

Novartis Campus Expansion

Project Review Special Permit Application

Novartis Institutes for Biomedical Research, Inc.

November 7, 2011

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Images / Drawings

City of Cambridge, Massachusetts

Planning Board

City Hall Annex, 344 Broadway, Cambridge, MA 02139

a. SPECIAL PERMIT APPLICATION – COVER SHEET

To the Planning Board of the City of Cambridge:

The undersigned hereby petitions the Planning Board for one or more Special Permits in accordance with the requirements of the following Sections of the Zoning Ordinance:

- | | | | |
|----|------------------------|----|------------------------------|
| 1. | 19.20 (Project review) | 2. | 17.604.2 (Additional Height) |
| 3. | 17.606 (Parking) | 4. | 10.40 Special Permit |

Applicant: Novartis Institutes for BioMedical Research, Inc.

Address: 250 Massachusetts Avenue, Cambridge, MA

Telephone: 617-871-4961

FAX: 617-871-3295

Location of Premises: 181 Massachusetts Avenue and 22 Windsor Street

Zoning District: Special District 15

Submitted Materials:

Survey, Site Plan, Elevations, Floor Plans, Photographs, Supporting Statements, Project Narrative, Traffic Impact Study, Tree Study, Urban Design Objectives Narrative, Sewer Narrative, Water Narrative, Noise Mitigation Narrative, Owner Certificate, Dimensional Form

Signature of Applicant: Novartis Institutes for BioMedical Research, Inc.



Chris Klee, CFO

For the Planning Board, this application has been reviewed and is hereby certified complete by the Community Development Department:

Date

Signature of CDD Staff

b. SPECIAL PERMIT APPLICATION – SUMMARY OF APPLICATION

Project Name:	Novartis Research Building
Address of Site:	181 Massachusetts Avenue and 22 Windsor Street
Applicant:	Novartis Institutes for BioMedical Research, Inc.
Planning Board Project Number:	(CDD)

Hearing Timeline (CDD)

Application Date:

Planning Board 1st Hearing Date: _____ *

(PUD Development Proposal, other special permit)

Planning Board Preliminary Determination: _____ *

(PUD Development Proposal)

Second Submission Date: _____ *

(PUD Final Development Plan)

Planning Board 2nd Hearing Date: _____ *

(PUD Final Development Plan)

Final Planning Board Action Date: _____ *

(PUD Final Development Plan, other special permit)

Deadline for Filing Decision: _____ *

*Subject to extension by mutual agreement of the Applicant and the Planning Board

Requested Relief: (include other boards and commissions)

- Project Review Special Permit (Section 19.20)
- Additional Height (Section 17.604.2)

Project Description

Brief Narrative: Petitioner seeks to construct two buildings for technical office/research use with a single below grade parking facility under both buildings

Project Size:

- Total GFA: 572,663 sf
- Non-residential uses GFA: 0
- Site Area (acres and SF): 3.76 acres (163,618 sf)
- # of Parking Spaces: 458

Proposed Uses:

- # of Dwelling Units: N/A
- Other Uses: Technical office/Research development with accessory retail
- Open Space (% of the site and SF): Approximately 50%

Proposed Dimensions:

- Height: 125'
- FAR: 3.5

OWNERSHIP CERTIFICATE - PLANNING BOARD SPECIAL PERMIT

This form is to be completed by the OWNER, signed, and returned to the Office of the Planning Board.

I hereby authorize: Novartis Institutes for BioMedical Research, Inc.
(Petitioner)

Address: 250 Massachusetts Avenue, Cambridge, MA

to apply for a special permit for: Two laboratory, office and retail buildings
(type of development)

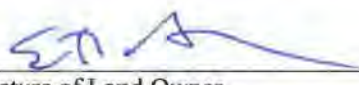
on premises located at: 181 Massachusetts Avenue and 22 Windsor Street

for which the record title stands in the name of: MIT 177 Massachusetts Avenue LLC

whose address is: MIT Investment Management Company, 238 Main Street, Cambridge

by deeds duly recorded in the: Middlesex South Registry of Deeds in Book 51973, Page 518 and Book 57084
Page 594 ; or Registry District of the Land Court, Certificate No.:

Book: Page: MIT 177 Massachusetts Avenue LLC
By: Massachusetts Institute of Technology, its manager
By: MIT Investment Management Company
its authorized agent

By: 
Signature of Land Owner
(If authorized Trustee, Officer or Agent, so identify)

Seth D. Alexander, President

Commonwealth of Massachusetts, County of Middlesex

The above named Seth D. Alexander personally appeared before me,

This 3rd of November, 2011 and made oath that the above statement is true.

Notary: 

My Commission Expires:



INTRODUCTION

This is an application for a Special Permit by Novartis Institutes for BioMedical Research, Inc. (NIBRI). The project involves the construction of two proposed buildings at 181 Massachusetts Avenue and 22 Windsor Street totaling 539,513 sf. The renovation of the existing building at 211 Massachusetts Avenue containing 33,150 sf of gross floor area is also part of the redevelopment of the site but since that building and use is pre-existing, it is not the subject of this Special Permit application. The total floor area for all three buildings on the site is 572,663 sf. The new development is located directly across NIBRI's current global headquarters on Massachusetts Avenue and is comprised of retail, office and laboratory spaces connected by a green courtyard. Parking for 458 cars will be provided below grade and accessed from State Street.

The project as submitted satisfies the citywide Urban Design Objectives of Article 19.30 and the Design Guidelines of the newly created Special District 15.

DIMENSIONAL FORM

Special Permit #

Address: 181 Massachusetts Avenue/22 Windsor Street

	Allowed/Required	Existing 211 Mass Ave	Proposed 181 Mass Ave	Proposed 22 Windsor	Granted
Total FAR					
Residential	N/A	N/A	N/A		
Non-Residential	3.5	0.20	3.5		
Inclusionary Bonus	N/A	N/A	N/A		
Total GFA in Sq. Ft.					
Residential	0	0	0		
Non-Residential	572,663 sf	33,150 sf	277,374 sf	262,139 sf	
Inclusionary Bonus	0	0	0		
Max. Height					
Range of heights	140'	32'-0"	125'	110'	
Lot Size	N/A	163,618 sf	163,618 sf		
Lot area/du	N/A	N/A	N/A		
Total Dwelling Units					
Base units	N/A	N/A	None		
Inclusionary units	N/A	N/A	None		
Min. Lot Width	None	352'-7"	None		
Front					
Massachusetts Avenue	0	6'-3"	6'-3"	345'-1"	
Windsor Street	0	1'-3"	238'-10"	26'	
State Street	0	200'	191'-6"	7'-10.5"	
Osborn Street	0	281'	6'-3"	25'	
Albany Street	0	N/A	6'-8"	N/A	
Total % Open Space					
Usable	None	10,480 sf / 6.4%	81,809 sf / 50%		
Other	None	None	None		
Off Street Parking					
Min #	427 spaces	229 spaces	458 spaces		
Max #	855 spaces	N/A	N/A		
Handicapped		6 spaces	9 spaces		
Bicycle Spaces	1/10 auto spaces	None	120 spaces		
Loading Bays	5 bays	None	5 bays		

PROJECT DESCRIPTION

The Project

Novartis Institutes for BioMedical Research, Inc (NIBRI) located at 250 Massachusetts Ave will enhance its Cambridge campus to include new laboratory, office and retail facilities on a parcel directly across Massachusetts Avenue from its current global research headquarters. The site bounded by Osborn, State, Albany and Windsor Streets, contains 163,618 square feet. It currently consists of the parking lot at 181 Massachusetts Avenue, the existing three-story red brick structure at 211 Massachusetts Avenue and associated parking at 22 Windsor Street, the privately owned Smart Street, and the former Analog building at 21 Osborn Street which will be demolished.

The mixed use lab/office/retail project will contain 539,513 square feet of newly constructed GFA and a below grade parking structure to accommodate 458 vehicles, as well as an enclosed loading dock with 3 truck and 2 trash bays. The project also includes the adaptive reuse of the existing structure at 211 Massachusetts Avenue (~33,150 sf). The two biomedical research buildings at 181 Massachusetts Avenue and 22 Windsor Street will be built upon a common underground foundation containing a parking garage, specialized science support space, and a central tri-generation utility plant. The new buildings will house laboratories for biomedical research, collaborative work areas, administrative areas, auditorium, cafeteria and 8,000 GSF of retail space along Massachusetts Avenue. The adaptive reuse of 211 Massachusetts Avenue will be a support building for administrative uses and site amenities for NIBRI. The buildings will be organized around an open landscaped courtyard that will permit controlled public access and cross site pedestrian circulation. The landscaped courtyard will knit the existing and new Novartis facilities into the neighboring Central Square district. The first floor of 181 Massachusetts Avenue will fill a critical gap along the Massachusetts Avenue retail frontage.



The Courtyard

The 1.35 acre courtyard at the site is intended to become a social crossroads for the Cambridge Novartis campus, where NIBRI employees and others from the larger Central Square/Kendall Square/MIT area can interact with one another in an informal setting. Key elements of the design include a generously proportioned entry plaza along Massachusetts Avenue, smaller gathering spaces with moveable seating, lawns, and meandering walkways connecting the buildings that surround the space with each other and with the adjacent public sidewalks. The ground plane of the courtyard is lifted at the northern end and slopes gently down toward the main entrance at Massachusetts Avenue, providing deeper views into and out from the courtyard for both users and passersby. A grove of trees provides seasonal variety and unites the ensemble of visually distinct buildings that surround the space.

Research Buildings

The north and east edges of the courtyard are framed by the two new research science blocks (181 Massachusetts Avenue and 22 Windsor Street). The two science buildings will be connected at the below grade floors as well as by a bridge at the sixth floor. Both buildings have roof top mechanical penthouses that are obscured behind an integrated building envelope design.

181 Massachusetts Avenue

This single building has two components. The mixed use building along Massachusetts Avenue and the southern edge of the courtyard consists of four stories with retail space at the ground floor facing Massachusetts Avenue. The NIBRI employee and visitor entrance to the campus is



through the courtyard in an opening between the existing 211 Massachusetts Avenue Building and the sloped canopy of the building which houses an auditorium. The unique feature of the first building component is the low diaphanously perforated exterior stone screen that provides both shade and privacy from the street. Behind the stone screen, glass curtain wall will span the four stories. The perimeter veil is of local granite

supported from above by a stainless steel frame and will be abstractly reminiscent of the historic stone walls that are ubiquitous in New England. The humanistic scale of the stone screen creates a dialogue with the neighboring structures along

Massachusetts Avenue, Albany and Osborn Streets, and provides a lower scale buffer to the eight story science building. The roof of the lower scale wing will be covered with an extensive green roof planting system.

Setback from the street, the science building is the second component and is designed as a long narrow rectangular glass clad block. The glass facades will make for a light and airy quality to the massing from within the courtyard and will become an elegant symbol of the Novartis presence in Cambridge providing employees with distinct views of the courtyard, Cambridge, and the Boston skyline. The science building roof top mechanical penthouse will be obscured behind extensions of the building envelope design which will further enhance the simplicity of the building. On the sixth floor of the science building, a glass bridge will connect the two buildings which frame the courtyard.

22 Windsor Street

Located on the northern edge of the courtyard along State Street, 22 Windsor Street fronts three streets. Its full block size and its relationship to the overall campus, requires 22 Windsor Street to be responsive to both its street level entry on Windsor Street as well as its orientation to the campus courtyard. The building has four major frontages.



The Windsor Street elevation is the entrance for the employees and public, the State Street elevation is for vehicular traffic, and the southern courtyard elevation is the more formal entry for employees of Novartis and visitors arriving to the campus. Given this emphasis, the design for 22 Windsor Street focuses on the southern façade, creating a dynamic circulation space on this façade to highlight the activity within. The active southern façade stair also serves as a device to connect the entries at Windsor Street, the courtyard, and the bridge to 181 Massachusetts Avenue. Increased setbacks on Windsor and Osborn Streets allow for gracious public sidewalks and paths which open into the campus courtyard.

In context, 22 Windsor Street is located in an industrial area immediately adjacent to the MIT campus as well as a number of research facilities. Given the variety of scales adjacent to the building, a variety of architectural devices were employed to minimize the building massing. These include overhangs, the interplay of building materials and volumetric shifts in massing. The façade utilizes a combination of terracotta louvers (baguettes), terracotta rain screens, and GFRC soffits. This façade system is also an environmental strategy which helps mitigate the negative effects of the hot summer sun by cutting off its high angle at the façade, and alternately allows the lower angle of the winter sun to penetrate deeply within the building promoting natural lighting of the labs and social space. As a fourth element, the building is clad with a double height glazing at all of its social spaces. Oriented to the south, the double height social spaces cascade down the southern façade of the building arriving at an inviting glass lobby and formal entry to the building at the corner of Windsor and State Streets.

In addition to the glazed south and east façade, 22 Windsor also provides the site's delivery and vehicular access at the north elevation on State Street. The base of this elevation will be clad in solid stone. This stone will also wrap the base of the building's east elevation.

Sustainability

Environmentally responsible and sustainable design is a fundamental principal for Novartis. The new development is expected to integrate the highest standards for sustainability with a focus on minimizing the overall energy usage of the project. Both passive and active design solutions will be utilized to reduce energy consumption of what is conventionally a high-energy usage building type. It is Novartis' goal that the project will meet or exceed the minimum criteria necessary for LEED gold certification from the USGBC.

19.31 New projects should be responsive to the existing or anticipated pattern of development.

The enhancement of the NIBRI campus has been designed to integrate into both the commercial setting of Massachusetts Avenue as well as the institutional context represented by MIT. It has been designed as a mixed use complex that shares the functional context of both uses and facilitates connections through the campus during business hours.

Retail functions at the first level create continuity with development along Massachusetts Avenue extending social activity along the street. The Novartis entrance for 181 Massachusetts Avenue has been pulled into the open courtyard. The courtyard is a green space open to the public during business hours and functions as the center of the buildings that bound it. The scale of the campus is consistent with this context. The face of 181 Massachusetts Avenue is 66'-6" high along Massachusetts Avenue and responds by being similar in scale to the existing commercial context. The portion of the building along Osborn Street is taller, but set back from both Massachusetts Avenue and Osborn Street.

The design of the 181 Massachusetts Avenue facade complements the adjacent building at 211 Massachusetts Avenue and working together will form the main entry to the courtyard. The ground floor of 181 Massachusetts Avenue will include 8,000 square feet of retail space, NIBRI's main entrance, atrium and the dining facility. The ground floor of the main buildings will be transparent around a majority of the site.

The north elevation of 22 Windsor Street houses the support functions, such as loading docks and vehicular entry. The location of these functions is consistent with neighboring complexes on State Street.

19.32 Development should be pedestrian and bicycle-friendly, with a positive relationship to its surroundings.

The campus is designed around a pedestrian courtyard that is both a gathering space and a diagonal pedestrian short-cut across the site. NIBRI is a bicycle riding community and plans include indoor, secure accommodations for 120

bicycles, well in excess of that required by zoning. All parking for the site will be below grade. Store fronts along Massachusetts Avenue and the courtyard entry to the site will activate the north side of Massachusetts Avenue. All ground floor spaces will be actively inhabited with a transparent facade. The design maintains a wide public sidewalk and provides space for shade trees in the public way. Entries to 181 Massachusetts Avenue and 22 Windsor Street are safely located and will support rational and safe pedestrian movement across streets. Great care is being taken in the design of the project to afford pedestrians and bicyclists safe access to building entries and bicycle parking entries.

19.33 The building and site design should mitigate adverse environmental impacts of a development upon its neighbors.

The mechanical penthouse design for both buildings is integrated with the building façade system to reduce the visibility of rooftop mechanical equipment. A concerted effort has been made to integrate a major portion of the equipment into lower portions of the building. All equipment remaining on the roof is screened behind either curtain wall or roof top louvers. No rooftop mechanical elements will be seen from street level except a portion of the exhaust stacks.

All loading and waste processing functions will take place in an internal loading dock area sheltered from street view. The entrance for these loading docks is on State Street. This will concentrate all NIBRI operations in one internalized area thus mitigating the view and noise that come from these operations. Specialized equipment will be utilized in segregated trash areas that will be fully enclosed and designed specifically to control odor.

The site has been designed to meet the provisions of the Department of Environmental Protection (DEP) Storm Water Management Policy for a redevelopment project. *See Storm Water Narrative in this application.*

Building shadows primarily affect the landscaped courtyard. Gaps in the massing of the buildings allow for breezes. The transparency and open plans of the buildings will provide intermittent natural light through the forms of buildings further dissipating blocks of shadow.

The lighting of exterior environments (including building facades, the central

courtyard, pedestrian way-finding, and the parking garage with associated access lighting) will be closely integrated with the buildings and the site to subtly highlight identifying elements and features without creating light pollution or objectionable glare. Given the urban nature of the site, minimizing light trespass to neighboring properties will be emphasized. The lighting systems will be designed to enhance visual quality while minimizing lighting energy use, and will be designed to provide task luminance levels as required.

19.34 Projects should not overburden the City infrastructure services, including neighborhood roads, city water supply system, and sewer system.

Storm water management strategies for the site improvements will seek to mitigate the storm water runoff as required by the City of Cambridge standards and standard engineering practices of the Commonwealth of Massachusetts. Mitigation measures proposed include the use of Cambridge approved Best Management Practices, (BMP's), including green roofs, underground detention/infiltration system, low-flow plumbing fixtures in restrooms, and rainwater collection/reuse cisterns that will help control peak rates of runoff. Also, where possible, site storm water will be directed into landscaping to promote increased infiltration.

The capacity and condition of the existing water supply infrastructure has been determined to be adequate for the project. Based on hydrant flow tests to be performed, it will be determined if a booster pump will be added to the project to enhance the existing pressures. The project will utilize water efficiency measures, such as low flow plumbing fixtures, to minimize water use and runoff and has targeted a minimum of a 30% reduction of water usage when compared to the EPA standard. The capacity and condition of the sewer mains in Massachusetts Avenue, Osborn Street, and State Street have been discussed with the City of Cambridge Department of Public Works (DPW) and have been determined to be adequate for the project.

The Transportation Impact Study (TIS) prepared for the project by Vanasse & Associates, Inc. (VAI) indicates that the project will have a minimal affect on area neighborhood and adjacent streets, with no changes in vehicle levels-of-service at any of the studied intersections caused by the project.

19.35 New construction should reinforce and enhance the complex urban aspects of Cambridge as it has developed historically.

The introduction of life science uses into a location that has historically contained industrial uses is consistent with the trend of commercial development in this section of Cambridge.

This site serves to reinforce the physical and institutional connections between a private research facility and the surrounding campus of a major research-focused university. Linkage between Kendall and Central Square provides an enlarged customer base for area establishments and encourages employees to live, shop and reside in the neighborhoods.

The courtyard will serve as a pedestrian connection and will act as a link between the Novartis facilities on both sides of Massachusetts Avenue. Due to the collaborative nature of the Novartis work place it is expected that there will be heavy pedestrian traffic crossing between the two sites.

The variety of uses planned for this site will extend the time the area is active throughout the day. The design provides for 8,000 square feet of retail space, which will provide for occupancy of multiple retail tenants along the Massachusetts Avenue elevation of the new building. Locating retail tenants in this area will encourage pedestrian travel along a significant stretch of a main artery through the city, and will help link this development to the existing adjacent retail areas.

211 Massachusetts Avenue figures prominently in the master plan for the development of this site. Preservation and restoration of the exterior façade will help reinvigorate the building, and will enhance the adjacent pedestrian courtyard.

19.36 Expansion of the inventory of housing in the city is encouraged.

The project does not contain a housing component and does not abut a residential zoning district.

19.37 Enhancement and expansion of open space amenities in the city should be incorporated into new development in the city.

The centerpiece of the campus is a publicly accessible open space that will serve as a pedestrian connection between Kendall and Central Squares during business hours while also being integral and vital to the design of the complex. This urban scaled courtyard will also be an inspiration to the scientists working in the spaces around it.

The gently sloping and fully ADA accessible courtyard will positively affect Massachusetts Avenue presenting views from the sidewalks and street to the garden space beyond. The new open space will contribute to the spatial richness and variety of Massachusetts Avenue including the recently constructed Jill Brown Rhone Park in Lafayette Square. Further, the open space will contribute to the City's leadership in responsible environmental and sustainable development by reducing heat island effects, sequestering carbon, reducing night-glare with well-engineered lighting, and by controlling the rate of storm water runoff from the site all while providing an environment with rich planting and exceptionally detailed paving and seating systems.

1. Parking should be located below grade where possible.

All vehicular parking at the site will be located in a three level, below grade parking facility with access from State Street.

2. Vehicular access/egress should not be located on Massachusetts Avenue or Albany Street.

Both the entrance and exit ramps from the below grade parking structure have been located on State Street. Similarly, all loading bays are located on State Street.

3. Public pedestrian connections are encouraged through the site.

The design of the courtyard intentionally creates a pleasing pedestrian route to facilitate movement from Massachusetts Avenue to the corner of Osborn and State Street. Pedestrian paths also lead in an east west direction from Windsor to Osborn Street.

4. Open space in the form of plazas, landscaped areas and pedestrian pathways should be integrated into the site plan so as to benefit building users and the general public.

The courtyard has been designed to allow for inviting areas for seating and visual enjoyment of the landscape. Tables and chairs are located throughout the courtyard and may be used by Novartis employees, visitors, and the general public.

5. To the extent possible, active uses and transparency is encouraged on the ground floor of new buildings. The ground floor building frontage along Massachusetts Avenue shall create an active street presence with a particular emphasis on retail uses and shall be generally 50% transparent.

The building at 181 Massachusetts Avenue will occupy a prominent corner at Albany Street and Massachusetts Avenue. The entire ground floor along those two edges will be transparent and occupied by active uses, such as retail. That same design feature extends around the ground floor of the building to the area fronting onto the plaza at the sidewalk level.

This plaza area, with its water feature and elevated ceiling above will provide an ideal location for outside tables and chairs for a likely café use in the adjacent ground floor space.

6. The applicant should indicate how a proposed building would relate physically to the most current design plans developed by the MBTA for implementation of the Urban Ring transportation project.

The building design provides for active uses at the corner of Massachusetts Avenue and Albany Streets, the proposed location of a stop in the plans for the Urban Ring Transportation project. The entrance to the building has been located away from this busy corner so as to avoid any potential conflicts with pedestrian activity likely to accompany an Urban Ring stop or possible station entrance at this location.

7. Attention should be given to walkability, with appropriate sidewalk widths, maintenance of street trees, and other pedestrian friendly amenities.

The site has public edges on five city streets. The most prominent public sidewalk along Massachusetts is presently well designed and is appropriately sized for pedestrian activity, street furniture, and street trees. Novartis will work with the Department of Public Works, Transportation, Traffic and Parking Department, and the City Arborist to identify areas along the adjacent public sidewalks to improve and enhance.

8. The site massing should include a variety of heights to provide visual interest and break-up building mass.

The design of 181 Massachusetts Avenue is a model of this design guideline. Along the entire Massachusetts Avenue edge the building height is only sixty-five feet and its mass is further articulated by the slope of the stone screen that dominates its façade. By contrast, the height of the remainder of the building along Osborn Street is one hundred twenty five (125) feet in height, but at the public edge along Osborn Street the slope of the stone screen serves to effectively break the mass of the building into a pedestrian friendly scale.

The height of 22 Windsor Street is consistent at one hundred twenty (120) feet, but its mass is distinguished by the design of its façade, including the use of terra-cotta louvers, terra-cotta rain screens, and GFRC soffits.

CONFORMANCE to SECTION 10.43

Criteria for Issuance of Special Permit

Granting the Special Permit requested for 181 Massachusetts Avenue/22 Windsor Street (location) would not be a detriment to the public interest because:

(a) The requirements of the Ordinance can be met.

As detailed in the materials submitted with this application, the project satisfies the Citywide Urban Design Objectives of Section 19.30 and the Design Guidelines for Special District 15 set forth in Section 17.607.

(b) Traffic generated or patterns of access or egress will not cause congestion, hazard, or substantial change in established neighborhood character.

The Transportation Impact Study (TIS) submitted with this application demonstrates that the project will have no adverse impact on city traffic.

(c) The continued operation or development of adjacent uses as permitted in the Zoning Ordinance will not be adversely affected by the nature of proposed use.

The surrounding uses include many similar life science/research buildings which would be complemented by the addition of this project.

(d) No nuisance or hazard will be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City.

The buildings will comply with all requirements for noise mitigation and will satisfy state and municipal health and building code requirements.

(e) The proposed use will not impair the integrity of the district or adjoining districts, or otherwise derogate from the intent and purpose of the Ordinance.

The project as proposed is consistent with the purpose of the newly created Special District 15 Zoning District to provide for “the creation of a high quality general and technical office environment” and the remaining urban design objectives set forth in Section 17.602 of the Zoning Ordinance.

(f) The building construction is consistent with the Urban Design Objectives set forth in Section 19.30.

See conformance to *Section 19.30*.

TRAFFIC SUMMARY

In accordance with the provisions of section 19.30 the applicant has submitted a Transportation Impact Study (TIS) to the city's Traffic, Parking and Transportation Department (TPT) which has certified the study as reliable.

As referenced previously, the TIS prepared by VAI reviewed potential transportation impacts and parking demands, site access conditions, and mitigation measures necessary to accommodate this expansion of the NIBRI campus. The study also reviewed the project with respect to the Article 19 Large Project Review Special Permit Criteria. The study was completed in accordance with the City's guidelines for TIS and followed the scoping determination issued by the Cambridge Traffic, Parking, and Transportation (TPT) Department dated August 1, 2011.

As required by the City, the project's impact has been measured against 5 criteria as indicators of the project's impact. Based upon the Large Project Review Special Permit Criteria Analysis, there are a total of 171 indicators which were reviewed. Of the 171 project indicators reviewed, a total of seven (7) were exceeded. Four of these were exceeded under existing conditions, and two trip generation indicators were exceeded by the project. One indicator related to pedestrian delay at an unsignalized intersection crossing is exceeded by the project, but the crossing remains at LOS B with the project. The remaining two indicators are related to trip generation for the project. None of the 24 indicators related to vehicular traffic or traffic on neighborhood streets were exceeded.

Mitigation for the project is focused on continuing the low SOV mode split through the following measures, already in place at existing NIBRI facilities:

- Continue to charge for parking, offering discounted parking for dedicated HOV vehicles;
- Dedicated HOV parking spaces;
- Continue as a member of the CRTMA and the EZ Ride Shuttle bus;
- MBTA passes available on site, as well as MBTA pass subsidies;
- Promotion of commute options through companywide emails and intranet site;
- Provide information about transportation options available to employees at orientations and on the company website;
- Provide information about transportation options available to faculty and staff at employee orientations, in the employee handbook and on the website;
- Provide showers and lockers accessible to all members of the NIBRI community;
- Continue to work with the Cambridge Office of Workforce Development.

-
- Additional measures include replacement of missing or deteriorated pedestrian accommodations at the intersections of Osborn Street and State Street; Osborn Street and Albany Street; and State Street at Windsor Street. NIBRI will also remove the ramp at the existing intersection of Smart Street and Massachusetts Avenue, eliminating a curb cut onto Massachusetts Avenue.

A copy of the TIS has been submitted as part of this application.



CITY OF CAMBRIDGE
Traffic, Parking and Transportation
344 Broadway
Cambridge, Massachusetts 02139

www.cambridgema.gov/traffic

Susan E. Clippinger, Director
Brad Gerratt, Deputy Director

Phone: (617) 349-4700
Fax: (617) 349-4747

October 13, 2011

Mr. Scott Thornton
Vanasse & Associates, Inc.
10 New England Business Center Drive, Suite 314
Andover, MA 01810-1066

RE: Novartis Institute for Biomedical Research, Inc.

Dear Scott,

We have reviewed your revised Traffic Impact Study (TIS) for the proposed Novartis Institute for BioMedical Research Expansion project and certify it as complete and reliable.

Please call Adam Shulman at 617-349-4745 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Susan E. Clippinger", written over a horizontal line.

Susan Clippinger
Director

cc: Adam Shulman, TPT, Susanne Rasmussen, CDD, Cara Seiderman, Stephanie Groll, CDD.

The total average daily flow generated by the proposed buildings is estimated to be 75,150 gallons per day. This is based on a total net building area of 547,197 square feet and the Title V Sewage Flow Design flow of 75 gallons per day per 1,000 square feet for an office building classification and an estimate from the plumbing engineer of 150 gallons per day per 1,000 square feet for laboratory space. The total average daily flow generated (based on 79 percent - 21 percent laboratory/office ratio) is estimated to be 8,850 gallons per day for the office area and 66,300 gallons per day for the laboratory area.

Sanitary flows from the proposed buildings will be discharged into the existing 15-inch sewer main in Massachusetts Avenue, the existing 18-inch sewer main in Osborn Street, and the existing 12-inch sewer main in State Street. This part of the city infrastructure provides both separate sanitary and storm water sewer collection systems and combined sewer collection systems, however all the proposed connections will be connected to the separated sewer mains. The building sanitary service connections will be appropriately sized to carry the anticipated daily flow from each building. The project team will work with the City of Cambridge Department of Public Works (DPW) to coordinate the service connection locations to the existing sewer mains.

STORM WATER/DRAINAGE SUMMARY

The proposed storm water management system will be designed in a manner that will meet or exceed the provisions of the DEP Storm Water Management Policy for a redevelopment project.

Storm water management strategies for the proposed buildings and site improvements will mitigate the storm water runoff as required by the City of Cambridge standards and standard engineering practices of the Commonwealth of Massachusetts. Mitigation measures proposed include the use of Cambridge approved Best Management Practices, (BMP's), including underground detention/infiltration system and rainwater collection/reuse cisterns that will help control peak rates of runoff. Also, where possible, site storm water will be directed into landscaping to promote increased infiltration and enhance water conservation. Green Space design is organized around a 60,000 square foot (1.35 acre) landscaped courtyard. The significant green, open space will maximize water infiltration.

In addition to the structural and non-structural BMP's proposed, the design will also provide a pedestrian-oriented layout at the site, eliminating the existing surface parking area and reducing the types of pollutant loads associated with vehicular areas. Rainwater collected from the rooftops of the new buildings will be directed into the rainwater reuse cisterns and any overflow will be routed to the landscaped areas and underground detention/infiltration system. The detention basin will be sized to mitigate the storm water flows into the city system as required by the City of Cambridge standards. Given that the existing project site is largely covered with impervious parking areas and buildings, the strategies proposed represent an improvement over current storm water management provisions particularly from a water quality perspective. During construction, standard engineering practices for erosion and sedimentation control will be implemented on site. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared for the site as required by the United States Environmental Protection Agency (US EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) as project construction will disturb more than one acre. The SWPPP will also be used to document compliance with the Leadership in Energy and Environmental Design (LEED) Sustainable Sites Prerequisite for Erosion and Sedimentation Control.

The proposed drainage system will consist of rainwater collection and reuse cisterns (located in the bottom level of the proposed parking garage) and an underground detention/infiltration system designed in conformance with the City of Cambridge storm water management guidelines. Specifically, the peak rate of runoff from the post-development condition for a 25-year storm event will be less than the peak rate of runoff from the pre-development condition for a 2-year storm event. The infiltration component of the detention system is designed to infiltrate the volume of water anticipated from the under slab drainage beneath the parking garage. This volume of water, per City of Cambridge requirements, will not be discharged to the municipal storm sewer system. A green roof is also proposed on a portion of 181 Massachusetts Avenue which has a beneficial effect on storm water runoff rates and quality.

The proposed reuse cisterns will collect storm water runoff from the proposed buildings and site. The runoff from the roofs and site will be discharged directly to the two rainwater cisterns at the bottom level of the proposed parking garage. The rainwater collected in these cisterns will be reused in the cooling towers for the proposed buildings. Once these cisterns fill to capacity they will overflow to the proposed detention/infiltration system. The detention system has been designed to mitigate the peak rate of runoff per City standards utilizing an outlet control structure to regulate the discharge flow rates for a 24-hour storm event. After detention, the storm water will be routed to the existing 66-inch storm drain located in Massachusetts Avenue that discharges to the Charles River.

The most significant positive impact of the Project in terms of improving storm water management onsite is that it will mitigate the peak rate of runoff from the post-development condition to less than pre-development levels through the use of rainwater reuse and storm water detention. Also, in the proposed design, the site is being “greened” by reducing the amount of impervious area on the project site which will provide a benefit from a storm water quality perspective. The project team will work with the DPW to establish the final design for site drainage.

The proposed buildings are expected to require approximately 114,150 gallons per day for domestic water demand, 71,150 gallons per day for the office/laboratory spaces and an average daily demand of 43,000 gallons per day for the cooling towers. The rainwater collection cisterns will be used to supplement the cooling tower demand reducing the actual demand on the municipal water system. The project's service connections will be from the existing 20-inch water main in Osborn Street and the 20-inch water main in State Street.

The capacity and condition of the existing water supply infrastructure is currently under investigation; however, based on NIBRI's previous experience opposite this site, there are typically no water capacity issues in the vicinity of the project. Hydrant flow tests will be performed to determine the capacity and pressures in the water mains in State and Osborn Streets. Should it be determined that there is inadequate pressure to provide the required flows, a booster pump will be added to the project to handle the deficiency.

The building domestic water and fire protection service connections will be appropriately sized for each building. For the current design the installation of a 6-inch, ductile iron, potable water connection and an 8-inch, ductile iron, fire protection connection are being anticipated for each building. The connections to the existing mains will be fully coordinated with the CWD. The fire protection system design will be coordinated with the City of Cambridge Fire Department.

NOISE MITIGATION SUMMARY

Careful attention has been given to the location and placement of rooftop mechanical equipment in order to mitigate its visual and acoustical impact.

Noise attenuation strategies to be employed in order to satisfy the requirements of the Cambridge Noise Ordinance will include the following:

- The rooftop mechanical equipment is set back from the edge of the building which provides useful screening. The option of making some of the rooftop screening solid may be employed where need to provide additional screening.
- The high velocity fans have integral sound attenuators built in them to reduce the external noise emission.
- The generators will have packaged sound attenuator enclosures to reduce their external noise emission.

TREE STUDY SUMMARY

In accordance with the requirements of the Tree Protection Ordinance the Survey of Existing Significant Trees, Tree Protection Plan, and Mitigation Plan has been completed and submitted to the city arborist. Existing tree sizes and heights were verified in the field in September, 2011.

A copy of the study is included in the Appendix.

COMPLIANCE with LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN (LEED v.2.1)

Novartis Institutes for Biomedical Research (NIBRI) has made sustainability an integral part of the NIBRI campus project's design process. As required under Article 22 of the Zoning Ordinance, the buildings shall achieve a minimum of Leadership in Energy and Environmental Design (LEED) Silver (for buildings over 50,000 square feet gross floor area). The NIBR team's continued efforts in developing buildings that are sustainably designed, energy efficient, environmentally conscious, and healthy for the researchers and staff are likely to earn the project at least 60 credit points under the LEED-NC v2009 system, for a LEED Gold rating.

The NIBR campus project will be registered with the USGBC and target several credits which span the seven LEED categories (Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design Process and the additional Regional Priority Credits) to enable the project to meet the zoning requirement as outlined in the Sustainability Report.



31 October 2011

By Email

5435 NIBRI

To Whom It May Concern:

I, Nico Kienzl, hereby state the following:

LONDON
GLASGOW
NEW YORK
NEW HAVEN
SAN FRANCISCO
ABU DHABI

45 East 20th Street, 4th Floor
New York, New York 10003
T +1 (212) 254 4500
F +1 (212) 254 1259
nyc@atelier10.com
atelier10.com

1. I am a LEED-AP Certified Director and Project Manager employed by
Atelier Ten
45 East 20th Street, 4th Floor
New York, New York 10003
2. I have been retained by NIBRI to review the building standards being employed in the design and construction of the proposed building at 181 Massachusetts Avenue and 22 Windsor Street in Cambridge Massachusetts.
3. To the best of my knowledge, the project has been designed to achieve the LEED requirements of Section 22.23 of the Cambridge Zoning Ordinance.

Signed and sworn to under the pains and penalties of perjury.

Sincerely,

A handwritten signature in black ink, appearing to read "Nico Kienzl".

Nico Kienzl, DDes, HBDP, LEED AP BD+C
Director

LEED 2009 for New Construction
5435 NIBR
October 12, 2011

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

68 5 16 22 66 Projected Points
GOLD

Prerequisites				Standard	
Y				SS Prereq 1	Construction Activity Pollution Prevention Create and implement erosion control plan that meets the 2003 EPA Construction General Permit
Y				WE Prereq 1	Water Use Reduction: 20% Reduce water use by 20% over the baseline specified in LEED.
Y				EA Prereq 1	Fundamental Commissioning of Building Energy Systems Engage commissioning agent, and develop and execute a commissioning plan.
Y				EA Prereq 2	Minimum Energy Performance Reduce energy cost by 10%, compared to ASHRAE 90.1-2007, Appendix G
Y				EA Prereq 3	Fundamental Refrigerant Management Eliminate CFCs in building HVAC&R
Y				MR Prereq 1	Storage & Collection of Recyclables Provide space for the collection and storage of paper, cardboard, glass, plastic, and metals.
Y				IEQ Prereq 1	Minimum IAQ Performance Meet sections 4 through 7 of ASHRAE 62.1-2007.
Y				IEQ Prereq 2	Environmental Tobacco Smoke (ETS) Control Prohibit smoking inside building, and locate exterior smoking areas at least 25 feet away from building.

Sustainable Sites				Standard	
22	2	3	0	SS Credit 1	Site Selection Do not develop sites that are prime farmland, floodplains or wetlands, parkland, or key habitat.
1				SS Credit 2	Development Density and Community Connectivity Locate project in dense areas or near key community services.
5				SS Credit 3	Brownfield Redevelopment Locate project on a remediated brownfield site.
1				SS Credit 4.1	Alternative Transportation: Public Transportation Access Locate project within 1/2 mile of a rail station or 1/4 mile of two bus lines.
6				SS Credit 4.2	Alternative Transportation: Bicycle Storage & Changing Rooms Provide bicycle racks for 5% of building occupants and showers for 0.5% of FTE occupants.
2				SS Credit 4.3	Alternative Transportation: Low-Emitting and Fuel-Efficient Vehicles Provide preferred parking for hybrid vehicles for 5% of the project's parking capacity.
3				SS Credit 4.4	Alternative Transportation: Parking Capacity Do not exceed zoning parking requirements; provide preferred carpool parking for 5% of parking capacity.
		2		SS Credit 5.1	Site Development: Protect or Restore Habitat Restore 50% of site open space or 20% of the total site, whichever is greater, for native /adapted vegetation.
	1			SS Credit 5.2	Site Development: Maximize Open Space Exceed zoning open space requirements by 25% OR if there are no local zoning ordinances, provide open space equal to 20% of the total site area.
1				SS Credit 6.1	Stormwater Design: Quantity Control Reduce site runoff over existing conditions by 25%.
				SS Credit 6.2	Stormwater Design: Quality Control Develop stormwater plan that meets local best management practice, and removes 80% TSS.
	1			SS Credit 7.1	Heat Island Effect: Non-Roof Use open-grid paving, light-colored paving, or provide shade on 50% of all hardscape.
				SS Credit 7.2	Heat Island Effect: Roof Use light-colored membrane for 75% of roof or vegetated roof for 50% of roof.
				SS Credit 8	Light Pollution Reduction No nighttime light trespass from building AND meet exterior lighting requirements of ASHRAE 90.1-2007.

Water Efficiency				Standard	
4	0	1	5	WE Credit 1	Water Efficient Landscaping: 50% Reduction Reduce potable water used for irrigation by 50%
2				WE Credit 1	Water Efficient Landscaping: No Potable Water No potable water use for irrigation.
			2	WE Credit 2	Innovative Wastewater Technologies Reduce water used for sewage conveyance by 50%.
			2	WE Credit 3	Water Use Reduction: 30% / 35% / 40% Reduce water use by 30%/35%/40% over the baseline specified in LEED.

Energy & Atmosphere				Standard	
16	2	6	11	EA Credit 1	Optimize Energy Performance: 12% / 14% / 16% Reduce building energy cost by 12%/ 14%/ 16% compared to ASHRAE 90.1-2007, Appendix G.
3				EA Credit 1	Optimize Energy Performance: 18% / 20% / 22% Reduce building energy cost by 18%/ 20%/ 22% compared to ASHRAE 90.1-2007, Appendix G.
3				EA Credit 1	Optimize Energy Performance: 24% / 26% / 28% Reduce building energy cost by 24%/ 26%/ 28% compared to ASHRAE 90.1-2007, Appendix G.
	2	1		EA Credit 1	Optimize Energy Performance: 30% / 32% / 34% Reduce building energy cost by 30%/ 32%/ 34% compared to ASHRAE 90.1-2007, Appendix G.
			3	EA Credit 1	Optimize Energy Performance: 36% / 38% / 40% Reduce building energy cost by 36%/ 38%/ 40% compared to ASHRAE 90.1-2007, Appendix G.
			4	EA Credit 1	Optimize Energy Performance: 42% / 44% / 46% / 48% Reduce building energy cost by 42%/ 44%/ 46%/ 48% compared to ASHRAE 90.1-2007, Appendix G.
			2	EA Credit 2	On-Site Renewable Energy: 1% / 3% Produce renewable energy on-site for 1% / 3% of building energy consumption, calculated by cost.
			2	EA Credit 2	On-Site Renewable Energy: 5% / 7% Produce renewable energy on-site for 5% / 7% of building energy consumption, calculated by cost.
			3	EA Credit 2	On-Site Renewable Energy: 9% / 11% / 13% Produce renewable energy on-site for 9% / 11% / 13% of building energy consumption, calculated by cost.
			2	EA Credit 3	Enhanced Commissioning Design review, post occupancy review, recommissioning manual.
	2			EA Credit 4	Enhanced Refrigerant Management Select refrigerants with low global warming potential and ozone depletion potential.
			3	EA Credit 5	Measurement & Verification Develop and implement an M&V plan that meets IPMVP, Options B or D.
			2	EA Credit 6	Green Power Purchase Green-e certified electricity supply for 2 years, for 35% of building's electricity demand.

Materials & Resources				Standard	
7	0	1	6		

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10/12/2011

1 of 2

LEED 2009 for New Construction

5435 NIBR

October 12, 2011

Achievability
hi med low NP
68 5 16 22

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

66 Projected Points

GOLD			
3	MR Credit 1.1	Building Reuse: Maintain Existing Walls, Floors, & Roof, 55% / 75% / 95%	Maintain existing structure and envelope for 55% / 75% / 95% of the existing building.
1	MR Credit 1.2	Building Reuse: Maintain Existing Interior Nonstructural Elements, 50%	Use existing interior nonstructural elements in at least 50% of the completed building.
2	MR Credit 2	Construction Waste Management: 50% / 75%	Create a construction waste management plan and recycle and/or salvage construction waste.
2	MR Credit 3	Materials Reuse: 5% / 10%	Use salvaged, refurbished, or reused materials for 5% / 10% of construction materials, calculated by cost.
2	MR Credit 4	Recycled Content: 10% / 20% (post-consumer + 1/2 pre-consumer)	Use materials or products with recycled content for 10% / 20% of construction materials, calculated by cost.
2	MR Credit 5	Regional Materials: 10% / 20%	Use materials extracted and manufactured within 500 miles for 10%/20% of construction materials, calculated by cost.
1	MR Credit 6	Rapidly Renewable Materials	Use rapidly renewable materials for 2.5% of construction materials, calculated by cost.
1	MR Credit 7	Certified Wood	Use FSC-certified wood for 50% of wood-based materials, calculated by cost.

11	0	A	0	Indoor Environmental Quality		Standard
1				IEQ Credit 1	Outdoor Air Delivery Monitoring	Install monitoring of outdoor air on ventilation systems and monitor CO2 concentrations.
		1		IEQ Credit 2	Increased Ventilation	Increase ventilation rates by 30% above ASHRAE 62.1-2007.
1				IEQ Credit 3.1	Construction IAQ Management Plan: During Construction	Develop an IAQ plan that meets SMACNA IAQ Guidelines for Occupied Buildings Under Construction.
1				IEQ Credit 3.2	Construction IAQ Management Plan: Before Occupancy	Provide air quality testing or building flush-out prior to occupancy.
1				IEQ Credit 4.1	Low-Emitting Materials: Adhesives & Sealants	Use adhesives and sealants that comply with the SCAQMD Rule #1168
1				IEQ Credit 4.2	Low-Emitting Materials: Paints & Coatings	Use products with VOC levels specified in Green Seal Standard GS-11 and GC-03, and SCAQMD Rule 1113.
1				IEQ Credit 4.3	Low-Emitting Materials: Flooring Systems	Use carpet that meets the CRI Green Label requirements and FloorScore compliant hard surface flooring.
1				IEQ Credit 4.4	Low-Emitting Materials: Composite Wood & Agrifiber Products	Use materials with no added urea-formaldehyde resins or adhesives.
1				IEQ Credit 5	Indoor Chemical & Pollutant Source Control	Floor grates at doors, MERV 13 filters, and exhausts and hazardous liquid container in chemical use areas.
1				IEQ Credit 6.1	Controllability of Systems: Lighting	Provide lighting controls for 90% of individuals AND 100% of group lighting controls.
		1		IEQ Credit 6.2	Controllability of Systems: Thermal Comfort	Provide comfort controls or operable windows for 50% of individuals AND 100% of group spaces.
1				IEQ Credit 7.1	Thermal Comfort: Design	Meet ASHRAE 55-2004, Thermal Comfort Conditions for Human Occupancy.
1				IEQ Credit 7.2	Thermal Comfort: Verification	Meet IEQc7.1, provide permanent monitoring system, and perform a thermal comfort survey after occupancy.
		1		IEQ Credit 8.1	Daylight & Views: Daylight	Meet prescriptive requirements, or achieve 25 footcandles, in 75% of regularly occupied spaces.
		1		IEQ Credit 8.2	Daylight & Views: Views	Provide direct views to the outside in 90% of regularly occupied spaces.

Innovation in Design				Standard		
1	1	1	0			
1				ID Credit 1.1	Innovation in Design, Green Housekeeping	Pending USGBC judgment.
1				ID Credit 1.2	Innovation in Design, Green Building Education	Pending USGBC judgment.
		1		ID Credit 1.3	Innovation in Design, Greatly Exceed MR Credit	Pending USGBC judgment.
1				ID Credit 1.4	Innovation in Design, SSc4 Transportation Demand Management Plan	Pending USGBC judgment.
	1			ID Credit 1.5	Innovation in Design, LEED Pilot Credit	Pending USGBC judgment.
1				ID Credit 2	LEED™ Accredited Professional	LEED accredited professional on design team.

Regional Priority				Standard
1	0	0	0	
1				RP Credit 1.1 Regional Priority, SSc3: Brownfield Redevelopment Locate project on a remediated brownfield site.
1				RP Credit 1.2 Regional Priority, SSc6.1 Stormwater Design: Quantity Control Reduce site runoff over existing conditions by 25%.
1				RP Credit 2 Regional Priority, SSc7.1: Heat Island Effect: Non-Roof Use open-grid paving, light-colored paving, or provide shade on 50% of all hardscape.
1				RP Credit 2 Regional Priority, SSc7.2: Heat Island Effect: Roof Use light-colored membrane for 75% of roof or vegetated roof for 50% of roof.

Sustainability Report Narrative

This report provides a discussion of the sustainability efforts the Novartis Institutes for Biomedical Research (NIBR) will pursue related to the NIBR campus project. The NIBR Campus is committed to developing buildings that are sustainably designed, energy efficient, environmentally conscious and healthy for the staff and researchers. There are seven categories in the LEED certification guidelines: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design Process and the additional Regional Priority Credits. The NIBR campus project will be registered with the USGBC and target several credits which span the seven categories and enable the project to meet the zoning requirement as described below. The project will be registered under LEED NC v2009 and is projected to meet the Gold Certification threshold with at least 60 credit points.

Sustainable Sites

The project site is located on a previously developed site in urban Cambridge, close to several public transportation services including a Massachusetts Bay Transportation Authority subway stop, and public bus services. Occupants shall have access to bicycle racks and showers, as well as preferred parking for hybrid and/or low-emitting vehicles. Efforts will be made to reduce the Heat Island Effect.

Prerequisite 1 Construction Activity Pollution Prevention

The contractor shall follow best practice construction methods and submit and implement an Erosion and Sedimentation Control (ESC) Plan for construction activities related to the construction of the new building specific to this project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit and specific municipal requirements for the City of Cambridge.

Credit 1 Site Selection

The project site is located on a previously developed urban site in Cambridge.

Credit 2 Development Density and Community Connectivity

The project site is on the NIBR campus in urban Cambridge, Massachusetts. The surrounding community is replete with housing, restaurants, shops, grocery stores, educational and religious institutions, performance venues and other community amenities.

Credit 3 Brownfield Redevelopment

The project site was assessed for hazardous materials and it was determined to be a Brownfield site. A site environmental survey will be required to confirm soil classification.

Credit 4.1 Alternative Transportation, Public Transportation Access

The project site is within ¼ mile of the MBTA No 1 and No 2 bus lines and the MBTA Subway Red Line.

Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms

To account for 5% of the building occupants, the program requires 53 secure and covered bike racks in the parking garage and 120 are currently provided. The architect has confirmed intent to provide storage for at least 120 bikes, either in Building 615 with access under Building 613 from State Street. The team will need to include 6 changing areas with showers to pursue this credit. 16-32 showers are currently anticipated.

Credit 4.3 Alternative Transportation, Low-Emitting and Fuel-Efficient Vehicles (FEV)

To accommodate 5% of the building's parking spaces, the design includes 23 preferred parking spaces for hybrid or low-emitting vehicles AND charging stations. These are located at B1 near the Building 608 elevator bank and Building 613 elevator banks, B2 near the Building 608 elevator bank and Building 613 elevator banks, and B3 at the Building 608 elevator bank.

Credit 4.4 Alternate Transportation Parking Capacity

Preferred parking is included for 10% of capacity for carpools; however, parking capacity has not been determined for zoning. After zoning for special permit is established, requirements for this credit will be recalculated and included in design.

Credit 5.1 Site Development, Protect or Restore Habitat

Based on Criteria Design milestone documents, courtyard vegetated space does not meet credit requirements. However, green roof area can contribute to this credit. Compliance will be recalculated during the next phase to target credit requirements. The design team is evaluating design options that to specify native or adapted vegetation for trees and green roofs to meet credit requirements and limit turf grass.

Credit 5.2 Site Development, Maximize Open Space

Given the amount of open space provided for this project, achieving this credit is anticipated.

Credit 6.1 Stormwater Design, Quantity Control

The current design includes a water reuse strategy with stormwater capture from roof surfaces for reuse in cooling towers. The intent will be to design the system such that the reuse strategy and landscape design is 25% less than predevelopment rate and volume.

Credit 6.2 Stormwater Design, Quality Control

The stormwater treatment strategy will include treatment of 90% of stormwater falling on site, including collection from roof and site/landscape runoff strategies, for 80% reduction in total suspended solids (TSS).

Credit 7.1 Heat Island Effect, Non-Roof

The design includes high SRI pavers, which would comply with the requirements for this credit. Alternately, the credit could be met if shade is provided for 50% of hardscape areas.

Credit 7.2 Heat Island Effect, Roof

The design team is currently evaluating options to achieve this credit with the use of green roof technologies and high SRI roofing materials.

Credit 8 Light Pollution Reduction

This credit will be pursued under dark-sky lighting strategies. Credit compliance will be fully evaluated in the next phase. Efforts will be made to design the site with night sky friendly fixtures.

Water Efficiency

The project will specify low-flow and low-flush plumbing fixtures to achieve Water Efficiency. The team shall also consider other water strategies to reduce potable water use.

Prerequisite 1 Water Use Reduction, 20% Reduction

Through the use of low-flow and low-flush plumbing fixtures in the building, as outlined in the project basis of design, the project shall implement water use reduction strategies that use at least 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements. The current design meets approximately 30% savings based on Criteria Design package.

Credits 1.1 and 1.2 Water Efficient Landscaping, Reduce by 50% / No Potable Use or No Irrigation

To meet the credit requirements of 50% or 100% reduction in potable water use for irrigation, potable water use for irrigation will be limited and reuse strategies feasible for irrigation will be explored, including stormwater, reverse osmosis, or other reuse water available for irrigation AND/OR use of native, drought resistant vegetation. Current design includes conservation strategies and no reuse.

Credit 2 Innovative Wastewater Technology

Design calculations show that implementing water conserving fixtures achieves approximately 40% savings, using low flow plumbing fixtures. It is not anticipated that the project will achieve a 50% savings without water reuse. This credit is currently not anticipated for achievement.

Credit 3 Water Use Reduction

The team has specified water conserving fixtures to achieve at least a 30% savings, using low flow fixtures.

Energy and Atmosphere

The building systems shall be designed to optimize energy performance and will not use refrigerants that are harmful to the environment. The owner has engaged a third party Commissioning Agent to confirm the building systems are installed and function as intended and designed.

Prerequisite 1 Fundamental Commissioning of the Building Energy Systems

Sebesta Blomberg, a third party Commissioning Agent (CxA), has been engaged for purposes of providing both basic and enhanced commissioning services for the building energy related systems including heating, ventilation, air condition, and refrigeration (HVAC & R), lighting and domestic hot water systems. The CxA shall verify the building systems are installed, calibrated and performing to the building owner's project requirements. Augustus Engineering (Cx consultant) is also involved in design meetings.

Prerequisite 2 Minimum Energy Performance

The current design should meet this prerequisite. The next model will measure energy cost savings against LEED Baseline. Further study and energy modeling in subsequent project phases will confirm compliance.

Prerequisite 3 Fundamental Refrigerant Management

The specifications for refrigerants used in the building HVAC systems shall not permit the use of CFC based refrigerants.

Credit 1 Optimize Energy Performance

The design is targeting at least a 28% savings through the design of an efficient building envelope, high performance lighting and energy-saving HVAC systems.

Credit 2 On-Site Renewable Energy

Currently, there are no renewables included in the project design. Credit is not likely

Credit 3 Enhanced Commissioning

Sebesta Blomberg, Commissioning Agent (CxA), has been engaged. The CxA's role shall include reviewing the owner's project requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents. Augustus Engineering (Cx consultant) is also involved in design meetings.

Credit 4 Enhanced Refrigerant Management

Equipment with refrigerant over 0.5 lbs should be selected for low LCGWP and LCODP. In addition to central plant equipment, the controlled temperature rooms and other lab equipment will be considered in the calculation.

Credit 5 Measurement and Verification

The mechanical design will incorporate an M&V plan. Building systems integration will include at a minimum LEED requirements.

Credit 6 Green Power

A primary strategy for this project will be reduction in energy consumption. The team will discuss green power purchasing if another LEED credit is necessary to achieve a target certification rating. NIBR could sign a contract for Green-e certified power if desired.

Materials and Resources

Throughout the construction phase of the project, the contractor shall endeavor to divert construction and demolition waste from area landfills and procure materials that have recycled content and/or are manufactured locally.

Prerequisite 1 Storage and Collection of Recyclables

Storage of collected recyclables shall be accommodated throughout the buildings. At least 500 square feet has been allocated for recycling storage in the lower level of Building 613 and a recycling plan will be developed. Building systems integration may include waste stream tracking.

Credits 1.1 and 1.2 Building Reuse

These credits are not applicable to new construction projects. Renovation of Building 614 will be further evaluated and would only achieve this credit if certified apart from the other buildings on the campus.

Credits 2.1 and 2.2 Construction Waste Management

Demolition and construction waste recycling and diversion from landfill are best practices that will be followed in the project.

Credit3 Materials Reuse

Salvaged materials not likely applicable for this building type. Credit not likely pursued.

Credits 4.1 and 4.2 Recycled Content 10%/20% (post-consumer & ½ pre-consumer)

The project specifications shall require materials to include pre- and/or post-consumer recycled content, prioritizing high cost items.

Credit 5.1 and 5.2 Regional Materials, 10%/20% Extracted, Processed and Manufactured Regionally

Materials with regional content will be specified, prioritizing high cost items. The project specifications shall indicate which materials are to be extracted, harvested, recovered and manufactured within a 500 mile radius of the job site.

Credit 6 Rapidly Renewable Materials

Possible to achieve if rapidly renewable materials are selected; however, these materials tend to have low durability. Credit not likely met.

Credit 7 Certified Wood

The project specifications shall indicate that a minimum of 50% of purchased wood installed within the building envelope be FSC certified.

Indoor Environmental Quality

The air quality shall be monitored during the construction phase of the project and likely prior to occupancy. Low emitting materials will be used throughout construction to maintain and improve air quality. The building occupants will be able to maintain a comfortable environment through access to thermal and lighting controls.

Prerequisite 1 Minimum IAQ Performance

The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 62.1-2007 sections 4 through 7 and/or applicable building codes.

Prerequisite 2 Environmental Tobacco Smoke (ETS) Control

Smoking should be prohibited inside the building and within 25 feet of the building, especially any entryways or air intakes.

Credit 1 Outdoor Air Delivery Monitoring

CO2 sensors will be installed in multi-occupant spaces including lab spaces, and monitor outdoor air.

Credit 2 Increased Ventilation

Credit requires increasing ventilation requirements 30% above ASHRAE 62.1-2007. The buildings will be designed with 100% outside air.

-

Credit 3.1 Construction IAQ Management Plan (during construction)

Indoor Air Quality Management Plan for the construction and pre-occupancy phases of the project shall meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter3). Periodic photos of IAQ measures will be provided, as well as a complete IAQ report at the end of construction.

Credit 3.2 Construction IAQ Management Plan (before occupancy)

The construction team is considering either a 1-month flush out or air quality testing to be conducted prior to occupancy.

Credits 4.1 Low-Emitting Materials, Adhesives & Sealants

Materials should be specified that meet Volatile Organic Compounds (VOC) criteria for adhesives and sealants requirements.

Credits 4.2 Low-Emitting Materials, Paints and Coatings

The specifications will include requirements for paints and coatings should meet low VOC criteria for paints and coatings.

Credits 4.3 Low-Emitting Materials, Flooring Systems

The specifications should include requirements for hard surface flooring materials to be FloorScore certified and carpet systems shall comply with the Carpet Institute Green label program.

Credit 4.4 Low Emitting Materials, Composite Wood and Agrifiber Products

The project team shall use composite wood and agrifiber products that contain no added urea-formaldehyde.

Credit 5 Indoor Chemical and Pollutant Source Control

The project team shall design to minimize and control the entry of pollutants into the building and to contain chemical use areas. All entrances should have permanently installed 10 ft deep floor grates, sufficient exhaust in chemical use areas, self-closing doors, deck-to-deck partitions, and MERV 13 (or higher) filters on supply air. In chemical use spaces, the exhaust rate shall be at least 0.50 cfm/sq.ft. with no air recirculation.

Credit 6.1 Controllability of Systems, Lighting

Credit will be pursued by providing lighting controls in all multi-occupant spaces as well as individual controls or task lighting in offices and on workbench areas within the lab spaces.

Credit 6.2 Controllability of Systems, Thermal Comfort

Credit compliance would require individual controls per each lab bench. Credit will be challenging to meet.

Credit 7.1 Thermal Comfort Design

It is the intent of the design to meet ASHRAE 55-2004 Thermal Comfort Conditions for Human Occupancy. Credit is likely to be met.

Credit 7.2 Thermal Comfort Verification

This credit is possible if NIBR performs a thermal comfort survey after occupancy and takes prescribed corrective measures if 20% or more of occupants are uncomfortable.

Credit 8.1 Daylight and Views, Daylight for 75% of the spaces

Credit will be challenging with below grade facilities and deep floor plates. Credit compliance will be evaluated based on the Criteria Design package. While the LEED criteria will not be met, daylight has been carefully studied by the team, and building envelopes have been optimized for increased daylight potential, visual comfort, and thermal performance.

Credit 8.2 Daylight and Views, Views for 90% of the spaces

Credit may be challenging pending classification of below grade facilities as regularly occupied space. Credit compliance will be evaluated based on the Criteria Design package.

Innovation & Design Processes

The project team has identified several possible ID credits which are listed below, limited to 5 ID credits total. Throughout the design process these along with other potential innovation and design process credits will be evaluated.

Credit 1.1 Green Housekeeping – under consideration

Green housekeeping is a recommended best practice. The team will discuss developing and implementing a plan for all buildings.

Credit 1.2 Green Building Education – under consideration

Green building education is a recommended best practice. NIBR is considering educational building dashboards and shall pursue an informational website, building tours, or signage for sustainable features.

Credit 1.3 Exemplary Performance, Greatly Exceed Materials Credit – under consideration

This innovation credit can be earned by greatly exceeding a material credit, such as 30% of materials having recycled content or 30% having regional content.

Credit 1.4 Innovation in Design, Transportation Demand Management Plan – under consideration

NIBR may develop a transportation demand management plan demonstrating a quantifiable reduction in personal automobile use, including public transportation, bicycle storage, carpool promotion, etc.

Credit 1.5 Innovation in Design, Pilot Credit – under consideration

A10 to revisit in next phase with CD to determine if LEED Pilot credits are applicable, mainly PC-17: Cooling Tower Makeup Water, PC-18: Appliance and Process Water Use Reduction, or PC-26 Advanced Energy Metering. The team has expressed preference in pursuing PC-17: Cooling Tower Makeup Water, as the cooling towers are a strong focus of the site water strategy.

Regional Priority Credits

Regional Priority Credits (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. Up to four RPCs can be achieved on a project. The following RPCs are applicable to the NIBR campus area:

Credits Pursued

SSc6.1 Stormwater Design: Quantity Control
SSc7.1 Heat Island Effect: Non-Roof
SSc7.2 Heat Island Effect: Roof
SSc3 Brownfield Redevelopment

Credits Not Pursued

MRc1.1 Building Reuse
EAc2 On-Site Renewable Energy