HARVARD
UNIVERSITY

SCIENCE AND ENGINEERING COMPLEX

INSTITUTIONAL MASTER PLAN NOTIFICATION FORM / NOTICE OF PROJECT CHANGE
NOVEMBER 2015

Appendices

Appendix A:
Community Benefits

Excerpt from:
Annual Report on Harvard University's
Cooperation Agreements
with the City of Boston
April 1, 2014- June 30, 2015

Status of Cooperation Agreements:
Science Complex Cooperation Agreement (signed 4/2/08): Part 1 of 4

Description	Budget	Obligation and Timing	Status
TRANSPORTATION ACCESS PLAN AGREEMENT			
Develop Transportation Access Plan Agreement		Science project requires a TAPA prior to opening.	Draft TAPA sent to BTD in 2008. Will be re-started with revised Science project.
TRANSPORTATION-RELATED COMMITMENTS			
Pedestrian and Bicycle Access Improvements		Implement measures to facilitate walking and bicycling access.	Bike lanes added to Western Avenue and North Harvard Street. Installed Hubway stations at HBS, I-Lab, Barry's Corner, and Brighton Mills.
Transit Improvements: Public Transit		Work with MBTA to develop recommendations for improvements to service in the neighborhood.	Will be completed with occupancy of Science project.
Transit Improvements: Shuttle Service		Expand connections between Harvard campuses.	Will be completed with occupancy of Science project.
Transit Improvements: Expanded Shuttle Service		Harvard to study public access to Harvard shuttle services.	Harvard shuttle opened to public as part of 28 Travis project. Harvard will implement Barry's Corner/Harvard Square shuttle route and extend the Allston Express shuttle to Barry's Corner as part of Continuum project.
Transportation Demand Management Program		Implement TDM program for project users.	Will be part of revised Science project.
Roadway Infrastructure Improvements		Construct new roadways as part of project.	Will be part of revised Science project.
LINKAGE			
Housing	$3,848,430	Annual payments began in 2011.	Ongoing through 2018.
Jobs	$767,730	Payments due with issuance of building permit.	Complete.
PILOT			
Negotiate PILOT agreement		Develop PILOT Agreement.	Complete and Ongoing. Harvard University has long embraced its civic partnerships and has consistently made financial payments to its host communities. Harvard engages in regular discussions with the City of Boston as it aims to strike a balance between our direct programming and reliable financial contributions that support basic city services and enhance quality of life for Boston residents.
PUBLIC REALM IMPROVEMENTS			
Portsmouth Park	$60,000	Fund improvements to Portsmouth park.	Complete. Check issued to Parks Department in 2006.
Western Avenue Sidewalk and Tree Plantings	$1,200,000	Improve Western Avenue through new sidewalks and tree plantings.	Complete. Designed and constructed sidewalk improvements and planted approx. 150 trees along twelve blocks of Western Avenue.

Status of Cooperation Agreements:
Science Complex Cooperation Agreement (signed 4/2/08): Part 2 of 4

Description	Budget	Obligation and Timing	Status
Barry's Corner Improvements	$1,800,000	Provide landscaping and streetscape improvements, including Ed Portal landscape, and Citgo landscape.	Completed Ed Portal landscape, CITGO (Stonehearth) landscape. The City and Harvard conducted a "Study" (The Western Avenue Edge Guidelines) in 2011 and presented it to the Task Force with the intention of identifying projects to be funded out of this budget. In this document, several areas were identified as potential project areas in Barry's Corner, including, the parking lot at 175 N. Harvard St, the green space in front of Charlesview, the area in front of Swissbakers, the sidewalk in front of 224 Western Avenue, the area around the gas station, and the Charlesbank Cleaner site. In 2014, improvements were made to the Grove in front of Charlesview. This included removing the fence around the site, creating pathways, adding lighting for safety, pruning the trees, and adding benches. All of this is open to the public. The remaining budget is $575,000. It should be noted that several of the identified projects have been addressed as a part of other building projects.
Longfellow Path	$700,000	Construct Longfellow Path. Due at Occupancy Permit for Science.	Will be developed in coordination with Smith Field Master Plan and Soldiers Field Road Crossings Study.
Rena Path	$700,000	Construct Rena Path Due at Occupancy Permit for Science.	Ongoing. Rena Path is included in the plans for Rena Park.
Public Events	$240,000 ($24,000/year)	Program public events in Barry's Corner area through 2013.	Complete and Ongoing. Farmers' Market has been operating since 2008.
Library Park and Maintenance for 10 years	Total of $5,700,000	Design and build one-acre park. Maintain park for 10 years.	1.74-acre Raymond V. Mellone Park opened in 2010. We are in Year 4.
Rena Park Design and Interim Improvements	$1,500,000	Due at Occupancy Permit for Science.	Planning and design process started in 2014. Design is on hold while Harvard replaces BWSC-owned storm drain in Rena Park area during summer and fall of 2015. Implementation of Rena Park design will follow replacement of storm drain.
Stadium Way and Rena Street Extension		Due at Occupancy Permit for Science.	Stadium Way 25% design is an obligation under new IMP and is underway. Rena Street Extension is now called Science Drive and will be part of revised Science project.
Design and reconstruct Western Avenue (east of Barry's Corner)		Design by 2011. Construction by April 2018.	Initial designs submitted to BRA. In addition, Harvard has continued to work with BTD on the design and implementation of bike lanes and the City's first cycle track.
Design and reconstruct North Harvard Street (north of Barry's Corner)		Design by 2011. Construction by April 2018.	Initial designs submitted to BRA. In addition, Harvard has continued to work with BTD on the design and implementation of bike lanes.
Significant Improvement of Properties		Replacement and removal of fences and planting trees.	The following properties have been improved: The parking lot at 175 N. Harvard Street, Travis Street, and Windom Street. In addition, properties west of Barry's Corner were repainted and improved.
Additional interim public realm improvements in Barry's Corner		Provide additional improvements by December 31, 2013.	Improvements were made to the public realm in front of Swissbakers, along the Science construction site, and in front of 224 Western Avenue.

Status of Cooperation Agreements:
Science Complex Cooperation Agreement (signed 4/2/08): Part 3 of 4

Description	Budget	Obligation and Timing	Status
SURVEY/NEEDS ASSESSMENT			
Conduct Survey/Needs Assessment	$500,000	Conduct Survey/Needs Assessment.	Complete. Conducted survey in 2008.
EDUCATION			
Create and fund Ed Portal		Design, build, and fund Ed Portal.	Ed Portal opened in July 2008.
Computer Lab at Ed Portal	$100,000	Build computer lab at Ed Portal.	Complete.
Ed Portal Coordinator		Hire staff person.	Complete.
Form Ed Portal Advisory Board		Form Ed Portal Advisory Board.	Complete.
Programming	$1,100,000	Provide programming for the Ed Portal including tutoring, mentoring, Secondary School Scholarships, and Summer Athletic Camps scholarships.	Ongoing. In Year 7.
Gardner School	$120,000	Partner with the Gardner School for ten years of activities.	Ongoing. In Year 7.
Adult Education	$215,000	Continue and expand adult education programs including A/B community scholars, new lecture series, and computer teaching classroom.	Ongoing. In Year 7.
Outreach	$250,000 over ten years	Provide updates through website, letters, Allston Update, Ed Portal flyers, and emails.	Ongoing. In Year 7.
PARTNERSHIP FUND			
Partnership Fund	$500,000 ($100,000/year)	Checks issued to BRA annually for 2008-2013.	Science commitment complete. Commitment picked up by 28 Travis Street project.
EMPLOYMENT			
Construction Employment		Prepare Boston Residents Construction Employment Plan .	Will be revised with updated Science project.
Permanent Employment		Prepare MOU/First Source Agreement.	Will be revised with updated Science project.
Workforce Program Development	$200,000	Develop workforce development programs.	Ongoing.
Rent for Resource Center	$600,000	Provide in-kind rent for 2009 through 2019.	Ongoing. With the opening of the Ed Portal, residents of Allston-Brighton have a centralized location to receive a variety of workforce development and employment services, the end result of which will be the more efficient use of community benefit funding and JCS resources. JCS, the Authority and Harvard agree that, with the programming that can be provided at the new Ed Portal, the Allston-Brighton Resource Center will be closed in order to promote efficiency and avoid duplication of services. Services include job counselling, resume writing, and workshops. Harvard, in consultation with JCS, will retain workforce development programming specialists to help with the implementation, oversight, and delivery of such programs at the new Ed Portal.

APPENDIX B

Denotes items related to the Transformative Project.

Status of Cooperation Agreements:
Science Complex Cooperation Agreement (signed 4/2/08): Part 4 of 4

Description	Budget	Obligation and Timing	Status
Operation of Resource Center	$1,000,000	Fund operation of Resource Center for ten years.	Ongoing. With the opening of the Ed Portal, residents of Allston-Brighton have a centralized location to receive a variety of workforce development and employment services, the end result of which will be the more efficient use of community benefit funding and JCS resources. JCS, the Authority and Harvard agree that, with the programming that can be provided at the new Ed Portal, the Allston-Brighton Resource Center will be closed in order to promote efficiency and avoid duplication of services. Services include job counselling, resume writing, and workshops. Harvard, in consultation with JCS, will retain workforce development programming specialists to help with the implementation, oversight, and delivery of such programs at the new Ed Portal.
Human Resource staff person		Hire staff person.	Complete. HR team provides workshops at Career Resource Center, runs youth employment program on campus.
Advertising of workforce programs	$50,000	Advertise workforce programs.	Ongoing.
Workforce Development Classes	$1,000,000 ($100,000/year)	Offer workforce development classes for ten years.	Ongoing, in Year 7. The Workforce Program continues to offer two classes every semester in the Charlesview computer classroom. The computer classes continue to be the focus. In addition, the Workforce Program added some drop in/one-on-one sessions for computer tutoring.
LONG TERM PARTNERSHIP			
Evaluate options for a transformative project (i.e. community school, university-assisted school, community center)		Transformative project evaluation to happen prior to filing a new IMP.	Complete. Transformative project evaluation was included in 2013 IMP.
Collaborate on planning West of Barry's Corner.		Participate in City's Community Wide Planning process.	Complete. Harvard participated in City's CWP process.
OTHER			
Contractor Pre-Apprenticeship Program	$30,000/year (total of 120K)	Provide 5 slots/year.	One year program participation but program is on hold and being evaluated.
Retail Use Restriction		Use best efforts to lease retail space to local businesses which are retail and restaurant uses.	Will be part of revised Science project.
Day Care Facilities	Valued at $450,000 over ten years	At occupancy, 15% of slots will be made available to Allston/Brighton residents.	Will be addressed as part of revised Science project.
Construction Management Plan		Prior to issuance of a full building permit.	Will be addressed as part of revised Science project.
Wireless Communications		Review if roof of Science is suitable location for wireless communications equipment.	Will be addressed as part of revised Science project.

Denotes items related to the Transformative Project.

Status of Cooperation Agreements:
28 Travis Street Cooperation Agreement (signed 1/2/14)

Description	Budget	Obligation and Timing	Status
Submit Construction Management Plan		Submit CMP.	Complete.
Submit a Transportation Access Plan Agreement		Submit TAPA.	Complete.
Pay linkage payments	Approximately $500,000	Underway.	Ongoing.
Construction Employment		Prepare Boston Residents Construction Employment Plan.	Complete.
Voluntary Employment Opportunity Plan		Prepare Voluntary Employment Opportunity Plan.	Complete.
Maintenance and Operation		Keep the site in good and safe condition and repair.	Ongoing.
No Entrance/Exit on Travis Street		Keep Travis Street entrance closed.	Complete.
Rena Park Planning	Funded through Science Cooperation Agreement	Begin planning and identify implementable improvements that will begin construction in 2014.	Planning and design process started in 2014. Design is on hold while Harvard replaces BWSC-owned storm drain in Rena Park area during summer and fall of 2015. Implementation of Rena Park design will follow replacement of storm drain.
Prepare Comprehensive Support Services Plan		Prepare Support Services Plan for inclusion in IMP.	Complete – included in IMP.
Relocate services from 28 Travis		Implement recommendations from Comprehensive Support Services Plan by C of O for Science.	Will continue to be evaluated.
Restrict building use from 12:00 midnight to 6:00 AM		Restriction in place with opening of building.	Ongoing.
Extend Partnership Fund	$500,000 ($100,000/year for five years)	Extend Partnership Fund grants for five years, from 2013 through 2018.	Ongoing. In Year 2 of the extended fund.
Provide public access to Harvard shuttle system		Harvard to study public access to Harvard shuttle services.	Harvard shuttle opened to public as part of 28 Travis project. Harvard will implement Barry's Corner/Harvard Square shuttle route and extend the Allston Express shuttle to Barry's Corner as part of Continuum project.
Identify location for relocated Ed Portal		Identify location for relocated Ed Portal.	Complete. Ed Portal relocated and operational at 224 Western Avenue.

APPENDIX B

Status of Cooperation Agreements:
IMP Cooperation Agreement (signed 7/10/14): Part 1 of 3

Description	Budget	Obligation and Timing	Status
PUBLIC REALM			
Everett Street Improvements	$500,000	Provide funding for City-led project for improvements to Everett Street.	Complete. Check delivered to City on 9/30/14.
Soldiers Field Road Crossings	$150,000 for study and $3,350,000 for implementation	Study phase to be conducted in 2014 to be followed by an implementation phase.	Study commenced in fall of 2014. Updated study was submitted to BRA in July 2015.
Maintenance of Raymond V. Mellone Park	$400,000	Extend maintenance of Raymond V. Mellone Park from 2021 through 2025.	Begins in 2021.
Flexible Fund	$5,350,000 over ten years	Develop flexible fund for public realm improvements. Funds will be spent over ten years but there is a two-year planning period.	Establishment of Executive Committee by the City to be completed in 2015.
Interim improvements to Grove	Funded through Science Cooperation Agreement	Make immediate interim improvements to the Grove.	Complete – Grove opened in Summer 2014.
Commence Rena Park planning	$1,500,000 budget from Science Cooperation Agreement	Continue planning and identify implementable improvements that will begin construction in 2014.	Planning and design process started in 2014. Design is on hold while Harvard replaces BWSC-owned storm drain in Rena Park area during summer and fall of 2015. Implementation of Rena Park design will follow replacement of storm drain.
Greenway		Conduct planning process in 2014 for exploring strategies for interim implementation of the Greenway.	Memo on Greenway Planning submitted to BRA on 12/15/14.
EDUCATION			
Education Portal	$4,000,000 total	Continue to operate and fund the Ed Portal through 2024.	Ongoing. As described in the Science Cooperation Agreement, this extension will commence as part of the IMP Cooperation Agreement in 2019.
Programming		Extend academic and enrichment programming (including Mentoring and Community Scholarships) in the Ed Portal through 2024.	Ongoing. As described in the Science Cooperation Agreement, this extension will commence as part of the IMP Cooperation Agreement in 2019.
Gardner Pilot Academy		Extend partnership program with Gardner Pilot Academy through 2024.	Ongoing. As described in the Science Cooperation Agreement, this extension will commence as part of the IMP Cooperation Agreement in 2019.
Adult Education		Extend Adult Education programs through 2024.	Ongoing. As described in the Science Cooperation Agreement, this extension will commence as part of the IMP Cooperation Agreement in 2019.
Public Information and Outreach		Extend public information and outreach program through 2024.	Ongoing. As described in the Science Cooperation Agreement, this extension will commence as part of the IMP Cooperation Agreement in 2019.
Contribution to BPS/GPA	$500,000	Contribution to BPS in support of a capital project at the GPA.	Timing to be developed through BPS capital planning process in 2015/16.

Denotes items related to the Transformative Project.

Status of Cooperation Agreements:
IMP Cooperation Agreement (signed 7/10/14): Part 2 of 3

APPENDIX B

Description	Budget	Obligation and Timing	Status
WORKFORCE DEVELOPMENT			
Workforce Development	$2,000,000	Extend Workforce Development program from Science Cooperation Agreement through 2024.	Ongoing. With the opening of the Ed Portal, residents of Allston-Brighton have a centralized location to receive a variety of workforce development and employment services, the end result of which will be the more efficient use of community benefit funding and JCS resources. JCS, the Authority and Harvard agree that, with the programming that can be provided at the new Ed Portal, the Allston-Brighton Resource Center will be closed in order to promote efficiency and avoid duplication of services. Services include job counseling, resume writing, and workshops. Harvard, in consultation with JCS, will retain workforce development programming specialists to help with the implementation, oversight, and delivery of such programs at the new Ed Portal.
Jobs Linkage	$2,000,000		Ongoing.
PARTNERSHIP FUND			
Harvard Allston Partnership Fund	$500,000	Extension of Partnership Fund for 2019-2023.	First payment due in 2019.
HOUSING FUND			
Harvard Allston Housing Fund	$3,000,000	Commit $3,000,000 to assist third-party organization in housing stabilization.	MOU for third-party organization negotiated and signed; first year of housing fund.
DIP/LINKAGE			
DIP/Linkage	$11,000,000 to $13,000,000	Payments will be part of each IMP project that requires linkage.	Chao Center has made initial payments.
DONATION OF BROOKLINE MACHINE			
Donation of Brookline Machine site	$2,000,000	Initiate testing of site, demolish building, and transfer site to City.	MOU for transfer to City complete. City to commence public process around site future use.
TRANSFORMATIVE PROJECT			
Physical Space & Operations	$8,250,000 total	Relocate Ed Portal to 224 Western and transform space into Transformative Project by the end of 2015.	Complete & Ongoing. New Ed Portal opened in February 2015.
Programming		Programs including expanded marquee Ed Portal programming, AllstonX, Health & Wellness, Arts, Public School Parnterships Athletics, North Allston/ North Brighton Workforce and Business Development Program.	Ongoing.
Workforce Development		Enhance Workforce Collaborative Programs.	Ongoing.

Denotes items related to the Transformative Project.

Status of Cooperation Agreements:
IMP Cooperation Agreement (signed 7/10/14): Part 3 of 3

Description	Budget	Obligation and Timing	Status
DEVELOPMENT AGREEMENTS			
PILOT		Extend existing PILOT Agreement to new IMP projects	Complete and Ongoing. Harvard University has long embraced its civic partnerships and has consistently made financial payments to its host communities. Harvard engages in regular discussions with the City of Boston as it aims to strike a balance between our direct programming and reliable financial contributions that support basic city services and enhance quality of life for Boston residents.
Transportation Access Plan Agreement		Prepare TAPA for each IMP project.	Institutional TAPA signed. TAPA for Chao signed.
Construction Management Plan		Prepare CMP for each IMP project.	Institutional CMP Guidelines prepared. CMPs for Chao and Baker signed.
Construction Employment		Prepare Boston Residents Construction Employment Plan for each IMP project.	Part of each project. Agreement signed for Chao Center.
Permanent Employment		Prepare Permanent Jobs Agreements for each IMP project.	Part of each project. Agreement signed for Chao Center.
TRANSPORTATION			
Design of Stadium Way		Develop 25% design of Stadium Way by November 2015.	Ongoing.
Evaluate construction support area		Evaluate construction support area.	Ongoing.
Special events study		Prepare study by April 30, 2014.	Study submitted to BRA on 4/30/14 with follow-up information submitted on 3/11/15.
Study implementation of parking reserve		Prepare parking analysis memo.	Study submitted to BRA on 10/17/14.
Analysis of alternatives for surface parking		Prepare parking analysis memo.	Study submitted to BRA on 10/17/14.
Extend TDM measures to tenants		Extend TDM measures to commercial tenants in Allston.	Harvard joined TMA on behalf of certain commercial tenants. Memo describing measures submitted to BTD on 7/10/15.
Prepare transportation and parking analysis program, scope to be determined with BTD		Scope of analysis is essentially the items listed above.	Complete and underway.
Assist BTD in Residential parking		Assist BTD during 2014.	BTD implemented additional residential permit parking.
ANNUAL REPORT			
Submit Annual Report		Annual report submitted to BRA and Task Force.	Due by August 31 of each year.

Appendix B: Transportation Technical Appendix

Trip Generation
Auto Mode Share Summary
Vehicular Trip Distribution

Table 3

Trip Generation by Mode (no credits)

Development Site	Science Project				Science Project				TOTAL			
Development Type	Academic				114 Western Institutional Office				Science Only			
Methodology	Harvard Empirical Data (Existing SEAS)				Harvard Empirical Data (Existing SEAS)							
Size	360 Faculty/Staff + 1,000 Graduate Students/Researchers				60 Staff							
Direction	Person Trips [a]	Vehicle Trips [b]	Transit Trips [c]	Walk/Bike Trips	Person Trips [a]	Vehicle Trips [b]	Transit Trips [c]	Walk/Bike Trips	Person Trips	Vehicle Trips	Transit Trips	Walk/Bike Trips
Weekday Daily	2,580	500	1,040	1,040	110	70	20	20	2,690	570	1,060	1,060
Weekday AM												
Enter	520	100	210	210	25	15	5	5	545	115	215	215
Exit	35	10	15	10	5	0	5	0	40	10	20	10
Total	555	110	225	220	30	15	10	5	585	125	235	225
Weekday PM												
Enter	35	10	15	10	5	0	5	0	40	10	20	10
Exit	270	100	85	85	25	15	5	5	295	115	90	90
Total	305	110	100	95	30	15	10	5	335	125	110	100

a - Person Trips = ITE Trips

b - Vehicle Trips = (Person Trips * Vehicle Mode Share)/VOR

c - Transit Trips = Person Trips * Transit Mode Share

d - Walk/Bike Trips = Person Trips * Walk/Bike Mode Share

Table A1: Person Trips

	2007 Science Project			2013 IMP[1]	2015 SEC Project[1]		
	Science	114 Western	Total		Science	114 Western	Total
Weekday Daily	2,770	910	3,680	4,820	2,580	110	2,690
Weekday AM Peak Hour							
Enter	370	105	475	770	520	25	545
Exit	60	40	100	80	35	5	40
Total	430	145	575	850	555	30	585
Weekday PM Peak Hour							
Enter	40	25	65	65	35	5	40
Exit	370	75	445	560	270	25	295
Total	410	100	510	625	305	30	335

1. Not including undergraduate trips

Table A2: Vehicle Trips

	2007 Science Project			2013 IMP[1]	2015 SEC Project[1]		
	Science	114 Western	Total		Science	114 Western	Total
Weekday Daily	1,480	570	2,050	2,110	500	70	570
Weekday AM Peak Hour							
Enter	200	55	255	270	100	15	115
Exit	30	25	55	40	10	0	10
Total	230	80	310	310	110	15	125
Weekday PM Peak Hour							
Enter	20	15	35	30	10	0	10
Exit	200	40	240	280	100	15	115
Total	220	55	275	310	110	15	125

1. 2013 driveway counts at 114 Western Avenue parking lots
2. Not including undergraduate trips

Table 11
Science Project Academic
Based on projected population from Harvard

# of Faculty/Staff	**360**										
% of Staff - Daily	94%		*2010 Rideshare (TWR average, All employees All Schools)*								
# of Staff - Daily		338									
				Auto	Transit	Walk/Bike		Auto	Transit	Walk/Bike	
% Arriving AM Peak	41%	139	*2010 Rideshare (8:00-9:00, All employees All Schools)*	60%	20%	20%		83	28	28	
% Departing AM Peak	5%	17		60%	20%	20%		10	3	3	
% Arriving PM Peak	5%	17		60%	20%	20%		10	3	3	
% Departing PM Peak	47%	160	*2010 Rideshare (5:00-6:00, All employees All Schools)*	60%	20%	20%		96	32	32	
VOR	1.00										
# of Commuting Students	**1000**										
% of Commuting Students - Daily	95%		*2010 Rideshare (TWR average, All students, both campuses)*								
# of Commuting Students - Daily		950									
				Auto	Transit	Walk/Bike		Auto	Transit	Walk/Bike	
% Arriving AM Peak	40%	383	*SFPG Counts (Red permits, entering before noon)*	5%	48%	47%		19	184	180	
% Departing AM Peak	2%	19		5%	48%	47%		1	9	9	
% Arriving PM Peak	2%	19		5%	48%	47%		1	9	9	
% Departing PM Peak	12%	112	*2001 Grad Housing Survey. (Non-Harvard housing, bus school, avg of 5:00 &*	5%	48%	47%		6	54	53	
VOR	1.00										

Person Trips

AM			PM			Daily
Total	In	Out	Total	In	Out	
558	522	36	308	36	272	2580

Vehicle Trips

AM			PM			Daily
Total	In	Out	Total	In	Out	
113	102	11	113	11	101	500

Table 13a
Science Project 114 Western Avenue
Based on projected population from Harvard for 114 Western Avenue

# of Faculty/Staff	**60**									
% of Staff - Daily	94%		*2010 Rideshare (TWR average, All employees All Schools)*							
# of Staff - Daily		56								
				Auto	Transit	Walk/Bike	Auto	Transit	Walk/Bike	
% Arriving AM Peak	41%	23	*2010 Rideshare (8:00-9:00, All employees All Schools)*	69%	12%	19%	16	3	4	
% Departing AM Peak	5%	3		69%	12%	19%	2	0	1	
% Arriving PM Peak	5%	3		69%	12%	19%	2	0	1	
% Departing PM Peak	47%	27	*2010 Rideshare (5:00-6:00, All employees All Schools)*	69%	12%	19%	18	3	5	
VOR	1.10									

Person Trips

AM			PM			Daily
Total	In	Out	Total	In	Out	
26	23	3	29	3	27	110

Vehicle Trips

AM			PM			Daily
Total	In	Out	Total	In	Out	
16	15	2	18	2	17	70

Auto Mode Share Summary

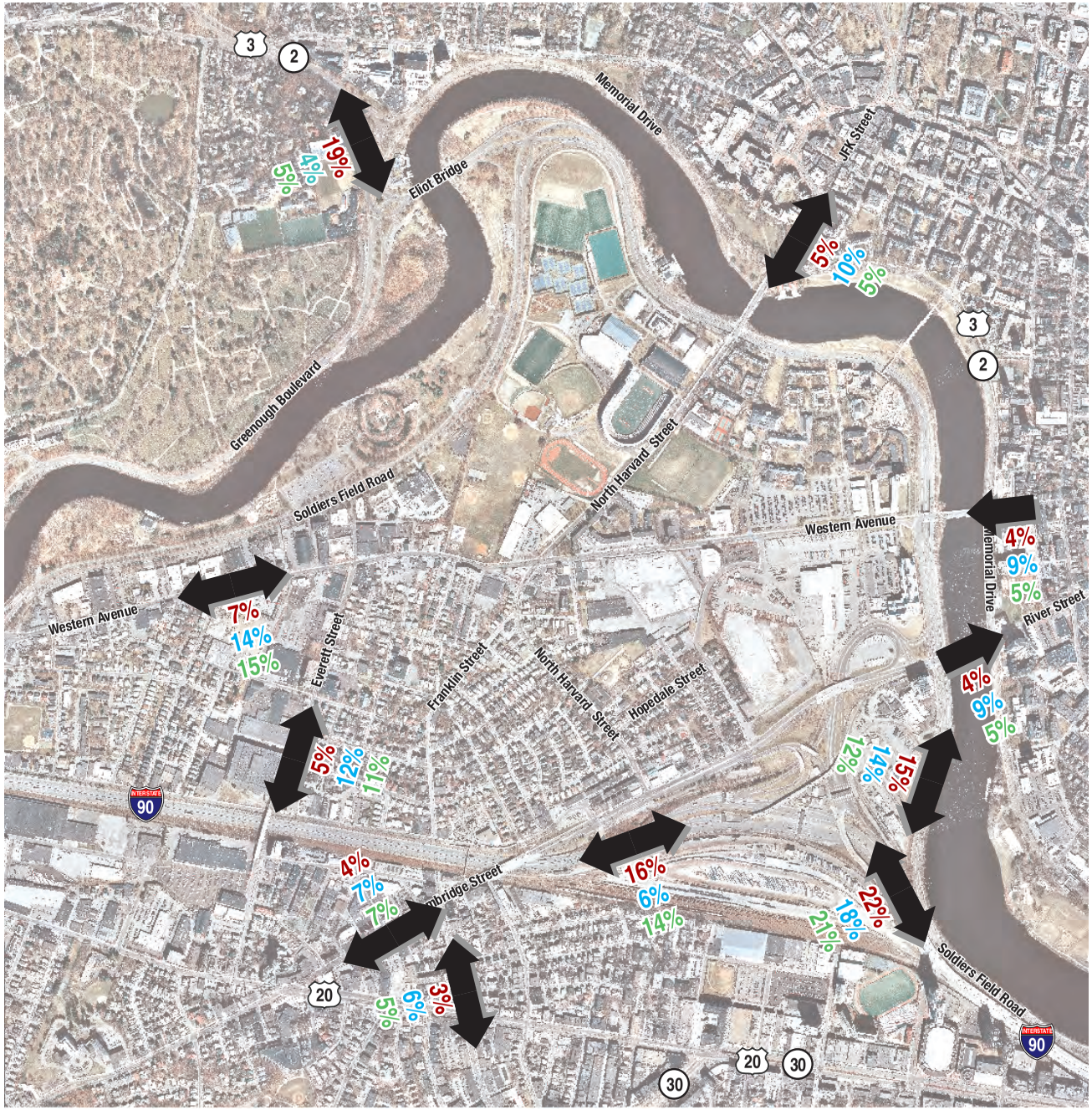
	October 2014 Parking Permit Data [a]		2014 SEAS Survey [b]				2015 SEC Project	
Population [d]	Cambridge Campus - SEAS Only	Allston Campus	Good Weather	Inclement Weather	Projected Future	Access Boston [c]	Assumed Auto Mode Share	Overall Composite
Staff	39%	59%	21%	24%	26%	59%	59%	21%
Faculty	46%	88%	35%	50%	46%	n/a	60%	
Blended Staff/Faculty	42%	64%	27%	35%	34%	n/a	59%	
Researchers/Grad Students	1%	n/a	4%	3%	4%	n/a	5%	

a October 2014 data does not include permits grouped as: Other Affiliate w/ ID, Union Employees, Casual -- Non-Researchers/Grad Students, Child Care, Contractor, Neighbor/Community, No Affiliaton, Restaurant Associates, Vendor, or Visitor to Campus. Totals 9 permits from Cambridge SEAS Campus and 359 permits from Allston Campus.

b Based on responses from 72 (40%) Staff, 27 (21%) Faculty, 98 (11%) Grads/Postdocs, and 185 (19%) Undergrads.

c Access Boston Mode Share for entering vehicles during the weekday mornign and exiting vehicles during the weekday evening for Area 17: Allston.

d Undergraduates are restricted from purchasing a parking permit and therefore were assumed to have a future auto mode share of zero percent.



Vanasse Hangen Brustlin, Inc.

Figure 15
Vehicular Trip Distribution

Appendix C: Air Quality Technical Appendix

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analysis.

Motor Vehicle Emissions

The EPA MOVES computer program generated motor vehicle emissions used in the garage stationary source analysis along with the mobile source CAL3QHC modeling and mesoscale analysis. The model input parameters were provided by MassDEP. Emission rates were derived for 2012 and 2022 for speed limits of idle, 10, 15, and 30 mph for use in the microscale analyses.

MOVES CO Emission Factor Summary

Carbon Monoxide Only

		2012	2022
Free Flow	30 mph	3.843	2.039
Right Turns	10 mph	6.481	3.281
Left Turns	15 mph	5.454	2.852
Queues	Idle	21.705	5.446

Notes: Winter CO emission factors are higher than Summer and are conservatively used
Urban Unrestricted Roadway type used

CAL3QHC

For the intersection studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOVES. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 370 cm was used for the intersection. Idle emission rates for queue links were based on 0 mph emission rates derived in MOVES. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

Background Concentrations

POLLUTANT	AVERAGING TIME	Form	2012	2013	2014	Units	ppm/ppb to µg/m³ Conversion Factor	2012-2014 Background Concentration (µg/m³)	Location
SO_2 [1][5]	1-Hour [4]	99th %	13.2	12	9.7	ppb	2.62	30.5	Kenmore Sq., Boston
	3-Hour [6]	H2H	*10.6*	*13.9*	*9.4*	ppb	2.62	36.4	Kenmore Sq., Boston
	24-Hour	H2H	5.4	*6*	*5*	ppb	2.62	15.7	Kenmore Sq., Boston
	Annual	H	1.87	1	0.94	ppb	2.62	4.9	Kenmore Sq., Boston
PM-10	24-Hour	H2H	28.0	50	53	µg/m³	1	53	Kenmore Sq., Boston
	Annual	H	15.7	19	14.9	µg/m³	1	19.0	Kenmore Sq., Boston
PM-2.5	24-Hour [4]	98th %	22.1	18	14.6	µg/m³	1	18.2	Kenmore Sq., Boston
	Annual [4]	H	9.0	8	6.02	µg/m³	1	7.7	Kenmore Sq., Boston
NO_2 [3]	1-Hour [4]	98th %	49	48	49	ppb	1.88	91.5	Kenmore Sq., Boston
	Annual	H	19.1	17.78	17.17	ppb	1.88	35.9	Kenmore Sq., Boston
CO [2]	1-Hour	H2H	1.3	1.3	1.3	ppm	1146	1489.8	Kenmore Sq., Boston
	8-Hour	H2H	0.9	0.9	0.9	ppm	1146	1031.4	Kenmore Sq., Boston
Ozone	8-Hour	H4H	0.078	0.059	0.054	ppm	1963	153.1	Harrison Ave., Boston
Lead	Rolling 3-Month	H	0.014	0.006	0.014	µg/m³	1	0.014	Harrison Ave., Boston

Notes:
From 2012-2014 MA DEP Annual Data Summaries. Missing data (in *italics*) from EPA's AirData Website

[1] SO_2 reported ppb. Converted to µg/m³ using factor of 1 ppm = 2.62 µg/m³.

[2] CO reported in ppm. Converted to µg/m³ using factor of 1 ppm = 1146 µg/m³.

[3] NO_2 reported in ppb. Converted to µg/m³ using factor of 1 ppm = 1.88 µg/m³.

[4] Background level is the average concentration of the three years.

[5] The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.

Model Input/Output Files

Due to excessive size CAL3QHC, and MOVES input and output files are available on digital media upon request.

Appendix D:
LEED Scorecard and Narrative

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Science and Engineering Complex and 114 Western Avenue

LEED Certification Narrative
10.20 .15

Project Overview – Science and Engineering Complex

The new Science and Engineering Complex (SEC) should be an exemplary project of integrated sustainability, in both quantitative as well as qualitative terms. In quantitative terms, the project aspires to reduce greenhouse gas emissions by 50% over a baseline building using the University's 2006 energy profile baseline, and to achieve at a minimum LEED for Building Design and Construction (LEED-BD&C) Version 4 Gold certification, a significant achievement for an energy intensive laboratory building. The project is being designed to comply with the Harvard Green Building Standards, which is a set of process oriented requirements that go above and beyond those of LEED certification. To achieve these goals the project will feature high-performance envelopes, highly efficient climate, ventilation, and heat recovery systems, and intelligent program zoning to ensure that air circulation, a major contributor to energy use, is minimized while optimizing occupant comfort and safety. The project will serve as a model of sustainable laboratory operations, integrating facility management and staffing discussions into the design phase to ensure successful long-term operation.

In qualitative terms, the SEC should be a model for an approach to sustainability that emphasizes the integration of architectural spaces for communication and collaboration with access to daylight, natural ventilation and comfort. Collaborative space in a variety of types and scales will be woven into the building in ways that support informal discussion outside of proper laboratory spaces and that optimizes opportunities for interdisciplinary interaction. In a building of such considerable scale, the individual should be given considerable control over their environment, to open a window, to raise and lower the lights, to fine-tune temperature, and to occupy spaces appropriate to various tasks and group sizes. Fresh air and daylight will be combined with intelligent programming to create multiple climate zones appropriate to space usage, which link occupants to natural environmental conditions and improve health, productivity, and well-being.

As the attached scorecard shows, we are anticipating earning at least 57 points based on the project design. There are an additional 43 points in the “Maybe” column, and the design team anticipates that many of these credits will be earned in addition to the 57 points listed in the “Yes” column. As a result, we are confident at this time that the project is on track to reach our certification goal. In support of the above statements, the following pages list a point by point narrative of the status of each LEED credit. Credits not anticipated to be earned are not included.

Project Overview – 114 Western Avenue

The 114 Western Avenue project is approximately 52,000 GSF of renovation of an existing 82,000 GSF building. The renovation is an opportunity to reconfigure the exiting spaces and provide offices, conference rooms, and five classrooms. The project is evaluating the option to pursue LEED certification and it is being designed to comply with the Harvard Green Building Standards.

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Anticipated LEED Credits

These are credits listed in the "Yes" column of the project scorecard, meaning credit achievement is either certain or extremely likely based on the current design. All prerequisites are met, and the total number of points associated with these credits, 57.

PIf1 – Minimum Program Requirements

The SEC project meets all the LEED minimum program requirements. A LEED project boundary, occupancy information, and area information will be finalized during the design process.

IPc1 – Integrative Process – 1 point

The energy modeling team has conducted preliminary energy modeling analysis prior to the completion of SD assessing shading, exterior landscape, massing, orientation, basic envelope attributes, lighting levels, pug and process loads, and programmatic and operational parameters. Additionally, a water budget analysis will be completed prior to the end of schematic design. Analyses and assessments of the project will be included in the OPR and BOD documents. Documentation of this credit will be finalized after Construction Documents are complete.

LTc2 – Sensitive Land Protection – 1 point

This project is designed on a previously developed site and will meet the credit requirements. Additionally, the project does not include development on:

- Prime farmland
- Previously undeveloped land
- Land identified as habitat for endangered species
- Land within 100 feet of wetlands
- Land previously designated as public parkland

Documentation of this credit will be finalized after Construction Documents are complete.

LTc4 – Surrounding Density and Diverse Uses – 4 points

The project site is surrounded by dense residential and non-residential units, within a ¼ mile radius from the project boundary. Additionally, the main entrance to the project is within ½ mile walking distance to over 9 diverse uses in 5 different use categories such as restaurants, banks, and a public library. Documentation of this credit will be finalized after Construction Documents are complete.

LTc5 – Access to Quality Transit – 3 points

The project has functional entries located within ¼-mile walking distance of existing MBTA public bus lines – 70/70A, 66, 86 and an existing Harvard University campus shuttle – Allston Campus Express with paired route service. All four bus lines provide a total of 289 weekday trips and 146 weekend trips, meeting the credit requirements for multiple transit types. Documentation of this credit will be finalized after Construction Documents are complete.

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LTc6 – Bicycle Facilities – 1 point

The project site is located within 200 yards walking distance to a bicycle network that connects to a bus rapid transit stop for MBTA bus lines 70 and 70A as well as Harvard University Shuttle stop i-Lab HBS and a Hubway bicycle network. The project team will include approximately 242 bike racks, out of which, 101 will be covered. Staff locker and shower rooms will also be included in the project. Documentation of this credit will be finalized after Construction Documents are complete.

SSp1 – Construction Activity Pollution and Prevention Plan – Prerequisite

The project civil engineer will create an erosion and sedimentation control plan for all construction activities associated with the project. The Contractor will implement the plan once construction begins. The plan complies with the requirements of the 2012 EPA Construction General Permit and includes graphic and written descriptions demonstrating measures that:

- Prevent soil loss by stormwater runoff and/or wind erosion.
- Prevent sedimentation of storm sewers or receiving streams.
- Prevent pollution of air with dust and particulate manner.

The project will meet the prerequisite requirements. Documentation of this credit will be finalized after Construction Documents are complete.

SSc2 – Site Development –Protect or Restore Habitat – 2 points

The project team will pursue Option 1 – On-site Restoration and the design will include bio-swales along the southern and western boundaries of the site to help store and redirect rainwater. Green roofs are designed to provide vital outdoor meeting spaces while making use of pervious materials that improve air quality, reduce carbon emissions and control storm-water run-off. Wet meadows, roof terraces and walking paths are designed to provide links to existing and future neighborhood amenities. Based on preliminary calculations, the above mentioned site development areas will contribute to 30% of the total site area being planted with native/adaptive vegetation. The current design will be further developed to meet this requirement. Documentation of this credit will be finalized after Construction Documents are complete.

SSc4 – Rainwater Management – 3 points

The project design will manage stormwater runoff via rain gardens, which will direct runoff to rainwater reuse tanks located within the building (75,000 gallon capacity). Runoff not collected in the tank will be treated to remove at least 80% TSS. Low impact development techniques such as water quality swales and infiltration trenches will also be incorporated into the design to address rainwater management. The rainwater management system will be capable of collecting and recharging up to the 100-year storm event. Documentation of this credit will be finalized after Construction Documents are complete.

SSc6 – Light Pollution Reduction – 1 point

The project will include shielded full-cutoff fixtures to control glare, light trespass, and light pollution. The exterior lighting will be design to meet uplight and light trespass requirements for the backlight-uplight-glare (BUG) method. Documentation of this credit will be finalized after Construction Documents are complete.

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WEp1 – Outdoor Water Use Reduction, 30% – Prerequisite
As part of the Harvard Green Building Standards, projects are required to reduce outdoor water use by at least 50% and to separately sub-meter irrigation water use from other potable water use. Preliminary calculations indicate that the project irrigation system is expected to achieve a 67% reduction in outdoor water use. The project will meet the prerequisite requirements.The credit documentation will be finalized after Construction Documents are complete.

WEp2 – Indoor Water Use Reduction, 20% – Prerequisite
As part of the Harvard Green Building Standards, projects are required to reduce indoor potable water use by a minimum of 35%. Preliminary calculations indicate that the project will achieve a minimum of 35% indoor water use reduction. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

WEp3 – Building Level Water Metering – Prerequisite
The project will include utility water meters to provide monthly water use data. The design includes meters for domestic cold water at the water service. Additionally, all metering associated with domestic water, heating hot water, laboratory water, and potentially storm water recycling system will be monitored by the building automation system (BAS). The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

WEc1 – Outdoor Water Use Reduction, 100% Reduction – 2 points
Preliminary calculations indicate that the project irrigation system is expected to achieve a 67% reduction in outdoor water use. Additionally, the irrigation system design will include a 75,000 gallon rainwater reuse tank, which will help meet the irrigation demand. The credit documentation will be finalized after Construction Documents are complete.

WEc2 – Indoor Water Use Reduction, 35% Reduction –3 points
Preliminary calculations indicate that the project will achieve a minimum of 35% indoor water use reduction. The credit documentation will be finalized after Construction Documents are complete.

WEc4 – Water Metering – 1 point
The project will include at least two water meters to measure irrigation water use and reclaimed rainwater. The credit documentation will be finalized after Construction Documents are complete.

EAp1 – Fundamental Commissioning and Verification – Prerequisite
The SEC project team has selected a third party commissioning authority for this project. The project will meet the prerequisite requirements. The credit documentation will be finalized after the commissioning process is complete.

EAp2 – Minimum Energy Performance – Prerequisite
The project team has created a whole building energy simulation model to demonstrate the energy performance improvement in the proposed building when compared with a baseline building. Using the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010, the proposed building is demonstrating an anticipated energy use reduction of 25%, as well as a reduction in expected utility costs of 24%, when compared to a baseline building. This exceeds the prerequisite minimum energy reduction of 5%. The Harvard Green building standards

require a 19.5% reduction in expected energy use. The credit documentation will be finalized after Construction Documents and the final iteration of the energy model are complete.

EAp3 – Building-Level Energy Metering – Prerequisite

The current schematic design narrative includes new building-level energy meters. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

EAp4 – Fundamental Refrigerant Management – Prerequisite

Chilled water shall be supplied to the SEC from the District Energy Facility, which will include two chilled water systems. The systems will not use CFC-based refrigerants and the project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

EAc1 – Enhanced Commissioning – 6 Points

As part of the Harvard Green Building Standards, projects are required to conduct enhanced and envelope commissioning. Additionally, the project will pursue monitoring-based commissioning. The credit documentation will be finalized after the commissioning process is complete.

EAc2 – Optimize Energy Performance, 24% Reduction – 10 points

The project team has created a whole building energy simulation model to demonstrate the energy performance improvement in the proposed building when compared with a baseline building. Using the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010, the proposed building is demonstrating an anticipated energy use reduction of 25%, as well as a reduction in expected utility costs of 24%, when compared to a baseline building. The Harvard Green building standards require a 19.5% reduction in expected energy use. The credit documentation will be finalized after Construction Documents and the final iteration of the energy model are complete.

Savings are expected as a result of implementing numerous energy efficiency measures including:

- Daylighting and natural ventilation strategies
- High performance building envelope
- Reduced laboratory ventilation rates
- Aggressive lighting power densities
- Energy efficient HVAC systems

EAc3 – Advanced Energy Metering – 1 point

The project will incorporate a building automation system (BAS) with metering and aggressive scheduling, reset and optimization routines. The control system will have extensive monitoring and energy metering capability. The credit documentation will be finalized after Construction Documents are complete.

EAc6 – Enhanced Refrigerant Management – 1 point

Chilled water shall be supplied to the SEC from the District Energy Facility, which will include two chilled water systems. The systems will not use CFC-based refrigerants. The credit documentation will be finalized after Construction Documents are complete.

MRp1 – Storage and Collection of Recyclables – Prerequisite
The project will include dedicated areas for the collection and storage of recyclable materials, including batteries, and electronic waste, accessible to waste haulers and building occupants. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

MRp2 – Construction and Demolition Waste Management Planning – Prerequisite
Project specifications will require the Contractor to develop and implement a Construction and Demolition Waste Management Plan, including waste diversion goals, waste streams generated, and disposal and diversion rates. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

MRc2 – Building Product Disclosure and Optimization - Environmental Product Declarations (EPD) – 1 point
As part of the Harvard Green Building Standards, projects are required to meet MRc2 Option 1. The project team will specify a minimum of 20 permanently installed products sourced from at least 5 different manufacturers that have EPD documentation. The credit documentation will be finalized after Construction Documents are complete.

MRc3 – Building Product Disclosure and Optimization - Sourcing of Raw Materials – 1 point
As part of the Harvard Green Building Standards, projects are required to meet MRc3 Option 1. The project team will specify a minimum of 20 permanently installed products sourced from at least 5 different manufacturers that have corporate sustainability reports. The credit documentation will be finalized after Construction Documents are complete.

MRc4 – Building Product Disclosure and Optimization - Material Ingredients – 1 point
As part of the Harvard Green Building Standards, projects are required to meet MRc4 Option 1. The project team will specify a minimum of 20 permanently installed products sourced from at least 5 different manufacturers that have material ingredient reporting documentation. The credit documentation will be finalized after Construction Documents are complete.

MRc5 – Construction and Demolition Waste Management – 2 points
As part of the Harvard Green Building Standards, projects are required to divert at least 90% of construction and demolition waste from landfills. The project specifications will require the Contractor to implement a Construction and Demolition Waste Management Plan that will meet the 90% requirement for at least four material streams. The credit documentation will be finalized after Construction Documents are complete.

EQp1 – Minimum IAQ Performance – Prerequisite
The project ventilation system design will meet the ASHRAE 62.1-2010 standards, including outdoor air delivery monitoring. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

EQp2 – Environmental Tobacco Smoke Control – Prerequisite
No smoking is permitted in the building or within 25 feet of doors, windows, and outdoor air intakes. Appropriate signage will be installed to ensure credit compliance. The project will meet the prerequisite requirements. The credit documentation will be finalized after Construction Documents are complete.

EQc1 – Enhanced IAQ Strategies – 2 points
The project design will include permanent entryway systems in the vestibules serving all exterior entrances to the SEC project and a minimum of MERV 13 filtration in all mechanically ventilated systems. Additionally, areas where hazardous gases and chemicals will be used and stored will be sufficiently exhausted and negatively pressurized to prevent air migration out of those spaces. The ventilation system will also include CO2 sensors in classrooms and conference rooms and other densely occupied spaces. The credit documentation will be finalized after Construction Documents are complete.

EQc2 – Low-Emitting Materials – 1 point
Project specifications will include VOC emissions and content language for adhesives and sealants, paints and coatings, flooring, composite wood, insulation, and furniture. The credit documentation will be finalized after Construction Documents are complete.

EQc3 – Construction IAQ Management Plan – 1 point
Project specifications will require the Contractor to develop and implement a construction indoor air quality management plan that meets the SMACNA IAQ Guidelines for Occupied Buildings under Construction. The credit documentation will be finalized after Construction Documents are complete.

EQc5 – Thermal Comfort – 1 point
The project team will design the HVAC and building envelope systems to meet the requirements of ASHRAE Standard 55-2010. The credit documentation will be finalized after Construction Documents are complete.

EQc6 – Interior Lighting – 1 point
The lighting control system will be designed to provide daylight dimming, low voltage switch controls, occupancy sensors, and central control/monitoring of the systems, providing lighting controls to individual and multi-occupant spaces. Additionally, daylight responsive dimming control and task lighting will be employed to the maximum extent possible throughout the building. It is anticipated that most areas will be provided with photocell controlled LED lighting with dimmable drivers. The credit documentation will be finalized after Construction Documents are complete.

EQc7 – Daylight – 2 points
The building will be designed to provide ample natural daylight to interior spaces. Window treatments (shades or blinds) will be provided where appropriate to control the amount of daylight entering the space. Automated interior shades will be provided in the atrium and public spaces for glare control. The project team will create daylight simulation models to demonstrate credit compliance. The credit documentation will be finalized after Construction Documents are complete.

IDc1.1 – Green Building Education – 1 point

As part of the Harvard Green Building Standards, projects are required to complete and publish a comprehensive case study, and either (A) provide regular tours or (B) provide educational signage highlighting the LEED and sustainability features of the project. The project plans to incorporate option B. The credit documentation will be finalized after Construction Documents are complete.

IDc2 – LEED Accredited Professional – 1 point

Emil Cuevas-Melendez, LEED AP BD+C is on the project team and meets the requirements of this credit. The credit documentation will be finalized after Construction Documents are complete.

RP2 – SSc4 – Rainwater Management – 1 point

The rainwater management system will be capable of collecting and recharging up to the 100-year storm event. Documentation of this credit will be finalized after Construction Documents are complete.

RP4 – EAc2 – Optimize Energy Performance – 1 point

The project team has created a whole building energy simulation model to demonstrate the energy performance improvement in the proposed building when compared with a baseline building. Using the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010, the proposed building is demonstrating an anticipated energy use reduction of 25%, as well as a reduction in expected utility costs of 24%, when compared to a baseline building. The credit documentation will be finalized after Construction Documents and the final iteration of the energy model are complete.

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Potential Credits

These are credits listed in the "Maybe" column in the project scorecard, meaning credit achievement is possible but requires additional investigation or is based on construction practices that are difficult to estimate in the design phase. Extensive prior experience indicates that at least half to two-thirds of these credits will be earned at the completion of construction, and we currently have 43 total points in this classification, resulting in 78 points (Gold: 57 + (43*50%) = 78.5) anticipated overall. This is likely a conservative estimate of the total points the project will achieve. As many of these credits require additional investigation or cannot be calculated, justifications for their achievement are not provided.

LTc3 – High Priority Site – 2 points

The project site is located on a brownfield where remediation due to contamination has taken place. Remediation reports (2006) will be reviewed to determine credit feasibility and document the credit. Documentation of this credit will be finalized after Construction Documents are complete.

LTc4 – Surrounding Density and Diverse Uses – 1 point

The project site is surrounded by dense residential and non-residential units, within a ¼ mile radius from the project boundary. Additionally, the main entrance to the project is within ½ mile walking distance to over 9 diverse uses in 5 different use categories such as restaurants, banks, and a public library. Preliminary calculations indicate that the project can potentially achieve one additional point. Documentation of this credit will be finalized after Construction Documents are complete.

LTc5 – Access to Quality Transit –2 points

Harvard University is proposing a new campus shuttle line serving the project. With the addition of this new campus shuttle service, the project will potentially achieve the minimum requirements for two additional points. Documentation of this credit will be finalized after Construction Documents are complete.

LTc7 – Reduced Parking Footprint – 1 point

The project team will pursue a campus approach for the documentation of this credit. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be completed after Construction Documents are completed.

LTc8 – Green Vehicles – 1 point

Provision for alternative fuel stations for green vehicles will be made if parking is provided as part of a campus approach. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be completed after Construction Documents are completed.

SSc1 – Environmental Site Assessment – 1 point

The project team has completed site assessments and surveys. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be completed after Construction Documents are completed.

SSc3 – Open Space – 1 point
There is future development planned for the project site after the SEC project is complete, but the scope of work and the amount of vegetated outdoor space is unknown. Documentation of this credit will be finalized after Construction Documents are complete.

SSc5 – Heat Island Reduction –2 points
The project specifications will potentially include performance requirements for paving (3-year aged SR value of at least 0.28) and roofing materials (3-year aged SR value of at least 64). The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

WEc2 – Indoor Water Use Reduction, 35% Reduction –1-2 points
Preliminary calculations indicate that the project will achieve a minimum of 35% indoor water use reduction. To further reduce building water consumption, the project team will specify ultra-low flow water-conserving plumbing fixtures including electronic type valves. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

WEc3 – Cooling Tower Water Use – 1-2 points
The project team will evaluate the feasibility of limiting cooling tower cycles in order to reduce water use. The credit documentation will be finalized after Construction Documents are complete.

EAc4 – Demand Response – 2 points
The project team will evaluate the feasibility of participating in a demand response program. The credit documentation will be finalized after Construction Documents are complete.

EAc5 – Renewable Energy Production – 2 points
The project team is currently evaluating the feasibility of incorporating a photovoltaic (PV) system including roof mounted and building integrated PV. Current calculations estimate a maximum annual renewable energy generation of 616,000 kWh/yr (6% of total energy load). The credit documentation will be finalized after Construction Documents are complete.

EAc7 – Green Power and Carbon Offsets – 2 points
The project team is evaluating the feasibility of engaging in a 5-year contract for green power, RECs, and carbon offsets. The credit documentation will be finalized after Construction Documents are complete.

MRc1 – Building Life-Cycle Impact Reduction – 3 points
The project team will pursue Option 4 – Whole-Building Life-Cycle Assessment and will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

MRc2 – Building Product Disclosure and Optimization - Environmental Product Declarations (EPD) – 1 point

As part of the Harvard Green Building Standards, projects are required to pursue the documentation for MRc2 Option 2. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

MRc3 – Building Product Disclosure and Optimization - Sourcing of Raw Materials – 1 point

As part of the Harvard Green Building Standards, projects are required to pursue the documentation for MRc3 Option 2. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

MRc4 – Building Product Disclosure and Optimization - Material Ingredients – 1 point

As part of the Harvard Green Building Standards, projects are required to pursue the documentation for MRc4 Options 2 and 3. The project team will evaluate the feasibility of meeting the credit requirements. The credit documentation will be finalized after Construction Documents are complete.

EQc2 – Low-Emitting Materials – 2 points

Project specifications will include VOC emissions and content language for adhesives and sealants, paints and coatings, flooring, composite wood, insulation, and furniture. The credit documentation will be finalized after Construction Documents are complete.

EQc4 – Indoor Air Quality Assessment – 1-2 points

The project team will evaluate the feasibility of conducting a building flush-out or IAQ testing. The credit documentation will be finalized during the construction phase of the project.

EQc6 – Interior Lighting – 1 point

The project team will evaluate the feasibility of meeting the lighting quality requirements. The credit documentation will be finalized after Construction Documents are complete.

EQc7 – Daylight – 1 point

The project team will create daylight simulation models to demonstrate credit compliance and evaluate the feasibility of meeting the daylight requirement for 75% of the regularly occupied area. The credit documentation will be finalized after Construction Documents are complete.

EQc8 – Quality Views – 1 point

The building will be designed to optimize quality views through the window openings. The team will evaluate the feasibility of achieving the credit requirements in the lab spaces. The credit documentation will be finalized after Construction Documents are complete.

EQc9 – Acoustic Performance – 1 point

The project team will evaluate the feasibility of all MEP systems meeting the ANSI S12.60-2002, with maximum permissible background noise of 35 dBA in all learning spaces. The credit documentation will be finalized after Construction Documents are complete.

IDc1.2-1.5 – Innovation and Design – 4 points

The project team is evaluating the feasibility of meeting the requirements of the following Innovation and Design credits:

- SSc4 Rainwater Management – Exemplary Performance
- Design for Active Occupants
- Material Ingredients Product Manufacturer Supply Chain Optimization
- Environmentally Preferable Interiors Finishes and Furnishings
- Green Training for Contractors, Trades, Operators, and Service Workers
- Verified Construction and Demolition Recycling Rates
- Lamp Purchasing
- Design for flexibility

The credit documentation will be finalized after Construction Documents are complete.

RP1 – LTc3 – High Priority Site – 1 point

The project site is located on a brownfield where remediation due to contamination has taken place. Remediation reports (2006) will be reviewed to determine credit feasibility and document the credit. Documentation of this credit will be finalized after Construction Documents are complete.

RP3 – WEc1 – Indoor Water Use Reduction – 1 point

As part of the Harvard Green Building Standards, all LEED project are required to reduce indoor potable water use by a minimum of 35%. To reduce building water consumption further, the project team will specify ultra-low flow water-conserving plumbing fixtures including electronic type valves. The credit documentation will be finalized after Construction Documents are complete.

RP5 – EAc5 – Renewable Energy Production – 1 point

The project team will evaluate the feasibility of incorporating a photovoltaic (PV) system. Current calculations estimate a maximum annual renewable energy generation of 616,000 kWh/yr (6% of total energy load). The credit documentation will be finalized after Construction Documents are complete.

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LEED-BD+Cv4 Scorecard

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LEED-BD&C (LEEDv4)
Allston Science
September 21, 2014

LEED

KEY		PROJECT MILESTONES		KEY
LEED Online Access Code:		SD:		Important - Upcoming Deadline
Demo Begins:		DD:		Past Due
Design Phase Submittal Target Date:		CD:		RP = Regional Priority Credit
Construction Phase Submittal Target Date:		Advanced Construction:		EP = Exemplary Performance point available
Bldg. Occupancy:	Bldg. GSF: 544,083	Construction Start:		
Project Occupancy:	Project GSF: 544,083	Occupancy:		
		General notes: Boundary issues (detached building, central plant).		

POINTS Y	?+	?-	N	POSSIBLE POINTS	HU GBS*	SUBMITTAL PHASE	CREDIT NUMBER	CREDIT NAME	TEAM MEMBER	Next Steps	DUE DATE	GENERAL NOTES
1	0	0	0	1 Point		**INTEGRATIVE PROCESS**						
1				1		D	IPc1	**Integrative Process**	**GBS TRANSSOLAR VANZELM**	GBS: Document how analysis informed decisions in OPR and BOD. TRANSSOLAR: Perform energy modeling analysis prior to completion of SD. Assess at least 2 of the following: 1. Site conditions (shading, exterior lighting, hardscape, etc) 2. Massing and orientation 3. Basic envelope attributes 4. Lighting levels 5. Thermal comfort ranges 6. Plug and process load needs 7. Programmatic and operational parameters. VANZELM: Perform preliminary water budget analysis prior to completion of SD (indoor, outdoor, and process water demand).		**Credit Requirements** Credit requires participation in the predesign phase of the project. energy-related systems, water-related systems.
9	7	0	0	16 Points		**LOCATION & TRANSPORTATION**						
			x	8 to 16		D	LTc1 OR the following:	**LEED for Neighborhood Development Location** Certified LEED-ND Location (8 pts)	N/A			**Credit Requirements** LEED ND must be Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the 2012 rating system
			x					Silver LEED-ND Location (10 pts)				
			x					Gold LEED-ND Location (12 pts)				
			x					Platinum LEED-ND Location (16 pts)				
1				1		D	LTc2	**Sensitive Land Protection**	**GBS**	GBS: Document credit (project is located on a previously developed site).		**Credit Requirements** **Option 1:** Project is on a previously developed site. OR **Option 2:** sensitive land protection (i.e. not prime farmland, flood hazard area, etc.)
	2			2		D	LTc3	**High Priority Site**	**GBS**	GBS: Review remediation reports from 2006 and determine credit feasibility.		**Credit Requirements** **Option 1:** historic district (1 point) AND/OR **Option 2:** priority designation - i.e. Federal Empowerment Zone, EPA National Priorities list (1 point) OR **Option 3:** brownfield remediation (2 points). For exemplary performance pursue Option 2 or 3 in addition to Option 1.
2	1			5		D	LTc4	**Surrounding Density and Diverse Uses** Option 1: Surrounding Density (2-3pts) (EP) AND/OR Option 2: Diversity of Uses (1-2 pts)	**GBS**	GBS: Document credit.		**Credit Requirements** **Option 1:** Combined density of 22,000 SF per acre of buildable land (2 points; 3 points for 35,000 SF) OR 7 residential units/acre and a nonresidential FAR of 0.5 (2 points; 3 points for 12 DU/acre and 0.8 FAR). Exemplary Performance (Option 1 ONLY): Double upper thresholds (70,000 sf or greater of buildable land; 24 DU/acre or greater; 1.6 FAR or greater) **Option 2:** LEEDv3: Project site located within 0.5 mi radius of 10 basic services. LEEDv4 requires within 0.5 mi walking distance.
3	2			5		D	LTc5	**Access to Quality Transit** (EP)	**GBS**	GBS: Document credit.		**Credit Requirements** For Multiple Transit Types: 1 point: 72 min. weekday trips, 40 min. weekend trips 3 points: 144 min. weekday trips, 108 min. weekend trips 5 points: 360 min weekday trips, 216 min. weekend trips EP: 720 min weekday trips, 432 min. weekend trips For Commuter Rail or Ferry Service Only: 1 point: 24 min. weekday trips, 6 min. weekend trips 3 points: 40 min. weekday trips, 8 min. weekend trips 5 points: 60 min weekday trips, 12 min. weekend trips EP: 120 min weekday trips, 24 min. weekend trips
1				1		D	LTc6	**Bicycle Facilities**	**GBS BEHNISCH**	GBS: Document credit. BEHNISCH: Provide occupancy information and drawings showing bike storage and shower locations. Current Occupancy: FTE: 1,415 Visitors/Transients (Students): 1,000 Peak Visitors/Transients: 2,000 Bike Requirement: Short Term: 50 spaces Long Term (Covered): 71 spaces Showers: 10		**Credit Requirements** Short term bike parking for 2.5% of peak visitors population (no <2 spaces per project); 100 ft. from entrance Long term bike parking for 5% FTE (no <2 spaces per project); 100 ft. from entrance One shower for first 100 FTE; one for every 150 FTE after **Group Approach Notes** Distances measured from furthest building 242 bike racks are being shown in SD progress set (83 covered). Staff locker/shower rooms are shown on Level C.
	1			1		D	LTc7	**Reduced Parking Footprint** (EP)	**GBS**	Determine LEED project boundary. GBS: Determine credit feasibility (campus approach).		**Credit Requirements** **Case 1:** 20% parking capacity reduction from base ratio for 1 point; Exemplary Performance - 40% parking capacity reduction OR **Case 2:** 40% parking capacity reduction from base ratio for 1 point; Exemplary Performance - 60% parking capacity reduction (must be pursued by projects earning 1 or more points on LTc4).
	1			1		D	LTc8	**Green Vehicles**	**GBS**	Determine LEED project boundary. GBS: Document credit if pursuing (campus approach).		**Credit Requirements** Designate 5% of all parking spaces used by the project as preferred parking for green vehicles. Provide alternative vehicle fuel stations.
6	4	0	0	10 Points		**SUSTAINABLE SITES**						
Y				Required		C	SSp1	**Construction Activity Pollution Prevention**	**NITSCH GC**	NITSCH: Develop ESC plan. GC: Implement ESC plan.		**Credit Requirements** Implement an erosion and sedimentation control plan during construction. Updated EPA Construction General Permit from 2003 to 2012.

POINTS Y	POINTS ?+	POINTS ?-	POINTS N	POSSIBLE POINTS	HU GBS*	SUBMITTAL PHASE	CREDIT NUMBER	CREDIT NAME	TEAM MEMBER	Next Steps	DUE DATE	GENERAL NOTES
	1			1		D	SSc1	**Site Assessment**	**NITSCH**	NITSCH: Complete a site survey and document credit.		**Credit Requirements** Analyze: topography, hydrology, climate, vegetation, soils, human use, human health effects
2				2		D	SSc2	**Site Development - Protect or Restore Habitat**	**SSA**	SSA: Document credit.		**Credit Requirements** **Option 1:** On-site restoration of previously developed areas to greenfields - non-turf - 30% (2 points), 60% (Exemplary Performance) **Option 2:** Financial support ($0.40/SF - 1 point, $0.80/SF for exemplary performance)
	1			1		D	SSc3	**Open Space**	**SSA**	SSA: Document credit.		**Credit Requirements** Open space for at least 30% of site area (no turf, and if paved - pedestrian or recreation-oriented) , at least 25% of the open space must be vegetated
3				3		D	SSc4	**Rainwater Management**	**NITSCH**	NITSCH: Determine credit feasibility.		**Credit Requirements** **Option 1:** percentile of rainfall events - 100% of 95th managed on-site -2 points, 98th-3 points (or 3 points- 85th percentile for zero lot line projects). **Option 2:** natural land cover conditions - 3 points
	2			2		D	SSc5	**Heat Island Reduction**	**GBS** **BEHNISCH**	GBS: Determine credit feasibility. BEHNISCH: Specify paving materials with 3-year aged SR value of at least 0.28 (initial SR of 0.33), roof material with 3-year aged SR value of at least 64 (initial SR of 82).		**Credit Requirements** **Option 1:** nonroof and roof - 2 points OR **Option 2:** parking under cover - 1 point. EP - pursue both options
1				1		D	SSc6	**Light Pollution Reduction**	**BEHNISCH** **LIGHTING DESIGNER**	Determine LEED project boundary. Coordinate with HPPM planning group efforts for lighting.		**Credit Requirements** Install fixtures that meet BUG (backlight, uplight, glare) ratings per lighting zone
6	**4**	**1**	**0**	**11 Points**		**WATER EFFICIENCY**						
Y				**Required**		D	WEp1	**Outdoor Water Use Reduction,** 30% Reduction	**SSA**	SSA: Complete landscape water use calculation using EPA WaterSense Water Budget Tool.		**Credit Requirements** Reduce water use by 30% from the baseline EPA Water Budget Tool OR no irrigation.
Y				**Required**		D	WEp2	**Indoor Water Use Reduction,** 20% Reduction	**BEHNISCH** **VANZELM**	BEHNISCH/SEAS: Provide occupancy information (FTE, visitors, etc.) VANZELM: Specify low-flow plumbing fixtures (WaterSense labeled) and energy star appliances. Complete Water Use Reduction calculator.		**Credit Requirements** Reduce water use by 20% from the baseline. Fixtures must have Water Sense Label. Appliance and Process Water Use Requirements: Residential Clothes Washers: Energy Star or performance equivalent Commercial Clothes Washers: CEE Tier 3A Residential Dishwashers (standard and compact): Energy Star or equivalent Prerinse Spray Valves: less than or equal to 1.3 gallons per minute Ice Machine: Energy Star or equivalent and use either air-cooled or closed-loop cooling (chilled or condenser water system) Heat Rejection and Cooling: No once-through cooling with potable water for any equipment or appliances that reject heat. Cooling Towers and Evaporative Condensers: Equip with makeup water meters, conductivity controllers and overflow alarms, efficient drift eliminators that reduce drift to max of 0.002% of recirculated water volume for counterflow towers and 0.005% of recirculated water flow for cross-flow towers.
Y				**Required**		D	WEp3	**Building Level Water Metering**	**BEHNISCH** **VANZELM**	BEHNISCH/VANZELM: Ensure meters are included in the project.		**Credit Requirements** Requirements: install meters to measure total potable water use for the building and grounds. Potable water used for landscape irrigation must be tracked in any of three ways: by including it with a single building, by installing a dedicated meter, or by installing multiple meters.
2				2		D	WEc1	**Outdoor Water Use Reduction,** 50%, 100%	**SSA**	See WEp1 above. SSA: Determine feasibility of using collected stormwater for irrigation.		**Credit Requirements** 50% reduction for 1 point, 100% reduction for 2 points
1 1 1 1 1 1				1 to 6	**3**	D	WEc2	**Indoor Water Use Reduction** 25% Reduction 30% Reduction 35% Reduction 40% Reduction 45% Reduction 50% Reduction	**BEHNISCH** **VANZELM**	See WEp2 above.		See WEp2. Harvard Green Building Standards
	2			2		D	WEc3	**Cooling Tower Water Use**	**VANZELM**	VANZELM: Determine credit feasibility.		**Credit Requirements** Applicable if there is a new cooling tower. 1 point for setting the cooling tower(s) to cycle at level determined by LEED form.
1				1		D	WEc4	**Water Metering**	**BEHNISCH** **VANZELM**	BEHNISCH/VANZELM: Determine credit feasibility.		**Credit Requirements** Select two or more of the following: **Option 1:** Irrigation (min 80% of landscaped area) **Option 2:** Indoor plumbing fixtures and fittings (min 80%) **Option 3:** DHW (min 80%, including both tanks and on-demand heaters) **Option 4:** Boiler with aggregate projected annual water use of 100,000 gal or more, or 500,000 BtuH (150kW) **Option 5:** Reclaimed water **Option 6:** Other process water (min 80%; humidifiers, dishwashers, clothes washers, pools, etc.) **Group Approach Notes** All buildings in the group can be served by the same submeter for irrigation systems, boilers, and reclaimed water, provided all the water used by the group is captured. **Other Notes** Recommendation: require irrigation and indoor plumbing
18	**6**	**1**	**0**	**33 Points**		**ENERGY & ATMOSPHERE**						
Y				**Required**		C	EAp1	**Fundamental Commissioning & Verification**	**WSP**	WSP: Document credit.		**Credit Requirements** Complete an OPR and BOD. Confirm commissioning authority will complete all commissioning activities related to mechanical, electrical, plumbing, and renewable energy systems. Provide dates for commissioning authority reviews and indicate commissioning systems scope. Prepare and maintain a current facilities requirements and operations and maintenance plan, including sequence of operations, occupancy schedule, run-time schedules, setpoints, lighting levels, outside air requirements, etc.
Y				**Required**		D	EAp2	**Minimum Energy Performance** 5% new buildings, 3% existing buildings	**TRANSSOLAR** **BEHNISCH** **VANZELM**	TRANSSOLAR: Develop energy model to document compliance with Option 1. Document energy modeling input assumptions. BEHNISCH/VANZELM: Ensure compliance with mandatory provisions of ASHRAE 90.1-2010 standard.		**Credit Requirements** **Option 1:** Whole-Building Energy Simulation (ASHRAE 90.1-2010) **Option 2:** Prescriptive Compliance - ASHRAE 50% Advanced Energy Design Guide **Option 3:** Prescriptive Compliance - Advanced Buildings Core Performance Guide
Y				**Required**		D	EAp3	**Building-Level Energy Metering**	**GBS**	GBS: Document credit.		**Credit Requirements** Requires each project to be capable of measuring whole building energy use.

POINTS Y	POINTS ?+	POINTS ?-	POINTS N	POSSIBLE POINTS	HU GBS*	SUBMITTAL PHASE	CREDIT NUMBER	CREDIT NAME	TEAM MEMBER	Next Steps	DUE DATE	GENERAL NOTES
Y				Required		D	EAp4	**Fundamental Refrigerant Management**	VANZELM	VANZELM: Document credit.		**Credit Requirements** Provide mechanical cooling and refrigeration equipment information: equipment type, location, refrigerant used, manufacturer, model number, and installation date. For projects reusing existing HVAC&R equipment with CFCs, provide a CFC phase-out plan. Do not use CFC-based refrigerants.
				3 to 6		D	EAc1	**Enhanced Commissioning**	WSP	WSP: Document credit.		**Credit Requirements**
3					3			Option 1 (Path 1): Enhanced Systems Commissioning (3 pts)				**Option 1:** Enhanced Systems Commissioning (3-4 points) Path 1: Enhanced Commissioning (3 points) OR Path 2: Enhanced and Monitoring-Based Commissioning (4 points) *AND/OR* **Option 2:** Envelope Commissioning (2 points)
1								Option 1 (Path 2): Enhanced and Monitoring-Based Commissioning (4 pts)				
2					2			Option 2: Envelope Commissioning (2 points)				
				1 to 18		D	EAc2	**Optimize Energy Performance**	TRANSSOLAR	See EAp2 above (current design 25% reduction).		**Credit Requirements**
10					7			Option 1 (1-18 pts) Major Renovation: 4% (1 point), 6% (2), 8% (3), etc				**Option 1 -** Whole building energy simulation. Exemplary Performance (Option 1 Only): 54% improvement in energy performance. **Option 2** - Prescriptive compliance with ASHRAE 50% Advanced Energy Design Guide **Option 3** - Prescriptive compliance with Advanced Buildings Core Performance Guide
1				1		D	EAc3	**Advanced Energy Metering**	VANZELM	VANZELM: Determine credit feasibility.		**Credit Requirements** Requirements: At least one meter per energy source per floor; all energy end-uses that represent 10% or more of the total energy consumption of the building to be metered.
	2			1 to 2		C	EAc4	**Demand Response**	GBS	GBS: Review Harvard University policy and determine credit feasibility.		**Credit Requirements** **Case 1:** Demand response program available (2 points): enroll in minimum 1 year contract. Develop a comprehensive plan for meeting the contractual commitment. **Case 2:** Demand response program not available (1 point)
	2	1		1 to 3		D	EAc5	**Renewable Energy Production** (EP)	HPPM TRANSSOLAR	HPPM: Determine if credit will be pursued. TRANSSOLAR: Determine annual energy use (see EAp2) and set target.		**Credit Requirements** 1% - 1 point, 5% - 2 points, 10% - 3 points, 15% - Exemplary Performance
1				1		C	EAc6	**Enhanced Refrigerant Management**	VANZELM	VANZELM: Complete refrigerant impact calculation.		**Credit Requirements** 1 point: Average refrigerant impact per ton must be less than or equal to 100
	2			2		C	EAc7	**Green Power and Carbon Offsets**	HPPM GBS	HPPM: Determine if credit will be pursued. GBS: Provide pricing options for RECs and carbon offsets.		**Credit Requirements** 5 year contract, delivered annually for 50% or 100% of energy use via green power, carbon offsets, or RECs. RECs can only be used to offset electricity use.
5	**7**	**0**	**2**	**13 Points**		**MATERIALS & RESOURCES**						
Y				Required		D	MRp1	**Storage & Collection of Recyclables**	GBS BEHNISCH SEAS	GBS: Document credit. BEHNISCH: Provide recycling storage areas, number and volume of bins. SEAS: Provide waste study data and report.		**Credit Requirements** Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. The recycling storage area must additionally accommodate two or more of the following: batteries, mercury-containing lamps, and/or electronic waste.
Y				Required		C	MRp2	**Construction and Demolition Waste Management Planning**	GC	GC: Develop CWM plan and establish waste diversion goals (90-95%).		**Credit Requirements** Develop and implement a construction and demolition waste management plan. Establish waste diversion goals for the project. Provide a final report detailing all major waste streams generated, including disposal and diversion rates.
	3		2	5		D/C	MRc1	**Building Life-Cycle Impact Reduction (EP)**	GBS BEHNISCH	GBS/BEHNISCH: Determine credit feasibility. Option 4 is potentially feasible.		**Credit Requirements** **Option 1 -** historic building reuse (5 points); EP: N/A **Option 2** - abandoned/blighted building reuse (5 points); EP: N/A **Option 3** - building and material reuse (1-4 points); EP: 95% building reuse **Option 4** - new construction life cycle assessment for structure and enclosure that demonstrates 10% reduction in at least 3 impact measures (3 points), including global warming potential; EP: any improvement over required credit thresholds in all 6 impact measures
				1 to 2		C	MRc3	**Building Product Disclosure and Optimization - Environmental Product Declaration**	BEHNISCH GC GBS	BEHNISCH: Include LEEDv4 material language in specifications and identify 20-25 products that meet credit requirements. GBS: Specification review. GC: Document credits.		**Credit Requirements** **MRc3:** Option 1: 20 products from 5 manufacturers for 1 point; EP: 40 products from 5 manufacturers Option 2: 50% of total value by cost for 1 point; EP: 75% of the total value by cost **MRc4:** Option 1: 20 products from 5 manufacturers for 1 point; EP: 40 products from 5 manufacturers Option 2: 25% of the total value for 1 point; EP: 50% of the total value **MRc5:** Option 1: 20 products from 5 manufacturers for 1 point; EP: 40 products from 5 manufacturers Option 2: 25% of the total value for 1 point; EP: 50% of the total value
1					1			Environmental Product Declaration (1 pt) (EP)				
	1							Multi-Attribute Optimization (1 pt) (EP)				
				1 to 2		C	MRc4	**Building Product Disclosure and Optimization - Raw Materials Extraction**				
1					1			Raw Material Source and Extraction Reporting (1 pt) (EP)				
	1							Leadership Extraction Practices (1 pt) (EP)				
				1 to 3		C	MRc5	**Building Product Disclosure and Optimization - Material Ingredients**				
1					1			Material Ingredient Reporting (1 pt) (EP)				
	1							Material Ingredient Optimization (1 pt) (EP)				
	1							Product Manufacturer Supply Chain Optimization (1 pt)				
				1 to 2		C	MRc6	**Construction and Demolition Waste Management** (EP)	GC	GC: Divert at least 75% of total construction and demolition material.		**Credit Requirements** **Option 1:** Diversion **Path 1:** Divert at least 50% of the total construction and demolition material; diverted materials must include at least three material streams. (1 point) OR **Path 2** Divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams. (2 points) OR **Option 2:** Reduction of Total Waste Material **-** Do not generate more than 2.5 pounds of construction waste per square foot (12.2 kilograms of waste per square meter) of the building's floor area. (2 points) **Exemplary Performance** **Option 1:** Diversion: Meet Path 1 or Path 2 requirements and use a recycling facility certified by the Institute for Certification of Sustainable Recyclers. **Option 2:** Reduction of Total Waste: In addition Option 2, demonstrate waste diversion by meeting the requirements of Option 1.
2					2			Diversion (1-2 pts) OR Reduction of Total Waste Material (2 pts)				
8	**8**	**0**	**0**	**16 Points**		**INDOOR ENVIRONMENTAL QUALITY**						
Y				Required		D	EQp1	**Minimum IAQ Performance**	VANZELM	VANZELM: Complete ASHRAE ventilation rate calculations and provide airflow monitoring and alarms.		**Credit Requirements** Must comply with ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata). Outside air delivery monitoring is also required.
Y				Required		D	EQp2	**Environmental Tobacco Smoke Control**	GBS BEHNISCH SEAS	GBS: Document credit. BEHNISCH: Develop no-smoking signage. SEAS: Campus grounds will likely be smoke free.		**Credit Requirements** Smoking is prohibited inside the building and outside the building except in designated smoking areas at least 25 feet from all entries, outdoor air intakes, and operable windows. No-smoking policy applies to spaces outside the property line used for business purposes. Signage must be posted within 10 feet (3 meters) of all building entrances indicating the no smoking policy.

POINTS Y	?+	?-	N	POSSIBLE POINTS	HU GBS*	SUBMITTAL PHASE	CREDIT NUMBER	CREDIT NAME	TEAM MEMBER	Next Steps	DUE DATE	GENERAL NOTES
2				2		D	EQc1	**Enhanced IAQ Strategies** (EP)	VANZELM	VANZELM: Document credit.		**Credit Requirements** **Option 1:** Enhanced IAQ Strategies (1 point) Provide 10'+ entryway systems. Exhaust, self-closing door, deck to deck partitions, and negative pressure where chemicals are used, MERV 13+ filters AND/OR **Option 2:** Additional Enhanced IAQ Strategies (1 point). Options: Exterior contamination prevention; Increased ventilation (mechanically ventilated/mixed-mode spaces only); Carbon dioxide monitoring (mechanically ventilated spaces only); Additional source control and monitoring; Natural ventilation room-by-room calculations (naturally ventilated spaces and mixed-mode spaces only). **Exemplary Performance:** Achieve both Option 1 and Option 2, and incorporate an additional Option 2 strategy.
1	2			3		C	EQc2	**Low-Emitting Materials** (EP)	BEHNISCH GC GBS	BEHNISCH: Include LEEDv4 material language in specifications. GBS: Specification review. GC: Credit documentation.		**Credit Requirements** See credit requirements. Includes the following categories: paints/coatings, adhesives/sealants, flooring, composite wood, ceilings/walls/thermal/acoustic insulation, furniture **Exemplary Performance:** Earn all points in Option 1 and 100% of products AND reach 100% under Option 2
1				1		C	EQc3	**Construction IAQ Management Plan**	GC	GC: Develop IAQ management plan.		**Credit Requirements** Implement an IAQ plan during construction per SMACNA guidelines (2007). **Group Approach Notes** Calculated on an aggregate basis with building specific sampling
				1 or 2	1	C	EQc4	**Indoor Air Quality Assessment** Flush-out Before occupancy (1 pt) OR Air Testing (2 pts)	SEAS HPPM VANZELM GBS	SEAS/HPPM: Determine path to pursue. VANZELM: Provide flushout calculation if pursuing flush-out option. GBS: Complete documentation if pursuing air testing option.		**Credit Requirements** Building flush-our or IAQ testing post-occupancy
1				1		D	EQc5	**Thermal Comfort**	VANZELM	VANZELM: Determine credit feasibility.		**Credit Requirements** Meet ASRHAE 55-2010 or ISO and CEN standards. Confirm window height and accessibility.
				1 to 2		D	EQc6	**Interior Lighting**	VANZELM GBS	VANZELM: Complete credit documentation. GBS: Provide Light Quality LEED language for specifications.		**Credit Requirements** **Option 1:** Lighting control (1 point) For at least 90% of individual occupant spaces, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes (on, off, midlevel). Midlevel is 30% to 70% of the maximum connected lighting load. For all shared multi-occupant spaces, meet all of the following requirements: Provide multizone control systems that enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, off, midlevel). Lighting for any presentation or projection wall must be separately controlled. Locate switches or manual controls in the same space with the controlled luminaires. A person operating the controls must have a direct line of sight to the controlled luminaires. AND/OR **Option 2:** Lighting quality (1 point) Choose four strategies from categories listed in the credit requirements.
1								Option 1: Light Control (1 pt)				
	1							Option 2: Light Quality I (1 pt)				
2	1			1 to 3		D	EQc7	**Daylight** Option 1: Simulation: Spatial Daylight Autonomy and Annual Sunlight Exp (2-3 pts)	BEHNISCH	BEHNISCH: Determine credit feasibility.		**Credit Requirements** **Option 1:** Must be at least 55% for 2 points, and 75% for 3 points **Option 2:** Must be at least 75% for 1 point, and 90% for 2 points **Option 3:** Must be at least 75% for 2point, and 90% for 3 points Provide manual or auto glare-control devices (i.e. shades) for all regularly occupied spaces. Simulation should include permanent interior obstructions, but moveable furniture and partitions may be excluded.
			x					Option 2: Simulation: Illuminance Calculation (1-2 pts)				
			x					Option 3: Measurement (2-3 pts)				
	1			1		D	EQc8	**Quality Views (EP)**	BEHNISCH	BEHNISCH: Determine credit feasibility.		**Credit Requirements** Direct line of sight to outdoors via vision glazing for 75% of all regularly occupied areas, with at least two of the four types of views outlined in the requirements (multiple lines of sight, views that include sky/movement/objects 25+ feet away, unobstructed views, view factor greater than 3) Exemplary performance for 90% of all regularly occupied areas.
	1			1		D	EQc9	**Acoustic Performance**	BEHNISCH VANZELM ACOUSTICAL CONSULTANT	BEHNISCH/VANZELM/AC: Determine credit feasibility.		**Credit Requirements** Complete Acoustic Performance Calculator; evaluate the four performance areas for the project (HVAC background noise levels, sound isolation, reverberation time and reverberant noise buildup, and sound reinforcement and masking systems).
2	**4**	**0**	**0**	**6 Points**		**INNOVATION (up to 6)**						
1				1		D/C	IDc1.1	**IDc1.1 Innovation in Design - Green Building Education**	GBS	GBS: Develop case study and document credit.		
	1			1		D/C	IDc1.2	**IDc1.2 Innovation in Design - TBD**	GBS	TBD		Some options: - Design for Active Occupants - Environmental Preferable Interior Finishes and Furnishings - Green Training for Contractors, Trades, Operators, and Service Workers - Social Equity
	1			1		D/C	IDc1.3	**IDc1.3 Innovation in Design - TBD**	GBS	TBD		
	1			1		D/C	IDc1.4	**IDc1.4 Innovation in Design - TBD**	GBS	TBD		
	1			1		D/C	IDc1.5	**IDc1.5 Innovation in Design - TBD**	GBS	TBD		
1				1		C	IDc2	**IDc2 LEED AP**	GBS	GBS: Document credit.		
2	**3**	**0**	**0**	**4 Points**		**REGIONAL PRIORITY CREDITS (up to 4)**						
	1			1		D	RP	**Regional Priority Credit:** EAc5 - Renewable Energy Production	Auto			Point Threshold: 2
1				1		D	RP	**Regional Priority Credit:** EAc2 - Optimize Energy Performance				Point Threshold: 8
	1			1		D	RP	**Regional Priority Credit:** LTc3 - High Priority Site				Point Threshold: 2
1				1		D	RP	**Regional Priority Credit:** SSc4 - Rainwater Management				Point Threshold: 2
	1			1		D	RP	**Regional Priority Credit:** WEc1 - Indoor Water Use Reduction				Point Threshold: 4
57	**43**	**2**	**2**			**TOTAL (pre-Certified** 40 to 49 points **Silver** 50 to 59 points **Gold** 60 to 79 points **Platinum** 80+ points						
	100	**102**	**104**									

Appendix E:
Climate Change Resiliency Checklists

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	**Science and Engineering Complex (SEC)**
Project Address Primary:	**140 Western Avenue, Allston, MA**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Joe O'Farrell / Senior Project Director for Science and Engineering Complex / Harvard Planning and Project Management / **joseph_ofarrell@harvard.edu**

A.2 - Team Description

Owner / Developer:	**Harvard Planning and Project Management , Harvard University**
Architect:	**Behnisch Architekten**
Engineer (building systems):	**Van Zelm (MEPFP) / Buro Happold (Structure)**
Sustainability / LEED:	**Transsolar (Climate Engineering) / Thornton Thomasetti (LEED)**
Permitting:	**Harvard Planning and Project Management , Harvard University**
Construction Management:	**Turner Construction Company**
Climate Change Expert:	**Parsons Brinkeroff**

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

PNF / Expanded PNF Submission	Draft / Final Project Impact Report Submission	BRA Board Approved	Notice of Project Change
Planned Development Area	BRA Final Design Approved	Under Construction	Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	Research, Education
List the First Floor Uses:	Research , Education, Food Service, Retail, Campus Services

What is the principal Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building? Steel building at grade on existing steel/concrete foundation

Site Area:	*"site area" needs to be further defined*	Building Area:	535,218 *SF*
Building Height:	*95' Ft. Top of Cornice 110' 6" Top of Penthouse 141' Top of Equipment (measured from*	Number of Stories:	*6 occupied, 7 Flrs including Penthouse*

	20'6 ff elevation)		
First Floor Elevation (reference Boston City Base):	*18' 3" Elev at Western Avenue 20' 6" at South*	Are there below grade spaces/levels, if yes how many:	*Yes / 2*

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	Homes Midrise	Homes	Other
Select LEED Outcome:	Certified	Silver	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes / No*	Certified:	*Yes / No*
	Yes		*Yes*

A.6 - Building Energy

VZ Note: All numbers below include the demand from the ESF and SEC unless noted otherwise

What are the base and peak operating energy loads for the building?
Note: The building loads DO NOT include ESF

Electric:	***4,588*** *(kW)*	Heating:	***10.4*** *(MMBtu/hr)*
What is the planned building Energy Use Intensity:	**100-150**(kBtu/sf)	Cooling:	***1,878*** *(Tons/hr)*

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	***2 MW*** *(kW)*	Heating:	***3-4 (SEC Only)*** *(MMBtu/hr)*
		Cooling:	***75 (SEC Only)*** *(Tons/hr)*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	***1.5 MW (Natural Gas)/ 750 KW(Diesel)*** *(kW)*		Fuel Source:	***Natural Gas (Standby)/ Diesel (Emergency)***
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	***(1) Standby & (1) Emergency (2 total units) (Units)***

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?
Note: varies by system between 25 and 50 years

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

0 °F / 95 °F Deg.

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

95 °F Deg.	*1* Days	*5* Events / yr.

What Drought characteristics will be used for project planning – Duration and Frequency?

14 Days	*0.50* Events / yr.

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

35.7 Inches / yr.	*1.33* Inches	*4* Events / yr.

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

Peak Wind	Hours	Events / yr.

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	*24 min%*
How is performance determined:	eQuest modeling; targeting 24% better than ASHRAE 90.1-2010

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:	High performance building envelope	High performance lighting & controls	Building day lighting	EnergyStar equip. / appliances
	High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:				

What are the insulation (R) values for building envelope elements?

Roof:	*R = 30*	Walls / Curtain Wall Assembly:	*R = 20 (opaque)*
Foundation:	*R = 10*	Basement / Slab:	*R =10 **(Check this vs code, ASHRAE 90.1 2010 & 2013 have R-20 for Slab on Grade floors under heated)***
Windows:	*R = 3.3 / U =0.3*	Doors:	*R = TBD / U =TBD*

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

On-site clean energy / CHP system(s) This only applies if the ESF is being considered as part of the "project"	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
On-site Solar PV	On-site Solar Thermal	Wind power	None
Describe any added measures:			

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	Connected to local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

Will the building remain operable without utility power for an extended period? **Note: Operable assumed to mean that some of building operations could continue with only essential support provided**

YES	If yes, for how long:		***Indefinitely with available natural gas supply from utility***
If Yes, is building "Islandable?	NO		
If Yes, describe strategies:			

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented - longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	High Performance Building Envelop
Describe any added measures:	**On-Site storm water storage (Limited by tank volume)**			

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	High reflective roof materials	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	On-site retention systems & ponds	Infiltration galleries & areas	vegetated water capture systems	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

Yes / No

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base Elev.approx. 16' (south) to 18'-6" (north)*
Building Proximity to Water:	*2,250 Ft.*

Is the site or building located in any of the following?

Coastal Zone:	*Yes / No*	Velocity Zone:	*Yes / No*
Flood Zone:	*Yes / No*	Area Prone to Flooding:	*Yes / No*

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes / No*	Future floodplain delineation updates:	*Yes / No*

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

2,250 Ft.to Charles River to the east

If you answered YES to any of the above Location Description and Classification questions, please complete the

following questions. *Otherwise you have completed the questionnaire; thank you!*

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*Ft.*	Frequency of storms:	*per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev. 20'-0"*	First Floor Elevation:	*Boston City Base Elev. 20'-6"*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	YES	If Yes, to what elevation	*Boston City Base Elev. 20'-6"*
If Yes, describe:	Entrances along Western Ave will remain at grade and will transition to 20'-6" inside the building through various ramps and stairs. The perimeter of the building and all vents and access points will be raised to 20'-6" with the exception of the loading dock ramp, which will be protected by either a passive or active flood barrier at the entrance of the ramp.		

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1st Floor. **Emergency Power systems are located above 1st floor however non-emergency and basic building infrastructure is not**	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No		If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	Yes
If Yes, describe:	The landscaping on the site will transition from the sidewalk elevations to the design flood elevation within the site.

Will the building remain occupiable without utility power during an extended period of inundation:

Yes / No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

considering USACE material classes descriptions 2-4 for building entrance conditions, below grade submersible pumps and controls in sump pits,

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation? **Notes: Responses depend on definition of "inundation". Flood to below design flood elevation is assumed**

Select appropriate:	***YES***	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	***Yes***	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:	Areas of the landscaping are being raised to the design flood elevation			

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	***YES***	Solar PV	Solar Thermal	Clean Energy / CHP System(s) **CHP opportunities dependant on ESF design**
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:	Passive solar, natural ventilation, stormwater storage and reuse			

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	Science and Engineering Complex East
Project Address Primary:	114 Western Avenue, Allston, MA
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Joe O'Farrell / Senior Project Director for Science and Engineering Complex / Harvard Planning and Project Management / joseph_ofarrell@harvard.edu

A.2 - Team Description

Owner / Developer:	Harvard Planning and Project Management , Harvard University
Architect:	Behnisch Architekten
Engineer (building systems):	Van Zelm (MEPFP) / Buro Happold (Structure)
Sustainability / LEED:	Transsolar (Climate Engineering) / Thornton Thomasetti (LEED)
Permitting:	Harvard Planning and Project Management , Harvard University
Construction Management:	Turner Construction Company
Climate Change Expert:	Parsons Brinkeroff

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

PNF / Expanded PNF Submission	Draft / Final Project Impact Report Submission	BRA Board Approved	Notice of Project Change
Planned Development Area	BRA Final Design Approved	Under Construction	Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	Research, Education, University Services
List the First Floor Uses:	University Services

What is the principal Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building? Existing steel, open web joist frame with concrete floors

Site Area:	*"site area" needs to be further defined*	Building Area:	*80,449 SF*
Building Height:	*38' 6" Ft.*	Number of Stories:	*3 stories*
First Floor Elevation (reference Boston City Base):	*18'-2 ¼" BCB based on previous plans*	Are there below grade spaces/levels, if yes how many:	*No*

A.5 - Green Building Note: Do not anticipate either following LEED (other than Harvard GBS Requirements) or pursuing certification

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)? None

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	Homes Midrise	Homes	Other
Select LEED Outcome:	Certified	Silver	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes / No*	Certified:	*Yes / No*
	No		*No*

A.6 - Building Energy

What are the base and peak operating energy loads for the building?

Electric:	***750*** *(kW)*	Heating:	***1.5*** *(MMBtu/hr)*
What is the planned building Energy Use Intensity:	**80-100** kBtu/sf	Cooling:	***200*** *(Tons/hr)*

What are the peak energy demands of your critical systems in the event of a service interruption? Note: Harvard Police and their data center, emergency lighting, fire pump and some allowance for critical systems.

Electric:	***175 KW*** *(kW)*	Heating:	*(MMBtu/hr)*
		Cooling:	***10*** *(Tons/hr)*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	***200*** *(kW)*		Fuel Source:	***Diesel***
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

5 °F/ 90 °F *Deg.*

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency? **None**

Deg.	*Days*	*Events / yr.*

What Drought characteristics will be used for project planning – Duration and Frequency? **None**

Days	*Events / yr.*

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year? **None**

Inches / yr.	*Inches*	*Events / yr.*

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year? **None**

Peak Wind	*Hours*	*Events / yr.*

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	Need to establish what code will require for limited building renovation
How is performance determined:	

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:				
	High performance building envelope	High performance lighting & controls **Limited in areas of renovation only**	Building day lighting **Limited in areas of renovation only**	EnergyStar equip / appliances **Assumed**
	High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:				

What are the insulation (R) values for building envelope elements?

Roof:	***Existing to remain***	Walls / Curtain Wall Assembly:	***Existing to remain, any new would be…****R = 20 (opaque)*
Foundation:	***Existing to remain***	Basement / Slab:	***Existing to remain***
Windows:	***Existing to remain – any new would be*** *R = 3.3 / U*	Doors:	***t.b.d.***

=0.3			

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
On-site Solar PV	On-site Solar Thermal	Wind power	None

Describe any added measures:

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems? None

Select all appropriate:	Connected to local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

No	If yes, for how long:	*Days*

If Yes, is building "Islandable?

If Yes, describe strategies:

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	High Performance Building Envelop

Describe any added measures:

What measures will the project employ to reduce urban heat-island effect? None

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	High reflective roof materials	Vegetated roofs

Describe other strategies:

What measures will the project employ to accommodate rain events and more rain fall? None

Select all appropriate:	On-site retention systems & ponds	Infiltration galleries & areas	vegetated water capture systems	Vegetated roofs

Describe other strategies:

What measures will the project employ to accommodate extreme storm events and high winds? None

Select all appropriate:	Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)

Describe other strategies:

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

	Yes / No

Describe site conditions? The first floor is relatively even with grade at Western Avenue

Site Elevation – Low/High Points:	*Boston City Base Elev.(Ft.)approx. 18'*
Building Proximity to Water:	*Approx. 1,900' to Charles River to the east*

Is the site or building located in any of the following?

Coastal Zone:	*Yes / No*	Velocity Zone:	*Yes / No*
Flood Zone:	*Yes / No*	Area Prone to Flooding:	*Yes / No*

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes / No*	Future floodplain delineation updates:	*Yes / No*

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

	Ft.

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*Ft.*	Frequency of storms:	*per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No		If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	Yes / No
If Yes, describe:	

Will the building remain occupiable without utility power during an extended period of inundation:

Yes / No		If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water	Wastewater	Back up energy

		storage	storage	systems & fuel
Describe any specific or additional strategies:				

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

Appendix F:
Accessibility Checklists

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

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Project Information

Project Name:	Science and Engineering Complex (SEC)
Project Address Primary:	140 Western Avenue, Allston, MA
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Joe O'Farrell / Senior Project Director for Science and Engineering Complex / Harvard Planning and Project Management / joseph_ofarrell@harvard.edu

Team Description

Owner / Developer:	Harvard University
Architect:	Behnisch Architekten
Engineer (building systems):	Van Zelm (MEPFP) / Buro Happold (Structure)
Sustainability / LEED:	Transsolar (Sustainability)/Thorton Thomasetti (LEED)
Permitting:	Harvard Planning and Project Management , Harvard University
Construction Management:	Turner Construction Company

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One	Residential -	Institutional	Education

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	to Three Unit	Multi-unit, Four +		
	Commercial	Office	Retail	Assembly
	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	*Retail, Assembly, Education, Laboratory, Storage and Utility*			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*"site area" needs to be further defined*	Building Area:	*535,218 SF* *(see Zoning GSF memo)*
Building Height:	*95' Ft. Top of Cornice* *110' 6" Top of Penthouse* *141' Top of Equipment* *(measured from 20'6 ff elevation)*	Number of Stories:	*6 occupied, 7 Flrs including Penthouse.*
First Floor Elevation:	*18' 3" Elev at Western Avenue* *20' 6" at South*	Are there below grade spaces:	*Yes / No*

Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and proximate institutions such as, but not limited to hospitals, elderly and disabled housing, and general neighborhood information. The proponent should identify how the area surrounding the development is accessible for people with mobility impairments and should analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the development neighborhood and identifying characteristics.	North Allston has mostly low-density land uses such as athletic fields, city and state parkland, retail and light industrial buildings, and low density residential neighborhoods. Most buildings are one to two stories high with off-street surface parking. Transportation is primarily vehicular, but the area is served by 4 MBTA bus lines. Due to future growth and development, multi-modal transportation is planned, with an emphasis on pedestrian and bicycle transport.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	The site is accessible from two T stations which are each about 20 minutes by foot, as well as four MBTA bus lines which connect the site to Central Square, Harvard Square, Brighton, Cleveland Circle, Sullivan Square, Waltham, and Watertown. Bus 70 and 70 A stop at the north-east corner of the site. Buses 66 and 86 stop 200 feet from the northwest corner of the site on North Harvard Avenue.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Harvard Business School, Harvard Stadium, Joseph M Smith Community Health Center.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	No. Allston Branch Library, Library Park, and Smith Playground.

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	No
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	No
Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian	No

ramps been verified as compliant? If yes, please provide surveyors report.	
Is the development site within a historic district? If yes, please identify.	No

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Yes
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Main
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Frontage Zone – ranges from 14' to 60' Pedestrian Zone – 6' Furnishings Zone – 4' min.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	Frontage Zone – Unit pavers and concrete pavement Pedestrian Zone – Concrete per City of Boston Standards Furnishings Zone – Open joint concrete pavers
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with	Yes

the City of Boston Public Improvement Commission?	
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	There are no sidewalks cafes planned.
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	225 total. HPPM to verify.
What is the total number of accessible spaces provided at the development site?	7 total. HPPM to verify.
Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	Yes, no. HPPM to verify.
Where is accessible visitor parking located?	Street parking on Academic and Stadium Way. HPPM to verify.
Has a drop-off area been identified? If yes, will it be accessible?	No. HPPM to verify.
Include a diagram of the accessible routes to and from the accessible	Attached. HPPM to verify.

parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	Attached.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Flush Condition
Are the accessible entrance and the standard entrance integrated?	Yes
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?	N/A

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How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	N/A
How many accessible units are being proposed?	N/A
Please provide plan and diagram of the accessible units.	N/A
How many accessible units will also be affordable? If none, please describe reason.	N/A
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	N/A
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	N/A
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	N/A

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

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Project Information

Project Name:	Science and Engineering Complex East
Project Address Primary:	114 Western Avenue, Allston, MA
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Joe O'Farrell / Senior Project Director for Science and Engineering Complex / Harvard Planning and Project Management / joseph_ofarrell@harvard.edu

Team Description

Owner / Developer:	Harvard University
Architect:	Behnisch Architekten
Engineer (building systems):	Buro Happold
Sustainability / LEED:	Transsolar (Sustainability)/Thorton Thomasetti (LEED)
Permitting:	
Construction Management:	Turner Construction

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

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Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	Residential - Multi-unit, Four +	Institutional	Education
Commercial	Office	Retail	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other

First Floor Uses (List)	*Retail, Assembly, Office, Storage and Utility*

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*"site area" needs to be further defined*	Building Area:	*80,449 SF*
Building Height:	*38' 6" Ft.*	Number of Stories:	*3 Flrs.*
First Floor Elevation:	*18'-2 ¼" BCB Elev.*	Are there below grade spaces:	*Yes / No*

Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and proximate institutions such as, but not limited to hospitals, elderly and disabled housing, and general neighborhood information. The proponent should identify how the area surrounding the development is accessible for people with mobility impairments and should analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the development neighborhood and identifying characteristics.	North Allston has mostly low-density land uses such as athletic fields, city and state parkland, retail and light industrial buildings, and low density residential neighborhoods. Most buildings are one to two stories high with off-street surface parking. Transportation is primarily vehicular, but the area is served by 4 MBTA bus lines. Due to future growth and development, multi-modal transportation is planned, with an emphasis on pedestrian and bicycle transport.
List the surrounding ADA compliant MBTA transit lines and the proximity	The site is accessible from two T stations which are each about 20 minutes by foot, as well as four MBTA bus lines which connect the site to Central Square,

to the development site: Commuter rail, subway, bus, etc.	Harvard Square, Brighton, Cleveland Circle, Sullivan Square, Waltham, and Watertown. Bus 70 and 70 A stop right outside 114 Western Avenue. Buses 66 and 86 stop 800 feet from 114 Western Avenue.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Harvard Business School, Harvard Stadium, Joseph M Smith Community Health Center.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	No. Allston Branch Library, Library Park, and Smith Playground.

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	No
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	No
Are the sidewalks and pedestrian ramps existing-to-remain? **If yes,** have the sidewalks and pedestrian ramps been verified as compliant? **If yes,** please provide surveyors report.	No
Is the development site within a historic district? **If yes,** please identify.	No

Surrounding Site Conditions – Proposed

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This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Yes
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Main
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Frontage Zone – 10' Pedestrian Zone – 6' Furnishings Zone – 4' min.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	Frontage Zone – Unit pavers and concrete pavement Pedestrian Zone – Concrete per City of Boston Standards Furnishings Zone – Open joint concrete pavers
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	Yes
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	There are no sidewalks cafes planned.
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	116
What is the total number of accessible spaces provided at the development site?	6
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No
Where is accessible visitor parking located?	Surface parking adjacent to building.
Has a drop-off area been identified? **If yes,** will it be accessible?	No.
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	Attached.

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

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**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	Enclosed.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Flush Condition.
Are the accessible entrance and the standard entrance integrated?	Yes.
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	No.
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No.

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?	N/A
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	N/A
How many accessible units are being proposed?	N/A
Please provide plan and diagram of the accessible units.	N/A
How many accessible units will also be affordable? If none, please	N/A

describe reason.	
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	N/A
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	N/A
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	N/A

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities