

REPLACEMENT OF BRANDY BROW ROAD CULVERT OVER EAST MEADOW RIVER

NOTICE OF INTENT

Presented on November 20, 2025 to the Haverhill Conservation Commission

On behalf of the City of Haverhill

OVERVIEW





INTRODUCTION

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Applicant: The City of Haverhill

Representative: Greenman-Pedersen, Inc.

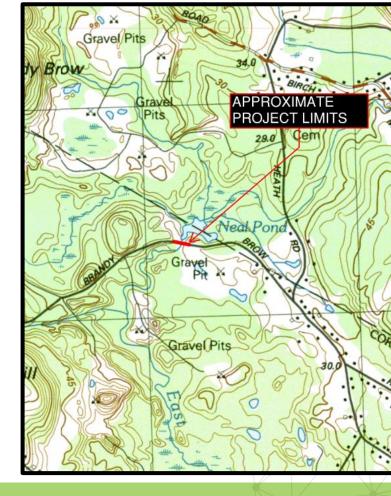
Location: Brandy Brow Road Culvert

over East Meadow River

Total Linear Length: 115' (includes the length of

the existing culvert and the

east and west approaches)







PROJECT PURPOSE AND NEED

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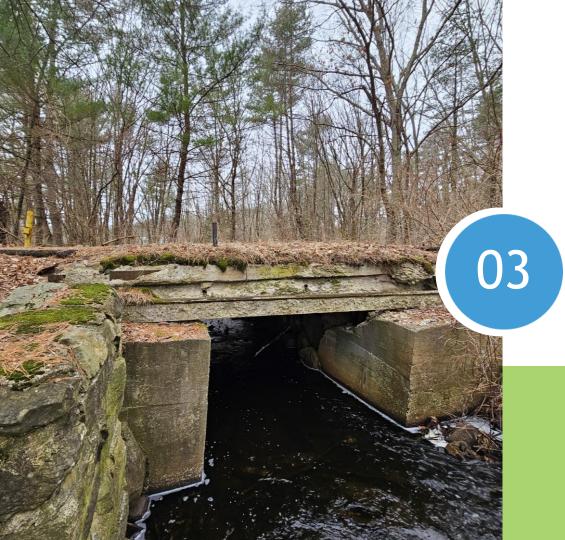
Full replacement of existing failing culvert.



Streambed and streambank restoration.



Narrow travel lane over culvert from 20-feet to 6-feet.



EXISTING CONDITIONS

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It is unsafe to cross the culvert, preventing pedestrians and emergency vehicles from crossing.

The existing culvert does not fully meet the MA River and Stream Crossing Standards.



The existing culvert is at risk of structural failure and shows signs of severe erosion along the culvert walls.

The existing culvert is undersized and cannot convey extreme storm events adequately.

The existing roadway over the culvert is in poor condition.

















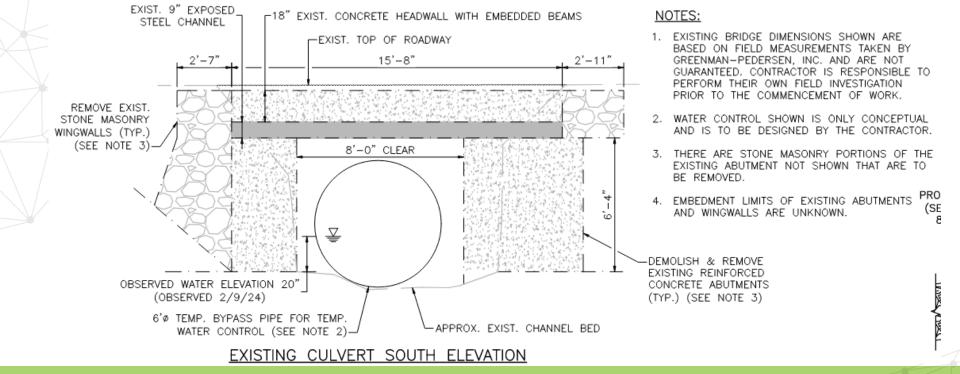


PROPOSED IMPROVEMENTS

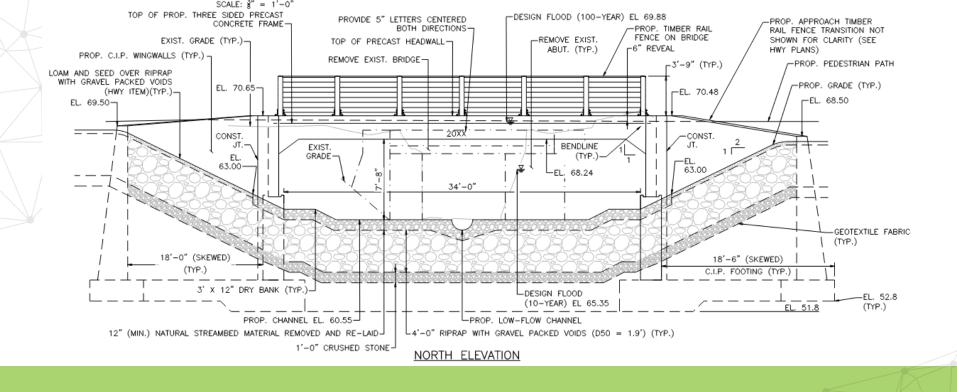


- Demolish and remove existing failing culvert.
- Replace existing reinforced concrete and stone masonry culvert (34'L x 8'W x 6'4"H) with proposed open bottom, 3sided, precast concrete box culvert (8'L x 34' W x 7'8" H).

CULVERT REPLACEMENT



CULVERT REPLACEMENT (EXISTING CULVERT)

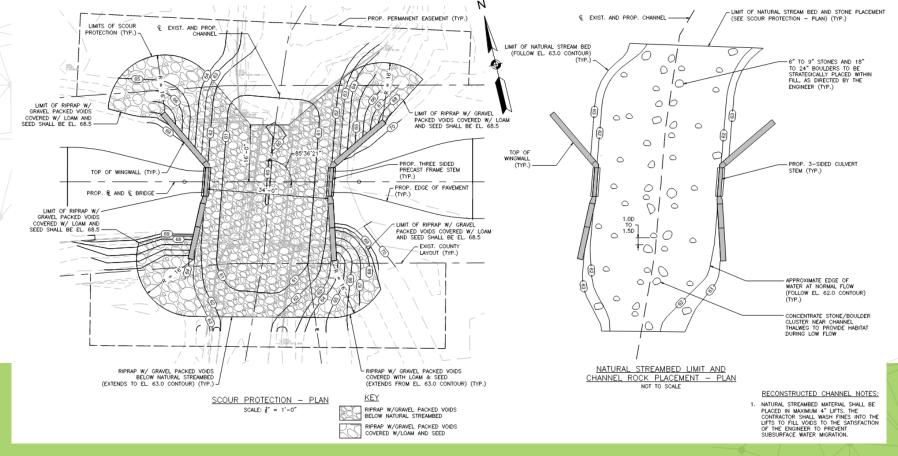


CULVERT REPLACEMENT (PROPOSED CULVERT)



- Grade a low flow channel to maintain natural water depth and velocity during various flow conditions.
- Install natural streambed material with salvaged and stockpiled excavated stones and cobbles on site.
- Install scour protection along the new stream channel with riprap and gravel packed voids, overlaid with a loam and native seed mix.
- Remove existing check dam located approximately 12' upstream of culvert.

STREAMBED AND STREAMBANK RESTORATION



STREAMBED AND STREAMBANK RESTORATION



- Narrow the existing 20' travel lane to 6' over the culvert.
- Full width resurfacing of the roadway approaches.
- Install timber rail fences over the culvert and along roadway approaches.

ROADWAY RECONSTRUCTION AND RESURFACING



WETLAND RESOURCE AREA IMPACTS AND OTHER ENVIRONMENTAL CONSTRAINTS

WETLAND RESOURCE AREAS WITHIN AND ADJACENT TO THE PROJECT LIMITS

- Bordering Vegetated Wetlands (BVW)
- Bank to Perennial Stream
- Land Under Water Bodies and Waterways (LUWW)
- 200-foot Riverfront Area (RA)
- Bordering Land Subject to Flooding (BLSF)

OTHER ENVIRONMENTAL CONSTRAINTS

- Natural Heritage Endangered Species Program (NHESP) Priority Habitat (ID: PH 2148)
- Outstanding Resource Water (ORW) and Surface Water Supply Protection Area Zone A associated with Public Water Supply Watershed Millvale Reservoir
- Article 97 land associated with Neal Pond Water Supply
- Cold-water Fishery associated with East Meadow River

Work Within BVW

Work will occur within BVW in one (1) location at the northwestern project limit between BVW wetland flags WF 1-1 to WF 1-2. All of the proposed work is eligible to be treated as a limited project pursuant to 310 CMR 10.53(3)(i), "maintenance and repair of culverts."

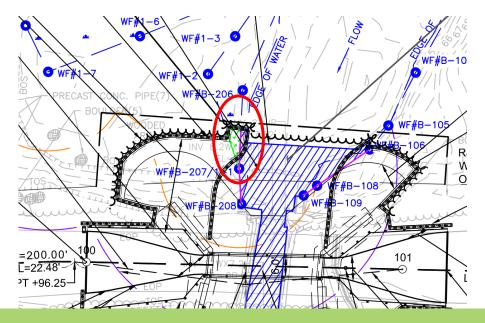
	Bordering Vegetated Wetland Impacts
Permanent (sf)	0
Temporary (sf)	30
Total (sf)	30

Temporary Alteration

Grading.

Installation of erosion and sediment control measures.

Construction phase site access.



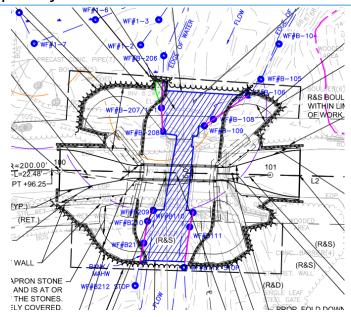


Work Along Bank and Within LUWW

Work will occur along Bank and within LUWW in one (1) location associated with East Meadow River. All of the proposed work is eligible to be treated as a limited project pursuant to 310 CMR 10.53(3)(i), "maintenance and repair of culverts."

Flag Series	Station	Permanent (If)	Temporary (If)	Total (If)
WF#B-105 to WF#B-112	100+75	49	0	49
WF#B-206 to WF#B-212	100+50	49	0	49
Total		98	0	98

	Land Under Water Bodies and Waterways Impacts
Permanent (sf)	0
Temporary (sf)	1,412
Total (sf)	1,412





Work Within 200-foot RA and BLSF

Work will occur within the 200-foot RA and BLSF throughout the entirety of the project limits. All of the proposed work is eligible to be treated as a limited project pursuant to 310 CMR 10.53(3)(i), "maintenance and repair of culverts."

Permanent Alteration

Culvert replacement and frame unit construction.

Scour protection construction.

Temporary Alteration

Grading, installation of erosion and sediment control measures.

Streambed restoration and enhancement.

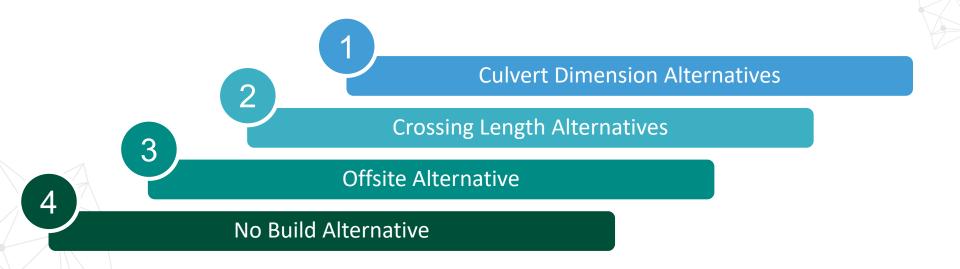
Construction phase site access.

	200-foot Riverfront Area Impacts		
	Inner Riparian	Outer Riparian	Total
Permanent (sf)	1,436	0	1,436
Temporary (sf)	2,434	0	2,434
Total (sf)	3,870	0	3,870

Elevation	Proposed	Proposed	Net
	CUT Volume (CY)	FILL Volume (CY)	Volume (CY)
71 - 70	3	0	3
70 - 69	55	0	55
69 - 68	48	0	48
68 -67	38	1	37
67 - 66	52	0	52
66 - 65	71	0	71
65 - 64	98	0	98
64 - 63	105	0	105
63 - 62	108	0	108
62 - 61	82	0	82
61 - 60	42	1	41
60 - 59	13	0	13
Totals	714	2	712 ←

Overall net increase in floodplain storage.









Culvert Dimension Alternatives

- Provides a larger opening to avoid overtopping during the 100-year storm event.
- Provides a significantly more efficient opening relative to an arch.
- Achieves DER's minimum 6' height requirement and nearly achieves DER's optimum 8' height goal.
- Headwalls were omitted to increase the vertical opening.
- Frame units are skewed to match the channel and better accommodate significant flood volumes reflected in the Hydraulics Report.

2

Crossing Length Alternatives

- Reduces the total crossing length from 34' to 8' along East Meadow River.
- Complies with the MA River and Stream Crossing Standards.
- Narrows the existing 20' travel lane to 6' and accommodates pedestrian and emergency vehicle traffic.
- Minimizes impacts to the 200-foot RA and is the least impactful to wetland resource areas.

3

Offsite Alternative

- Any new culvert construction intended to bypass Brandy Brow Road Culvert would have major impacts on private property, environmentally sensitive areas, and perpetuate safety concerns that would significantly outweigh any potential benefits.
- There is no feasible off-site alternative that would be less environmentally impactful.
- This alternative was not considered.



No Build Alternative

- Pedestrian and emergency vehicle accessibility, safety concerns, and culvert structural failure would remain and further degrade over time.
- Traffic over the culvert will remain closed to pedestrians and emergency vehicles.
- The culvert does not fully meet the MA River and Stream Crossing Standards and will continue to remain deficient.
- This alternative was not considered.

Work Within Buffer Zones and City of Haverhill Protection Zones

Work will occur within 100-foot Buffer Zone, 50-foot No Build Zone, and 25-foot No Build-No Disturbance Zone throughout the project limits. All of the work within these Zones are coincident with the 200-foot RA.

	100-foot Buffer Zone Impacts	50-foot No Build Zone Impacts	25-foot No Build-No Disturbance Zone Impacts
Permanent (sf)	629	477	330
Temporary (sf)	1,261	750	423
Total (sf)	1,890	1,227	753

Permanent Alteration

Culvert replacement and frame unit construction.

Scour protection construction.

Temporary Alteration

Grading, installation of erosion and sediment control measures.

Streambed restoration and enhancement.

Construction phase site access.





CONCLUSION

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The proposed culvert meets the MA River and Stream Crossing Standards and provides habitat for aquatic organisms.

The culvert has been designed in accordance with guidance from DER through the Culvert Replacement Municipal Assistance Grant Program.



The project complies with the Wetland Protection Act Performance Standards for impacts to wetland resource areas where unavoidable.

The proposed culvert is designed to safely convey the runoff generated from a 10-year storm event.

The project proposes to reconstruct the roadway over the culvert and approaches to improve accessibility for pedestrians and emergency vehicles.



QUESTIONS?

