

WRRDA 7001 Submissions Package
U.S. Army Corps of Engineers

Proposal Name: East Hartford Flood Reduction System (Connecticut River LB & Hockanum River RB Levee) – Rehabilitation Project

Submission Date: 09/16/2016

Proposal ID Number: 7fa2ecab-f101-4e8f-8337-5bc8087e5e24

Purpose of Proposal: The purpose of the rehabilitation project is to improve levee performance and further reduce the risk of failure of the levee system located along the Connect and Hockanum Rivers. The flood reduction project for East Hartford, Connecticut was authorized by the Flood Control Act approved June 28, 1938, House Document No. 455, 75th Congress, 2nd Session, as modified by Public No. 859, 76th Congress, approved October 15, 1940.

Structural Improvements include the replacement of impacted toe / collector drain system, elimination of seepage paths at the closure structures and the replacement of a damaged water stop on the Meadow Hill Pump Station box culvert.

Structural Improvement Costs = \$ 8,760,000 (construction & inspection costs)

Dredging of the Meadow Hill Storage Pond located at the Meadow Hill Pump Station is required to remove the accumulation of sediment within the storage pond. The project will restore the storage pond to the original lines and grades. Dredging Costs = \$ 3,950,000

Stormwater Pump Station Renovation includes the updating / replacement of the three original storm water pump stations. Pump Station Renovation Costs = \$ 4,500,000

Operational Improvements: The Flood Protection System was constructed in the 1940's. Many of the features incorporated into the System are based on 1930's technology. The operations of various System elements are of obsolete technology and require a significant labor effort. Implementation of automation and the updating the outdated technology will improve the overall performance and operation of the System with limited staffing. Operational Improvement Cost = \$ 1,800,000

TOTAL COST OF OVERALL PROJECT: \$19,010,000

1. Administrative Details

Proposal Name: East Hartford Flood Reduction System (Connecticut River LB & Hockanum River RB Levee) – Rehabilitation Project

by Agency: Town of East Hartford

Locations: CT

Date Submitted: 09/16/2016

Confirmation Number: 7fa2ecab-f101-4e8f-8337-5bc8087e5e24

Supporting Documents

File Name	Date Uploaded
EH letter of support repair 091416.pdf	09/16/2016
cost benefit data.pdf	09/16/2016
System overview map.pdf	09/16/2016

2. Provide the name of the primary sponsor and all non-Federal interests that have contributed or are expected to contribute toward the non-Federal share of the proposed feasibility study or modification.

Sponsor	Letter of Support
Town of East Hartford(Primary)	The Town of East Hartford is the non-Federal sponsor and will be an active participant in the Rehabilitation of the flood reduction system. The rehabilitation of the flood reduction system is a high priority of the Town and is fully committed to its implementation. The Town continues to explore all options to ensure that the flood reduction system protects its residents and business community by ensuring the System provides its intended level of protection. The Town is prepared to provide the required local cost share of the project.

3. State if this proposal is for a feasibility study, a modification to an authorized USACE feasibility study or a modification to an authorized USACE project. If it is a proposal for a modification, provide the authorized water resources development feasibility study or project name.

[x] Modification to an Authorized USACE Project : East Hartford Flood Reduction System (Connecticut River LB & Hockanum River RB Levee)

4. Clearly articulate the specific project purpose(s) of the proposed study or modification. Demonstrate that the proposal is related to USACE mission and authorities and specifically address why additional or new authorization is needed.

The purpose of the rehabilitation project is to improve levee performance and further reduce the risk of failure of the levee system located along the Connecticut and Hockanum Rivers. The flood reduction project for East Hartford, Connecticut was authorized by the Flood Control Act approved June 28, 1938, House Document No. 455, 75th Congress, 2nd Session, as modified by Public No. 859, 76th Congress, approved October 15, 1940.

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5. To the extent practicable, provide an estimate of the total cost, and the Federal and non-Federal share of those costs, of the proposed study and, separately, an estimate of the cost of construction or modification.

	Federal	Non-Federal	Total
Study	\$0	\$0	\$0
Construction	\$12,356,500	\$6,653,500	\$19,010,000

Explanation (if necessary)

6. To the extent practicable, describe the anticipated monetary and nonmonetary benefits of the proposal including benefits to the protection of human life and property; improvement to transportation; the national economy; the environment; or the national security interests of the United States.

The existing flood reduction system protects approximately 756 structures with an estimated value of \$859,800,000 and an estimated population ranging from 6,410 (daytime) to 2,177 (night). Failure or overtopping of the System could result in loss of life and the economic losses estimated at \$364,200,000 with areas of inundation over 20 feet deep. The Town of East Hartford is eager to complete the rehabilitation of the flood reduction system to ensure it provides the appropriate level of protection to the Town's residents and others working and living within the protected area of the levee.

7. Does local support exist? If ‘Yes’, describe the local support for the proposal.

Yes

Local Support Description

The attached correspondence outlines the local sponsor’s support for the rehabilitation of the flood reduction system and our commitment to provide the local cost share necessary for the study. We understand that the inclusion in the WRDA 7001 Report is the first step in the process and that a USACE Chief’s report, congressional authorizations and appropriations are required to enter into an agreement for the project. The Town is committed to making the necessary improvements and modifications to the flood reduction study to protect lives, property and infrastructure located behind the flood reduction system.

8. Does the primary sponsor named in (2.) above have the financial ability to provide for the required cost share?

Yes

Primary Sponsor Letter of Support

(As uploaded)

EH letter of support repair 091416.pdf

MARCIA A. LECLERC
MAYOR

TOWN OF EAST HARTFORD

740 Main Street
East Hartford, Connecticut 06108

Phone: 860 291-7200
Fax: 860 289-0831

Office of the Mayor



September 15, 2016

John Kennelly
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

RE: Proposal from Non-Federal Sponsor for inclusion in the Annual Section 7001 Report to Congress for WRRDA - East Hartford Flood Reduction System

Dear Mr. Kennelly,

The Town of East Hartford takes our responsibility for the protection of the community as it relates to the Flood Protection System (System) very seriously. Since 2006 the Town has invested over \$21 million for repairs, modifications and upgrades to the System in order to meet Federal Emergency Management Agency (FEMA) and the United States Army Corps of Engineers (USACE) standards, maintain levee accreditation, active status and to ensure the protection of lives and property for those who live and work adjacent to the System. The Town has been working closely with FEMA, USACE and the Connecticut Department of Energy and Environmental Protection (CT DEEP) through every stage of the multi-phase rehabilitation of the System.

The Town of East Hartford requests assistance in the rehabilitation of the Town's flood reduction system. The project would involve improvements in four major categories which include the following:

1. Structural improvements including closure structure upgrades, toe & collector drain upgrades / replacement and repairs to a concrete box culvert levee penetration.
2. Improvements to the interior storm drainage system including the dredging of the Meadow Hill storage pond.
3. Renovations and upgrades to the three storm water pump stations
4. Operational improvements throughout the system to assist in the maintenance and operation of the levee system.

The first step in a comprehensive rehabilitation of the System would be an evaluation of the existing facilities and operations. Consideration should be given for various alternatives for rehabilitation, modification and /or upgrades to the System during the design process.

On behalf of the citizens and business community, The Town of East Hartford gives it full support for the rehabilitation of the Flood Reduction System and is committed to provide our local cost share for the project. We appreciate the technical support of the USACE in assisting the Town on the project.

Thank you for the opportunity to submit the Town's request along with our support of the project.

Sincerely,

A handwritten signature in blue ink that reads "Marcia A. Leclerc". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Marcia A. Leclerc
Mayor

Additional Proposal Information

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cost benefit data.pdf

East Hartford, CT Flood Control System Benefit Cost Analysis for Flood and Erosion Control Board Program Request for Financial Assistance October, 2015

1.0 Background

GEI Consultants has prepared this report to assist in the Town of East Hartford's efforts to conduct a benefit-cost analysis for the Flood and Erosion Control Board Program Request for Financial Assistance application. The Connecticut Department of Environmental Protection requests that applicants seeking state funds demonstrate the financial efficiency of a proposed project using a benefit-cost analysis. This portion of the application is worth a total of five (5) points if the benefit-cost ratio (B/C) is greater than one (1); and zero (0) points if the ratio is less than one (1). A benefit-cost ratio that is greater than one (1) has a project price that is lower than the value of the buildings and property it is designed to protect from a particular flooding event.

2.0 Data and Methods

An analysis of estimated flooding damage from a 500-year flood (0.2% chance of occurrence in any given year) conducted by the US Army Corps of Engineers in 2013 was used as the input for damages avoided (benefit) if the project was funded. These avoided damages were calculated to be \$364,200,000.

The Town of East Hartford provided three (3) costs for various project phases that would protect to the 500-year flooding event and prevent the \$364,200,000 in damages. Phase 1 alone was \$8,760,000; Phase 1-3 was \$14,010,000; and the Overall Project (Phase 1-4) was \$19,010,000

Depending on the funding source, benefit-cost ratios sometimes need to incorporate a discount rate that calculates the net present day value of the damages being avoided in the future. For example, FEMA requires that a 7% discount rate be used for Hazard Mitigation grants; however they often only require designing to today's 100-year flood event. Some state and county governments request using a 3.3% discount rate; which is the general growth of the economy over recent decades.

There was no mention of using or requiring discount rates in any of the funding documents provided to GEI, so the first table of results does not include discounting future benefits. The second table of results does include discounting future benefits, at 7% and 3.3% for each project phase, and depending on when a 500-year flood would occur in the future. GEI was informed that the lifespan of the project would not last more than sixty (60) years so future benefits were not modeled beyond 2075.

3.0 Results

Table 1 shows the benefit-cost ratios for the three (3) project phases. The Overall Project had a benefit-cost ratio of 19.16 and would be considered cost beneficial since the ratio is greater than one (1). There was no project phase that had a benefit-cost ratio less than one (1).

Avoided Damages	Project Phase 1	Project Phase 1-3	Overall Project	Benefit-Cost Ratio Phase 1	Benefit-Cost Ratio Phase 1-3	Benefit-Cost Ratio Overall Project
\$364,200,000	\$8,760,000	\$14,010,000	\$19,010,000	41.58	26.00	19.16

Table 1. Benefit-cost analysis for East Hartford flood defenses with future benefits not discounted. Ratios in green are considered fiscally efficient because they are greater than one (1).

Table 2 shows the benefit-cost ratios for the three (3) project phases broken down by a 7% and 3.3% discount rate. Future benefits are discounted depending on the number of years in the future that a 500-year flood could occur (first column). The probability of a 500-year flood occurring within those years was also calculated (second column). Using a 7% discount rate, the benefit-cost ratio for the Overall Project was no longer fiscally efficient (benefit-cost ratio less than 1) when the 500-year flood occurred after forty (40) years from today. The benefit-cost ratio for the Overall Project remained fiscally efficient sixty (60) years from today using a 3.3% discount rate.

Yrs. in the Future	Prob. of 500-yr Flood	Avoided Damages (7% Disc. Rate)	Avoided Damages (3.3% Disc. Rate)	Benefit-Cost Ratio Phase 1 (7% Disc. Rate)	Benefit-Cost Ratio Phase 1 (3.3% Disc. Rate)	Benefit-Cost Ratio Phase 1-3 (7% Disc. Rate)	Benefit-Cost Ratio Phase 1-3 (3.3% Disc. Rate)	Benefit-Cost Ratio Overall Project (7% Disc. Rate)	Benefit-Cost Ratio Overall Project (3.3% Disc. Rate)
1	0.20%	\$340,373,832	\$352,565,344	38.86	40.25	24.30	25.17	17.90	18.55
5	1.00%	\$259,669,567	\$309,626,650	29.64	35.35	18.53	22.10	13.66	16.29
10	2.00%	\$185,140,812	\$263,230,814	21.13	30.05	13.21	18.79	9.74	13.85
15	3.00%	\$132,002,840	\$223,787,136	15.07	25.55	9.42	15.97	6.94	11.77
20	3.90%	\$94,116,201	\$190,253,875	10.74	21.72	6.72	13.58	4.95	10.01
25	4.90%	\$67,103,550	\$161,745,387	7.66	18.46	4.79	11.54	3.53	8.51
30	5.80%	\$47,843,904	\$137,508,738	5.46	15.70	3.41	9.82	2.52	7.23
35	6.80%	\$34,112,042	\$116,903,816	3.89	13.35	2.43	8.34	1.79	6.15
40	7.70%	\$24,321,415	\$99,386,428	2.78	11.35	1.74	7.09	1.28	5.23
45	8.60%	\$17,340,833	\$84,493,923	1.98	9.65	1.24	6.03	0.91	4.44
50	9.50%	\$12,363,774	\$71,832,977	1.41	8.20	0.88	5.13	0.65	3.78
55	10.40%	\$8,815,200	\$61,069,204	1.01	6.97	0.63	4.36	0.46	3.21
60	11.30%	\$6,285,116	\$51,918,322	0.72	5.93	0.45	3.71	0.33	2.73

Table 2. Benefit-cost analysis for East Hartford flood defenses with future benefits discounted at 7% and 3.3%. Ratios in green are considered fiscally efficient because they are greater than one (1). Ratios in red are not considered fiscally efficient because they are less than one (1).

4.0 Conclusion

The Town of East Hartford qualifies for a five (5) point score on Cost Benefit Ratio question of its application for Financial Assistance to the FECB, as the proposed project has a benefit-cost ratio greater than one (1). The benefit-cost ratio is 19.16 when constant dollars are utilized in the ratio. The application does not require or ask for a discount rate to be applied when calculating the benefit-cost ratio. Even if future benefits are discounted at a high annual rate of 7% as required by FEMA in certain situations, the proposed project still has a benefit-cost ratio greater than one (1), as long as a 500-year flood can be expected to occur within the next forty (40) years.

Additionally, the National Climate Assessment report (2014) noted that extreme precipitation events are projected to increase in frequency and intensity as the climate continues to change. If the amount of precipitation from today's 500-year event is more likely to occur in the future, it would make many of the benefit-cost ratios in Table 2 even more fiscally efficient since the future benefits (avoided damages) would be occurring sooner.

5.0 GEI Preparers

Report Prepared by: Alex Gray, Adaptation Specialist/GIS Analyst

Reviewed by: J.T. Lockman, AICP, Senior Project Manager

Approved and Submitted by: John McGrane, PE, Project Manager

6.0 References

Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipschultz, 2014: Ch. 16: Northeast. *Climate Change Impacts in the United States: The Third Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 16-1-nn.



SEE MAP 27

SEE MAP 27
Lot 171

CORNELIUS MEADUS PFE PARK

ARNA & MORAS SCHOOL

TOWN OF EAST HARTFORD, CONNECTICUT
ASSESSOR'S MAP
SEE MAP 26

SEE MAP 10

See Map No. 26 - Lot 2441

CORRECTIVE

RIVER

SEE MAP 14

MAP 14





SEE MAP 13

TOWN OF E. HARTF
6
1 781
1 782

SEE MAP 13

TOWN OF EAST HARTFORD, CONNECTICUT -

ASSESSORS MAP

SCALE 1"=100'

MAP 14

C O N N E C T I C U T

R I V E R

TOWN OF E. HARTF.

EAST HARTFORD RIVER

CASE ROAD

HELLO ROW



STATE OF CONN.
GEO. MAP No. 18-1912
2187 AL.



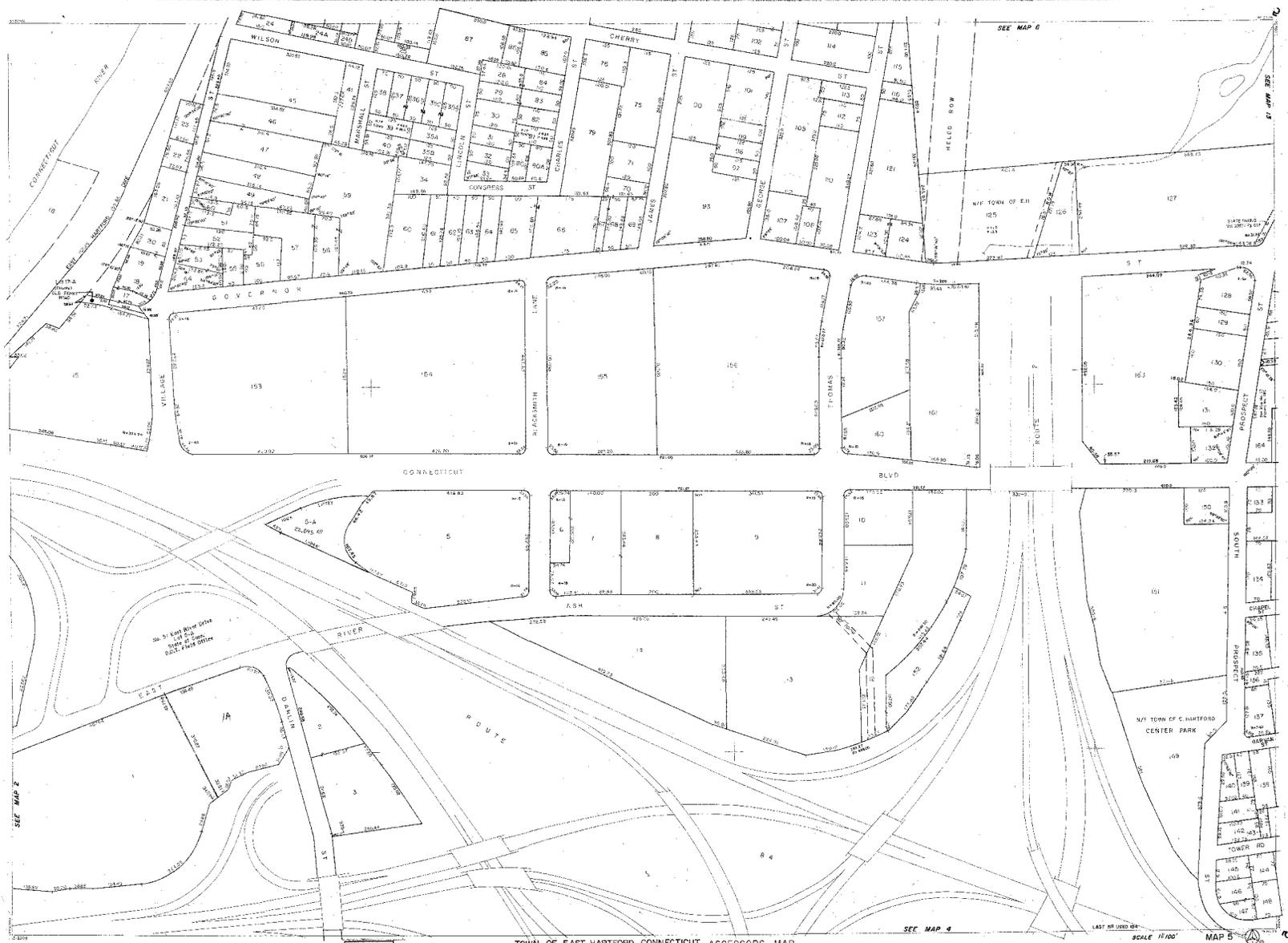
SEE MAP 5

UNIT OF 1000 SQ. FT.

SCALE 1/8" = 100'

MAP 6

TOWN OF EAST HARTFORD, CONNECTICUT - ASSESSORS' MAP



TOWN OF EAST HARTFORD, CONNECTICUT ASSESSORS MAP

SEE MAP 4

SCALE 1" = 100'

MAP 5

LAST OR USED BY

6

CONNECTICUT



© 1998

TOWN OF EAST HARTFORD, CONNECTICUT - ASSESSORS MAP

SEE MAP 2

FOUNDERS BRIDGE

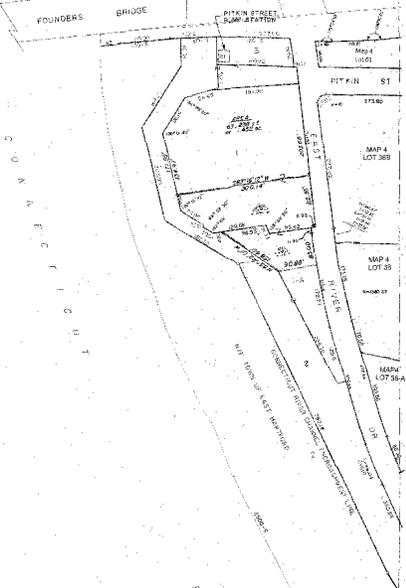
CONAECTICUT

W. SIDE OF EAST HARTFORD

SCALE 1800'

MAP 1

SEE MAP 4





SEE MAP 5

SEE MAP 12

TOWN OF EAST HARTFORD, CONNECTICUT - ASSESSOR'S MAP

SEE MAP 3

DATE OF 1988
SCALE 1"=100' MAP 4



TOWN OF EAST HARTFORD, CONNECTICUT - ASSESSORS' MAP

SCALE 1/400' MAP 12



SEE MAP 14

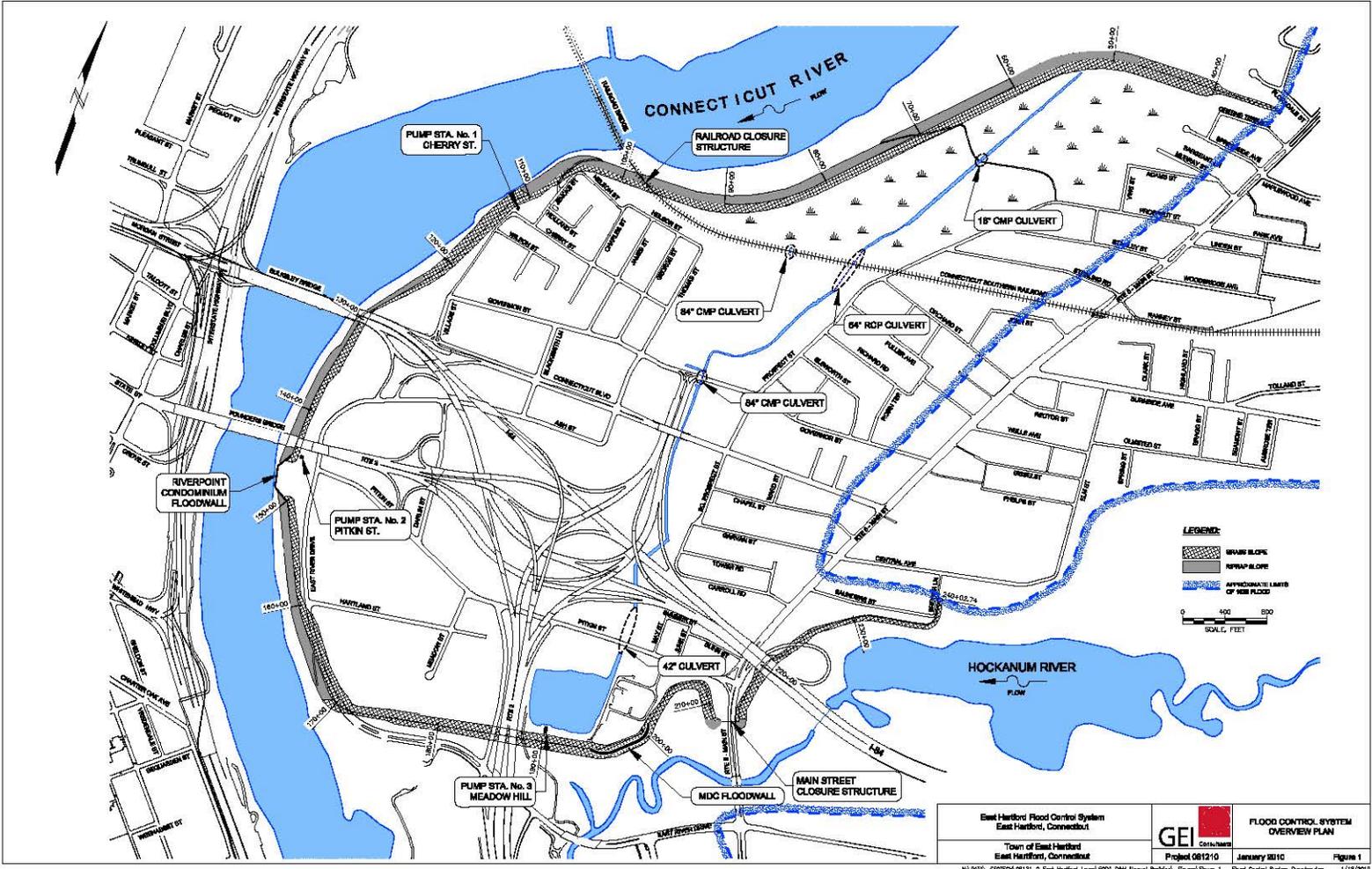
TOWN OF EAST HARTFORD, CONNECTICUT - ASSESSORS MAP

SCALE 1"=100'
MAY 1958
MAP 13

Map Document

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System overview map.pdf



<p>East Hartford Flood Control System East Hartford, Connecticut Town of East Hartford East Hartford, Connecticut</p>	<p>GEI Consultants</p>	<p>FLOOD CONTROL SYSTEM OVERVIEW PLAN Project 081210 January 2010</p>
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