The architectural treatment of the ground floor facing CambridgePark Drive is approximately 50% glass and highlights the retail space.

(d) Entries to buildings are located so as to ensure safe pedestrian movement across streets, encourage walking as a preferred mode of travel within the city and to encourage the use of public transit for employment and other trips. Relating building entries as directly as possible to crosswalks and to pathways that lead to bus stops and transit stations is encouraged; siting buildings on a lot and developing site plans that reinforce expected pedestrian pathways over the lot and through the district is also encouraged.

The entrances to the retail uses are setback from CambridgePark Drive approximately 23 feet, and the Project's curb cut on the Shared Driveway is located approximately 195 feet away from the nearest crosswalk to minimize pedestrian/vehicular conflicts. The Project is in close proximity to the Alewife Reservation and to the Alewife MBTA station, which will provide alternate commuting and recreational options for the residents. As described in more detail below, The Project will provide for safe pedestrian movement to and through the Site.

(e) Pedestrians and bicyclists are able to access the site safely and conveniently; bicyclists should have secure storage facilities conveniently located on-site and out of the weather. If bicycle parking is provided in a garage, special attention must be paid to providing safe access to the facilities from the outside.

Pedestrians and bicyclists will be able to access the Project safely and conveniently. The Site is located in close proximity to the Alewife Reservation, and has ready access to the extensive bicycle and pedestrian trails in Cambridge, Arlington, and Watertown. Bicycle lanes are provided on Cambridgepark Drive and the new Shared Driveway design provides generous pedestrian and bicycle accommodations. Signalized crosswalks are located at the intersections of CambridgePark Drive with Alewife Station Access Road and with Alewife Brook Parkway. There are three unsignalized crosswalks across CambridgePark Drive: midway between Alewife Brook Parkway and Alewife Station Access Road, at 100 CambridgePark Drive, and at 150 CambridgePark Drive.

The Project provides enclosed, secure, on-site parking for 328 bicycles inside the Parking Component to provide convenient bicycle access for all residents and encourage non-automotive transportation. The bicycle storage facilities are designed in accordance with City of Cambridge guidelines, separated from the automobile parking area and provide safe, direct access to the outside. Bicycle pump and repair facilities will also be provided for resident use. Additionally, several outdoor racks are

provided near the entries to the Project for short-term bicycle parking to encourage the use of bicycles for multiple trips throughout the day.

(f) Alternate means of serving this policy objective 19.32 through special building design, siting, or site design can be anticipated where the building form or use is distinctive such as freestanding parking structures, large institutional buildings such as churches and auditoriums, freestanding service buildings, power plants, athletic facilities, manufacturing plants, etc.

The Project complies with the policy objective 19.32.

3) Pursuant to Section 19.33 of the Ordinance, the building and site design should mitigate adverse environmental impacts of a development upon its neighbors. Indicators include:

(a) Mechanical equipment that is carefully designed, well organized or visually screened from its surroundings and is acoustically buffered from neighbors. Consideration is given to the size, complexity and appearance of the equipment, its proximity to residential areas, and its impact on the existing streetscape and skyline. The extent to which screening can bring order, lessen negative visual impacts, and enhance the overall appearance of the equipment should be taken into account. More specifically:

(i) Reasonable attempts have been made to avoid exposing rooftop mechanical equipment to public

(ii) Treatment of the mechanical equipment (including design and massing of screening devices as well as exposed mechanical elements) that relates well to the overall design, massing, scale and character of the building.

(iii) Placement of mechanical equipment at locations on the site other than on the rooftop (such as in the basement), which reduces the bulk of elements located on the roof; however, at-grade locations external to the building should not be viewed as desirable alternatives.

(iv) Tall elements, such as chimneys and air exhaust stacks, which are typically carried above screening devices for functioning reasons, are carefully designed as features of the building, thus creating interest on the skyline.

(v) All aspects of the mechanical equipment have been designed with attention to their visual impact on adjacent areas, particularly with regard to residential neighborhoods and views and vistas.

The Project is designed to minimize negative impacts on its surroundings and enhance the overall appearance of the existing streetscape and

skyline. First and foremost, the Project significantly improves the appearance of the Site by replacing the existing structures and surface parking lot with a thoughtfully designed and landscaped first class residential building with ground floor retail and structured parking. Minimal mechanical equipment will be located on the roof of the Project and will be located out of sight line to the maximum extent possible. All unit HVAC is provided by mechanical equipment located within the units with the exception of the low-profile rooftop air-conditioning units which are located in the center of the Project, out of view from the street and nearby open spaces. Several pieces of mechanical equipment are located in enclosed, out of sight, at-grade rooms and wall-mounted gas meters are appropriately located on the eastside of the Project, away from the publicly accessible areas of the Site.

(b) Trash that is handled to avoid impacts (noise, odor, and visual quality) on neighbors, e.g. the use of trash compactors or containment of all trash storage and handling within a building is encouraged.

The trash/recycling storage and handling for the Project are contained within the Project to avoid noise, odor, and visual impacts on the neighbors and residents. Centralized trash and recycling rooms are provided on each floor of the Residential Component, with chutes connecting to a main trash/recycling room at the ground level adjacent to the Parking Component. In compliance with the Ordinance, no refuse storage areas are located in the front yard or anywhere on-grade outside of the Residential Component.

(c) Loading docks that are located and designed to minimize impacts (visual, operational and noise) on neighbors.

The loading/unloading area is provided along, but off of, the Shared Driveway. This provides a secure area that will not block traffic circulation, with direct access to a building entry and elevator core. Loading activities will occur inside the Building and thereby minimize visual and noise impacts on abutters.

(d) Stormwater Best Management Practices and other measures to minimize runoff and improve water quality are implemented.

The Project implements Stormwater Best Management Practices and other measures to minimize runoff and improve water quality in accordance with the Massachusetts Stormwater Handbook for both water quality and quantity. Stormwater quality requirements are anticipated to be achieved with the use a combination of deep sump and hooded catchbasins, water quality units, bioretention tree pits and a subsurface infiltration system. Additionally, the Project has been designed in accordance with current Alewife Area Stormwater Management Guidelines. As such, the Project

provides detention of the difference between the two year existing stormwater rate of runoff and the proposed 25-year rate of runoff from the site. This is anticipated to be accomplished with a pre-cast underground detention system located under the building and designed to promote groundwater recharge and reduce peak stormwater flow rates exiting the Site. As described above, the stormwater management design for the Project has been approved by the Cambridge Conservation Commission in connection with the Order of Conditions.

(e) Landscaped areas and required Green Area Open Space, in addition to serving as visual amenities, are employed to reduce the rate and volume of stormwater runoff compared to pre-development conditions.

The Project incorporates Low Impact Development (LID) design features into the overall stormwater management design of the Project, including providing a significant number of new trees along the Shared Driveway, two vegetative upper level building courtyards, and underground stormwater detention systems working together as part of a stormwater management system to reduce the rate and volume of stormwater runoff.

(f) The structure is designed and sited to minimize shadow impacts on neighboring lots, especially shadows that would have a significant impact on the use and enjoyment of adjacent open space and shadows that might impact the operation of a Registered Solar Energy System as defined in Section 22.60 of the Ordinance.

The Project is surrounded by 88 CambridgePark Drive to the South, the office building at 100 CambridgePark Drive to the west, CambridgePark Drive to the north, and a residential building to the east. The Project is set at a height (as defined in the Ordinance) of approximately 85 feet, well below the height of 105 feet that could be allowed by special permit.

A shadow model is included in Volume II of this Application.

(g) Changes in grade across the lot are designed in ways that minimize the need for structural retaining walls close to property lines.

The Project minimizes changes in grade across the relevant property and minimizes the need for structural retaining walls, but may need retaining walls to accommodate flood-resiliency features of the Project.

(h) Building scale and wall treatment, including the provision of windows, are sensitive to existing residential uses on adjacent lots.

The Project's scale is designed carefully to address the pedestrian scale along the CambridgePark Drive and the Shared Driveway, and to complement the surrounding architecture. In addition, window position,

scale and wall treatment have been carefully considered in the existing context to ensure compatibility for both expected residents, retail customers and users of the adjacent office and residential buildings.

(i) Outdoor lighting is designed to provide minimum lighting and necessary to ensure adequate safety, night vision, and comfort, while minimizing light pollution.

Architectural lighting will be designed to provide the minimum lighting necessary to ensure adequate safety, night vision and comfort as well as to minimize light pollution. The Retail Component's entrance fronting on CambridgePark Drive will provide a soft "glow," accenting the safety and pedestrian friendly lighting around the Project. Architectural lighting will be used to illuminate key features of the Project's roofline. Street lighting will be provide along the Shared Driveway. The lighting for the Project will comply with the City's lighting ordinances.

(j) The creation of a Tree Protection Plan that identifies important trees on the site, encourages their protection, or provides for adequate replacement of trees lost to development on the site.

The Project is a redevelopment of an existing site which is currently almost entirely covered with a parking lot. A Tree Study and Plans were submitted to the City of Cambridge Arborist on April 9, 2018. A copy of the Tree Study is included in Volume II of this Application. The Project will remove a total of 101 caliper inches of trees deemed to be significant on the Site, but new trees will be planted on site in connection with the Project to replace the 101 caliper inches of trees lost. The new tree plantings will provide greater density of trees on Site.

4) Pursuant to Section 19.34 of the Ordinance, projects should not overburden the City infrastructure services, including neighborhood roads, city water supply system, and sewer system. Indicators include:

(a) The building and site design are designed to make use of water-conserving plumbing and minimize the amount of stormwater run-off through the use of best management practices for stormwater management.

As described above, the Project's stormwater management system has been designed to incorporate best management practices and has been unanimously approved by the Cambridge Conservation Commission. Water-conserving plumbing fixtures will be installed in each residence, and potable water will be submetered so that residents are aware of their own usage.

(b) The capacity and condition of drinking water and wastewater infrastructure systems are shown to be adequate, or the steps necessary to bring them up to an acceptable level are identified.

Sanitary Sewer Service Infrastructure

The Residential Component contains a total of up to 390 bedrooms, resulting in 42,900 gallons per day (gpd) of sewer flows and the Retail Component contains a total of 6,992 sf resulting in 350 gallons per day (gpd), per calculations performed as required under Title 5 of the State Environmental Code and related regulations at 310 CMR 15. Additionally, the Project will be required to reduce storm water inflow and infiltration at a 4:1 ratio (163,000) from the existing City of Cambridge Sewer System. The Applicant is working with the City's Department of Public Works to identify existing I/I issues in the vicinity of the Site that can be corrected in connection with the Project to meet the 4:1 reduction requirement.

The Project's sewerage will be collected and discharged via an 8-inch sewer service line exiting the Site's northern side. The proposed sewer will ultimately connect to the existing 12-inch sanitary sewer main in CambridgePark Drive.

In addition to the typical sanitary sewer connection, the City of Cambridge requires developments in this area to provide an on-site sewerage storage tank for use during significant rainfall storm events. The Project's storage tank, located under the front sidewalk area of the building and provides approximately 12-hours of storage with a safety factor, which equates to a 19,300-gallon tank. This system will be connected to the City's remote monitoring system that will activate when the CSO pump activates at the pumping station. When the peak subsides, the wastewater will be released by the City. In the event of an unusually long storm event in which the tank capacity is exceeded, the system is also equipped with an overflow.

The Cambridge Department of Public Works has indicated that the City's existing sanitary system has the capacity to handle the Project's sewerage discharge, and will be required to remove I/I, as described above, at a ratio of 4 gallons of I/I for every 1 gallon of Project's new sanitary flow.

Water Service Infrastructure

The Project will require approximately 47,575 gallons per day for its domestic water demands. The Cambridge Department of Public Works has indicated that the existing water supply system has the capacity to handle the Project's proposed domestic and fire protection services. Flow tests with the Cambridge Department of Public Works will be performed to confirm the system capacity.

(c) Buildings are designed to use natural resources and energy resources efficiently in construction, maintenance, and long-term operation of the building, including supporting mechanical systems that reduce the need for mechanical equipment generally and its location on the roof of a building specifically. The buildings are sited on the lot to allow construction on adjacent lots to do the same. Compliance with Leadership in Energy and Environmental Design (LEED) certification standards and other evolving environmental efficiency standards is encouraged.

The Project will seek to be Silver certifiable under the Energy Star Home program, the US Green Building Standard and LEED for Homes Mid-rise. An overview of the Project's LEED compliance is contained in the LEED Narrative and LEED Checklist submitted with this Application.

5) Pursuant to Section 19.35 of the Ordinance, new construction should reinforce and enhance the complex urban aspects of Cambridge as it has developed historically. Indictors include:

(a) New educational institutional construction that is focused within the existing campuses.

N/A to the Project.

(b) Where institutional construction occurs in commercial areas, retail, consumer service enterprises, and other uses that are accessible to the general public are provided at the ground (or lower) floors of buildings. Where such uses are not suitable for programmatic reasons, institutional uses that encourage active pedestrian traffic to and from the site.

N/A to the Project.

(c) In large, multiple-building non-institutional developments, a mix of uses, including publicly accessible retail activity, is provided where such uses are permitted and where the mix of uses extends the period of time the area remains active throughout the day.

N/A to the Project,

(d) Historic structures and environments are preserved.

N/A to the Project.

(e) Preservation or provision of facilities for start-up companies and appropriately scaled manufacturing activities that provide a wide diversity of employment paths for Cambridge residents as a component of the development; however, activities heavily dependent on trucking for supply and distribution are not encouraged.

The Project will be a complementary use to the existing, and future, commercial use in the area, introducing additional residential living and new retail uses convenient for employees in the surrounding office buildings.

6) Pursuant to Section 19.36 of the Ordinance, expansion of the inventory of housing in the city is encouraged. Indicators include:

(a) Housing is a component of any large, multiple building commercial development. Where such development abuts residential zoning districts substantially developed to low-scale residential uses, placement of housing within the development such that it acts as a transition/buffer between uses within and without the development.

N/A to the Project.

(b) Where housing is constructed, providing affordable units exceeding that mandated by the Ordinance. Targeting larger family-sized middle income units is encouraged.

The Residential Component will add up to approximately 299 additional residential dwelling units to the housing inventory of the City. A range of unit types are provided, of which approximately 28% will be three-bedroom units, two-bedroom units or one bedroom/den units. The Project will include affordable units in compliance with the Ordinance.

7) Pursuant to Section 19.37 of the Ordinance, enhancement and expansion of open space amenities in the city should be incorporated into new development in the city. Indicators include:

(a) On large-parcel commercial developments, publicly beneficial open space is provided.

(b) Open space facilities are designed to enhance or expand existing facilities or to expand networks of pedestrian and bicycle movement within the vicinity of the development.

(c) A wider range of open space activities than presently found in the abutting area is provided.

The Project enhances and expands open space amenities in the City. The outdoor courtyard space, pool area, and children's play area will provide new outdoor recreation areas for residents, and on-grade landscaping enhances the Shared Driveway. Also, landscape improvements along CambridgePark Drive and the Shared Driveway allow for the creation of strong streetscape. The planting strategy for the Site utilizes drought tolerant native or adapted species along the perimeter of the Site and transitions to a blend of native and hardy ornamental materials closer to

the Residential Building. All irrigated planting areas will employ efficient drip tubing. Although the Site will have less than the 25% permeable area required under Section 20.96.1 of the Ordinance, the Applicant will certify to the Superintendent by the City Engineer that the Site and the Project meet the Department of Public Works' standards for water quality management and the retention/detention of the difference between the 2-year 24-hour pre-construction runoff hydrograph and the post-construction 25-year 24-hour runoff hydrograph, and requests a finding by the Planning Board that the permeable area provided advances the purposes of Section 20.96 of the Ordinance.

IV. CONCLUSION

As described above, the Project is appropriate to the Site and surroundings. It provides needed additional housing, including affordable housing, to the City's housing stock. The project has a minimal transportation impact on the area roadways and enhances adjacent properties. Finally, the Project will replace existing office buildings and surface parking lot with a thoughtfully designed and landscaped, first-class, mixed-use building, with only a modest increase in the number of parking spaces compared to what currently exists. In short, the Project furthers the objectives of the Ordinance and applicable planning studies of the area in several significant ways. Accordingly, for the reason set forth above, the Applicant respectfully requests that the Board find that the Project satisfies all applicable requirements of the Ordinance in connection with the granting of the requested Special Permits.

Infrastructure Narratives

Climate Change Preparedness & Resilience Narrative

In response to the City of Cambridge Climate Change Vulnerability Assessment recommendations, the Project will be required to prepare for anticipated 100-year storm events and related flood elevations associated with the Vulnerability Assessment's model for the Year 2070. Per the City of Cambridge DPW, the Project is designed for the retail portion of the project to be above the 2070 10-year flood elevation and the residential amenity areas to be above the 2070 100-year flood elevation. The Project demonstrates how it would recover from the 2070 100-year storm event with and associated flooding, and also provides compensatory flood storage up to Year 2070 10-year flood elevation on site through site grading and at grade under-building flood storage areas.

The critical site elevations are as follows:

Flooding Event	Elevation in City of Cambridge Base (CCB)
FEMA 100-year Flood Elevation	**18.44 CCB**
Projected 2070 10-year	**19.0 CCB**
Projected 2070 100-year (Precipitation)	**20.2 CCB**
Project 2070 100-year (Storm Surge)	**22.4 CCB**

In response to the "DRAFT Cambridge Climate Change Preparedness and Resilience (CCPR) - Alewife Preparedness Plan", the 50 CambridgePark Drive project has identified the following elements our planned site development per the CCPR framework for your consideration:

- **Prepared Community**
  - Resilience Hub – The common amenity space within the second-floor level of this proposed residential building will serve as a resource to residents providing "education, training and implementation of resilience and sustainability measures". Building property management will engage with residents on a regular basis to assist in their preparedness for climate-related and other events that impact the property and its residents. The common amenity space will also be the main location for storage of emergency preparedness supplies, which will be made available to all residents in time of need.
  - "Cool" Cooling Centers – The common amenity space within the second-floor level of this proposed residential building will serve as a resource to residents providing a "cool cooling center" where they will have access to interior and exterior amenities suitable for use on days of increased heat. The proposed building features a media room, common living room and kitchen area and an outdoor pool and grill area for resident and visitor use.
  - Support for Vulnerable Populations – In full compliance with the City Council's recently amended inclusionary ordinance this building provides 20% affordable units. All building amenities are accessible to all our residents and their visitors regardless of unit type. The common amenity space within the second-floor level of this proposed residential building will serve as a resource to all residents, providing valuable opportunity to meet fellow neighbors and build a stronger social network.
  - Emergency Communications Systems – Unlike single-family or condominium residential buildings, rental apartment buildings have the benefit of a property management team that can create a network for communication with all tenants via phone, e-mail contact and on-site in-personal conversations with their residents. The building will also have a transportation demand management board in the common

amenity space per City of Cambridge requirements that allows them to post notice to all residents in a common space that is regularly in use by members of the community.

- Business and Organizational Preparedness – The proposed building will also have retail space on the ground floor and the property management team and property ownership will work with these future retail tenants to relay the opportunities and risks associated with these ground-level non-residential CambridgePark Drive spaces and organize an emergency preparedness plan that includes these retailers and their users.
- Emergency Preparedness Plan – The proposed building will have a documented emergency plan on file with City of Cambridge Department of Public Works (DPW) as required by the department in coordination with the site's Operation and Maintenance Plan.
- Stronger Social Network - The common amenity space within the second-floor level of this proposed residential building will serve as a valuable opportunity to meet fellow neighbors and build a stronger social network. Improving social cohesion is integral to the success of the prior referenced initiative to ensure that all CambridgePark Drive stakeholders feel a strong connection to the neighborhood and each other, regardless of income level, length of residency/use and other factors, and are better able to adapt to climate stresses. The Hanover Company has extensive experience developing residential communities throughout the country that focus on common space amenities and social programming, such as barbeques, fitness classes, and other events, to foster lasting connections between their residents.

- **Adapted Buildings**
  - Flood Protection for New Buildings – In response to the anticipated rising flood elevations, any residential building should have minimal habitable space on the ground floor**.** At 50 CPD all residential units are located on the second floor and higher, above projected future flood elevations. In fact, unites will be located more than eight (8) feet higher than projected 2070 100-Year storm surge flood elevation. While there will be some lobby and amenity spaces on the ground floor, much of the space will be utilized as parking area, which could be designed to be an enclosed garage that uses flood gates or barriers at entries and doors to prepare for future climate change flooding impacts. All the lobby and amenity spaces are designed to be protected from flooding by minimizing the number of openings below the flood level.
  - Heat Protection for New Buildings – The building is designed with a white roof along with the elevated courtyards incorporating a combination of vegetated planters and a swimming pool to reduce the effects of urban heat island effect. the building windows will provide glazing to improve window insulation efficiency. Additionally, the building common amenity area will have its air conditioning connected to the building's emergency generator such that in periods of lost power the residents will have a cooling zone to congregate if needed.
  - Building Management for Flood and Heat Protection – An operation and management plan will be developed to enable the building residents and management to effectively manage and operate the resilient features of the building.
  - Site Green Infrastructure – The majority of the stormwater generated within the Project site boundary will be collected by building roof drains prior to being detained and discharged to the City drainage infrastructure in CambridgePark Drive. The stormwater detention/infiltration system consists of two hundred and twenty (220) pre-cast concrete galley chambers which are located under the proposed building. These chambers have been designed to infiltrate stormwater runoff prior to discharging into the 24" drain line in Cambridgepark Drive. Stormwater flows generated within the boundary of the new street improvements will be collected in a series of catch basins

and water quality units before being discharged to the existing 66" drain line along the property's western boundary. Biofiltration tree wells are proposed along the driveway to the property to promote groundwater recharge using green infrastructure on site.

- **Resilient Infrastructure**
  - Resiliency of Building Electrical and Mechanical Systems - Surface utility equipment infrastructure (electrical and fiber optics communications) are set at an elevation where this vital equipment is out of the CCVA projected 2070 100-year flood elevation (precipitation), at a minimum. The Applicant will also work with utility companies to maximize the preparedness of building electrical and mechanical systems to locate vital utility service components appropriately based upon potential flood risk. The Project also relocates dry wire utility services from overhead infrastructure to underground infrastructure for protection from high wind storm events
  - Resiliency of Transportation System - The Project is designed with a healthy mix of vehicular parking, car-sharing, bicycle parking and improved pedestrian pathways to MBTA Alewife T/Bus Station. This encourages multi-modal traffic and lessen the use of single-occupant vehicle trips. The site driveway and adjacent pedestrian sidewalks and bicycle lane(s) will be elevated above the FEMA 100-year floodplain elevation to promote resilient neighborhood access. On-site structured parking has been elevated above the CCVA projected 2070 100-year floodplain elevation and will be constructed in a manner that will allow the future installation of flood gates based upon updated flood elevation projections.
  - Watershed/Neighborhood Flood Storage - The Project proposes to demolish the existing buildings and surface parking areas for the construction of the new residential building with at grade parking below a portion of the building. Portions of the building will be constructed such that the structure is elevated above the FEMA design 100-year flood elevation and above the recommended 2070 100-year flood event based upon precipitation. This type of design will allow water to be stored under the building during the 100-year flood event and will mitigate the impact to the existing watershed/neighborhood floodplain by providing additional flood storage.
  - Combined Sewer Separation – A sewer holding tank is provided for the building to allow for 72-hour holding of sanitary sewerage during/following a storm event prior to any release into the municipal system. This tank will assist in potentially reducing CSO (Combined Sewer Overflow) events in Alewife area.
  - Stormwater Storage - The majority of the stormwater generated within the Project site boundary will be collected by building roof drains prior to being detained and discharged to the City drainage infrastructure in CambridgePark Drive. The stormwater detention/infiltration system consists of two hundred and twenty (220) pre-cast concrete galley chambers, which are located under the proposed building. These chambers have been designed to infiltrate stormwater runoff prior to discharging the 24" drain line in Cambridgepark Drive. Stormwater treatment is provided prior to discharge into the municipal stormwater system through natural and structural Best Management Practices (BMPs), such as a Stormceptor water quality units (or approved equal), deep sump hooded catch basins and other elements.

- **Resilient Ecosystems**
  - Resilient Urban Forest – The Project will significantly increase the amount of tree canopy both on site and in the adjacent site driveway and CambridgePark Drive streetscape areas. The Project is committed to enhanced landscaping similar to the other Hanover Company projects developed previously along CambridgePark Drive.

- Enhanced Outdoor Thermal Comfort; Reduced Impervious Area – Site design reduces impervious surfaces on the site to promote groundwater recharge and reduce stormwater runoff and includes enhanced landscape plantings throughout the site. These improvements will help to lessen the urban heat island effect experienced in North Cambridge.
- Green Infrastructure Opportunities - The majority of the stormwater generated within the Project site boundary will be collected by building roof drains prior to being detained and discharged to the City drainage infrastructure in CambridgePark Drive. The stormwater detention/infiltration system consists of two hundred and twenty (220) pre-cast concrete galley chambers, which are located under the proposed building. These chambers have been designed to infiltrate stormwater runoff prior to discharging the 24" drain line in Cambridgepark Drive. Stormwater flows generated within the boundary of the new street improvements will be collected in a series of catch basins and water quality units before being discharged to the existing 66" drain line along the property's western boundary. Biofiltration tree wells are proposed along the driveway to the property to promote groundwater recharge using green infrastructure on site.

The Initiative: Neighborhood Climate Change Preparedness & Resilience

The 50 CambridgePark Drive (50 CPD) project is committed to working with its CambridgePark Drive neighbors to provide the City of Cambridge with a neighborhood Climate Change preparedness and resilience plan for CambridgePark Drive "Triangle" neighborhood. This Initiative will be strongly based upon the "DRAFT Cambridge Climate Change Preparedness and Resilience Plan for Alewife District" and the Mayor's Special Advisory Committee on Neighborhood-Based Resiliency's "Assessing and Improving Neighborhood-Based Resiliency in Cambridge". The Initiative, will be the first privately-led initiative in Cambridge that can be replicated in other neighborhoods throughout the City. The 50 CPD developer, the Hanover Company, has engaged a Resiliency Planner to lead this initiative by drafting the climate change preparedness and resilience plan and engaging with the City of Cambridge, all property owners along CambridgePark Drive, and other stakeholders. The Hanover Company is very excited to take the lead role on this initiative, which has been well-received by CambridgePark Drive neighbors and is scheduled to commence stakeholder meetings in late Spring 2018.

Methods of communication and preparedness can be developed by this initiative, so that the City and all the residents and property managers, plus office workers and ownership groups, are well-educated on the opportunities and challenges associated with the Triangle neighborhood and are prepared to support each other before, during and after potential storms and other events. Improving social cohesion is integral to the success of the initiative to ensure that all CambridgePark Drive stakeholders feel a strong connection to the neighborhood and each other, regardless of income level, length of residency/use and other factors, and are better able to adapt to climate stresses. The Hanover Company has extensive experience developing residential communities throughout the country that focus on common space amenities and social programming, such as barbeques, fitness classes, and other events, to foster lasting connections between their residents. This neighborhood initiative will strive to extend that experience beyond the individual residential buildings into the CambridgePark neighborhood to benefit all stakeholders.

Sewer Service Infrastructure Narrative

Sanitary Sewer

The existing site is currently comprised of three low-rise commercial buildings and associated parking lots.

A breakdown of the site's estimated existing sanitary sewer flow rates are as follows:

Existing Sanitary Sewer Flows[1]:

Use	GPD/Unit	Unit	GPD
Office	75 per 1,000 sf	33,332[2]	2,500 gpd
		Total Existing Sanitary Flows	**2,500 gpd**

1. Proposed Sanitary flow calculations per 310 CMR 15.203
2. Existing building square footage as listed by City of Cambridge Assessors' Property Database.

This Project proposes to construct one (1) residential building with a total of 299 rental apartment units (390 bedrooms) and up to 6,992 square feet of ground-level retail use space based upon information provided by the Project Architect on May 15, 2018. The Project's sewerage will be collected and discharged via an 8-inch sewer service line exiting the Site's northern side. The proposed sewer will ultimately connect to the existing 12-inch sanitary sewer main in CambridgePark Drive.

A breakdown of the Project's sewer design flow rates are as follows:

Proposed Sanitary Sewer Flows[1]:

Use	GPD/Unit	Unit	GPD
Residential	110 per bedroom	390 bedrooms	42,900 gpd
Retail	50 per 1,000 SF	6,992 sf	350 gpd
		Total Proposed Sanitary Flows	**43,250 gpd**

3. Proposed Sanitary flow calculations per 310 CMR 15.203

In addition to the typical sanitary sewer connection, the City of Cambridge requires developments in this area to provide an on-site sewerage storage tank for use during significant rainfall storm events. The Project's storage tank, located under the front sidewalk area of the building and provides approximately 12-hours of storage with a safety factor, which equates to a 19,300-gallon tank. This system will be connected to the City's remote monitoring system that will activate when the CSO pump activates at the pumping station. When the peak subsides, the wastewater will be released by the City. In the event of an unusually long storm event in which the tank capacity is exceeded, the system is also equipped with an overflow.

Additional sewer improvement requirements imposed by DEP and the City to the existing system will be required. Inflow and Infiltration (I/I) mitigation will be required at a removal rate of 4:1 at locations to be determined by the City Engineer. Based upon deduction of the existing flows from the proposed sanitary sewer flows, the total additional flows are approximately 40,750 gpd. The anticipated I/I removal is 163,000 gpd for the Project. The Project will work with DPW on eliminating existing site I/I and meeting the required I/I removal.

Stormwater/Drainage

The proposed drainage system is designed in compliance with DEP's Stormwater Management Standards, as well as the City of Cambridge's Concord-Alewife Area Stormwater Management Guidelines, these include the recent incorporation of "NOAA Atlas 14, Volume 10, Version 2 Point Precipitation Frequency Estimates" in stormwater modeling, and the City of Cambridge Climate Change Vulnerability Assessment initial recommendations for flood elevations associated with the 100-year storm event for the Year 2030.

The majority of the stormwater generated within the Project site boundary will be collected by building roof drains prior to being detained and discharged to the City drainage infrastructure in CambridgePark Drive. The stormwater detention/infiltration system consists of two hundred and twenty (220) pre-cast concrete galley chambers, which are located under the proposed building. These chambers have been designed to infiltrate stormwater runoff prior to discharging the 24" drain line in Cambridgepark Drive. Stormwater flows generated within the boundary of the new street improvements will be collected in a series of catch basins and water quality units before being discharged to the existing 66" drain line along the property's western boundary. Further biofiltration tree wells are proposed along the driveway to the property to promote groundwater recharge through the use of green infrastructure on site.

Water Runoff Rates

The Project provides the attenuation required to reduce offsite peak runoff rates that are less than the pre-development conditions. Attenuation is achieved by precast stormwater detention/infiltration chambers under the building. The subsurface detention/infiltration system provides the necessary detention to reduce peak flows from the site during the 2, 10, 25 and 100-year storms as follows:

Peak Flow Rates Summary – Design Point 1 (Site Flows Within Property Boundary)

	Existing Flows (cfs)	Proposed Flows (cfs)	Peak Runoff Comparison (cfs)
2-year Peak Runoff	5.75	2.43	-3.32
10-year Peak Runoff	9.17	4.13	-5.04
25-year Peak Runoff	11.30	5.45	-5.85
100-year Peak Runoff	14.58	7.58	-7.00

Peak Flow Rates Summary – Design Point 2 (Site Flows Within Area of Street Improvements)

	Existing Flows (cfs)	Proposed Flows (cfs)	Peak Runoff Comparison (cfs)
2-year Peak Runoff	1.36	1.40	0.04
10-year Peak Runoff	2.32	2.36	0.04
25-year Peak Runoff	2.91	2.95	0.04
100-year Peak Runoff	3.82	3.85	0.03

Peak Flow Rates Summary – Total Site and Street Improvements

	Existing Flows (cfs)	Proposed Flows (cfs)	Peak Runoff Comparison (cfs)
2-year Peak Runoff	7.10	3.84	-3.26
10-year Peak Runoff	11.49	6.49	-5.00
25-year Peak Runoff	14.21	8.36	-5.85
100-year Peak Runoff	18.39	11.36	-7.03

Water Quality

The proposed stormwater management system has been designed to exceed the recommended 80% TSS removal goal with the implementation of the following:

- Deep Sump (6-foot) and Hooded Catch Basins (per City of Cambridge standard)
- StormCeptor Water Quality Units (or approved equal)

Groundwater Recharge

Groundwater recharge is provided with the substantial reduction of impervious surface on site. There is a reduction of approximately 8,000 SF of impervious surface in the proposed condition.

As a redevelopment, the Project has been designed to meet the requirements of the Massachusetts Wetland Protection Act (310 CMR 10.00) as well as the Massachusetts Department of Environmental Protection's Massachusetts Stormwater Handbook to the maximum extent practicable.

The proposed development consists of reducing the amount of impervious surfaces throughout the site. By reducing the amount of impervious areas located on site, peak runoff flows, volumes and increased ground water recharge is achieved.

Conclusions

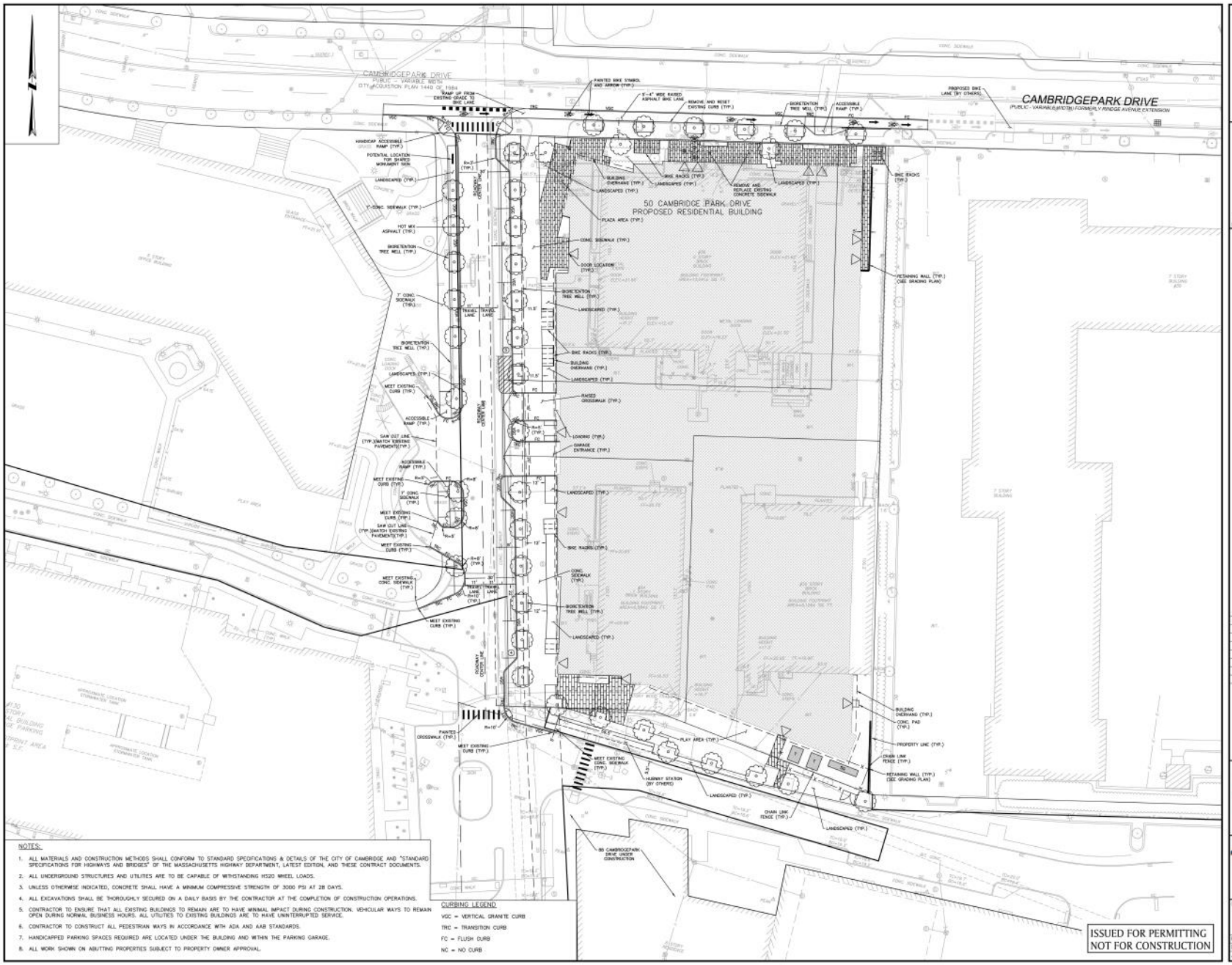
The Project has been designed to meet, and in some cases, exceed, the applicable provisions of the Stormwater Management Standards as well as the City of Cambridge Stormwater Management Guidelines.

Water Service Infrastructure Narrative

The Project will require a total of approximately 47,575 gallons per day for its domestic water demands, based on the sanitary flow calculations per 310 CMR 15.203. All domestic water services and fire services required for the Project will be connected to the existing water infrastructure. It consists of a 10-inch water main in CambridgePark Drive. All water service connections will be fully coordinated with the City Water Department and its requirements.

BSC has meet with the Cambridge Water Department whom has indicated that there is adequate water available for the project. Hydrant flow tests will be performed to confirm the capacity available to the site. Should it be determined that there is inadequate pressure to provide the required flows for the potable water, a booster pump will be added to the Project to handle any deficiency. All connections will be fully coordinated with the City of Cambridge Water Department.

The fire protection system design will be coordinated with the City Fire Chief. Based upon the existing infrastructure along CambridgePark Drive, no new fire hydrants are expected to be installed as part of this Project.



DATE

PROFESSIONAL ENGINEER

THE RESIDENCES AT 50 CAMBRIDGE PARK DRIVE

32, 34, 36
CAMBRIDGEPARK DRIVE
IN
CAMBRIDGE
MASSACHUSETTS
(MIDDLESEX COUNTY)

LAYOUT & MATERIALS PLAN

FEBRUARY 7, 2018

REVISIONS:

NO.	DATE	DESC.

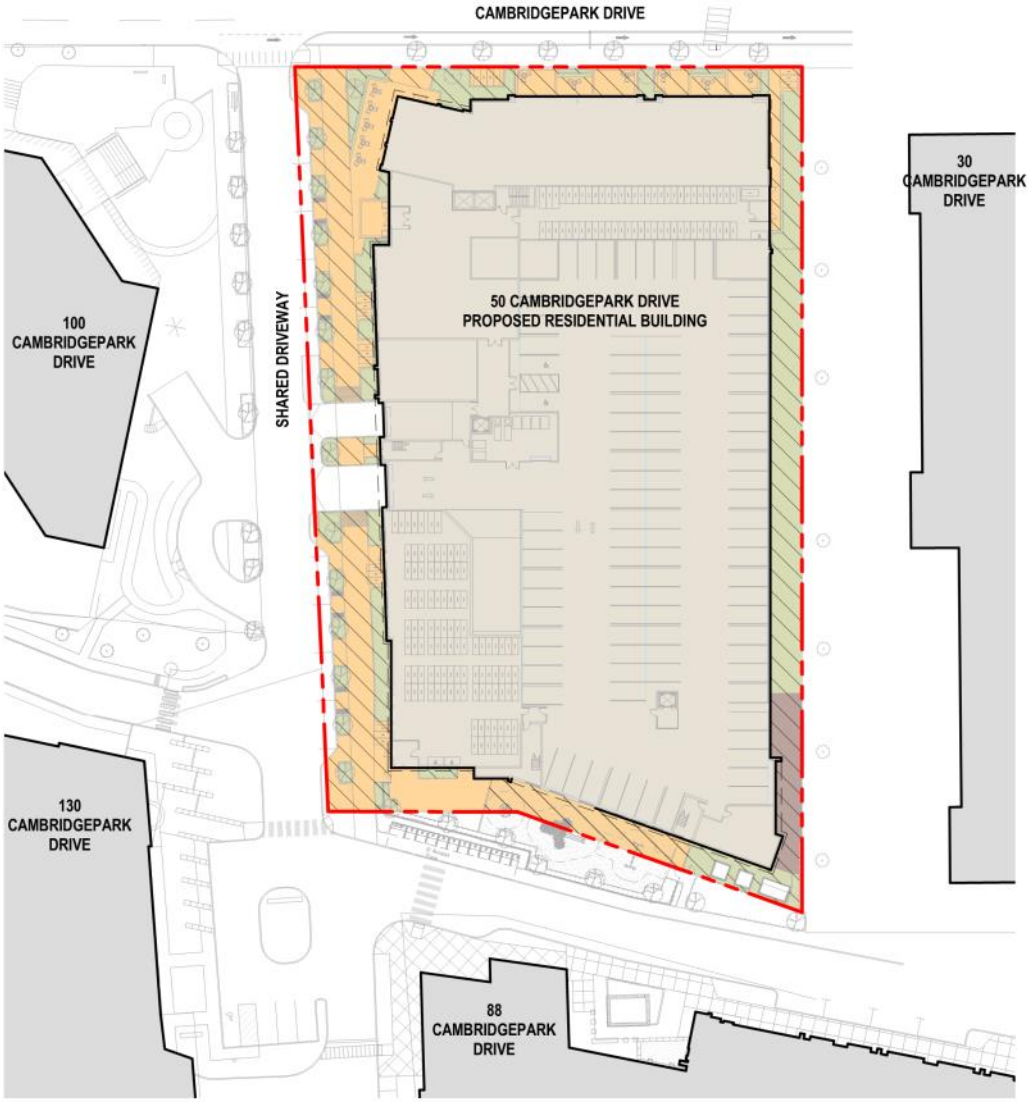
PREPARED FOR:

THE HANOVER COMPANY
2 SEAPORT LANE
BOSTON, MA 02210

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300

SCALE: 1" = 20'
0 10 20 40 (80)

FILE: \P-7\23175201\Civil\Drawings
DWG: DWG
JOB. NO. 2-3175.20
SHEET C-102



AT GRADE OPEN SPACE AND PERMEABLE AREA

KEY	AREA	% LOT
GREEN AREA	7,688 SF	9.69 %
PERMEABLE AREA	7,461 SF PERMEABLE	
PUBLICLY BENEFICIAL	10,438 SF	13.15 %
PERMEABLE AREA	8,651 SF PERMEABLE	
PRIVATE	1,018 SF	1.28 %
PERMEABLE AREA	1,018 SF PERMEABLE	

CALCULATIONS

LOT AREA = 79,321 SF

AT GRADE OPEN SPACE	AREA	% LOT
REQUIRED 15% OF 79,321 SF =	11,898 SF	15%
PROVIDED GREEN AREA + PUBLICLY BENEFICIAL + PRIVATE OPEN SPACE =	19,144 SF	24.12 %
PERMEABLE AREA	**AREA**	**% LOT**
REQUIRED 25% OF 79,321 SF =	19,830 SF	25 %
PROVIDED PERMEABLE GREEN + PUBLICLY BENEFICIAL + PRIVATE OPEN SPACE =	17,130 SF	21.59 %

SCALE: 1" = 60'

0' 30' 60' 120'

PRIVATE OPEN SPACE		
KEY	AREA	% LOT
PRIVATE	14,524 SF	18.31 %

CALCULATIONS		
LOT AREA = 79,321 SF		
PRIVATE OPEN SPACE	**AREA**	**% LOT**
REQUIRED 15% OF 79,321 SF =	11,898 SF	15%
PROVIDED		
DOG RUN (AT GRADE)	1,018	
COURTYARD - NORTH	6017	
COURTYARD - SOUTH	3554	
BALCONIES - 4TH	787	
BALCONIES - 5TH	787	
BALCONIES - 6TH	787	
BALCONIES - 7TH	787	
BALCONIES - 8TH	787	
TOTAL PROVIDED =	14,524 SF	18.31 %

SCALE: 1" = 60'

0' 30' 60' 120'

BSC GROUP
Transportation ▪ Energy ▪ Land Development

803 Summer Street
Boston, MA 02127

Tel: 617-896-4300
800-288-8123

www.bscgroup.com

May 9, 2018

BSC Project No. 2.3175.20

Mr. H. Theodore Cohen, Chairman
Cambridge Planning Board
City Hall Annex
344 Broadway
Cambridge, MA 02139

RE: 50 CambridgePark Drive
Flood Storage Mitigation Certification

Dear Mr. Cohen and Members of the Board:

As required by Section 20.75 of the Cambridge Zoning Ordinance and by the Massachusetts Wetlands Protection Act (WPA), the project site's flood storage capacity was evaluated for storm events up to and including the 100-year storm to determine if the proposed site development would reduce the available flood storage capacity at the site. Additionally, in response to the City of Cambridge Climate Change Vulnerability Assessment initial recommendations, the project will strive to prepare for anticipated 100-year storm events and associated flood elevations associated with the Vulnerability Assessment's model for the Year 2070. Per the City of Cambridge DPW, the Project is designed for the retail portion of the project to be above the 2070 10-year flood elevation, the residential amenity areas above the 2070 100-year flood elevation, all residential units on the second floor and above, and to demonstrate how it would recover from the 2070 100-year storm event with and associated flooding. The Project also provides compensatory flood storage up to Year 2070 10-year flood elevation on site through site grading and at grade under-building flood storage areas.

BSC determined that the construction of the Project as proposed would result in a net loss of the site's available flood storage for certain incremental flood elevations. Therefore, in accordance with the Zoning Ordinance and the WPA, the flood loss will need to be compensated, or mitigated, for the loss of flood storage for those incremental elevations where the loss took place.

To compensate for the lost available flood storage, the proposed under the building parking and amenity areas will be elevated such that the areas underneath will mitigate the lost available flood storage at the exact flood elevations where the loss will take place for the site improvements. The Project has been designed such that the bottom the buildings' first floor slabs are elevated higher than the potential flooding associated with the anticipated 2070 10-year storm event, which for this site is expected to be Elevation 19.0. The building lobby spaces floor elevations are designed at Elevation 20.25 with the Retail spaces designed at elevation 19.25. The Project provides compensatory flood storage up to Elevation 19.00 on site through site grading and at grade under-building flood storage areas.

The Flood Report and associated design drawings highlight the evaluation results and provides in detail the incremental and cumulative available flood storage calculations for the proposed project. The attached Flood Report has been submitted as part of a Notice of Intent Application to the Cambridge Conservation Commission. At their February 9, 2018 meeting, the Commission unanimously voted to approve the Project and the proposed flood plain impacts and mitigation measures. In summary the project as designed provides an additional 2,066 cy of additional available flood storage on site.

In accordance with Section 20.75 of the Zoning Ordinance and with the requirements of the Wetlands Protection Act, BSC Group certifies that the Project and the associated site improvements (as presented in the Special Permit package) provide the required compensation for the flood storage losses due to the construction of the proposed buildings, associated structured parking and site infrastructure. The site's flood storage capabilities will not be adversely affected by the construction of said improvements. Additionally, the project has been designed to meet the City of Cambridge Climate Change Vulnerability Assessment initial recommendations.

Sincerely,
BSC GROUP, INC.

5/9/18

David P. Biancavilla, P.E., LEED AP
Senior Associate, MA Registration Number: 47846

FLOOD REPORT

The Residences at
50 CambridgePark Drive
CAMBRIDGE, MASSACHUSETTS

FEBRUARY 7, 2018
REVISED: MAY 17, 2018

Owner/Applicant:

THE HANOVER COMPANY
2 Seaport Lane
Boston, MA 02210
(978) 408-1041

BSC Job Number: 2-3175.20

Prepared by:

BSC GROUP

803 Summer Street
Boston, MA 02127

TABLE OF CONTENTS

SECTION 1.0

PROJECT NARRATIVE

1.01 EXISTING SITE FLOOD PLAIN CONDITIONS

Portions of the project property at 32, 34 & 36 CambridgePark Drive (the Project), and portion of the adjacent properties at 100, 150, 130 and 88 Cambridgepark Drive (within the limits of work) are located within the outer limits of the 100-year floodplain as shown on the current FEMA Map dated June 4, 2010. A 100-year flood elevation of 6.8 NAVD 1988, as shown on Cross Section "12P" in the Study, was taken at a section across the river to the north of the project to define the 100-year flood elevation.

The existing conditions survey provided as part of this project and all calculations and supporting documentation has been prepared on Cambridge City Base. As such, the 100-year flood elevation conversion is required as follows;

FEMA Flood Elevation	= 6.8' NAVD 1988
Conversion to NVGD 1929	+0.8' = 7.6 NVGD 1929
Conversion to Cambridge City Base	+10.84 = 18.44 CCB

The existing site elevations within the limits of the work vary from a low point of 15.50+/-' CCB to elevation 21.00+/- CCB. This relatively flat site consists of low areas separated from higher areas, some above the 100-year elevation of 18.44' CCB and others slightly below. Generally, the center of the existing parking lot is depressed and within the 100-year flood elevation and the surrounding areas are above the 100-year flood elevations.

1.02 POST-DEVELOPMENT FLOOD PLAIN CONDITIONS

The post development site condition has been designed to lessen the impact to the existing floodplain and to provide additional flood storage onsite. A total of 57,500 +/- square feet and 1,303 cubic yards of the 100-year flood plain area exist on the property. The project proposes to mitigate the impacts from the development by constructing portions of the proposed residential buildings above the existing 100-year flood plain such that available flood storage is provided at grade under the building and additional storage on the east side through site grading. The following is a summary of the proposed impacts to the 100-year flood plain;

	Existing Conditions	Post-Development Conditions
100-year Flood Plain Area	57,500 +/- sf	50,400 +/- sf
100-year Flood Plain Volume	1,303 cy	3,353 cy

In response to the City of Cambridge Climate Change Vulnerability Assessment initial recommendations, the project will strive to prepare for anticipated flooding events and associated flood elevations associated with the Vulnerability Assessment's model for the Year 2030 and the Year 2070. Per the City of Cambridge DPW, the project shall design to the projected 2070 100-year flood elevation (20.2 CCB) and demonstrate how it would recover from the projected 2070 1% SSL flooding event (22.4 CCB).

The Project has been designed such that building first floor for the residential portion is at 20.25 CCB with is slightly above the projected 2070 100-year flood event of 20.2 CCB. The street front retail first floor is proposed at elevation 19.25 CCB above the current 100-year flood elevation of 18.44'. The Project provides compensatory flood storage up to Elevation 19.75 on site through site grading and at grade under-building flood storage areas.

As required by the Cambridge Department of Public Works, the flood mitigation area has been designed such that after flooding events the area under the slab, where flood storage has been designed, can be cleaned of sediments and debris left from receding flood waters. This area is to be paved and sloped such that building maintenance staff will be able to wash debris out from the under building flood storage areas. Debris can then be collected and disposed.

Additionally, the Project provides a connection from the proposed flood storage area to the larger Alewife Brook / Little River floodplain. The connection will be in the northeast corner of the site where there is an existing low area in the CambridgePark Drive sidewalk. Currently, the majority of the site flood volume is isolated from the larger Alewife Brook / Little River flood plain.

SECTION 2.0

FLOOD VOLUME MITIGATION CALCULATIONS

2.0 FLOOD VOLUME MITIGATION CALCULATIONS

A portion of the project site lies within Bordering Land Subject to Flooding (i.e. the flood plain), as defined by the Massachusetts Wetlands Protection Act (the "Act"). A Flood Insurance Study of the City of Cambridge was performed and dated June 4, 2010. This Study provided elevations for the 10-, 50-, 100- and 500-year floods in the area of Little River behind to the north of CambridgePark Drive.

Specifically, Cross Section "12P" in the Study was taken at a section across the river approximately to the north of the project. The flood elevations for this cross section are as follows:

Table 1 Current FEMA Flood Elevations*

	10-year	50-year	100-year	500-year
Cross Section "12P" (Little River)	3.1 NAVD 1988 14.7 CCB**	4.9 NAVD 1988 16.5 CCB**	6.8 NAVD 1988 18.44 CCB**	10.7 NAVD 1988 22.3 CCB**

* Reference: June 4, 2010 FEMA Flood Insurance Study
Datum: North American Vertical Datum (NAVD)

** CCB = City of Cambridge Base

Flood Storage Volumes

The Act requires that no project shall displace more flood volume than what currently exists at that site. The Act further requires that any loss in flood storage shall be compensated, or mitigated, for any project that results in a loss of flood storage for each incremental elevation where the loss took place. With the construction of the Project, flood storage has been mitigated by site grading and by providing flood storage under the proposed building.

Calculations to determine the amount of available flood storage due to the construction of this project have been performed for each elevation increment between existing grade and the current flood elevation of 18.44' CCB and for additional available flood storage up to elevation 19.75' CCB to account for climate change. The proposed condition available flood storage volume was then compared to the existing condition available flood storage provided for the same elevation increments.

Using Autodesk Civil 3D design software, the available flood storage volumes for the existing site were determined and the results are provided herein. The software compared the existing contours of the site to each incremental (per foot) flood elevation up to the Project's proposed 100-year flood elevation, 18.44' CCB and 19.75' CCB. The total volume per increment was calculated and tabulated (see Table 1 below). The same process was performed for the proposed grading of the site along with separate manual calculations for the area under the proposed residential buildings.

Table 1: Existing Available Flood Storage

Elevation	Existing Cumulative Available Flood Storage (CY)	Existing Incremental Available Flood Storage (CY)
Up to 16.00	0	0
16.00 to 17.00	67	67
17.00 to 18.00	634	567
18.00 to 18.44	1303	669
18.44 to 19.00	2554	1251
19.00 to 19.75	4625	2071

Table 2: Proposed (Post-Development) Available Flood Storage

Elevation	Proposed Cumulative Available Flood Storage (CY)	Proposed Incremental Available Flood Storage (CY)
Up to 16.00	8	8
16.00 to 17.00	585	577
17.00 to 18.00	2451	1866
18.00 to 18.44	3353	902
18.44 to 19.00	4687	1334
19.00 to 19.75	6936	2249

To determine the total loss (or gain) of available flood storage for the post-development conditions, the total available storage volume for the post-development was compared to the total available storage volume for the pre-development condition for *each incremental elevation*. The net result was determined and the findings are as follows (see Table 3 below):

Table 3: Net Incremental Available Flood Storage

Elevation	Existing Incremental Available Flood Storage (Table 1) (CY) a	Proposed Incremental Available Flood Storage (Table 2) (CY) b	Net Incremental Available Flood Storage (CY) b-a
Up to 16.00	0	8	+8
16.00 to 17.00	67	577	+510
17.00 to 18.00	567	1866	+1299
18.00 to 18.44	669	902	+233
Total up to Current 100 Year Flood	1,303	3,353	2,050
18.44 to 19.00	1251	1334	+83
19.00 to 19.75	2071	2249	+178
Total	4625	6936	+2311

As shown in Table 3, the proposed site improvements result in a net increase in available flood storage for the site. The increase in available flood storage can be attributed to the compensatory storage area provided under the proposed residential building.

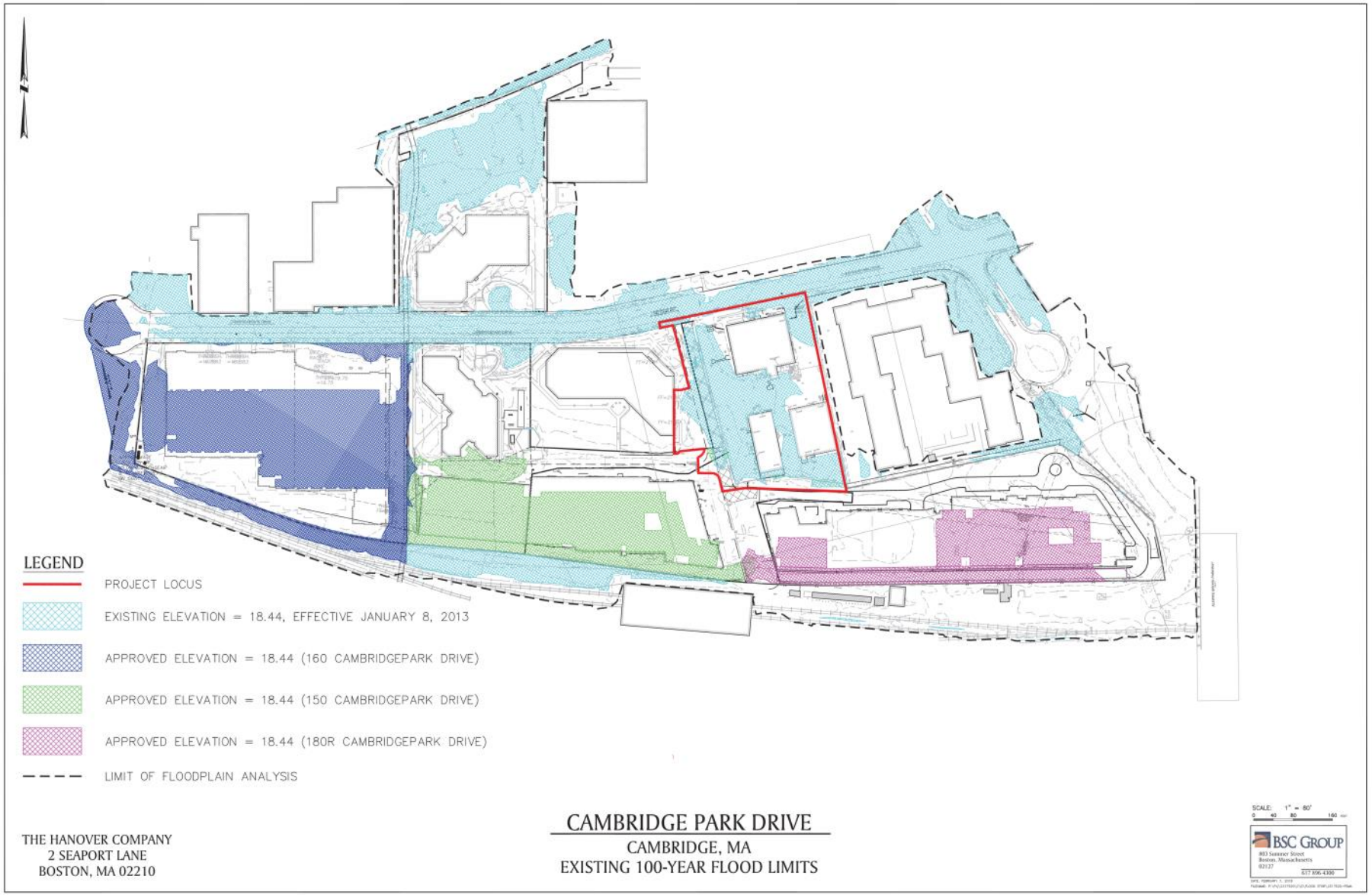
The proposed space under the building provides flood storage volumes on site to help mitigate the project impacts. Flood waters will be able to flow unrestricted in and out of the space by large inlets that consist of vertical grates along the east side. Calculations for the available flood storage under the building are based on providing incremental storage under the building on an incremental basis only. No credit is taken for any elevations above or below the given elevation the project seeks to mitigate. This approach allows an unrestricted flow of flood waters for both increasing and receding to flow through the vertical grates to be installed.

Conclusion

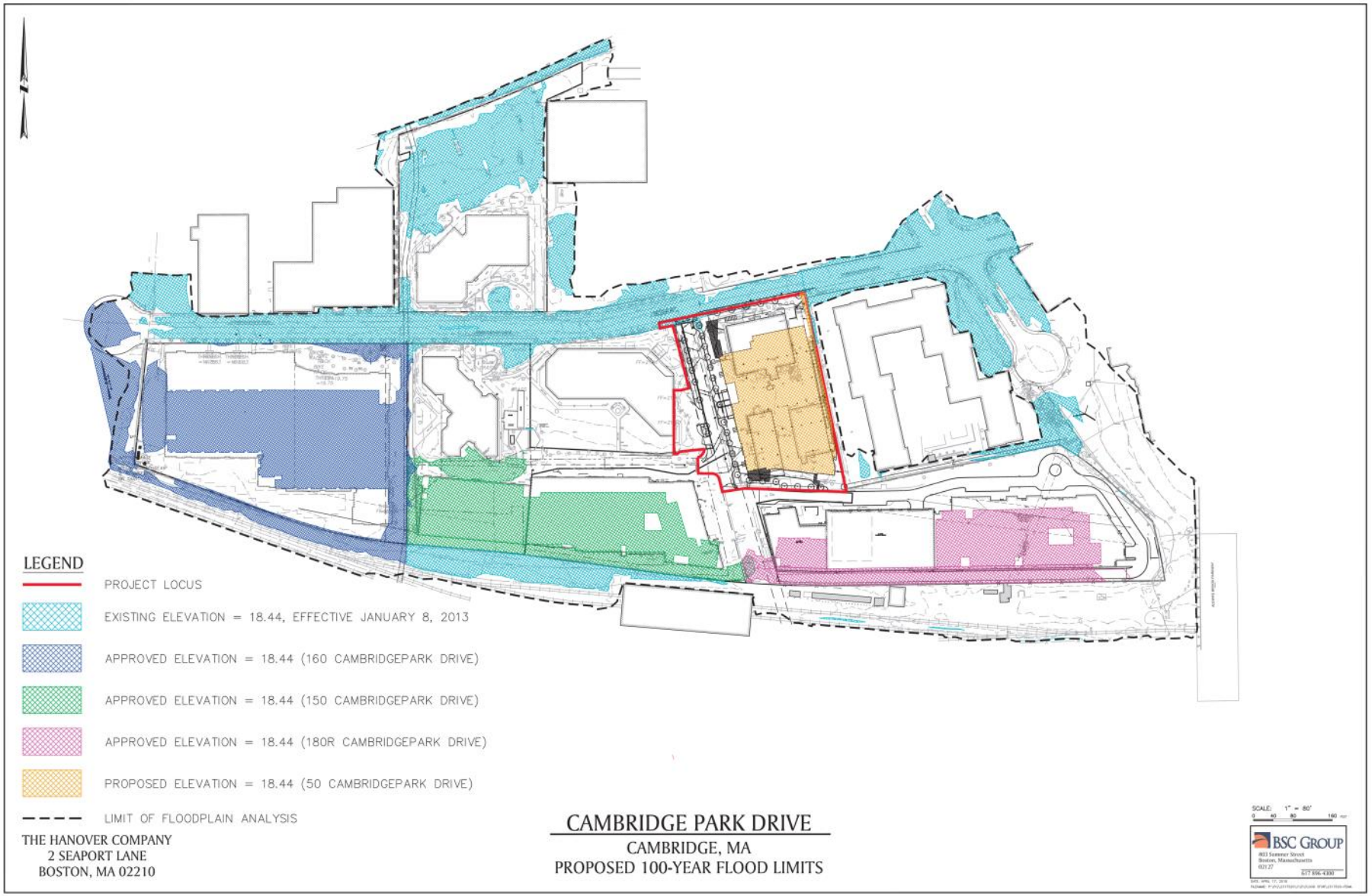
In accordance with the Wetlands Protection Act, the proposed improvements provide the required compensation to the flood storage loss due to the construction of the proposed buildings and infrastructure. Additionally, the project connects the existing isolated flood volumes to the larger Alewife Brook / Little River flood plain.

APPENDICES

PRE-DEVELOPMENT FLOOD PLAIN MAP


LEGEND
PROJECT LOCUS
EXISTING ELEVATION = 18.44, EFFECTIVE JANUARY 8, 2013
APPROVED ELEVATION = 18.44 (160 CAMBRIDGEPARK DRIVE)
APPROVED ELEVATION = 18.44 (150 CAMBRIDGEPARK DRIVE)
APPROVED ELEVATION = 18.44 (180R CAMBRIDGEPARK DRIVE)
LIMIT OF FLOODPLAIN ANALYSIS
THE HANOVER COMPANY
2 SEAPORT LANE
BOSTON, MA 02210
CAMBRIDGE PARK DRIVE
CAMBRIDGE, MA
EXISTING 100-YEAR FLOOD LIMITS
BSC GROUP

POST-DEVELOPMENT FLOOD PLAIN MAP


LEGEND
PROJECT LOCUS
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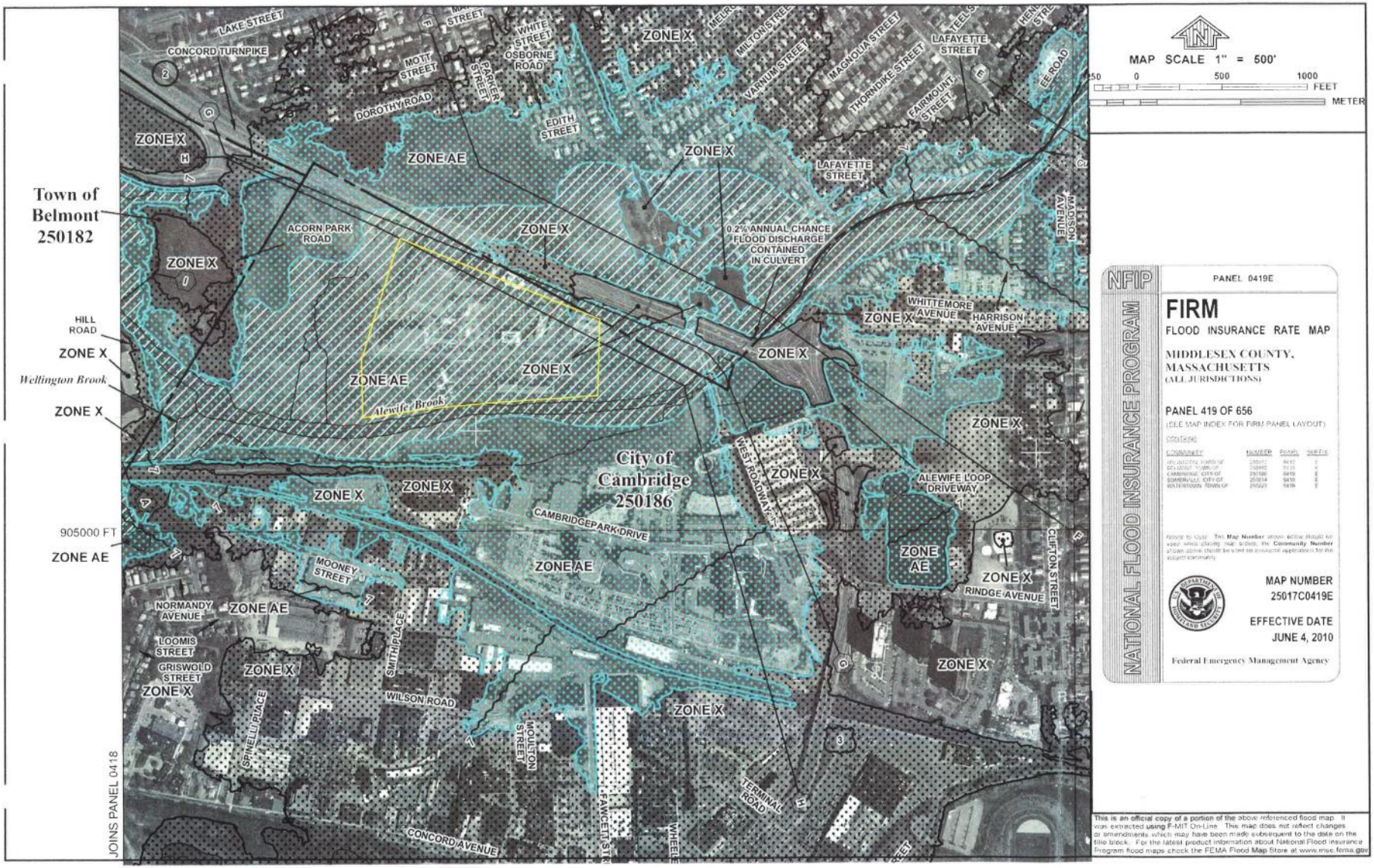
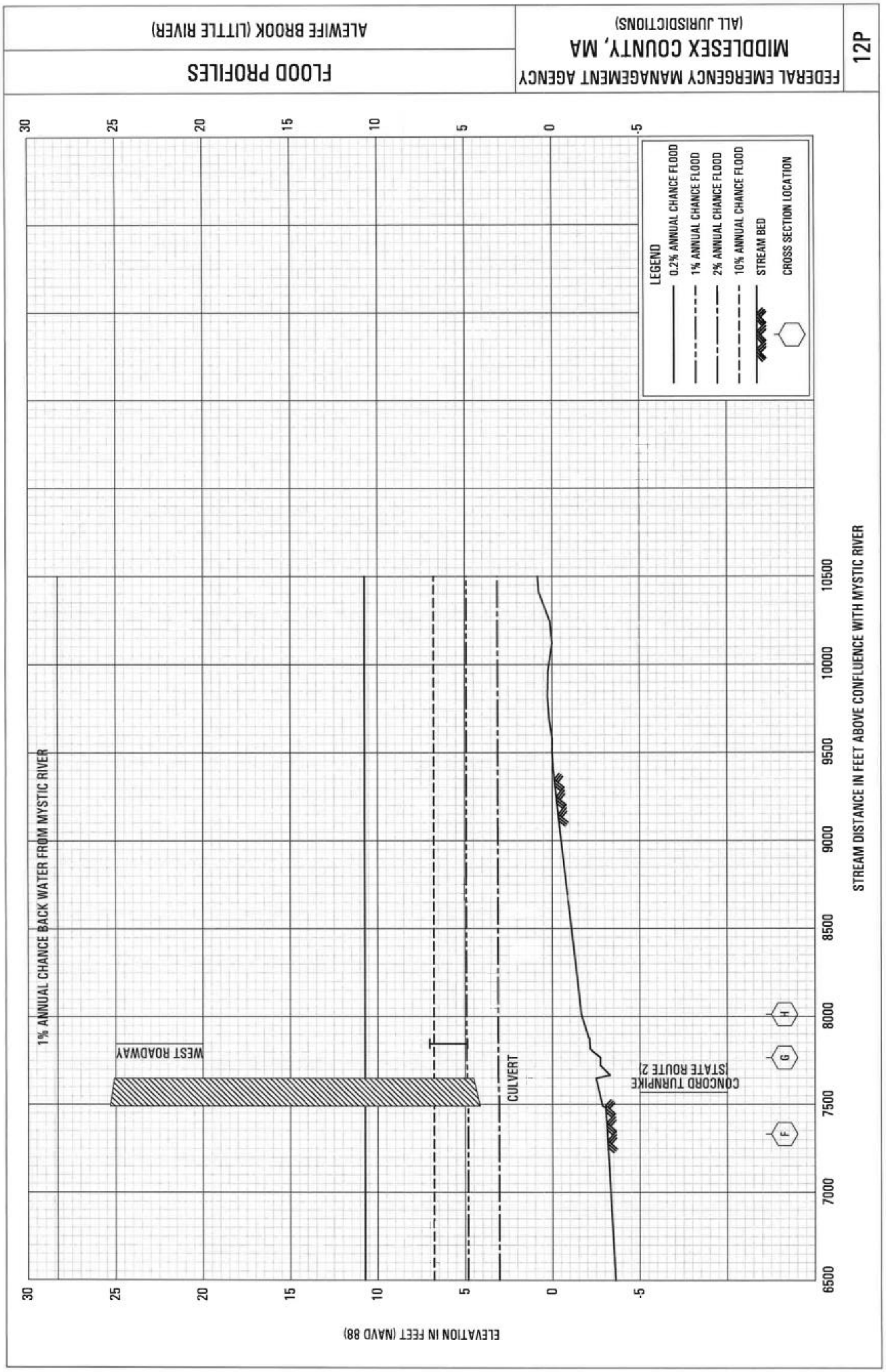
PROPOSED ELEVATION = 18.44 (50 CAMBRIDGEPARK DRIVE)
LIMIT OF FLOODPLAIN ANALYSIS
THE HANOVER COMPANY
2 SEAPORT LANE
BOSTON, MA 02210
CAMBRIDGE PARK DRIVE
CAMBRIDGE, MA
PROPOSED 100-YEAR FLOOD LIMITS
SCALE: 1" = 80'
BSC GROUP

FEMA Flood Plain Data


MAP SCALE 1" = 500'
500 0 500 1000
FEET
METER
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0419E
FIRM
FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)
PANEL 419 OF 656
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
25017C0419E
EFFECTIVE DATE
JUNE 4, 2010
Federal Emergency Management Agency
Town of Belmont 250182
City of Cambridge 250186
ZONE AE
ZONE X
LAKE STREET
CONCORD TURNPIKE
DOROTHY ROAD
ACORN PARK ROAD
HILL ROAD
Wellington Brook
Alewife Brook
0.2% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT
WHITTEMORE AVENUE
HARRISON AVENUE
ALEWIFE L'OOP DRIVEWAY
CAMBRIDGEPARK DRIVE
WEST ROADWAY
CLIFTON STREET
RINDGE AVENUE
MOONEY STREET
NORMANDY AVENUE
LOOMIS STREET
GRISWOLD STREET
SMITH PLACE
WILSON ROAD
SPINELLI PLACE
MOULTON STREET
TERMINAL ROAD
CONCORD AVENUE
LAFAYETTE STREET
MADISON AVENUE
905000 FT
JOINS PANEL 0418
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


FEDERAL EMERGENCY MANAGEMENT AGENCY
MIDDLESEX COUNTY, MA
(ALL JURISDICTIONS)
FLOOD PROFILES
ALEWIFE BROOK (LITTLE RIVER)
12P
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
1% ANNUAL CHANCE BACK WATER FROM MYSTIC RIVER
WEST ROADWAY
CULVERT
CONCORD TURNPIKE (STATE ROUTE 2)
ELEVATION IN FEET (NAVD 88)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH MYSTIC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Aberjona River North Spur								
A	130[1]	33	148	0.9	64.3	64.3	64.3	0.0
B	2,260[1]	68*	324	0.6	68.1	68.1	68.1	0.0
C	2,860[1]	152	203	0.9	68.2	68.2	68.2	0.0
D	4,400[1]	124*	713	0.5	75.8	75.8	75.8	0.0
E	6,500[1]	18	15	2.1	78.3	78.3	78.3	0.0
F	7,880[1]	47*	68	1.1	81.5	81.5	81.5	0.0
G	9,410[1]	18*	27	0.5	83.0	83.0	83.0	0.0
Alewife Brook (Little River)								
A	100[2]	77*	427	1.1	6.7	3.9[4]	4.1	0.2
B	250[2]	101*	399	1.2	6.7	3.9[4]	4.1	0.2
C	2,960[2]	74	381	1.2	6.7	4.1[4]	4.3	0.2
D	3,970[2]	56*	372	1.5	6.7	4.5[4]	4.7	0.2
E	5,220[2]	84	327	1.2	6.7	4.6[4]	4.9	0.3
F	7,330[2]	500*	1,135	0.3	6.8	4.9[4]	5.3	0.4
G	7,770[2]	1,556*	2,294	0.2	6.8	5.0[4]	5.3	0.3
H	8,010[2]	1,675*	3,477	0.1	6.8	5.0[4]	5.4	0.4
I	11,625[2]	70	569	0.8	7.4	6.4[4]	7.2	0.8
Angelica Brook								
A	500[3]	16	23	6.9	190.1	190.1	190.1	0.0
B	1,360[3]	8	25	6.4	207.1	207.1	207.9	0.8
C	2,770[3]	100	525	0.3	223.4	223.4	223.4	0.0

[1] Feet above confluence with Aberjona River

[2] Feet above confluence with Mystic River

[3] Feet above confluence with Reservoir No. 3

[4] Elevation computed without consideration of backwater effects from Mystic River

* The measured top width on the FIRM may differ due to the effects of ineffective flow, the exclusion of small pocket areas due to map scale limitations, or is estimated due to HEC-RAS modeling limitations

TABLE 8

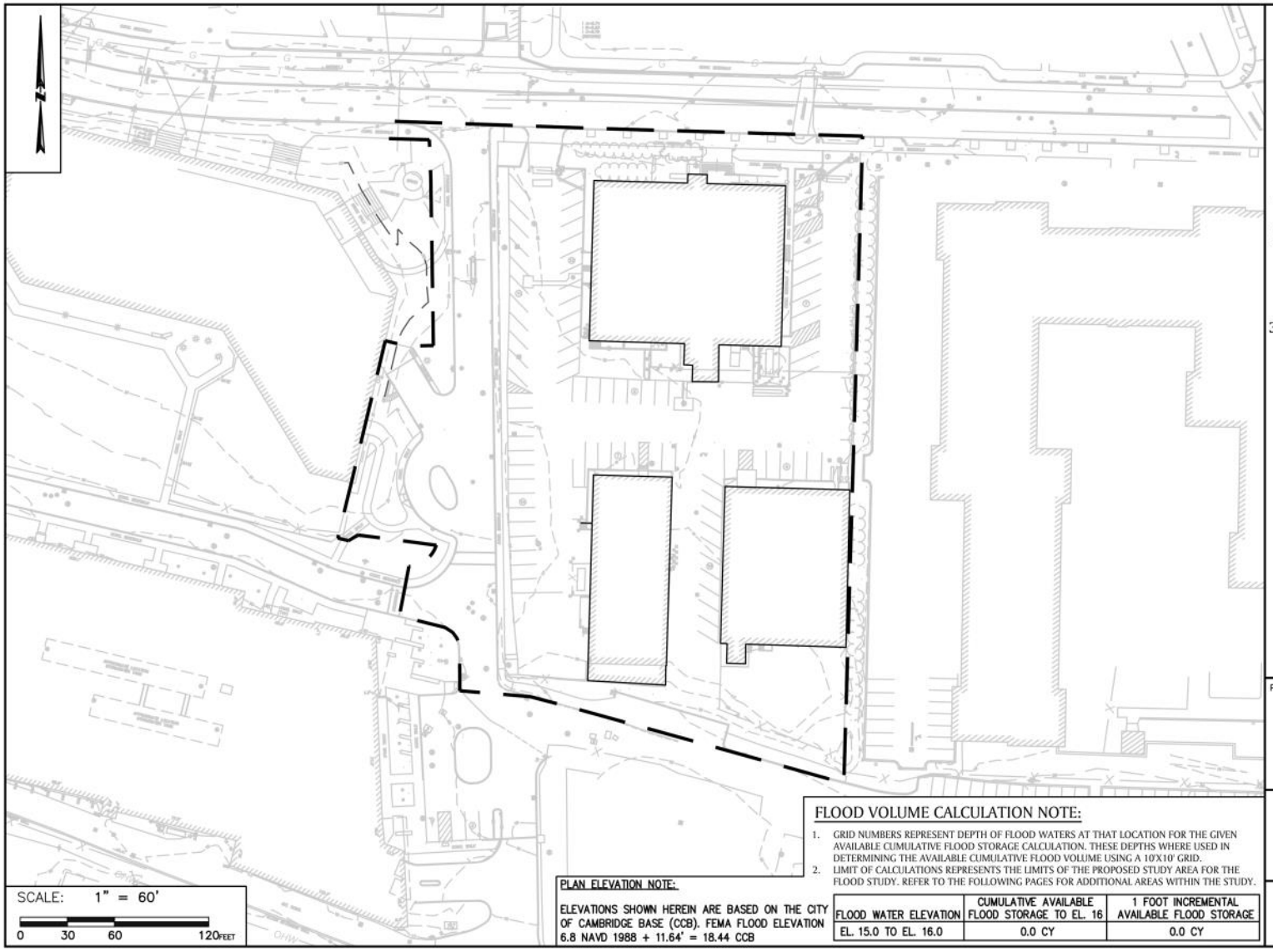
FEDERAL EMERGENCY MANAGEMENT AGENCY

MIDDLESEX COUNTY, MA
(ALL JURISDICTIONS)

FLOODWAY DATA

ABERJONA RIVER NORTH SPUR – ALEWIFE BROOK (LITTLE RIVER) – ANGELICA BROOK

AVAILABLE FLOOD STORAGE PLANS



PLAN ELEVATION NOTE:

ELEVATIONS SHOWN HEREIN ARE BASED ON THE CITY OF CAMBRIDGE BASE (CCB). FEMA FLOOD ELEVATION 6.8 NAVD 1988 + 11.64' = 18.44 CCB

FLOOD VOLUME CALCULATION NOTE:

1. GRID NUMBERS REPRESENT DEPTH OF FLOOD WATERS AT THAT LOCATION FOR THE GIVEN AVAILABLE CUMULATIVE FLOOD STORAGE CALCULATION. THESE DEPTHS WHERE USED IN DETERMINING THE AVAILABLE CUMULATIVE FLOOD VOLUME USING A 10'X10' GRID.
2. LIMIT OF CALCULATIONS REPRESENTS THE LIMITS OF THE PROPOSED STUDY AREA FOR THE FLOOD STUDY. REFER TO THE FOLLOWING PAGES FOR ADDITIONAL AREAS WITHIN THE STUDY.

FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 16	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 15.0 TO EL. 16.0	0.0 CY	0.0 CY

THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 16.0

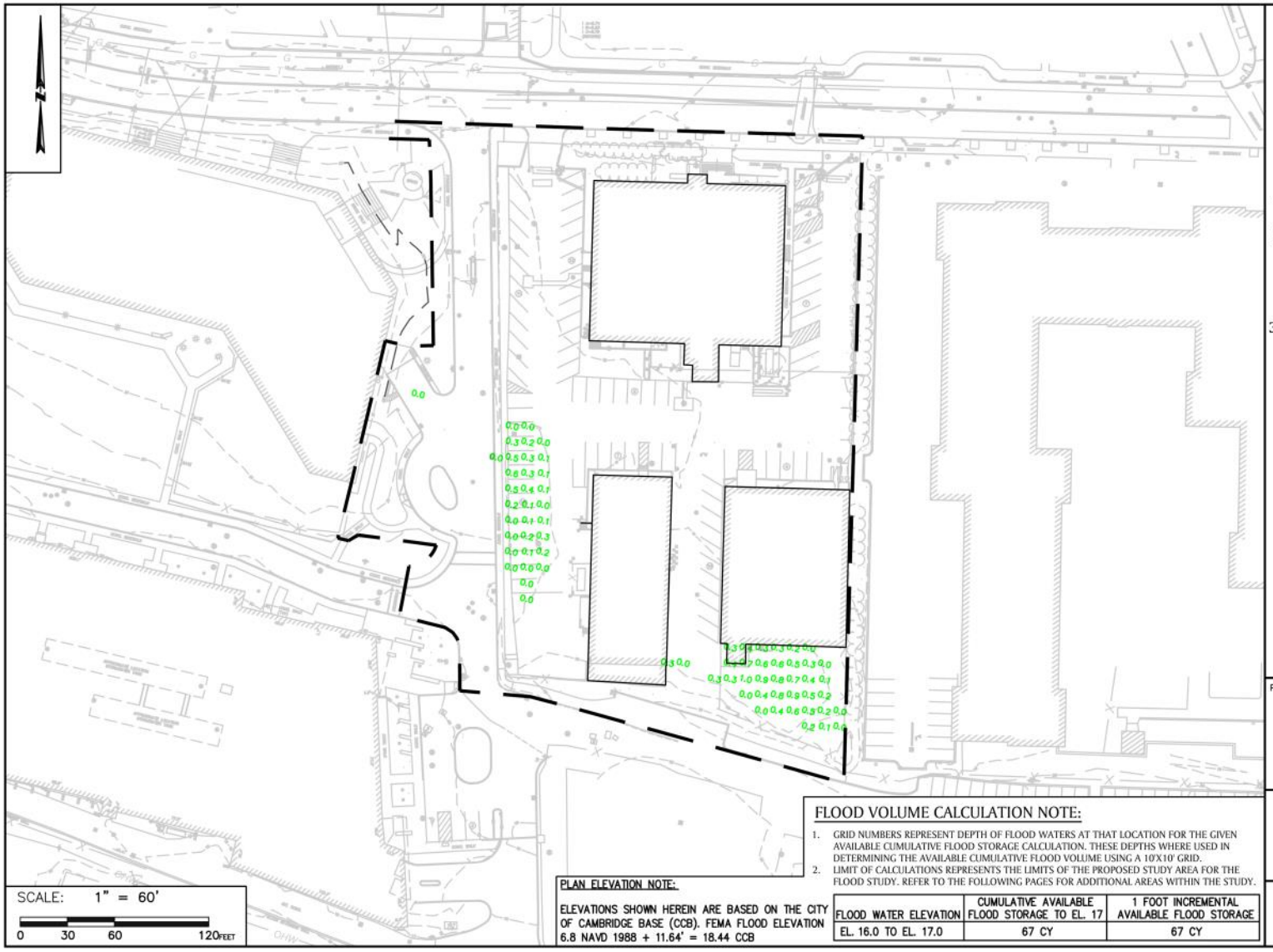
FEBRUARY 7, 2018

PREPARED FOR:

THE HANOVER COMPANY
2 SEAPORT LANE
BOSTON, MA 02210

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300

Job No.: 23175.20 Date: 2/07/2018
Scale: AS SHOWN Revised:
Dwg No:
File:



PLAN ELEVATION NOTE:

ELEVATIONS SHOWN HEREIN ARE BASED ON THE CITY OF CAMBRIDGE BASE (CCB). FEMA FLOOD ELEVATION 6.8 NAVD 1988 + 11.64' = 18.44 CCB

FLOOD VOLUME CALCULATION NOTE:

1. GRID NUMBERS REPRESENT DEPTH OF FLOOD WATERS AT THAT LOCATION FOR THE GIVEN AVAILABLE CUMULATIVE FLOOD STORAGE CALCULATION. THESE DEPTHS WHERE USED IN DETERMINING THE AVAILABLE CUMULATIVE FLOOD VOLUME USING A 10'X10' GRID.
2. LIMIT OF CALCULATIONS REPRESENTS THE LIMITS OF THE PROPOSED STUDY AREA FOR THE FLOOD STUDY. REFER TO THE FOLLOWING PAGES FOR ADDITIONAL AREAS WITHIN THE STUDY.

FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 17	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 16.0 TO EL. 17.0	67 CY	67 CY

THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 17.0

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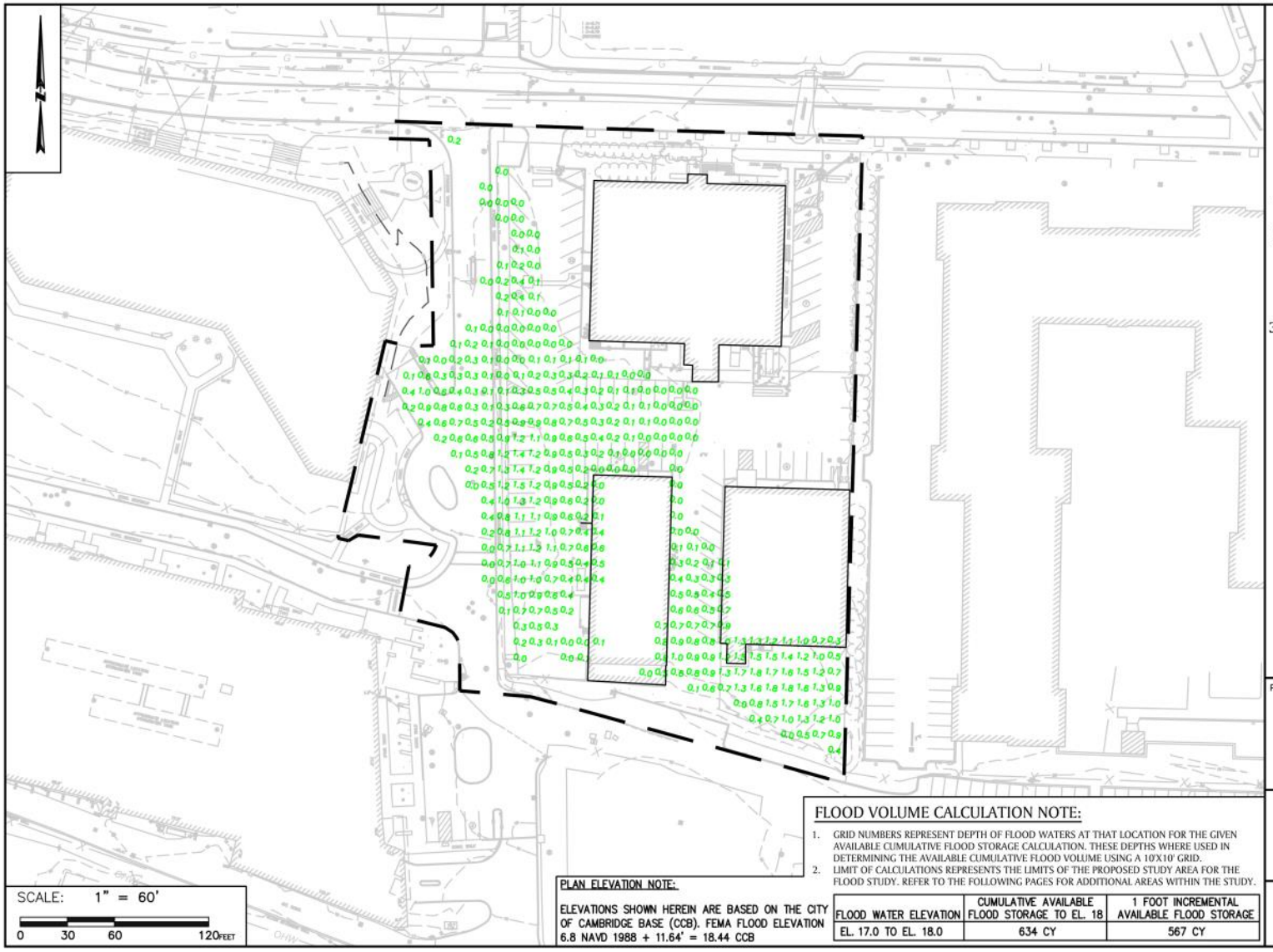

THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 18.0

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 18	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 17.0 TO EL. 18.0	634 CY	567 CY

PLAN ELEVATION NOTE:

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THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 19.0

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 19	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 18.44 TO EL. 19.0	2,554 CY	1,251 CY

PLAN ELEVATION NOTE:

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THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 19.0

FEBRUARY 7, 2018

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 19	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 18.44 TO EL. 19.0	2,554 CY	1,251 CY

THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

EXISTING AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 19.75

FEBRUARY 7, 2018

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BOSTON, MA 02210

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 19.75	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 19.0 TO EL. 19.75	4,625 CY	2,071 CY

PLAN ELEVATION NOTE:

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FLOOD STORAGE BUILDING CROSS-SECTION

PLAN ELEVATION NOTE:

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 16	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 15.0 TO EL. 16.0	8 CY	8 CY

THE RESIDENCES AT 50 CAMBRIDGEPARK DRIVE

32/34/36 CAMBRIDGEPARK DRIVE
CAMBRIDGE, MASSACHUSETTS
(MIDDLESEX COUNTY)

PROPOSED AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 16.0

FEBRUARY 7, 2018
REVISED: MAY 17, 2018

PREPARED FOR:
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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 17	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 16.0 TO EL. 17.0	585 CY	577 CY

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PROPOSED AVAILABLE FLOOD STORAGE PLAN BELOW FLOOD ELEVATION 17.0

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FLOOD WATER ELEVATION	CUMULATIVE AVAILABLE FLOOD STORAGE TO EL. 18	1 FOOT INCREMENTAL AVAILABLE FLOOD STORAGE
EL. 17.0 TO EL. 18.0	2,451 CY	1,866 CY

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