 40% of greenfield and restore 30% of previously developed site (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).
3				SS Credit 4	**Rainwater Management**	Manage runoff for the 95th percentile (2pt), 98th percentile (+1pt) with low-impact development (LID) and green infrastructure.
2				SS Credit 5	**Heat Island Reduction**	Meet high albedo requirements for roof and site 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.
1	1	0	0		**Water Efficiency**	**Standard**
1				WE Credit 1	**Outdoor Water Use Reduction:** 50% Reduction	Reduce potable water used for irrigation by 50%.
	1			WE Credit 1	**Outdoor Water Use Reduction:** No Potable Water	No potable water use for irrigation.
4	1	0	0		**Innovation in Design**	**Standard**
1				ID Credit 1.1	**Innovation in Design**, Green Education	Pending GBCI review and comment.
1				ID Credit 1.2	**Innovation in Design**, Green Cleaning	Pending GBCI review and comment.
1				ID Credit 1.3	**Innovation in Design**, Organic Landscape Management	Pending GBCI review and comment.
	1			ID Credit 1.4	**Innovation in Design**, Integrated Pest Management	Pending GBCI review and comment.
1				ID Credit 2	**LEED™ Accredited Professional**	LEED Accredited Professional on design team.
1	1	0	0		**Regional Priority**	**Standard**
	1			RP Credit 1.3	**Regional Priority**, High Priority Site	Pursuant to USGBC determined zone-based regional priority credit (2 points, required point threshold = 2)
1				RP Credit 1.4	**Regional Priority**, Rainwater Management	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)

LEED v4 for BD+C: Core and Shell

Project Checklist

Project Name: Building 2

Date: 5/6/2015

Y	?	N			
1			Credit	Integrative Process	1

17	3	0	Location and Transportation	20
			Credit	LEED for Neighborhood Development Location	20
2			Credit	Sensitive Land Protection	2
	3		Credit	High Priority Site	3
6			Credit	Surrounding Density and Diverse Uses	6
6			Credit	Access to Quality Transit	6
1			Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

8	2	2	Sustainable Sites	11
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
	1		Credit	Open Space	1
3			Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1
2			Credit	Tenant Design and Construction Guidelines	1

6	3	4	Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2		2	Credit	Outdoor Water Use Reduction	2
3	1	2	Credit	Indoor Water Use Reduction	6
	2		Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

6	12	14	Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
2	3	1	Credit	Enhanced Commissioning	6
3	3	11	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

6	5	3	Materials and Resources	14
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
3		3	Credit	Building Life-Cycle Impact Reduction	6
	2		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1	1		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

4	3	3	Indoor Environmental Quality	10
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
2	1		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
		3	Credit	Daylight	3
	1		Credit	Quality Views	1

2	0	0	Innovation	6
1			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

2	2	0	Regional Priority	4
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1

52	30	26	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Building 3

LEED v4 for Core and Shell Development
Project Scorecard

Project Name: Site N
Project Address: Main Street Cambridge, MA
Updated: May 12, 2015

TOTALS				
63	6	14	26	Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

				GENERAL PROJECT DOCUMENTATION		
Y				PI form 1	Minimum Program Requirements	Required
Y				PI form 2	Project Summary Details	Required
Y				PI form 3	Occupant Usage Data	Required
Y				PI form 4	Schedule and Overview Documents	Required
Y				PI form 5	Building Systems Control	Required

Yes	?+	?-	No				
1	0	0	0	**Integrative Process**		1	5/12 updates
1				Credit 1	**Integrative Process**	1	

Yes	?+	?-	No				
17	0	3	0	**Location + Transportation**		20	5/12 updates
				Credit 1	**LEED for Neighborhood Development**	20	
2				Credit 2	**Sensitive Land Protection**	2	
		3		Credit 3	**High Priority Site**	3	
6				Credit 4	**Surrounding Density and Diverse Uses**	6	Master Site Credit
6				Credit 5	**Access to Quality Transit**	6	Master Site Credit
1				Credit 6	**Bicycle Facilities**	1	Master Site Credit
1				Credit 7	**Reduced Parking Footprint**	1	Master Site Credit
1				Credit 8	**Green Vehicles**	1	Master Site Credit

Yes	?+	?-	No				
8	1	1	0	**SUSTAINABLE SITES**		11	5/12 updates
Y				Prereq 1	**Construction Activity Pollution Prevention**	Required	REQUIRED
1				Credit 1	**Site Assessment**	1	Master Site Credit
2				Credit 2	**Site Development - Protect or Restore Habitat**	2	MITIMCo interested in pursing crecit via Option 2. Via Land Trust support
	1			Credit 3	**Open Space**	1	Consider attempting on a project basis - dependent on final design
3				Credit 4	**Rainwater Management**	3	Master Site Credit
1		1		Credit 5	**Heat Island Reduction**	1 to 2	Master Site Credit
		1		Credit 6	**Light Pollution Reduction**	1	Consider pursing on project basis
1				Credit 7	**Tenant Design and Construction Guidelines**	1	Assumes owner will provide non-binding Tenant Design and Construction Guidelines to potential tenants

Yes	?		No				
7	1	2	1	**WATER EFFICIENCY**		11	5/12 updates
Y				Prereq 1	**Outdoor Water Use Reduction**	Required	REQUIRED. Master Site
Y				Prereq 2	**Inddoor Water Use Reduction**	Required	REQUIRED
Y				Prereq 3	**Building Level Water Metering**	Required	REQUIRED
2				Credit 1	**Outdoor Water Use Reduction 50%**	2	Master Site Credit; assumes reduced potable water use for irrigation by 50% OR no irrigation
4		1	1	Credit 2	**Indoor Water Use Reduction 30%-50%**	2 to 6	Assumes project will achieve a 40% water use reduction and attempt to reach the 40% threshold
	1	1		Credit 3	**Cooling Tower Water Use**	1 to 2	Consider attempting this credit requires conducting a one-time potable water analysis to measure 5 established control parameters and determining the max allowed concentration level of each in the make up water. Limit cooling tower cycles.
1				Credit 4	**Water Metering**	1	Consider attempting - requires additional water end use metering

Building 3

Yes	?		No					
10	2	2	19	ENERGY & ATMOSPHERE		33		5/12 updates
Y				Prereq 1	**Fundamental Commissioning of Building Energy Systems**	Required	REQUIRED	
Y				Prereq 2	**Minimum Energy Performance**	Required	REQUIRED	
				Prereq 3	**Building Level Energy Metering**	Required	REQUIRED	
Y				Prereq 4	**Fundamental Refrigerant Management**	Required		
6				Credit 1	**Enhanced Commissioning**	2 to 6	Project will pursue enhanced commissioning; monitor based commissioning and building envelop commissioning.	
3	1	2	12	Credit 2	**Optimize Energy Performance**	up to 18	Pending AHA energy model updates. HOLD until MEP design is further developed	
	1			Credit 3	**Advanced Energy Metering**	1	Consider attempting this credit. Requires installation of advanced energy metering for the base building and to enable tenants to independently meter energy consumption for all systems within their space NOTE: MIT is typically interested in a high level of energy metering	
			2	Credit 4	**Demand Response**	2	Assumed 'no'	
			3	Credit 5.1	**Renewable Energy Production**	3	Dependent on design team input; Assumed 'no'	
1				Credit 5.2	**Enhanced Refrigerant Management**	1	Dependent on design team input	
			2	Credit 6	**Green Power and Carbon off-sets**	1 to 2	Not a design decision	
Yes	?		No					
6	2	3	3	MATERIALS & RESOURCES		14		5/12 updates
Y				Prereq 1	**Storage and Collection of Recyclables**	Required	REQUIRED	
Y				Prereq 2	**Construction and Demolition Waste Management Planning**	Required	REQUIRED. Master Site prerequisite. May on be applicable if the CM is the same for all projects and construction occurs simultaneously or progressively	
3			3	Credit 1	**Building Life-Cycle Impact Reduction**	2 to 6	Assumes project will pursue Option 4 whole-building life-cycle assessment	
	1	1		Credit 2	**Building Product Disclosure and Optimization - Environmental Product Declaration**	2	Assumes project will attempt Option 1 EPDs for 20 products from at least 5 different manufacturers	
1		1		Credit 3	**Building Product Disclosure and Optimization - Sourcing of Raw Materials**	2	Assumes project will attempt Option 2 Leadership extraction practices and consider Option 1 Raw material source & extraction reporting	
	1	1		Credit 4	**Building Product Disclosure and Optimization - Material Ingredients**	2	Assumes project will attempt Option 2 Leadership extraction practices	
2				Credit 5	**Construction and Demolition Waste Management**	2	Assumes technical specifications will include a section for Construction Waste Management in Division 1	
Yes	?		No					
5	0	2	3	INDOOR ENVIROMENTAL QUALITY		10		5/12 updates
Y				Prereq 1	**Minimum Indoor Air Quality Performance**	Required	REQUIRED	
Y				Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required	REQUIRED. Master site prerequisite	
1		1		Credit 1	**Enhanced Indoor Air Quality Strategies**	2	Assumes project will meet criteria for walk off mats, filtration, etc.	
2		1		Credit 2	**Low Emitting Materials**	1 to 3	Assumes 4 of the possible 6 categories will be met	
1				Credit 3	**Construction Indoor Air Quality Management Plan**	1	Assumes technical specifications will include a section for Indoor Air Quality Management in Division 1	
			3	Credit 4	**Daylight**	3	Assumed 'no'. Requires daylight modeling	
1				Credit 5	**Quality Views**	1	Dependent on typical tenant layout	
Yes	?		No					
6	0	0	0	INNOVATION IN DESIGN		6		5/12 updates
1				Credit 1.1	**ID - Exemplary Performance in SSc4.1**	1	Master Site Credit	
1				Credit 1.2	**ID - Exemplary Performance SSc7.2**	1	Master Site Credit	
1				Credit 1.3	**ID - Green Education**	1	Master Site Credit	
1				Credit 1.4	**ID - Green Cleaning**	1	Master Site Credit	
1				Credit 1.5	**ID -Organic Landscape Management or Integrated Pest Control**	1	Master Site Credit	
1				Credit 2	**LEED® Accredited Professional**	1		
Yes	?		No					
3	0	1	0	REGIONAL PRIORITY - zip code 02139		4		5/12 updates
1				Credit 1	**Regional Priority for 02139:** Renewable Energy Production; Optimize Energy Performance 8pt threshold; High Prio	1	Rainwater Management	
1				Credit 2	**Regional Priority for 02139:** Renewable Energy Production; Optimize Energy Performance 8pt threshold; High Prio	1	Building Life Cycle Impact Assessment	
1				Credit 3	**Regional Priority for 02139:** Renewable Energy Production; Optimize Energy Performance 8pt threshold; High Prio	1	40% Indoor water use reduction	
		1		Credit 4	**Regional Priority for 02139:** Renewable Energy Production; Optimize Energy Performance 8pt threshold; High Prio	1		
Yes	?		No					
63	6	14	26	PROJECT TOTALS (Certification Estimates)		110		

Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

LEED v4 for New Construction - Kendall Square Building 4

last updated: May 4, 2015

Achievability				
hi	med	low	NP	
58	26	17	9	70 Projected Points

Certified 40 to 49 points **Silver** 50 to 59 points **Gold** 60 to 79 points **Platinum** 80 or more points

Achievability rating: **Hi** = 90%, **Med** = 60%, **Low** = 10%, **NP** = not possible.

					Prerequisites	**Standard**
Y				SS Prereq 1	**Construction Activity Pollution Prevention**	Create and implement erosion control plan that meets the 2003 EPA Construction General Permit.
Y				WE Prereq 1	**Outdoor Water Use Reduction:** 30%	Reduce outdoor water use by 30% over the baseline specified in LEED.
Y				WE Prereq 2	**Indoor Water Use Reduction:** 20%	Reduce indoor water use by 20% over the baseline specified in LEED and meet requirements for process water use.
Y				WE Prereq 3	**Building-Level Water Metering**	Install permanent water meters for building and grounds
Y				EA Prereq 1	**Fundamental Commissioning and Verification**	Engage commissioning agent, and develop and execute a commissioning plan. 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 the USGBC for 5 years
Y				EA Prereq 4	**Fundamental Refrigerant Management**	Eliminate CFCs in building HVAC&R.
Y				MR Prereq 1	**Storage & Collection of Recyclables**	Provide space for the collection and storage of paper, cardboard, glass, plastic, and metals.
Y				MR Prereq 2	**Construction and Demolition Waste Management Planning**	Develop and implement a construction and demolition waste management plan
Y				IEQ Prereq 1	**Minimum IAQ Performance**	Meet sections 4 through 7 of ASHRAE 62.1-2010.
Y				IEQ Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Prohibit smoking inside building, and locate exterior smoking areas at least 25 feet away from building.
1	0	0	0		**Integrative Process**	**Standard**
1				IP Credit 1	**Integrative Process**	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.
12	2	2	0		**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.
		2		LT Credit 3	**High Priority Site**	Locate the project on a site where contaminated soil/groundwater remediation is required or in historic district/building.
5				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.
5				LT Credit 5	**Access to Quality Transit**	Locate project within 1/2 mile of a rail station or ferry terminal or 1/4 mile of bus, streetcar or rideshare.
1				LT Credit 6	**Bicycle Facilities**	Access to bicycle network. Short term (2.5% peak visitors) and long term (5% all occupants) bike parking and FTE showers
	1			LT Credit 7	**Reduced Parking Footprint**	Preferred parking for carpools for 5% of the total parking spaces
	1			LT Credit 8	**Green Vehicles**	Preferred parking for Green Vehicles: 5% of all parking spaces and electric vehicle charging or alternative fuel facility for 2%
6	3	0	1		**Sustainable Sites**	**Standard**
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	**Site Development:** Protect or Restore Habitat	Protect 40% of greenfield and restore 30% of previously developed site (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).
3				SS Credit 4	**Rainwater Management**	Manage runoff for the 95th percentile (2pt), 98th percentile (+1pt) with low-impact development (LID) and green infrastructure.
2				SS Credit 5	**Heat Island Reduction**	Meet high albedo requirements for roof and site 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.
3	4	2	2		**Water Efficiency**	**Standard**
1				WE Credit 1	**Outdoor Water Use Reduction:** 50% Reduction	Reduce potable water used for irrigation by 50%.
		1		WE Credit 1	**Outdoor Water Use Reduction:** No Potable Water	No potable water use for irrigation.
2	1			WE Credit 2	**Water Use Reduction:** 25% / 30% / 35%	Reduce building water use over LEED baseline .
	2	1		WE Credit 2	**Water Use Reduction:** 40% / 45% / 50%	Reduce building water use over LEED baseline .
			2	WE Credit 3	**Cooling Tower Water Use**	Conduct a water analysis to optimize cooling tower cycles. Maximizing cycles (1pt), >10 cycled or 20% non-potable water use (2pts).
	1			WE Credit 4	**Water Metering**	Install permanent water meters for two or more water subsystems.

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14	3	12	4	Energy & Atmosphere		Standard
6				EA Credit 1	**Enhanced Commissioning**	CD review, post occupancy review, recommissioning manual (3pts) AND develop monitoring procedures (4pts) AND/OR envelope Cx (2pts)
3				EA Credit 2	**Optimize Energy Performance:** 6% / 8% / 10%	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
3				EA Credit 2	**Optimize Energy Performance:** 12% / 14% / 16%	Reduce building energy cost by 12% / 14% / 16% compared to ASHRAE 90.1-2010, Appendix G.
2	1			EA Credit 2	**Optimize Energy Performance:** 18% / 20% / 22%	Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2010, Appendix G.
	2	1		EA Credit 2	**Optimize Energy Performance:** 24% / 26% / 29%	Reduce building energy cost by 24% / 26% / 29% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 32% / 35% / 38%	Reduce building energy cost by 32%/ 35%/ 38% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 42% / 46% / 50%	Reduce building energy cost by 42%/ 46%/ 50% 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.
			2	EA Credit 4	**Demand Response**	Design building and equipment for participation in demand response programs through load shedding or shifting.
		2	1	EA Credit 5	**Renewable Energy Production:** 1% / 5% / 10%	Produce renewable energy on-site for 1% / 5% / 10% of building energy consumption, calculated by cost.
			1	EA Credit 6	**Enhanced Refrigerant Management**	Select refrigerants with low global warming potential and ozone depletion potential.
		2		EA Credit 7	**Green Power and Carbon Offsets**	Engage a 5 year contract for at least 50% or 100% of the project's energy from green power, carbon offsets, or RECs

5	6	0	2	Materials & Resources		Standard
	3		2	MR Credit 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). Credit can also be earned for building and material reuse, or renovation of an abandoned building (2-5pts).
1	1			MR Credit 2	**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 , 50% by cost (1 pt)
1	1			MR Credit 3	**Building Product Disclosure & Optimization:** Sourcing of Raw Materials	Use 20 products sourced from five different manufacturers that have publicly released a report from their raw material suppliers (1pt) AND/OR products that meet responsible extraction criteria, 25% material cost (1pt)
1	1			MR Credit4	**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, 25% material cost (1pt)
2				MR Credit 5	**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)

11	4	1	0	Indoor Environmental Quality		Standard
2				IEQ Credit 1	**Enhanced Air Quality Strategies**	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) AND/OR prevent exterior contaminatior or increase ventilation or monitor CO2 (1pt).
2	1			IEQ Credit 2	**Low-Emitting Materials:** 2 / 4 / 5 categories	Achieve the threshold level of compliance with emissions and content standards for 2, 4 or 5 product categories
1				IEQ 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
1	1			IEQ Credit 4	**Indoor Air Quality Assessment**	Perform pre-occupancy building flush out (1pt) or testing (2pts).
1				IEQ Credit 5	**Thermal Comfort**	Meet ASHRAE 55-2010, Thermal Comfort Conditions for Human Occupancy.
2				IEQ Credit 6	**Interior Lighting**	Provide lighting controls for 90% of individuals AND/OR meet four of LEED's lighting quality requirements.
2		1		IEQ Credit 7	**Daylight:** 55% / 75%	Demonstrate through annual simulations that daylight autonomy300/50% (sDA300/50%) is achieved (2/3pts)
	1			IEQ Credit 8	**Quality Views**	Provide direct views to the outside in 75% of regularly occupied spaces which meets 2 out of 4 LEED view criteria.
	1			IEQ Credit 9	**Acoustic Performance**	Meet requirements for HVAC background noise, sound isolation, reverberation time, & sound reinforcement for all occupied spaces.

4	2	0	0	Innovation in Design		Standard
1				ID Credit 1.1	**Innovation in Design**, Green Education	Pending GBCI review and comment.
1				ID Credit 1.2	**Innovation in Design**, Green Cleaning	Pending GBCI review and comment.
1				ID Credit 1.3	**Innovation in Design**, Low Mercury Lighting	Pending GBCI review and comment.
	1			ID Credit 1.4	**Innovation in Design**, Organic Landscape Management	Pending GBCI review and comment.
	1			ID Credit 1.5	**Innovation in Design**, Integrated Pest Management	Pending GBCI review and comment.
1				ID Credit 2	**LEED™ Accredited Professional**	LEED Accredited Professional on design team.

2	2	0	0	Regional Priority		Standard
	1			RP Credit 1.1	**Regional Priority**, Indoor Water Use Reduction	Pursuant to USGBC determined zone-based regional priority credit (Up to 6 points, required pt threshold = 4)
1				RP Credit 1.2	**Regional Priority**, Optimize Energy Performance	Pursuant to USGBC determined zone-based regional priority credit (Up to 18 points, required pt threshold = 8)
	1			RP Credit 1.3	**Regional Priority**, High Priority Site	Pursuant to USGBC determined zone-based regional priority credit (2 points, required point threshold = 2)
1				RP Credit 1.4	**Regional Priority**, Rainwater Management	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)
				RP Credit	**Regional Priority**, Renewable Energy Production	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)

LEED v4 for Core & Shell - Kendall Square Building 5

last updated: April 23, 2015

Achievability			
hi	med	low	NP
63	21	21	6

Certified 40 to 49 points **Silver** 50 to 59 points **Gold** 60 to 79 points **Platinum** 80 or more points
Achievability rating: **Hi** = 90%, **Med** = 60%, **Low** = 10%, **NP** = not possible.

71 Projected Points

						Prerequisites	Standard
Y				SS	Prereq 1	**Construction Activity Pollution Prevention**	Create and implement erosion control plan that meets the 2003 EPA Construction General Permit.
Y				WE	Prereq 1	**Outdoor Water Use Reduction:** 30%	Reduce outdoor water use by 30% over the baseline specified in LEED.
Y				WE	Prereq 2	**Indoor Water Use Reduction:** 20%	Reduce indoor water use by 20% over the baseline specified in LEED and meet requirements for process water use.
Y				WE	Prereq 3	**Building-Level Water Metering**	Install permanent water meters for building and grounds
Y				EA	Prereq 1	**Fundamental Commissioning and Verification**	Engage commissioning agent, and develop and execute a commissioning plan. 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 the USGBC for 5 years
Y				EA	Prereq 4	**Fundamental Refrigerant Management**	Eliminate CFCs in building HVAC&R.
Y				MR	Prereq 1	**Storage & Collection of Recyclables**	Provide space for the collection and storage of paper, cardboard, glass, plastic, and metals.
Y				MR	Prereq 2	**Construction and Demolition Waste Management Planning**	Develop and implement a construction and demolition waste management plan
Y				IEQ	Prereq 1	**Minimum IAQ Performance**	Meet sections 4 through 7 of ASHRAE 62.1-2010.
Y				IEQ	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Prohibit smoking inside building, and locate exterior smoking areas at least 25 feet away from building.

1	0	0	0			Integrative Process	Standard
1				IP	Credit 1	**Integrative Process**	Perform preliminary energy model and water budget before the completion of SD and document in OPR & BOD.

17	0	3	0			Location & Transportation	Standard
			20	LT	Credit 1	**LEED for Neighborhood Development Location**	Locate the project in within a development certified under LEED for Neighborhood Development
2				LT	Credit 2	**Sensitive Land Protection**	Locate the development footprint on land that has been previously developed.
		3		LT	Credit 3	**High Priority Site**	Locate the project on a site where contaminated soil/groundwater remediation is required or in historic district/building.
6				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.
6				LT	Credit 5	**Access to Quality Transit**	Locate project within 1/2 mile of a rail station or ferry terminal or 1/4 mile of bus, streetcar or rideshare.
1				LT	Credit 6	**Bicycle Facilities**	Access to bicycle network. Short term (2.5% peak visitors) and long term (5% all occupants) bike parking and FTE showers
1				LT	Credit 7	**Reduced Parking Footprint**	Preferred parking for carpools for 5% of the total parking spaces
1				LT	Credit 8	**Green Vehicles**	Preferred parking for Green Vehicles: 5% of all parking spaces and electric vehicle charging or alternative fuel facility for 2%

6	3	1	0			Sustainable Sites	Standard
1				SS	Credit 1	**Site Assessment**	Complete comprehensive site survey; topography, hydrology, climate, vegetation, soils, human use and human health effects.
	2			SS	Credit 2	**Site Development:** Protect or Restore Habitat	Protect 40% of greenfield and restore 30% of previously developed site (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).
3				SS	Credit 4	**Rainwater Management**	Manage runoff for the 95th percentile (2pt), 98th percentile (+1pt) with low-impact development (LID) and green infrastructure.
2				SS	Credit 5	**Heat Island Reduction**	Meet high albedo requirements for roof and site 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.
	1			SS	Credit 7	**Tenant Design and Construction Guidelines**	Develop Tenant Guildelines for future tenants to fit out their space.

6	4	1	0			Water Efficiency	Standard
1				WE	Credit 1	**Outdoor Water Use Reduction:** 50% Reduction	Reduce potable water used for irrigation by 50%.
	1			WE	Credit 1	**Outdoor Water Use Reduction:** No Potable Water	No potable water use for irrigation.
3				WE	Credit 2	**Water Use Reduction:** 25% / 30% / 35%	Reduce building water use over LEED baseline .
1	1	1		WE	Credit 2	**Water Use Reduction:** 40% / 45% / 50%	Reduce building water use over LEED baseline .
	2			WE	Credit 3	**Cooling Tower Water Use**	Conduct a water analysis to optimize cooling tower cycles. Maximizing cycles (1pt), >10 cycled or 20% non-potable water use (2pts).

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1				WE Credit 4	**Water Metering**	Install permanent water meters for two or more water subsystems.

12	5	13	3		**Energy & Atmosphere**	**Standard**
4		2		EA Credit 1	**Enhanced Commissioning**	CD review, post occupancy review, recommissioning manual (3pts) AND develop monitoring procedures (4pts) AND/OR envelope Cx (2pts)
3				EA Credit 2	**Optimize Energy Performance:** 6% / 8% / 10%	Reduce building energy cost by 6% / 8% / 10% compared to ASHRAE 90.1-2010, Appendix G.
3				EA Credit 2	**Optimize Energy Performance:** 12% / 14% / 16%	Reduce building energy cost by 12% / 14% / 16% compared to ASHRAE 90.1-2010, Appendix G.
	3			EA Credit 2	**Optimize Energy Performance:** 18% / 20% / 22%	Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2010, Appendix G.
	2	1		EA Credit 2	**Optimize Energy Performance:** 24% / 26% / 29%	Reduce building energy cost by 24% / 26% / 29% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 32% / 35% / 38%	Reduce building energy cost by 32%/ 35%/ 38% compared to ASHRAE 90.1-2010, Appendix G.
		3		EA Credit 2	**Optimize Energy Performance:** 42% / 46% / 50%	Reduce building energy cost by 42%/ 46%/ 50% 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.
		2		EA Credit 4	**Demand Response**	Design building and equipment for participation in demand response programs through load shedding or shifting.
			3	EA Credit 5	**Renewable Energy Production:** 1% / 5% / 10%	Produce renewable energy on-site for 1% / 5% / 10% of building energy consumption, calculated by cost.
1				EA Credit 6	**Enhanced Refrigerant Management**	Select refrigerants with low global warming potential and ozone depletion potential.
		2		EA Credit 7	**Green Power and Carbon Offsets**	Engage a 5 year contract for at least 50% or 100% of the project's energy from green power, carbon offsets, or RECs

5	3	3	3		**Materials & Resources**	**Standard**
		3	3	MR Credit 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). Credit can also be earned for building and material reuse, or renovation of an abandoned building (2-5pts).
1	1			MR Credit 2	**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 , 50% by cost (1 pt)
1	1			MR Credit 3	**Building Product Disclosure & Optimization:** Sourcing of Raw Materials	Use 20 products sourced from five different manufacturers that have publicly released a report from their raw material suppliers (1pt) AND/OR products that meet responsible extraction criteria, 25% material cost (1pt)
1	1			MR Credit4	**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, 25% material cost (1pt)
2				MR Credit 5	**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)

9	3	0	0		**Indoor Environmental Quality**	**Standard**
2				IEQ Credit 1	**Enhanced Air Quality Strategies**	Provide entryway systems, prevent interior cross-contamination, and specify MERV 13 filters (1pt) AND/OR prevent exterior contaminatior or increase ventilation or monitor CO2 (1pt).
2	1			IEQ Credit 2	**Low-Emitting Materials:** 2 / 4 / 5 categories	Achieve the threshold level of compliance with emissions and content standards for 2, 4 or 5 product categories
1				IEQ 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
1	1			IEQ Credit 4	**Indoor Air Quality Assessment**	Perform pre-occupancy building flush out (1pt) or testing (2pts).
2	1			IEQ Credit 5	**Daylight:** 55% / 75%	Demonstrate through annual simulations that daylight autonomy300/50% (sDA300/50%) is achieved (2/3pts)
1				IEQ Credit 6	**Quality Views**	Provide direct views to the outside in 75% of regularly occupied spaces which meets 2 out of 4 LEED view criteria.

5	1	0	0		**Innovation in Design**	**Standard**
1				ID Credit 1.1	**Innovation in Design**, Green Education	Pending GBCI review and comment.
1				ID Credit 1.2	**Innovation in Design**, Green Cleaning	Pending GBCI review and comment.
1				ID Credit 1.3	**Innovation in Design**, Low Mercury Lighting	Pending GBCI review and comment.
1				ID Credit 1.4	**Innovation in Design**, Organic Landscape Management	Pending GBCI review and comment.
	1			ID Credit 1.5	**Innovation in Design**, Integrated Pest Management	Pending GBCI review and comment.
1				ID Credit 2	**LEED™ Accredited Professional**	LEED Accredited Professional on design team.

2	2	0	0		**Regional Priority**	**Standard**
	1			RP Credit 1.1	**Regional Priority**, Indoor Water Use Reduction	Pursuant to USGBC determined zone-based regional priority credit (Up to 6 points, required pt threshold = 4)
1				RP Credit 1.2	**Regional Priority**, Optimize Energy Performance	Pursuant to USGBC determined zone-based regional priority credit (Up to 18 points, required pt threshold = 8)
	1			RP Credit 1.3	**Regional Priority**, High Priority Site	Pursuant to USGBC determined zone-based regional priority credit (2 points, required point threshold = 2)
1				RP Credit 1.4	**Regional Priority**, Rainwater Management	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)
				RP Credit	**Regional Priority**, Renewable Energy Production	Pursuant to USGBC determined zone-based regional priority credit (Up to 3 points, required pt threshold = 2)

LEED v4 for BD+C: Core and Shell

Project Checklist

Project Name: Kendall Building 6 (Draft Checklist)

Date: 30-Apr-15

Y	?	N			
	1		Credit	Integrative Process	1

12	5	23	Location and Transportation	20
		20	Credit	LEED for Neighborhood Development Location	20
1	1		Credit	Sensitive Land Protection	2
1		2	Credit	High Priority Site	3
4	2		Credit	Surrounding Density and Diverse Uses	6
4	2		Credit	Access to Quality Transit	6
1			Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
		1	Credit	Green Vehicles	1

8	1	2	Sustainable Sites	11
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
1		1	Credit	Site Development - Protect or Restore Habitat	2
		1	Credit	Open Space	1
2	1		Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
1			Credit	Tenant Design and Construction Guidelines	1

6	2	3	Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
2	1	3	Credit	Indoor Water Use Reduction	6
1	1		Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

13	6	14	Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
5	1		Credit	Enhanced Commissioning	6
6	4	8	Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
		3	Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
	1	1	Credit	Green Power and Carbon Offsets	2

1	7	6	Materials and Resources	14
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	3	3	Credit	Building Life-Cycle Impact Reduction	6
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	1	1	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
1	1		Credit	Construction and Demolition Waste Management	2

8	2	0	Indoor Environmental Quality	10
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
2	1		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
3			Credit	Daylight	3
	1		Credit	Quality Views	1

3	2	1	Innovation	6
2	2	1	Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

0	4	0	Regional Priority	4
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1

51	30	49	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

SECTION F: MIT Kendall Square Acoustical Study

ACENTECH

33 Moulton Street
Cambridge MA 02138
617 499 8000
acentech.com

13 July 2015

Ms. Sandra Smith, AIA, LEED AP
Perkins+Will
225 Franklin Street, Suite 1100
Boston, MA 02110

Via email: sandra.smith@perkinswill.com

Subject: Article 19 Noise Mitigation Narrative
MIT Investment Management Company/MIT
SoMa and NoMa Site Environmental Noise Evaluation and Compliance
Cambridge, MA
Acentech Project No. 626051

Dear Ms. Smith:

We present you the MIT and MITIMCo South of Main (SoMa) and North of Main (NoMa) Noise Mitigation Narrative as a part of the Article 19 submission for the City of Cambridge. A final compliance for noise will be reviewed and confirmed as the various projects develop.

INTRODUCTION

The following is a list of the building sites for SoMa and NoMa as part of this study, also shown in the figure on the following page:

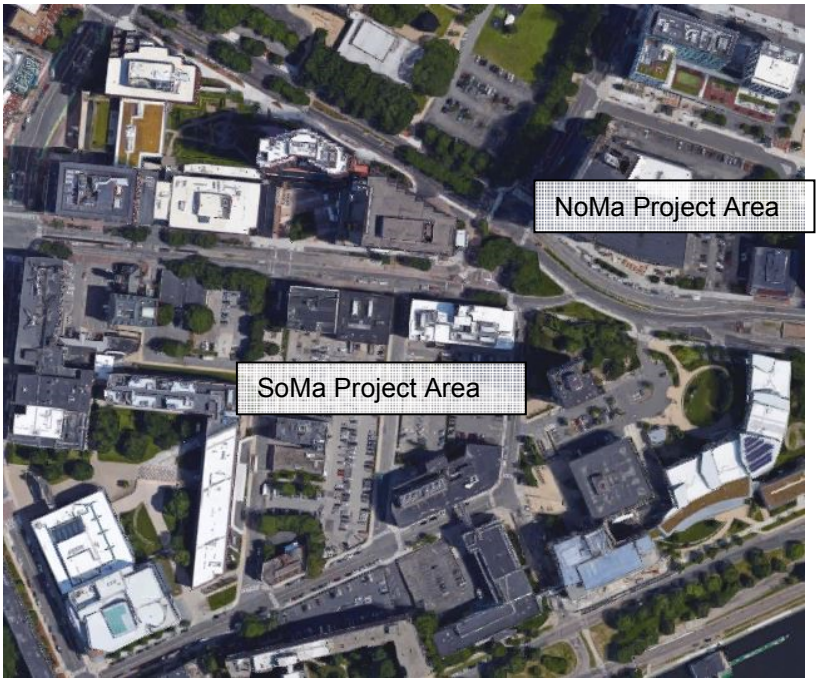
- Site 1 - This will be a residential tower with ground floor retail space designed by Elkus | Manfredi (MIT)
- Site 2 - This will be a future laboratory tower to be designed by Elkus | Manfredi (MITIMCo)
- Site 3 - This will be a new laboratory/office tower designed by Perkins + Will (MITIMCo)
- Site 4 - This will be a mixed-use Retail/Office/Residential tower and some renovation of the existing E38 and E39 buildings designed by Perkins + Will and NAADA (MIT); a mostly underground parking garage designed by Perkins + Will (MITIMCo), which will connect the various SoMa sites, is adjacent to the south side of Site 4
- Site 5 - This will be a commercial office building that will include space for the MIT Museum and retail space on the lower floors designed by Weiss/Manfredi (MIT)
- Site 6 - This will be a building used for Retail/Office designed by nArchitects (MITIMCo)

Acentech has reviewed project information from all of the different design teams, conducted a series of ambient sound measurements, and estimated property line and off-site sound levels associated with the proposed equipment. The pertinent findings of our study are summarized in this letter report.

Figures 1-S1 through 1-S6 show the preliminary design layout for each building and the locations of the major sound sources.

EXISTING ACOUSTIC ENVIRONMENT

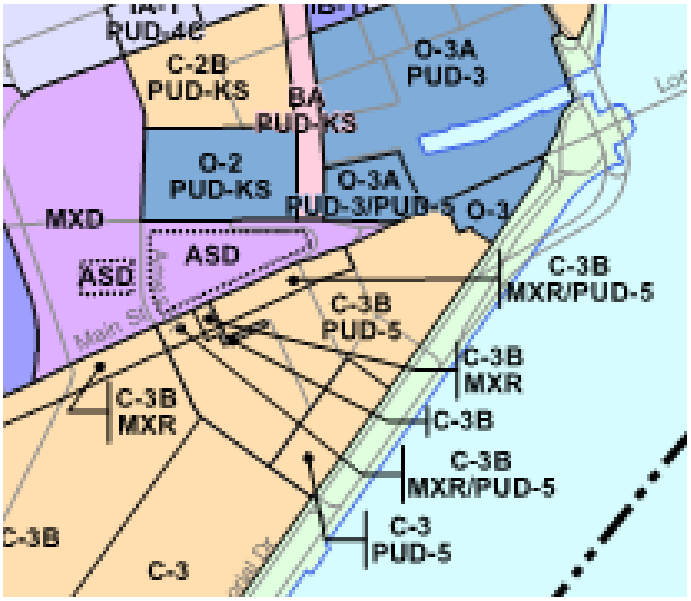
The figure below is an aerial photograph that shows the SoMa and NoMa project and surrounding community areas.



There are two hotels and one residential tower that we are aware of adjacent to the SoMa and NoMa sites. One hotel is north of Site 4 and another hotel is located between Sites 5 and 6. A residential tower is located north of Site 1. In April and May of 2015, we collected continuous ambient sound data during nominal one week periods at four locations and obtained short-term sound data during nighttime surveys at ten additional locations.

The purpose of the ambient survey was to characterize the existing land uses, sound sources, and acoustic environment in the area. The long-term measurements demonstrated the variation in the ambient sound levels over the day and night hours of weekday and weekend periods. In addition, we conducted short-term ambient sound measurements and observations on two weeknights as part of the overall April/May 2015 survey. Table 1 attached to the end of this narrative lists the instruments that we employed for the ambient measurements. Each sound monitor was laboratory-calibrated within the past year and each instrument's calibration was checked in the field with an acoustic calibrator before and after the measurements. The microphone for each instrument was fitted with a windscreen and mounted at a height of about four to five feet above the ground or roof location. Weather conditions during the overall survey period from 24 April to 14 May 2015 were quite variable with day and night temperatures ranging from about 40ºF to above 85ºF, periods of calm to moderately high winds, and a few periods of light rain. Although there was construction along Main Street during the weekdays, we judge that, in general, the sound data and observations collected during our survey characterize the typical existing acoustic environment in the area.

Zoning in this area is complex; the following figure shows the published Cambridge zoning map for the area. All "C" zoned areas are considered residential and all "O" zoned areas are offices. "ASD" is a part of Ames Street District, which is a mixed-use development area. For the purpose of our study, our recommendations base the hotels and residential tower as "residential" per the City of Cambridge Noise Ordinance. All other properties are considered "Business".



LONG-TERM DATA

The long-term collected sound data show the hour-to-hour and day-to-day variations in the background sound levels in the area and the short-term data characterize the background acoustic environment during typically quieter times. The main areas of interest are toward the Marriott Residences Hotel north of SoMa and the Kendall Hotel between Sites 5 and 6. The Watermark residential tower located north of NoMa is another property of interest. A MIT residential building is south of the SoMa site but much farther away along Memorial Drive. Other land uses in the area include: office towers north of SoMa; office and lab buildings northwest and west of SoMa; and MIT academic buildings west, south, and east of SoMa.

Figure 2 identifies the four locations selected for the collection of representative long-term ambient sound data. The long-term monitoring locations, which were selected based on their accessibility as well as their proximity to the project areas and potential noise sensitive community receptors, are:

- Location A -- Low roof of Badger Building (One Broadway) next to future Site 1
- Location B -- Lawn around Eastgate (on grade) at Site 2
- Location C -- Roof of MIT Coop across Main Street from Sites 4, 5, and 6
- Location D -- Low roof between Mudd Building and Whitaker College close to Sites 5 and 6

Figures 3a, 3b, 3c, and 3d show the L1, Leq, and L90 A-weighted sound levels for each 10-minute interval over the survey at the four long-term monitoring locations. These figures indicate a wide range of sound levels at the four locations, with the highest and lowest levels typically measured, respectively, during the day and night. The Leq sound levels include both the steady background sounds (e.g., distant traffic, distant construction, building HVAC systems) plus the short-term intrusive sounds (e.g., local car passbys). The L1 sound levels represent the nominal maximum sounds (e.g., local car passbys or sirens) that must occur for at least 1% of each interval (i.e., six seconds of each 10-minute interval). The L90 sound levels characterize the lowest background, or residual sound level that is exceeded for 90% of the time of each interval (i.e., 9 minutes of each 10-minute interval). The L90 sound level occurs when short-term intrusive sound sources, such as local traffic passbys, are absent and the sound level returns to a lower residual value. During this survey, the L90 sound levels were typically controlled by sounds of distant road traffic and modest to moderate contributions of sounds from the existing nearby commercial buildings. The four figures indicate that the lowest sound levels of about 52 to 56 dBA typically occurred at night.

SHORT-TERM DATA

In addition to long-term sound data, we performed manual short-term sampling of the overall A-weighted sound levels and spectral levels, and observed sound sources during two nighttime periods at each of the 10 locations shown in Figure 4 attached. The sound data were measured over a 10-minute period at each location with a precision sound level meter. The primary sound sources observed at these locations include: local traffic and existing mechanical equipment from the commercial buildings in the surrounding area. Sound from a water sprinkler system was also noted at one location on one night. Table 2 summarizes the residual (L90) ambient sound levels that were measured at each location. As noted above, the L90 level is the value exceeded for nine of the 10-minute sampling period at a location and represents the background, or residual, sound level. The data in Table 2 and Figure 5 indicate residual ambient sound levels ranging from 54 to 61 dBA on the first night and from 50 to 57 dBA on the second night over the 10 locations. As Figure 5 illustrates, the measured residual levels are greater than the residential nighttime standard and less than the commercial anytime standard in the Cambridge Noise Ordinance.

SOUND CRITERIA AND SUGGESTED OVERALL PROJECT SOUND GOALS

During the permitting phase it is necessary to determine the degree of sound reduction required. This is based upon estimates of the sound that will propagate from the facility and the sound level criteria appropriate for the neighborhood. The sound criteria for this project will address the following factors:

- Ambient or background sound levels during the quieter times
- Type of neighborhood – residential, business, or industrial
- Character of sound generated by proposed facility – sound level and spectrum

EXISTING LOCAL AND STATE NOISE REQUIREMENTS

Depending on the major equipment and noise control selected for a project, a typical emergency generator facility can emit tonal and/or broadband sounds, low frequency sound, and steady and/or intermittent sounds that are noticeable in the community. The City of Cambridge and the MassDEP have noise requirements that protect residents from excessive sound. These requirements are:

LOCAL CAMBRIDGE NOISE REQUIREMENTS

We understand from the City of Cambridge that the emergency generator noise emissions from each building do not need to be included as part of the noise emissions study. The emergency generators for this project are exempt from this ordinance, as long as they are tested during the daytime hours. We will provide appropriate generator noise control measures to meet the MassDEP Noise Guidelines. All mechanical equipment components for each of the sites listed in this report will need to meet the Chapter 8.16, NOISE CONTROL of the City of Cambridge Code of Ordinances. This includes cooling towers, air handling units, exhaust fans, and all mechanical room louver openings.

Under City of Cambridge Zoning Ordinance Article 19 for Planning & Urban Design, the article has requirements to submit a Noise Mitigation Narrative. This article also references the City of Cambridge noise ordinance as discussed above.

STATE MASSDEP NOISE GUIDELINES

The Commonwealth of Massachusetts has enacted regulations for the control of air pollution (310 CMR 7.10). To enforce these regulations, The Massachusetts Department of Environmental Protection (MassDEP) has issued guidelines that limit the level of industrial noise in inhabited areas as follows: a) not to increase the residual ambient sound level by more than 10 dBA and b) not to produce a pure tone condition where the sound pressure level in one octave band exceeds the levels in the two adjacent octave bands by 3 dB or more. The residual ambient sound level may be defined for the purpose of these guidelines as the measurement of the L90 level over the time period of concern or by other means acceptable to MassDEP. In addition, MassDEP typically applies these guidelines both at the property line and at the nearest inhabited residences, with most concern at the residence. No other project noise criteria have been provided to us for consideration.

Based on our discussions with the City of Cambridge, we understand that emergency generators in a commercial area with no residences nearby do not need to meet the daytime and nighttime noise regulation due to the emergency nature. However, the generators must only be tested during the daytime hours. The generator must still adhere to the MassDEP noise guidelines. Based on the MassDEP guidelines and the results of our ambient sound survey, we suggest the following sound goals for the emergency generators:

- No significant tonal sounds at community residences; and
- 60 dBA - maximum sound level at the community residences

LOADING DOCK NOISE

A preliminary study has been conducted by the design team regarding the location of the loading docks and truck paths in the SoMa and NoMa project areas. The loading docks are shown in gray for each building on Figure 6 attached. Most of the loading dock areas are partially enclosed within the respective buildings, reducing the likelihood of noise impact to the residences. The loading dock for Site 5, which is adjacent the Kendall Hotel, will be provided with a solid screen on the east side of the loading dock. When the trucks are idle, they will be required to shut off their engine for loading and unloading. The loading dock for Site 1 will face Main Street and would not interfere with the residences at Watermark north of Site 1. All deliveries will occur between 9AM and 9PM as agreed under the City of Cambridge Noise Ordinance, limiting truck noise during the nighttime hours.

OPERATION SOUND AND MITIGATION MEASURES

Based on the equipment layout shown in Figures 1-S1 through 1-S6, abatement methods to be employed to control the sound of the SoMa and NoMa project will include the following:

Site 1

The design team for Site 1 will provide the following:

- Solid acoustical barrier around the cooling towers
- Visual screen around the emergency generator as required by Article 19

- Acoustical enclosure around the emergency generator to meet the MassDEP noise limit
- Generator exhaust pipe will be outfitted with 'critical hospital' grade muffler
- Mechanical penthouses will enclose the major mechanical equipment, with louvers and roof openings outfitted with sound attenuators where needed to mitigate sound to the exterior
- All lower level mechanical room louvers, if any, will be provided with sound attenuators where needed
- Garage exhaust fans, if any, will be provided with sound attenuators where needed to mitigate sound to the exterior

Sites 2 and 3

The design teams for Sites 2 and 3 will provide the following, which will be confirmed once design is more established. The following mitigation measures are based on the building systems initially designed for Site 3:

- Solid acoustical barrier around cooling towers
- Sound attenuators outfitted for the discharge and intake openings of all rooftop lab exhaust fans, visual screens provided as required by Article 19
- Mechanical penthouse enclosing the chillers, boilers, pumps, and air handling units, with louvers and roof openings outfitted with sound attenuators where needed to mitigate sound to the exterior

Site 4

The design team for Site 4 will provide the following:

- All lower level mechanical rooms will be provided with sound attenuators where needed at the louvers
- All residential tower mechanical rooms will be provided with sound attenuators where needed at the louvers
- Solid acoustical barrier around all outdoor equipment on the lower roof and higher roof
- Emergency generator will be provided with an acoustic enclosure to meet the MassDEP noise limit
- Generator exhaust pipe will be outfitted with 'critical hospital' grade muffler
- Visual screen around the emergency generator as required by Article 19
- Garage ventilation fans will be provided with sound attenuators

Site 5

The design team for Site 5 will provide the following:

- Solid acoustical barrier around cooling towers and exhaust fans
- Sound attenuators outfitted for all rooftop exhaust fans
- Mechanical penthouse enclosing the chillers, boilers, pumps, and air handling units, with louvers and roof openings outfitted with sound attenuators to mitigate sound to the exterior
- Emergency generator will be provided with an acoustic enclosure to meet the MassDEP noise limit
- Generator exhaust pipe will be outfitted with 'critical hospital' grade muffler
- Visual screen around the emergency generator as required by Article 19

- All ground level mechanical room louvers will be provided with sound attenuators where needed

Site 6

The design team for Site 6 will provide the following:

- Air cooled condenser units and air handling units will be located within a mechanical well, with sound absorptive finishes on the inside face of the mechanical well
- Air cooled condenser units with inlet and discharge sound attenuators will be provided
- The air handling unit will be provided with sound attenuators at the outside air opening and the exhaust air opening

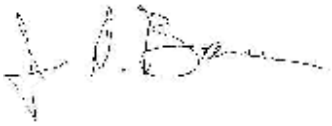
The sound emissions from emergency generators for SoMa and NoMa will be specified to address compliance with the MassDEP noise guidelines and City of Cambridge Noise Standards. Table 3 presents the initial sound estimates for the project-only equipment at representative community locations, which include both residential and commercial areas. These estimates are based on information provided us on the equipment that will operate continuously (24/7 operation) and on the recommended noise specification values. Table 4 presents similar information as Table 3, but the estimated total sound levels include the contributions of both the project equipment sound and the average ambient sound that we measured on the quieter second night in the community across Locations 1 – 10. The estimates, which are based on current project information, address compliance with the applicable noise requirements.

****

I trust that this letter provides a useful summary of our study. Should you have any questions regarding our study or this report, please call me at 617-499-8018.

Sincerely yours,

James D. Barnes, P.E.



Acentech Incorporated

Figures 1 to 6
Tables 1 to 4

cc: Rose Mary Su – Acentech

Figure 1-S1. Preliminary Layout of Generator and Mechanical Equipment (Site 1).

ROOF LEVEL

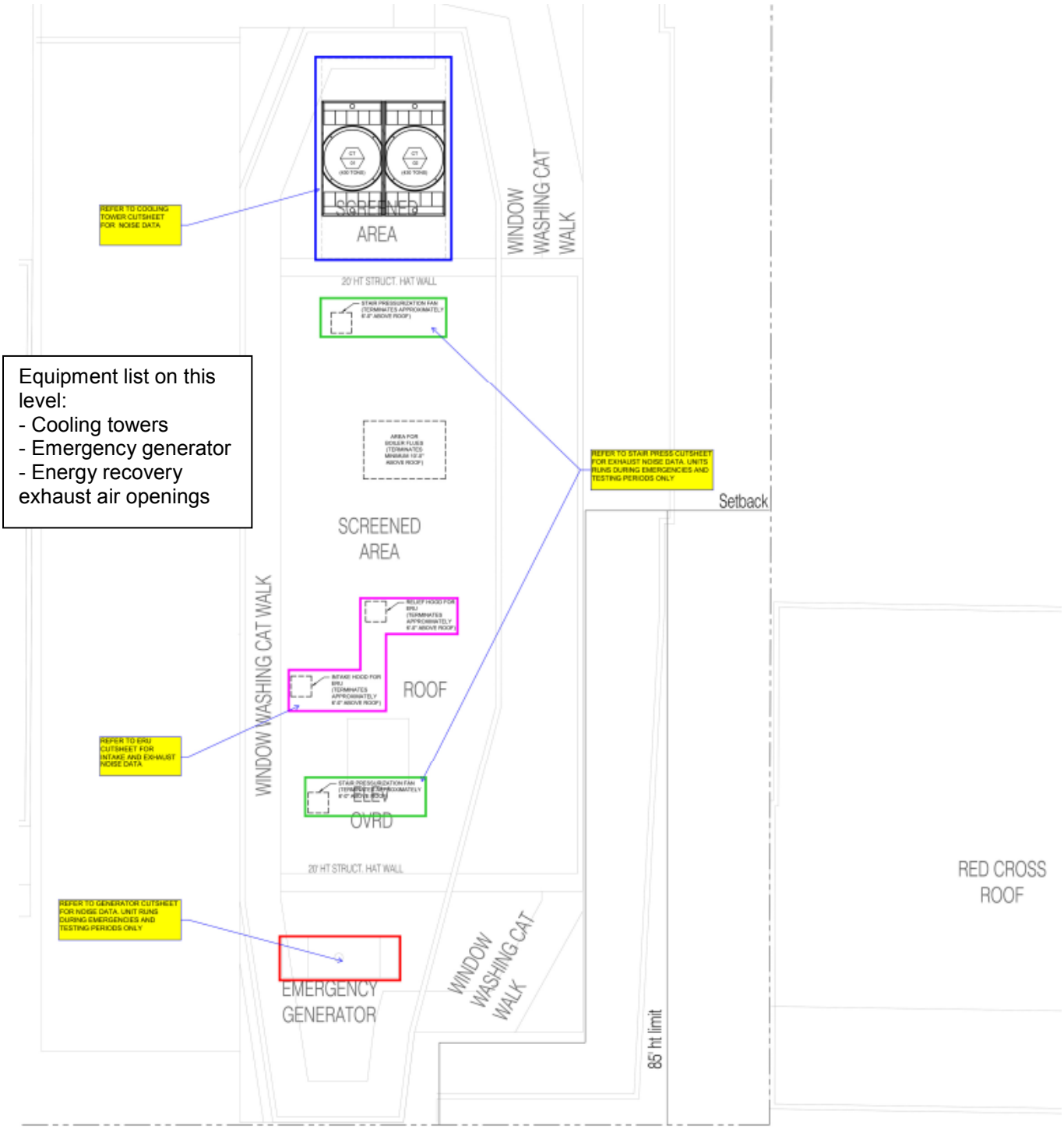


Figure 1-S1 (Con't). Preliminary Layout of Generator and Mechanical Equipment (Site 1).

ROOF AND PENTHOUSE LEVEL

Equipment list on this level:
- Energy recovery units
- Pumps

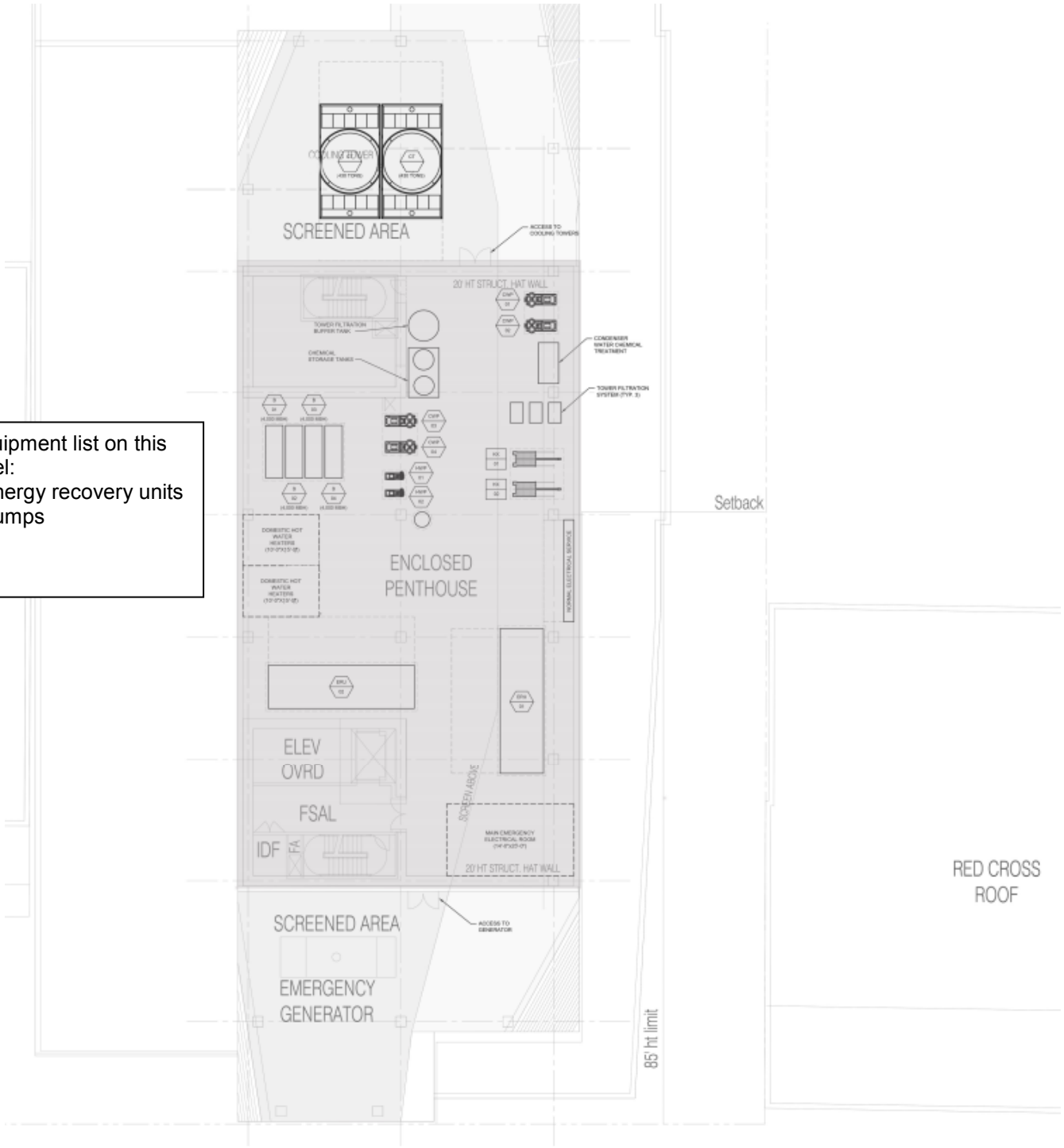
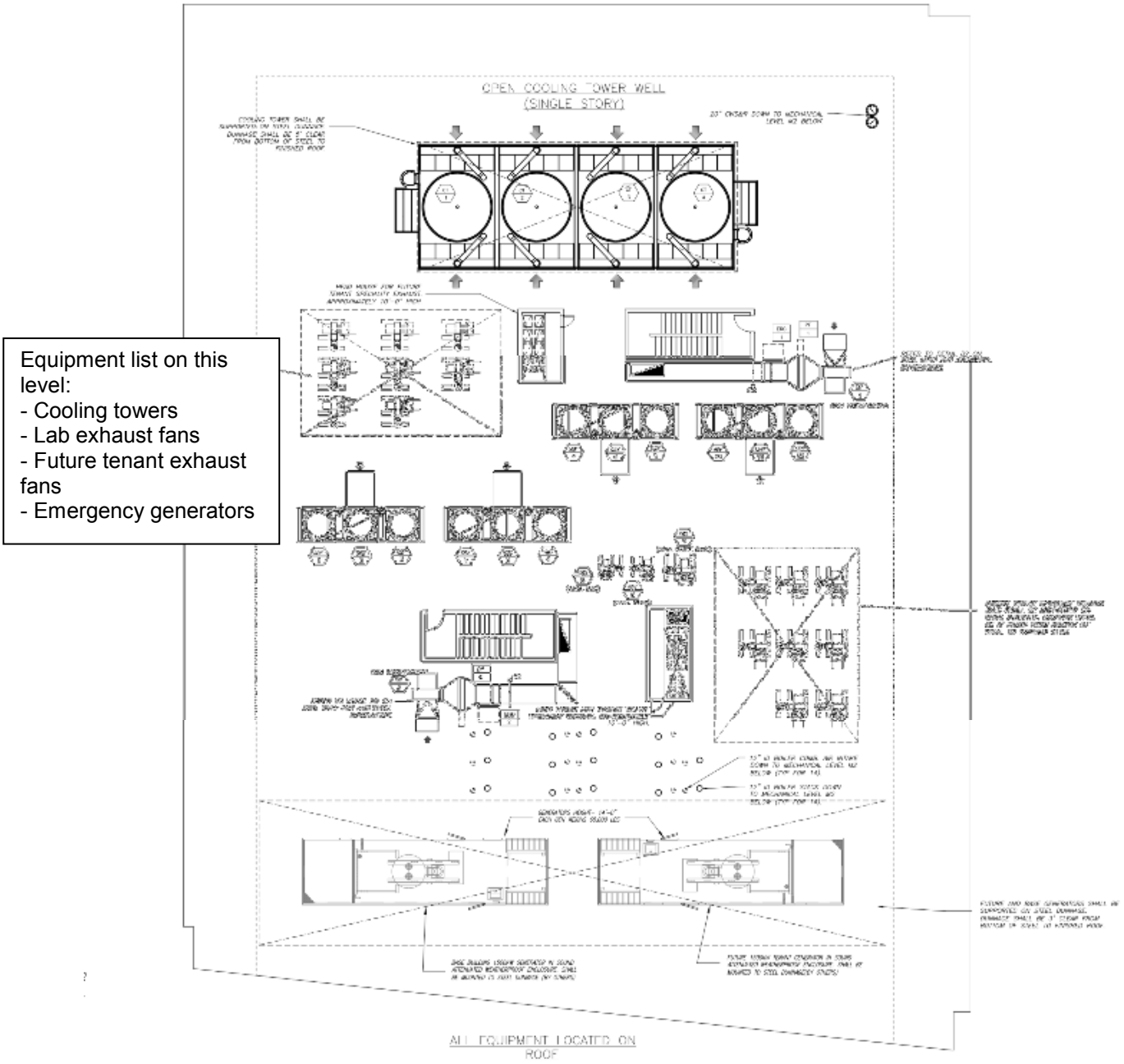


Figure 1-S2. Preliminary Layout of Generator and Mechanical Equipment (Site 2).
No information is available for this building at this time. The building for Site 2 is modeled as a building that is similar to Site 3.

Figure 1-S3. Preliminary Layout of Generator and Mechanical Equipment (Site 3).

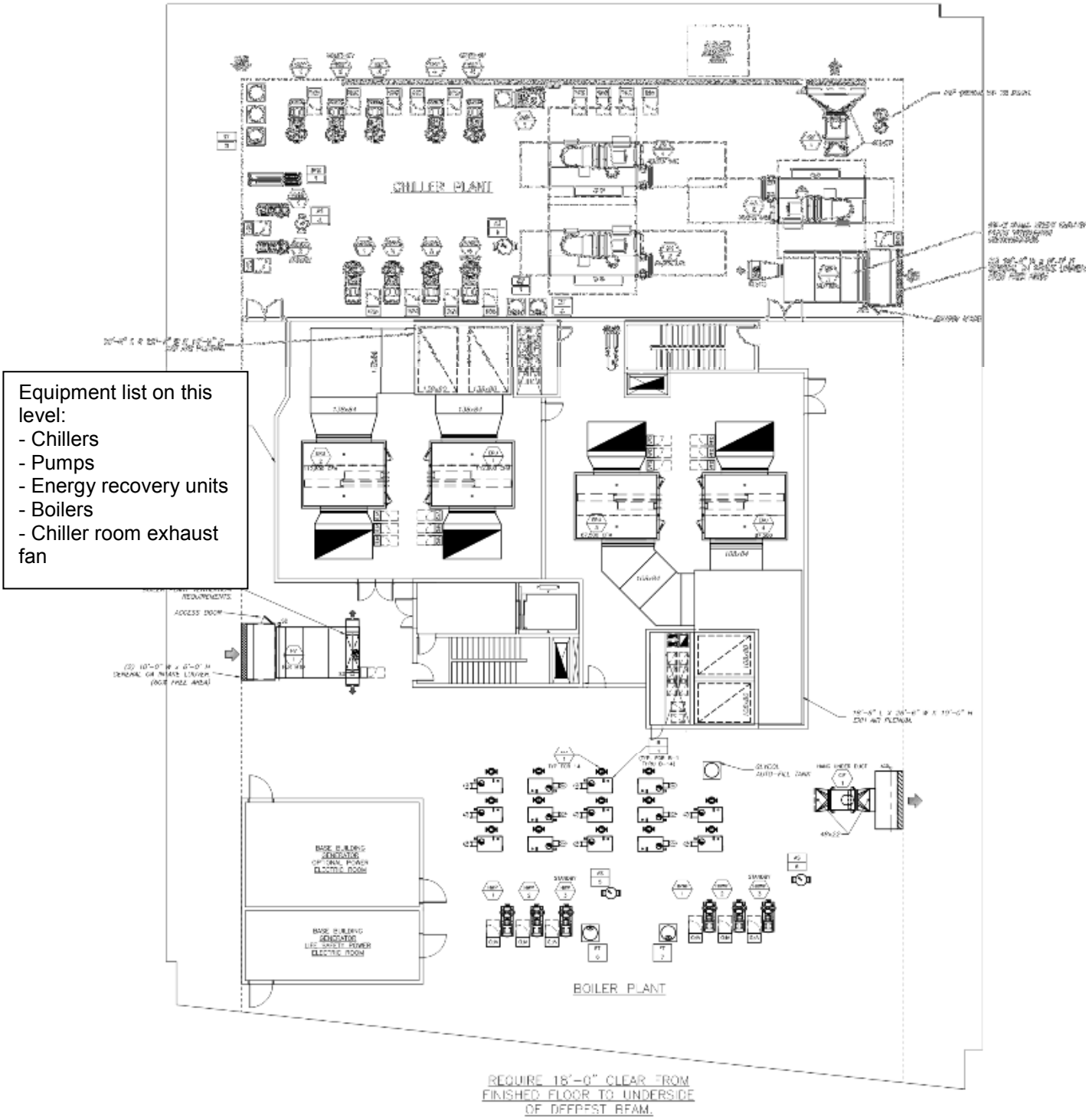
ROOF LEVEL



Equipment list on this level:
- Cooling towers
- Lab exhaust fans
- Future tenant exhaust fans
- Emergency generators

Figure 1-S3 (Con't). Preliminary Layout of Generator and Mechanical Equipment (Site 3).

PENTHOUSE LEVEL 2



Equipment list on this level:
- Chillers
- Pumps
- Energy recovery units
- Boilers
- Chiller room exhaust fan

Figure 1-S3 (Con't). Preliminary Layout of Generator and Mechanical Equipment (Site 3).

PENTHOUSE LEVEL 1

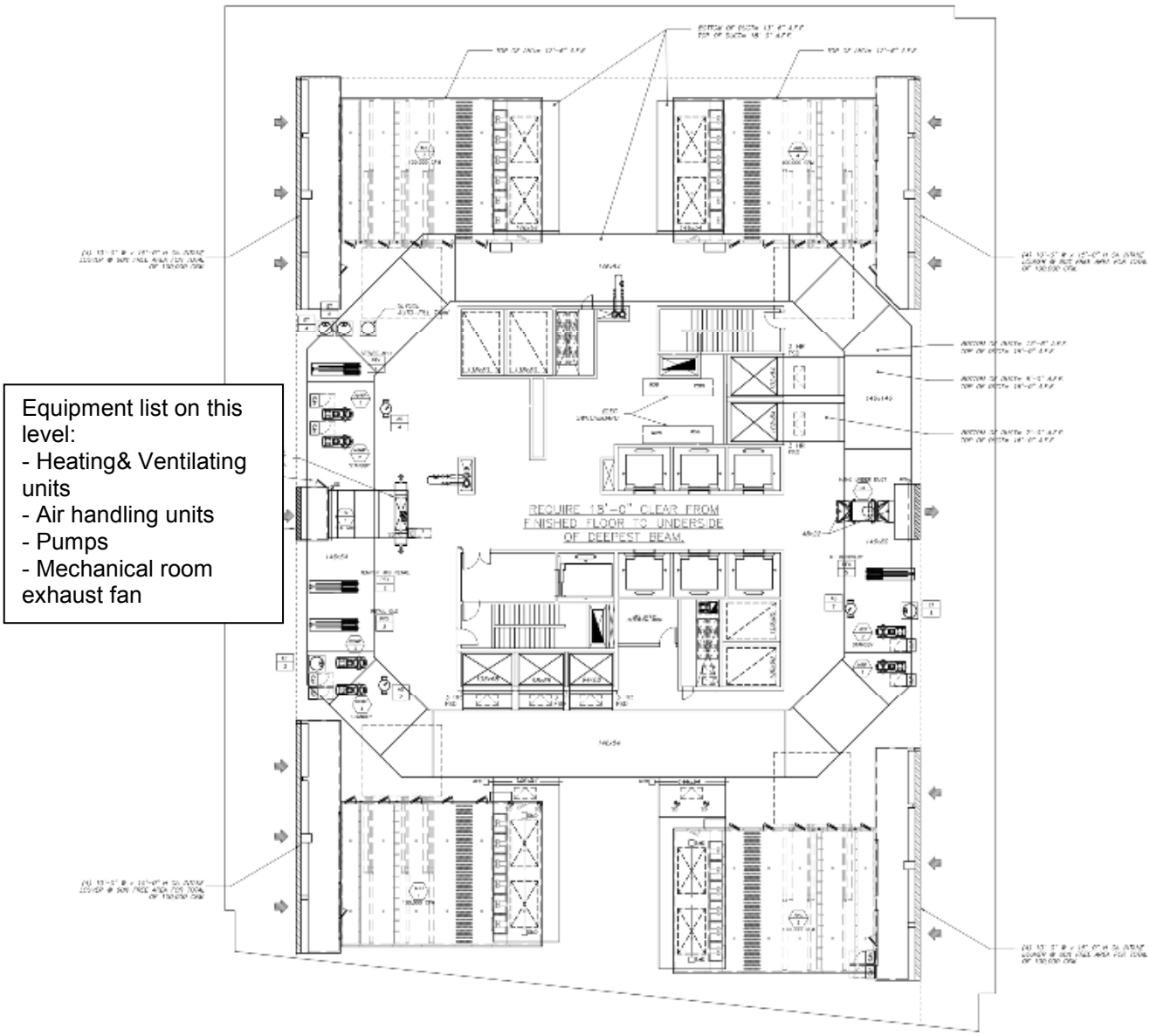


Figure 1-S4. Preliminary Layout of Generator and Mechanical Equipment (Site 4).

Equipment list on this level:
- Air handling units
- Emergency generator
- General exhaust fans

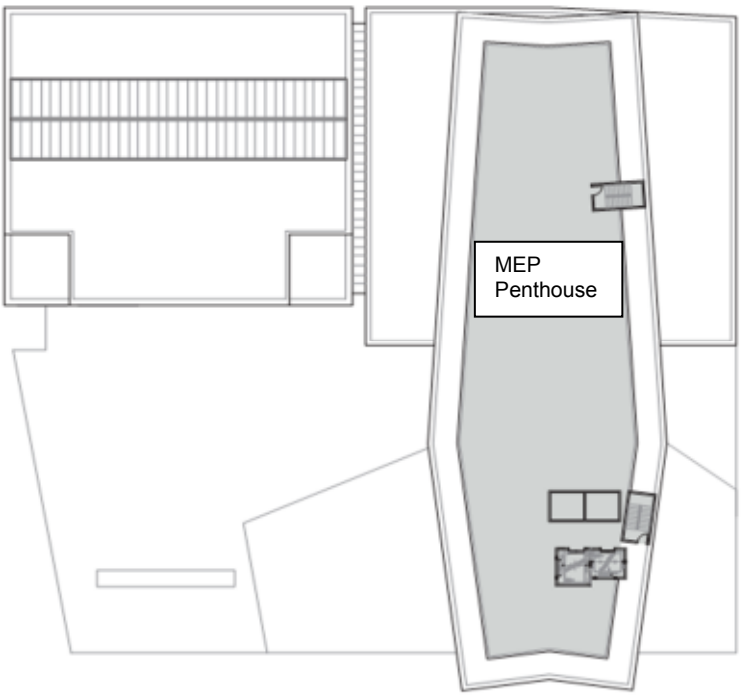
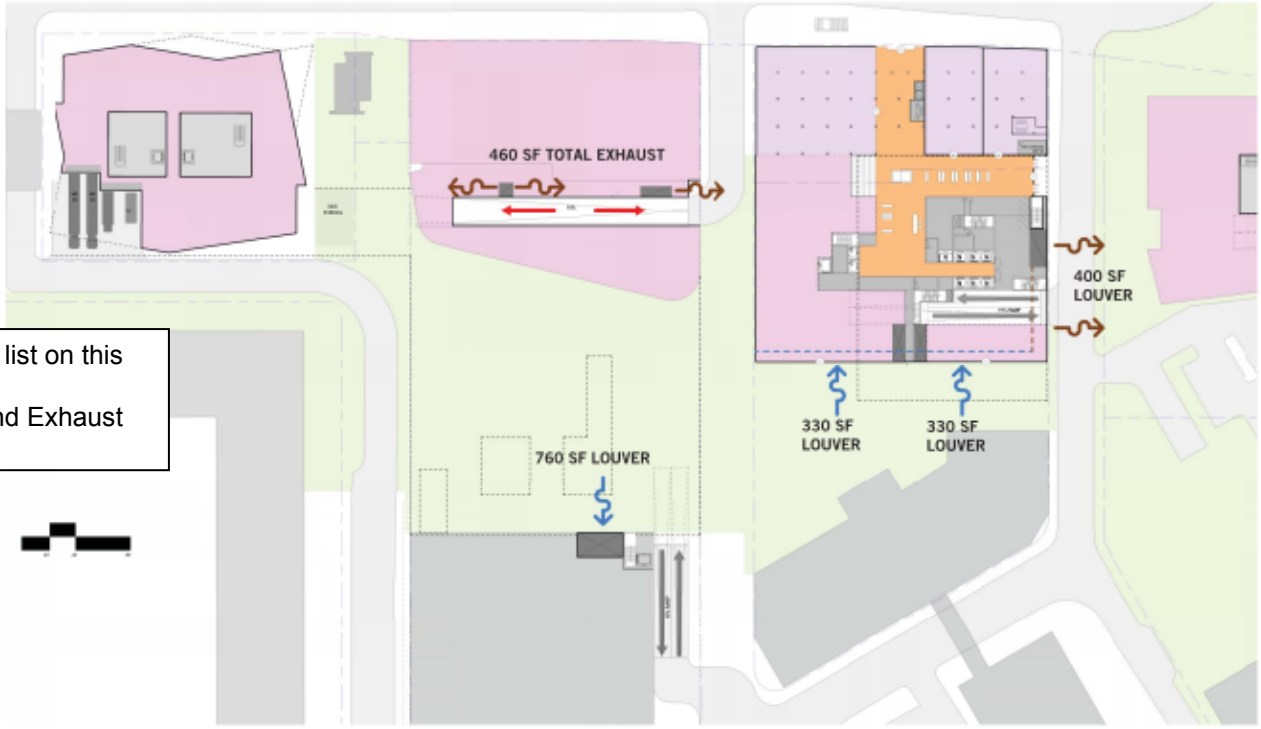


Figure 1-S4 (Con't). Preliminary Layout of Garage Level Mechanical Equipment (South Side of Site 4).

GROUND FLOOR



Equipment list on this level:
- Supply and Exhaust Fans

Figure 1-S5. Preliminary Layout of Generator and Mechanical Equipment (Site 5).

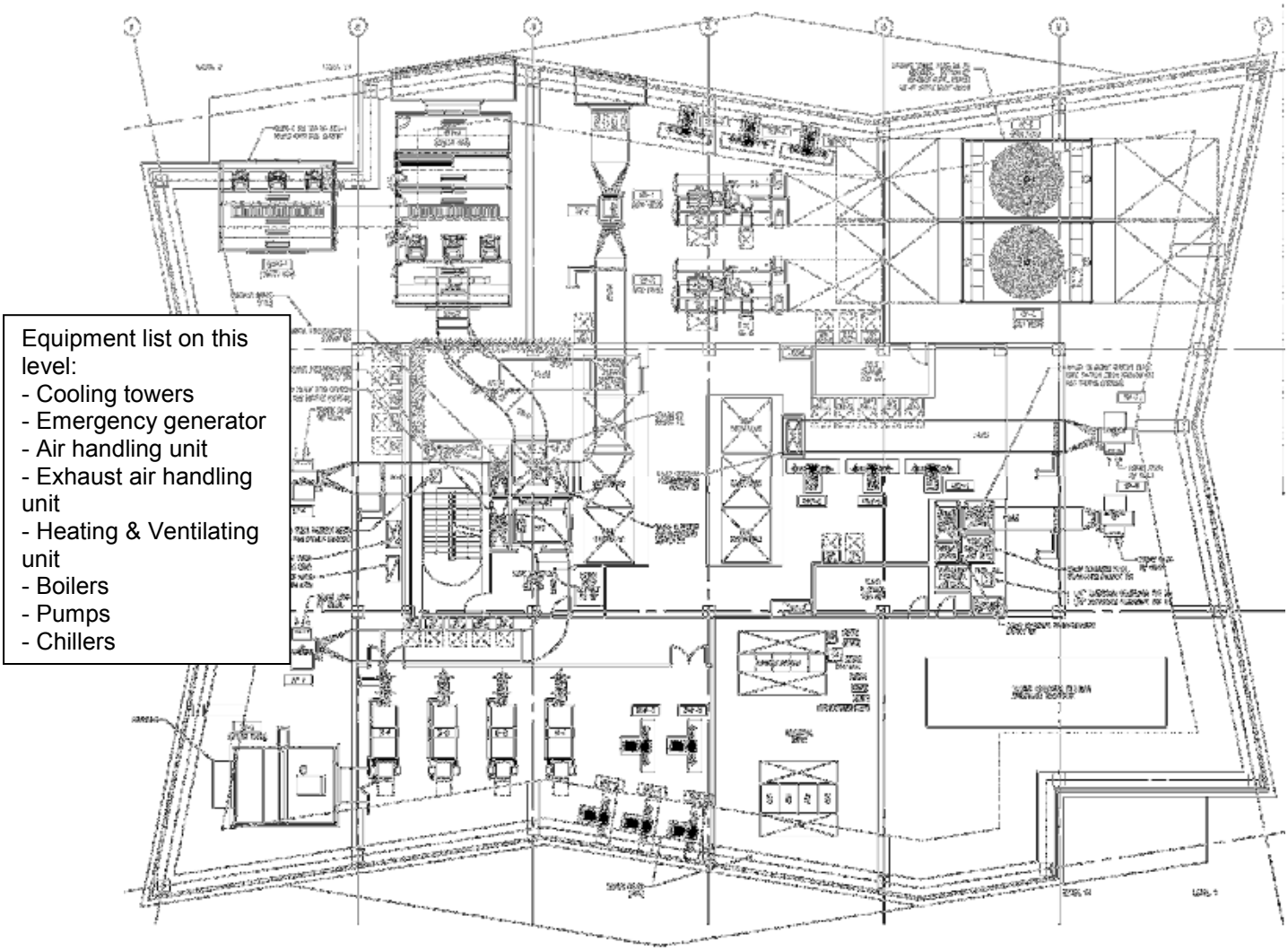


Figure 1-S6. Preliminary Layout of Mechanical Equipment (Site 6).

Equipment list on this level:
- Air cooled condenser units
- Energy recovery unit

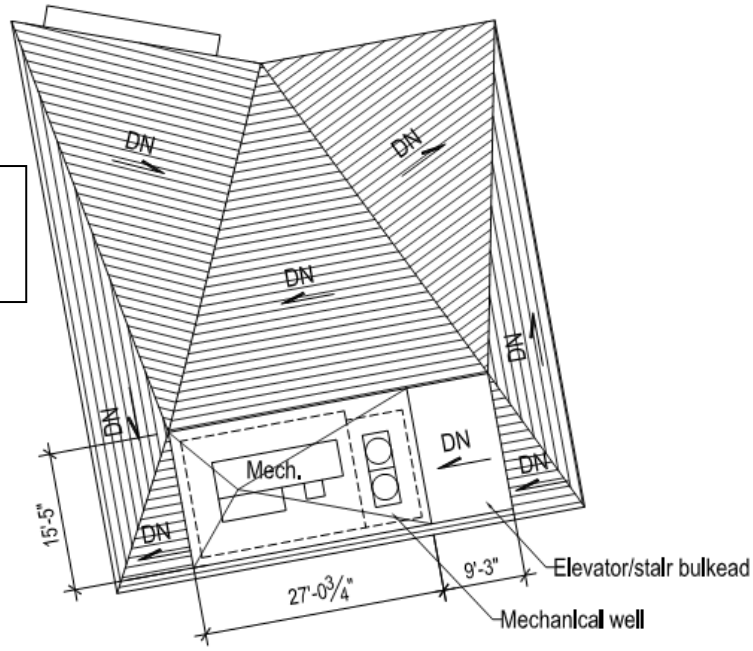


Figure 2. Aerial Photo Showing General Areas of Kendall SoMa/NoMa and Long-Term Sound Measurement Locations A to D (April/May 2015 Survey).

Figure 3a. L1, Leq, and L90 Sound Levels Measured for 10-Minute Intervals at Monitoring Location A (4 to 11 May 2015).

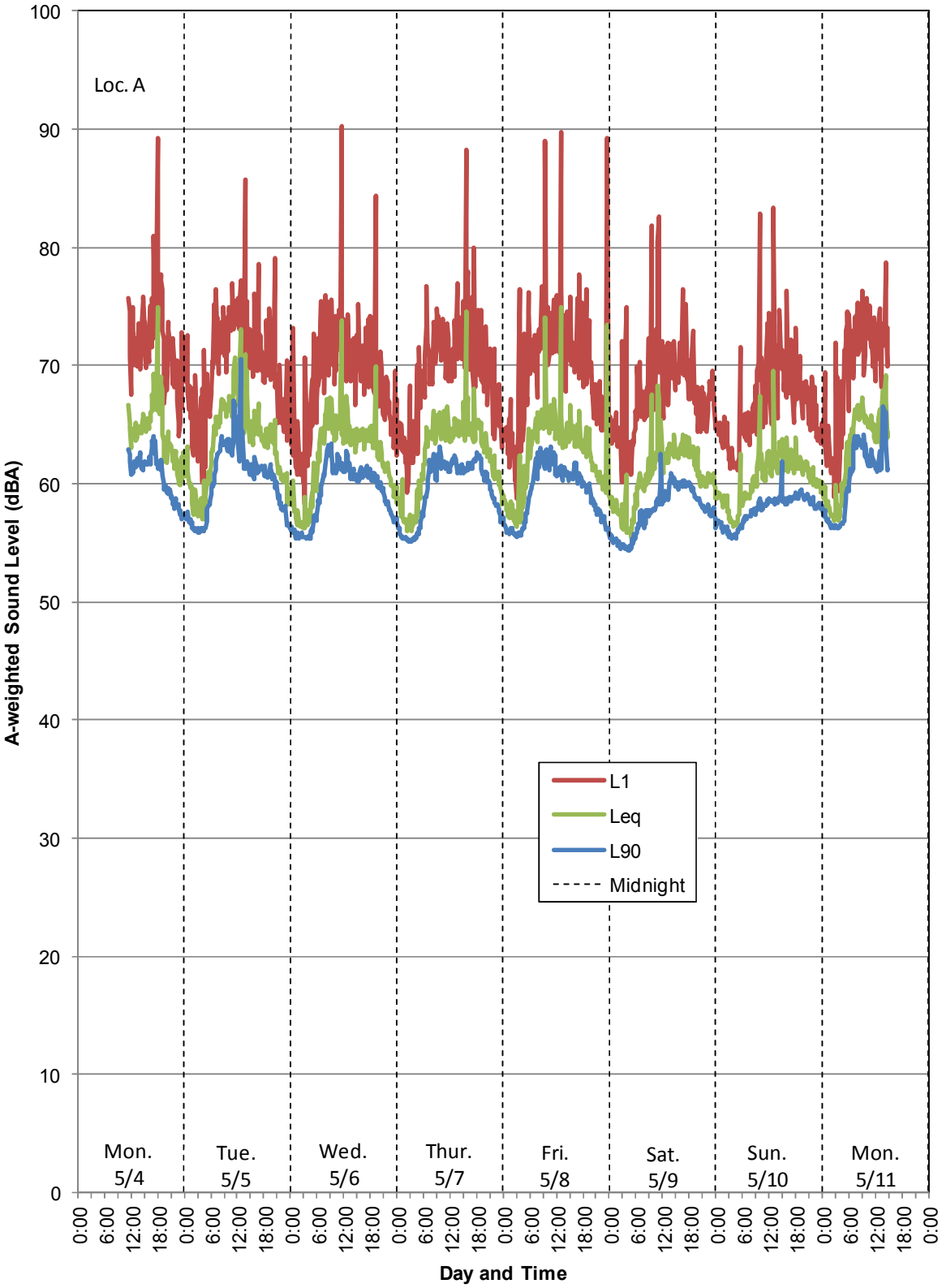


Figure 3b. L1, Leq, and L90 Sound Levels Measured for 10-Minute Intervals at Monitoring Location B (24 April to 1 May 2015).

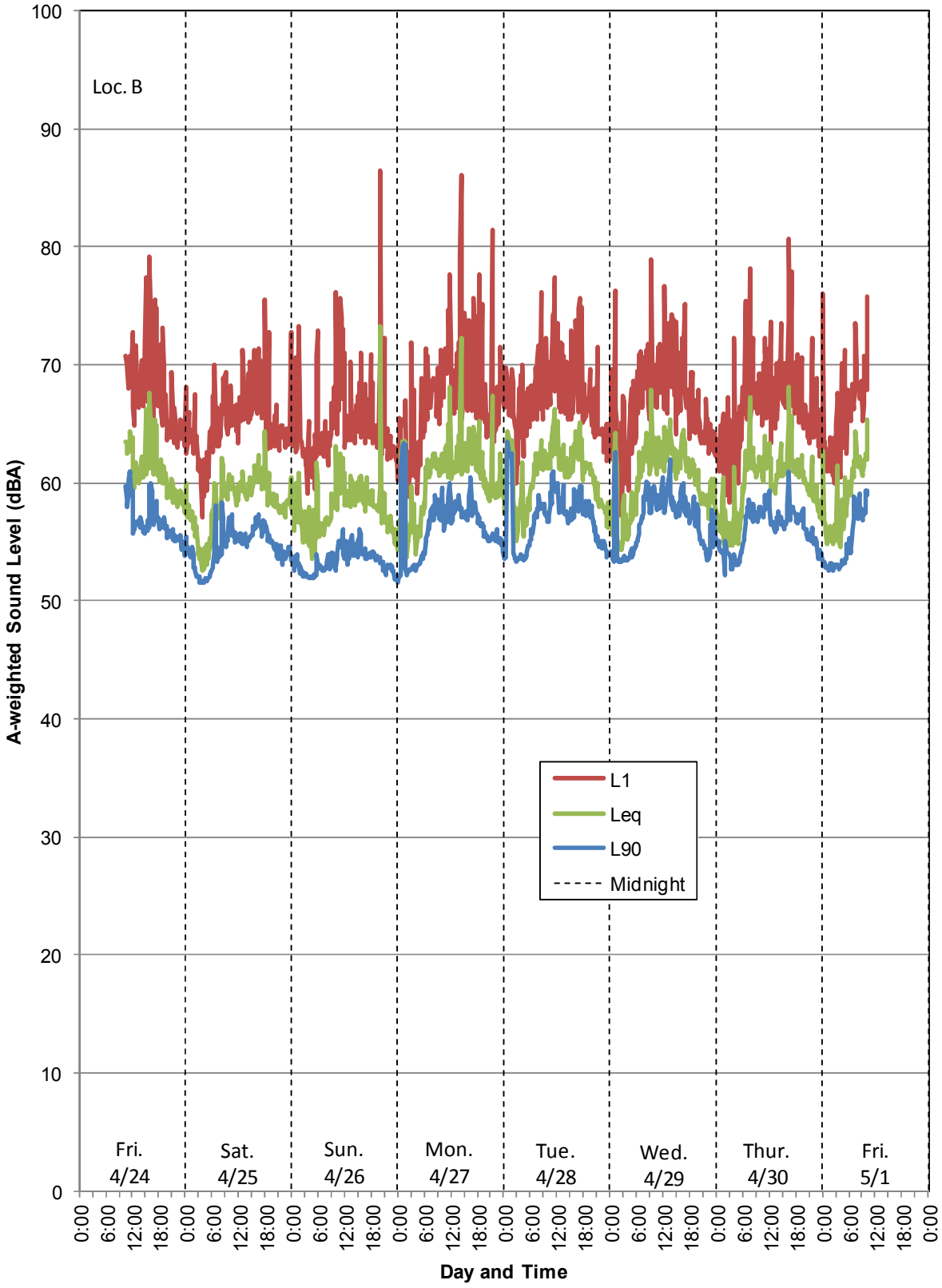


Figure 3c. L1, Leq, and L90 Sound Levels Measured for 10-Minute Intervals at Monitoring Location C (29 April to 7 May 2015).

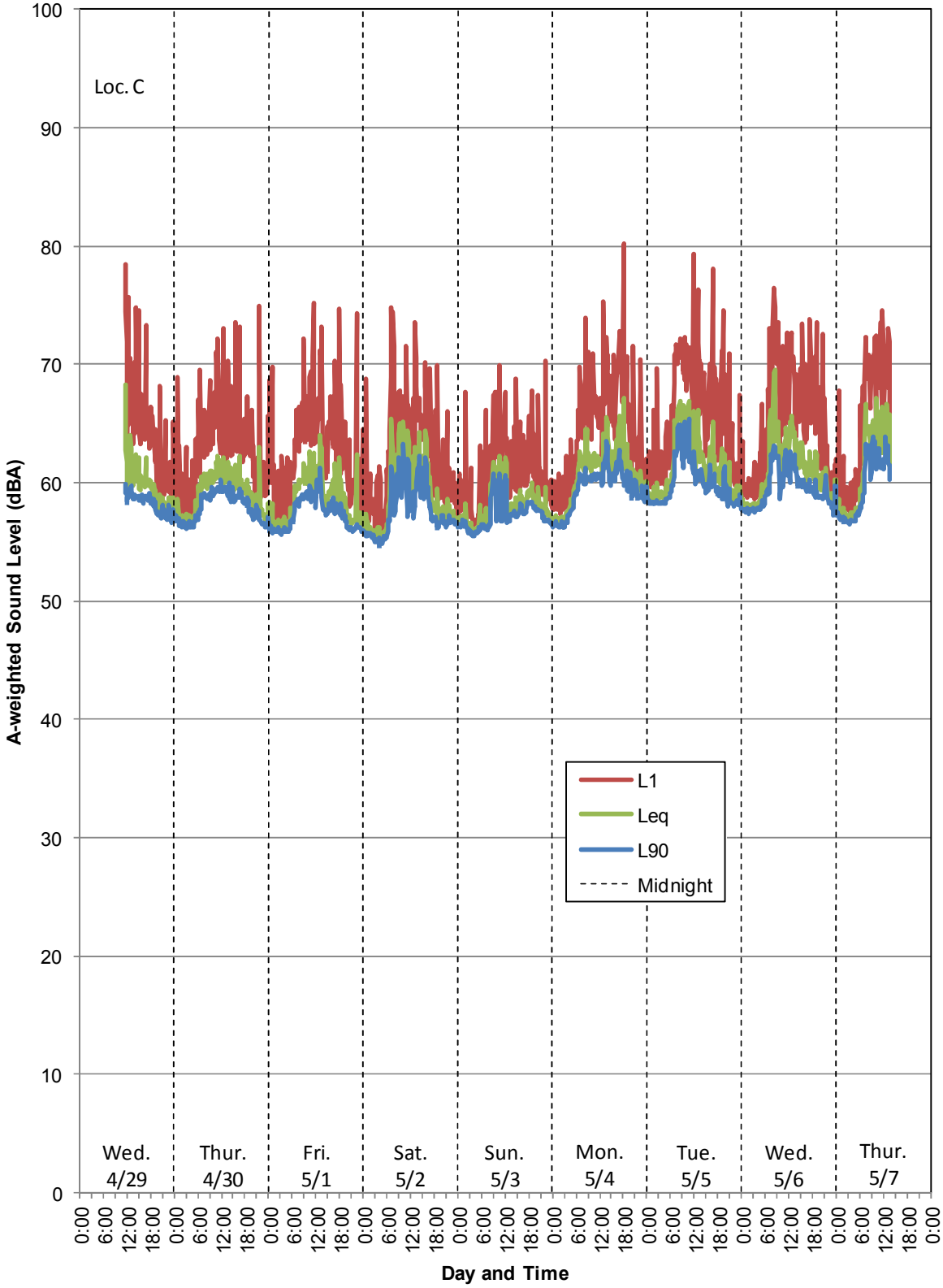


Figure 3d. L1, Leq, and L90 Sound Levels Measured for 10-Minute Intervals at Monitoring Location D (24 April to 1 May 2015).

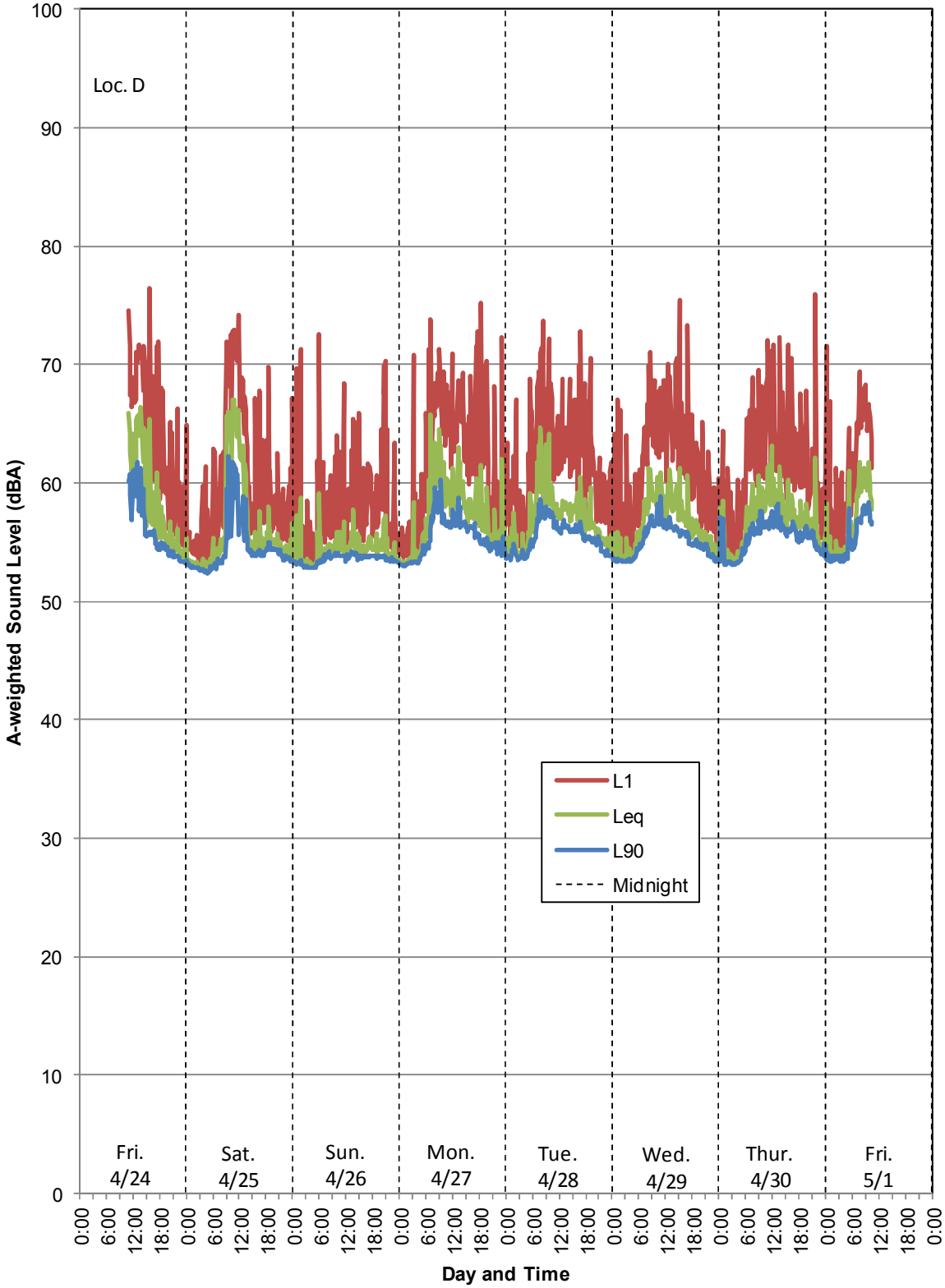


Figure 4. Aerial Photo Showing General Area of Kendall SoMa/NoMa and Short-Term Sound Measurement Locations 1 to 10 (April/May 2015 Survey).

Figure 5. Range of Short-Term Sound Measurements Obtained during Two Nights (4-5 May and 13-14 May 2015) at Locations 1 to 10 and Cambridge Residential and Commercial Noise Standards.

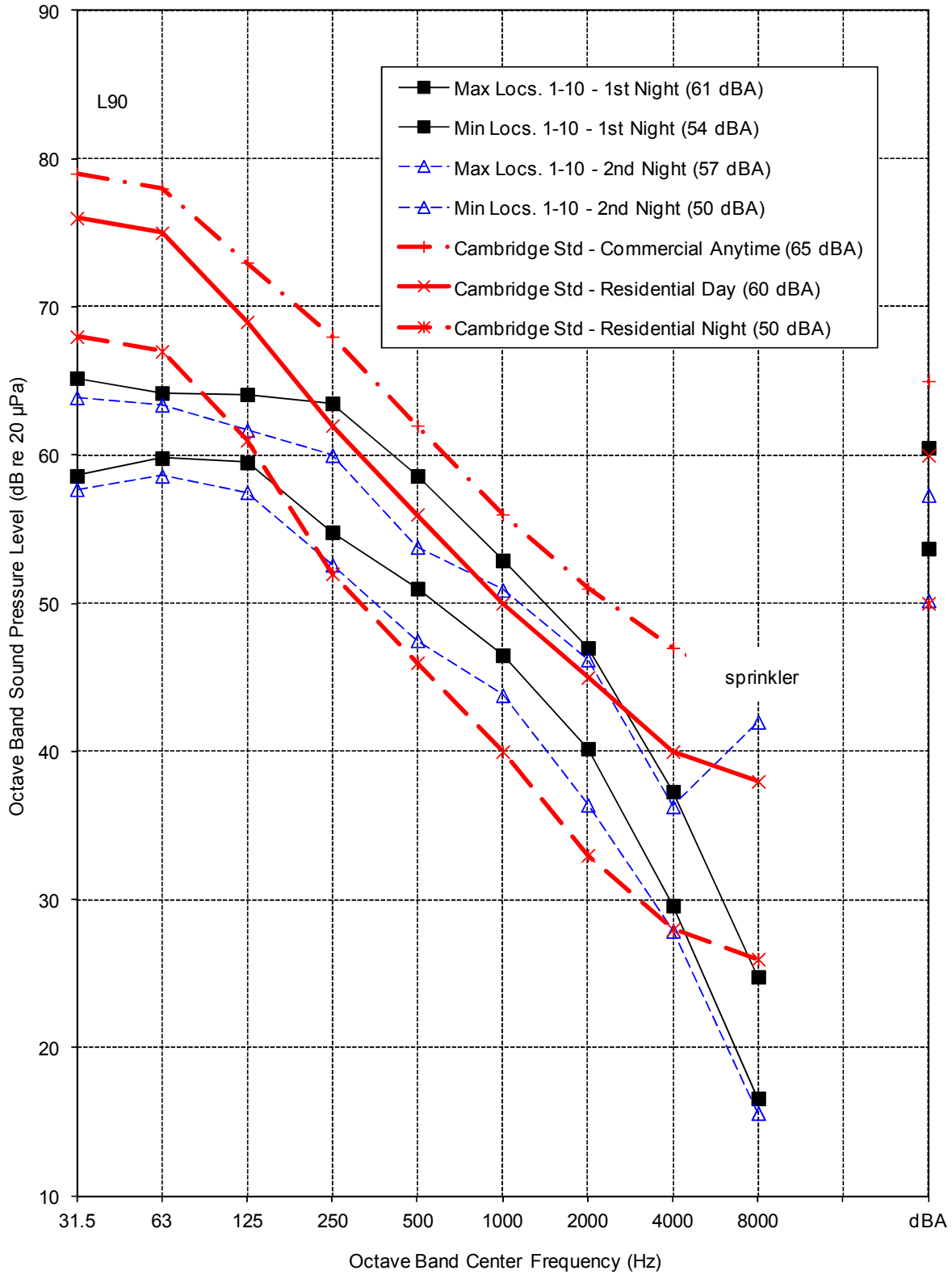


Figure 6. Loading Dock Study (shown in gray).

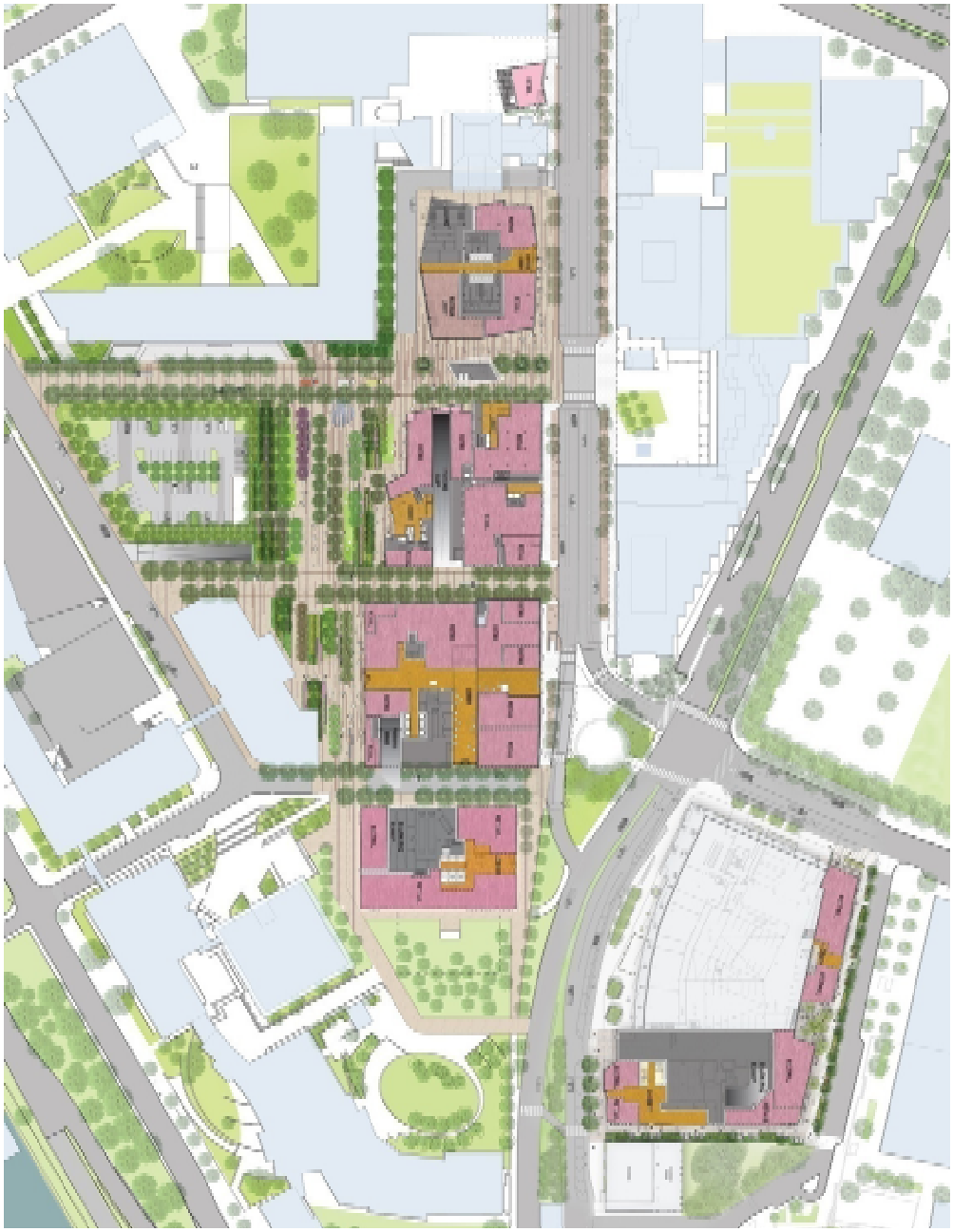


Table 1. Type of Acoustic Instrumentation Used for Ambient Sound Measurements during April/May 2015 Survey.

SHORT-TERM MEASUREMENTS

Instrument Type	Manufacturer	Model
Sound Level Meter	Rion	NA-28
Preamplifier	Rion	NH-23
1/2" Microphone	Rion	UC-59
Acoustic Calibrator	Norsonic	1251

LONG-TERM MEASUREMENTS

Instrument Type	Manufacturer	Model
Sound Level Meter	Rion	NL-52
Preamplifier	Rion	NH-25
1/2" Microphone	Rion	UC-59
Acoustic Calibrator	Gen Rad	1987

Table 2. Summary of Short-Term Residual (L90) Sound Measurements Obtained during Two Nights (4-5 May and 13-14 May 2015) at Locations 1 to 10.

Location	Octave Band Center Frequency (Hz)									Overall dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
	Nighttime Ambient (5/4-5/2015 11:10pm - 1:10am)									
1	64	61	64	64	59	52	42	35	23	61
2	62	61	63	59	54	47	40	30	17	56
3	62	63	62	58	54	50	44	33	21	56
4	64	64	63	61	56	53	47	37	25	59
5	62	60	60	55	51	49	43	32	20	54
6	65	62	61	57	51	47	40	33	22	54
7	62	62	61	56	52	48	42	33	18	54
8	63	63	62	57	53	49	43	32	19	55
9	62	62	61	56	53	49	43	33	18	55
10	59	60	60	57	51	48	43	33	17	54
	Nighttime Ambient (5/13-14/2015 11:00pm - 1:10am)									
1	60	59	58	57	52	47	39	28	16	54
2	60	59	58	53	48	44	36	28	16	50
3	62	61	60	58	53	49	43	31	16	55
4	64	63	61	60	54	51	46	36	24	57
5	63	62	62	57	51	48	41	30	17	54
6	60	59	58	53	50	46	39	28	17	52
7	59	60	59	54	50	47	40	35	42	53
8	60	60	59	54	51	48	42	32	18	53
9	58	59	58	56	51	47	41	35	20	53
10	62	63	61	56	53	49	43	34	21	55

Data obtained for 10-minute period at each street level location with a hand-held sound level meter.

Table 3. Estimates of Project-Only Sound Pressure Levels and Overall A-Weighted Sound Levels at Community Locations Compared with Average Measured Nighttime Ambient Sound Levels and City of Cambridge Noise Standards.

Location	Octave Band Center Frequency (Hz)									Overall dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Watermark Condos-elevated (west bldg)	46	47	46	43	42	39	33	27	14	44
100 Memorial Drive Apts (elevated)	43	45	44	39	34	30	25	18	2	37
Marriott Hotel (elevated)	46	49	47	45	41	39	33	26	12	44
Kendall Hotel (elevated)	56	60	55	42	34	26	26	25	22	42
1	42	43	42	38	32	28	23	16	-2	35
2	47	47	49	43	46	42	34	26	18	46
3	44	46	46	42	39	35	29	23	12	40
4	48	48	47	40	42	39	30	23	13	43
5	42	44	43	39	36	34	25	17	2	38
6	47	50	49	44	37	33	30	26	16	41
7	40	41	39	35	30	25	20	14	-1	32
8	41	43	42	37	34	31	24	17	5	36
9	41	42	38	31	27	24	18	8	-8	30
10	45	46	39	30	24	20	14	6	-4	29
	Average Ambient Measured during Quieter Nighttime									
1-10	61	61	59	56	51	47	41	32	21	54
	City of Cambridge Noise Standards									
Commercial Anytime	79	78	73	68	62	56	51	47	44	65
Residential Day	76	75	69	62	56	50	45	40	38	60
Residential Night	68	67	61	52	46	40	33	28	26	50

Emergency generators not included in Project-Only sound estimates.

Average ambient sound levels based on the quieter second night data shown on Table 2.

Table 4. Estimates of Total (Project + Ambient) Sound Pressure Levels and Overall A-Weighted Sound Levels at Elevated Receptor and Property Line Locations.

Location	Octave Band Center Frequency (Hz)									Overall dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Watermark Condos-elevated (west bldg)	61	61	60	56	52	48	42	33	22	54
100 Memorial Drive Apts (elevated)	61	61	60	56	51	48	41	32	21	54
Marriott Hotel (elevated)	61	61	60	56	52	48	42	33	21	54
Kendall Hotel (elevated)	62	63	61	56	51	47	41	33	24	54
1	61	61	59	56	51	47	41	32	21	54
2	61	61	60	56	52	48	42	33	23	54
3	61	61	60	56	51	48	41	32	21	54
4	61	61	60	56	52	48	41	32	21	54
5	61	61	59	56	51	48	41	32	21	54
6	61	61	60	56	51	48	41	33	22	54
7	61	61	59	56	51	47	41	32	21	54
8	61	61	59	56	51	48	41	32	21	54
9	61	61	59	56	51	47	41	32	21	54
10	61	61	59	56	51	47	41	32	21	54

Totals include the Project-Only and Average Nighttime Ambient sound levels shown in Table 3. Emergency generators not included.