

# **Hartford and East Hartford, CT Section 216 Levee Rehabilitation Flood Risk Management Feasibility Study**

**Draft Feasibility Report & Draft Environmental  
Assessment**



**APPENDIX 2-E  
CIVIL ENGINEERING**

**U.S. Army Corps of Engineers  
North Atlantic Division  
New England District**

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# 1. INTRODUCTION:

## 1.1 Purpose

The purpose of this appendix is to document civil engineering design considerations for selected measures within the Hartford and East Hartford Flood Protection System.

## 1.2 Scope

This appendix documents the development of site plans for each selected measure. Site plans depict existing site conditions, utility information, access routes, staging areas, and anticipated work limits to support design development and constructability.

# 2. EXISTING CONDITIONS:

## 2.1 References and Resources

A substantial portion of the civil engineering effort in feasibility involved compiling existing conditions data to better understand and depict the proposed project sites, existing site features, existing utilities, and available space for construction. The accuracy of the sources varies and the reliability is sufficient for the current study phase, however additional survey information will be requested and compiled to complete the study. A series of resources were consulted to compile this information including:

- Record Drawings and Reports
  - Scanned NAE Hartford Dike Original Drawings (Dated 1939 - 1941)
  - Scanned NAE East Hartford Dike Original Drawing (Dated 1938 - 1944)
  - Inspection of Park River Conduit Gate Valves (June 2009)
- Operation & Maintenance (O&M) Manual for Hartford Local Protection Project
  - Volume I – Manual Main Body, Last revision date: June 2009
  - Volume II – Inspection Program and Reproducible Forms Main Body. Last revision date: June 2009
  - Volume III – Pertinent Drawings. Last revision date: June 2009
- Online Reference Databases
  - Connecticut Parcel Viewer – 2023 State Parcel Data<sup>1</sup>
  - Digital Coast Data Access Viewer – 2023 Connecticut GIS Office LiDAR: Connecticut Statewide<sup>2</sup>
  - Google Earth was used as a reference for building features, road and street names, manhole locations, and determining access routes.

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<sup>1</sup>

[https://experience.arcgis.com/experience/068a00e313bf439a8753838234fd517f/#data\\_s=id%3AdataSource\\_1-194d1b0b3f2-layer-7](https://experience.arcgis.com/experience/068a00e313bf439a8753838234fd517f/#data_s=id%3AdataSource_1-194d1b0b3f2-layer-7)

<sup>2</sup> <https://coast.noaa.gov/dataviewer/#/lidar/search/-8091748.058034111,5129731.943462299,-8091673.409120697,5129851.3817237625>

- Bing Maps was used within Autodesk Civil 3D for aerial imagery.

## **2.2 Topography**

LiDAR-derived topographic surfaces were processed in Autodesk ReCap using the 2023 Connecticut Statewide LiDAR dataset obtained from Connecticut GIS metadata. Survey data are currently being obtained from the USACE NAE Survey Section to establish control points and develop a more accurate topographic surface for subsequent design phases. The horizontal datum is based on the North American Datum of 1983 (NAD83) for the State of Connecticut in US survey feet. The vertical datum referenced the North American Vertical Datum of 1988 (NAVD88), also in US survey feet.

## **2.3 GIS Data**

GIS parcel outline data were provided by the GIS PDT member and parcel attributes; parcel number, ownership and area were obtained from the State of Connecticut Parcel viewer. These datasets were used to support parcel identification, feature mapping, and base plan development.

## **2.4 Imagery**

Aerial imagery shown on these drawings was obtained from the Connecticut ECO State GIS Aerial Imagery database (Spring 2019) and is used for general reference and site orientation. Bing Maps was also used within Civil3D.

## **2.5 Existing Utilities**

In Hartford, subsurface utility information for Hartford is not available at this time. However, most features of the proposed work do not require excavation and site plans can be developed using aerial imagery. The Dutch Point location is the exception, and additional survey will be conducted to obtain the necessary utility information.

In East Hartford, utility information was obtained from the BSC Group Right-of-Way Survey of the East Hartford Dike prepared for the East Hartford Flood Control System FEMA Accreditation Project (January 2014) and supplemented by real estate property records maintained by the Town of East Hartford. Utilities and easements captured from this data include storm sewer lines, water lines, electric lines and easements, natural gas lines, oil pipes and its easements, sewer lines and tis easements, as well as existing toe drains.

Additional utility information, to include existing manholes, inverts, and surface features will be identified and captured via the anticipated USACE NAE Survey effort referenced above.

### 3. SITE DESIGN AND ACCESS

During the Feasibility Study, the Project Delivery Team (PDT) evaluated alternatives to improve the performance and reliability of the Hartford and East Hartford Flood Protection System. Based on system need, constructability, and flood risk reduction benefits, a series of measures were advanced for further consideration. As part of the civil engineering effort, each site was reviewed and staging and access plans were developed. the following measures were advanced for further consideration.

#### 3.1 Pump Station Rehabilitation

The construction of the proposed pump station rehabilitation measures will primarily occur interior to the existing pump stations. At each location, a site plan was developed to identify staging, laydown, and access needs. While access needs are different for each pump station, staging areas are similar consisting of a 50' by 100' area to accommodate 3 tractor trailers, 2 conex boxes, and a loading crane. Existing electric overhead lines were identified using Google Earth Street Viewer and added to drawings accordingly. google earth street viewer

##### 3.1.1 North Meadows Pump Station (*Hartford*)

Site plans for the North Meadows Pump Station were developed using the building footprint provided in the architectural model prepared by the architectural team member. This footprint was aligned with available aerial imagery and by examining the area with Google Earth Street Viewer. The facility is surrounded by a large open area that easily accommodates the construction staging needs located along the roadway adjacent to the facility. Site access is provided via the service road extending from Leibert Road (see Figure 1).



- NOTES
1. INFORMATION SHOWN ON THIS PLAN IS FOR REFERENCE ONLY. THIS INFORMATION SHALL NOT BE USED FOR LEGAL DESCRIPTION OR CONVEYANCES WITHOUT FURTHER VERIFICATION.
  2. UTILITY DECRYPTED FROM AERIAL IMAGERY.
  3. LAYDOWN AREA IS SUBJECT TO CHANGE.
  4. PROPERTY LINES DEPICTED ARE FROM GEOGRAPHICAL INFORMATION SYSTEMS (GIS) DATA OBTAINED FROM CONNECTICUT PARCEL VIEWER. THE DATA WAS DISTRIBUTED IN SHAPEFILE FORMAT WITH A HORIZONTAL DATUM THAT REFERENCES THE CT SPCS, NAD 83.
  5. AERIAL IMAGERY SHOWN ON THESE DRAWINGS IS FROM 2023 AND WAS OBTAINED BY CT EDD STATE GIS. AERIAL IMAGERY SHOWN ON THESE DRAWINGS ARE FOR GENERAL INFORMATION ONLY AND IS NOT TO BE USED FOR MEASUREMENTS.

REAL STATE LEGEND	
DESCRIPTION	SYMBOL
CITY OF HARTFORD	[Green hatched symbol]
COMMERCIAL PROPERTY	[Blue hatched symbol]
NO WORK ZONE	[White symbol]

PROPOSED WORK LEGEND	
DESCRIPTION	SYMBOL
SITE ACCESS	[Cyan dashed line symbol]
LAYDOWN AREAS	[Green hatched symbol]
PUMP STATION WORK AREA	[Black hatched symbol]

EXISTING UTILITY LEGEND	
DESCRIPTION	SYMBOL
SITE FENCE	[Black dashed line symbol]
WATER PIPE	[Blue dashed line symbol]
UNKNOWN LOCATION	[Red dashed line symbol]
ELECTRIC LINES	[Red dashed line symbol]

B1 REAL ESTATE PLAN NORTH MEADOW PUMP STATION  
 SCALE: 1" = 50'

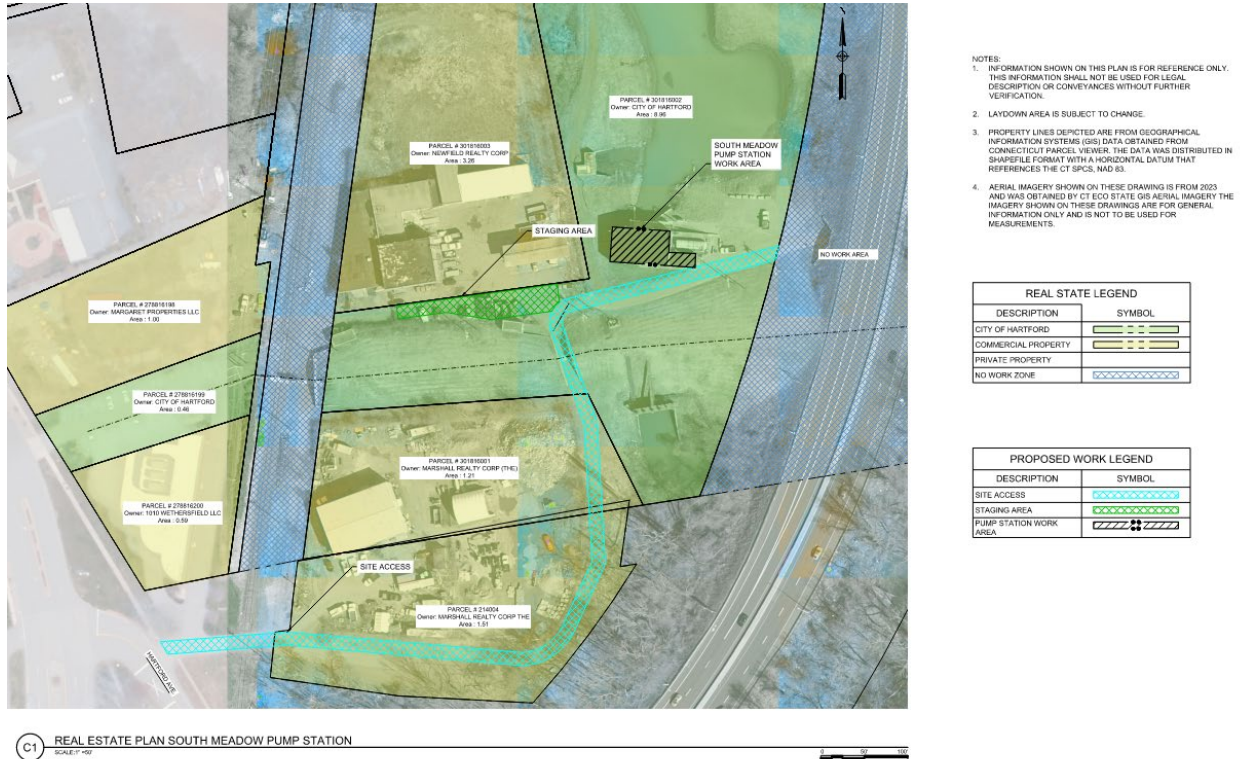
PARCEL AREA IMPACTS					
PARCEL #	PARCEL TYPE	PARCEL OWNER	PARCEL AREA	ACCESS AREA	STAGING AREA
32607008	MUNICIPAL	CITY OF HARTFORD	408649.87 SF, 0.38 AC	31325 SF	5000 SF

**Figure 1: North Meadows Pump Station**

### 3.1.2 South Meadows Pump Station (Hartford)

Site plans for the South Meadows Pump Station were developed using aerial imagery. The site is constrained by adjacent commercial and private properties, resulting in limited staging opportunities.

The preferred staging area is located along the levee toe west of the closure structure and pump station. Site access is provided via a private roadway that traverses a commercial property and crosses the municipal boundary into the Town of Wethersfield (see Figure 2).



PARCEL EASEMENT AREA					
PARCEL #	PARCEL TYPE	PARCEL OWNER	PARCEL AREA	ACCESS AREA	STAGING AREA
30181002	MUNICIPAL	CITY OF HARTFORD	8.96 AC	16805 SF	4325 SF
30181002	COMMERCIAL	MARSHALL REALTY CORP (THE)	1.21 AC	2075 SF	N/A
214004	COMMERCIAL	MARSHALL REALTY CORP THE	1.51 AC	6620 SF	N/A
UNKNOWN	ROAD ROW	WEATHERSFIELD	N/A	1910 SF	N/A

**Figure 2: South Meadows Pump Station**

### 3.1.3 Meadow Hill Pump Station (East Hartford)

Site plans for the Meadow Hill Pump Station were developed using aerial imagery. Overhead electrical utilities were identified based on visible features. A utility inquiry was submitted through CBYD/811; responses indicated either no known underground utilities or no response from utility providers. As this measure does not involve excavation, site plans focus on access routes and construction staging. (see Figure 3).

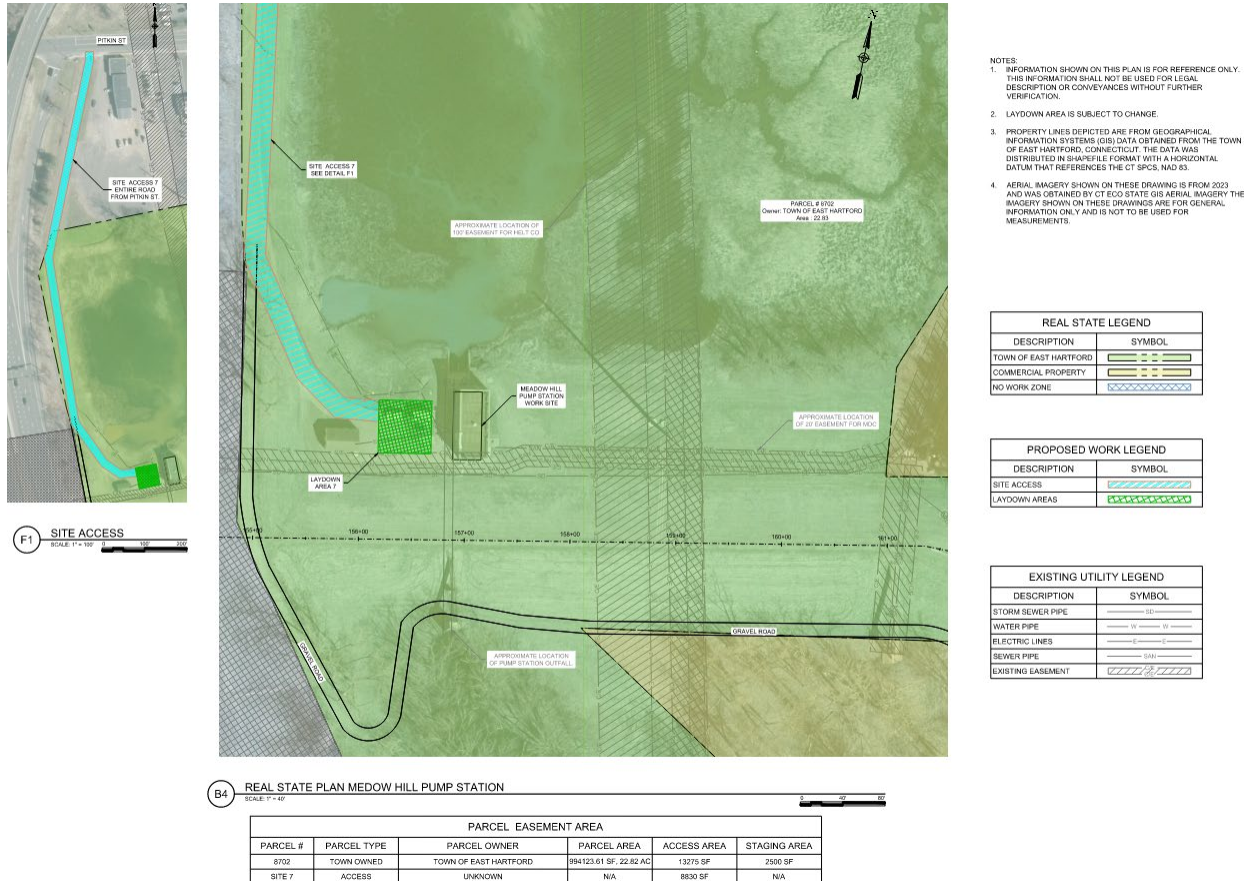
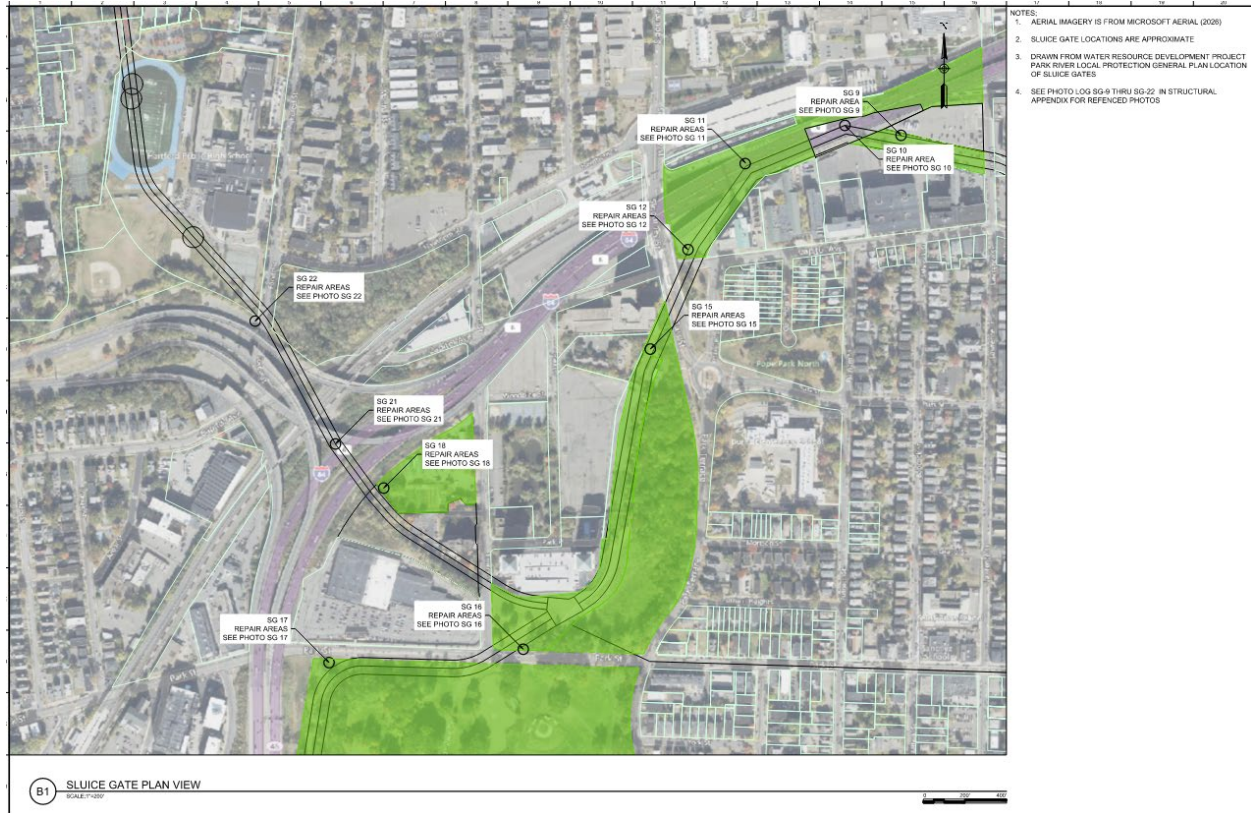


Figure 3: Meadow Hills Pump Station

### 3.2 Park River Sluice Gates System Replacement (Hartford)

Similar to the above proposed pump station rehabilitation, the Park River Sluice Gates System Replacement involves minimal civil design effort. Site layout drawings were developed to identify the 10 existing gate locations for sites likely requiring concrete repairs, gate replacement, or both. Potential space for staging and means of access were also considered in development of the layout drawings. Original drawings of the Park River Conduit (PRC) contained in O & M Volume III were used in combination with 2009 PRC Inspections report. (See Figure 4)



**Figure 4: Park River Conduit Gate Locations**

### 3.3 Toe Drain Replacement – Segments #2, #4, #5, and #6 (East Hartford)

Internal drainage improvements for the Town of East Hartford include replacement of the existing levee toe drain. The toe drain is not performing as originally designed, resulting in reduced interior drainage conveyance and increased seepage risk to the levee system. The table below shows length of toe drain replacement for each segment:

**Table 1: Toe Drain Length**

SEGMENT	LENGTH
#2	2800 ft
#4	2400 ft
#5	2700 ft
#6	1700 ft
Total	9600 ft

Design plans were developed using Autodesk Civil 3D by incorporating LiDAR-derived topography. Existing design plan PDFs were referenced into the model to establish the approximate toe drain alignment and utility location. The proposed measure consists of replacing the existing toe drain in kind, generally along the current alignment.



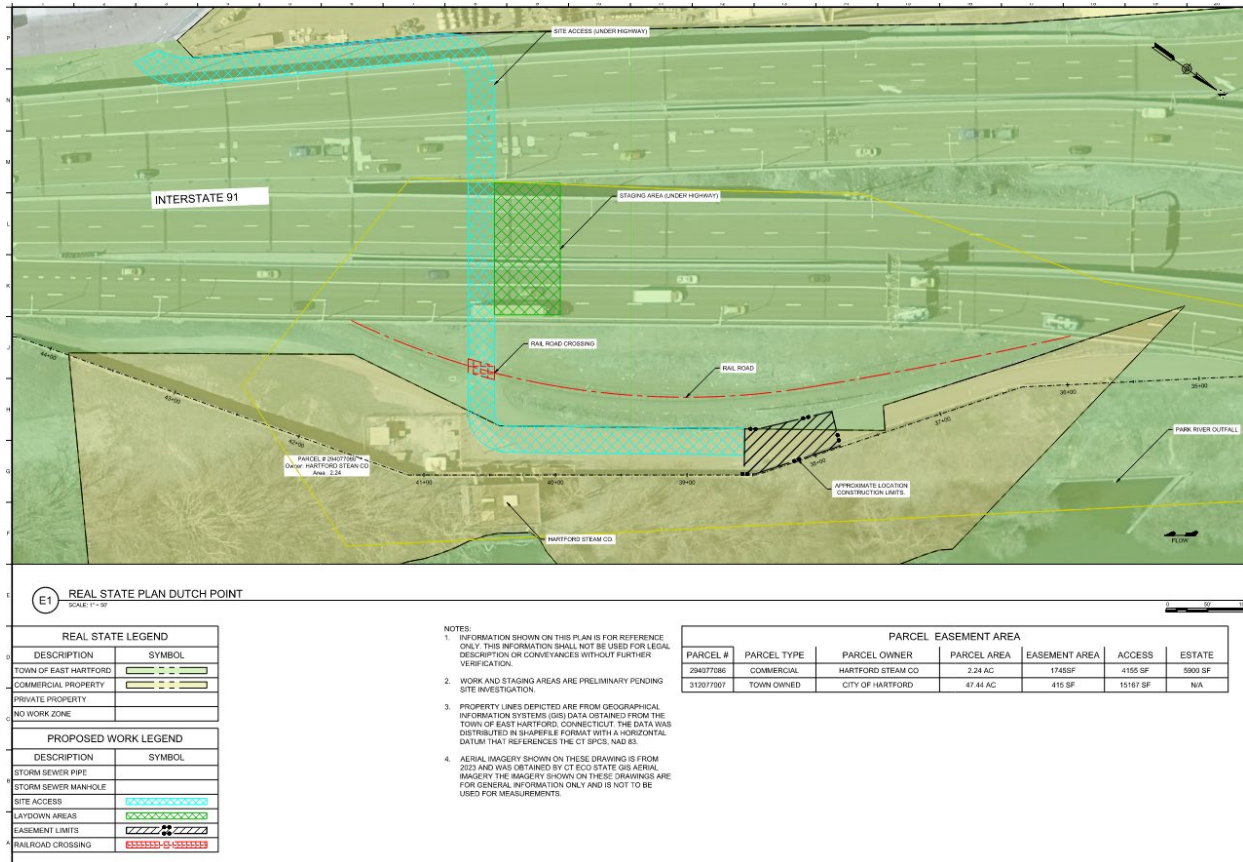


Figure 6: Dutch Point Flood Wall

### 3.5 Main Street Closure Structure – Seepage Risk Mitigation (East Hartford)

Geotechnical evaluation identified unsuitable embankment material adjacent to the floodwall-to-levee tie-in at the Main Street Closure Structure. The recommended mitigation includes removal of existing material and replacement with a filter layer consisting of a 2-foot-thick sand layer, a 1-foot-thick gravel layer, and a 1-foot-thick riprap layer.

Unlike other measures, work limits extend into adjacent private property. Site access is assumed from Main Street, with a material stockpile area located across the roadway adjacent to the levee (see Figure 7).



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  2. LAYDOWN AREA IS SUBJECT TO CHANGE.
  3. STAGING AND ACCESS AREAS ARE TEMPORARY. EASEMENT'S PERIOD REQUIRED IS SIX MONTHS.
  4. PROPERTY LINES DEPICTED ARE FROM GEOGRAPHICAL INFORMATION SYSTEMS (GIS) DATA OBTAINED FROM THE TOWN OF EAST HARTFORD, CONNECTICUT. THE DATA WAS DISTRIBUTED IN SHAPFILE FORMAT WITH A HORIZONTAL DATUM THAT REFERENCES THE CT SPCS, NAD 83.
  5. DATA DRAWN FROM BSC GROUP RIGHT OF WAY SURVEY OF EAST HARTFORD DIKE FOR THE EAST HARTFORD FLOOD CONTROL SYSTEM FEMA ACCREDITATION PROJECT JAN 24, 2014 AND REAL PROPERTY RECORDS OF THE TOWN OF EAST HARTFORD, CONNECTICUT.
  6. AERIAL IMAGERY SHOWN ON THESE DRAWING IS FROM 2023 AND WAS OBTAINED BY CT ECC STATE GIS AERIAL IMAGERY. THE IMAGERY SHOWN ON THESE DRAWINGS ARE FOR GENERAL INFORMATION ONLY AND IS NOT TO BE USED FOR MEASUREMENTS.

EXISTING UTILITY LEGEND	
DESCRIPTION	SYMBOL
STORM SEWER PIPE	
WATER PIPE	
ELECTRIC LINES	
NATURAL GAS	
OIL PIPE	
SEWER PIPE	
COMMUNICATION LINES	
EXISTING EASEMENT	

PROPOSED WORK LEGEND	
DESCRIPTION	SYMBOL
SITE ACCESS	
LAYDOWN AREAS	
CONSTRUCTION WORK LIMITS	

REAL STATE LEGEND	
DESCRIPTION	SYMBOL
TOWN OF EAST HARTFORD	
COMMERCIAL PROPERTY	
PRIVATE PROPERTY	
NO WORK ZONE	

D1 REAL STATE MAIN STREET CLOSURE  
 SCALE: 1" = 50'

PROJECT IMPACTS					
PARCEL #	PARCEL TYPE	PARCEL OWNER	PARCEL AREA	PROJECT USE AREA	TEMPORARY EASEMENT
8702	TOWN OWNED	TOWN OF EAST HARTFORD	994123.61 SF, 22.82 AC	3394.16 SF	1388.02 SF
8700	COMMERCIAL	RIVER BEND FUNERAL HOME & CREMATORIUM LLC	13430.63 SF, 0.31 AC	N/A	N/A
8703	COMMERCIAL	639 MAIN STREET REALTY LLC	19394.86 SF, 0.45 AC	N/A	2044.45 SF
8704	COMMERCIAL	639 MAIN STREET REALTY LLC	20029.44 SF, 0.46 AC	N/A	N/A
ROAD ROW	TOWN OWNED	MAIN ST	N/A	2869.63 SF	571.3 SF

Figure 7: Main St. Closure

## 4. REAL ESTATE COORDINATION

Real Estate Plans were developed for all project sites to identify parcel boundaries and determine real estate requirements. Work limit footprints were calculated to quantify temporary and permanent impacts to both public and private properties. Construction staging areas and access routes were evaluated to identify potential temporary easement and/or acquisition needs. Potential utility conflicts have been identified, and additional investigation will be conducted to further assess the potential conflicts once the survey form NAE is available and a level accuracy is sufficient to provide recommendations for resolution where needed. See Hartford and East Hartford RE Plans for the compiled real estate drawing package on the teams Real Estate folder.