Highest and Best Use

The highest and best use of this property would appear to be for residential development. However a further study of the general shape of the parcel and the location of the two large bunkers indicates that residential development would present one of two problems. To use only that land which is readily available would result in a loss of approximately eight acres occupied by the bunkers. Too, the entryways to the bunkers would require sealing and covering. This would leave the developers faced with the disposal of the two areas to the town, for park areas, or to the residents of the completed development.

The alternative would be to demolish the bunkers to reclaim the eight acres. The cost of such a project would be prohibitive.

Therefore the highest and best use of the land is for park and recreation or educational purposes. Under such uses the bunkers could probably be put to some practical use.

Land Value

The subject property is the largest parcel of undeveloped residential land in the more exclusive section of Nahant. Few sales of acreage have occurred since 1960 and none comparable in size to the subject property.

Sales

No. 1

Grantor:	Maurice A. Goldman
Grantee:	Bass Realty Corporation
Location:	Bass Neck Estate
Date:	6/10/60
Area:	6.29 Acres
Consideration:	$40,000.00 or $6359.00 per acre
Confirmed:	Frank Boland, Clerk to Board of Assessors
Comments:	This is level land with 600 feet of frontage on a paved road. It has water frontage. Electricity, sewer and water are available in the road. The location is superior to the subject. The entire road frontage is usable as compared to about 500 feet of the approximate 650 feet at the subject.

A PROPOSAL

FOR A MARINE SCIENCE RESEARCH INSTITUTE

AT NORTHEASTERN UNIVERSITY

NORTHEASTERN UNIVERSITY
Boston, Massachusetts

April, 1965

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A PROPOSAL FOR A MARINE SCIENCE RESEARCH INSTITUTE AT NORTHEASTERN UNIVERSITY

Introductory Statement

Northeastern University has for several years been interested in purchasing a shore site on which it could develop facilities for proposed marine biology and environmental engineering programs. Preliminary negotiations have been carried out for various properties both north and south of Boston. The Nahant property described in this application was first brought to the attention of the University by Mr. C. L. Bradley, Chairman of the East Point Subcommittee of the Nahant Conservation Commission. Inspection by officers and faculty of the University has led us to believe that this site will best serve our purposes and allow us to carry out our objectives within reasonable distance of the Boston campus.

In event the University can acquire title to this East Point Nahant property it proposes to establish a Marine Science Research Institute. This Institute would provide a year-round facility for research and instruction in the marine sciences and related fields for Northeastern, as well as other universities and the medical research institutions of Greater Boston.

Interest in the marine sciences has never been higher. For centuries the oceans have provided man with an important means of transportation and with much of his food. The importance of these two functions will increase rather than decrease in the years ahead. Man will also utilize the vast mineral resources locked up in ocean waters and in the lands beneath the sea; even seawater itself will become an important source of fresh water for industry, agriculture and domestic use.

A greater knowledge of the oceans and their floors will become essential for national security, because of the implications of the submarine, long-term weather forecasting, and the disposal of radioactive wastes in ocean water. In addition, studies of marine life under varying conditions - such as high pressures - will have important applications in medicine and in our understanding of life in other environments, including those found in space and on other planets.

Northeastern's Proposed Marine Science Research Institute

Marine laboratories operated by universities and similar non-profit organizations account for the largest share of oceanic research today. There is no marine laboratory in the Greater Boston area, however, despite the presence of numerous educational institutions, many of them among the most distinguished in the world.

For this reason, Northeastern University proposes to establish a Marine Science Research Institute, hereafter referred to as the Institute, at Nahant, a rocky promontory extending out into the Harbor north of Boston. Here the University will provide a year-round facility for marine research. The Institute will serve the needs of Northeastern's own research and instructional programs primarily, but provisions will also be made for investigators from other institutions both at home and abroad.

Researchers in hospitals, medical research institutions, and Government laboratories located in the Greater Boston area urgently need a year-round facility for investigations that require high-quality circulating seawater. The Institute will attract researchers from outside the Boston area as well, because of the ready access to Greater Boston's world famous universities, hospitals, and library collections.

Supervision of the proposed Institute will be provided by an Administrative Committee, headed by Professor Nathan W. Riser, Chairman of Northeastern's Department of Biology. Dr. Riser and other members of the Administrative Committee will be guided by a Scientific Advisory Committee, chosen from senior investigators in the marine sciences. Research space at the Institute not needed by the University will be allocated by these committees on the basis of the scientific worth of the proposed investigation.

A Unique Shore Front Location

Northeastern University seeks to obtain from the General Services Administration the tract of land forming East Point at Nahant, Massachusetts. The tract consists of approximately 28.44 acres, of which the U. S. Navy will reserve 8.30 acres for its own use.

Despite its relatively small area, Nahant has an unusually diverse fauna and a wide variety of littoral habitats, ranging from rockbound cliffs and sandy beaches on the seaward side, to tidal mud flats on the landward side. The University seeks to acquire the whole of East Point in order to make it a wildlife preserve. Only in this way can the unusual littoral and benthonic faunas be protected adequately. In addition, the University can assure that pollution will not jeopardize the continued high quality of the seawater for laboratory studies.

The land now controlled by the General Services Administration at East Point contains several buildings that have undergone extreme vandalism. Only one of these buildings will be used by the University. It is a well-constructed, one-story, cinder-block building containing

approximately 20,000 square feet of floor space. Here the University will develop wet laboratories and other research areas.

Additional facilities to be constructed by the University initially will include a pump house and storage tank for salt water and quarters for a caretaker. Rowboats for near-shore investigations will be provided, and docking facilities for seagoing research vessels are available in nearby Dorothy Cove.

Fields to be Investigated by the Institute

Northeastern's proposed Institute at Nahant will provide a unique research and instructional tool for many departments at the University. Rental of laboratory space to investigators from other institutions will also be an important function of the Institute.

Biology

The Department of Biology proposes to use the Nahant site for the study of phyto-and zooplankton and for algology studies. Sanitary microbiologists in the Department will find the location highly advantageous for their studies on harbor pollution. Basic studies on microbial ecology, microbial associations and microbial variation patterns related to seasonal and other physical changes can be carried out only in the natural environment of the organisms. The Nahant site would make feasible studies on the interchange of microorganisms between marine, brackish, freshwater and terrestrial environments. Essential studies on interrelationships between bacteria and marine animals, including zoonoses, as well as studies on the physiological relationship between microbial organisms and boring and fouling organisms, require a facility with running seawater such as that proposed at Nahant.

Students will come to Nahant for Biology field trips, and the Department will utilize the site for growing land plants in a greenhouse and for growing marine plants along the shoreline. The Nahant site will also serve as a supply area for research and teaching needs at the Institute and at the University. Sea urchin eggs, for example, are in constant demand for cancer research and embryology studies.

The shoreline storage tank for salt water will have several important uses, including the maintenance of continuously circulating, high quality, high salinity water to provide a controlled environment in which marine life can be kept for observation and experimentation.

At some future date, biologists and/or engineers at the University may well find themselves engaged in research dealing with the possibilities of human life beneath the surface of the sea, both on a short term or long-term basis. The Nahant site, with its rapid drop-off into deeper waters, would provide an ideal location for such studies.

Chemistry.

Dr. Conrad M. Jankowski, Associate Professor of Chemistry at Northeastern University, specializes in analytical measurements and is particularly interested in extending his current studies in environmental analytical chemistry to oceanographic chemistry.

Recent work in the field of oceanographic analytical chemistry has been based upon samples that have been removed from their normal "habitat," and thus have been changed by the sampling process and by their new laboratory environment. The Nahant site will permit development of instruments and sampling techniques for underwater use, so that samples will undergo as little change as possible prior to their analysis.

It is proposed that the ionic strength and the concentration of biologically significant ions, such as calcium, iron, and magnesium, be measured and compared with measurements previously reported for "removed" samples. It is also proposed that the necessary instrumentation be designed to measure the highly variable carbon dioxide content of seawater. These measurements could be used to map ecologic zones.

In the years ahead, the Department of Chemistry anticipates increased research activity in the fields of chemical oceanography and marine biochemistry. The proposed Marine Science Institute at Nahant would greatly assist members of the Department's staff in making research contributions in these fields.

Chemical Engineering

For the past seven years Northeastern University's Department of Chemical Engineering has been engaged in research on heat exchanger surfaces very similar to those used in apparatus for the conversion of saline water. In addition, the Department currently plans to begin an investigation of the thermosiphon phenomenon, which is common to most of the distillation units used in saline water treatment. Establishment of the proposed Institute would enable the Department to move part or all of this research to the Nahant location.

Several members of the staff of the Department of Chemical Engineering have done research on the corrosive effects of seawater in the past, and the Department currently offers a graduate course in the field of corrosion. Acquisition of the Nahant site by the University would undoubtedly stimulate research at Northeastern in this important field.

Civil Engineering

The Department of Civil Engineering at Northeastern University could make immediate use of the Nahant site for instructional work in surveying.

The location offers numerous possibilities for taking observations, for electronic, gravimetric and seismic measurements, and for hydrographic surveying.

The Department would also use the site for research and instruction in such aspects of sanitary engineering as conversion of saline water, air pollution and dispersion, and waste-water disposal in salt water, including its effect on marine life.

In addition, the Department would conduct much of its materials research at Nahant. The site would make an excellent exposure station for studies of the resistance of materials and coatings to saline water. Research could also be conducted on concrete to compare the effects of natural freeze and thaw with laboratory cycles.

Mechanical Engineering

During the summer of 1964, Northeastern University's Department of Mechanical Engineering cooperated with the Woods Hole Oceanographic Institute on a corrosion fatigue study of aluminum and steel alloys in a salt water environment. The proposed Marine Science Institute at Nahant would encourage further materials studies in a marine environment, as well as possible future cooperation with Woods Hole in this and other areas. A further area of interest might be a pilot saline water conversion plant.

Electrical Engineering

Research efforts currently underway in the University's Department of Electrical Engineering necessitate the establishment of radio communication with remote sites in such areas as Greenland and New Mexico. Efforts to establish communication from Northeastern's Huntington Avenue Campus have

been only moderately successful because of the intense man-made noise. Locating a radio transmitter at Nahant would in large part overcome these problems.

The Department is also presently engaged in atmospheric research involving night airglow observation. Several stations around the world are now obtaining suitable data, but conditions at the Huntington Avenue Campus do not permit local observations of a meaningful nature. A facility away from the dust and contamination of the city would be of great value.

Northeastern University and the University of Florida have jointly prepared a research proposal that will be submitted through the Air Force Missile Test Center in Cocoa Beach, Florida. The proposal concerns the improvement of ionospheric high frequency channels used for data transmission, and the research involved requires a reasonably quiet radio environment. The Nahant location would provide this location.

In future years, the Department of Electrical Engineering foreseas extensive use of the Nahant site for research in the general area of communications, because the site is away from the coastal landmass and is in a good radio and atmospheric environment. In addition, acquisition of the Nahant site would undoubtedly stimulate faculty currently on the Department's staff who are interested in the field of underwater acoustics, but not active in this field at the present time.

Northeastern University understands that the U. S. Navy plans to use the 8.30 acre tract that it has reserved at East Point for Electronic research. Northeastern's Department of Electrical Engineering looks forward to possible cooperation with the U. S. Navy in this research once the University's new Institute is established.

Bio-medical Engineering

Bio-medical engineers are interested in the effects of physical agents - such as high pressures, electromagnetic radiation at various wavelengths, and electric and magnetic fields - on the growth, development, metabolism and function of various species of marine organisms. Already marine organisms are being used in embryological studies and in studies on teratogenesis.

Many individuals, qualified in the engineering or physical sciences, are interested in applying their backgrounds and techniques to problems in the biological sciences. Such problems include (1) the study of electrical properties of various marine organisms, (2) the study of physiological and behavioral processes by means of small telemetry units for attachment to the organism, using techniques which will allow transmission of information through the aqueous medium, and (3) the investigation of various biological sensors and transducers within the organism. Northeastern's proposed Marine Science Institute can provide an important facility for training and research in the field of bio-medical engineering.

Natural Science

Northeastern University's Department of Natural Science now offers elective courses in General Oceanography and Conservation of Natural Resources. The Nahant site will provide for the Department an ideal outdoor laboratory for field trips and marine projects related to these courses, as well as other courses currently offered in the natural sciences.

In the years ahead, studies are envisioned in the productivity of marine ecosystems, taking into account seasonal changes in temperature, salinity and available nutrients. Natural fluctuations in the available marine flora and fauna at Nahant would provide an ideal situation to study

the effects of pollution and of man's encroachment into the sea. Additional studies should result as man increases his utilization of natural resources at the edge of the sea. Their utilization will require more knowledge about the physical, chemical and biological character of in-shore marine environments.

Additional Uses for the Nahant Site

Northeastern University seeks to utilize the Nahant site to its fullest potential. For this reason, activities other than those just mentioned would be permitted, provided that they did not interfere with the scientific activities of the proposed Institute.

The University has an active Underwater Society, for example, with a membership of more than seventy-five young people - one of the largest underwater societies on any college campus in the nation today. The membership includes many trained scuba divers who are eager to volunteer their time for the research activities of the proposed Institute. At present, members of the Society are called upon by the American Littoral Society to assist in such projects as making fish counts. Northeastern's Underwater Society would use the Nahant site as a training and exploration area.

The University's Boston-Bouve' College has several programs in physical education and recreation that involves marine activities. Life saving is currently being taught in pools and fresh water lakes, but future instructors also need experience under simulated beach life saving conditions as well. In addition, the Nahant site would also be an ideal location for sailing instruction and recreational sailing.

The full range of additional activities which could be carried on at the Nahant site cannot now be fully anticipated. As the proposed Institute develops, other ways in which to utilize the facility will undoubtedly be uncovered. Students in fine arts courses, for example, might come here for instruction in sketching and painting.

Northeastern University's Financial Capability

Northeastern University will use its own resources to assure the development of the proposed marine science research institute, and operate it as part of the total educational program of the University. The annual operating budget of Northeastern University is now $15,800,000 per year, and the total gross corporate assets are $56,000,000. The University is engaged in a $52,100,000 general development campaign and its assets are growing at a steady rate.

An expenditure of $45,000 has been authorized for preparation of the site including general clean-up and the demolition of existing buildings damaged beyond repair by vandals.