as amended September 26, 1989

CHESTNUT HILL RESERVOIR AND PUMP STATIONS

Boston Landmarks Commission
Environment Department
City of Boston

as amended September 26, 1989

Report of the Boston Landmark Commission
on the Potential Designation of

THE CHESTNUT HILL RESERVOIR AND PUMPING STATIONS
as a
LANDMARK

under Chapter 772 of the Acts of 1975, as amended

Approved: Judith B. McDonough August 21, 1989
(Executive Secretary) (Date)

Accepted: Alan Schwartz August 21, 1989
(Chairman) (Date)

Gratitude is expressed to Ellen J. Lipsey
For her research and contributions to this study report.

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1.0 LOCATION OF THE PROPERTY

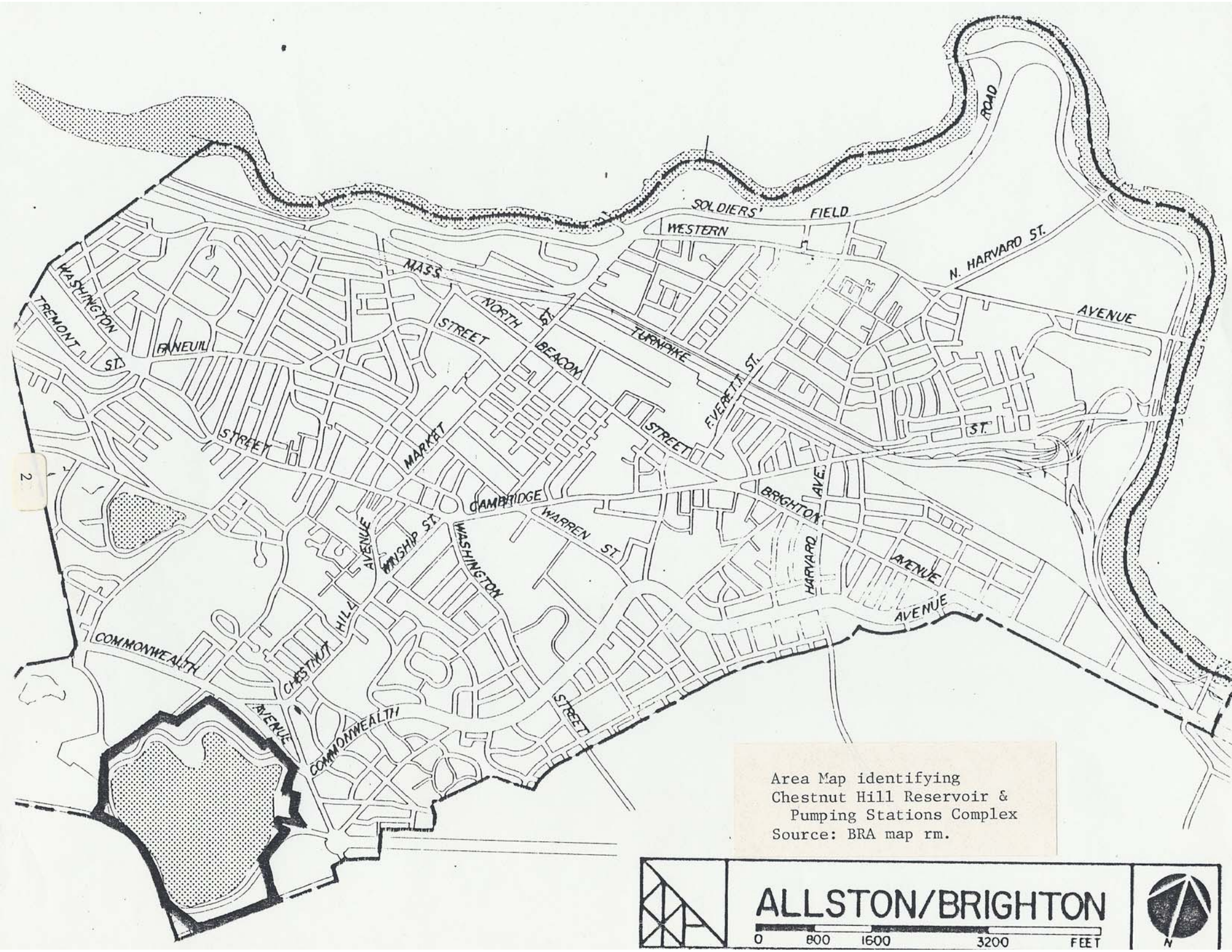
1.1 The address for the Low Service reservoir pumping station is 2400 Beacon Street; the address for the High Service pumping station is 2450 Beacon Street. The assessor's parcel numbers are 2439, 2472, most of 2442-5. The complex is in ward 21.

Boundary: - The area petitioned for Landmarks designation is comprised of: parcel 2439 which includes the high and low service pump stations, ancillary buildings and surrounding property; parcel 2472, which includes the reservoir, gate houses and surrounding greenbelt; and, parcel 2442-5 which includes the Chestnut Hill Driveway, St. Thomas More Road and surrounding greenbelt.

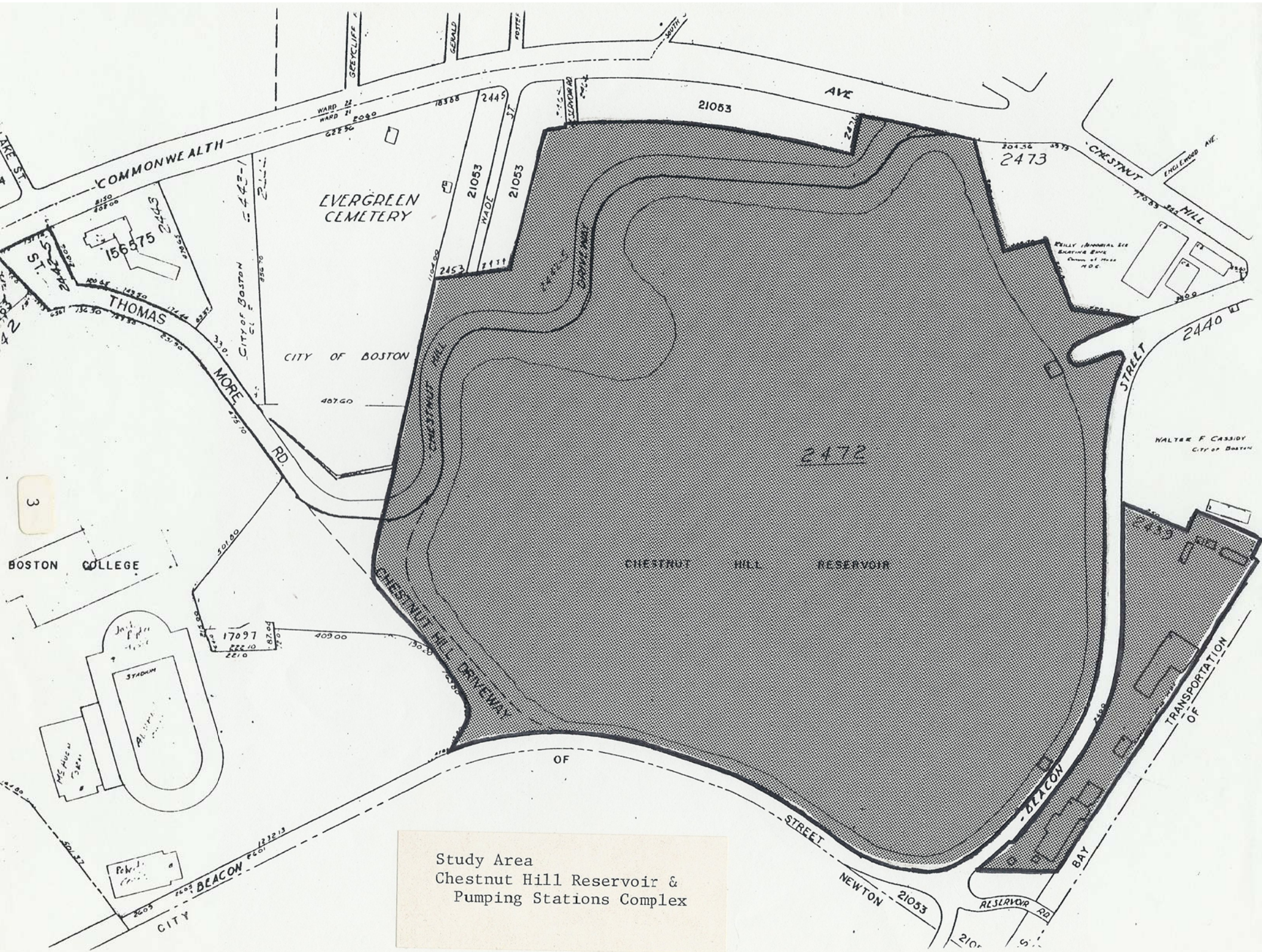
1.2 Area in which the property is located: Chestnut Hill Reservoir is located in Brighton, approximately 5 miles southwest of downtown Boston via Beacon Street, and about 1 1/2 mile south of the Charles River and the Massachusetts Turnpike extension (I-90). The reservoir and its facilities are named for Chestnut Hill, the area where Brookline, Newton, and Brighton converge. Major roads nearby are Commonwealth Avenue, Chestnut Hill Avenue, and Beacon Street which crosses the property. The property shares borders with the MBTA Riverside line, Brookline, Newton, Boston College, Evergreen Cemetery, Cassidy Playground, and the MDC pool/Reilly Ice Rink park area.

The Allston-Brighton district is predominantly residential, with three major commercial areas and some industrial land. The petitioned property is adjacent to Boston College; there is a large student population in the immediate area. The city ranks Allston-Brighton in the middle of Boston's 19 districts with respect to population density and open space acreage.

1.3 Maps showing location: following.



Area Map identifying
Chestnut Hill Reservoir &
Pumping Stations Complex
Source: BRA map rm.



Study Area
Chestnut Hill Reservoir &
Pumping Stations Complex

2.0 DESCRIPTION OF THE PROPERTY

2.1 Type and use: The Chestnut Hill Reservoir complex is comprised of the Bradlee Basin, two gatehouses on its embankment, the Chestnut Hill Driveway and greenbelt, two pumping stations, several ancillary service structures, and two structures in Newton which are outside the purview of the Boston Landmarks Commission. The combined land area is approximately 135 acres. The reservoir, two gate houses (one in Newton), both pumping stations and service buildings are used by the Massachusetts Resource Authority (MWRA) on a stand-by basis to maintain adequate pressure in the system. Water service can be activated if it is needed, and the facilities are staffed year-round.

Joggers and walkers use the path around the basin; the outer path is open to the public, the inner one has been sealed off behind an iron fence for reasons of health and safety. The Chestnut Hill Driveway is posted "For Pleasure Vehicles Only", it includes parking and is framed by a wooded greenbelt area along the north border of the parkway. Through-traffic on Beacon Street separates the basin from the pumping station area; the western end of the Chestnut Hill Driveway serves traffic at the eastern end of the Boston College campus.

2.2 Physical description: The site was originally a natural basin with marsh and meadow lands. Above the shore, between Beacon Street and Commonwealth Avenue is a hilly area with rocky outcroppings and mature trees, including oaks and evergreens. Adjacent to the reservoir fence, on the northeast side, is a par (exercise) course and foot paths. Between the fence and the water's edge are field grass, mature trees, rock outcroppings and the original inner path. The Driveway and parkway area are on a relatively flat grade with well-maintained landscape including mature trees, grass, and rock outcroppings. Many of the trees on the property appear to date from at least the original development of the reservoir in 1866-70, and from the building of the pumping stations in the 1880s and 1890s.

The following components make up the Chestnut Hill Reservoir complex. They are described in chronological order by completion date.

Bradlee Basin - The parcel containing the basin is approximately 110 acres. According to figures at the time of construction, the water covers 87 1/2 acres. The average depth is 20 feet and there is a capacity of about 550,600,000 gallons. The elevation of the reservoir is 125 feet. The embankment is built up in places to a maximum height of 35 feet. It is sodded, and in places is topped by the original gravel footpath, which is 8 feet wide, 1.57 miles long and circles the basin.

The inner slope of the basin is lined with dry laid rubble stone 2 1/2 feet thick which extends down 19 1/2 feet on the slope to a berm and riprap reinforcement at the foot. The slope lining is capped with granite blocks about 3 feet below the top of the embankment. Bradlee Basin was originally paired with an upper (higher) basin, the Lawrence Meadow, which was constructed at the same time and had less than half the capacity of Bradlee. The upper basin was sold to Boston College in 1949, and filled for a playing field and other facilities in 1950. The dam which separated the two basins serves as part of the Bradlee embankment and the road bed for part of the Driveway. The fence, with pineapple shaped finials, is extant in many places. Additional new fence was required when the boundary of the Reservoir was moved from the shoreline to the shoulder of the slope to help prevent debris from collecting and entering the water. At the same time the inner path was sealed off and the outer path was developed so that the reservoir would continue to serve the recreational needs of the community. The work was done for the MDC by Coughlan Construction Co, Inc. with landscape plans provided by Storch Associates.

Chestnut Hill Driveway and Landscaping - Part of the original Driveway, constructed around both basins in 1866-70, is extant at the north and western shoreline of Bradlee Basin, running from Commonwealth Avenue to Beacon Street. Including the parkway greenbelt it comprises about 16 acres. The northern portion is serpentine in plan. The 1977 blacktop surfacing is cut away at intervals, exposing the original granite paving blocks which act as speed bumps. Angle parking is provided in the margins within the original 80-foot width of the driveway. There is an overlook area near the Commonwealth Avenue end built in 1977 with a granite bench, pavers, and a stone plaque which shows the distance from Bradlee Basin to other MDC water supplies. Other 1977 additions to the landscape include stone walls at each entrance of the drive, with plaques reading "Chestnut Hill Reservoir, Metropolitan District Commission, Commonwealth of Massachusetts" and pedestrian crossings laid with new granite pavers. The granite curbing along the drive also appears to have been done in 1977.

The wooded greenbelt area provides a buffer between the Driveway and housing north of the reservoir; it abuts Evergreen Cemetery at the northwest bend of the drive. All of the landscape additions done in 1977 are compatible in design, scale and materials, with the existing landscape.

Originally, a large pastoral park was laid out at the eastern edge of the Reservoir at the current site of the Cassidy playground (owned by the City of Boston) and Reilly Memorial Ice Skating Rink (owned by the MDC). Remnants of the original landscaping exist along the northeast edge of parcel 2473 and on either side of the Chestnut Hill Driveway along the northern edge of the Reservoir. This landscape is characterized by groves of trees, rocky outcroppings and other informal, naturalistic features.

Original Effluent Gate House - Constructed c. 1869, this gate house is located on the edge of the basin near Cleveland Circle. It is a two level square structure with a hip roof and a central ventilator at the roof apex (the ventilator has lost its original cap). The walls are dressed granite ashlar in random rangework with darker rock-faced quoins and window surrounds. The structure is three bays across; the round-headed windows have been bricked in. The building was constructed on quick sand with rubble piers and brick arches resting on bedrock. In addition, granite sidewalls, an earthen bulkhead and brick groined arches are required. The granite foundation above the water line and the monumental granite double stairway facing Cleveland Circle relate to the basement structure of aqueduct and main connections.

Intermediate Gate House (not within study area) - Built on the dam between the basins this building belongs to Boston College and is now located at the edge of their playing field. It is no longer operated by MDC or MWRA. This simple looking granite block regulated the water between the basins; it dates from 1866-70. Boston College demolished the original Influent Gate House in 1950 which was located on the northwest shore of Lawrence Basin and which let water into the reservoir from the Cochituate aqueduct.

Sudbury Terminal Chamber (not within study area) - Originally built for the city of Boston, this building is located in Newton on Beacon Street opposite the Driveway entrance. It is the terminus of the Sudbury aqueduct system which was completed in 1878, and houses five aqueduct gates. The walls consist of smooth and rockfaced granite ashlar. A row of five arched windows, mirrored below by five stone disks, symbolize the five pipe connections. The striking building appears to have been influenced by the designs of Philadelphia architect, Frank Furness.

High Service Pumping Station - This is the first pumping station at Chestnut Hill, built 1887-88 to supply high pressure water service for distribution to the higher elevations of newly annexed areas of Boston. It is located on the south side of Beacon Street opposite the reservoir between Cleveland Circle and the Newton city line. The High Service station is an asymmetrical picturesque composition in the Richardsonian Romanesque style.

The massing is horizontal. Three main gable roofs rise in stages from east to west, punctuated east of center with a 150-foot rear smokestack and in front by a 112-foot, hipped roof tower with an open observatory at the top. The original structure is comprised of a 84' 10" x 64' 8" engine room; a 79' 10" x 56' 2" boiler room; a 62' x 65' 4" coal pocket; and, a 43' 8" x 19' 10" addition. The 2 1/2 story building features assymetrical fenestration, with rectangular and arched windows in groups of two and three.

The main Syrian entrance arch balances the left-hand tower somewhat as it is offset to the right of the central gabled entrance pavilion. The doorway leads directly into the original engine room. To the extreme left, at the structure's lowest point is the coal storage area. The right gabled wing is an addition which was added in 1897-99 to house another engine. The date 1897 appears on the crossgable end which forms the west elevation of the station. The original plans allowed for this expansion. The pavilions forming the separate rooms articulate functions and are impressive in terms of scale and detail.

Characteristic of the Richardsonian style, the high service building displays a variety of textures and colors. The front and side elevations of the station are rockfaced Milford granite ashlar laid in random rangework. The bold reddish brown trim is Longmeadow freestone, used chiefly for horizontal banding and window and door surrounds. The exterior elevations are primarily pink and brown in color. The roof is blue-grey slate with oxidized copper flashing and cornices. A bronze sign over the doorway reads "Metropolitan Water Works", replacing an earlier "Boston Water Works" name plate.

The tall smokestack and the rear elevation are red brick. There are railroad tracks behind the building where the Boston & Albany Railroad unloaded coal to power the boilers for steam-driven pumps. The tracks now serve the MBTA Riverside line and the rear elevation of the station shows many additions and alterations.

The building has masonry walls with iron roof trusses in the original engine room. For the 1897-99 addition steel was used for the floor frame and roof truss. The engine rooms are separated by an arcaded masonry wall, replacing the original west wall of the building. The engine room areas are clear open spaces to the high room, with pump wells below. The land was cleared of earlier reservoir service structures for the station. According to the Boston Building Department's document jacket for the construction permit, the land is filled and the hard gravel foundation is laid on earth.

Present equipment in the High Service station includes two 20th century pumps (one is operable and kept on stand-by) and three obsolete but impressive steam-driven engines which are two stories in height and trimmed with brass.

One is the Leavitt engine, a unique triple expansion vertical three crank rocker engine with 575.7 horsepower and a capacity to pump 20 million gallons of water in 24 hours. It was taken out of service in 1928. Next to it is a Holly Company double compound engine dated 1921. In the addition is an Edward P. Allis Company triple compound engine, built 1897-1900.

A bronze plaque in the outside entrance area reads: "1887-88; High Service Pumping Station; Hugh O'Brien, Mayor; Water Commissioners - Horace T. Rockwell, Thomas F. Doherty, William B. Smart, Robert Grant; William Jackson, City Engineer; Arthur H. Vinal, City Architect."

Renovations to the High Service station were completed in 1977, and cost approximately $300,000. The work included roof repairs, replacement of the original windows with matching sash and glazing, and acid cleaning and repointing of the exterior walls. MDC used an in-house architect.

Grounds work for the entire pumping station area was also done in 1977 in conjunction with the reservoir basin landscaping. The lawn, driveway configuration, and tree planting appear similar to the features visible in an 1890 photograph (see following photos). Many of these trees have matured and the driveway and parking areas are in good condition.

Effluent Gate House No. 2 - Constructed c.1898 to provide the Low Service station with water and increase the flow to the High Service station, this gate house assumed the operations of the original Effluent Gate House. It is located on the embankment directly across Beacon Street from the High Service station. It is one-story in height, three window bays across, and one deep. High style classical Renaissance Revival features include the rusticated banding of the dressed granite ashlar, the iron window grills, and the low-pitched copper clad hip roof with bronze cheneau. This gate house is currently operational.

Low Service pumping station - This station is located on the south side of Beacon Street just east of the High Service station. It was built to provide additional low pressure service to the Boston area when the downtown began to grow. Construction dates from 1898-1901 although the pumps were in service before the latter date. The Low Service station is a classical building, basically horizontal in form with a symmetrical main block, rear tower that is low enough to resemble a belvidere, and a wing to the left side of the main block. The roofs are flat and encircled with parapets. The front and side elevations are clad in light grey finely dressed Indiana limestone ashlar. The foundation and main stairs are pink Milford granite. Window frames are cast iron with grill work. The plastic articulation of the main block and its entrance pavilion facade exemplifies the high style of Beaux-Arts Classicism.

The station's focal point is the projecting main entrance pavilion with a colossal order of stylized Corninthian columns and pilasters. The deep arch soffit is coffered, the order of the recessed doorway is Ionic. The parapet pedestals repeat the articulation of the order below. A central carved panel reads: Metropolitan Water Works MDCCCXCVIII. The composition is crowned with a carved limestone torch. The main entrance opens directly into the engine room.

On either side of the entrance, the wall area of the main block is dominated by a large round-headed window with cast iron sash. The classical treatment of the fenestration in the main block includes clathri and fish-scale grill work. The south elevation repeats the design of the single dominant round-headed window. A continuous spring line molding, full entablature, and parapet unify the design across the facade and around the corner on the south wall.

The east wing is wide across the front and set back from the main block. The lower roof line helps it recede visually and reflects the floor height here which is lower than in the engine room. The space houses the boiler room in front and the coal house in the rear, both of which are presently used for storage. The facade of the wing has a three-leaved garage door with the original clathri gone from the semi-circular transom and the light filled in or painted over. There are high small windows.

The classical frieze and cornice across the facade and east elevation of the wing and the continuous parapet are simplified versions of the main block features.

The rear of the Low Service station is red brick. The quoins are limestone. The parapet brick is different than that of the wall surface. The main block has a low, flat roofed extension across it with a higher central entrance; the tower rises from the ground in the angle of the main block limestone cladding, the fourth in exposed brick. The tower roof is hipped and red-tiled. The smokestack is yellow brick, rising from the roof of the coal house.

On the interior, the engine room is finished in buff brick with red brick trim, polished quartered oak and ash, and a green slate tile floor. Alterations are evident at the rear but to a lesser extent than on the High Service station. Abutting the west elevation is a modern wire cage with rusticated concrete side walls which houses mechanical equipment.

According to the Boston Building Departments document jacket for the building permit (granted September 27, 1898) the floor is supported on iron. Plans dated 1898 show the metal floor and roof framing, entirely clear open spaces in the engine and boiler rooms, a gallery in the boiler room, and iron or steel columns in the coal house. Although the exterior reads as two stories this building has one main floor with extremely high ceilings, like the High Service station. It contains two operable 20th century turbine pumps and three obsolete steam-driven engines. Two of the engines are vertical triple expansion engines built by the Holly Manufacturing Company, dated 1900. The third engine is similar and is dated 1910.

One plaque in the main entranceway bears the following information regarding the building: "Erected 1899; Frederic P. Stearns, Chief Engineer; Dexter Brackett, Engineer of Distribution Department; Shepley, Rutan & Coolidge, Architects; Metropolitan Water Board - Henry H. Sprague, Wilmot R. Evans, Henry P. Walcott. Another plaque gives water system information: Metropolitan Water Act recommended by State Board of Health; Cochituate and Sudbury Systems of the City of Boston taken January 1, 1898; Wachusett System taken February 23, 1898 and added to Metropolitan Water Supply March 7, 1898."

As mentioned for the High Service, re-landscaping was done in 1977. At that time a fountain was installed in front of the building; its modern simplicity complements the classical design of the building. There is ivy on the walls of the east wing. Driveways and parking areas connect the two pumping stations and their ancillary service buildings.

Impressively sited behind an expanse of lawn, the two stations are far enough apart to stand as individual monuments, and they are well balanced in terms of size and scale. As viewed from Chestnut Hill Driveway scenic overlook, both relate well to their surroundings.

Connection Chamber - Constructed in 1901, this building compliments in style and material, the adjacent High Service Pumping station. This building is constructed of quarry faced Milford granite with brownstone trim. It has a hipped slate roof with wooden bracketed cornice.

The following, although not major contributing features, are located within the complex:

Garage - A one-story building, three window bays across, located between the two stations. It dates from c.1890 and is similar in style to the original gate houses. Window and door openings are segmentally-arched, the roof is flat, trim is granite and brick. The building originally served as a carriage house and there is a rear addition of brick with some windows infilled. The MWRA has ongoing plans to add an addition to the garage. Plans call for use of identical materials and compatible scale and size. A stable was built beside it and later converted to a machine shop. The machine shop burned down in the 1960s.

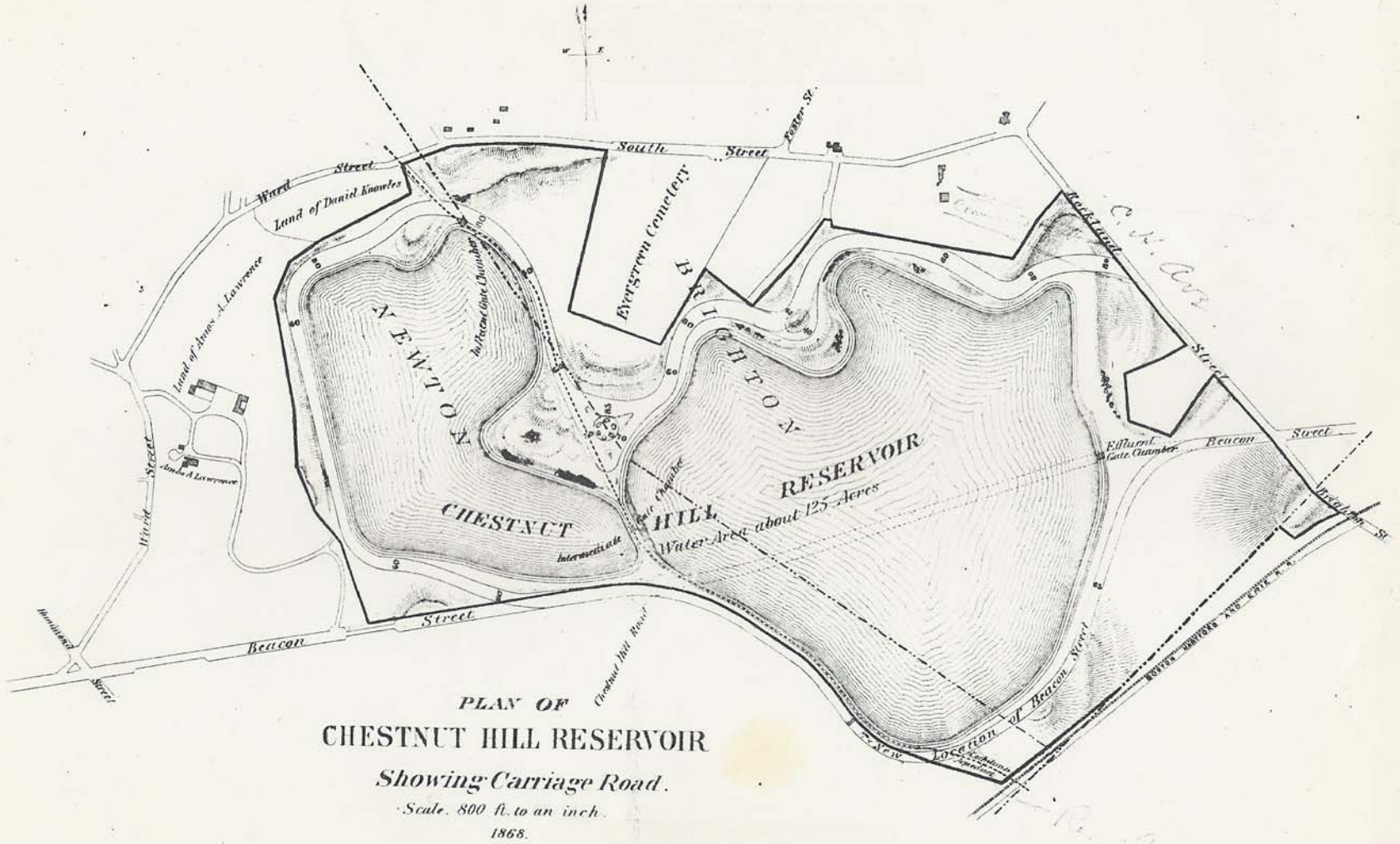
Pipe yards - The yards consist of four wood frame stuccoed vernacular buildings located at the east end of the site, oriented to form a courtyard facing west which is blacktopped for parking. Two of the structures are garage shelters which flank cottage form buildings, domestic in scale. The pipe yards are well-suited to the site in terms of massing, orientation, date of construction, color, and texture.

A small square concrete block shed is at the south side of the high service station. It is non-contributing.

In general, the buildings within the complex appear to be in good condition. All parts of the property are well maintained. The total amount spent in 1977 for High Service renovation and landscaping work around the stations and reservoir basin was approximately $1,500,000.

2.3 Photographs:

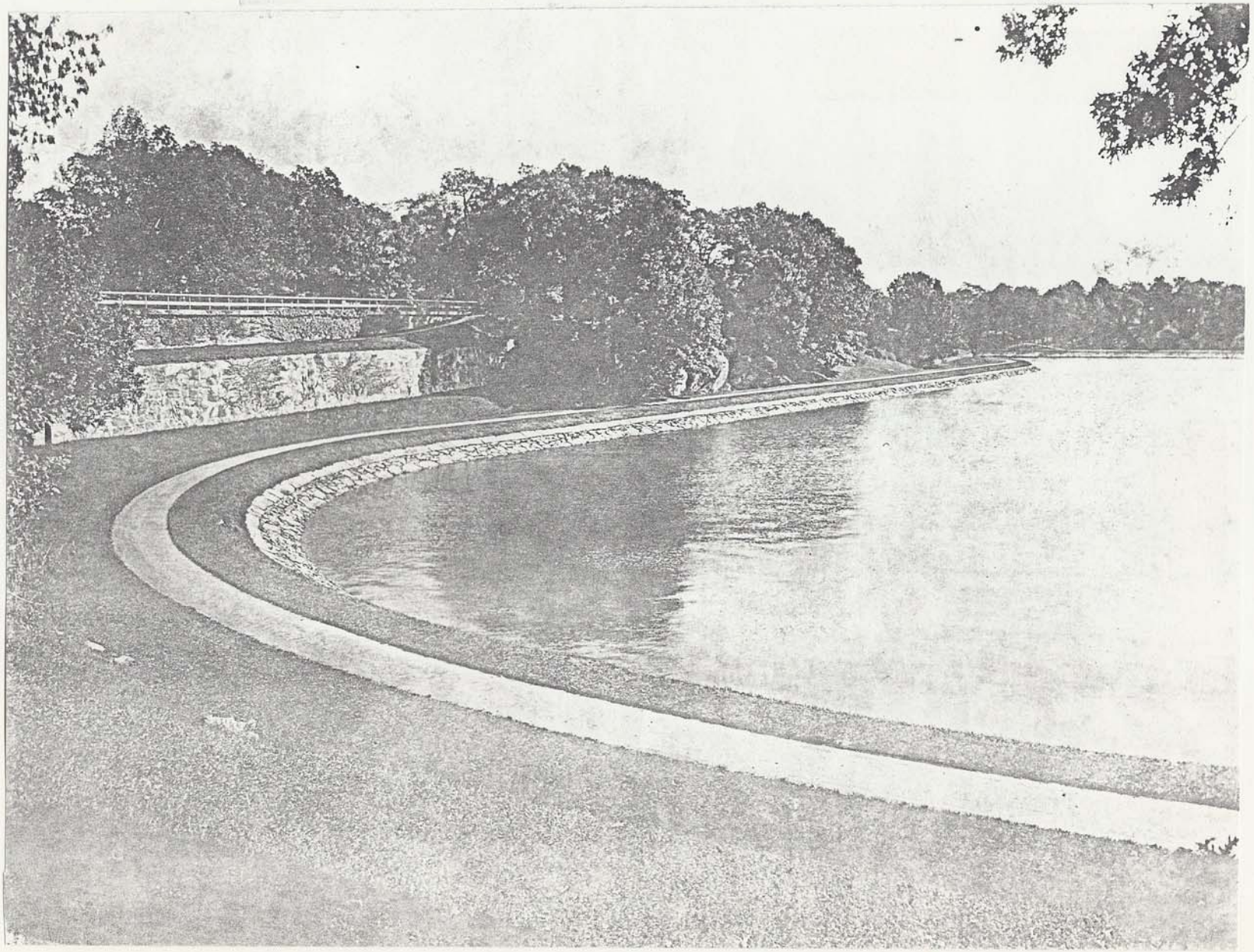
Attached.



Chestnut Hill Reservoir original land area with two basins, Driveway, and green belts. Cochituate Water Board (City of Boston), 1868

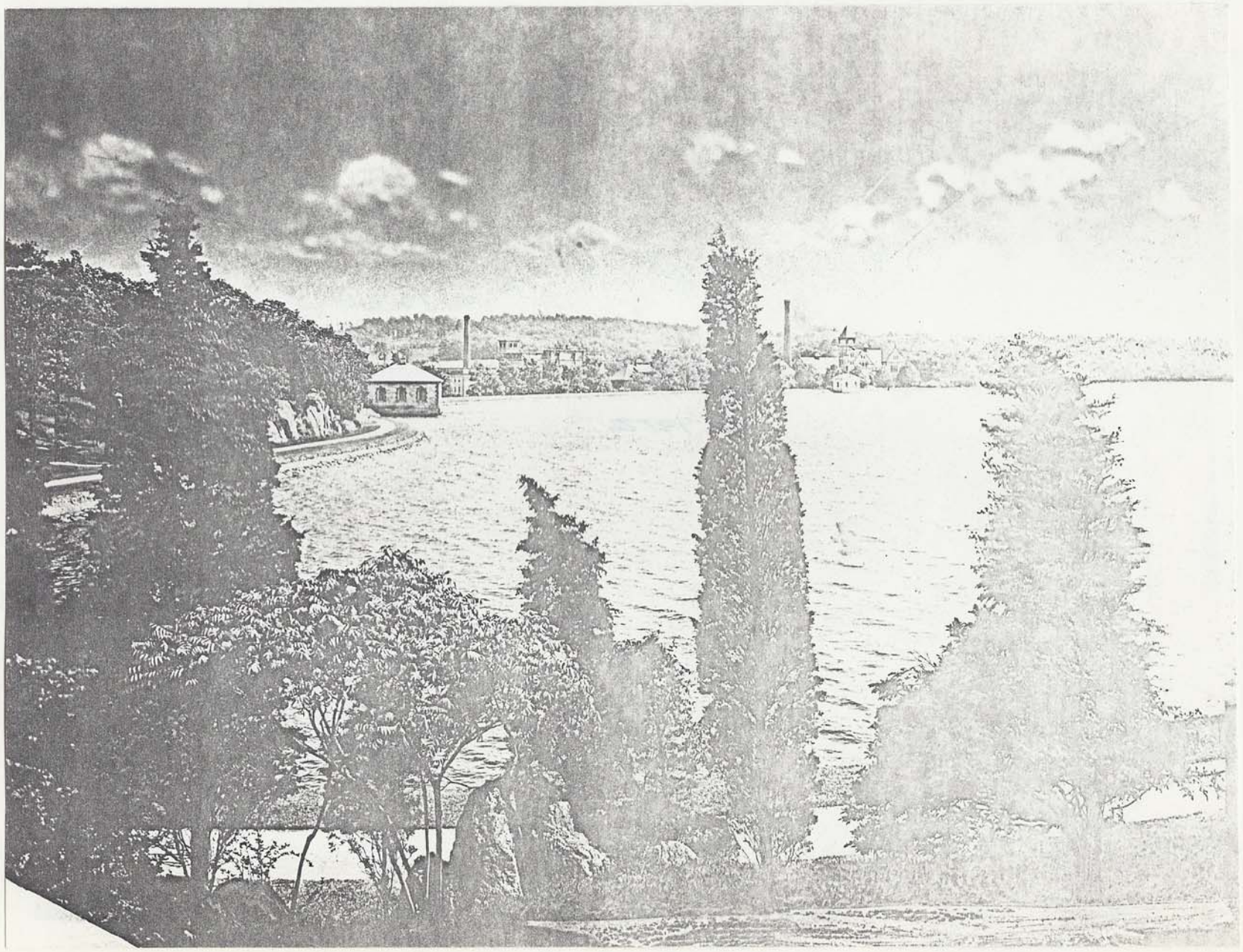
Bradlee Basin, Chestnut Hill Reservoir, constructed 1866-70 (Photograph 8/1989)
Top: View looking southwest from lookout on Driveway.
Bottom: View from greenbelt area looking west.

Chestnut Hill Reservoir showing walkway on embankment and retaining wall.



C. 1912
Society for the Preservation of New England Antiquities.

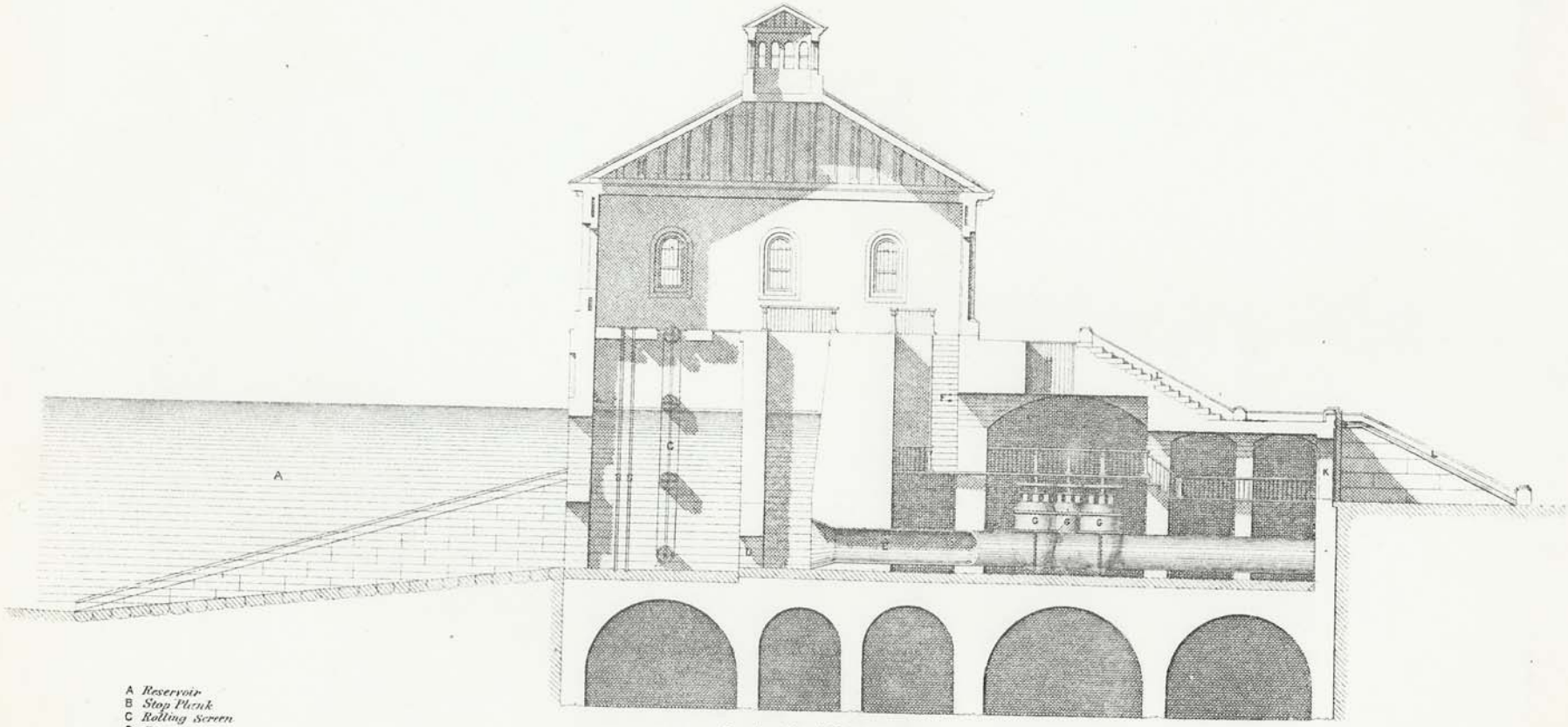
View of Chestnut Hill reservoir and pumping stations looking east.



C. 1912
Society for the Preservation of New England Antiquities.

Original Effluent Gate House, constructed 1869-70 (Photograph, 8/1989)
Top: View from North.
Bottom: View from East.

Original Effluent Gate House, looking north, November 1979.

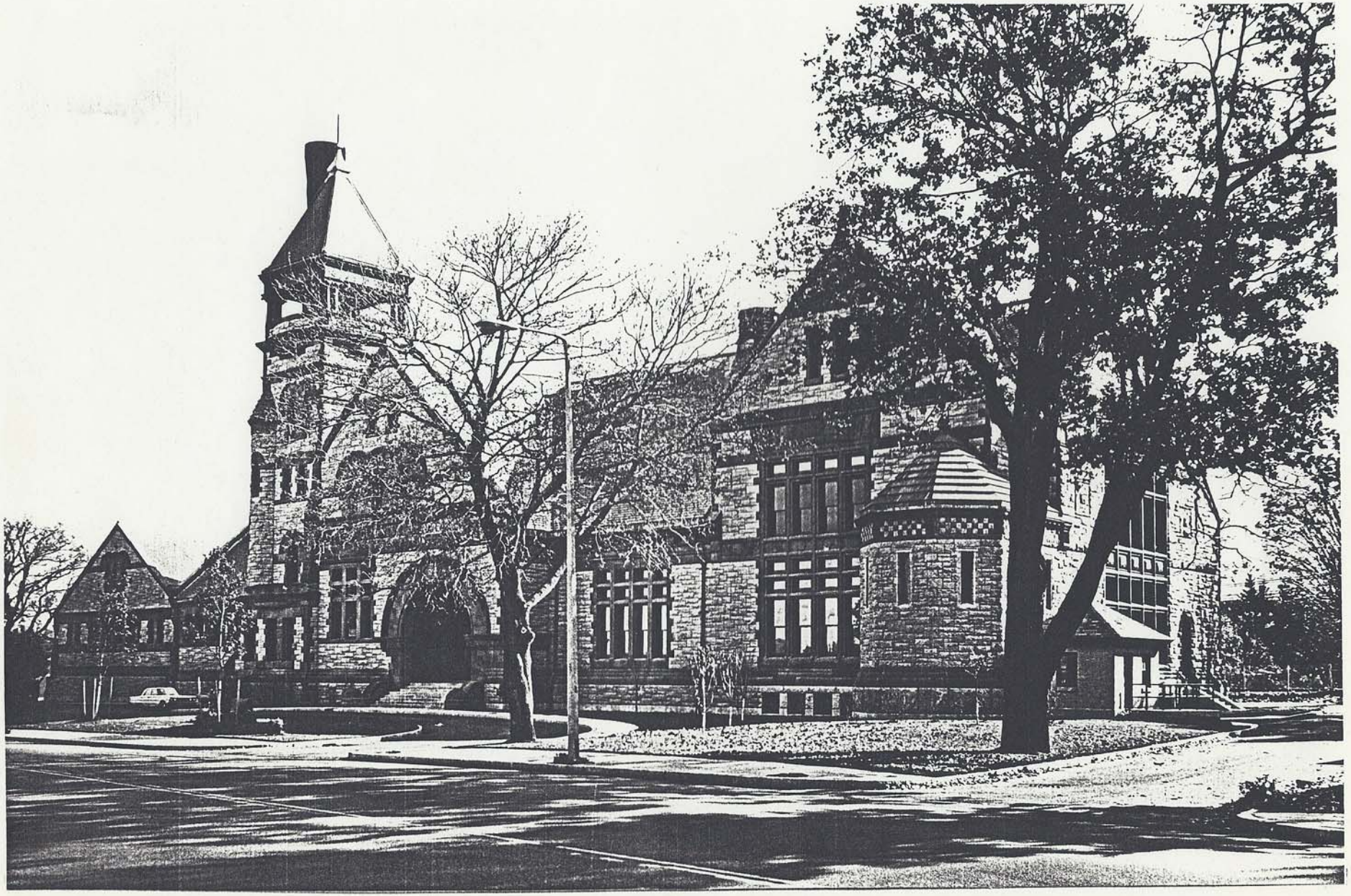


A Reservoir
B Stop Plank
C Rolling Screen
D Gates
E 48 inch Pipes
F Stairs down from Upper Floor
G Stop Cocks
H Light to Pipe Chamber
K Door under Embankment
L Steps up to Gate House.

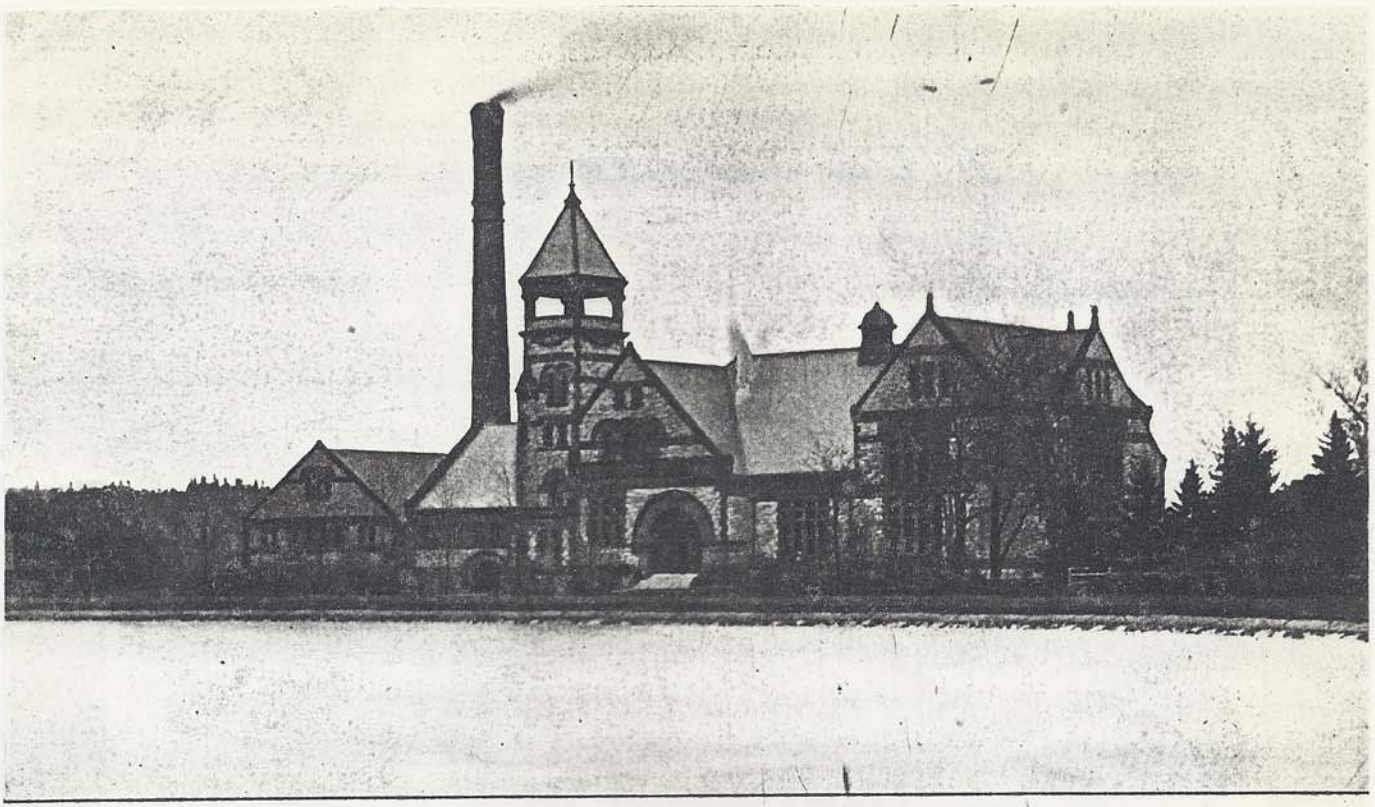
Longitudinal Vertical Section
of
Lower Gate House
at
Chestnut Hill Reservoir.

Original Effluent Gate House
Fitzgerald, History of the Boston Water Works from 1868 to 1876.

High Service Pumping Station, constructed 1887-88. (Photograph, 8/1989)
Top: View from north, Beacon Street in foreground
Bottom: View from west.

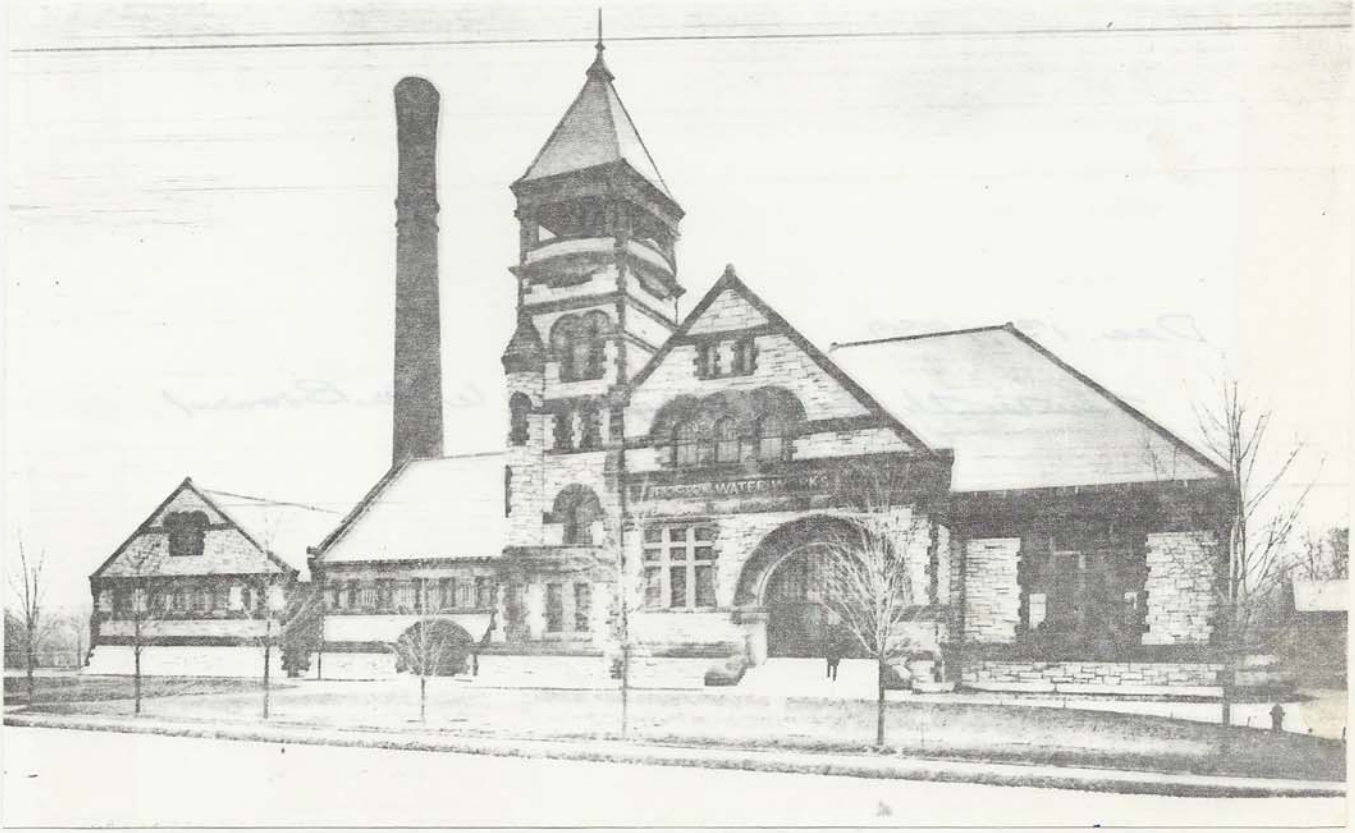


High Service, main elevation, November 1979.



HIGH-SERVICE PUMPING STATION AT CHESTNUT HILL RESERVOIR, WITH THE RECENT ADDITION AT THE RIGHT.

MDC undated-c. 1899

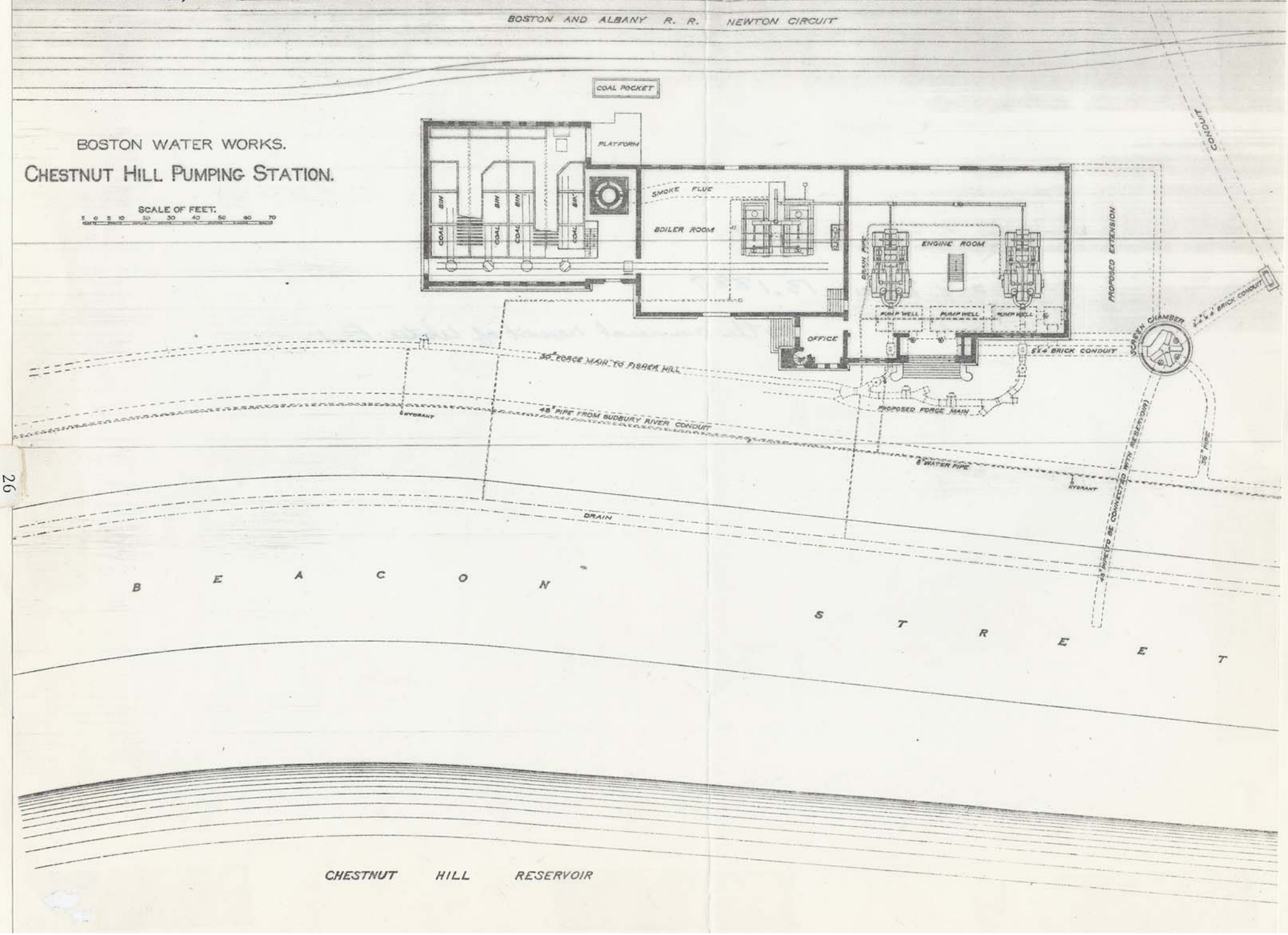


High Service as it was originally designed.
Thirteenth Annual Report of the Boston Water Board, Dec. 13, 1889

High Service, rear elevation, November 1979.

Effluent Gate House #2, constructed 1898. (Photograph 8/1989)
Top: View from east.
Bottom: View from northeast.

Effluent Gate House No. 2, front and west elevations, November 1979.

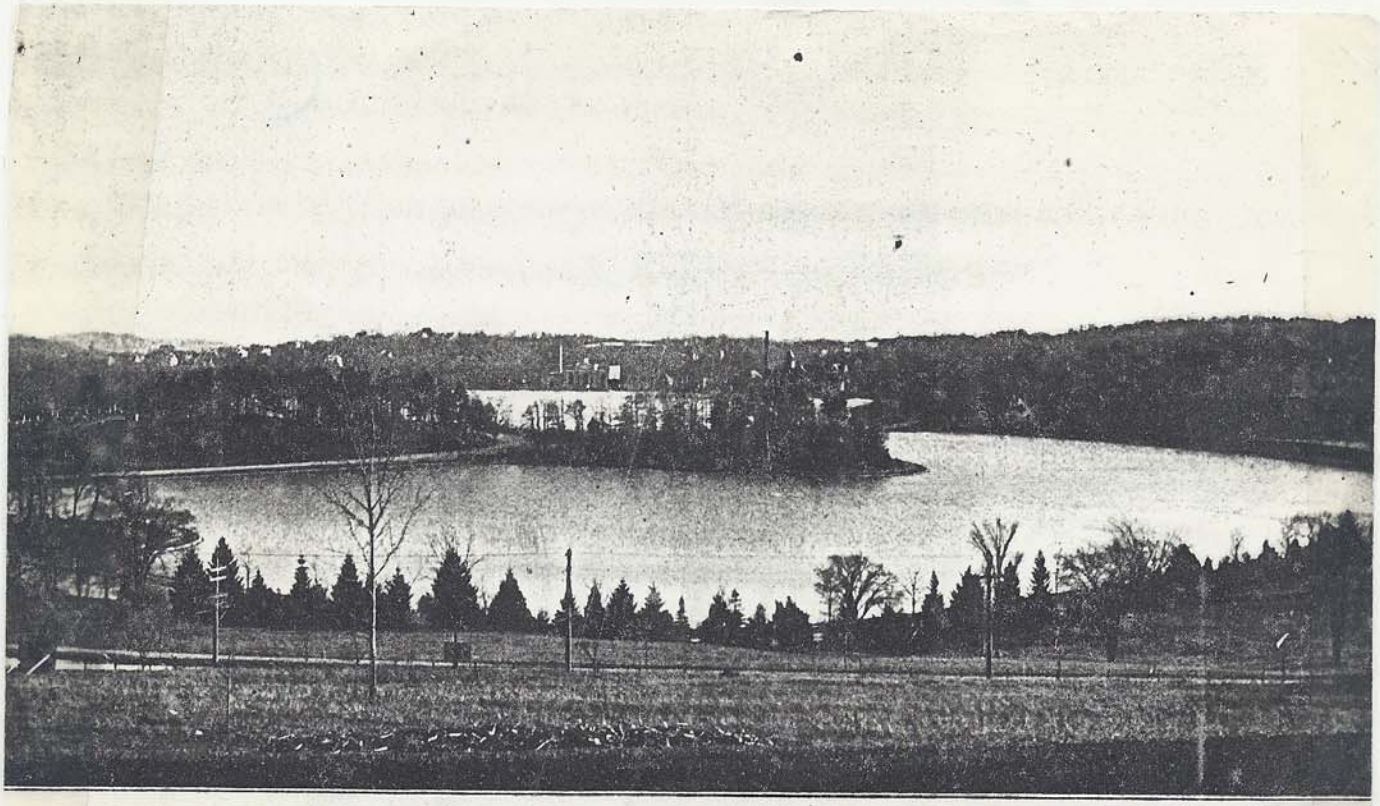

BOSTON AND ALBANY R. R. NEWTON CIRCUIT
BOSTON WATER WORKS.
CHESTNUT HILL PUMPING STATION.
SCALE OF FEET.
5 0 5 10 20 30 40 50 60 70
COAL POCKET
PLATFORM
BIN
COAL
SMOKE FLUE
BOILER ROOM
ENGINE ROOM
DRAIN PIPE
PUMP WELL
OFFICE
PROPOSED EXTENSION
CONDUIT
SCREEN CHAMBER
2'-2" x 4' BRICK CONDUIT
5'-6" BRICK CONDUIT
30" FORCE MAIN TO FISHER HILL
HYDRANT
48" PIPE FROM SUDBURY RIVER CONDUIT
PROPOSED FORCE MAIN
8" WATER PIPE
36" PIPE
DRAIN
B E A C O N S T R E E T
CHESTNUT HILL RESERVOIR

Low Service Pumping Station, constructed 1898-1901 (Photograph 8/1989)
Top: View from west.
Bottom: view from southwest.

Low Service, showing east wing and main entrance, November 1979.

Top: Pipe Yards (Photograph 8/1989)
Bottom: Garage, constructed c.1890 (Photograph 8/1989)

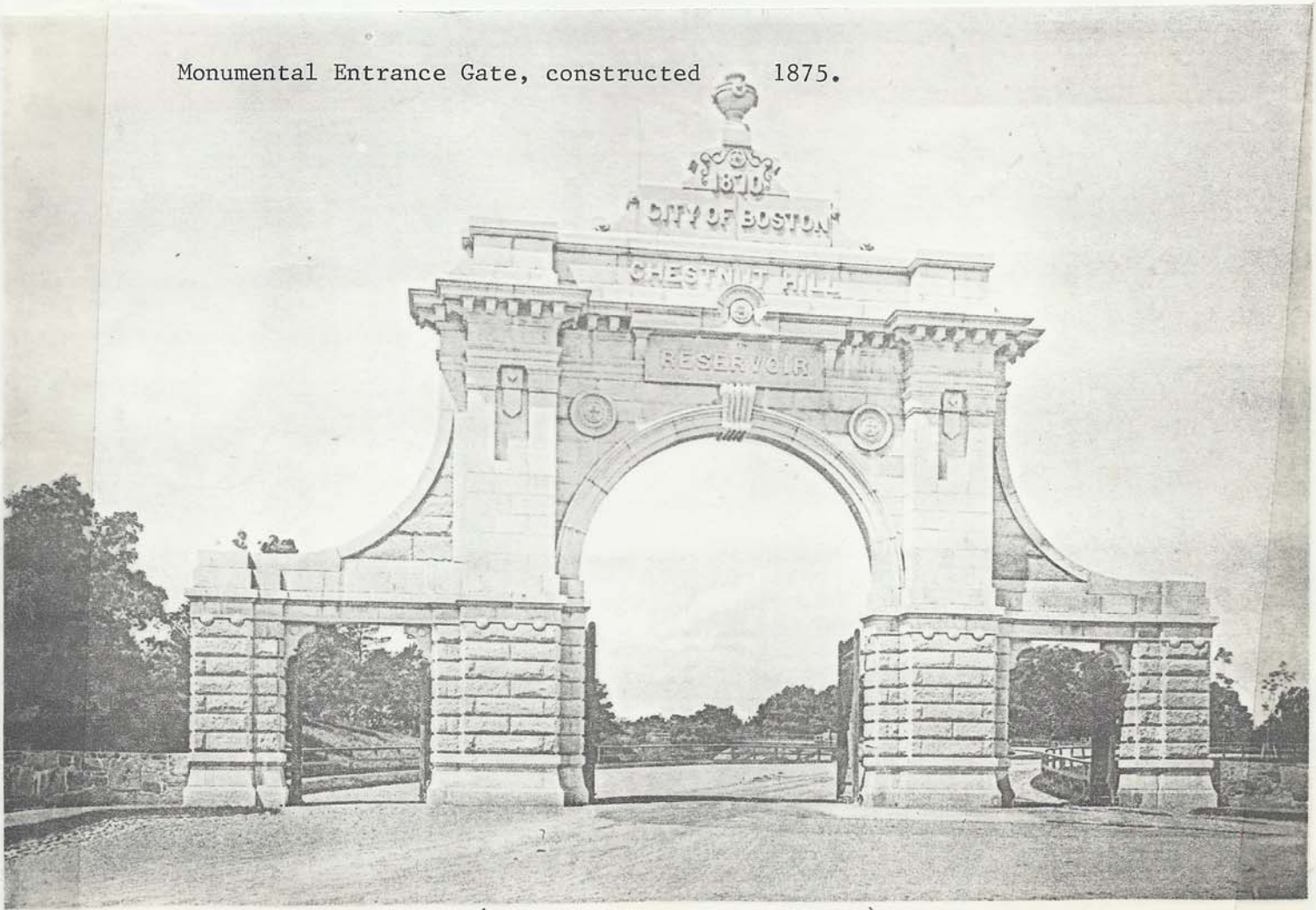
Top: View across Bradlee Basin (1866-70) from Lookout (1977)
Bottom: Granite marker at Lookout (1977).



CHESTNUT HILL RESERVOIR IN BOSTON, WITH HIGH AND LOW SERVICE PUMPING STATIONS.

(Date Unknown)

Monumental Entrance Gate, constructed 1875.



(Demolished early 1900s)

ENTRANCE ARCH TO DRIVE-WAY.

3.0 SIGNIFICANCE OF THE PROPERTY

3.1 **Summary** - The Chestnut Hill reservior and pumping stations are extremely significant as an unusually intact example of a 19th century complex. It combines several of Boston's best examples of public architecture, engineering and technology. The complex reflects planning polices which gained importance in the second half of the 19th century and mirrors a growing civic pride, manifested in public improvements.

The complex was created out of a concern for public health and safety. The city used the opportunity to construct a number of high style civic buildings and to create a pastoral park and drive intended for use by the public. In addition many noteworthy architects and planners were associated with the works.

In a comprehensive report on the entire metropolitan water system, prepared for the Metropolitan District Commission by the Cultural Resources Group of Louis Berger & Associates, Inc. titled The Water Supply System of Metropolitan Boston 1845-1926, the following is written on the significance of Chestnut Hill:

> Chestnut Hill is among the most significant, and certainly the most highly visible, complex within the Metropolitan Water Supply System. It marks the connection between supply (Cochituate and Sudbury aqueducts) and distribution (high and low service pumping stations) that operated until completion of the City Tunnel and its extension in the mid-20th century. The constant development and expansion of facilities at Chestnut Hill have left a technological legacy of gravity and pressure conduits, manual and hydraulic gates, and a veritable museum of 19th and early 20th century pumping engines, plus modern gas powered replacements.
>
> Arranged around Bradlee Basin, the buildings and structures at Chestnut Hill present a compendium of the water system's architectural themes. The Greek Revival, first employed on the Cochituate, is represented in the intermediate and effluent gatehouses built in 1868-70. The picturesque eclecticism associated with the "additional supply" developed in the 1870s is portrayed to great effect in George Clough's Sudbury Terminal Chamber. The addition by Wheelwright and Haven, is an outstanding example of the Richardsonian Romanesque style, and rightly, an area landmark. The turn-of-the-century revival of neoclassical styles is vividly illustrated in Shepley, Rutan and Coolidge's low service pumping station, a highly successful adaptation of the Beaux Arts style to utilitarian function, and, on a smaller scale, in contemporary low and high service gatehouse.

Although the Chestnut Hill facility is largely obsolete, the buildings and landscaped grounds remain well-maintained symbols of the Boston and Metropolitan water supply systems. Combining functional, technological and architectural importance, Chestnut Hill must be considered a pivotal element in the system as a whole, with the priority given to its future care and conservation.

Historical Overview of the Metropolitan Water System - Boston's first inhabitants received their water from cisterns and underground wells. The quality was often poor and the availability was sporadic. In 1796, the Aqueduct Corporation, a private company, began delivering water from Jamaica Pond by a system of wooden pipes.

By the mid-19th century, the water supply was inadequate. It was thought that the prevention of disease, particularly cholera, was linked with pure water and air. In addition, water was required for fire fighting purposes. In 1846 the Commonwealth granted the City the authority to develop a water supply; John Jervis was hired to design and oversee the construction of a reservoir and aqueduct. Jervis utilized Long Pond in Natick, later renamed Lake Cochituate.

Construction was begun in August, 1846, and the water lines were connected on October 25, 1848. The opening was celebrated at a ceremony at the Frog Pond in the Boston Common; water was sent through a fountain, 80 feet into the air. The water flowed through the Cochituate Aqueduct to the Brookline Reservoir (still extant on Route 9-Boylston Street in Brookline). The aqueduct is an egg-shaped, brick conduit, 76 inches high, 60 inches wide, and fourteen miles long. This system supplied the city with 18 million gallons per day.

By the late 1870s, Boston needed additional water to serve its rapidly growing population. In 1875-78, the city expanded its water supply by utilizing the Sudbury River Watershed. This system provided water from four reservoirs in Framingham. Water flowed through the Sudbury Aqueduct into the recently completed Chestnut Hill Reservoir, increasing the city's supply to 69 million gallons per day.

In 1895, the state Legislature established the Metropolitan Water Board (forerunner of the MDC and MWRA) to supply water to seven cities and six towns in the Boston metropolitan area. Regional jursidiction was needed to coordinate efforts and keep rates low.

The Metropolitan Water Board took control of major portions of Boston's water supply system including Chestnut Hill. To expand the water supply, Sudbury Reservoir in Southborough was developed first. Then, a reservoir on the Nashua River in Clinton was constructed, now known as the Wachusetts Reservoir. It began supplying water to the Sudbury system in 1908. A network of 400 miles of tunnels, aqueducts and large pipes and over 6000 miles of smaller pipes was laid out; this system was in place and functioning by the 1930s. These facilities served metropolitan Boston until construction of the Quabbin began in the 1930s.

The Massachusetts Water Board's original plan, developed by Frederic Stearns, the Public Health Board's chief engineer, called for a much larger reservoir to be added in the future. It was known that increasing development near the Wachusetts Reservoir was detrimental to water quality. In 1939, the Quabbin Reservoir was completed. It held 412 billion gallons of water, and was filled to capacity by 1946. The reservoir now provides water to 2 million people, an average of 300 million gallons per day.

Chestnut Hill Reservoir - The Chestnut Hill Reservoir played a major role in the supply of water to the Metropolitan area. It functioned as a supply and distribution reservoir for over 100 years.

The need for a new reservoir, to supplement the capacity of the Brookline reservoir, had been repeatedly brought before the Cochituate Water Board in 1865. The Chestnut Hill site was chosen because the topography and location provided access between the water source and distribution, with the proper intermediary elevation for gravity flow. The City Engineer, N. Henry Crafts, recommended the site; the Commonwealth's authorization was was granted in 1865. The Board decided to purchase additional acreage for a second basin, the Lawrence Meadow property then owned by Amos A. Lawrence.

Nineteen separate land transactions were needed in order to purchase the entire site; this was accomplished by 1867 and cost the City $120,000. While Beacon Street had to be moved to a more southerly alignment, it appears that no other developments were affected. According to John G. Hale's 1830 survey, there were no other structures in the area. The topography was marsh and meadow land with woodlands and hills.

Construction of the reservoir basins at Chestnut Hill occurred between 1866-70. Albert Stanwood was Superintendent of Chestnut Hill reservoir in March 1866. Henry M. Wightman, the Resident Engineer at Chestnut Hill, and his staff of five were responsible for detailed surveys and plans. Plans and specifications for the gate house were made by the office of the City Engineer, N. Henry Crafts.

Housing was built on site for the over 400 workers, many were recent Irish immigrants and veterans returning from the Civil War. Stables were constructed for teams of horses and oxen; at least fifty animals were utilized. Construction work included building the embankment, dam, gate houses and support sheds, laying brick drainage sewers and blasting ledge rock. Wages were $1.50 per day; a strike in 1867 brought them up to $1.75. According to the History of the Boston Water Works from 1868 to 1876, the total cost of land aquisition and construction, in the first decade, was almost 2.5 million dollars. However, revenues from city water sales for the same period were over $565,000.

Lawrence Basin was finished first; water was let in on October 27, 1868, the twentieth anniversary of the introduction of pure water into Boston. The basin was named for Amos Lawrence, the first president of the Cochituate Water Board and former owner of Lawrence Meadow. A celebration was held, featuring speeches from Mayor Shurtleff and Nathaniel J. Bradlee, president of the Water Board. Bradlee stated that the completed basins could provide a month's supply of water in case of a break in the aqueduct. Also on that day the Highland Standpipe in Roxbury began operation. The standpipe was intended to provide high pressure service throughout the city.

Bradlee Basin was completed and operational two years later, on October 25, 1870. This basin was named after Nathaniel J. Bradlee, noted architect and president of the Water Board. An impermeable earth and stone dam separated the two basins. The chamber of a small granite gatehouse, built on the dam, allowed either basin to be emptied for cleaning or repairs. The Cochituate Aqueduct runs underneath the reservoir.

The Chestnut Hill reservoir was originally built with two 48-inch mains, one to Brookline reservoir and one directly to the city. It served for many years as the principal receiving and distributing reservoir for Boston, supplying water by gravity. When the Sudbury aqueduct opened in 1878, it was connected to the Chestnut Hill reservoir as an additional source through the Terminal Chamber. In the last third of the 19th century, Boston's sanitary projects were to take one-third of the total City budget.[1]

When elevated territory was annexed to Boston in the mid 1870s, additional high service was needed. At this time, the Boston water system serviced the fifth largest population in the nation following New York City, Philadelphia, Brooklyn, and Chicago.[2] During this period of growth, Chestnut Hill supplied most of Boston's water; it was chosen as the site of the new high service facility. The high service station was constructed, in conjunction with the Reservoir on Fisher Hill in Brookline, for this purpose in 1887. The pumps at Chestnut Hill were used to fill Fisher Hill reservoir one mile away, at the higher elevation of 241 feet. From there the water went to Parker Hill Reservoir (now McLaughlan field on Mission Hill) at 219 feet elevation or directly to distribution. In 1890, over half of the city required high pressure service in order to be supplied with water from Chestnut Hill, according to The Manual of American Water-Works 1889-90.

In 1897 construction began for an engine room addition to High Service. In 1898 construction of the Low Service pumping station began. The second pumping station at Chestnut Hill was needed to fill a "near" storage and distributing reservoir at Spot Pond (Stoneham) and to increase low service pressure for a growing downtown. By the end of 1898 the Metropolitan Water Board had increased its total storage capacity to 15,755,000,000 gallons and its daily capacity to over 105,000,000 gallons per day.

The most important technological aspect of the facilities' operations was the design and installation of the Leavitt engine in the original High Service engine room. Erasmus Darwin Leavitt, Jr., was one of America's foremost designers of large steam engines and his equipment was admired for its efficiency. He was born in Lowell, Massachusetts in 1836 and died in Cambridge, Mass. in 1916. Leavitt apprenticed in the Lowell Manufacturing Company machine shop. Later he was in charge of constructing the engine for the U.S.S. Hartford in Providence, R.I. After serving in the Navy during the Civil War and teaching steam engineering at the Naval Academy, Annapolis, he opened a private practice as a mechanical engineer in 1867.

Leavitt received recognition for a pumping engine constructed in 1874 in Lynn, Mass. His success brought him to Europe, where he met Professor Riedler of the Royal Polytechnic School, Berlin, who granted Leavitt rights to use the Riedler pump and valve gear in the U.S. Leavitt was the first recipient of an honorary PH.D. in Engineering from Stevens Institute of Technology in 1884. He was an original member of the American Society of Mechanical Engineers and was elected president of the ASME in 1883. Leavitt also was a Fellow in the American Academy of Arts and Sciences.

The Chestnut Hill engine is Leavitt's only known surviving work. The name plate reads: "Boston Water Works, Riedler Pumping Engine, Designed by E.D. Leavitt. Built by N.F. Palmer, Jr. and Co., Quintard Iron Works, New York." The engine was constructed 1892-94; although the principal castings were U.S. manufactured, some parts were forged by the Krupp works in Germany and are so labeled. The Leavitt engine was designated a National Historic Mechanical Engineering Landmark by the American Society of Mechanical Engineers in 1973. The Smithsonian Institution displays a scale model of it.

The Chestnut Hill complex served Boston for over 100 years. It began to be phased out in the 1940s with the completion of the City Tunnel, directly from the Quabbin Reservoir. Earth from the City Tunnel was used to fill the Lawrence Basin, purchased in 1950 by Boston College. The completion of the Dorchester Tunnel in the mid-1970s, ending service from Chestnut Hill.

3.2 **Summary of architectural significance** - Each individual component at Chestnut Hill -- the Bradlee Basin, the high and low service pumping stations, the gate houses, the greenbelt and driveway -- is significant in its own right. As an intact complex, the structures and landscape achieve even greater significance, and are thought to be the finest and most intact 19th century complex of the metropolitan water system.

Chestnut Hill Driveway and Landscaping - The Chestnut Hill reservoir landscaping, dating from 1866-70, is an excellent, early example of the picturesque style. It is the first large-scale rural park-like setting to be developed by the City of Boston, even before the Park Commission was established in 1874. The Water Board decided, based largely on citizen opinion, to create the Driveway in the grandest possible manner. When completed the Chestnut Hill reservoir offered Bostonians a beautiful carriage drive or promenade in clean air, out Beacon Street and over the Brighton Road, far from the impure city air.

The Chestnut Hill reservoir landscaping was extolled in Boston guidebooks throughout the last quarter of the 19th century and the early decades of the 20th century. Boston Illustrated, 1878, carried superlatives in its description:

> The Chestnut Hill Reservoir is not only a great benefit to the city in its practical uses, it is also a great pleasure resort. A magnificent driveway, varying from sixty to eighty feet in width, surrounds the entire work, and is one of the greatest attractions of the suburbs of Boston. It is, in fact, the most popular drive in the vicinity.

In King's Hand Book of Boston (7th ed. 1885) parks were titled "The Lungs of the City" and the walks and drives of Chestnut Hill were listed as being "much enjoyed" by its neighbors who lived in attractive estates on the wooded hill overlooking the reservoir from the east.

The 1916 publication, A Guide Book to Boston states:

> All around the winding outlines of the basin runs a trim driveway, and beside it a smooth gravel footpath. On all sides of the lake are symmetrical knolls, covered with forest trees and the greenest of turf. The banks to the water's edge are sodded and bordered with flowering shrubs; and the stonework, which in one place carries the road across a natural chasm, and the great natural ledges, are mantled over the clinging vines, and in autumns are aflame with the crimson of the Ampelopsis and the Virginia creeper.

The park-like development of Chestnut Hill reservoir was first discussed by the Water Board in 1866. Preliminary instructions to the City Engineer, Crafts, were for a road no less than 80 feet in width. Crafts laid out a crushed gravel surface, as was done for Boston's finer streets. The Board also contributed to the aesthetics of the design. Nathaniel Bradlee describes the drive in the 1868 history of Boston's water works:

> ...approximately eighty feet in width; compromising that width in cases of fine shade trees, and of ledges which may add picturesqueness...The road follows the rise and the descent of the ground, and except where it passes through groves or around rocks, lies upon the margin of the Reservoir, or keeps the water in sight, thus avoiding monotony, and affording beautiful views for the whole distance.

Bradlee, member of the Cochituate Water Board from 1865-1871, first biographer of the City water system, and Water Board president from 1868-71 was most likely the person who added the aesthetic principles to Crafts' engineering knowledge in laying out the Driveway. At the age of seventeen Bradlee began training in the office of George M. Dexter, a prominent mid-19th century Boston architect. In subsequent years Bradlee became Dexter's successor and was well-known in Boston for the design of banks, churches, railroad stations, hotels and apartments, office buildings, schools, and blocks of innumberable bow fronts in the South End. Walter Kilham in Boston After Bulfinch attributed 500 Boston buildings to Nathaniel J. Bradlee. Aside from being a prolific Boston architect, Bradlee made a civic contribution as a member of the Water Board. He earned the honor of having the larger basin at Chestnut Hill reservoir named after him.

Construction of the Driveway was expected to cost $125,000 -- the final cost was over $200,000. The crowning element was a triumphal granite entrance arch, erected in 1870 to commemorate the water works. In the early 1900s the arch was removed for street widening.

According to Cynthia Zaitsevsky's Frederick Law Olmsted and the Boston Park System, Chestnut Hill Driveway was included in a 1887 plan to link the Emerald Necklace with other parks in Boston including Chestnut Hill Reservoir and Marine Park in South Boston. The plan was titled, in part "...Public Ways adapted to Pleasure Travel." Olmsted had designed and improved sections of Commonwealth Avenue in Brighton and Beacon Street in Brookline, the two major roads leading to Chestnut Hills. This created a loop with the previously laid-out Chestnut Hill Driveway; Olmsted called this the Chestnut Hill Circuit.

High Service Station - The first Chestnut Hill pumping station is an excellent example of the Richardsonian Romanesque style. It is considered one of the finest works of Boston architect, Arthur Vinal.

The High Service station was built in 1887-1888. Vinal was one of many admiring architects who worked in the style which Richardson has been credited with creating. Richardson's genius lay in his handling of common late 19th century eclectic idioms with a powerful simplicity and coherence. Whereas Victorian designs abandoned focus in favor of surface richness, Richardson made beautiful carving and lush surface treatment subordinate to mass, volume, and scale. Large public buildings became the Richardsonian hallmark, and in the late 1880s many cities built libraries, city halls, schools, post offices, and churches in the style.

The Chestnut Hill High Service station is bold in its use of granite and freestone in cathedral-like grandeur for a strictly utilitarian building. The broad, open site is well-suited to Richardsonian massing and horizontality. The Wheelwright & Haven addition of 1887-89 is sensitive to the original design in terms of form and surface treatment. The Chestnut Hill pumping station is a very lively design; the details in the tower are particularly striking, and the bold exterior is well-suited to the two-story steam engines which it was built to house.

According to a 1910 publication by the Metropolitan Water Board, the total expenditure made for the original pumping station and addition was approximately $265,000. Contractors for the original construction of 1887-88 included Collins & Ham, builders; Donahue Bros., masonry; Jeremiah Carew, free-stone; Edward Marley & Bros., copper work; John McLaren, carpentry; Walworth Manufacturing Co., steam pipes; Cofrode & Saylor, iron roofs; and George R. Clarke & Co., tile work. C.A. Dodge & Co. was the contractor for the 1897-99 addition, and the steel work was executed by Edward Kendall & Sons.

Arthur H. Vinal (1854-1923) practiced architecture in Boston and was City Architect from 1884-88. At various times he was in partnership with Fowler, Doge, and Tracy. Vinal designed many houses on Bay State Road and Commonwealth Avenue, Colonial Apartments at 382 Commonwealth, Kelsey Building on Tremont Street, the Robert Brigham Hospital, Globe (now Center) Theatre at 686 Washington, Boston City Hospital Nurses Dormitory at Harrison Avenue and East Springfield, and his own residence at Melville and Allston in Dorchester. As City Architect he designed several schools and submitted a design for the Boston Public Library in the Richardsonian Romanesque style.

Some controversy surrounded the construction of the High Service building and the office of city architect. The Freestone Cutter's Association of Boston charged that Jeremiah Carew had supplied inferior stone and workmanship. There were thirteen City hearings on the issue which spanned four months and 524 pages of transcripts. The final comment by the Freestone Association was that Vinal "...was at least remiss and negligent..." in his supervision.

The office of City Architect was held by five men: George A Clough, 1874-83; Charles J. Bateman, 1883-84; Arthur H. Vinal, 1884-88; Charles J. Bateman, 1888-89; Harrison H. Atwood (James C. Tucker assisting), 1889-91; and Edmund M. Wheelwright, 1891-95. The position was created to raise the quality of buildings which the City had gotten through private commissions. However, by Vinal's term there were serious questions about the City Architect's ability to improve matters. The American Architect and Building News cited (Feb. 1886) that schools in Boston cost twice as much as those in Chicago. Wheelwright prepared a report when he took office to clarify the record (City Document N. 136, 1891). Much of the blame for high costs of operating the office was placed on the practice of splitting work into small contracts. Wheelwright's report did not help Vinal; it showed 13.5% administrative costs for the years of 1887-88 when the High Service station was being built, almost three times the prevailing architect's commission rate of 5%. Wheelwright attempted to save professional face by lowering the cost of the office to 3% during his term. However, the City, fearful that successors might not be so conscientious, abolished it for an Office of Consulting Architect in 1896.

Edmund M. Wheelwright (1854-1912), also a prominent Boston architect, was born in Roxbury, Massachusetts. He was a Harvard graduate, a student at MIT and the Ecole des Beaus Arts, and an employee of Peabody & Stearns and McKim, Mead & White. The subway headhouses at Park Street on the Common are similar in style to the Effluent Gate House No. 2. As City Architect Wheelwright designed several Boston City Hospital buildings and schools.

The partnership with Parkman B. Haven (1853-1943) began in 1889; a second partner, Edward A. Hoyt, joined the firm in the 1890s. The firm prepared plans for several large public buildings including Horticultural Hall, New England Conservatory of Music, the Opera House of 1908, Jordan Hall, and the State Historical Building in the Fenway. Wheelwright was a consulting architect to Guy Lowell on the design of the Museum of Fine Arts. He died in Dedham after having spent two years in a sanitarium in Connecticut as the result of a nervous breakdown attributed to overwork. Wheelwright was elected a fellow of the American Institute of Architects in 1901. He authored School Architecture (1901) and articles for professional magazines.

Low Service pumping station - This building is one of Boston's very few public buildings designed in the Beaux Arts Classical style. It is also significant as a work designed by the nationally prominent firm of Shepley, Rutan & Coolidge. The Low Service station was constructed as part of the massive expansion plan initiated by the Metropolitan Water Board. It's pumps provided water to Spot Pond, Stoneham and directly to the city. In addition to housing pumps and engines, the tower contained an overflow tank which could hold 31,000 gallons of water. Coal for the engines was brought directly from a siding of the Boston and Albany railroad tracks at the rear of the station.

Beaux-Arts Classicalism takes its name from the Academy des Beaux Arts in Paris. In the last quarter of the 19th century many American architectural students went to Paris and returned to the U.S. to lead successful careers. The style called Beaux-Arts Classicism is set apart from the Neo-Classical Revival and the Renaissance Revival styles with which it was contemporaneous. Characteristic elements of the style include paired or even clustered columns, deeply sculptural ornament and a high parapet or attic. Windows may be enframed by free-standing columns, balustraded sill, and pedimented entablature on top. It is a style almost exclusively used for civic architecture.

The Low Service station exemplifies the shift in American architecture since the High Service station had been built. High style public design was classical; Victorian colors and forms were abandoned for symmetry and classical lines.

The classicalism of the turn of the century used all the modern technology available in its structural underpinnings. Even though the exteriors were faced with stone and made to appear to be masonary construction, the buildings usually contained steel or reinforced concrete. The Chestnut Hill Low Service station is no exception. The foundation sits on previous landfill with boulders, rocks, and earth from the reservoir basins. Plans show iron plates below the three original engines and a metal tank in the tower.

In the event that emergency service is required, two 1974, solar gas turbine engines, housed in the low service building, are still functional.

The Low Service station was built by Norcross Brothers, contractors for many H.H. Richardson buildings and later for Shepley, Rutan & Coolidge. The amount of the contract was $182,659.50.*

Richardson's successor firm, Shepley, Rutan & Coolidge, designed many noteworthy buildings throughout the United States, such as the Lionberger, Tiffany, and Mallinkridt buildings in St. Louis; the original Stanford University campus; the Art Institute and the Chicago Public Library; Vassar Chapel; Government Hospital for the Insane, Washington D.C; Brown University Library; and buildings at the University of Chicago. The Ames Building, a Shepley, Rutan & Coolidge design, was the highest building in Boston when it was completed in 1892 -- the firm located their offices on the top floor. Important Boston area commissions include South Terminal Station, Harvard Medical School, the Easton Buildings on State Street, the Weld Building on Federal Street, the First Parish Church in Brookline, the Episcopal Theological School Library in Cambridge, many houses, the Public Library in New London, Conn., and the First Congressional Church in Fall River, Mass.

Charles Rutan (1851-1914) was born in Newark, N.J., and trained in Boston in the office of Gambrill & Richardson. George Shepley (1860-1903) was born in St. Louis and educated there at Washington University and at MIT. He married Richardson's oldest daughter and died an untimely death at the age of 43. Charles Allerton Coolidge (1858-1936) was born in Boston and educated at Harvard and MIT. His later partners included George C. Shattuck from 1914-1922, and also Coolidge, Shepley (Henry R., son of George), Bulfinch, and Abbott in 1925. Coolidge was married to George Shepley's sister. He was elected a Fellow of the AIA in 1891, he received an honorary Doctor of Arts degree from Harvard in 1906, he was president of the Boston Society of Architects, and he held many public and honorary positions in the course of his long career.

Effluent Gate House No. 1 This is the first structure built in the Chestnut Hill Reservoir complex. Constructed between 1869-70, this gate house contained the major control gates for the Chestnut Hill Reservoir. The structure was constructed to house four pipes, although only two were used. In 1874, two hydraulic gates were installed.

*Given the prolific work of the Olmsted firm in and around Boston at the time of the construction of the Low Service building, an attempt was made to investigate the possibility that landscape work by Olmsted may have been done at Chestnut Hill. Information derived from the Library of Congress Manuscripts Department, holders of the Olmsted firm's papers, has revealed that the firm's only involvement in projects at Chestnut Hill was an instance of the recommendation of possible sub-formen in May, 1904 (work related to the construction of the Low Service building).

Effluent Gate House No. 2 - This gate house was built in 1900-01 as a major component of Metropolitan Water Board's expansion plans, to supply water to the low and high service pumping stations. The Renaissance Revival design is by Wheelwright & Haven, who also designed the High Service addition. It was built by John S. Jacob & Sons for an estimated cost of $10,000. The structure houses three hydraulic gates which control three 60" mains, beneath a cast iron floor.

Connection Chamber - This structure, adjacent to the High Service station, was used to take water from the Cochituate Aqueduct by a four foot main, to the High Service station. This simple, Milford granite structure, was built by the Norcross Brothers.

Buildings and structures with contributing significance - The puddingstone garage is architecturally significant in terms of its relationship to the property as a whole.

Contributing background buildings and structures - The four Pipe Yard buildings, while not significant individually, are part of the completeness of the complex; they do not detract architecturally from the whole composition.

3.3 Relationship to the criteria for Landmark designation

The Chestnut Hill Reservoir and Pumping Stations meet all four criteria for designation as a Landmark, as established in Section 4 of Chapter 772 of the Acts of 1975, as amended. They are:

--inclusion in National Register of Historic Places as provided in the National Historic Preservation Act of 1966; (voted eligible by the Massachusetts Historical Commission in 1977)

--structures, sites, objects, man-made or natural, at which events occurred that have made an outstanding contribution to, and are identified prominently with, or which best represent some important aspect of the cultural, political, economic, military or social history of the city, commonwealth, the New England Region or the nation.

--structures, sites, objects, man-made or natural, associated significantly with the lives of outstanding historic personages;

--structures, sites, objects, man-made or natural, representative of elements of architectural or landscape design or craftsmanship which embody distinctive characteristics of a type inherently valuable for study, of a period, style or method of construction or development, or a notable work of an architect, landscape architect, designer, or builder whose work influenced the development of the city, the commonwealth, the New England region or the nation.

4.0 ECONOMIC STATUS

4.1 Current assessed value and property tax - Assessor's parcel number 2472 which encompasses the Bradlee reservoir basin and a portion of the driveway is 4,804,748 square feet; it is assessed at $21,865,000. Assessor's parcel number 2439 is 345,780 square feet and contains the High Service and Low Service pumping stations, the two stone kiosks, the stone garage, the Pipe Yards buildings, landscaped grounds, parking area and driveways. It is assessed at $1,440,000. The included portion of assessor's parcel number 2442-5 (approximately 9/10 of the total parcel) contains a portion of the Driveway and all of the parkway along the northern boundary of the property. The land area is approximately 688,030 square feet. The assessed value for this City-owned land is $3,551,000. Total assessed value of the parcels above as listed is $26,856,000. All three parcels, two owned by the MDC and one owned by the City, are tax exempt.

4.2 Current ownership, occupancy and status - Parcel number 2472 and 2493 containing the Bradlee Basin and pumping stations are owned by the Metropolitan District Commission, Commonwealth of Massachusetts, and are under the control and management of the Massachusetts Water Resources Authority, Commonwealth of Massachusetts. Parcel number 2442-5 is owned by the City of Boston, Park Department and was leased to the MDC for 99 years, until November 20, 2077. The MWRA is developing a use plan for the Pumping station and its grounds. The MWRA is proceeding with the review of prospective firms for the development of the facility. After the selection process is completed, the MWRA expects a design by January of 1990. The proposed plan is discussed further in the planning section of this report.

5.0 PLANNING CONTEXT

5.1 Background - The Metropolitan District Commission Water Division had developed plans for the Chestnut Hill facility before transfer of operations to the Massachusetts Water Resources Authority took place in July, 1985. The MDC's plans for reuse of the Low Service building included moving its archives into an adapted space, installing a general Water Division operations and control center, and adding another turbine to the present pumping equipment.

The MDC presently owns the Chestnut Hill property (except for parcel 2442-5 which is owned by the City of Boston and is leased to the MDC), and the MWRA operates and manages the facility. Beginning in July, 1985, the MWRA received control of the facility, and a memorandum of understanding created later set the specifications of the MDC-MWRA agreement. It is the MWRA which has planning and developmental control over the property.

5.2 Current planning issues directly or indirectly affecting the property - The Massachusetts Water Resource Authority has developed a plan for use of the Chestnut Hill facility and the summary of the project as presented here is from the Scope of Services Project Summary, an MWRA planning document for the selection of a firm for the project. The current plans of the MWRA propose the use of the two pumping stations, the garage, the pipe yard buildings, and their common grounds. The facility is no longer used for pumping, although two pumps in the Low service building and one in the high service building are operable and will be retained for emergency use. The "Scope of Services" describes in its "Project Summary:"

> The MWRA project consists of the rehabilitation of all the usable space within the low and high service buildings and rehabilitation of the existing pipe yard buildings and/or construction of new buildings at the Chestnut Hill site to consolidate several Waterworks Division functions. It is anticipated the site will house Waterworks Division's Metropolitan Operations staff, a laboratory, trade shops, archives, parking and storehouse facilities, and the new operations center for the central monitoring system.

The intended uses of the buildings on the Chestnut Hill Reservoir as stated in the Scope of Services "Project Summary" are as follows.

1. High Service Building
   a. museum, including "hall of machines" and public display areas (not part of this project)

(1. con't)
b. office area, enclosed and open typing and conference rooms, auditorium, drafting area and record center
c. archives

2. Garage
a. operations center and central monitoring system (not part of this project)

3. Low Service Building
a. laboratory
b. office areas
c. support areas, such as lunchroom, lockers, showers and toilets for men and women, work area for on-the-road staff to fill out reports, area for receiving uniforms

4. Pipe Yard Building
a. trade shops for carpentry, electrical, machine, plumbing and painting activities
b. storehousing
c. garage space

5. Grounds
a. parking for the Authority's vehicles and heavy equipment
b. parking areas for staff and visitors
c. pipe stock storage

The "Project Summary" makes some other specifications regarding the use of these buildings. It states that the proposed museum for the High Service Building is planned to be a combined effort of the MWRA and various private interests; and although the museum design is not a part of this contract, the museum space must be considered in the overall design. The "Summary" also states that any rehabilitation of the High Service Building structure itself, the roof repair in particular, will be done as a part of this project. The museum will occupy approximately 13,000 square feet and will consist of various display areas.

The planned laboratory for the Low Service building is to be an expanded version of the MWRA laboratory at Somerville to meet the new requirements of the 1986 Amendments to the Safe Drinking Water Act. The design should take into consideration specialized needs of a water quality laboratory such as ventilation, exhaust, and room pressure requirements for trace analysis.

The trade shops, maintenance facility, equipment housing and storage requirements are generally expected to be the combination of present operations at the Authority's facilities located at Glenwood Yard, Mystic Shops, and Rutherford Avenue (electronic maintenance personnel only). The MWRA's goal is to relocate as much of the Operations Department to this site as is possible within site constraints.

The facilities at Chestnut Hill are expected to accommodate an aggregate staff of approximately 175 persons, with about 50 to 75 stationed at Chestnut Hill and the others on the road and reporting in and out. The Scope of Services states that the consultant must take into account the surrounding environment for architectural and landscape design. The Scope also states that there are emergency pumps in the basements of both the Low and High Service buildings and the consultant must identify provisions for keeping these pumps intact during the construction phase.

The MWRA is aware of historic preservation considerations regarding the property. The Scope of Work "Project Summary" states"

> The buildings, surroundings, and select pieces of pumping equipment have been identified as being architecturally and historically significant. Every effort must be made to preserve this heritage and all design must conform to the guidelines of the Historical and Landmark Commissions.

The MWRA's Scope of Services states in the "Preliminary Design Phase" that the consultant must "determine required guidelines by State, Federal and other regulatory agencies and Landmark/Historical Commissions applicable to the facility, and coordinate the project with these agencies and commissions." In the "Project Management for Preliminary & Final Design Phases" it is stated that the consultant "prepare for and attend meetings with regulatory agencies and Historic/Landmark Commissions and neighborhood groups."

In 1983, the MDC received a Survey and Planning Grant from the Massachusetts Historical Commission to conduct an historic inventory of Metropolitan Boston's water supply system. The survey identified over 120 structures including 11 in Boston, 8 which are at Chestnut Hill. A Multiple Resource Area Nomination to the National Register of Historic Places has been completed. It is expected that the Massachusetts Historical Commission will hear the nomination in Fall, 1989. If accepted by the Massachusetts Historical Commission, and then the Department of the Interior, the Chestnut Hill Complex would be listed on the National Register of Historic Places.

5.3 Relationship to current zoning - the Chestnut Hill reservoir and pumping station property is divided into several zoning classifications involving housing. They consist of S-.3 single family; R-.5 two family; H-1, H-2, and H-3 apartment zones. The adjacent properties of the MDC Cleveland Circle park/recreation area and the Cassidy Playground/Chestnut Hill Park area are zoned H-2 and S-.3 respectively.

Other planning issues deal with the Chestnut Hill facility or have the potential to effect it. The BRA's Allston-Brighton Iterim Planning Overlay District (IPOD), effective August 18, 1987, states in its statement of purpose the desire "to prevent overcrowding of land [and] to preserve, enhance, and create open space." Under the IPOD's "Open Space Plan," the Allston-Brighton Planning and Zoning Advisory Committee (PZAC) is considering designating the Chestnut Hill Reservoir as open space. The plan is an attempt to recognize "historic, geographic and functional links to historic Allston-Brighton, to activity modes within Allston-Brighton, and to the open space and park system of Boston." Full consideration of this open space designation would take place in the fall of 1989. If approved, designation would place on the property specific land use restrictions defined by the classification given the property by the PZAC (i.e., parkland, recreation, urban wild, etc.).

6.0 ALTERNATIVE APPROACHES

6.1 Alternatives:

Alternatives open to the Boston Landmarks Commission include designation of the entire complex as a landmark, or any component(s) within the complex. The nature of the property, a cohesive unit in terms of development history, common purpose, ownership and/or jurisdiction, suggests designation as a Landmark. The commission may also designate part of the site, within 1200 feet of a Landmark, as a protection area.

The Commission retains the option to not designate specific components or the entire complex. Not designating elements as a Landmark would mean that the City could offer no protection or guidance under future owners.

Landmark designation under Chapter 772 would require the review of physical changes to the exterior of the buildings and specified landscape elements in accordance with the standards and criteria adopted as part of the designation.

An alternative would be the inclusion of the properties on the National Register of Historic Places. The property was voted eligible for listing on the National Register in 1977. If accepted, listing on the Register would offer a limited degree of protection against federal or state undertakings.

6.2 Impact of alternatives:

Landmark designation under Chapter 772 would require the review of physical changes to the exterior of the buildings, included in the designation, as well as the reservoir grounds in accordance with the standards and criteria adopted as part of the designation. It would not, however, affect the use or treatment of the interior of the buildings.

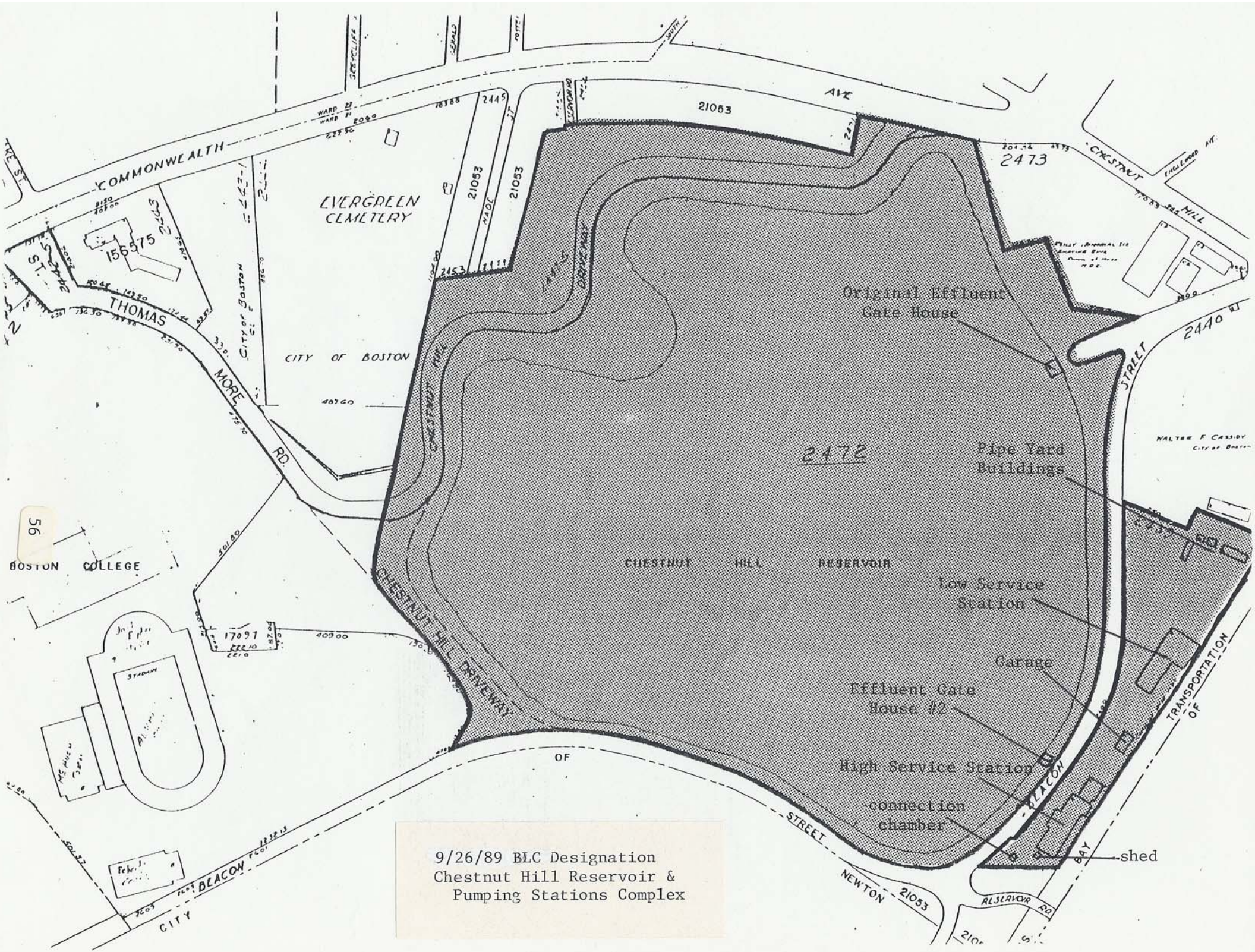
Listing on the National Register of Historic Places would provide protection from federal, federally-licensed or federally-assisted actions undertaken by Section 106 Review process. Similar protection from state-sponsored activities is achieved by the concurrent listings of all National Register properties to the State Register of Historic Places under Chapter 254, General Laws of Massachusetts.

7.0 RECOMMENDATIONS

7.1 Recommended action - The staff of the Boston Landmarks Commission recommends that the Chestnut hill reservoir and pumping stations complex be designated a Landmark under Chapter 772 of the Acts of 1975, as amended.

The boundaries of the proposed designation are the following: all of Parcel 2439; the Bradlee Basin, defined on the east and south sides by the boundary of parcel 2472 (starting at the intersection with Commonwealth Avenue) and on the north and west sides by the Chestnut Hill Driveway; Chestnut Hill Driveway, from the intersection at Beacon Street, proceeding north along the fenceline bordering the Boston College playing field to a line extending across the Driveway along the eastern fenceline of Evergreen Cemetery, and the remaining portion of parcel 2442-5 to the north and east.

See attached map.



9/26/89 BLC Designation
Chestnut Hill Reservoir &
Pumping Stations Complex

8.0 GENERAL STANDARDS & CRITERIA

8.1 Introductory Statement on Standards and Criteria to be used in Evaluating Applications for Certificates

Per sections 4, 5, 6, 7, and 8 of the enabling statute (Chapter 772 of the Acts of the 1975 of the Commonwealth of Massachusetts) Standards and Criteria must be adopted for each Landmark Designation which shall be applied by the Commission in evaluating proposed changes to the property. Before a Certificate of Design Approval or Certificate of Exemption can be issued for such changes, the changes must be reviewed by the Commission with regard to their conformance to the purposes of the statute.

The Standards and Criteria established thus note those features which must be conserved and/or enhanced to maintain the viability of the Landmark Designation.

The intent of these guidelines is to help local officials, designers, and individual property owners to identify the characteristics that have led to designation, and thus to identify the limitation to the changes that can be made to them. It should be emphasized that conformance to the Standards and Criteria alone does not necessarily insure approval, nor are they absolute, but any request for variance from them must demonstrate the reasons for, and advantages gained by, such variance. The Commission's Certificate of Design Approval is only granted after careful review of each application and public hearing, in accordance with the statute.

As intended by the statute a wide variety of buildings and features are included within the area open to Landmark Designation, and an equally wide range exists in the latitude allowed for change. Some properties of truly exceptional architectural and/or historical value will permit only the most minor modifications, while for some others the Commission encourages changes and additions with a contemporary approach, consistent with the properties' existing features and changed uses.

In general, the intent of the Standards and Criteria is to preserve existing qualities that cause designation of a property; however, in some cases they have been so structured as to encourage the removal of additions that have lessened the integrity of the property.

It is recognized that changes will be required in designated properties for a wide variety of reasons, not all of which are under the complete control of the Commission or the owners. Primary examples are:

(a) Building code conformance and safety requirements.

(b) Changes necessitated by the introduction of modern mechanical and electrical systems.

(c) Changes due to proposed new uses of a property.

The response to these requirements may, in some cases, present conflicts with the Standards and Criteria for a particular property. The Commission's evaluation of an application will be based upon the degree to which such changes are in harmony with the character of the property.

In some cases, priorities have been assigned within the Standards and Criteria as an aid to property owners in identifying the most critical design features.

The Standards and Criteria have been divided into two levels: (1) those general ones that are common to almost all landmark designations (subdivided into categories for buildings and landscape features); and (2) those specific ones that apply to each particular property that is designated. In every case the Specific Standard and Criteria for a particular property shall take precedence over the General ones if there is a conflict.

8.2 GENERAL STANDARDS AND CRITERIA

A. APPROACH

1. The design approach to the property should begin with the premise that the features of historical and architectural significance described within the Study Report must be preserved. In general this will minimize the exterior alterations that will be allowed.

2. Changes to the property and its environment which have taken place in the course of time are evidence of the history of the property and the neighborhood. These changes to the property may have developed significance in their own right, and this significance should be recognized and respected. ("Later integral features" shall be the term used to convey this concept.)

3. Deteriorated material or architectural features, whenever possible, should be repaired rather than replaced or removed.

4. When replacement of architectural features is necessary it should be based on physical or documentary evidence of original or later integral features.

5. New materials should, whenever possible, match the material being replaced in physical properties, design, color texture and other visual qualities. The use of imitation replacement materials is generally discouraged.

6. New additions or alterations should not disrupt the essential form and integrity of the property and should be compatible with the size, scale, color, material and character of the property and its environment.

7. Contemporary design is encouraged for new additions; thus, they must not necessarily be imitative of an earlier style or period.

8. New additions or alterations should be done in such a way that if they were to be removed in the future, the essential form and integrity of the historic property would be unimpaired.

9. Priority shall be given to those portions of the property which are visible from public ways or which it can be reasonably inferred may be in the future.

10. Color will be considered as part of specific standards and criteria that apply to a particular property.

B. EXTERIOR WALLS

I. MASONRY

1. Retain whenever possible, original masonry and mortar.

2. Duplicate original mortar in composition, color, texture, joint size, joint profile and method of application.

3. Repair and replace deteriorated masonry with material which matches as closely as possible.

4. When necessary to clean masonry, use gentlest method possible. Do not sandblast. Doing so changes the visual quality of the material and accelerates deterioration. Lest patches should always be carried out well in advance of cleaning (including exposure to all seasons if possible).

5. Avoid applying waterproofing or water repellent coating to masonry, unless required to solve a specific problem. Such coatings can accelerate deterioration.

6. In general, do not paint masonry surfaces. Painting masonry surfaces will be considered only when there is documentary evidence that this treatment was used at some point in the history of the property.

II. NON-MASONRY

1. Retain and repair original or later integral material whenever possible.

2. Retain and repair, when necessary, deteriorated material with material that matches.

C. ROOFS

1. Preserve the integrity of the original or later integral roof shape.

2. Retain original roof covering whenever possible.

3. Whenever possible, replace deteriorated roof covering with material which matches the old in composition, size, shape, color, texture, and installation detail.

4. Preserve architectural features which give the roof its character, such as cornices, gutters, iron filligree, cupolas, dormers, brackets.

D. WINDOWS AND DOORS

1. Retain original and later integral door and window openings where they exist. Do not enlarge or reduce door and window openings for the purpose of fitting stock window sash or doors, or air conditioners.

2. Whenever possible, repair and retain original or later integral window elements such as sash, lintels, sills, architraves, glass, shutters and other decorations and hardware. When replacement of materials or elements is necessary, it should be based on physical or documentary evidence.

3. On some properties consideration will be given to changing from the original window details to other expressions such as to a minimal anonymous treatment by the use of a single light, when consideration of cost, energy conservation or appropriateness override the desire for historical accuracy. In such cases, consideration must be given to the resulting effect on the interior as well as the exterior of the building.

E. PORCHES, STEPS AND EXTERIOR ARCHITECTURAL ELEMENTS

1. Retain and repair porches and steps that are original or later integral features including such items as railings, balusters, columns, posts, brackets, roofs, ironwork, benches, fountains, statues and decorative items.

F. SIGNS, MARQUEES AND AWNINGS

1. Signs, marquees and awnings integral to the building ornamentation or architectural detailing shall be retained where necessary.

2. New signs, marquees and awnings shall not detract from the essential form of the building nor obscure its architectural features.

3. New signs, marquees, awnings shall be of a size and material compatible with the building and its current use.

4. Signs, marquees and awnings applied to the building shall be applied in such a way that they could be removed without damaging the building.

5. All signs added to the building shall be part of one system of design, or reflect a design concept appropriate to the communication intent.

6. Lettering forms or typeface will be evaluated for the specific use intended, but generally shall either be contemporary or relate to the period of the building or its later integral features.

7. Lighting of signs will be evaluated for the specific use intended, but generally illumination of a sign shall not dominate illumination of the building.

8. The foregoing not withstanding, signs are viewed as the most appropriate vehicle for imaginative and creative expression, especially in structures being reused for purpose different from the original, and it is not the Commission's intent to stifle a creative approach to signage.

G. PENTHOUSES

1. The objective of preserving the integrity of the original or later integral roof shape shall provide the basic criteria in judging whether a penthouse can be added to a roof. Height of a building, prominence of roof form, and visibility shall govern whether a penthouse will be approved.

2. Minimizing or eliminating the visual impact of the penthouse is the general objective and the following guidelines shall be followed:

   (a) Location shall be selected where the penthouse is not visible from the street or adjacent buildings; setbacks shall be utilized.

   (b) Overall height or other dimensions shall be kept to a point where the penthouse is not seen from the street or adjacent buildings.

   (c) Exterior treatment shall relate to the materials, color and texture of the building or to other materials integral to the period and character of the building, typically used for appendages.

   (d) Openings in a penthouse shall relate to the building in proportion, type and size of opening, wherever visually apparent.

H. LANDSCAPE FEATURES

1. The general intent is to preserve the existing or later integral landscape features that enhance the landmark property.

2. It is recognized that often the environment surrounding the property has character, scale and street pattern quite different from that existing when the building was constructed. Thus, changes must frequently be made to accommodate the new condition, and the landscape treatment can be seen as a transition feature between the landmark and its new surroundings.

3. The existing landforms of the site shall not be altered unless shown to be necessary for maintenance of the landmark or site. Additional landforms shall only be considered if they will not obscure the exterior of the landmark.

4. Original layout and materials of the walks, steps, and paved areas should be maintained. Consideration will be given to alterations if it can be shown that better site circulation is necessary and that the alterations will improve this without altering the integrity of the landmark.

5. Existing healthy plant materials should be maintained as long as possible. New plant materials should be added on a schedule that will assure a continuity in the original landscape design and its later adaptations.

6. Maintenance of, removal of, and additions to plant materials should consider maintaining existing vistas of the landmark.

I. EXTERIOR LIGHTING

1. There are three aspects of lighting related to the exterior of the building:

(a) Lighting fixtures as appurtenances to the building or elements or architectural ornamentation.

(b) Quality of illumination on building exterior.

(c) Interior lighting as seen from the exterior.

2. Wherever integral to the building, original lighting fixtures shall be retained. Supplementary illumination may be added where appropriate to the current use of the building.

3. New lighting shall conform to any of the following approaches as appropriate to the building and to the current or projected use:

(a) Accurate representation of the original period, based on physical or documentary evidence.

(b) Retention or restoration of fixtures which date from an interim installation and which are considered to be appropriate to the building and use.

(c) New lighting fixtures which are contemporary in design and which illuminate the exterior of the building in a way which renders it visible at night and compatible with its environment.

4. If a fixture is to be replaced, the new exterior lighting shall be located where intended in the original design. If supplementary lighting is added, the new location shall fulfill the functional intent of the current use without obscuring the building form or architectural detailing.

5. Interior lighting shall only be reviewed when its character has a significant effect on the exterior of the building; that is, when the view of the illuminated fixtures themselves, or the quality and color of the light they produce, is clearly visible through the exterior fenestration.

J. REMOVAL OF LATER ADDITIONS AND ALTERATIONS

1. Each property will be separately studied to determine if later additions and alterations can, or should, be removed. It is not possible to provide one general guideline.

2. Factors that will be considered include:

(a) Compatibility with the original property's integrity in scale, materials and character.

(b) Historic association with the property.

(c) Quality in the design and execution of the addition.

(d) Functional usefulness.

9.0 SPECIFIC STANDARDS & CRITERIA

The intention of these standards is to preserve the architectural integrity and appearance of the significant buildings and landforms of the complex, which have been respectfully maintained throughout their history. The general approach is to maintain the relationship between the reservoir, the two pumping stations, and the smaller structures, in a way that reflects the original design of the complex as both a pastoral park and as a functional facility in the water supply system. Should any major restoration or construction projects for any structures within the complex be considered, the Boston Landmarks Commission recommends the proponents consult a building conservator early in the planning process.

All Structures

1. No additions, which are visible from any major vista within the complex, shall be allowed to either the roofs or the facades of the buildings. No existing openings shall be closed. The rear elevations of the high & low service stations, which were not constructed as public elevations, will receive less stringent review than the primary elevations.

2. Window replacement should be done in kind, matching the existing windows in size, shape, configuration and materials, however, alternative replacement windows may be considered.

3. All proposals for visible HVAC equipment shall be reviewed by the Commission, and such equipment shall be concealed within the integral architectural features of the building.

4. No duct work or exposed conduit may be installed on the exterior walls.

5. Original masonry & mortar shall be retained whenever possible.

6. Original mortar shall be duplicated in composition, color, texture, joint size, joint profile, and method of application.

7. Deteriorated masonry shall be repaired and replaced with material which matches as closely as possible.

8. When necessary to clean masonry, the gentlest method possible shall be used. Sandblasting is prohibited. Test patches should always be conducted and examined through a full set of seasons prior to cleaning.

9. Waterproofing or water repellent coating shall not be applied to masonry, unless required to solve a specific problem, since such coatings can accelerate deterioration.

10. Masonry surfaces shall not be painted.

11. No additional lighting fixtures should be attached to the structures, although interior architectural illumination may be appropriate.

12. No new openings in the masonry walls will be allowed.

Low Service Station

1. Any replacement of copper trim that is required shall be done using lead coated copper and matching existing profiles.

2. All iron grillwork shall be retained.

3. The existing roof materials on the belvidere shall be retained. Any replacement shall be done in kind, matching existing color, shape, form, composition and profile.

4. Any replacement doors shall match the existing in size, shape and configuration, and should be paneled to reflect the style of the building.

5. Granite steps shall be retained and any repairs or replacement should be done in kind.

High Service Station

1. The slate roof shall be retained, and any repairs or replacement shall be done in kind, matching existing in shape, color, composition, form, and profile.

2. The gutters, downspouts, and other existing copper trim shall be repaired or replaced in kind, using red copper and matching existing profile.

3. Repair and cleaning of the "Metropolitan Water Works" signboard is encouraged.

4. Any replacement doors shall be representative of the style of the building.

5. The small kiosk adjacent to the southwest elevation of the High Service building need not be retained.

Connection Chamber

1. Because materials and style of this building reflect that of the High Service Station, the same standards and criteria apply. It is also encouraged that the infill on this structure's windows be removed and replacement be done according to the above-mentioned standards (as mentioned in "All Structures").

Effluent Gate House #2

1. The grill work on the windows and door shall be retained.

2. Removal of the window infill and window replacement is encouraged. Wood replacement windows are preferable, but other materials may be considered. Windows should compliment the character of the building.

3. The entry door shall be retained; repair and cleaning is recommended.

4. The copper roof shall be retained and any repairs or replacement shall be done in kind. All roofing detail and decoration must be retained or replaced in kind. No roof alterations, projections, or additions shall be allowed.

5. The entrance gate and steps to the gate house shall be retained and repaired as needed.

Effluent Gate House #1

1. Removal of the window infill and window replacement is encouraged. Wood replacement windows are preferable, but other materials may be considered. Windows should compliment the character of the building.

2. All roofing detail and decoration must be retained and repaired or replaced in kind. No roof alterations, projections, or additions shall be allowed. The shape and pattern of the slate shingles shall be retained, and replaced in kind when necessary.

3. Masonry steps and retaining wall shall be retained. Railings similar to the style of this gatehouse should be investigated, for replacement of the pipe railing that exists.

Pipe Yard Buildings

1. Retention and rehabilitation of original buildings is encouraged.

2. If new construction is needed in the pipe yard area, structures should be similar in size and scale to existing pipe yard structures.

3. Any need for additional parking in this area should be designed in keeping with the naturalistic setting of the complex. Where appropriate plantings should be used to screen parking.

Garage

1. If window replacement is necessary, wood replacement windows are preferable, but other materials may be reviewed. Windows should match the existing in size, shape and configuration.

2. The cast stone parapet shall be retained.

3. Replacement of doors should be done in keeping with the scale, style and character of the building.

Landscaping

The general intent is to preserve, as much as possible, the character of the scenic drive, pastoral setting, and original land forms as originally designed and as later compatibly designed. The development of additional hard surfaced facilities is to be avoided. Maintenance and replacement of existing trees and other existing elements should be done in a manner consistent with the site's character. New elements, if any, should be designed to be as unobtrusive as possible.

1. The form of the reservoir and the materials visible above the water line shall be retained.

2. Any changes to the present appearance shall respect the naturalistic and pastoral character of the original design. Formal plantings on any of the complex's grounds are discouraged.

3. The reservoir fence shall be retained. The pineapple finials of the fence shall be retained and replaced in kind where appropriate.

4. The Commission has no desire to interfere with normal maintenance procedures. Standards mentioned below for roadways shall apply to the Chestnut Hill Driveway, but shall not apply to Beacon Street. Beacon Street shall be exempt from review unless major alterations in alignment are proposed. In order to provide some guidance, the activities which might be expected to take place, and which might be construed as causing an alteration to the physical character of the property, have been categorized into:

   -- Activities for which no application need be filed for a Certificate from the Commission;

   -- Activities for which a Certificate of Design Approval or Certificate of Exemption must be obtained from the Commission.

   4.1. The following activities shall <u>not</u> be subject to review by the Commission.

      a. Normal pruning and feeding of trees and shrubs; removal of dead trees and shrubs;
      b. Removal of live, but unhealthy trees or shrubs;
      c. Minor repairs to road surfaces and paths involving no changes in materials or design;
      d. Mowing, plowing, cleaning, and similar activities;
      e. Events and recreational activities.

   4.2. The following activities will be reviewed:

      a. New construction of any type (including buildings, structures, roads, paths, parking area);
      b. Reconstruction of roads and paths;
      c. Major planting of new trees; cutting down or removal of live healthy trees; new grouping of trees; changes in type of trees;
      d. Additions or removal of major planting area(s);
      e. Changes in landform.

5. In the case of an activity not explicitly covered in these Standards and Criteria, the Executive Director or his or her designee shall determine whether an application is required and if so, whether it shall be for an application for a Certificate of Approval or Certificate of Exemption.

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