

**STATE PROJECT NO. 0130-0186
REHABILITATION OF BRIDGE NO. 07042
INTERSTATE 84 WESTBOUND OVER BULLET HILL BROOK
TOWN OF SOUTHURY**

PROJECT DESCRIPTION

Project Location:

Bridge No. 07042 conveys Bullet Hill Brook beneath Interstate 84 Westbound (I-84 WB) in the Town of Southbury. The structure is located 1.3 miles east of the I-84 Exit 15 interchange, at Mile Post 23.3.

Existing Bridge:

Bridge No. 07042, built in 1961, consists of a 9-foot diameter asphalt coated corrugated metal pipe (ACCMP) supported by a monolithic concrete headwall/endwall and wingwalls at the inlet and the outlet. The culvert is under approximately 10 to 20 feet of fill with sloped embankments at the inlet and outlet. The total length of the structure is 150 feet. I-84 WB over the structure consists of two 12-foot travel lanes with a right and left shoulder. Both sides of the roadway are protected by a three-cable guiderail. The AADT of I-84 WB over this structure is 36,000 vehicles per day (2018 CT DOT Traffic Logs). The structure is in serious condition (Rating = 3) due to the ACCMP and channel. The culvert invert has deteriorated throughout the pipe, including section loss up to 6 feet long by 40 inches wide resulting in a channel bed typically 5 inches below the invert. The shape of the metal pipe at the inlet is generally in good condition, but the headwall exhibits spalling and cracking through the monolithic headwall/wingwalls; the cutoff wall is not visible due to the full width concrete apron that extends approximately 100-feet upstream, which is in good condition. The endwall/wingwall exhibits extensive cracking, up to 10-feet long and seemingly full depth, causing the structure to shift and display offsets of up to 2 inches. An 8-foot section of the invert has overlapped itself at the outlet causing the shape of the pipe to become oblong. The outlet is perched approximately 50 vertical inches from the existing stream bed; a scour hole has formed which undermines the cutoff wall and footing along the entire length of the supporting structure by a depth of approximately 1 inch to 3 feet. The latest special inspection highlighted a 30-inch crack, open 3.5 inches with a 2.5-inch offset possibly causing a loss of fill behind the structure based upon the stream bed soil measurements and deposition of sand and gravel beneath the crack. The cutoff wall also suffers from multiple full height cracks exhibiting offsets. There is moderate buildup of cobbles and boulders up to 2 feet in diameter in the upstream channel and a large pile of boulders, cobbles and tree debris located just past the outlet wingwalls. The channel past the debris has vertical erosion up to 3 feet high and laterally up to 2 feet deep.

There are no overhead or underground utilities within the project area. The Project Site is not within an Aquifer Protection Area and is not within the FEMA 100-year floodplain. A review of the CTDEEP Natural Diversity Database (NDDDB) indicates that the project area is not located within an area of known habitat for endangered, threatened, or special concern species (NDDDB map dated December 2022).

Proposed Bridge Rehabilitation:

The purpose and need of this project is to address the serious structural condition of the bridge. The rehabilitation of the bridge will consist of constructing a 7.5-foot corrugated aluminum pipe within the existing pipe. The annular space between the existing pipe and the new pipe would be filled with controlled low strength material. Prior to the construction of the structural pipe liner, the existing pipe should be cleaned and any voids around the existing pipe should be filled with pressure grout. Angled corner baffles should be installed to facilitate fish passage and may be fastened to the proposed liner between the corrugations. Additionally, this alternative includes the construction of a concrete fishway installed at the outlet to complete fisheries enhancements.

The headwall and wingwalls need to be removed above the cracks and repaired utilizing doweled connections. The existing concrete apron and channel shall be removed to allow for more environmentally friendly fish passage. The artificial channels to be removed, including the bituminous ditch, in the project area should be replaced with a combination of riprap, channel toe boulders and natural streambed material. Water handling will likely consist of cofferdams and low flow pumping through the existing culvert. The endwall and wingwalls shall be removed and replaced in concert with the construction of the fish passage system.

One temporary and one permanent construction access road will be established off I-84 to reach the upstream and downstream ends of the structure to facilitate completion of the proposed work. All proposed rehabilitation work can generally be performed with minimal, temporary disturbance to the travel way, consisting of off-peak lane and shoulder closures. Sections of the existing three-cable guiderail would require temporary removal to maintain admittance to the construction access roads.

Construction is anticipated to begin in the spring of 2026.

Currently, the construction cost is to be undertaken with 100% State funds.