



DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
2600 ARMY PENTAGON
WASHINGTON, DC 20310-2600

DAEN

SEP 30 2013

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on navigation improvements for Boston Harbor, Massachusetts. It is accompanied by the reports of the New England District Engineer and the North Atlantic Division Engineer. These reports were prepared in response to a study authority contained in a Senate Subcommittee on Public Works Resolution dated September 11, 1969, which directed the Secretary of the Army to conduct a study to determine whether any modifications of the recommendations contained in the report of the Chief of Engineers on Boston Harbor, Massachusetts, published as House Document Numbered 733, Seventy-ninth Congress, and other pertinent reports, are advisable at this time, with particular reference to modifying the project dimensions of the Main Ship Channel from deep water in Broad Sound to the upstream limit of the federal project in the Mystic River. Further, the Energy and Water Development Appropriations Act for Fiscal Year 2000 provided funds to initiate the study with language requesting an evaluation of the deepening of the Main Ship, Reserved and Entrance Channels to Boston Harbor. Preconstruction, engineering and design activities for the Boston Harbor Navigation Improvement Project will continue under the authorities cited above.
2. The reporting officers recommend authorization of a project that will contribute significantly to the economic efficiency of commercial navigation in the New England region. Boston Harbor is located on the North Atlantic U.S. coast about 240 miles northeast of New York City and is New England's largest port. The harbor consists of entrance channels extending about three miles from Massachusetts Bay to President Roads, the main ship channel connecting the Roads to the inner harbor, anchorage areas in the Roads and lower inner harbor, and three principal deep-draft industrial tributaries in the Reserved Channel, Mystic River and Chelsea River. Improvements were considered from deep water in Massachusetts Bay to the heads of deep draft navigation on the three tributaries. The recommended plan will result in transportation cost savings by allowing cargo to shift from overland transport to ship transport and allowing the larger Post-Panamax vessels to operate more efficiently and experience fewer tidal and transit delays. The Massachusetts Port Authority (Massport) is the non-federal cost-sharing partner.
3. The reporting officers identified a plan for navigation improvements to four separable segments of the existing project which will contribute significantly to the economic efficiency of commercial navigation in the region. The recommended plan is the National Economic Development (NED) Plan and is supported by the non-federal sponsor.

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

a. Main Channels Improvement Plan: The first improvement would provide deeper access from Massachusetts Bay to Massport's Conley Terminal on the Reserved Channel in South Boston. A depth of -51 feet at mean lower low water (MLLW) would be provided in the present 40-foot deep lane of the Broad Sound North Entrance Channel from the Bay to the Outer Confluence (approximately 3.4 miles), with the channel widened in the bend opposite Finn's Ledge. A depth of -47 feet MLLW would be provided in the Main Ship Channel between the Outer Confluence and the Reserved Channel, the President Roads Anchorage, the lower Reserved Channel along the Conley Terminal, and the Reserved Channel Turning Area (approximately 4.5 miles). The Main Ship Channel above the Roads would be widened to 900 feet downstream of Castle Island and 800 feet upstream of Castle Island to the turning area (approximately 1.7 miles), with additional width provided in the channel bends. The Reserved Channel Turning Area would be widened to 1500 by 1600 feet, and further widened in its transition to the Reserved Channel (approximately 0.5 miles).

b. Main Ship Channel Deepening Extension to Massport Marine Terminal: The second improvement would extend the deepening of the Main Ship Channel upstream of the Reserved Channel Turning Area to the Massport Marine Terminal (approximately 0.5 miles), at a depth of -45 feet MLLW and width of 600 feet. Massport would provide a depth of at least -45 feet MLLW in the berth at the Marine Terminal.

c. Mystic River Channel at Medford Street Terminal: The third improvement would deepen an approximately nine acre area (1350 feet by 575 feet) of the existing -35-foot MLLW lane of the Mystic River Channel to -40 MLLW feet to improve access to Massport's Medford Street Terminal in Charlestown. Massport has already deepened the berth at this terminal to -40 feet MLLW and would maintain that depth in the future.

d. Chelsea River Channel: The fourth improvement would deepen the existing -38-foot MLLW Chelsea River Channel to -40 feet MLLW (approximately 1.9 miles). The channel would be widened by about 50 feet along the East Boston shore in the bend immediately upstream (approximately 0.3 miles) of the McArdle Bridge and in the bend downstream of the Chelsea Street Bridge (approximately 0.3 miles). This recommended improvement is contingent on agreement of the five principal terminals to deepen their berths to at least -40 feet MLLW.

4. The project would require the removal of approximately 11 million cubic yards of dredged material and one million cubic yards of rock. The U.S. Environmental Protection Agency (EPA) has concurred in the determination that the improvement project dredged materials are parent materials (material below the authorized depth and not previously disturbed) of largely glacial origin and acceptable for unconfined ocean water placement. The recommended plan requires placement of all dredged material and rock at the Massachusetts Bay Disposal Site. However, it is the policy of the U.S. Army Corps of Engineers to use dredged material, where practicable, for beneficial use. Potential beneficial uses for the rock and other dredged materials were considered by the reporting officers. Use of the rock for offshore reef creation and shore

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

protection projects will be investigated in partnership with the state during project design. The feasibility of a concept from EPA to use the other dredged materials to cap the former Industrial Waste Site in Massachusetts Bay will also be investigated in partnership with that agency and others during project design to finalize plans. None of these potential beneficial uses are expected to add to the cost of the project and will be done within budgeted authorized amount.

5. Project costs are allocated to the commercial navigation purpose and are based on July 2011 price levels escalated to October 2012.

a. Project First Cost. The estimated project first cost of construction is \$304,695,000 which includes the cost of constructing General Navigation Features (GNF) and the value of lands, easements, rights-of-way (LER) and relocations estimated as follows: \$286,971,000 for channel modification and dredged material placement; \$169,000 for LER provided by the non-federal sponsor; \$6,525,000 for planning, engineering and design efforts; and \$11,030,000 for construction management.

b. Estimated federal and non-federal shares: The estimated federal and non-federal shares of the project first cost are \$212,084,000 and \$92,611,000, respectively, as apportioned in accordance with the cost sharing provisions of Section 101(a) of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2211(a)), as follows:

(1) The cost for deepening GNF under the Main Channels Improvement Plan to -47 feet (-51 feet in the entrance channel) to access the Conley Container Terminal will be shared as follows:

(a) The cost of \$207,825,000 for deepening the GNF to -45 feet MLLW (49 feet in the entrance channel) will be shared at the rate of 75 percent by the government and 25 percent by the non-federal sponsor. Accordingly, the federal and non-federal shares of this zone of deepening are estimated to be \$155,869,000 and \$51,956,000, respectively.

(b) The cost of \$65,241,000 for deepening the GNF from -45 feet to -47 feet MLLW (from -49 feet to -51 feet in the entrance channel) will be shared at the rate of 50 percent by the government and 50 percent by the non-federal sponsor. Accordingly, the federal and non-federal shares of this zone of deepening are estimated to be \$32,620,500 and \$32,620,500, respectively.

(2) The costs of for deepening GNF under the Main Ship Channel Deepening Extension to Massport Marine Terminal segment to 45 feet will be shared at the rate of 75 percent by the government and 25 percent by the non-federal sponsor for depths up to 45 feet. The total cost for GNF in this reach is \$17,308,000 with \$12,981,000 in federal costs and \$4,327,000 in non-federal costs. A Limited Re-evaluation Report (LRR) is anticipated for this project segment during project design to confirm anticipated benefits and depth optimization.

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

(3) The costs for the deepening GNF under Mystic River Channel at Medford Street Terminal segment to 40 feet will be shared at the rate of 75 percent by the government and 25 percent by the non-federal sponsor. The total cost for GNF in this reach is \$2,419,000 with \$1,814,000 in federal costs and \$605,000 in non-federal costs. A LRR will be prepared for this project segment during project design to confirm anticipated benefits and depth optimization.

(4) The costs for the deepening GNF under Chelsea River Channel segment to 40 feet will be shared at the rate of 75 percent by the Government and 25 percent by the non-federal Sponsor. The total cost for GNF in this reach is \$11,734,000 with \$8,801,000 in federal costs and \$2,933,000 in non-federal costs.

(5) In addition to payment by the non-federal sponsor of its share of costs as estimated and described in sub-paragraphs b(1), b(2), b(3) and b(4) above, the estimated non-federal share of \$92,611,000 includes \$169,000 for the estimated value of LER that it must provide pursuant to Section 101(a)(3) of WRDA 1986, as amended (33 U.S.C.2211(a)(3)).

c. Additional 10 Percent Payment. In addition to payment by the non-federal sponsor of its share of the project first costs determined in sub-paragraphs b(1), b(2), b(3), and b(4) above, pursuant to Section 101(a)(2) of WRDA 1986, as amended (33 U.S.C. 2211(a)(2)), the non-federal sponsor must pay an additional 10 percent of the cost of the general navigation features of the project in cash over a period not to exceed 30 years, with interest. The additional 10 percent payment without interest is estimated to be \$30,453,000. The value of LER and relocations, estimated as \$169,000, provided by the non-federal sponsor under Section 101(a)(3) of WRDA 1986, as amended, will be credited toward payment of this amount.

d. Operations and Maintenance Costs. Due to lack of sediment sources the existing maintenance frequency at Boston Harbor ranges between 16 and 41 years depending on the project segment. The additional annual cost of operation and maintenance for this recommended plan is estimated at \$338,000. In accordance with Section 101(b) of WRDA 1986, as amended (33 U.S.C. 2211(b)), the non-federal sponsor will be responsible for an amount equal to 50 percent of the excess of the cost of the operation and maintenance of the project over the cost which would be incurred for operation and maintenance of the project if the project had a depth of 45 feet. The federal government would be responsible for \$322,000 of the incremental annual operations and maintenance costs and the non-federal sponsor would be responsible for the remaining \$16,000.

e. Associated Costs. Estimated associated costs of \$3,679,000 include \$3,405,000 for dredging of non-federal berthing areas adjacent to the federal channel (non-federal expense) and \$274,000 for aids to navigation (U.S. Coast Guard expense).

f. Authorized Project Cost and Section 902 Calculation. The project first cost for the purpose of calculating the maximum cost of the project pursuant to Section 902 of WRDA 1986, as amended, includes the cost of constructing the GNFs and the value of LER. Accordingly, as

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

set forth in paragraph 5.a, above, based on July 2011 price levels escalated to October 2012, the total estimated project first cost for these purposes is \$304,695,000 with an estimated federal share of \$212,084,000 and an estimated non-federal share of \$92,611,000. Based on a discount rate of 3.75 percent, and a 50-year period of economic analysis, the project average annual benefits and costs are estimated at \$103,469,000 and \$14,305,000, respectively, with resulting net excess benefits of \$89,191,000 and a benefit-to-cost ratio of 7.2 to 1.

6. The goals and objectives included in the Campaign Plan of the Corps have been fully integrated into the Boston Harbor planning process. The recommended plan was developed in coordination and consultation with various federal, state and local agencies using a systematic and regional approach to formulating solutions and evaluating the benefits and impacts. The project supports the President's National Export Initiative (Executive Order 13534) by improving the private sector's ability to export products at the Boston Harbor.

7. Risk and uncertainty were evaluated for economic benefits, costs, and sea level rise. Economic sensitivities examined the effects of reducing or increasing the number of carrier services calling on Boston, confidence limits on container volume shifts and growth, use of different vessel loading factors, limits on vessel drafts, and changes in sizes of vessels in service. In accordance with the Corps Engineering Circular on sea level change the study analyzed four sea level rise rates. Historic, baseline, mid-level and maximum expected sea level rise were estimated at 0.4, 0.9, 1.6 and 2.3 feet, respectively, over the 50-year project life. The study concluded that no impact would result from sea level rise with respect to dredging and channel use, and that terminal facilities would continue to operate under all conditions.

8. In accordance with the Corps Engineering Circular on review of decision documents, all technical, engineering, and scientific work underwent an open, dynamic, and vigorous review process to ensure technical quality. This included District Quality Control, Agency Technical Review (ATR), Policy and Legal Compliance Review, Cost Engineering Directory of Expertise (DX) Review and Certification, Model Review and Approval, and Independent External Peer Review (IEPR). All concerns of the ATR have been addressed and incorporated into the final report. The IEPR was completed by Battelle Memorial Institute in June 2008. The panel had 14 comments, five of which they considered significant. The comments pertained to transportation cost savings documentation, port fees, vessel fleet analysis, impacts to water quality and air quality, blasting impacts, beneficial use of rock, and design analyses. In response to economic comments by both the IEPR and Corps Headquarters, more extensive analysis of the project's economic assumptions and benefits evaluation was conducted from 2009 to 2012. A revised economic analysis was conducted which resulted in a project depth of -47 feet MLLW that reasonably maximizes net benefits in the inner harbor segments of the Main Channels Improvement Plan. In response, the final Feasibility Report and Final Supplemental Environmental Impact Statement were expanded to include additional information and the revised recommendation.

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

9. Washington level review indicates that the plan recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The plan complies with all essential elements of the U.S. Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation Studies. Further the recommended plan complies with other administration and legislative policies and guidelines. The views of interested parties, including federal, state and local agencies, have been considered. State and agency comments received during review of the final report and environmental assessment were addressed. Concerns expressed by the National Ocean and Atmospheric Administration's National Marine Fisheries Service included dredging effects, potential blasting effects, the capping of the industrial waste site, Essential Fisheries Habitat impacts, Fish and Wildlife Coordination Act, and Endangered Species Act effects. The EPA expressed concerns regarding the beneficial use of both ordinary dredged material and rock, removal of rock from the project area by blasting, and air quality impacts. The Federal Aviation Administration expressed concerns that birds will be attracted to the exposed dredged material during the dredging process in the flight path for Boston Logan International Airport.

10. I concur with the findings, conclusions, and recommendation of the reporting officers. Accordingly, I recommend that navigation improvements for Boston Harbor be authorized in accordance with the reporting officers' recommended plan at an estimated cost of \$304,695,000, with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 101 of WRDA 1986, as amended (33 U.S.C. 2211). The non-federal sponsor would provide the non-federal cost share and all lands, easements, and rights-of-way, including those necessary for the borrowing of material and the disposal of dredged or excavated material, and would perform or assure the performance of all relocations, including utility relocations. This recommendation is subject to the non-federal sponsor agreeing, in a Design Phase Agreement prior to initiating project design, and in a Project Partnership Agreement prior to project implementation, to comply with all applicable federal laws and policies, including but not limited to the following requirements:

a. Provide, during the periods of design and construction, funds necessary to make its total contribution for commercial navigation equal to:

(1) 25 percent of the cost of design and construction of the GNFs attributable to dredging to a depth in excess of -20 feet MLLW but not in excess of -45 feet MLLW, plus

(2) 50 percent of the costs attributable to dredging to a depth over -45 feet MLLW;

b. Provide all LER, including those necessary for the borrowing of material and placement of dredged or excavated material, and perform or assure performance of all relocations, including utility relocations, all as determined by the government to be necessary for the construction or operation and maintenance of the GNFs;

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the GNFs, an additional amount equal to 10 percent of the total cost of construction of GNFs less the amount of credit afforded by the government for the value of the LER and relocations, including utility relocations, provided by the non-federal sponsor for the GNFs. If the amount of credit afforded by the government for the value of LER, and relocations, including utility relocations, provided by the non-federal sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the non-federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LER and relocations, including utility relocations, in excess of 10 percent of the total costs of construction of the GNFs;

d. Provide, operate, and maintain, at no cost to the government, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the government, including but not limited to the following;

(1) Providing depths in at least two berths at elevations at least three feet deeper than that provided by the federal channels accessing the Conley Terminal.

(2) For the Main Ship Channel Extension to the Massport Marine Terminal provide a berth depth equal to the depth provided by the adjacent reach of the federal Main Ship Channel.

(3) For the Medford Street Terminal on the Mystic River, provide a berth depth at least equal to that provided by the adjacent improved portion of the federal Mystic River Channel.

(4) For the Chelsea River Channel, provide berths at the Eastern Minerals, Sunoco-Logistics, Gulf, Irving and Global Terminals at least equal in depth to the federal Chelsea River Channel and Turning Basin.

e. In the case of project features greater than -45 feet MLLW in depth, provide 50 percent of the excess cost of operation and maintenance of the project over that cost which the government determines would be incurred for operation and maintenance if the project had a depth of 45 feet;

f. Give the government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating and maintaining the GNFs;

g. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

DAEN

SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

h. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of three years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of the project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to state and local governments at 32 CFR, Section 33.20;

i. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the GNFs. However, for LER that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigation unless the federal government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

j. Assume complete financial responsibility, as between the federal government and the non-federal sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the project;

k. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

l. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, (42 U.S.C. 1962d-5b) and Section 101(e) of the WRDA 1986, Public Law 99-662, as amended, (33 U.S.C. 2211(e)) which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the non-federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

m. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended, (42 U.S.C. 4601-4655) and the Uniform Regulations contained in 49 CFR 24, in acquiring LER, necessary for construction, operation and maintenance of the project including those necessary for relocations, the borrowing of material, or the placement of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

n. Comply with all applicable federal and state laws and regulations, including, but not

DAEN

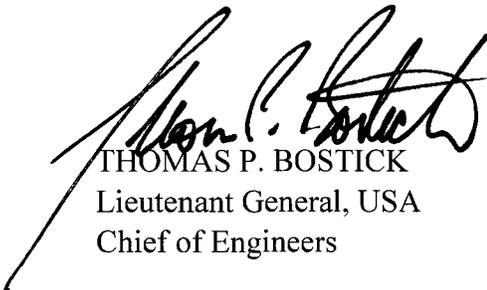
SUBJECT: Boston Harbor Navigation Improvement Project, Massachusetts

limited to, Section 601 of the Civil Rights Act of 1964, PL 88-352 (42 USC 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive changes the provision of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 et seq.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c);

o. Provide the non-federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation that are in excess of one percent of the total amount authorized to be appropriated for the project; and

p. Not use funds from other federal programs, including any non-federal contribution required as a matching share therefore, to meet any of the non-federal sponsor's obligations for the project costs unless the federal agency providing the federal portion of such funds verifies in writing that such funds are authorized to be used to carry out the project.

11. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the Executive Branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the Commonwealth of Massachusetts, Massport (the non-federal sponsor), interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.



THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers