TECHNICAL SPECIFICATIONS

TOWN OF CHESHIRE
BRIDGE NO. C-10-024
WEST MOUNTAIN ROAD OVER KITCHEN BROOK
CULVERT STRENGTHENING

SPECIAL PROVISIONS TO THE
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION – HIGHWAY DIVISION
STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

DIVISION II

All work under this contract shall be done in conformance with the 2025 Massachusetts Department of Transportation Highway Division Standard Specifications for Highways and Bridges including the latest Supplemental Specifications, the October 2017 Massachusetts Department of Transportation Highway Division Construction Standard Details, the 1990 Standard Drawings for Signs and Supports; the 2023 Manual on Uniform Traffic Control Devices (MUTCD) with Massachusetts Amendments and the Standard Municipal Traffic Code; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of the American Standard for Nursery Stock; the Plans and these Special Provisions. The 2024 Standard Specifications for Highways and Bridges shall be referred to collectively as the Standard Specifications.

The West Mountain Road over Kitchen Book Culvert Strengthening Project is located on a rural local road just to the west of Route 8 in the Town of Cheshire. Due to the project location, a complete closure of the roadway is not allowed as there is no feasible detour to provide residents or emergency services an alternative route. As such, a single 11’ lane of alternating one way traffic is to be maintained at all times throughout the duration of construction. The work includes the installation of a temporary bridge that spans over the excavation limits in order accommodate a single lane of traffic, excavating down to the existing culvert, casting a 12” thick reinforced concrete arch over the existing culvert, construction of reinforced concrete headwalls/safety curbs and return walls, installation of MSE wingwalls along the southern edge of roadway, backfilling the structure, placement of modified rock fill at each of the four bridge corners, stream bed restoration at the outfall scour hole, concrete repairs to the existing concrete footings, final paving/striping, and approach guardrail installation. Installation of the MSE wingwalls, stream bed restoration, and concrete repairs to the existing concrete footings will require control of water to allow the work to be completed in the dry. The Plans consist of 14 construction drawing sheets that were reviewed and approved by MassDOT on February 24, 2025 and then revised on November 17, 2025 to incorporate updated right of way information. Traffic management required to perform the proposed work shall be as shown on the construction drawings. Payment for materials or work shown on the Plans or as being part of the culvert strengthening which may be incidental to its construction and are not specifically included for payment under the Contract shall be considered incidental to the work performed. Where used within the contract documents, the terms “Department”, “Municipality”, and “Town” shall be taken to mean the Town of Cheshire. The term “Engineer” shall be taken to mean the authorized representative or Project Manager for the Town of Cheshire.

For the work specified under this Contract, the Contractor or Subcontractor(s) shall be prequalified by the Massachusetts Department of Transportation Highway Division (MassDOT) for the following classes of work:

Bridge Construction
Demolition
Ironwork shall be performed by a Steel Fabricator approved by MassDOT for work on bridge components.

PLANS AND DETAIL DRAWINGS

(Supplementing Subsection 5.02)

Plans for the existing culvert are not available. Existing conditions shown in plans were depicted from field survey and visual observations. The Contractor shall perform his/her own investigation of the existing culvert to determine its condition and details necessary for construction and base his/her bid thereon.

PROTECTION OF UTILITIES AND PROPERTY

(Supplementing Subsection 7.13)

The bridge plans may indicate the location of existing known utilities in the vicinity of the work. Bidders are cautioned to verify this information, as its accuracy and completeness are not guaranteed in any manner.

The Contractor is responsible for the protection of vehicular and pedestrian areas on and around the construction site and for the safety and security of the site whether work is ongoing or not. The Contractor at no additional compensation (unless otherwise, provided in this Contract) shall take all necessary precautions, including the use of shielding, to protect vehicles and pedestrians from debris.

NOTICE TO OWNERS OF UTILITIES

Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of publicly or privately owned utilities attached to, or in the vicinity of the bridge, of his intention to commence operations and the Contractor shall at that time file a copy of such notice with the Engineer.

Before the Contractor begins any work or operations that may cause damage to any subsurface structures, he shall carefully locate all such structures and conduct his operations so as to avoid any damage to them.

A list of public and private utilities can be found on the MassDOT website at:

https://hwy.massdot.state.ma.us/webapps/utilities/select.asp?t=CHESHIRE&d=1&c=59

The utility contact list is for guidance only and is not guaranteed to be complete or up to date.

The Contractor shall be responsible for informing the following officials in each area that he is assigned to work in:

DPW Director, Town of Cheshire
Police Department, Town of Cheshire
Fire Department, Town of Cheshire

UTILITY SHIELDING OR TEMPORARY RELOCATION COSTS

The Contractor is advised that existing overhead wires have been observed along the north side of West Mountain Road. The Contractor shall coordinate all construction activities in advance with the authorized representatives of the utility companies. Any required temporary relocations or shielding of the existing utilities will be paid for by the Contractor without additional compensation.

PROTECTION OF UNDERGROUND FACILITIES

The Contractor's attention is directed to the necessity of making his own investigation in order to assure that no damage to existing structures, drainage lines, traffic signal conduits, et cetera, will occur.

The Contractor is advised that there is an existing 8" watermain that runs below grade along the north side of West Mountain Road. There is also a large underground vault located below the roadway at the western limits of the project that provides access to this watermain. Both the watermain and the vault are to be protected in place.

The Contractor shall notify Massachusetts DIG SAFE and procure a Dig Safe Number for each location prior to disturbing existing ground in any way. The telephone number of the Dig Safe Call Center is 811 or 1-888-344-7233

PROVISIONS FOR TRAVEL AND PROSECUTION OF WORK

The Contractor shall notify the Town of Cheshire in writing at least two (2) weeks in advance of any proposed commencement of the work. Before starting any work under this Contract, the Contractor shall submit a Schedule of Operations. Work on roadways shall proceed only on such sections and widths thereof as will be approved by the Town of Cheshire.

The Contractor shall notify the Town of Cheshire in writing at least two (2) weeks in advance of installing the temporary bridge. During installation and removal of the temporary bridge, it is anticipated that police officers will be required to direct traffic safely through the workzone. Contractor shall coordinate police details with the Town of Cheshire.

SURVEY REQUIREMENTS

The Contractor shall be responsible for establishing line and grade for the project, using the provided control points on the plans.

ENVIRONMENTAL REQUIREMENTS

ORDERS OF CONDITIONS

This project is subject to Section 401 of the federal Clean Water Act, 33 USC 1341, and Massachusetts Clean Water Act, M.G.L. c 21, § 26-53, and has been issued Orders of Conditions by the Cheshire Conservation Commission. The Order of Conditions are considered to be part of this contract and a copy of the Orders of Conditions and all plans/attachments shall be on-site while activities regulated by the Orders of Conditions are being performed.

The Contractor's attention is directed to the fact that special conditions and other requirements are associated with the Orders of Conditions. It is the Contractor's responsibility to be aware of and comply with these conditions and requirements and plan his/her work and schedule accordingly. **The Contractor is hereby notified that he/she will be responsible and held accountable for performing any/all work necessary to satisfy and comply with the entire Orders of Conditions.**

The Order of Conditions are attached. The Contractor is advised that no additional compensation will be allowed for work required to establish, achieve, and maintain compliance with the Order of Conditions, as payment for the work shall be included in the various bid items. This work may include, but not limited to, the following: the hiring and paying for services of a Professional Biologist, Botanist, Wetland Scientist, Engineer, Landscape Architect, etc.; preparation and submission of as-built plans; wetland flagging; wetland replication monitoring reports, etc.

UNITED STATES ARMY CORPS OF ENGINEERS GENERAL PERMIT

A Self Verification Notification Form (SVNF) for the General Permits for Massachusetts was submitted on February 20, 2025 indicating the proposed work shall meet the terms and conditions of the applicable General Permits. The SVNF is attached. The Contractor is advised that no additional compensation will be allowed for work required to establish, achieve, and maintain compliance with the General Permits for Massachusetts, as payment for the work shall be included in the various bid items.

GENERAL

If field conditions and/or Contractor-proposed erection, demolition, temporary bridge location, storage, or other procedures not originally allowed by existing environmental permits require work to occur in or otherwise impact water or wetland resource areas, the Contractor is advised that no associated work can occur until all required environmental permits have been either amended or obtained allowing such work. The Contractor must notify the Town of Cheshire and Resident Engineer in writing at least 60 days prior to desired commencement of the proposed activity. All environmental submittals, including any contact with Local, State, or Federal environmental agencies, must be coordinated with the Town of Cheshire and the Resident Engineer. The Contractor is expected to fully cooperate with requests for information and provide the same in a timely manner. The Contractor is further advised that the Town of Cheshire will not entertain a delay claim due to the time required to modify or obtain the environmental permits.

PIGEON WASTE

The Contractor shall remove and dispose of any pigeon waste and any other debris accumulated on the bridge members in areas where work is being performed. Pigeon waste and debris material contaminates will require special handling and disposal in accordance with all Federal, state, and local requirements.

ARCHITECTURAL ACCESS BOARD TOLERANCES

The Contractor shall be responsible for constructing all project elements in strict compliance with the current AAB/ADA rules, regulations and standards. All construction elements in this project associated with sidewalks, walkways, wheelchair ramps and curb cuts are controlled by 521CMR - Rules and Regulations of the Architectural Access Board (AAB).

The AAB Rules and Regulations specify maximum slopes and minimum dimensions required for construction acceptance. There is no tolerance allowed for slopes greater than the maximum slope nor for dimensions less than the minimum dimensions.

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ITEM 140. BRIDGE EXCAVATION CUBIC YARD

Work under this item shall conform to the relevant provisions of Sections 120, 140 and 150 of the Specifications and the following:

Excavation shall be as required to construct the proposed culvert strengthening, MSE wingwalls, modified rockfill embankments, and full depth pavement areas to the lines and grades shown on the Plans. Any materials encountered shall be excavated under this item. This includes existing pavement, existing concrete or granite rubble, existing riprap/boulders, existing stone headwalls, and other material encountered within the excavation limits shown on the plans. Extreme care shall be taken not to damage the existing steel culvert to remain. Hand excavation shall be required within 12" from the top of the existing steel culvert.

This item also includes thoroughly cleaning the existing steel culvert of all debris in preparation for casting the 12" proposed reinforced concrete arch.

Any necessary temporary support of excavation shall be considered incidental to this item and shall be designed and stamped by a Professional Engineer registered in Massachusetts and submitted for approval.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement shall be made to the nearest cubic yard of Bridge Excavation complete and accepted by the Engineer. Payment will be made at the contract unit price per cubic yard and shall be considered full compensation for all labor, equipment, stockpiling, handling, formation of embankments, formation of shoulders, backfilling, hauling, disposal, and incidentals necessary to complete the work.

ITEM 143.1 CHANNEL EXCAVATION LUMP SUM

Work under this item shall conform to the relevant provisions of Section 140 of the Specifications and the following:

There are two locations within the project limits where debris is restricting the stream flow. One location is directly upstream of the structure, and one location is directly at the outfall of the structure. This work shall consist of the removal and satisfactory disposal of these two blockages to allow the stream to flow naturally.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for the work to be done under this item shall be at the contract lump sum bid price for Item 143.1 Channel Excavation, which price shall be full compensation for all labor, equipment, stockpiling, handling, hauling, disposal, and incidentals necessary to complete the work.

ITEM 151. GRAVEL BORROW CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 150 of the Standard Specifications and in close conformity with the lines and grades shown on the plans.

Gravel borrow conforming to material specification M1.03.0 Type B shall be used for the roadway subbase and under the stone drain channels where the existing base material is unsuitable as determined by the engineer.

ITEM 281.6 NATURAL STREAM BED MATERIAL CUBIC YARD

The purpose of this item is to provide additional material to fill the scour hole located at the outfall of the existing culvert and restore the streambed in this area to its natural state to the limits and grades shown in the plans.

The work to be done under this item shall conform to the relevant provisions of Section 983 of the Standard Specifications and the following:

This work shall consist of furnishing and placing stone fill material on the brook bed at the existing scour hole at the culvert outfall. Stone fill material shall be placed to maintain a natural bed appearance, and maintain aquatic organism passage. The ultimate product will, to the greatest extent possible, replicate the function and appearance of the existing stream.

Natural streambed material shall be rounded without angular edges and shall consist of gravel, cobble stone, and rip rap conforming to the following:

- Gravel Material meeting gradation of M 1.03.0 Type A.
- Cobble stones shall be from the project site or another site that replicates this stone to the greatest extent possible and shall be 6 to 12-inch cobble stone.
- Rip-Rap Material meeting the size requirements in M2.02.0

Placement of the natural streambed stone material shall be compacted in place and shall match in with the existing natural stream channel.

Once all material has been placed in the stream channel and approved by the Engineer, the Contractor shall remove the water control in such a way to slowly wet the stream to minimize the initial sediment pulse. Every attempt shall be made to minimize the downstream movement of sediment.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

This Item will be measured and paid at the Contract unit price per Cubic Yard of natural streambed material placed. The Contract price shall include all labor, tools, equipment, and incidental work necessary to complete the work.

ITEM 657. TEMPORARY FENCE FOOT

The work under this item shall conform to the relevant provisions of Section 644 of the Standard Specifications and the following:

The work shall include furnishing, installing, adjusting, resetting, and subsequently removing a temporary chain link fence across the access to the work area as necessary for safety and security, and as directed by the Engineer.

All posts, including end, corner, and intermediate brace posts and all access/egress gates and gate posts shall be included in the linear foot cost. The fencing height shall be 72 inches minimum. Material need not be new, but shall not be deteriorated nor in any way jeopardize the security purposes intended. All fencing materials shall meet the approval of the Engineer.

Fence fabric shall be placed on the face of the post away from the work area. The top edge of the fabric shall be finished with a “Knuckled” selvage.

A 48” x 30” sign, conforming to the relevant provisions of Subsection 852, shall be mounted on each gate. The sign legend shall be 8”-high, bold-red font, printed on white background, and shall read as follows:

DANGER

AREA CLOSED TO VEHICLE, BICYCLE, AND PEDESTRIAN TRAFFIC

It may be necessary to remove and reset sections of temporary fence at times during construction to accommodate construction operations. This shall be considered incidental to the work.

The Contractor shall be responsible for maintenance of the temporary fence; be responsible and cognizant that it remains secure, and that the area is always sealed off to the public. Fence gates shall always be secured closed with a padlock and chain while the Contractor is not on site.

MEASUREMENT AND PAYMENT

Item 657. will be measured per Foot of temporary fence installed, complete in place. Item 657. Will be paid for at the Contract unit price, per Foot. This price shall include all labor, tools, materials, equipment, signage, repair, restoration, or replacement of any damaged fencing, removal and disposal of the fence upon completion of the project, and all incidental costs required to complete the work.

ITEM 698.3 GEOTEXTILE FABRIC FOR SEPARATION SQUARE YARD

The work under this item shall conform to the requirements of Section M9.50.0 of the Standard Specifications and the following:

The work under this item includes the furnishing and installation of geotextile fabric under the modified rock fill.

At locations of fabric installation, all rocks, vegetation, and other obstructions shall be removed before placement of the fabric. The fabric shall be installed and fastened in place in conformance with the manufacturer’s recommendations.

MEASUREMENT AND PAYMENT

Geotextile fabric for separation shall be measured for payment per square yard, complete in place; any overlaps shall be measured as a single layer of cloth.

Geotextile fabric for separation shall be paid for at the Contract Unit price per square yard, which price shall include all labor, tools, material, equipment and incidental costs required to complete the work.

ITEM 751.7 **COMPOST BLANKET** **CUBIC YARD**

The work under this Item shall conform to the relevant provisions of Subsection 751 and M1.06.0 Organic Soil Additives of the Standard Specifications and the following:

Work shall consist of furnishing and pneumatically applying compost as a thin mulch blanket (1/2-1 inch depth) over prepared soil to provide temporary soil stabilization and organic matter for plant growth.

SUBMITTALS AND MATERIALS

No materials shall be delivered until the required submittals have been approved by the Engineer. Delivered materials shall match the approved samples. Approval of test results does not constitute final acceptance.

Contractor shall submit to the Engineer samples and certified test results no sooner than 60 days prior to application of compost. Vender certification that material delivered meets the test results shall be submitted if requested.

Compost may be a blended product of compost and fine wood chips. No kiln-dried wood, construction debris or ground palette is allowed. Material shall meet the following criteria:

- Organic matter content shall be minimum 30 percent (dry weight basis)
- Moisture content shall be 30-60 percent (wet weight basis)
- Bulk Density <1000 lb/cy
- pH shall be 5.5-7.5
- Conductivity shall be a maximum of 4 mmhos
- Stability test shall produce a maximum of 8mg CO2-C/gram of organic material per day
- Particle size shall not exceed ¾ inch
- Compost may be a blended product of compost and fine wood chips.

Compost testing shall be by a laboratory approved by the US Compost Council using the Testing Method for the Examination of Compost and Composting (TMECC) protocols.

The Engineer shall approve the Contractor's equipment for application.

CONSTRUCTION METHODS

Application of compost material shall not begin until the Engineer has approved the site and soil conditions. Soil preparation shall be as specified under the applicable item for soil placement or for seeding. The Contractor shall notify the Engineer when areas are ready for inspection and application of compost.

Compost blanket shall be pneumatically applied (blown on) to a minimum depth of one half to one inch. Where shown on the plans or when directed by the Engineer depth may be increased to provide berms for sediment control or to otherwise prevent slope erosion.

When compost blanket is proposed with seeding, seed shall be broadcast and shall occur in conjunction with compost blanket, as specified under the relevant item for seeding.

When compost blanket is proposed for areas with planting, compost (and seed if applicable) shall be applied after planting. If compost and seed occur prior to planting, areas shall be regraded and compost

and seed reapplied to the satisfaction of the Engineer and at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 751.7 will be measured and paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and all incidental costs required to complete the work of pneumatically applying compost.

Surface preparation of substrate receiving compost blanket shall be compensated under the applicable item for placement of loam, sand, ordinary borrow, wetland soil, topsoil rehandled and spread, tilled existing soil, or other specified substrate.

Seeding will be compensated for under the appropriate seeding items.

ITEM 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Sections 670, 751, and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment Control Barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier. Photo-biodegradable fabric shall not be used.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, sedimentation fence shall be used in addition to compost filter tubes and straw bales and shall be compensated under that item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. If necessary to accommodate field conditions and to maximize effectiveness, barrier locations may be shifted with approval from the Engineer. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

MATERIALS AND CONSTRUCTION

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

COMPOST FILTER TUBE

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

STRAW BALES

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

SEDIMENTATION FENCE

Materials and Installation shall be per Section 670.40 and 670.60 of the Standard Specifications and the following:

Sedimentation fence shall only be used if shown on the plans or when specified by Orders of Condition or

other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

MAINTENANCE

Maintenance of the sediment control barrier shall be per Section 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and sedimentation fence, shall be removed and disposed off-site by the Contractor.

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Sedimentation fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 989.2 REPAIRS TO CONCRETE CUBIC FOOT

The work under this item shall conform to the applicable provisions of Subsections 112 and 901 of the Standard Specifications and the following:

The work to be done under this Item consists of repairing a concrete spall at both existing footings directly above the concrete encased water line (as shown on the plans). The work shall consist of surveying the existing concrete around the existing crack/spall. The Contractor, under the direction of the Engineer, shall locate and remove loose concrete, deteriorated concrete, and concrete overlaying hollow areas, and patch these areas with patching material to the original contour. The above repair work requires being done in the dry. Refer to Item 991.11 Control of Water – Structure No. C10024.

MATERIALS

Patching material for the concrete repair shall be a MassDOT approved product listed on the QCML for vertical and overhead application. The patching material used shall be suitable for the anticipated depth of repair as shown on the contract plans by providing multiple lift thicknesses or extending the material using aggregate as recommended by the manufacturer.

CONSTRUCTION

The Contractor shall establish limits of the repair as shown on the plans and at the direction of the Engineer. The location shown on the plans is based upon records of bridge inspections and visual observations and is not guaranteed. The location and extent of the concrete repair is to be field verified and approved by the Engineer after the Contractor has sounded and marked out the repair area. The proposed repair area shall reasonably follow the outlines of the deterioration and preferably have square corners.

Once the limits of the repairs have been approved by the Engineer, the repair shall be sawcut along neat lines to a depth of ½” to produce a clean edge. All deteriorated and unsound concrete shall be removed with a minimum depth of 1½” and maximum depth of 6”.

After removal and edge preparation are complete, remove bond inhibiting materials (dirt, grease, loosely bonded aggregate) by abrasion blasting or high pressure water blasting with water that contains no detergents or bond inhibiting chemicals. Check the concrete surfaces after cleaning to insure that the surface is free from additional loose aggregate or that additional delaminations are not present.

Once surface preparation has been completed, presoak the concrete substrate with a water hose as long as site constraints permit. At the time of the repair concrete placement, substrate shall be saturated surface dry with no standing water.

All mixing and application of the patch material shall be done in strict accordance with the printed instructions supplied by the manufacturer and as directed by the Engineer. For deeper repairs, patch material shall be placed in lifts or extended using aggregate in accordance with the manufacturer's recommendations. Curing of patches shall be in strict accordance with the printed instructions supplied by the manufacturer and as directed by the Engineer.

MEATHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 989.2 will be measured and paid for at the contract unit price per cubic foot of repair concrete actually placed, which price shall be full compensation for locating and removal of deteriorated concrete, saw cutting, cleaning and surface preparation of the patch areas, furnishing, placing, finishing, and curing the concrete patch, including all equipment, tools, labor, and incidentals necessary to complete the work.

ITEM 989.3 CONCRETE CRACK REPAIR LINEAR FOOT

The work under this item shall conform to the applicable provisions of Subsections 112 and 901 of the Standard Specifications and the following:

The work to be done under this Item consists of repairing a vertical crack at both existing footings directly above the concrete encased water line (as shown on the plans). The work shall consist of cleaning and filling the cracks with low viscosity, high expansive material. The above repair work requires being done in the dry. Refer to Item 991.11 Control of Water – Structure No. C10024.

MATERIALS

Material for the crack repair shall be a low viscosity and high expansive material to allow penetration of the vertical crack. Once cured, the material shall be able to bond to the existing concrete and exhibit properties to allow expansive movement of the joint while providing a water tight seal.

Acceptable material includes the following:

1. Sikaflex 1a+ manufactured by Sika Corporation, 800-933-7452, www.sikausa.com.
2. Dymonic 100 manufactured by Tremco.
3. Or approved equal.

CONSTRUCTION

Cleaning of the existing crack, surface preparation, mixing, and application of the crack repair material shall be in strict accordance with the manufacturer's recommendations.

MEATHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 989.3 will be measured and paid for at the contract unit price per linear foot of crack repair actually performed, which price shall be full compensation for cleaning and surface preparation of the existing crack, furnishing, mixing, and application of the crack material, including all equipment, tools, labor, and incidentals necessary to complete the work.

ITEM 991.1 CONTROL OF WATER – STRUCTURE NO. C10024 LUMP SUM

The work to be done under this item shall conform to the relevant provisions of Sections 140 and 950 of the Standard Specifications and the following:

The work shall include the furnishing, installation, operation, maintenance, and removal of the water control system and sedimentation treatment basin required for the construction of the proposed

wingwalls, existing footing concrete repairs, and stream bed restoration at the outfall scour hole. The Water Control System shall be capable of diverting the water flow around the construction area, preventing flow through the constructed works, and lowering the water table to an elevation that allows the above work to be completed in the dry as determined by the Engineer and as shown on the plans.

To the greatest extent possible, work shall be done during period of low flow. The Water Control System shall prevent water flow into the construction area for flows up to the 2-year storm event water surface elevation shown on the Plans. Sandbags or other means of blocking the water, as approved by the Engineer, shall be used both upstream and downstream to prevent the flows. The Contractor shall adjust the height of the water control dam structure if needed and use supplemental pumping in the event of an extreme rain event or unusually high flows. Prior to installation of the Water Control System, the Contractor shall notify the Town of Cheshire Conservation Commission to inspect and document the existing conditions prior to excavation. Additionally, the Contractor shall comply with all conditions included with the Town of Cheshire Conservation Commission Order of Conditions, dated November 18, 2025 attached hereto (see Appendices). In case of conflict the Order of Conditions take precedence over these Specifications.

The Contractor shall install and maintain temporary measures for the containment of the stream flow, the collection of siltation and debris due to construction activities and the maintenance of drainage through the drainage system upstream and downstream during the construction period. Temporary control measures shall include, but not be limited to, the use of temporary sheeting, sandbags, stone dikes and dams, sedimentation basins, crushed stone, paved or unpaved waterways and other devices or methods which meet the requirements of this section and approval of the Engineer. The use of earthen berms in the stream is prohibited.

All excavation for the installation of the temporary water diversion shall conform to Section 120. All excavated materials for the temporary water diversion such as earth, rock, muck, pavement, and stone, shall be incidental to this item.

All dewatering and related earthwork shall be conducted in such a manner as to prevent siltation or contamination of the waterway. The pumping discharge shall not be allowed to enter directly into the waterway. The water from the work areas shall be pumped to a settling basin. This basin shall be constructed to allow the pumped water to pass through the basin with sediments settling out before out letting. At a minimum, the basin shall be constructed of an earthen or stone berm lined with geotextile fabric and surrounded by staked straw bales or compost filter tubes. The basin shall meet or exceed the following criteria:

A. The size and location of the basin shall be determined based on the size of the contractor’s pump and the anticipated flows for the work to be completed in the dry.

B. The outlet/weir of the dewatering basin shall not cause erosion of the surrounding area. An approved method of controlling erosion, such as an erosion control blanket, stone, etc., shall be used at the outlet of the basin.

C. The Contractor shall maintain the dewatering operations in working condition, including periodic removal of accumulated sediment within the basin to permit its proper function. The water pump and hoses for dewatering shall be in good working condition and of adequate power and size for the operation.

D. The contractor shall inspect straw bales/compost filter tubes that surround the outlet daily and shall immediately replace any that are damaged.

E. The proposed location and design of the settling basin shall be subject to the approval of the Engineer and the Cheshire Conservation Commission and MassDEP prior to construction.

Plans and calculations (if applicable) for all sandbags, settling basins and other water control measures shall be developed by the Contractor for this item. These plans and calculations shall be prepared and stamped by a Professional Engineer registered in Massachusetts and shall be submitted for the approval of the Engineer prior to the start of construction. Furthermore, this submission shall be submitted to the Cheshire Conservation Commission for review and approval prior to construction.

The Contractor shall be responsible for the removal and proper disposal of all temporary structures or devices to an off-site location. The Contractor is responsible for restoring the stream bed to its original state, regrading, loaming, and seeding of all disturbed areas, and any other incidental work required to perform this work as directed by the Engineer.

Prior to removal of the dewatering system, the Contractor shall notify the Town to inspect the restored area.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for the work to be done under this item shall be at the contract lump sum bid price for Item 991.1 Control of Water, which price shall include all labor, materials, equipment, sandbags or other means of blocking water and directing flow, temporary diversion pipes, excavation for temporary pipes, sedimentation basins, filter bags, pumping, removal of temporary water control devices, restoration of all disturbed areas and all incidental costs required to complete the work. Payment for all work related to the installation, removal, and restoration of temporary water control shall be included under this Lump Sum and not under other items of work in the contract.

ITEM 992.4 CULVERT STRENGTHENING - STRUCTURE NO. C10024 LUMP SUM

The work to be done under this Item shall conform to the applicable provisions of Sections 901 and 995 of the Standard Specifications and the specific requirements stipulated below for the component parts of this Item.

Work under this Item shall include all materials, equipment and labor needed to construct the following components: cast in place concrete arch, concrete safety curbs, head walls, return walls, bridge railing, and damp-proofing of the proposed concrete.

Materials shown on the plans as being part of this culvert strengthening or incidental to its construction shall be included for payment in this Lump Sum and shall not be included for payment under another Item in this contract.

5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE

5000 PSI, ¾ IN., 685 HP Cement Concrete shall be used to construct the proposed concrete arch, safety curbs, head walls, and return walls. 5000 PSI, ¾ IN., 685 HP Cement Concrete shall conform to all material and placement, finishing, and curing requirements of the Standard Specifications.

DRILLING AND GROUTING #5 AND #6 BARS

The work to be done under this item shall consist of drilling and grouting dowels in the existing footings for the culvert strengthening as shown on the Plans, or as directed by the Engineer. The dowel embedment must be adequate to fully develop 125% of the yield strength of the bar. The embedment length, the method and equipment used to drill the dowel holes, and the diameter of the drilled hole shall at a minimum conform to the recommendations of the manufacturer and be submitted to the Engineer for approval.

MATERIALS

The grout to be used for these dowels shall be a non-shrink, non-metallic composition containing a blend of selected Portland cements, plasticizing/water-reducing admixtures and shrinkage compensation agents, conforming to ASTM C1107. The shrinkage agents shall compensate for shrinkage in both the plastic and hardened states. Grout shall meet the following minimum material properties:

1. Compression strength at 28 days (ASTM C 942): 7500 psi
2. Bond strength – plastic grout to hardened concrete at 28 days (ASTM C 882): 1950 psi

The cementitious grout materials used shall be appropriate for bonding reinforcement dowels into concrete and shall be on the MassDOT approved products list of materials. MassDOT approved epoxy, vinyl, or polyester resin adhesives may be utilized in lieu of cementitious grout in accordance with the Engineering Directive E-10-001.

All grout materials shall be delivered in original, unopened containers with the manufacturer's name, labels, product identification and batch numbers. Damaged material must be removed from the site immediately. All materials shall be stored off the ground and protected from rain, freezing or excessive heat until ready for use.

Material shall not be applied if it is raining or snowing, or if such conditions appear to be imminent. The minimum application temperature is 7°C (45°F) and rising.

The Contractor shall submit copies of manufacturer's literature for approval, including product data sheets and appropriate material safety data sheets.

Reinforcing steel dowels shall meet requirements of AASHTO M31, Grade 60 (ASTM A615 Grade 60) and shall be epoxy coated. Reinforcing steel dowels shall be incidental to work under these headings.

CONSTRUCTION METHODS

All dowel holes shall be air drilled provided that the minimum edge distance of 6 inches is observed. Should, in the Engineer's opinion, air drilling be inappropriate due to questionable strength of the existing concrete or insufficient edge distance, the dowel holes shall be diamond core drilled. The inner surfaces of diamond core drilled dowel holes shall be scored to develop sufficient keying action. The method of scoring of the dowel hole's inner surfaces shall be subject to the approval of the Engineer. The diameter and embedment of the drilled dowel holes shall be in accordance with the recommendations of the grout manufacture and the following minimum dimensions:

Diameter: minimum 1" larger than the diameter of the bar, providing a minimum ½" annulus.

Embedment: as indicated on the plans and a minimum of fifteen times the bar's diameter.

The holes shall be blown clear of any debris and shall have the approval of the Engineer prior to the placement of any grout material.

The drilling operation shall be performed without damage to any existing reinforcing or portion of the structure that is to remain in place. Any damage to any existing portion of the structure that is to remain in place shall be repaired to a condition equal to or better than that existing prior to the beginning of the Contractor's operations and shall be repaired at the Contractor's expense.

The Contractor shall strictly follow the recommendations of the manufacturer for mixing and placing the grout material prior to the placement of the dowels. The Contractor shall, at a minimum, adhere to the ACI

code requirements regarding minimum and maximum temperatures while placing the grout. Any excessive grout around the hole after placement of the dowel shall be struck off smooth while the grout is still fresh.

The Contractor shall have no claim for any variations in the diameter of the hole, the method of drilling the hole, or the type of grout used in anchoring the proposed dowels.

METAL BRIDGE THRIE BEAM RAILING

The work to be performed under this heading shall consist of the fabrication and installation of a Thrie Beam Bridge Rail system. This item shall be fabricated by a MassDOT Approved Fabricator of Bridge Components (CPT). Work shall conform to the relevant provisions of Section 975, Metal Bridge Railings and Protective Screen, of the Standard Specifications and the following.

Thrie beam panels shall be double nested (2 layers) 12-gauge panels or 1 layer of 10-gauge panels and shall conform to AASHTO M 180 Class B. The posts, base plates, and thrie beam rail panels shall be galvanized after fabrication in accordance with AASHTO M111.

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

At the time of bid, the Contractor shall submit on his/her proposal form a schedule of unit prices for the major component Sub-Items that make up Item 992.4 as well as his/her total Culvert Strengthening Lump Sum cost. The Culvert Strengthening Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 992.4 and no further compensation will be allowed.

The schedule on the proposal form applies only to Culvert Strengthening Item 992.4. Payment for similar materials and construction at locations other than at this location shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

992.4 CULVERT STRENGTHENING

Sub-Item	Description	QTY.	UNIT
904.3	5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE	50	CY
910.1	STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED	9,100	LB
912.5	DRILLED AND GROUTED #5 DOWELS	12	EA
912.6	DRILLED AND GROUTED #6 DOWELS	84	EA
970.	DAMP-PROOFING	1230	SF
975.8	METAL BRIDGE THRIE BEAM RAILING	43	FT

ITEM 993.1 TEMPORARY BRIDGE NO. C-10-024 LUMP SUM

This item shall conform to the general provisions of Section 995 and the following requirements. Where no specific requirement is directed for a component part of the item, the Standard Specifications shall apply, except for payment.

The work under this item shall consist of constructing the temporary bridge structure for Bridge No. C-10-024 in accordance with the plans and specifications, and in accordance with guidelines of the manufacturer's technical handbook. The work includes furnishing and installing a temporary bridge superstructure, bridge deck, bridge railing, bridge abutments, retaining walls/support of earth (as required), and approach roadways.

The temporary bridge shall meet the following design criteria:

1. Design shall be in accordance with AASHTO Guide Design Specifications for Bridge Temporary Works, 2nd Edition.
2. The bridge shall be designed for HS20 loading at a minimum.
3. The railing system on the bridge and the barrier along the approach roadways shall be designed for AASHTO TL-2 loading as a minimum.
4. The roadway width on the approach roadway and on the bridge shall be a minimum of 11 feet.
5. The maximum allowable bearing pressure is 2 tons/sq. ft (4 ksf). If the Contractor chooses to exceed the maximum allowable, additional subsurface exploration and geotechnical evaluation shall be performed. The additional bearing capacity evaluation shall be submitted to the Engineer of Record for approval.
6. The temporary bridge and roadway shown on the plans are within the approximate Right of Way limits. If the Contractor chooses to exceed the ROW limits, the Contractor shall be responsible for obtaining written agreements from the Town and applicable property owners.
7. The temporary bridge shown on the plans has a span of 50 feet +/- and is located as shown. The Contractor may modify the geometry and layout of the bridge but shall not violate the temporary bridge criteria described in this specification. The Contractor is responsible for any permits required resulting from a change in the geometry or layout of the temporary bridge.

CONSTRUCTION METHODS

General.

The field personnel shall have knowledge of and follow the approved Field Erection Plan and Assembly Plan. Field Erection shall comply with 960.61, *Erection* and the Assembly Plan shall be as described below.

Submittal Requirements.

The Contractor shall submit a temporary bridge design package to the Engineer for approval prior to the installation of the temporary bridge which shall include calculations and plans for the design of the temporary bridge and retaining walls/support of earth (as required). Plans and calculations shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

Prior to erection of the temporary bridge, the Contractor shall submit for approval by the Engineer, detailed assembly plans, procedures, computations and drawings for transport, hoisting, erection and handling of the bridge stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The assembly plans shall include structural steel details, steel reinforcing details, deck details, the location and details of lifting devices, minimum concrete compressive strength to be obtained

prior to handling the units, as well as concrete stresses and steel member stresses during handling transport and erection, crane capacities, pick radii, sling geometry, and lifting hardware.

The erection procedure shall be in conformance with Subsection 960.61 and include the following as a minimum:

- Verification that the equipment can handle all pick loads and weights with appropriate factor of safety
- Evaluation of construction sequence/evaluation of any geometric conflicts in the placement procedures
- Design of crane supports including verification of subgrade for support.
- Documentation of all preparatory work necessary for moving personnel, equipment, supplies, additional equipment used to move the superstructure, and incidentals to the project site before beginning work.
- Provision of a pre-operations checklist, and a proposed schedule for meetings with the Engineer for review and approval of the pre-operations checklist.
- Documentation that the system shall be sufficiently redundant to avoid damage to the structure during fabrication, transport and placement.

The following submittals, as described above, shall be submitted to the Designer of Record:

- Calculations and Plans for temporary bridge
- Erection Procedure and Assembly Plan for temporary bridge
- Calculations and Plans for the transport, hoisting, erection and handling of the bridge

Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. The Town reserves the right to perform additional independent survey. This survey does not relieve the Contractor of performing survey for the construction. If discrepancies are found, the Contractor may be required to verify previous survey data.

Erection.

The elements shall be placed in the sequence and according to the methods outlined in the Erection and Assembly Plan.

Approach Roadway.

Approach roadways shall be constructed in accordance with the Standard Specifications. The temporary wearing surface materials and thicknesses shall be as shown on the plans.

Approach Guardrail/Barrier.

Approach guardrail/barrier shall be according to the latest edition of the MassDOT Construction Standard Details. Approach guardrail shall meet TL-2.

Restoration of Site.

After traffic is transferred to the proposed permanent bridge, the temporary bridge shall be disassembled and removed from the project site. The project site shall be restored to its original conditions. Limits of Loam Borrow and Seeding shall be according to the plans.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The 993.1 Lump Sum item shall include all design, labor, and materials for the temporary bridge, temporary abutments, support of earth, and approach roadway. The cost of labor and materials required to complete the work under this item shall be considered incidental to Item 993.1 and no further compensation will be allowed.

Temporary barrier at the approaches shall be paid for under Items 853.2 and 853.21 as appropriate.

Item 993.1 shall be paid according to the following payment schedule:

Partial Payment	Description
15%	**ACCEPTANCE OF PRELIMINARY DESIGN ENGINEERING**
60%	**INSTALLATION OF TEMPORARY BRIDGE**
25%	**REMOVAL OF TEMPORARY BRIDGE, ABUTMENTS, SUPPORT OF EARH, APPROACH ROADWAY AND RESTORATION OF SITE**

ITEM 996.33 STONE FACED MECHANICALLY STABILIZED EARTH WINGWALLS SQUARE YARD

The work performed under this item shall consist of the design, fabrication, furnishing, transportation, and erection of a Mechanically Stabilized Earth (MSE) retaining wall system of the required type, and miscellaneous items necessary for a complete installation.

The MSE retaining walls shall consist of galvanized wire-form baskets filled with stone material that are connected to reinforcing strips or reinforcing mesh or geogrid that are embedded in compacted gravel borrow. All reinforcing strips or mesh material shall consist of galvanized steel. The wall structures shall be dimensioned to achieve the design criteria shown on the Plans and specified herein. The MSE retaining walls shall be constructed in accordance with these specifications and in conformity with the lines, grades, design criteria, and dimensions shown on the Plans or established by the Engineer.

DESIGN REQUIREMENTS

Mechanically Stabilized Earth (MSE) retaining walls shall be designed and constructed as specified herein. The design shall be subject to review and acceptance by the Engineer. The acceptability of the MSE retaining wall design shall be at the sole discretion of the Engineer. Any additional design, construction or other costs arising as a result of rejection of a retaining wall design by the Engineer shall be borne by the Contractor.

All calculations and Shop Drawings shall be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.

The MSE retaining walls shall be designed to provide the grade separation shown on the Plans with a service life of not less than 75 years. In general, the MSE wall system shall be designed in accordance with the manufacturer's requirements, as specified herein and shown on the Plans, and in accordance with AASHTO LRFD Bridge Design Specifications.

A preliminary external stability analysis was performed with the given base width (B) and soil properties as shown in the Plans. The results of the analysis are given as Capacity to Demand Ratios (CDR) for sliding, eccentricity, and bearing. The MSE walls shall be dimensioned so that the maximum bearing pressure does not exceed the factored bearing resistance values along with other stability limits presented on the Plans.

The design of the wall by the Contractor shall consider the internal and compound stability of the wall

mass in accordance with AASHTO LRFD 11.10.6. The internal stability shall include soil reinforcement pullout, soil reinforcement rupture, and panel-reinforcement connection failure at each soil reinforcement level. The design shall be performed using the Simplified Method or Coherent Gravity Method. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. Compound stability shall be computed for the applicable strength limits. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal and external stabilities as defined in AASHTO LRFD.

The MSE wall design shall follow the general dimensions of the wall envelope shown on the Plans. The wall facing shall be placed so as not to interfere with drainage or other utilities, or other potential obstructions.

The wire-form stone facing panels shall have spiral connections along all joints including the interface with the culvert structure, both vertical and horizontal. The stone facing panels shall be installed on a leveling pad and/or crushed stone foundation in accordance with the manufacturers recommendations.

All appurtenances behind, in front of, under, mounted upon, or passing through the wall such as drainage structures, utilities, fences, guard rail posts, or other appurtenances shown on the Plans shall be accounted for in the stability design of the wall. Mechanically stabilized earth wingwalls where guardrail posts will extend into the reinforced backfill must either be constructed with vertical pipe sleeves or pre-cut geogrid in the reinforced backfill that will permit guardrail post installation without damage to the reinforced backfill. The wire-form stone-infill units that abut the culvert or return walls shall be fabricated to conform to the geometry and alignment of the culvert opening and return wall ends. The interface must also have a positive connection consisting of pre-installed wire loop inserts or post-installed u-shaped anchors to allow the wire units to be tied to the return walls.

MATERIALS

The Contractor shall be responsible for the purchase or manufacture of the wire-form panels, reinforcing mesh or strips or geogrid, panel/reinforcement connections, geotextile fabric, and all other necessary components. The Contractor shall furnish to the Engineer the appropriate Certificates of Compliance certifying that the applicable wall materials meet the requirements of the project specifications. All materials used in the construction of the MSE walls shall meet the requirements specified in MassDOT Standard Specifications and as specified herein.

Steel Components

All steel components (except the metallic screen) of the MSE Walls shall be galvanized in accordance with ASTM A123. Provide steel reinforcement that meets the following requirements:

- **Welded Wire Fabric Soil Reinforcement**
  Provide shop fabricated welded wire reinforcement from cold drawn steel wire that has a yield stress of 65,000 psi and conforming to the minimum requirements of ASTM A1064 and be welded into the finished configuration in accordance to ASTM A1064. A minimum galvanization coating of 2 oz/ft^2 or 3.4 mils thickness is required. Replace welded wire fabric that has been damaged during handling, placing or backfilling at the direction of the engineer, at no expense to the department.
- **Steel Reinforcing Strips and Tie Strips**
  As an alternate to welded wire reinforcing mesh, provide steel reinforcing strips or ladder reinforcing strips or equal, hot-rolled from bars, to the required shape and dimensions meeting the requirements of ASTM A-572 Grade 65 minimum and galvanized to a minimum thickness

of 3.4 mils. Tie strips shall be shop fabricated of hot-rolled steel meeting the requirements of ASTM A-1011 Grade 50.

- **Welded Wire Fabric Facing Panels**
  Provide welded wire fabric that is used to fabricate the facings of the wire-faced wall that has a yield stress of 65,000 psi. All steel shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of ASTM A1064 and be welded into the finished configuration in accordance to ASTM A1064. Replace welded wire fabric that has been damaged during handling, placing or backfilling at the direction of the engineer, at no expense to the department.
- **Fasteners**
  Galvanized high strength bolts meeting the requirements of AASHTO M164 or equivalent.
- **Connector Pins and Mat Bars**
  Connector pins and mat bars fabricated from cold drawn steel wire meeting the requirements of ASTM A82 and galvanized to according to ASTM A123 to a minimum thickness of 3.4 mils.

Metallic Screen

Provide a stainless steel or galvanized steel metallic screen per ASTM A740. The metallic screen should have an approximate opening of 1/4" and be made of 0.025" (minimum) gauge wire.

Joints

The joints shall be tied in such a manner that strength and flexibility at the point of connection is at least equal to the mesh. The connecting wire is to meet or exceed the same specifications as the wire used in the mesh. Lacing wire for assembling wire form baskets and interconnecting adjacent baskets and internal connecting wire for reinforcing side panels shall be coated steel wire having a minimum nominal diameter of U.S. Steel Wire Gage No. 13.5. Spiral binders for welded wire mesh shall pass through the openings and be tied at both ends.

Alternate methods and fasteners for assembling baskets and interconnecting adjacent baskets in lieu of lacing wire and spiral bindings must be approved by the Engineer. Alternate fasteners must remain closed when subjected to a 600 pound tensile force while confining the maximum number of wires to be confined by the fastener gabion structure. The submitted fastener must produce a joint strength of 1400 pounds per lineal foot. Installation procedures, fastener test results, and gabion manufacturer's acceptance shall be submitted for approval to the Engineer of alternate methods and fasteners.

The wire shall be galvanized with a zinc coating in conformance with ASTM A 641 class 3 finish 5.

Each shipment of units to a job site shall be accompanied by a certification which states that the material conforms to the requirements of this specification. A shipment shall consist of all material arriving at the job site at substantially the same time.

Geogrid

Geogrid supplied as reinforcing members shall be manufactured from long chain polymers limited to polypropylene, high-density polyethylene, polyaramid, and polyester. Geogrids shall form a uniform rectangular grid of bonded, formed, or fused polymer tensile strands crossing with a nominal right-angle orientation. The minimum grid aperture shall be 0.5 inch. The geogrid shall maintain dimension stability during handling, placing, and installation. The geogrid shall be insect, rodent, mildew, and rot resistant. The geogrid shall be furnished in a protective wrapping that shall prevent exposure to ultraviolet radiation and damage from shipping or handling. The geogrid shall be kept dry until installed. Each roll shall be clearly marked to identify the material contained.

The wall supplier shall provide the nominal long-term design strength (T_{al}) and nominal long-term connection strength, Talc as discussed below.

Nominal Long-Term Design Strength (T_{al})

The wall supplier shall supply the nominal long-term design strength (T_{al}) used in the design for each reinforcement layer and shall be determined by dividing the Ultimate Tensile Strength (T_{ult}) by the factors RF_{ID}, RF_{CR}, RF_D.

Hence,

$$T_{al} = \frac{T_{ult}}{RF_{ID} x RF_{CR} x RF_D}$$

where:

T_{ult} = Ultimate tensile strength of the reinforcement determined from wide width tensile tests (ASTM D6637) for geogrids based on the minimum average roll value (MARV) for the product.

RF_{ID} = Strength reduction factor to account for installation damage to the reinforcement. In no case shall RF_{ID} be less than 1.1.

RF_{CR} = Strength reduction factor to prevent long-term creep rupture of the reinforcement. In no case shall RF_{CR} be less than 1.2.

RF_D = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation. In no case shall RF_D be less than 1.1.

Values for RF_{ID}, RF_{CR}, and RF_D shall be determined from product specific test results. Guidelines for determining RF_{ID}, RF_{CR}, and RF_D from product specific data are provided in FHWA Publication No. FHWA-NHI-10-024 and FHWA–NHI-10-025 “Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes”.

Nominal Long-term Connection Strength T_{ac}

The nominal long term connection strength, T_{ac}, shall be based on laboratory geogrid connection tests between wall facing and geogrids. T_{ac} shall be as given below

$$T_{ac} = \frac{T_{ult} * CR_{cr}}{RF_D}$$

where:

T_{ac} = Nominal long-term reinforcement facing connection strength per unit reinforcement width at a specified confining pressure.

T_{ult} = Ultimate tensile strength of the reinforcement for geogrids defined as the minimum average roll value (MARV) for the product.

CR_{cr} = Long term connection strength reduction factor to account for reduced ultimate strength resulting from connection.

RF_D = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation.

T_{ac} shall be developed from the tests conducted by an independent laboratory on the same facing units and geogrids as proposed for the wall and shall cover a range of overburden pressures comparable to those anticipated in the proposed wall. The connection strength reduction factor CR_{cr} shall be determined in accordance with long-term connection test as described in Appendix B of FHWA Publication No. FHWA-NHI 10-025 "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes". CR_{cr} may also be obtained from the short term connection test meeting the requirements of NCMA test method SRWU-1 in Simac et al 1993 or ASTM D4884.

The Contractor shall provide a manufacturer's certificate that the Tult (MARV) of the supplied geogrid has been determined in accordance with ASTM D4595 or ASTM D6637 as appropriate. Contractor shall also provide facing unit to reinforcement connection test reports prepared and certified by an independent laboratory. Also provide calculations in accordance with AASHTO LRFD, and using the results of laboratory tests, that the facing unit-geogrid connections shall be capable of resisting 100% of the maximum tension load in the soil reinforcements at any level within the wall, for the design life of the wall system.

Stone Fill

Wired Facing Panels shall be filled with approved stone aggregate with a minimum size of 2 inches and a maximum size of 4 inches, with both stone measurements made in the greatest dimension. Stones used shall be hard durable, angular in shape; resistant to weathering and to water action, free from overburden, spoil, shale and organic material; and shall meet the gradation requirements specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted. Shale and stone with shale seams are not acceptable.

Leveling Pad

Leveling pad material shall conform to the gradation requirements for Crushed Stone, M2.02.0 or as specified by the MSE wall manufacturer.

Geotextile Fabric

Geotextile fabric shall conform to material requirement of M9.50.0 or as specified by MSE wall manufacturer.

Reinforced Backfill Material

As a minimum, all backfill materials used in the MSE Wall volume shall conform to the gradation requirements for Gravel Borrow for Backfilling Structures and Pipes, M1.03.0 Type C, or as specified by the MSE wall manufacturer.

Construction

The soils that will serve as the foundation for the MSE wall structures shall be graded level for a width equal to the length of reinforcement elements plus 3 feet. Prior to wall construction the foundation shall be compacted with at least 10 passes of vibratory compactors. Any foundation soils found to be unsuitable shall be removed and replaced with Gravel Borrow or Gravel Borrow for Bridge Foundations. The foundation for the structure shall be approved by the Engineer before erection is started.

Assembly: Assembly and erection of the wire facing panels shall be as per manufacturer's recommendations. The units shall be assembled and carried to the job site and placed in their proper location. For structural integrity, all adjoining empty baskets shall be connected along the perimeter of their contact surface in order to obtain a monolithic structure.

Filling: Wire facing panels shall be filled with stone carefully placed by hand or machine to assure alignment and avoid bulges with a minimum of voids. Along all exposed faces and edges, the outer

layers of stone shall be carefully placed and packed by hand, ensuring a neat, compact, square appearance.

Facing vertical tolerances and horizontal alignment tolerances shall not exceed 1 inch when measured with a ten-foot straight edge. During construction, the maximum allowable offset in any course shall be 1 inch. The overall vertical tolerance of the wall (top to bottom) shall not exceed 1 inch per ten feet of wall height.

Backfill placement shall closely follow erection of each course of wire facing. Backfill shall be placed in such a manner as to avoid any damage or disturbance of the wall materials or misalignment of the facing or reinforcing elements. Any wall materials which become damaged during backfill placement shall be removed and replaced at the Contractor's expense. Any misalignment or distortion of the wall facing panels due to placement of backfill outside the limits of this specification shall be corrected at the Contractor's expense. At each reinforcement level, the backfill shall be placed to the level of the connection. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize corrections as outlined in Note 7 of that test). For backfills containing more than 30 percent retained on the 3/4 inch sieve, the required compaction shall be achieved using mechanical tampers or approved compacting equipment. The use of vibratory rollers for compaction will not be permitted.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The maximum lift thickness after compaction shall not exceed 12 inches. The Contractor shall decrease this lift thickness in confined areas, in areas of overlapping reinforcement layers and if necessary, to obtain the specified density. Compaction within three feet of the back face of the wall shall be achieved by at least three passes of lightweight mechanical tamper. At the end of each day's operation, the Contractor shall slope the last lift of the backfill away from the wall facing to rapidly direct runoff away from the wall face. In addition, the Contractor shall not allow surface runoff from other areas to enter the wall construction site.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 996.33 shall be measured by the square yard of Stone Faced Mechanically Stabilized Earth Wingwalls installed, complete in place, and accepted by the Engineer. The payment area shall be the product of the length and height of wall units installed. The height shall be measured from the top of the crushed stone foundation to the top of each row of exposed gabion wall face. Payment shall be made at Contract Unit Price per square yard, which price shall be the full payment of all soil reinforcement, reinforced soil, wire faced panels, geotextile fabric, stone fill, connection hardware, labor, materials, tools, equipment, and incidentals necessary to complete the work, including the preparation of the design.

The following items will be paid separately:

- Item 140 Bridge Excavation for material removal to allow wall installation.
- Item 151.2 Gravel Borrow for Backfilling Structures and Pipes for material outside of reinforced soil zone.

CONTRACT ALLOWANCE PAYMENT ITEMS

The quantity to be paid for under these items shall be the actual amount paid by the Contractor to provide satisfactory testing operations as stipulated and required. Any associated Contractor overhead costs and profit shall be considered incidental to the cost of the contract.

ALLOWANCE ITEM 999.300 FABRICATION INSPECTION, MATERIALS INSPECTION, SAMPLING AND TESTING SERVICES

Allowance for Inspection, Verification, and Testing

Fabrication Inspection, Materials inspection, sampling and testing services shall be provided by independent testing consultants or firms that shall be retained by the Contractor to ensure compliance with the Standard Specifications and these Special Provisions. These services will include, but are not limited to the following:

- Portland Cement Concrete Field Inspection and Testing
- Bridge Railing Post Fabrication and Welding
- Sampling and Testing of MSE wall backfill

The firm(s) selected to provide these services must be pre-qualified by MassDOT in the discipline of Materials Inspection and Testing. The Contractor shall coordinate with the firm(s) and the Engineer as necessary while the work is ongoing to ensure that the appropriate materials inspection, sampling and testing is occurring. Test reports shall be provided to the Engineer with copies to the Contractor. Work on materials that fail to meet the requirements of these Special Provisions shall be promptly corrected by the Contractor in accordance with the standard specifications. The cost of tests that fail to show compliance will not be reimbursed to the Contractor. The Contractor shall be reimbursed under this allowance item for testing based on paid invoices from the independent testing consultant(s).

ALLOWANCE ITEM 999.800 ADDITIONAL MATERIALS

The Contractor will be paid his/her actual cost plus ten (10) percent for additional materials that are required to perform additional work if directed by the Engineer. However, no materials shall be ordered until approved by the Engineer and competitive prices may be required if the Engineer directs.

The Contractor is required to seek permission from the Engineer for use of artisans for the acquisition of materials. The Contractor will not bid this item. No materials that are incidental or required under a Bid Item shall be paid for under this allowance.

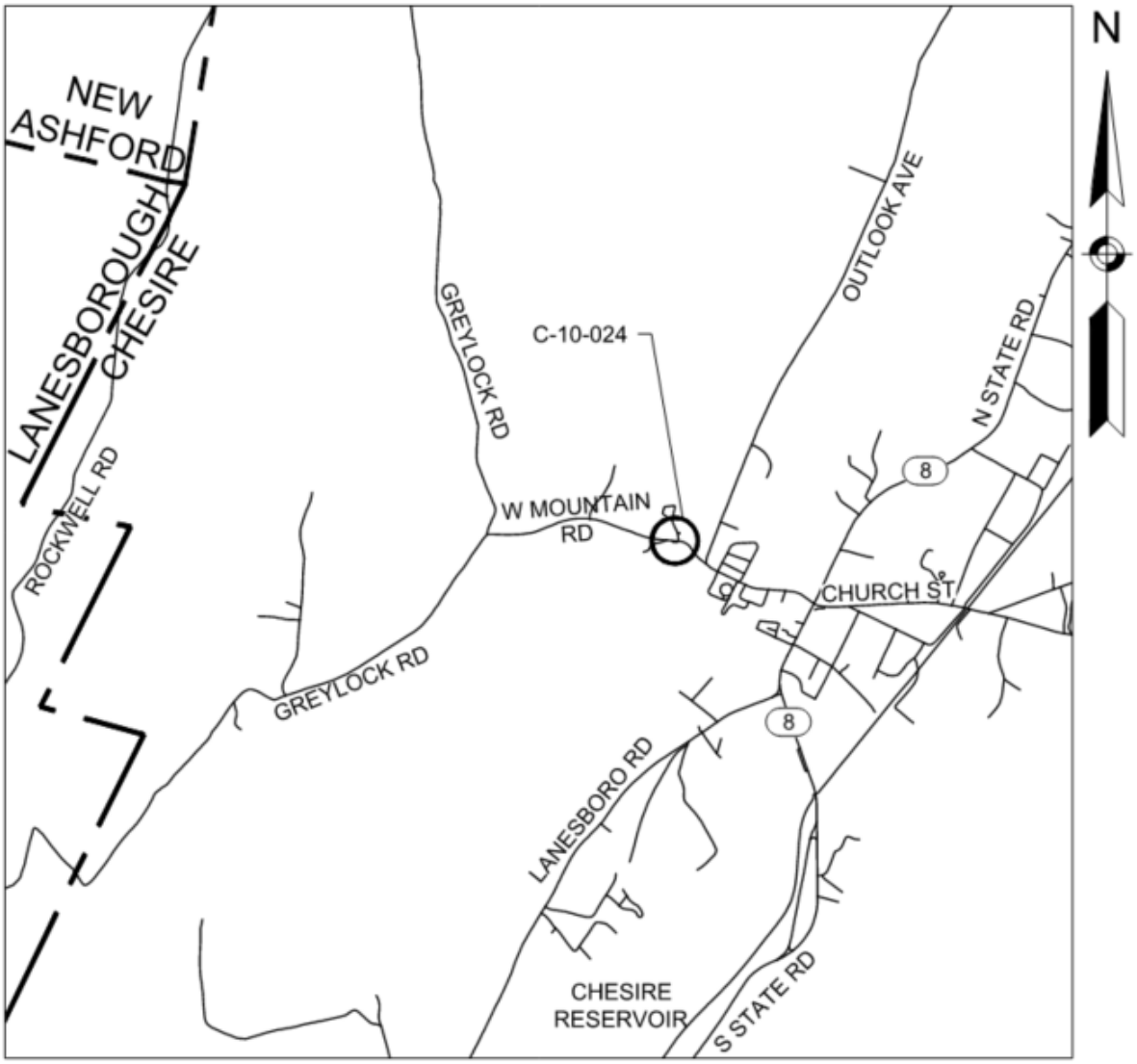
ALLOWANCE ITEM 999.801 ADDITIONAL ARTISANS

The Contractor will be paid his/her actual cost plus ten (10) percent for any additional artisans required to perform additional work if directed by the Engineer. However, no subcontractor shall be ordered until the estimate has been approved by the Engineer and competitive prices may be required if the Engineer so directs.

END OF SPECIAL PROVISIONS

APPENDIX A

LOCUS MAP



APPENDIX B

NOTICE OF INTENT

Notice of Intent

Culvert Strengthening No. C-10-024
West Mountain Road over
Kitchen Brook
Cheshire, Massachusetts

OCTOBER 2025

Applicant:

Corey McGrath
Town of Cheshire
191 Church Street
Cheshire, MA 01225

Representative:

Madison Sullivan
Gill Engineering
1234 Chestnut Street
Newton, MA 02464

Contents:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

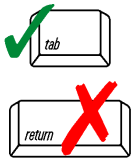
WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number
Cheshire
City/Town

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

244-259 West Mountain Road	Cheshire	01225
a. Street Address	b. City/Town	c. Zip Code

Latitude and Longitude:

42.5646	73.1736
d. Latitude	e. Longitude

21	214
f. Assessors Map/Plat Number	g. Parcel /Lot Number

2. Applicant:

Corey	McGrath
a. First Name	b. Last Name

Town of Cheshire Department of Public Works
c. Organization

191 Church Street
d. Street Address

Cheshire	MA	01225
e. City/Town	f. State	g. Zip Code

413-743-1690		dpw@cheshire-ma.gov
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name	b. Last Name

c. Organization

d. Street Address

e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email address

4. Representative (if any):

Madison	Sullivan
a. First Name	b. Last Name

Gill Engineering
c. Company

63 Kendrick Street
d. Street Address

Needham	MA	02494
e. City/Town	f. State	g. Zip Code

781-355-7100		msullivan@gill-eng.com
h. Phone Number	i. Fax Number	j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

0	0	0
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number
Cheshire
City/Town

A. General Information (continued)

6. General Project Description:

The purpose of this project is the strengthen a structurally deteriorating corrugated metal pipe culvert. The strengthening shall consist of a reinforced concrete arch formed over the existing arch and on the existing concrete abutments. The project will also include construction of concrete headwalls/safety curbs and the construction of mechanically stabilized earth retaining walls on the south side of the roadway.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ■ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ■ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

10.53i - Repair of Structures
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Berkshire North	
a. County	b. Certificate # (if registered land)
01127	513
c. Book	d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ■ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number
Document Transaction Number
Cheshire
City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ■ Bank	105 (1. linear feet)	(2. linear feet)
b. ☐ Bordering Vegetated Wetland	(1. square feet)	(2. square feet)
c. ■ Land Under Waterbodies and Waterways	521 (1. square feet); (3. cubic yards dredged)	154 (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ■ Bordering Land Subject to Flooding	244 (1. square feet); 0 (3. cubic feet of flood storage lost)	42 (2. square feet); 0 (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	(1. square feet); (2. cubic feet of flood storage lost)	(3. cubic feet replaced)
f. ■ Riverfront Area	Kitchen Brook (1. Name of Waterway (if available) - **specify coastal or inland**)	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

■ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 1815 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
429	429	

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ■ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ■ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number
Cheshire
City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ■ Project Involves Stream Crossings

0
a. number of new stream crossings

1
b. number of replacement stream crossings

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 – Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number
Document Transaction Number
Cheshire
City/Town

C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ■ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   b. Date of map _____

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.
** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 – Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number
Document Transaction Number
Cheshire
City/Town

C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ■ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Bourne to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Plymouth to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☐ Is this an aquaculture project? d. ☐ Yes ■ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number

Cheshire
City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ■ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ■ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ■ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ■ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ■ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☐ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ■ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number
Cheshire
City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

West Mountain Road over Kitchen Brook Permitting Plans	
a. Plan Title	
Madison Sullivan	John Phelps
b. Prepared By	c. Signed and Stamped by
10/15/25	Varies
d. Final Revision Date	e. Scale
Project Narrative, Abutter Notifications and Site Photographs	10/15/25
f. Additional Plan or Document Title	g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☐ Attach NOI Wetland Fee Transmittal Form

9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payor name on check: First Name	7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
WE 130-0199
MassDEP File Number

Document Transaction Number
Cheshire
City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Corey McGrath Digitally signed by Corey McGrath Date: 2025.10.16 11:02:56 -04'00'	
1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
Madison M. Sullivan	
5. Signature of Representative (if any)	6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

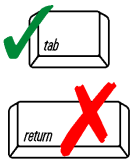
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

244-259 West Mountain Road	Cheshire
a. Street Address	b. City/Town
N/A	0
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Corey		McGrath
a. First Name		b. Last Name
Town of Cheshire Department of Public Works		
c. Organization		
191 Church Street		
d. Mailing Address		
Cheshire	MA	01225
e. City/Town	f. State	g. Zip Code
413-743-1690		dpw@cheshire-ma.gov
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name		b. Last Name
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Not Applicable			

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	0
State share of filing Fee:	a. Total Fee from Step 5 0 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	0 c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Attachment A – Project Narrative

Overview

The purpose of this project is to strengthen a structurally deteriorating corrugated metal pipe culvert. The project is located between 259 and 264 West Mountain Road in the town of Cheshire, MA. The structure spans over Kitchen Brook, a perennial stream that originates several miles north on the Mount Greylock State Reservation. The strengthening shall consist of a reinforced concrete arch formed over the existing arch and placed on the existing concrete abutments.

Site Description

West Mountain Road is oriented west-to-east and provides 2 lanes of traffic. It is classified as a Rural Local Road with an average daily traffic of 350 as of 2020. The surrounding area consists of residential homes with some trees and vegetation. At the project site, Kitchen brook is lain with sandy soil and cobblestones. The slopes upstream and downstream of the bridge contain debris and are overgrown with low lying heavy vegetation. The stream site drainage area mostly consists of forest and grassland with some residential development.

Local Geology

According to the USGS map of the area, the site geology contains a mix of sand, some silt, some clay with pebbles, cobble, boulder clasts, and some large surface boulders. The area has shallow bedrock with till generally less than 10 to feet 15 feet thick. See Attachment C for the map.

Existing Structure

The existing 18'-2½" diameter corrugated steel pipe culvert extends a length of 42'-5" and was originally constructed in 1970. The out-to-out width of the roadway is 34'-8¼" with varying slope and concrete headwalls on either side. The existing corrugated steel pipe is supported by concrete footings. The existing structure is beginning to show signs of deterioration, including loss of section to the culvert, and failing headwalls.

Proposed Structure

The proposed structure consists of the existing concrete footings with a reinforced concrete arch placed over the existing corrugated steel pipe arch with concrete headwalls and mechanically stabilized earth wingwalls along the South side of the road. Repairs will be made on the existing concrete footings in (2) locations and a scour hole on the downstream side of the culvert will be filled with natural stream channel material. Gravel borrow will be placed over the concrete arch and overlain with an HMA wearing surface that matches the approaches. Plans for the proposed structure can be found in Attachment D.

Construction Sequence

A sediment control barrier shall be placed around the perimeter of the work zone prior to the start of construction. In order to complete this project without closing the roadway, a temporary bridge and staged construction will be utilized in order to maintain a single lane of alternating traffic for the duration of construction. During the first stage of construction, a single alternating traffic lane will be maintained on the south side of the road while a temporary bridge is installed on the north side of the road. During Stage 2 of construction, traffic will be shifted on to the temporary bridge and the existing roadway will be excavated down to the existing culvert. The proposed reinforced concrete arch will then be cast over the existing pipe, the South headwall shall be constructed and a portion of the backfill and HMA wearing surface installed so that one lane of traffic can be opened. During Stage 3 of construction the temporary bridge shall be removed, the North headwall shall be constructed and the remaining portion of the backfill and HMA wearing surface shall be installed.

Temporary Water Control

Temporary water control shall be established to permit the concrete footing repairs, scour hole repair, and wingwall construction to be performed in the dry. Once construction is complete the temporary water control system will be removed. All dewatering and related earthworks shall be constructed in such a manner as to prevent siltation or contamination of the waterway. The pumping discharge shall be pumped to a settling basin before discharged into the waterway.

Revegetation

Where possible, a compost blanket with seeding is proposed on the area of disturbed ground. This area shall consist of a ½"-1" thin mulch blanket over prepared soil to provide temporary soil stabilization and organic matter for plant growth. Grass seed shall be broadcast in conjunction with the compost blanket.

Environmental Impacts

Banks:

The temporary water control system will have no permanent impact on the banks and will only temporarily direct water away from areas with required construction.

Land Under Waterbodies and Waterways:

The scour hole repair on the downstream side of the bridge will be a permanent impact to the land under Kitchen Brook. However, the proposed repair will fill in the scour hole with natural streambed material that matches the material upstream and downstream of the scour hole. The repair will provide continuity of the streambed and will have a positive impact on the stream. The remaining areas that will be sectioned off for temporary water control will be temporarily impacted but once construction is completed, natural stream flow will be restored and the areas shall remain unchanged.

Riverfront Area:

Since the riverfront area exceeds the project limits, all project limits adjacent to the stream are considered to be within the riverfront area. Permanent impacts to the riverfront area are considered to be where the 12" proposed concrete arch will be placed and the limits of the mechanically stabilized earth retaining walls on the south side of the bridge. Both areas of new construction will have minimal impacts to the surrounding environment. The remainder of the project limits in the riverfront area consist of area that will be excavated and backfilled to permit construction and should be restored to relatively similar conditions as it was prior to construction.

Bordering Land Subject to Flooding:

The 100-year flood elevation shown on the plan was obtained from a hydraulic analysis performed by Gill Engineering Inc. and is the maximum for the project area, upstream and downstream of the bridge. The project limits that overlap with the flood plain are limited to the corners of the proposed structure and do not raise any flood concerns.

Attachment B – Abutter Notifications

Notification to Abutters

By Hand Delivery, Certified Mail (return receipt requested), or Certificates of Mailing

This is a notification required by law. You are receiving this notification because you have been identified as the owner of land abutting another parcel of land for which certain activities are proposed. Those activities require a permit under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40).

In accordance with the second paragraph of the Massachusetts Wetlands Protection Act, and 310 CMR 10.05(4)(a) of the Wetlands Regulations, you are hereby notified that:

A. A Notice of Intent was filed with the Cheshire Conservation Commission on January 21st, 2025 seeking permission to remove, fill, dredge, or alter an area subject to protection under M.G.L. c. 131 §40. The following is a description of the proposed activity/activities:

> The proposed project will strengthen the deteriorated culvert at the West Mountain Road Crossing of Kitchen Brook in order to mitigate further deterioration to the existing culvert.

B. The name of the applicant is: Town of Cheshire.

C. The address of the land where the activity is proposed is: The culvert at the West Mountain Road crossing of Kitchen Brook is between 259 and 264 West Mountain Road (42.6912N, -70.8169W).

D. Copies of the Notice of Intent may be examined or obtained at the office of the Cheshire Conservation Commission, located at 191 Church Street Cheshire, MA 01225. The commission may be reached by phone at 413-743-1690 x 117 or by email at concom@cheshire-ma.gov.

E. Copies of the Notice of Intent may be obtained from the applicant or Gill Engineering by emailing Madison Sullivan at msullivan@gill-eng.com or calling 781-355-7100 between the hours of 8:00 am and 4:00 pm Monday through Friday. An administrative fee may be applied for providing copies of the NOI and plans.

F. Information regarding the date, time, and location of the public hearing regarding the Notice of Intent may be obtained from the Cheshire Conservation Commission. Notice of the public hearing will be published at least five business days in advance, in the local newspaper.

Notification provided pursuant to the above requirement does not automatically confer standing to the recipient to request Departmental Action for the underlying matter. See 310 CMR 10.05(7)(a)4.

C-10-024 West Mountain Road over Kitchen Brook List of Abutters

264 West Mountain Road:
Robert W. & Sheila Aitken

244 West Mountain Road:
Patricia L. & David A. St Pierre

259 West Mountain Road:
Jon W. Charbonneau & Cheryl A DiMaleo

231/233 West Mountain Road:
Mark F. & Wendy E. Warner

232 West Mountain Road:
John T. & Geraldine C. Baran

198 West Mountain Road:
Nicholas A. & Stephanie D. Osterberg

35 Outlook Avenue:
Thomas E. Viale Jr. and Lisa A. Denault-Viale

195 West Mountain Road:
Ian A. Purkayastha

299 West Mountain Road:
Michael S. & Judy M. Coons

61 Old West Mountain Road:
Michael & Karen Kruszyna

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Attachment C – Wetland Delineation and Fluvial Assessment

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Amherst Office
15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

February 28, 2023

Dawood Engineering, Inc.
Attn: Keith Barnes
325 Wood Road, Suite 109
Braintree, MA 02184
Via Email: *keith.barnes@dawood.net*

Re: Wetland/Watercourse Delineation
Kitchen Brook Culvert Replacement, West Mountain Road, Cheshire, MA
SWCA Project #: 73429

Dear Mr. Barnes:

SWCA Environmental Consultants (SWCA), in cooperation with Dawood Engineering (Dawood), conducted a wetland/watercourse delineation and fluvial assessment at the location of a proposed culvert replacement over Kitchen Brook on West Mountain Road in Cheshire, Massachusetts on February 15, 2023. The purpose of the assessment was to confirm the presence or absence of jurisdictional wetlands within 100 feet of the culvert (the assessment area), water course resource areas within 200 feet of the culvert, and to evaluate existing geomorphological conditions 300 feet upstream and 300 feet downstream of the culvert, including substrate analysis and field bankfull width estimates. Surveyors with Dawood were not present on the day of these evaluations; however, they will conduct stream cross-section and longitudinal profiles as well as topographic survey upstream and downstream of the culvert. These data will be used to assists the engineers in determining an appropriate culvert size for replacement. Stream corridor assessments follow methods adapted from Rosgen (1996). Figures illustrating the site are included in Appendix A. Photographs representing these assessments are included in Appendix B.

Kitchen Brook is a perennial stream with headwaters originating in New Ashford at Rounds Rock in the Mount Greylock State Reservation, flowing southeast to the Hoosic River, 0.5 mile south of Cheshire. Kitchen Brook is named because the basin near its head was called ‘The Kitchen’ for the Kitchen Brook Dolomite of the early Cambrian age. Culvert C10024-AB2-MUN-BRI is located at West Mountain Road, west of Outlook Avenue and North Street (Route 8) in Cheshire. Kitchen Brook flows from north to south at the crossing. The surrounding landscape consists of agricultural, undeveloped forested areas, and residential land uses. Kitchen Brook is mapped by the Massachusetts Department of Fish and Wildlife (MA DFW) as a Cold Water Fisheries resource (MA DFW 2022).

The culvert is in poor condition and consists of an arched galvanized corrugated steel culvert with concrete abutments (Photo 7, Appendix B). The North Atlantic Aquatic Connectivity Collaborative (NAACC) Data Center Stream Continuity Portal completed an inspection on January 13, 2021, noting the culvert was built in 1970 and is experiencing settlement of the field stone headwall (see Photo 5, Appendix B), roadway settlement (Photo 3), rusting, culvert

perforations, active leaking, and failing galvanized coating, for example (NAACC 2010). The benthic elevation drops 50 inches from the culvert outfall to the stream bottom at a scour pool. A 12-inch berm located at the culvert outfall could contribute to an aquatic disconnection in low-flow conditions, where aquatic macroinvertebrates and fish cannot pass through the culvert (Photo 6). Elevation drops at culvert outlets additionally worsen scour pools, leading to increased erosion and infrastructure damage, as evidenced at the Kitchen Brook culvert. The stream banks are eroded, and the stream is downcutting (see Photos 1, 8, 9, 14, and 15).

Kitchen Brook is illustrated on the most recent United States Geological Survey (USGS) topographic map with a solid blue line, indicating the stream is perennial [per 310 CMR 10.58(2)(a)(1)(a)]. Figure 1 illustrates the site location on a USGS topographic map. Figure 2 illustrates the site on an orthophotograph. Figure 3 illustrates the site is within flood zone A, the 100-year floodplain, on a Firmette (Federal Emergency Management Agency [FEMA] 1982).

Kitchen Brook is located within the Hoosic River watershed. SWCA ran a USGS StreamStats analysis by selecting a sub-watershed delineation point downstream of the culvert. The resulting StreamStats analysis calculates the sub-basin drainage area to be ±3.37 square miles (StreamStats Report, Appendix C). The stream channel type is a Rosgen B-4, a gravel-dominated (but with sections of coble), single-threaded stream with a riffle-pool morphology, within a colluvial valley, occasionally on well vegetated stable alluvial fans (Rosgen 1994, 1996). Bedform morphology, which may be influenced by debris constrictions and local confinement, typically produce scour pools, small rapids, and falls. Streambank erosion and channel aggradation/degradation process rates are normally low within these stream types.

Land use within the vicinity of the culvert is residential, with thin riparian vegetation other than maintained residential lawn. Trees are therefore sparse, but include eastern hemlock (*Tsuga canadensis*), Norway maple (*Acer platanoides*), white ash (*Fraxinus americana*), elm (*Ulmus americana*), blue spruce (*Picea pungens*), paper birch (*Betula papyrifera*), black birch (*Betula lenta*), and black cherry (*Prunus serotina*). Morrow's honeysuckle (*Lonicera morrowii*), Japanese knotweed (*Reynoutria japonica*), striped maple (*Acer pensylvanicum*), and intermediate wood fern (*Dryopteris intermedia*) are common in the understory along the riparian corridor. Residential areas associated with West Mountain Road abut the Brook upstream and downstream of the culvert, and much of the riparian corridor within the assessment area open canopied.

WETLAND AND WATERCOURSE DELINEATION

SWCA performed a delineation using a multiple parameter method approach following the Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40) (WPA) and its implementing regulations (310 CMR 10.00 et seq.), Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act (Massachusetts Department of Environmental Protection [MA DEP] 1995) and the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (v 2.0) (U.S. Army Corps of Engineers [USACE] 2012). SWCA examined soils, evidence of hydrology, vegetation, and bankfull indicators to identify limits of the federal and/or state definition of a jurisdictional wetland, and bankfull indicators to identify limits of the stream bank and the Mean Annual High Water (MAHW). Hydric soils and hydrophytic vegetation were able to be evaluated since ground conditions were not frozen and evidence of hydrology was observed. Figure 4 illustrates a site sketch with the resource areas flagged in the field; Dawood surveyors collected the locations of waterbody flags on February 15, 2023. SWCA delineated watercourses ±200 feet upstream and downstream of the culvert, and wetland boundaries ±100 feet upstream and downstream of the culvert as seen in Table 1.

Bank/Mean Annual High Water for the perennial Kitchen Brook (Stream 1) is denoted with blue flagging tape as:

- Stream 1-A1 to 1-A14 (right descending stream bank)
- Stream 1-B1 to 1-B14 (left descending stream bank)

Perennial Streams have a 200-Riverfront Area beginning at the MAHW mark.

Bank/Mean Annual High Water for the perennial Thunder Brook (Stream 2) is denoted with blue flagging tape as:

- Stream 2-A1 to 1-A2 (right descending stream bank)
- Stream 2-B1 to 1-B2 (left descending stream bank)

Perennial Streams have a 200-Riverfront Area beginning at the MAHW mark.

Photographs illustrating these areas and a stream dataform are included with this report (Appendices A and C, respectively).

Kitchen Brook is an upper perennial stream (Cowardin et al. 1979) with a bedform morphology indicative of a riffle/pool configuration, and a moderately well-developed floodplain (minorly terraced), despite stream downcutting and steep, eroding banks within the assessment area. Benthic material is well distributed in size but is dominated by gravel, with some boulders, cobbles, and sand.

The MAHW line of Kitchen Brook (Stream 1) was flagged on site as stated above. Figure 4 illustrates a site sketch of the resource areas flagged in the field. As set forth at 310 CMR 10.54(2)(a-c), Bank is defined as, 'the portion of land surface which normally abuts and confines a waterbody. It occurs between a waterbody and a vegetated bordering vegetated wetland and adjacent floodplain, or, in the absence of these, it occurs between a waterbody and an upland. The upper boundary of a Bank is the first observable break in slope or the MAHW level, whichever is *lower*. The lower boundary of the Bank is the Mean Annual Low Water (MALW) level.'

Kitchen Brook has a 200-foot Riverfront Area (RFA) extending outward 200-feet from the MAHW line on each side of the stream. The WPA regulations at 310 CMR 10.58(2)(a) state, "A Riverfront Area is the area of land between a river's MAHW line measured horizontally outwards from the river with a parallel line located 200-feet away." The RFA may include other resource areas or their buffer zones. The RFA does not have a buffer zone. Thunder Brook (Stream 2) joins Kitchen Brook ±200 feet downstream of the culvert

Table 1. Watercourses identified within the Survey Area at the West Mountain Road/Kitchen Brook Culvert Replacement

Stream ID	Stream Jurisdiction	Stream Flag Sequence*	Comments
Stream 1	Perennial	1-A1 to 1-A14 (RDB) 1-B1 to 1-B14 (LDB)	Kitchen Brook
Stream 2	Perennial	2-A1 to 2-A2 (RDB) 2-B1 to 2-B2 (LDB)	Thunder Brook

**RDB = Right Descending Streambank; LDB = Left Descending Streambank*

As set forth in 310 CMR 10.55(a-c), a Bordering Vegetated Wetland (BVW) is defined as, "area(s) where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants, 50% or more of the vegetational community consists of wetland indicator species, and the ground surface water regime and the

vegetational community which occurs in each type of freshwater wetland area specified in [the WPA].” No BVWs were observed within the assessment area.

The verification of the wetland and watercourse boundaries can only be definitively determined by the local Conservation Commission, by MA DEP, USACE, or Superior Court on appeal. Any proposed work within the streams or the 200-foot RFA would require filing a Notice of Intent from the Town of Cheshire Conservation Commission and MA DEP Land Under Water is also present (below the Mean Annual Low Water mark in Kitchen Brook) but was not separately delineated as it is within the limits of the MAHW line. As set forth in 310 CMR 10.56(2)(a-c), “Land Under Waterbodies and Waterways is the land beneath any creek, river, stream, pond, or lake. Said land may be composed of organic muck or peat, fine sediment, rocks or bedrock.” Land Under Water is the resource area below Mean Annual *Low* Water.

Please note that SWCA’s field effort was limited to identifying wetlands and watercourses; other state wetland resource areas, such as Bordering Land Subject to Flooding (BLSF), which coincides with the FEMA 100-year Flood Zone, also exist on site. SWCA recommends the engineer illustrate the limit of BLSF on the plans using the appropriate elevation.

Kitchen Brook is also jurisdictional under the U.S. Clean Water Act. Any work proposed within a federally jurisdictional resource will also require filing with the USACE for approval. If work within Kitchen Brook is below the MAHW mark, a Water Quality Certificate, a U.S. Army Corps General permit, or a Self-Verification Form may be required.

STREAM STATISTICS

SWCA ran a StreamStats analysis using a subwatershed drainage area delineation point immediately downstream of the culvert on West Mountain Road (statistical analysis results are attached to this letter, Appendix D). The drainage area is estimated to be 3.37 square miles with an estimated bankfull streamflow statistic of 240 cubic feet per second (cfs). The watershed drainage area has a mean basin elevation of 1,950 feet above sea level. The majority of the watershed drainage area within this reach is estimated to be forested (93.7%) with 1.57% wetlands and 0.7% developed (urban) land. The StreamStats estimated bankfull width is 30.2 feet, the bankfull depth is estimated to be 1.59 feet, the bankfull area is 47.7 square feet, and the bankfull streamflow value is 240 cfs.

Stream Bankfull Width Field Estimates

In addition to StreamStats analyses, SWCA collected field bankfull width estimates at 50-foot intervals for a distance of 300 feet upstream and 300 feet downstream of the culvert, including reference reach areas. Bankfull dimensions ranged from 17 feet to 23 feet. SWCA collected a total of 14 field bankfull width measurements. Of these, six are considered reference reaches with an average field bankfull width estimate to be 19.7 feet (6 meters). These are presented in Table 2 below. Dawood surveyed the locations of the Bankfull Stations and will illustrate those locations and elevations on the site plans.

Massachusetts General Stream Crossing Design Standards require a minimum channel width 1.2 times the bankfull width (Division of Ecological Restoration [DER] 2012). Taking the average reference reach field bankfull widths (n=6), the minimum recommended culvert size would be 23.7-feet wide (19.72-feet x 1.2). If we average all field bankfull widths (n=14), the minimum recommended culvert opening would be 24.09 feet (20.08 x 1.2). Therefore, we recommend a culvert with a minimum of 24-foot-wide opening to avoid channel constriction during normal bankfull flows.

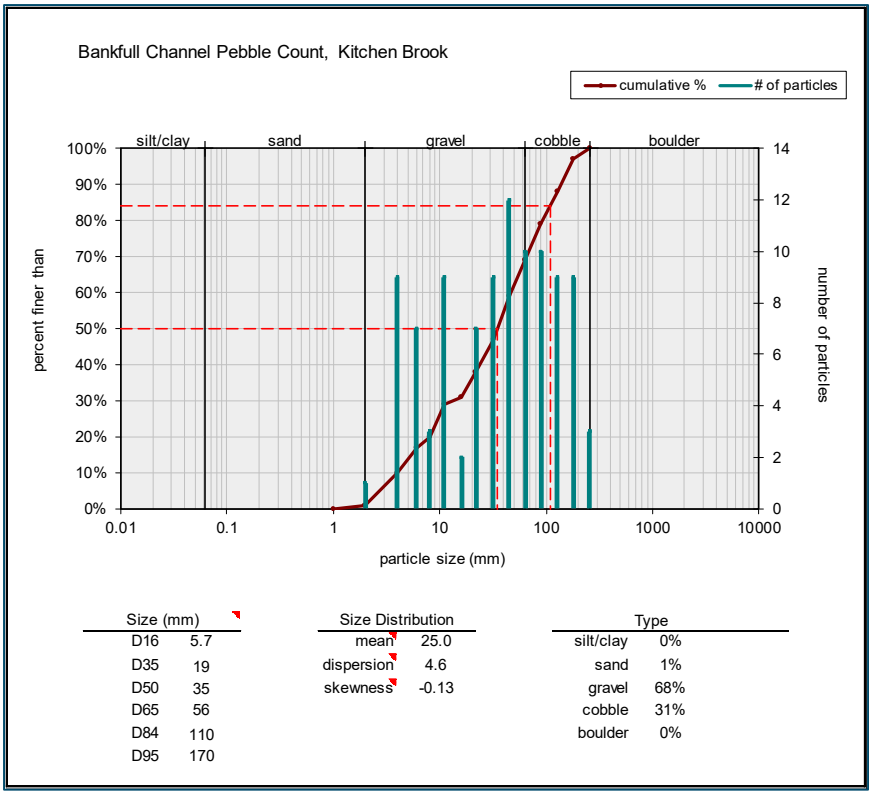
Table 2. Field Bankfull Width Estimates 300 feet upstream and 300 feet downstream of the West Mountain Road Culvert at Kitchen Brook, February 15, 2023

Kitchen Brook, West Mountain Road, Cheshire, MA - Field Bankfull Width					
Bankfull Station ID	***Bankfull Station Loc***	***Width (feet)***	***Width (inches)***	***Width (m)***	***Notes***
1	0+00	21	252	6.4	300' upstream from culvert (start of survey area): Reference Reach; Run; Water Depth 8"
2	0+50	20	240	6.09	Reference Reach; Pool; Water Depth 14"
3	1+00	19	228	5.79	Riffle; Bank erosion; Water Depth 9"
4	1+50	17	204	5.18	Run;Bank erosion; Water Depth 8"
5	2+00	20	240	6.09	Pool; Erosion on LDB at A-wetland; Water Depth 14"
6	2+50	17	204	5.18	Riffle; Water Depth 7"
7	3+00	16	192	4.87	At upstream end of culvert: Riffle; Water Depth 6"
8	3+36	23	276	7.01	At downstream end of culvert: Plunge pool; Water Depth 40" with additonal 12" berm (total drop >50")
9	3+86	24	288	7.31	Riffle; Water Depth 8"
10	4+36	19.66	236	5.99	Run; Water Depth 13"
11	4+86	20.66	248	6.29	Reference Reach; Run; Water Depth 11"
12	5+36	18	216	5.48	Reference Reach; Run; Thunder Brook junction; Water Depth 9"
13	5+86	21.33	256	6.5	Reference Reach; Riffle; Water Depth 11"
14	6+36	19.5	234	5.94	Reference Rach; Pool; Water Depth 12"

Bankfull Substrate Analysis

We performed material analyses (Wolman Pebble Count, Wolman 1954) at the study stream and analyzed the data to better describe river morphology and structure. The materials analysis shows the D50 = 35 mm (1.37 inches), or very coarse gravel comprising the majority of the substrate material. No silt/clay was collected; 1% of the material collected was comprised of sand, 68% was gravel, 31% was cobble, and 0% was boulder. Table 3 below presents the results of the particle analysis. Benthic particle analysis data are included in Appendix E.

Table 3. Wollman Pebble Count results for the Bankfull Width at a reference riffle at Kitchen Brook associated with the West Mountain Road Culvert Replacement



ADDITIONAL CONSIDERATIONS

SWCA reviewed the assessment reach for other potential sensitive environmental resource area constraints. The stream reach is located within a mapped Coldwater Fisheries Resource Waters (MA DFW 2022). Cold Water Fisheries Resources are considered important habitat for a number of cold water species, including trout (such as brook trout [*Salvelinus fontinalis*], for example). Precautions to avoid erosion, sedimentation, thermal loading, and excessive use of hard bank structures such as riprap, should be considered during the design and construction phase of this work to protect downstream Cold Water Fisheries Habitats.

The culvert is not located within Priority Habitat for Rare Species or Estimated Habitat for Rare Wildlife (NHESP 2021); however, a portion of Kitchen Brook upstream of the culvert is within Priority Habitat for Rare Species (outside the Limit of Work (Figure 5, Appendix A). No Areas of Environmental Concern (ACEC 2009) or Outstanding Resource Waters (ORWs 2010) are located within the work area; however, there are two ORWs nearby, including the Kitchen Brook Public Water Supply Watershed (upstream of the work area) and Thunder Brook retired Public Water Supply Watershed (associated with Thunder Brook).

Bordering Land Subject to Flooding (BLSF) typically coincides with the 100-year flood zone (see 310 CMR 10.57(2)(a)3). Digital data are not available for Franklin County. However, SWCA created a FEMA Flood Insurance Map (FEMA Firmette 1980) to determine whether BLSF is located within the Assessment Area. Portions of the assessment area are within BLSF (Figure 3). No digital FIRM data are available for this portion of the state; however, paper maps illustrate some of the work area is within the 100-year flood zone. SWCA recommends the engineers

illustrate the limits of BLSF on project plans and RFA on the plans. The Town of Cheshire does not administer a Wetland Protection Bylaw.

SUMMARY

SWCA completed a jurisdictional wetland and watercourse delineation to supplement the detailed survey data for a culvert replacement located on the West Mountain Road over Kitchen Brook in Cheshire, Massachusetts of February 15, 2023. We identified two perennial streams within 200 feet of the culvert and no BVWs within 100 feet of the culvert. The work is within BLSF. We are providing the delineation data in this letter. Based on our field bankfull estimates collected at 50-foot intervals for 300-feet upstream and downstream of the crossing, we recommend a culvert opening with a minimum of 24 feet to avoid channel constriction during normal bankfull flows. Dawood will additionally collect longitudinal profiles of the stream and topographic stream cross section survey at 25-foot intervals for a distance of 75-feet upstream and 75-feet downstream from the culvert. These data will be used to determine an appropriate culvert size for replacement. If SWCA can provide further assistance in relation to this culvert replacement project, please contact me at cmcdonough@swca.com or via direct office phone at 413-658-2063.

Sincerely,

Christin McDonough, M.S
Professional Wetland Scientist (PWS)
Certified Wildlife Biologist (CWB)

ATTACHMENTS:

Figure 1. USGS Topographic Map of Site
Figure 2. Orthophotograph of Site
Figure 3. FEMA Floodplain Map
Figure 4. Wetland/Watercourse Delineation Site Sketch
Figure 5. Natural Heritage and Endangered Species Program Areas & Outstanding Resource Waters

Appendix A. Figures
Appendix B. Photographs Representing Site
Appendix C. Stream Dataform
Appendix D. StreamStats Report (Basin Characteristics, Peak Drainage Statistics, and Bankfull Statists)
Appendix E. Particle Analysis

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APPENDIX A:

Figures

WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 1. USGS Topographic Map

● Project Location

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N

1:24,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 1,000 2,000 Feet
0 250 500 Meters

SWCA
ENVIRONMENTAL CONSULTANTS

WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 2. Aerial Map

Project Location

Road

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N

1:1,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 50 100 Feet

0 10 20 Meters

SWCA
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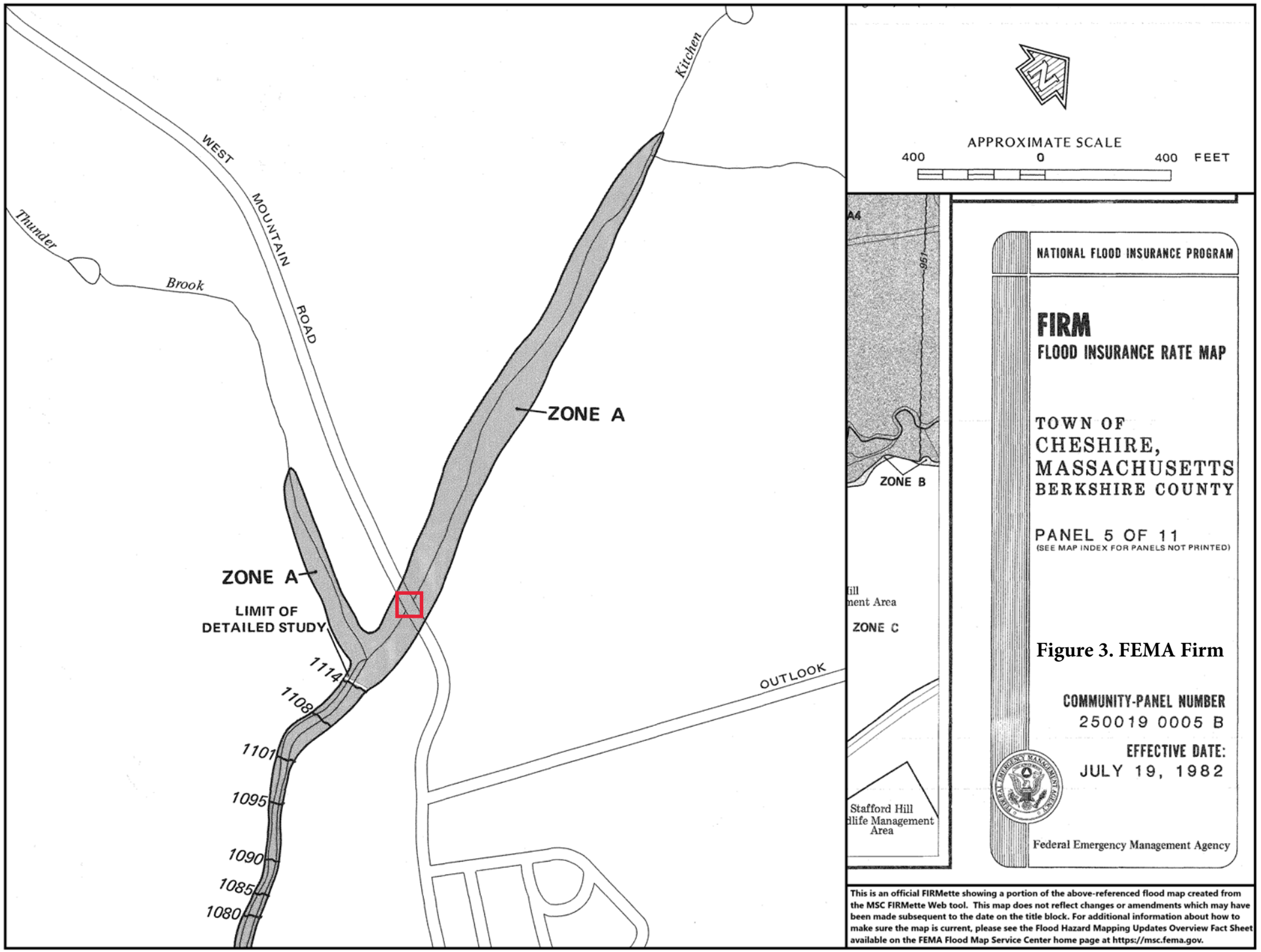
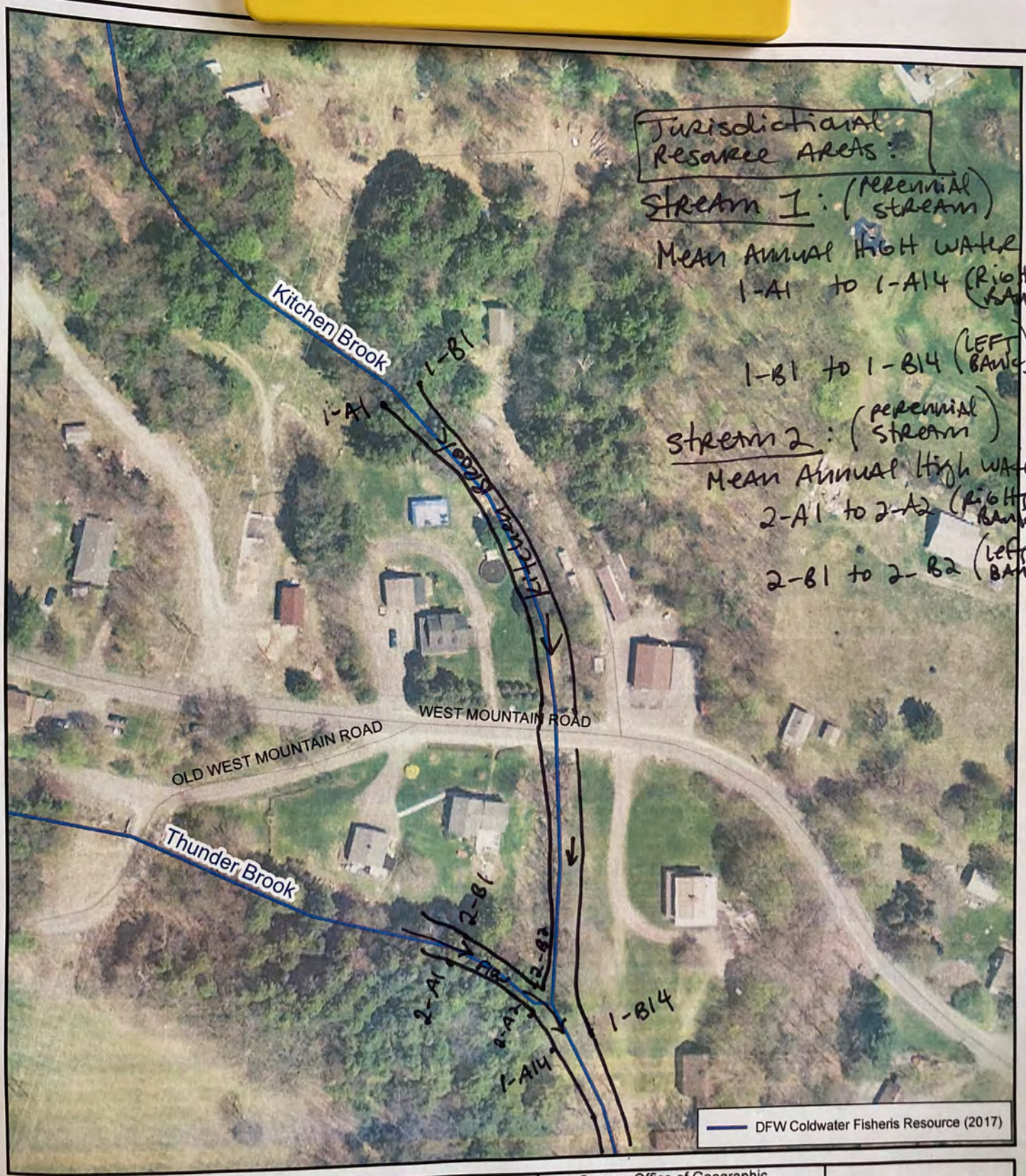


Figure 3. FEMA Firm



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Field Figure

Culvert Replacement
West Mountain Road
Cheshire, MA

10 Feb 2023

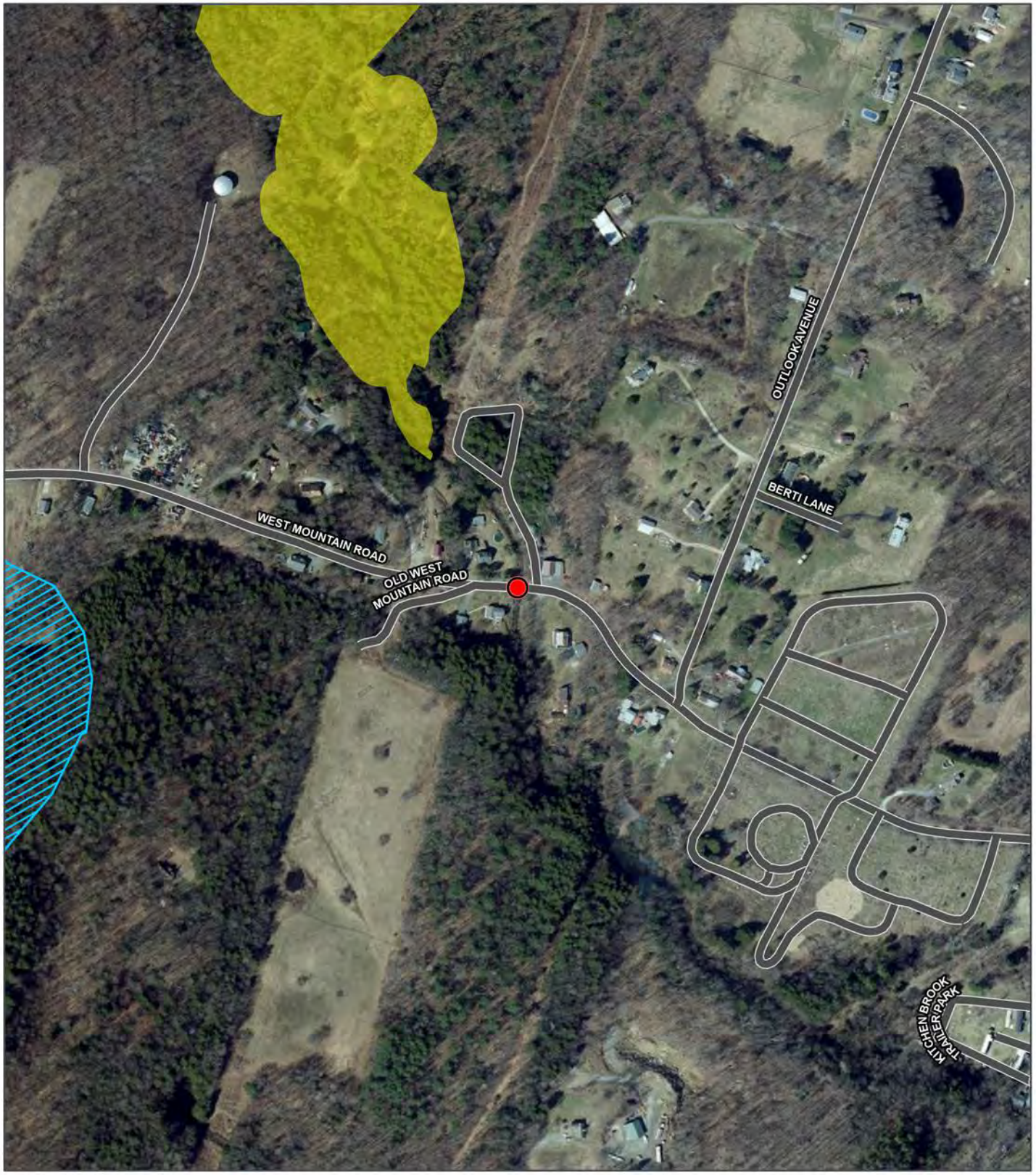
Data Source: Office of Geographic Information (MassGIS)

USGS Color Ortho Imagery (2013/2014)
MassDEP Wetlands (2017)
SSURGO Database

0 105 210 Feet

N

Latitude 42° 33' 52" N
Longitude 73° 10' 25" W



WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 5. NHESP Habitats and Outstanding Resource Waters

Project Location
Road
Priority Habitats of Rare Species
Outstanding Resource Waters

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N
1:5,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 200 400 Feet
0 50 100 Meters

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APPENDIX B:

Photographs

Photo 1: View facing upstream from the road crossing on West Mountain Road over Kitchen Brook. Note the stream downcutting and bank erosion. *Photo taken February 15, 2023*

Photo 2: View facing downstream from the road crossing on West Mountain Road over Kitchen Brook. Note the thin riparian vegetation. *Photo taken February 15, 2023*

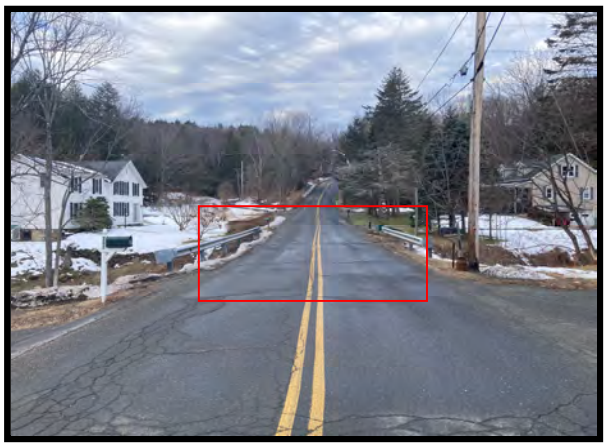

Photo 3: View facing west on West Mountain Road showing the road slumping at the crossing with Kitchen Brook. There are no mature trees within the Limit of Work. *Photo taken February 15, 2023*

Photo 4: View facing downstream showing the culvert inlet. Note the stream downcutting and steep, eroding banks. *Photo taken February 15, 2023*

Photo 5: View facing upstream showing the culvert outfall. Note the berm at the outfall (arrow) and concrete debris on the left descending stream bank. Also, note the condition of the field stone headwall (arrow). *Photo taken February 15, 2023*

Photo 6: View facing upstream showing the elevational drop at the outfall, which has led to a 50-inch-deep scour pool. *Photo taken February 15, 2023*

Photo 7: View facing downstream within Kitchen Brook showing the culvert. *Photo taken February 15, 2023*

Photo 8: View facing upstream from the culvert inlet. Note the stream downcutting and eroding steam banks. *Photo taken February 15, 2023*

Photo 9: Overhanging roots and exposed roots along the eroding banks provide wildlife habitat (as seen at 1-A5). *Photo taken February 15, 2023*

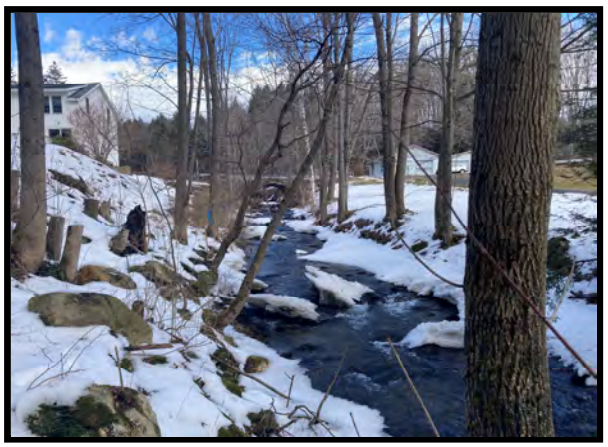

Photo 10: View facing upstream from 1-A13, showing the culvert outlet in the distance. Note the thin riparian vegetation. *Photo taken February 15, 2023*

Photo 11: View facing downstream from 1-A-13. *Photo taken February 15, 2023*

Photo 12: View facing upstream at Thunder Brook from the junction with Kitchen Brook. *Photo taken February 15, 2023*

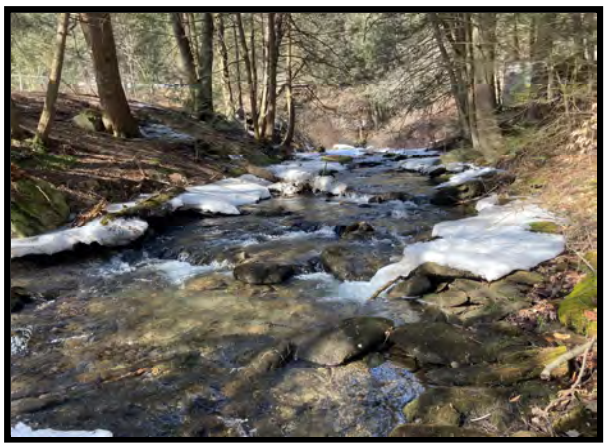

Photo 13: View facing upstream at Bankfull Station 0+00 showing reference reach section of Kitchen Brook. *Photo taken February 15, 2023*

Photo 14: View facing the right descending stream bank at Bankfull Station 1+50, showing the stream downcutting and bank erosion. *Photo taken February 15, 2023*

Photo 15: View facing downstream at Bankfull Station 1+50. Note the bank erosion and stream downcutting. *Photo taken February 15, 2023*

Photo 16: View facing upstream showing the culvert outlet and the limit of work area. Note no mature trees are located within the work area. *Photo taken February 15, 2023*

Photo 17: View facing upstream from Bankfull Station 6+36 (300 feet downstream from the culvert at West Mountain Road). *Photo taken February 15, 2023*

Photo 18: View facing upstream from the culvert outlet showing the decaying headwall. *Photo taken February 15, 2023*

APPENDIX C:

Dataforms

Waterbody Physical Characterization Data Sheet

Client: Dawood	Date: 02.15.23
Investigators: C. McDonough & M. Borenstein (SWCA)	
Project: Culvert C10024	
State: MA	County: Berkshire	Township: Cheshire
Waterbody Name: Kitchen Brook	
Feature ID: Bankfull Station 0+00	Weather or Recent Event: warm (58 F), partly clear
Milepost/Station N/A	
or Lat/Long: 42.564643 N/ -73.173598 W	

Waterbody type: __Lake __Pond __River ✓Stream __Stormwater *Check all that apply*

Flow type: ✓ Perennial __ Intermittent __ Ephemeral __ Ag. Ditch __ Road Ditch __ Swale __ Erosional Feature

Flow speed: ✓ Fast __ Moderate __ Slow __ Stagnate __ No flow

Origin: __Spring __Culvert __Wetland ✓Outside LOW

Sinuosity/Condition: __ Sinuous ✓Channelized __Braided __ Dam __ Piped __ Manmade *Check all that apply*

Degradation: __ Bank erosion ✓Downcutting __ Sedimentation __ Livestock/Manure __ Waste discharge pipe

Water quality: __ Odors– Sewage/Petrol __ Surface oils __Turbid– Slightly/Very __ Trash ✓ Clear __ Algae __ No water

Surrounding landuse ✓ Forested __ Fallow Field __ Pasture __ Ag. Field ✓ Residential __ Commercial __ Industrial __ Other

Top of Bank Width: 23 Ft

OHWM: 21 Ft ___ NA/Swale

Water Width: 20 Ft

Water Depth: _____ Ft 14 Inches

Bank height: 5 Left Bank Ft 4 Right Bank Ft *at CL crossing facing downstream*

Canopy Cover: __ Open __ Covered ✓ Partial

Dominant vegetation: Japanese knotweed*
Morrow's honeysuckle

Left Descending Bank Slope: __ Vertical __ 1:1 ✓ 2:1 __ 3:1 __ 4:1

Right Descending Bank Slope: ✓ Vertical __ 1:1 __ 2:1 __ 3:1 __ 4:1

Substrate: 0 % Bedrock 5 % Boulder 0 % Channery 35 % Cobble 50 % Gravel 10 % Sand
0 % Silt 0 % Clay 0 % Sediment

Organics: 1 Detritus– sticks, leaves, wood ____ Muck/Mud– black, fine organics 0 Marl– gray, shell fragment

Stream Morphology: ✓ Riffle and Run sequences ✓ Shallow Pool ✓ Deep Pool ___ Flat *Check all that apply*

Habitat: __Sand Bar __Gravel Bar __Mud Bar __Overhanging Veg ✓Bank Roots __Adj Wetland __Abutt Wetland

In-Stream Veg: ___ Submergent ___ Emergent ___ Algae

Riparian zone: ✓ Trees ✓ Shrubs/Saplings ✓ Herbaceous ___ Significant bare area

Aquatic organisms: *Observed:* ✓ Fish ✓ Minnows ✓ Frogs ✓ Salamanders ✓ Turtles
Odonates Other

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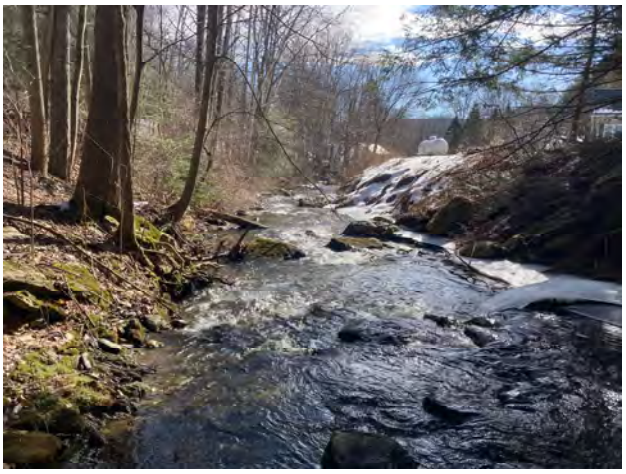
Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Feature ID: 0+00

View facing upstream at Bankfull Station 0+00, which is at a reference ereach



View facing downstream at Bankfull Station 0+00

View facing the right descending stream bank at Bankfull Station 0+00

View facing the left descending stream bank at Bankfull Station 0+00

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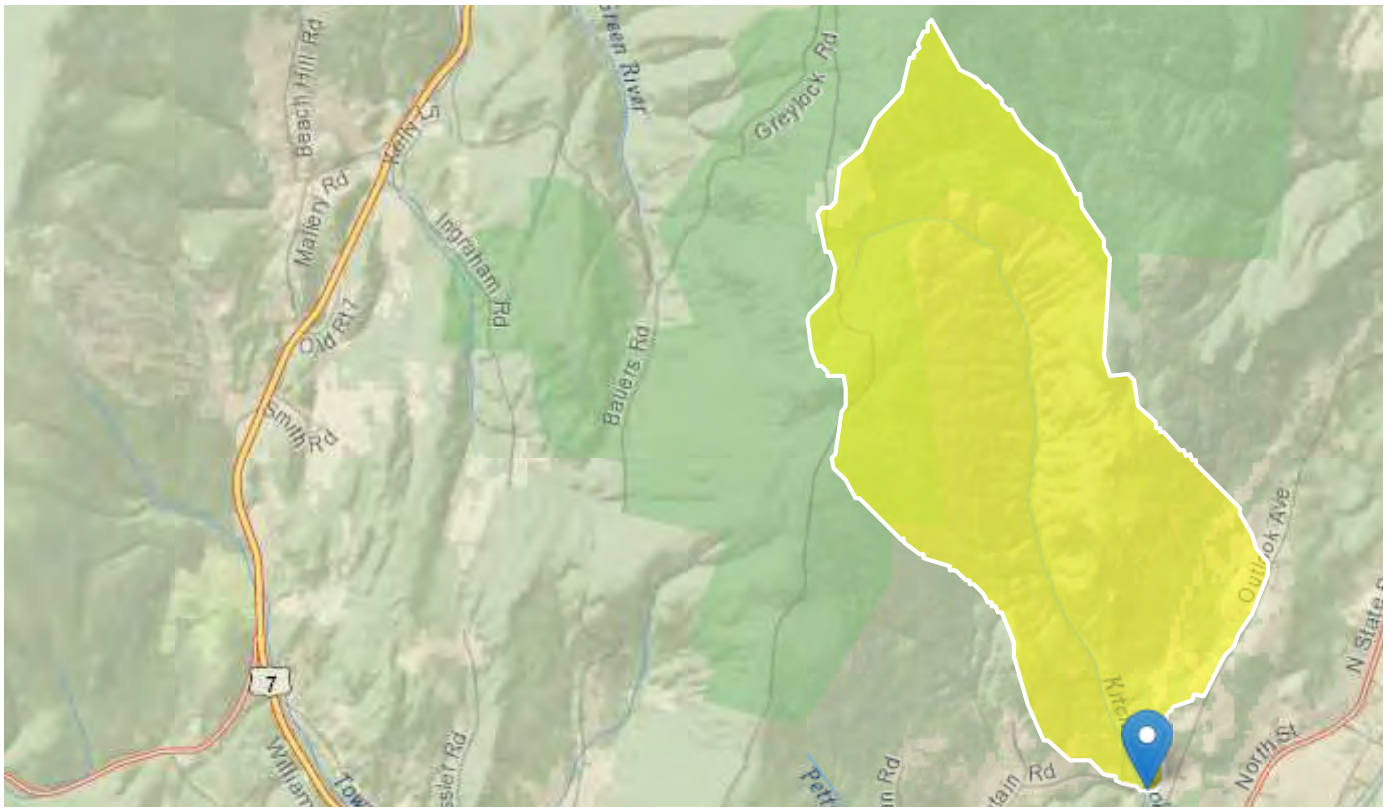
APPENDIX D:

StreamStats Analysis Report

StreamStats Report - Kitchen Brook, Cheshire, MA

Region ID: MA
Workspace ID: MA20230216152329680000
Clicked Point (Latitude, Longitude): 42.56449, -73.17356
Time: 2023-02-16 10:23:49 -0500



Sub-basin delineation point selected immediately downstream of culvert, south side of West Mountain Road, Cheshire, Massachusetts

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
ACRSDFT	Area underlain by stratified drift	0	square miles
BSLDEM10M	Mean basin slope computed from 10 m DEM	24.672	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	19.255	percent

Parameter Code	Parameter Description	Value	Unit
CAT1ROADS	Length of interstates lmtd access highways and ramps for lmtd access highways, includes cloverleaf interchanges (USGS Ntl Transp Dataset)	0	miles
CAT2ROADS	Length of sec hwy or maj connecting roads; main arteries & hwys not lmtd access, usually in the US Hwy or State Hwy systems (USGS Ntl Transp Dataset)	0	miles
CAT3ROADS	Length of local connecting roads; roads that collect traffic from local roads & connect towns, subdivisions & neighborhoods (USGS Nat Transp Dataset)	0	miles
CAT4ROADS	Length of local roads; generally paved street, road, or byway that usually have single lane of traffic in each direction (USGS Ntnl Transp Dataset)	4.65	miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	61764.5	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	927716.7	meters
CROSCOUNT1	Number of intersections between streams and roads, where the roads are interstate, limited access highway, or ramp (CAT1ROADS)	0	dimensionless
CROSCOUNT2	Number of intersections between streams and roads, where the roads are secondary highway or major connecting road (CAT2ROADS)	0	dimensionless
CROSCOUNT3	Number of intersections between streams and roads, where roads are local conecting roads (CAT3ROADS)	0	dimensionless
CROSCOUNT4	Number of intersections between streams and roads, where roads are local roads (CAT4ROADS)	6	dimensionless
CRSDFT	Percentage of area of coarse-grained stratified drift	0	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	343	feet per mi
DRFTPERSTR	Area of stratified drift per unit of stream length	0	square mile per mile
DRNAREA	Area that drains to a point on a stream	3.37	square miles
ELEV	Mean Basin Elevation	1950	feet
FOREST	Percentage of area covered by forest	93.7	percent
LAKEAREA	Percentage of Lakes and Ponds	0.09	percent
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	0.7	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.0917	percent
LFPLENGTH	Length of longest flow path	4.14	miles
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless
MAXTEMPC	Mean annual maximum air temperature over basin area, in degrees Centigrade	11.6	degrees C
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	62585	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	925115	feet
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	0	percent
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	52.1	inches
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	6.28	miles
WETLAND	Percentage of Wetlands	1.57	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.16	512
ELEV	Mean Basin Elevation	1950	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0	percent	0	32.3

Peak-Flow Statistics Disclaimers [Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

Statistic	Value	Unit
50-percent AEP flood	253	ft^3/s
20-percent AEP flood	445	ft^3/s
10-percent AEP flood	612	ft^3/s
4-percent AEP flood	871	ft^3/s
2-percent AEP flood	1100	ft^3/s
1-percent AEP flood	1350	ft^3/s
0.5-percent AEP flood	1630	ft^3/s
0.2-percent AEP flood	2060	ft^3/s

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	ASEp
7 Day 2 Year Low Flow	0.335	ft^3/s	0.0792	1.36	49.5	49.5
7 Day 10 Year Low Flow	0.182	ft^3/s	0.035	0.881	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	ASEp
50 Percent Duration	3.3	ft^3/s	1.48	7.33	17.6	17.6
60 Percent Duration	2.06	ft^3/s	0.737	5.72	19.8	19.8
70 Percent Duration	1.29	ft^3/s	0.471	3.5	23.5	23.5
75 Percent Duration	1.01	ft^3/s	0.377	2.67	25.8	25.8
80 Percent Duration	0.915	ft^3/s	0.274	3.02	28.4	28.4
85 Percent Duration	0.746	ft^3/s	0.224	2.44	31.9	31.9
90 Percent Duration	0.59	ft^3/s	0.173	1.97	36.6	36.6
95 Percent Duration	0.4	ft^3/s	0.101	1.53	45.6	45.6
98 Percent Duration	0.255	ft^3/s	0.0566	1.09	60.3	60.3
99 Percent Duration	0.19	ft^3/s	0.0383	0.888	65.1	65.1

Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

August Flow-Duration Statistics

August Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

August Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	Pll	Plu	SE	ASEp
August 50 Percent Duration	0.729	ft^3/s	0.216	2.42	33.2	33.2

August Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Bankfull Statistics

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	24.672	percent	2.2	23.9

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.07722	59927.7393

Bankfull Statistics Disclaimers [Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	30.2	ft
Bankfull Depth	1.59	ft
Bankfull Area	47.7	ft^2
Bankfull Streamflow	240	ft^3/s

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	25.2	ft
Bieger_D_channel_depth	1.59	ft
Bieger_D_channel_cross_sectional_area	40.6	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	35.5	ft
Bieger_P_channel_depth	1.8	ft
Bieger_P_channel_cross_sectional_area	64.3	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	19	ft
Bieger_USA_channel_depth	1.56	ft
Bieger_USA_channel_cross_sectional_area	32.9	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit

Statistic	Value	Unit
Bankfull Width	30.2	ft
Bankfull Depth	1.59	ft
Bankfull Area	47.7	ft^2
Bankfull Streamflow	240	ft^3/s
Bieger_D_channel_width	25.2	ft
Bieger_D_channel_depth	1.59	ft
Bieger_D_channel_cross_sectional_area	40.6	ft^2
Bieger_P_channel_width	35.5	ft
Bieger_P_channel_depth	1.8	ft
Bieger_P_channel_cross_sectional_area	64.3	ft^2
Bieger_USA_channel_width	19	ft
Bieger_USA_channel_depth	1.56	ft
Bieger_USA_channel_cross_sectional_area	32.9	ft^2

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)
Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_

Probability Statistics

Probability Statistics Parameters [Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	0	percent	0	100
FOREST	Percent Forest	93.7	percent	0	100

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Disclaimers [Perennial Flow Probability]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Probability Statistics Flow Report [Perennial Flow Probability]

Statistic	Value	Unit
Probability Stream Flowing Perennially	0.929	dim

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 1]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	8600	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.13.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX E:

Particle Analysis

Channel Material

This Worksheet

Three types of data can be accommodated to the right on this sheet:

1. Individual stand alone pebble count for:
   > riffle surface,
   > channel bed or
   > bankfull channel.

2. Weighted pebble counts representing the channel surface with samples taken separately from distinct features or depositional areas.
   > bed features (riffle, pool, etc),
   > bed surface and bank surface,
   > facies or patches of distinct grain size.

3. Bulk sieve analysis for:
   >point bar samples,
   >bed sub-pavement or
   >bank material.

Surface material from this worksheet is linked to the Dimension worksheet where it is used to estimate roughness. Individual or weighted samples will link. If no bed surface is entered, riffle surface is used and then the bankfull channel.

Shape factor and Largest Particle may be entered far to the right of this worksheet.

Reference Reach

Stream:	Kitchen Brook
Watershed:	Hoosic River Watershed
Location:	West Mountain Road, Cheshire
Latitude:	42.5644
Longitude:	-72.8267
County:	Berkshire
Date:	February 15, 2023
Observers:	CM (SWCA)
Channel Type:	B3
Drainage Area (sq.mi)	0.28

Channel Materials	Channel Surface			BkF Channel
D16 (mm)	5.7	---	---	5.7
D35 (mm)	19	---	---	19
D50 (mm)	35	---	---	35
D65 (mm)	56	---	---	56
D84 (mm)	110	---	---	110
D95 (mm)	170	---	---	170
mean (mm)	25.0			25.0
dispersion	4.6			4.6
skewness	-0.13			-0.13
Shape Factor	---			
% Silt/Clay	0%	---	---	0%
% Sand	1%	---	---	1%
% Gravel	68%	---	---	68%
% Cobble	31%	---	---	31%
% Boulder	0%	---	---	0%
% Bedrock		---		
% Clay Hardpan		---		
% Detritus/Wood		---		
% Artificial		---		
Largest Mobile (mm)	---			

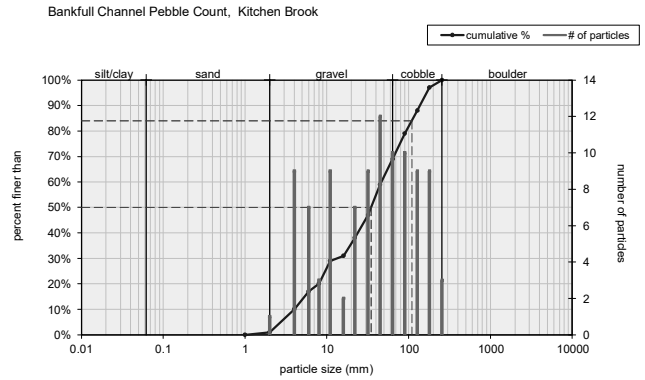
1) Individual Pebble Count

Two individual samples may be entered below. Select sample type for each.

Bankfull Channel

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	
very coarse sand	1 - 2	1
very fine gravel	2 - 4	9
fine gravel	4 - 6	7
fine gravel	6 - 8	3
medium gravel	8 - 11	9
medium gravel	11 - 16	2
coarse gravel	16 - 22	7
coarse gravel	22 - 32	9
very coarse gravel	32 - 45	12
very coarse gravel	45 - 64	10
small cobble	64 - 90	10
medium cobble	90 - 128	9
large cobble	128 - 180	9
very large cobble	180 - 256	3
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
total count:		100

Note: upstream from culvert

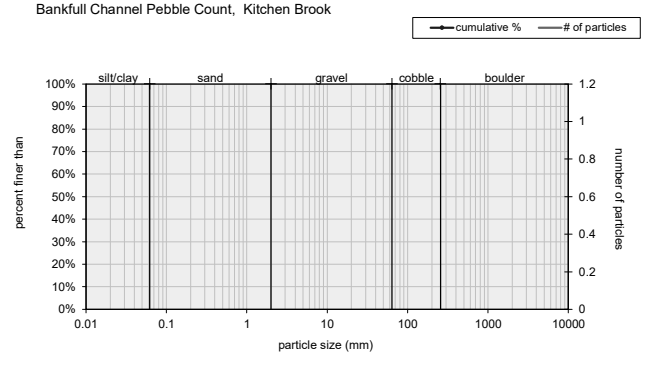


Size (mm)		Size Distribution		Type	
D16	5.7	mean	25.0	silt/clay	0%
D35	19	dispersion	4.6	sand	1%
D50	35	skewness	-0.13	gravel	68%
D65	56			cobble	31%
D84	110			boulder	0%
D95	170				

Bankfull Channel

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	
very coarse sand	1 - 2	
very fine gravel	2 - 4	
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		0
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
total count:		0

Note:



Size (mm)			Size Distribution		Type	
D16	---	3.4	mean	---	silt/clay	---
D35	---	12	dispersion	---	sand	---
D50	---	17	skewness	---	gravel	---
D65	---	20			cobble	---
D84	---	29			boulder	---
D95	---	39				

Attachment D – Site Photographs

Photo 1: Existing Culvert Outlet

Photo 2: Existing Culvert Inlet

Photo 3: Looking Downstream through Existing Culvert

Photo 4: Spall in East Footing

Photo 5: Spall in West Footing

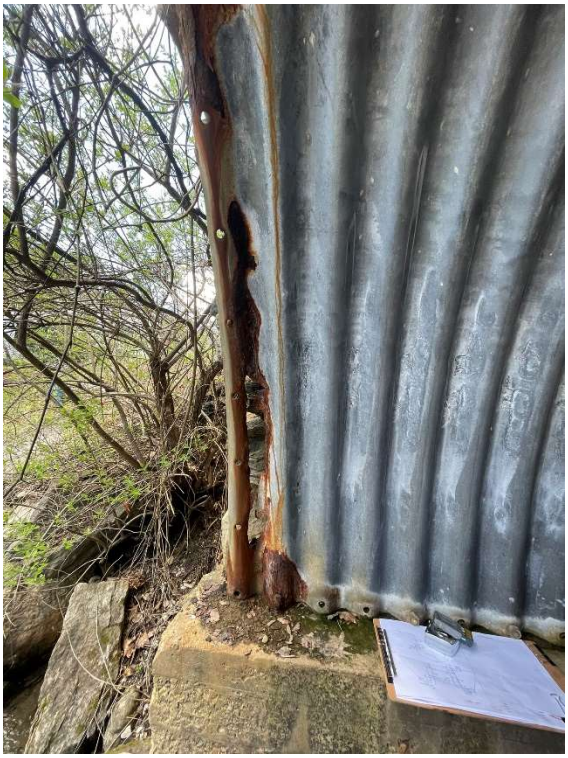


Photo 6: Deterioration on South End of Existing Culvert

Photo 7: Topside of Roadway looking West

Photo 8: Topside of Roadway looking East

Attachment E – Project Plans

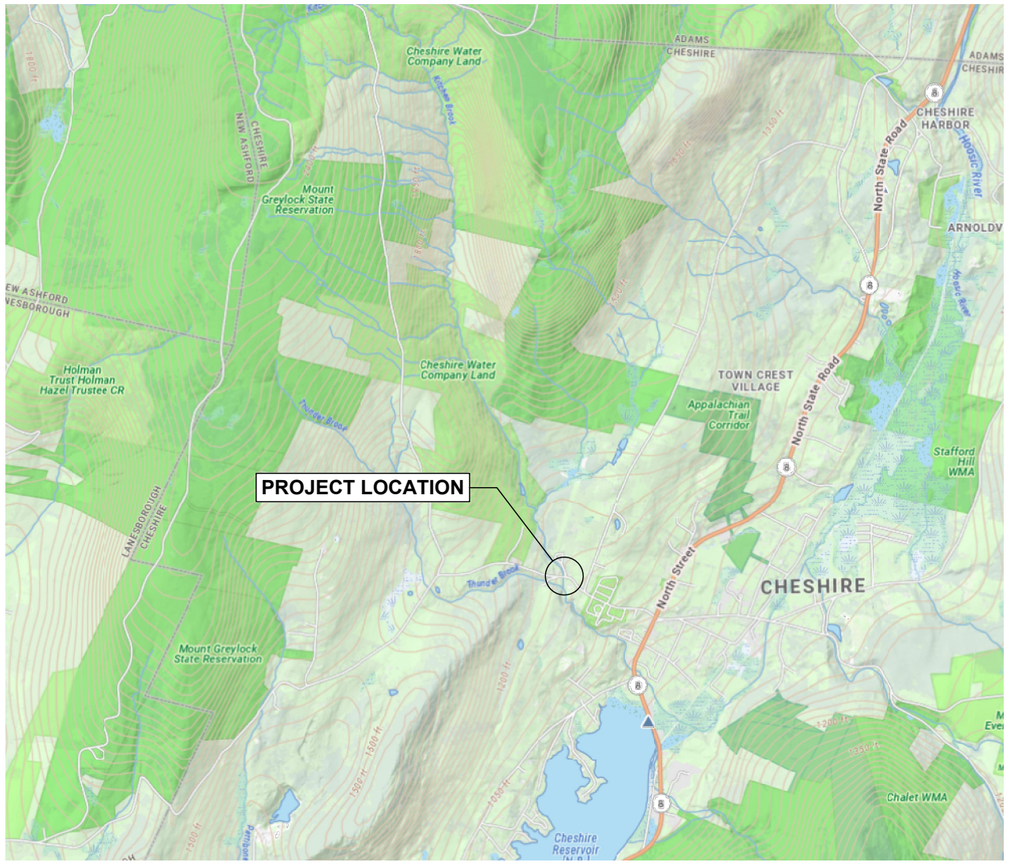
TOWN OF CHESHIRE

WEST MOUNTAIN ROAD OVER KITCHEN BROOK
C-10-024

IN THE TOWN OF

CHESHIRE, MA
BERKSHIRE COUNTY

ENVIRONMENTAL PERMITTING PLANS



LIST OF RESOURCE ABBREVIATIONS

BVW = BORERING VEGETATED WETLANDS

LUWW = LAND UNDER WATERBODIES AND WATERWAYS

RFA = RIVER FRONT AREA

BLSF = BORDERING LAND SUBJECT TO FLOODING

ILSF = ISOLATED LAND SUBJECT TO FLOODING

OHW = ORDINARY HIGH WATER

RESOURCE IMPACTS:

BANKS (TEMPORARY) = 105 LF
BANKS (PERMANENT) = 0 LF

LUWW (TEMPORARY) = 521 SF
LUWW (PERMANENT) = 154 SF
LAND DREDGED = 0 CF

BVW (TEMPORARY) = 0 SF
BVW (PERMANENT) = 0 SF

RFA (TEMPORARY) = 1,386 SF
RFA (PERMANENT) = 429 SF

BLSF (TEMPORARY) = 244 SF
BLSF (PERMANENT) = 42 SF

ILSF (TEMPORARY) = 0 SF
ILSF (PERMANENT) = 0 SF

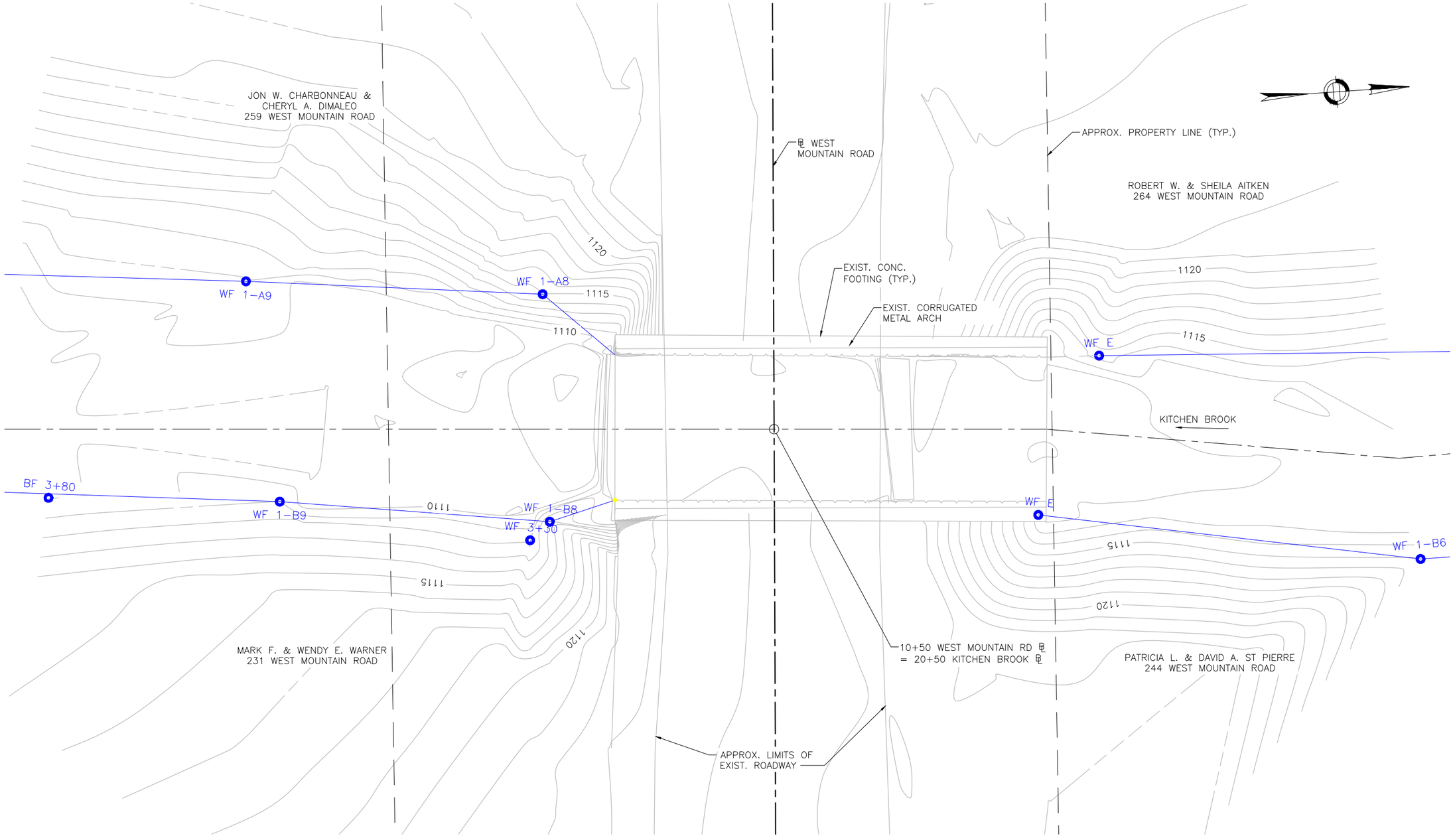
GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

TITLE SHEET



EXISTING CONDITIONS PLAN

0 5 10 15

SCALE: 1" = 5'

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

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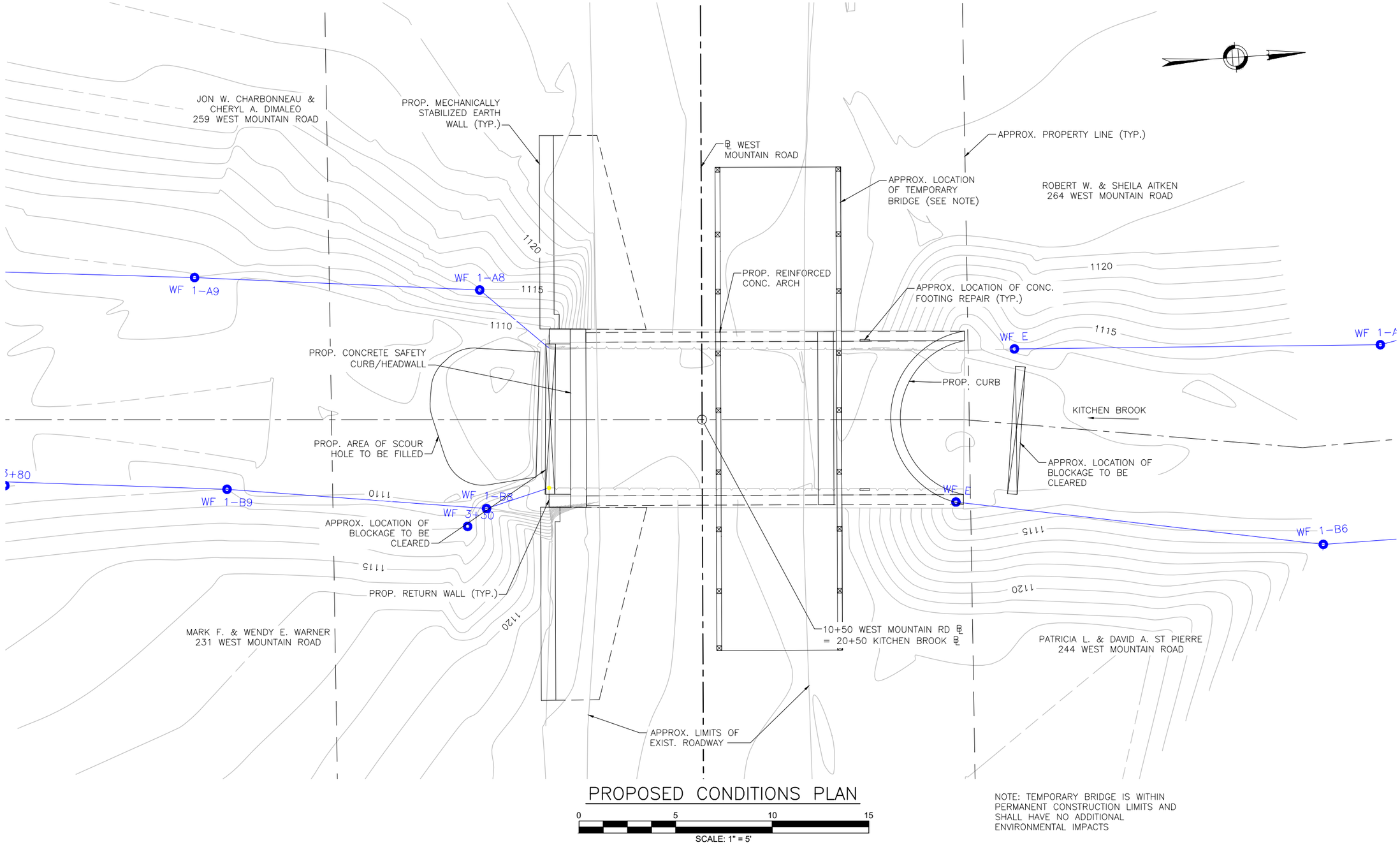
EXISTING CONDITIONS

SHEET 2 OF 10



PROPOSED CONDITIONS PLAN

NOTE: TEMPORARY BRIDGE IS WITHIN PERMANENT CONSTRUCTION LIMITS AND SHALL HAVE NO ADDITIONAL ENVIRONMENTAL IMPACTS

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

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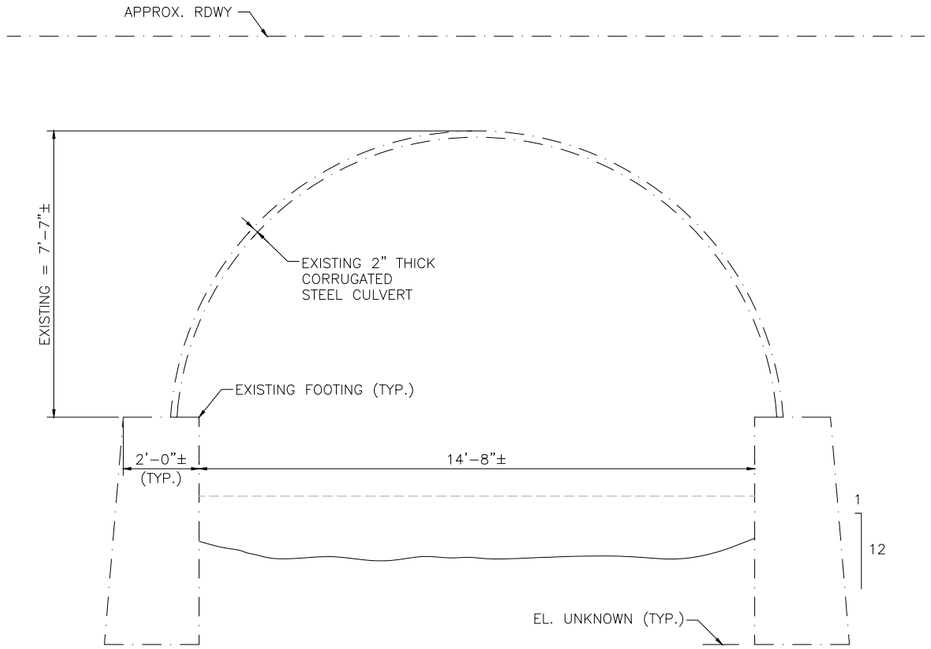
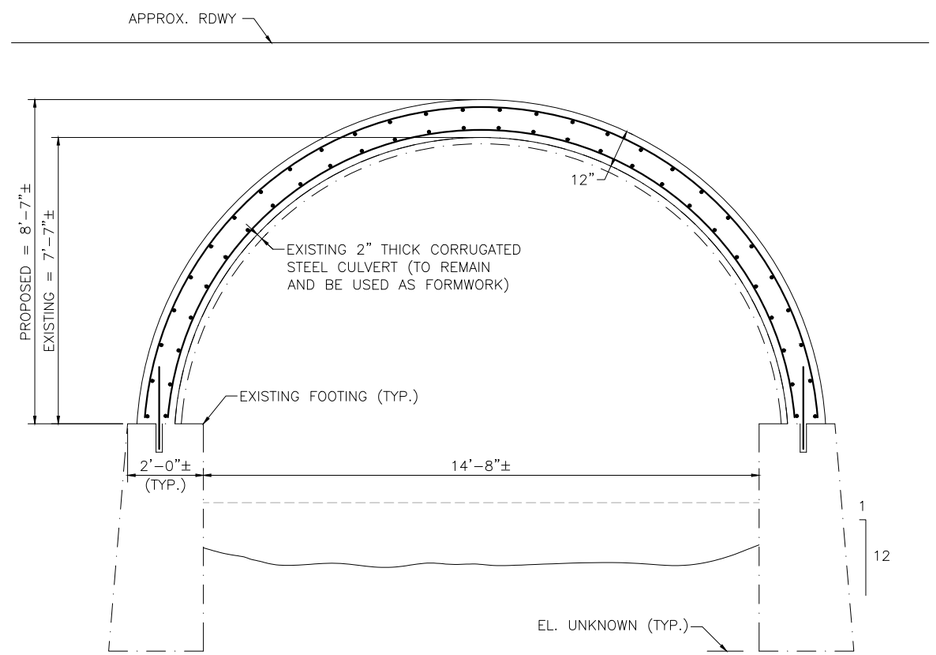
PROPOSED CONDITIONS



EXISTING LONGITUDINAL SECTION



PROPOSED LONGITUDINAL SECTION

0 2 4 6

SCALE: 1" = 2'

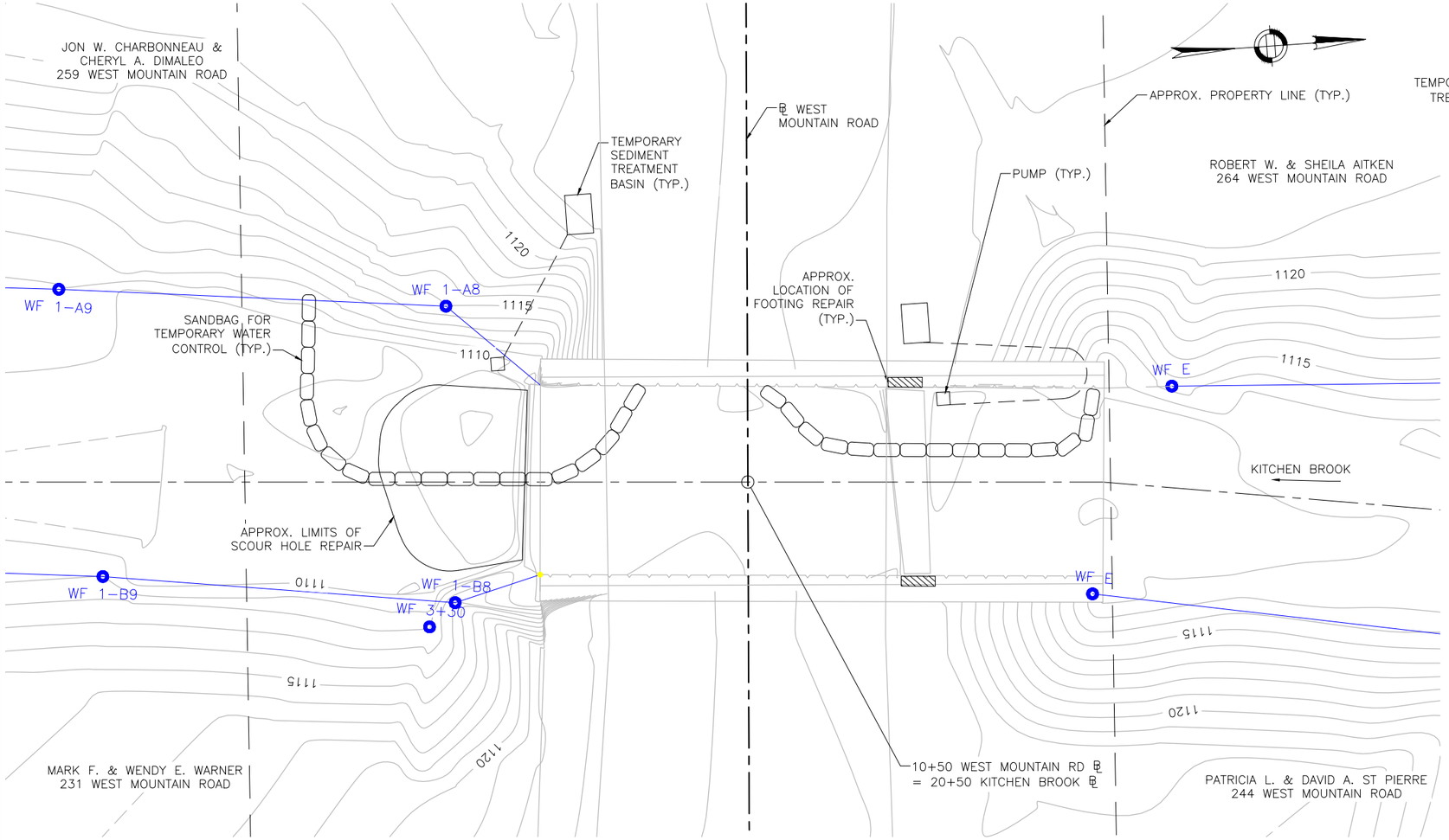
GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

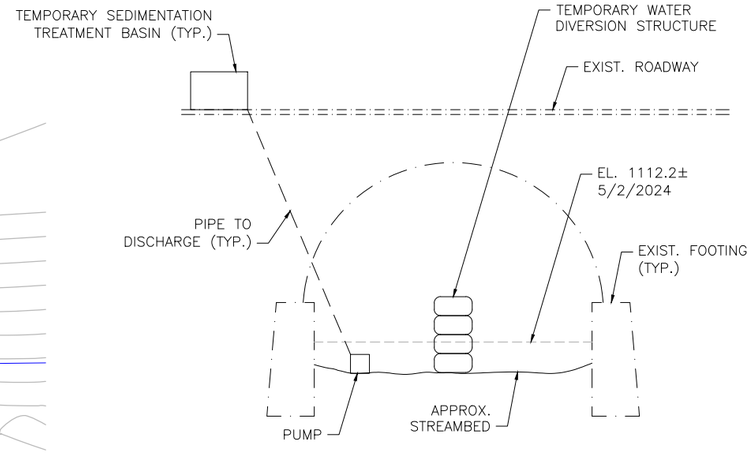
LONGITUDINAL SECTIONS



TEMPORARY WATER CONTROL PLAN

0 5 10 15

SCALE: 1" = 5'



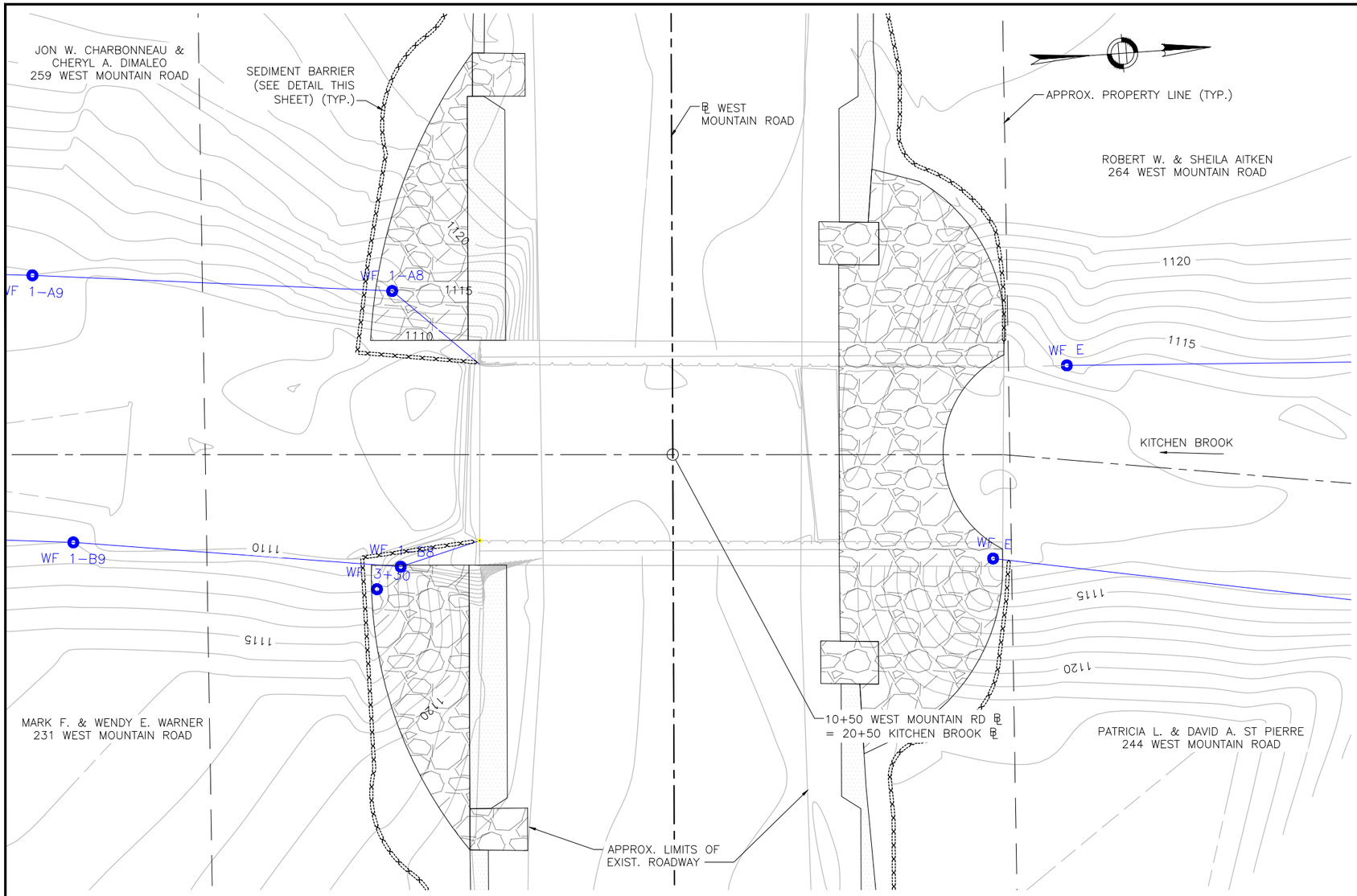
DEWATERING ELEVATION

0 4 8 12

SCALE: 1" = 4'

TEMPORARY WATER CONTROL NOTES:

1. TEMPORARY WATER CONTROL SHALL BE ESTABLISHED TO PERMIT THE CONCRETE FOOTING REPAIRS, SCOUR HOLE REPAIR, AND WINGWALL CONSTRUCTION TO BE PERFORMED IN THE DRY.
2. THE TEMPORARY WATER CONTROL PLAN AND DEWATERING ELEVATION SHOWN ARE CONCEPTUAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD A PROPOSED WATER DIVERSION AND DEWATERING PLAN FOR APPROVAL PRIOR TO CONSTRUCTION.
3. THE PLAN AND ELEVATION SHOWN IN FOR WORK ON THE WEST HALF OF THE STREAM. ONCE WORK IS COMPLETED ON THE WEST SIDE OF THE STREAM THE DIVERSION SHALL BE RESTAGED TO COMPLETE WORK ON THE EAST SIDE OF THE STREAM.
4. ALL DEWATERING AND RELATED EARTHWORK SHALL BE CONDUCTED IN SUCH A MANNER AS TO PREVENT SILTATION OR CONTAMINATION OF THE WATERWAY. THE PUMPING DISCHARGE SHALL BE PUMPED TO A SETTLING BASIN BEFORE BEING DISCHARGED INTO THE WATERWAY.



EROSION CONTROL AND REVEGETATION PLAN

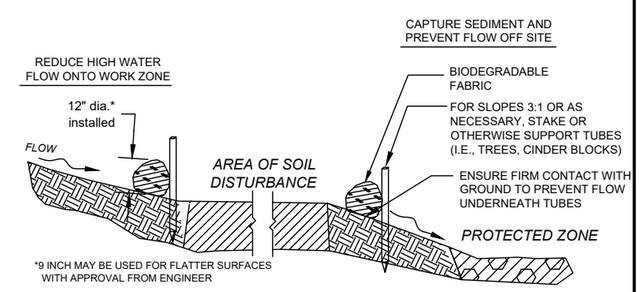
LEGEND:

= MODIFIED ROCK FILL

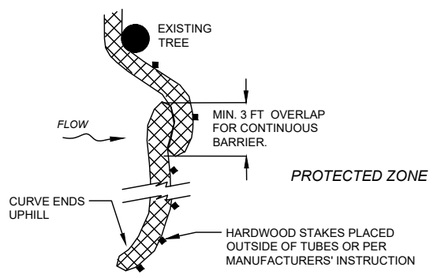
= COMPOST BLANKET AND SEED

EROSION CONTROL AND REVEGETATION NOTES:

1. THE SEDIMENT CONTROL BARRIERS SHALL BE INSTALLED IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS AND AS REQUIRED SO THAT NO EXCAVATED OR DISTURBED SOIL CAN ENTER MITIGATION AREAS, ADJACENT WETLANDS OR WATERWAYS. THE CONTRACTOR SHALL ENSURE THAT THE SEDIMENT CONTROL BARRIER ADEQUATELY CONTROLS SILTATION AND RUNOFF. NO WORK SHALL TAKE PLACE OUTSIDE THE BARRIERS.
2. THE PROPOSED AREA OF COMPOST AND SEEDING SHALL CONSIST OF A $\frac{1}{2}$"–1" THIN MULCH BLANKET OVER PREPARED SOIL TO PROVIDE TEMPORARY SOIL STABILIZATION AND ORGANIC MATTER FOR PLANT GROWTH. GRASS SEED SHALL BE BROADCAST IN CONJUNCTION WITH THE COMPOST BLANKET.



SECTION



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLAN VIEW

SEDIMENT BARRIER – COMPOST FILTER TUBE

NOT TO SCALE

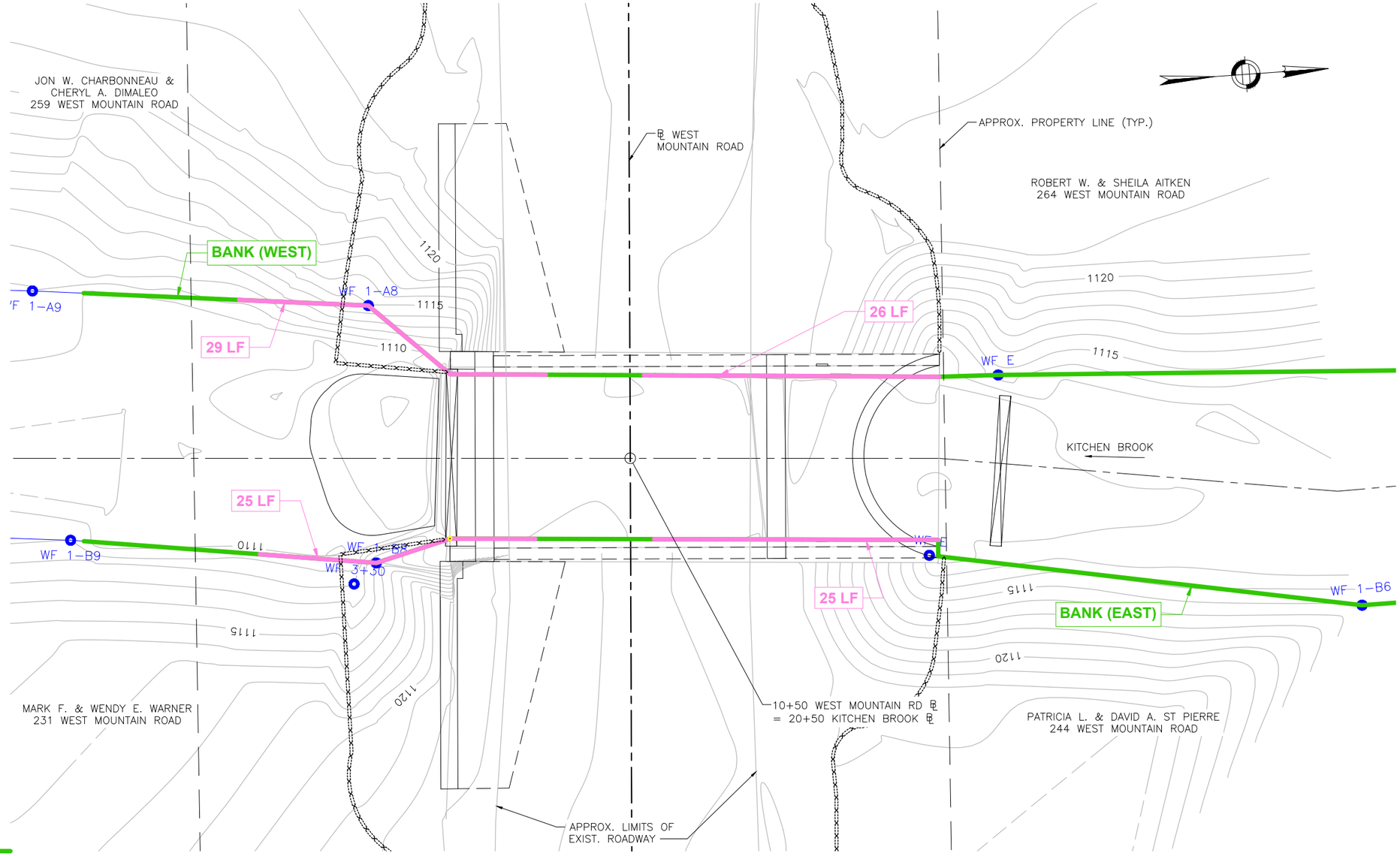
GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

EROSION CONTROL AND REVEGETATION DETAILS



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

BANK IMPACTS

PERMANENT: 0 LF

TEMPORARY: 105 LF

LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:

C10024 Permit Plans.dwg Plotted on 16-Oct-2025 9:44 AM

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

BANK IMPACT PLAN

SHEET 7 OF 10

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

LAND UNDER WATERWAYS AND WATERBODIES (LUWW) IMPACTS

PERMANENT: 154 SF

TEMPORARY: 521 SF

LAND DREDGED: 0 CF

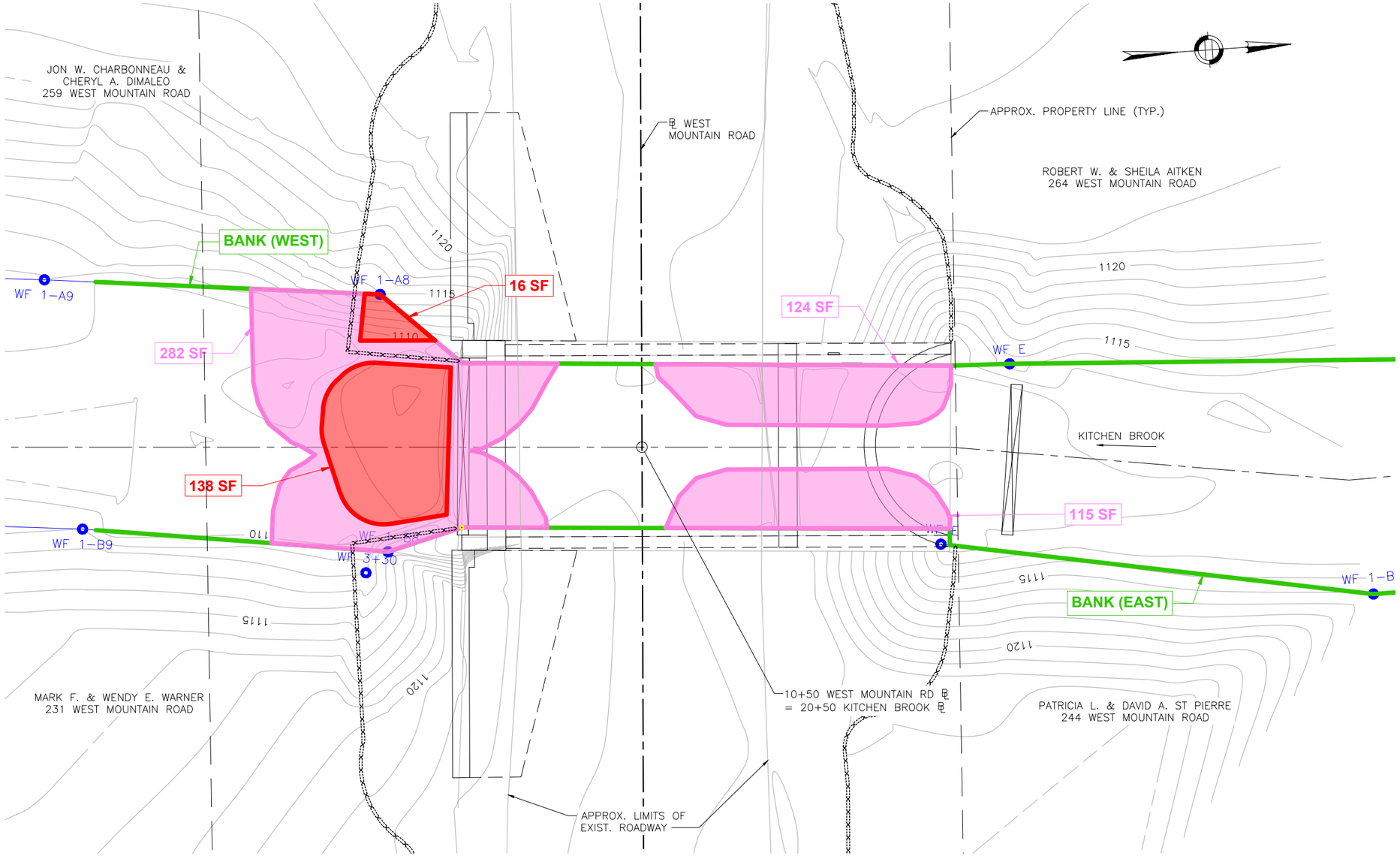
LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

LUWW IMPACT PLAN

SHEET 8 OF 10

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

RIVERFRONT AREA IMPACTS

PERMANENT: 429 SF

TEMPORARY: 1,386 SF

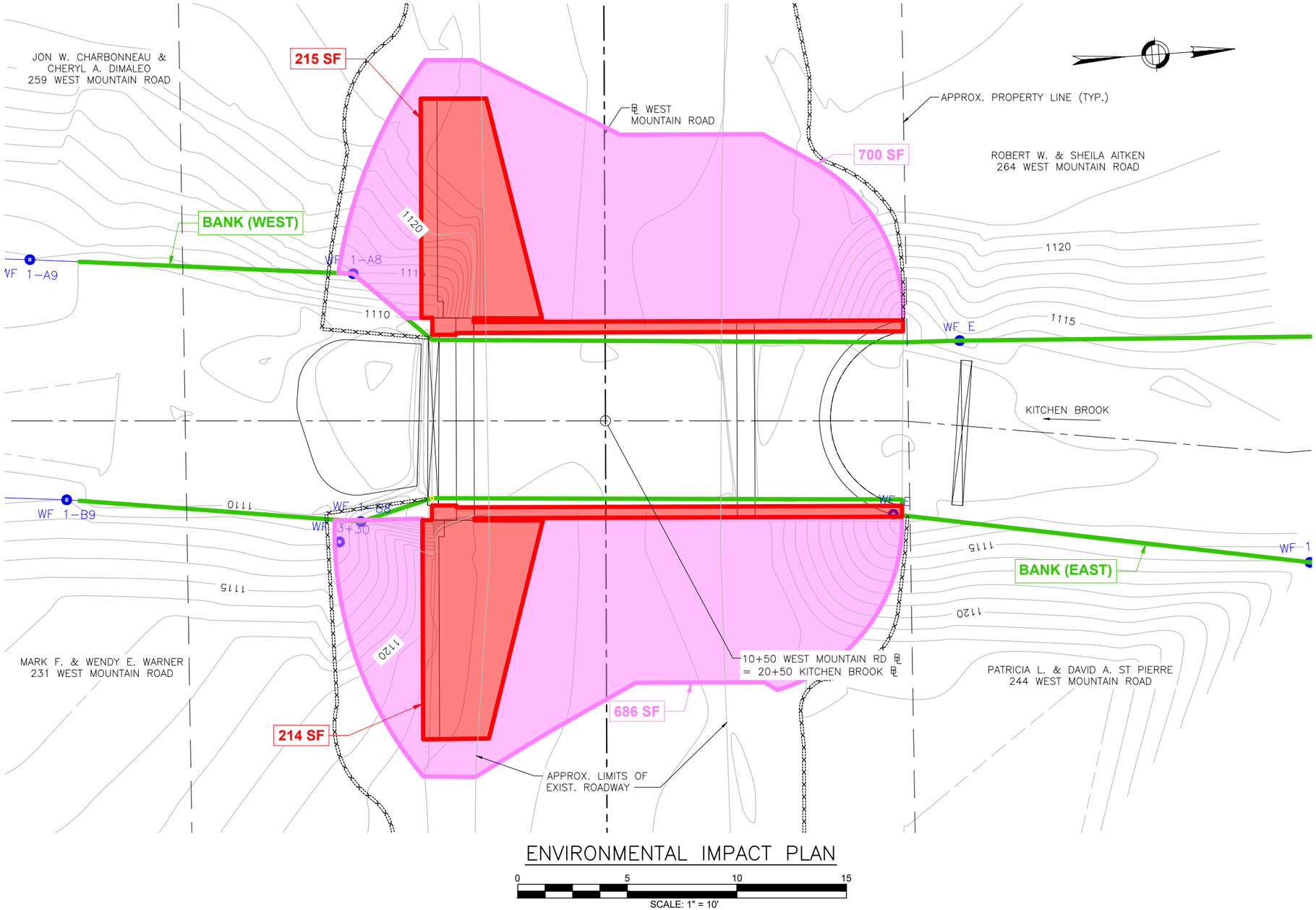
LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 10'

C10024 Permit Plans.dwg Plotted on 16-Oct-2025 9:44 AM

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

RIVERFRONT AREA IMPACT PLAN

SHEET 9 OF 10

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

BORDERING LAND SUBJECT TO FLOODING IMPACTS

PERMANENT: 42 SF

TEMPORARY: 244 SF

LEGEND

EXISTING BANK:

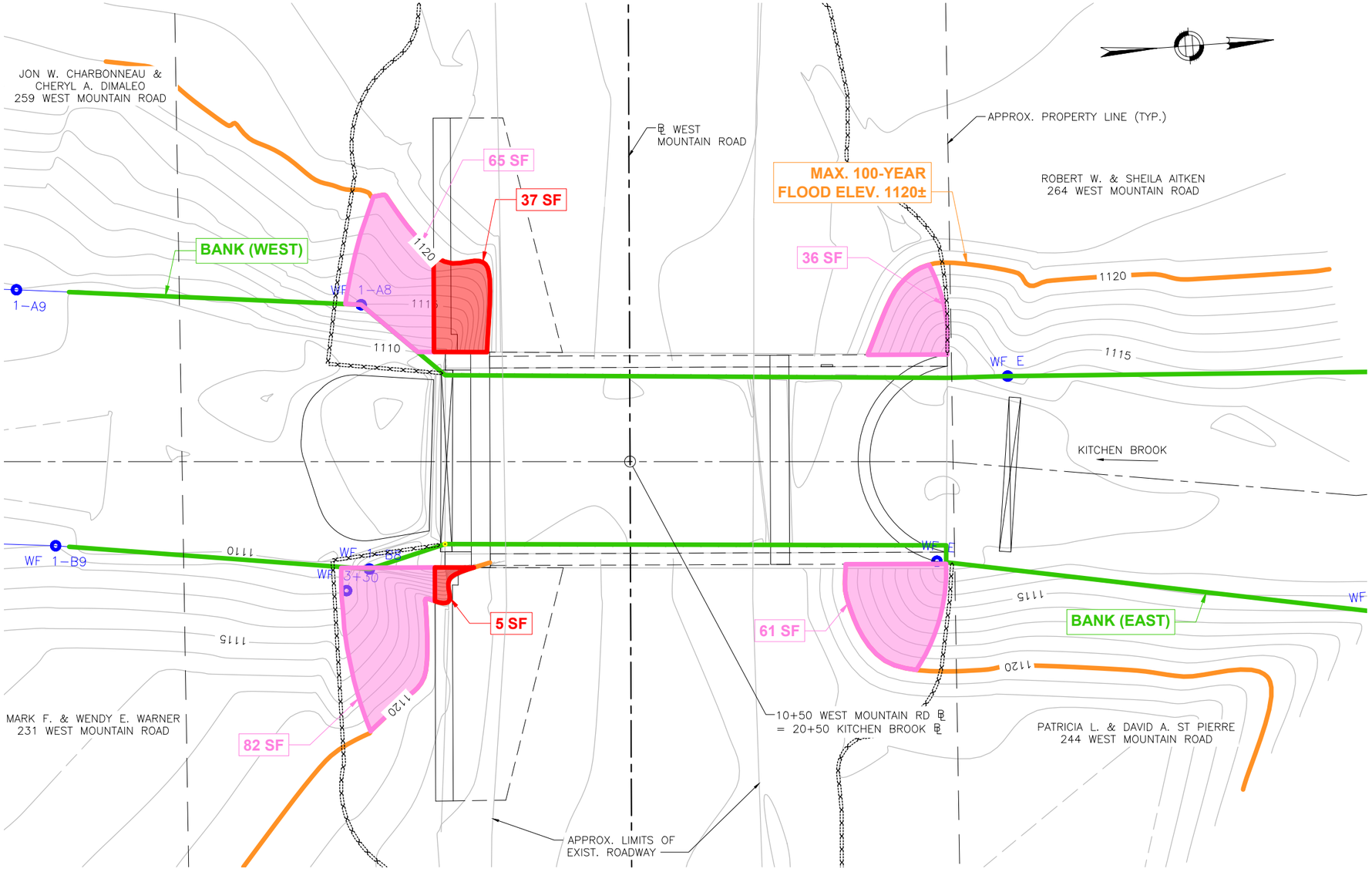
EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:

100-YR FLOOD ELEVATION:

NOTE: 100-YEAR FLOOD ELEVATION SHOWN ON THESE PLANS IS BASED ON HYDRAULIC OUTPUT RESULTS FROM A HYDRAULIC STUDY FOR THE EXISTING CULVERT DONE BY GILL ENGINEERING.



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

BLSF IMPACT PLAN

SHEET 10 OF 10

Gill Engineering Associates, Inc. 1234 Chestnut Street Newton, MA 02464 781-355-7100 www.gill-eng.com

APPENDIX C

WPA-5 ORDER OF CONDITIONS

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

FILE

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**MFEXEC24**
Transaction ID:	**1960283**
Document:	**WPA Form 5 - OOC**
Size of File:	**152.06K**
Status of Transaction:	**In Process**
Date and Time Created:	**11/20/2025:3:18:13 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:130-0199
eDEP Transaction #:1960283
City/Town:CHESHIRE

A. General Information

1. Conservation Commission: CHESHIRE
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	COREY	b. Last Name	MCGRATH		
c. Organization	TOWN OF CHESHIRE DEPARTMENT OF PUBLIC WORKS				
d. Mailing Address	191 CHURCH STREET				
e. City/Town	CHESHIRE	f. State	MA	g. Zip Code	01225

4. Property Owner

a. First Name		b. Last Name			
c. Organization	TOWN OF CHESHIRE				
d. Mailing Address	191 CHURCH STREET				
e. City/Town	CHESHIRE	f. State	MA	g. Zip Code	01225

5. Project Location

a.Street Address	244-259 WEST MOUNTAIN ROAD		
b.City/Town	CHESHIRE	c. Zip Code	01225
d. Assessors Map/Plat#	214	e. Parcel/Lot#	021
f. Latitude	42.56462N	g. Longitude	73.17352W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
NORTHERN BERKSHIRE		01127	513

7.Dates

a. Date NOI Filed :	10/28/2025	b. Date Public Hearing Closed:	11/17/2025	c. Date Of Issuance:	11/18/2025

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
WEST MOUNTAIN ROAD OVER KITCHEN BROOK PERMITTING PLANS	MADISON SULLIVAN	JOHN PHELPS	10/15/2025	VARIES
PROJECT NARRATIVE, ABUTTER NOTIFICATIONS AND SITE PHOTOGRAPHS			10/15/2025	

B. Findings

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:130-0199
eDEP Transaction #:1960283
City/Town:CHESHIRE

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

a. ☑ Public Water Supply	b. ☐ Land Containing Shellfish	c.☑ Prevention of Pollution
d. ☑ Private Water Supply	e. ☑ Fisheries	f. ☑ Protection of Wildlife Habitat
g. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

Approved subject to:

a. ☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

b.☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c.☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3.☐ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a). _____ a. linear feet

Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☑ Bank	105 a. linear feet	105 b. linear feet	0 c. linear feet	0 d. linear feet
5.☐ Bordering Vegetated Wetland	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
6. ☑ Land under Waterbodies and Waterways	521 a. square feet	521 b. square feet	154 c. square feet	154 d. square feet
	0	0		

	e. c/y dredged	f. c/y dredged		
7.☑ Bordering Land Subject to Flooding	244 a. square feet	244 b. square feet	42 c. square feet	42 d. square feet
Cubic Feet Flood Storage	0 e. cubic feet	0 f. cubic feet	0 g. cubic feet	0 h. cubic feet
8.☐ Isolated Land Subject to Flooding	 a. square feet	 b. square feet		
Cubic Feet Flood Storage	 c. cubic feet	 d. cubic feet	 e. cubic feet	 f. cubic feet
9.☑ Riverfront Area	429 a. total sq. feet	429 b. total sq. feet		
Sq ft within 100 ft	429 c. square feet	429 d. square feet	0 e. square feet	0 f. square feet
Sq ft between 100-200 ft	0 g. square feet	0 h. square feet	0 i. square feet	0 j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10.☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11.☐ Land Under the Ocean	 a. square feet	 b. square feet		
	 c. c/y dredged	 d. c/y dredged		
12.☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13.☐ Coastal Beaches	 a. square feet	 b. square feet	 c. c/y nourishment	 d. c/y nourishment
14.☐ Coastal Dunes	 a. square feet	 b. square feet	 c. c/y nourishment	 d. c/y nourishment
15.☐ Coastal Banks	 a. linear feet	 b. linear feet		
16.☐ Rocky Intertidal Shores	 a. square feet	 b. square feet		
17.☐ Salt Marshes	 a. square feet	 b. square feet	 c. square feet	 d. square feet
18.☐ Land Under Salt Ponds	 a. square feet	 b. square feet		
	 c. c/y dredged	 d. c/y dredged		
19.☐ Land Containing Shellfish	 a. square feet	 b. square feet	 c. square feet	 d. square feet

20.☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above c. c/y dredged d. c/y dredged
21.☐ Land Subject to Coastal Storm Flowage	a. square feet b. square feet

22.

☐ Restoration/Enhancement (For Approvals Only)

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

23.

☑ Streams Crossing(s)

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings	b. number of replacement stream crossings
0	1

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal

has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]
File Number :"130-0199"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☐ is not (2)☑ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period

erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
   1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
   2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission")

upon request; and

3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions:

SEE ATTACHED.

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☑ No

2. The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☐ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

11/18/2025
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

3
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Mary Summers

Raymond P. Killeen

Brett Gelinas

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land

subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

CHESHIRE
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

CHESHIRE
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

244-259 WEST MOUNTAIN ROAD — Project Location
130-0199 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

County — Book — Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book — Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Rev. 4/1/2010

TOWN OF CHESHIRE

CONSERVATION COMMISSION

191 CHURCH STREET CHESHIRE, MASSACHUSETTS 01225
PHONE (413)743-1690 EXT 117 | EMAIL CONCOM@CHESHIRE-MA.GOV

SPECIAL CONDITIONS FOR NOTICE OF INTENT

FILE

DEP FILE NO. 130-0199
DATE OF ISSUANCE: November 18, 2025

1. The outlet of the culvert shall be repeatedly maintained to prevent the erosion of the streambed or ground due to the erosive force of high-velocity water exiting the culvert, commonly known as a scour hole.
2. All soil(s) disturbed throughout the duration of the project shall be loamed, seeded with a conservation mix native to Berkshire County, Massachusetts, and hayed. All seeded area(s) shall be given adequate time for the establishment of vegetation prior to the submission of a Request for Certificate of Compliance.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
130-0199
MassDEP File #

eDEP Transaction #

Cheshire
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

20 MF
11/18/2025
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

3
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signature	Printed Name
Mary	Mary Summers
Raymond P. Killeen	Raymond Killeen
Brett Gelinas	Brett Gelinas

☒ by hand delivery on
20 MF
11/19/2025
Date

☐ by certified mail, return receipt requested, on

Date

APPENDIX D

US ARMY CORPS OF ENGINEERS SELF-VERIFICATION NOTIFICATION FORM

Self Verification Notification Form

Culvert Strengthening No. C-10-024
West Mountain Road over
Kitchen Brook
Cheshire, Massachusetts

February 13th, 2025

Madison Sullivan
Gill Engineering
63 Kendrick Street
Needham, MA 02494

Contents:

U.S. Army Corps of Engineers (USACE)

SELF-VERIFICATION NOTIFICATION (SVN)

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.

Principal Purpose This information will be used in evaluating activities under Self-Verification procedures within Massachusetts.

Routine Uses Routine uses will include: (1) Documenting compliance with the terms and conditions of the General Permit (GP) for activities that may require authorization pursuant to one or more of USACE's Regulatory authorities. (2) Records may be referred to other Federal, State, and local agencies for evaluation and enforcement purposes.

Disclosure Failure to fully comply and abide by the GP terms and conditions prior to commencing work and after completion project may result in formal enforcement action, up to and including monetary penalties and/or legal action, pursuant to 33 CFR Part 326.

Instructions The permittee must complete ALL required sections of this document before commencing USACE-regulated activities. A copy of this completed SVN must be kept on site during construction and be made available for review by USACE and other Federal, State, & Local regulatory authorities at any time. Within 30 days of initiating project construction, the permittee shall submit the completed SVN to USACE. The SVN shall be submitted to USACE as **ONE signed document** that includes project plans and documentation that supports each field (e.g., emails, letters, description, phone calls, surveys). Electronic submissions to the following address are strongly preferred: cenae-r-ma-sv@usace.army.mil. The email subject line shall contain the following: GP #, SVN, City/Town, and date submitted.

(ITEMS 1 THRU 3 TO BE FILLED BY USACE)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED

APPLICANT AND AGENT INFORMATION

4. APPLICANT'S NAME	7. AGENT'S ADDRESS:
First - Corey Middle - Last - McGrath	First - Madison Middle - M Last - Sullivan
Company - Town of Cheshire Department of Public Works	Company - Gill Engineering Inc.
E-mail Address - dpw@cheshire-ma.gov	E-mail Address - msullivan@gill-eng.com
5. APPLICANT'S ADDRESS:	8. AGENT'S ADDRESS:
Address- 191 Church Street	Address- 63 Kendrick St
City - Cheshire State - MA Zip - 01225 Country - USA	City - Needham State - MA Zip - 02494 Country - USA
6. APPLICANT'S PHONE NOs. w/AREA CODE	9. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax
413-743-1690	781-355-7100

NAME, LOCATION, AND DESCRIPTION OF PROJECT SITE

10. PROJECT NAME OR TITLE

Culvert Strengthening of C-10-024 West Mountain Road over Kitchen Brook

11. FILE NUMBER(S) OF PREVIOUS USACE ACTIONS ON THE SITE (if applicable)	12. NAME OF WATERBODY
	Kitchen Brook
13. PROJECT COORDINATES (in decimal degrees)	14. PROJECT STREET ADDRESS (if applicable)
Latitude: ◦N Longitude: ◦W	Address West Mountain Road
42.5646 -73.1736	City - Cheshire State - MA Zip - 01225

ACTIVITY TYPE, PROJECT IMPACTS, AVOIDANCE & MINIMIZATION

15. GENERAL PERMIT ACTIVITIES (CHECK ALL THAT APPLY)

1 ☐	6 ☐	11 ☐	16 ☐	21 ☐
2 ☐	7 ☐	12 ☐	17 ☐	22 ☐
3 ☐	8 ☐	13 ☐	18 ☐	23 ☑
4 ☐	9 ☐	14 ☐	19 ☐	24 ☐
5 ☐	10 ☐	15 ☐	20 ☐	25 ☐

16. SUMMARY OF PROJECT IMPACTS (*see instructions*)

Area (square feet)	Length (linear feet)	Volume (cubic yards)	Duration
	118		temporary
584			temporary
138			permanent

17. PROJECT PLANS (BY CHECKING THE BOXES BELOW, YOU CERTIFY THESE ITEMS ARE COMPLETE) (*see instructions*)

- [x] a. Plans shall at least contain the following: Vicinity Map, Plan View, and Typical Cross Section View of the proposed activity.
- [x] b. All direct, indirect and secondary impacts from USACE regulated activities are shown on the project plans.
- [x] c. The size of the impact area for each activity (acre, square feet, linear feet) are shown on the project plans.
- [x] d. For discharges of fill material (§404), the volume of fill material is identified on the project plans.
- [x] e. The duration of each impact, permanent or temporary (X days), is identified on the project plans.
- [ ] f. Do activities with permanent impacts result in the loss of waters? If so, this is identified on the project plans.
- [x] g. All aquatic resources in the vicinity of the USACE regulated activities are delineated on the project plans.

18. AVOIDANCE & MINIMIZATION (BY CHECKING THE BOXES BELOW, YOU CERTIFY THESE CRITERIA ARE MET) (*see instructions*)

- [x] a. The project has been designed to avoid and minimize impacts to aquatic resources.
- [x] b. The footprint of activities in waters of the U.S. has been reduced to only what is necessary to achieve the overall project purpose.
- [x] c. All practicable measures have been taken to avoid and minimize impacts to aquatic resources through construction techniques and site access (e.g., Best Management Practices, Time of Year Restrictions).
- [x] d. All temporary impacts from USACE regulated activities will be restored upon completion of construction and the project area will be returned to pre-construction contours and conditions.

COMPLIANCE WITH FEDERAL REGULATIONS & SUPPLEMENTAL INFORMATION

19. DUE DILIGENCE (*see instructions*)

Complete the entries below to document compliance with the following Federal requirements. Construction may NOT begin if a PCN is/may be required, and you must contact USACE to determine permitting requirements. Documentation that demonstrates how the activity complies with each field below shall be submitted to the USACE as noted in the instructions block. See each General Condition (GC) in the GP for how to comply with each requirement.

a. State Historic Preservation Officer	Per Appendix A, the activity has no potential to affect historic properties.
b. Massachusetts BUAR	Per Appendix A, BUAR was notified and they did not respond with concerns within 30 days.
c. Tribal Historic Preservation Officers	The Tribe(s) were notified and they didn't respond with concerns within 30 days.
d. Endangered Species Act - NOAA	The activity is not located within the ESA-listed Species Range.
e. Endangered Species Act - USFWS	The activity is not located within the ESA-listed Species Range.
f. Northern Long Eared Bat (ESA)	NLAA determination reached with the Rangewide D-Key. See Instructions below.*
g. Essential Fish Habitat	The project footprint does not contain EFH (see EFH definition in the MA GP).
h. Wild & Scenic Rivers	There are no WSR's within 0.25 miles of the project area.
i. 401 Water Quality Certification 401	The activity qualifies under the general 401 WQC for the 2023 MA GPs.
	401 WQC/OOC File Number: TBD OOC issued: 401 issued:
j. Section 408 Permission	Not Required per GC 15a-f, no Federal Projects are within the project vicinity.
k. Coastal Zone	The project is not located within the coastal zone.
l. Construction Mats	N/A, the activity does not require the installation of construction mats.
m.Time of Year Restrictions	N/A, the project is not located in a waterbody that has TOY restrictions.
n. Vernal Pools	Per GC 28, the project is not located in a vernal pool.
o. Sediment & Erosion Controls	Per GC 25, the activity uses BMPs to avoid/minimize sedimentation & erosion.
p. Stream/Wetland Crossings	The activity complies with all applicable terms in GC 31.

20. AQUACULTURE ACTIVITIES - GP 18 (*see instructions*)

- [ ] a. If required, an Aquaculture Certification from the Massachusetts Division of Marine Fisheries was obtained prior to commencing work.
- [ ] b. Coordination with the U.S. Coast Guard pursuant to Private Aids to Navigation has occurred prior to commencing work.
- [ ] c. If required, a MEPA Certificate was obtained from the Massachusetts Environmental Protection Agency prior to commencing work. Not Required
- [ ] d. The prospective permittee contacted local authorities (e.g. harbormaster, select board, shellfish constable) for authorization of their facility prior to commencing work.

21. ADDITIONAL INFORMATION/ATTACHMENTS (*see instructions*)

- [x] a. The project plans are enclosed in this SVN submittal (see block 17).
- [ ] b. The activity IS NOT funded through the Bipartisan Infrastructure Bill (also known as the Infrastructure Investment and Jobs Act).
- [x] c. All required state, local and federal approvals were acquired prior to starting construction in USACE jurisdiction.
- [x] d. After construction of the activity is completed, a complete Certificate of Compliance will be submitted to USACE.

22. IS THERE ANOTHER LEAD FEDERAL AGENCY:

- [ ] YES
- [x] NO

23. STATEMENT OF AUTHORIZATION *(see instructions)*

I certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
Digitally signed by Corey McGrath Date: 2025.02.19 14:08:22 -05'00'	2/19/25	Madison M. Sullivan Digitally signed by Madison M. Sullivan DN: C=US, E=msullivan@gill-eng.com, O=Gill Engineering, CN=Madison M. Sullivan Date: 2025.02.13 11:25:06-05'00'	

24. SIGNATURES *(see instructions)*

I hereby certify that the information in this Self-Verification Notification is complete and accurate. As the applicant or their duly authorized agent, I certify the activity was completed in accordance with the terms and conditions of the GP. This includes all applicable terms, general conditions, and activity-specific GP criteria. I agree to allow the duly authorized representatives of the Corps of Engineers Regulatory Program and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supersedes and waives that prohibition and grants permission to enter the property despite such posting.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
Digitally signed by Corey McGrath Date: 2025.02.19 14:08:48 -05'00'	2/19/25	Madison M. Sullivan Digitally signed by Madison M. Sullivan DN: C=US, E=msullivan@gill-eng.com, O=Gill Engineering, CN=Madison M. Sullivan Date: 2025.02.13 11:27:03-05'00'	

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Instructions for Preparing a
Department of the Army
General Permit (GP) Self-Verification

Blocks 1 through 3. To be completed by the Corps of Engineers.

Block 4. Applicant' Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the self-verification, please attach a sheet of paper with the necessary information marked Block 4.

Block 5. Address of Applicant. Please provide the full address of the party or parties responsible for the self-verification. If more space is needed, attach an extra sheet of paper marked Block 5.

Block 6. Applicant Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 7 through 9. To be completed, if you choose to have an agent.

Block 7. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 8 and 9. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where they can be reached during normal business hours.

Block 10. Proposed General Permit Activity Name or Title. Please provide a name identifying the proposed GP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 11. File Number(s) of Previous USACE Actions on the Site Please provide any known USACE file number. If the activity does not have a known USACE file number, you may state N/A.

Block 12. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the GP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 13. Proposed Activity Coordinates. Please enter the latitude and longitude of where the proposed GP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 13.

Block 14. Proposed Activity Street Address. If the proposed activity is located at a site having a street address (not a box number), enter it in Block 14.

Block 15. General Permit Activity Type. Please select all GP activity types that apply to the proposed activity. A list of GP activity types can be found in Section III of the GP.

Block 16. Summary of Project Impacts. Please provide ALL proposed impacts, both temporary and permanent in duration, that are located in Waters of the United States. The area of impact shall be provided in square feet (SF). When applicable, impacts that result in conversion of stream bank or shoreline must also be identified in linear feet (LF). Dredging or the discharge of dredged or fill material shall also include the volume, cubic yards (CY), of material removed from or placed into Waters of the U.S. If more entries are required, please attach a table matching the desired format in Block 16.

Block 17. Project Plans. Please verify that items a-g are included in the project plans. Three types of illustrations are necessary to properly depict the proposed work. These illustrations or drawings are identified as a Vicinity Map, a Plan View (Aerial view) and a Cross Section Map. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings (longitudinal profile) should also be included. Plans must accurately depict the existing conditions and all aspects of the proposed activity located in waters of the U.S. Please submit one copy of all drawings formatted to print on 8½ x 11 inch or 11 x 17 inch plain white paper. Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross section). While illustrations need not be certified engineering sheets; they should be clear, accurate, contain all necessary information, and depict all proposed work. Each submission must also include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by USACE.

Block 18. Avoidance & Minimization. Please verify that items a-d have been implemented for the proposed activity.

Block 19. Due Diligence. Please complete all the fields and submit documentation to USACE to demonstrate compliance with the above requirements. This Documentation may include emails, letters, meeting notes, phone call log, project narrative, project plans, a species list from the NOAA Section 7 Mapper, a completed copy of the IPAC determination keys, etc. Documentation should be limited to what is necessary to demonstrate how the proposed activity meets each requirement. Refer to the MA GP, Appendix A, for specific guidance on the identification of previously identified historic properties and previously unidentified historic properties. Endangered Species: *The applicant must be designated as the non-federal representative for the purposes of Section 7 consultation to select the Rangewide D-Key options. Otherwise, the applicant shall select the following option when IPAC indicates the NLEB is present: "The activity IS located within the NLEB Species Range (PCN Required)."

Block 20. Aquaculture Activities. Please verify that items a-d have been obtained or completed prior to commencing work in waters of the U.S.

Block 21. Additional Information/Attachments. Please verify that items a-d have been completed prior to commencing work in waters of the U.S.

Block 22. Lead Federal Agency. Please identify if there is another lead federal agency involved with the proposed activity. Enter the lead federal agency name (e.g., the Federal Emergency Management Agency, FEMA) and the agency's designated person of contact for the activity.

Block 23. Statement of Authorization. The applicant shall sign this section for all activities. If an agent is to be employed, the agent shall sign this section.

Block 24. Signatures. The SVN must be signed by the person proposing to undertake the GP activity, and if applicable, the authorized party (agent) that prepared the SVN. The signature of the person proposing to undertake the GP activity shall be an affirmation that the party submitting the SVN possesses the requisite property rights to undertake the GP activity.

Attachment A – Project Plans

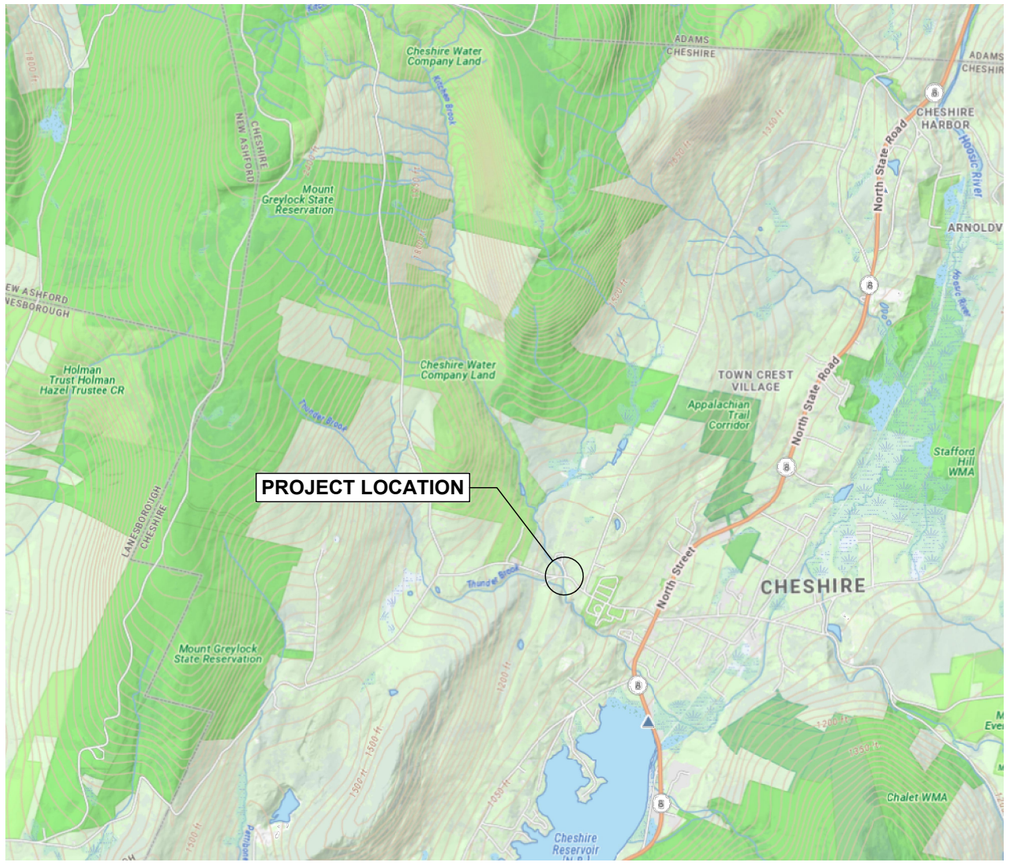
TOWN OF CHESHIRE

WEST MOUNTAIN ROAD OVER KITCHEN BROOK
C-10-024

IN THE TOWN OF

CHESHIRE, MA
BERKSHIRE COUNTY

ENVIRONMENTAL PERMITTING PLANS



LIST OF RESOURCE ABBREVIATIONS

BVW = BORERING VEGETATED WETLANDS

LUWW = LAND UNDER WATERBODIES AND WATERWAYS

RFA = RIVER FRONT AREA

BLSF = BORDERING LAND SUBJECT TO FLOODING

ILSF = ISOLATED LAND SUBJECT TO FLOODING

OHW = ORDINARY HIGH WATER

RESOURCE IMPACTS:

BANKS (TEMPORARY) = 113 LF
BANKS (PERMANENT) = 0 LF

LUWW (TEMPORARY) = 570 SF
LUWW (PERMANENT) = 138 SF
LAND DREDGED = 0 CF

BVW (TEMPORARY) = 0 SF
BVW (PERMANENT) = 0 SF

RFA (TEMPORARY) = 1,112 SF
RFA (PERMANENT) = 429 SF

BLSF (TEMPORARY) = 102 SF
BLSF (PERMANENT) = 42 SF

ILSF (TEMPORARY) = 0 SF
ILSF (PERMANENT) = 0 SF

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

TITLE SHEET

SHEET 1 OF 9

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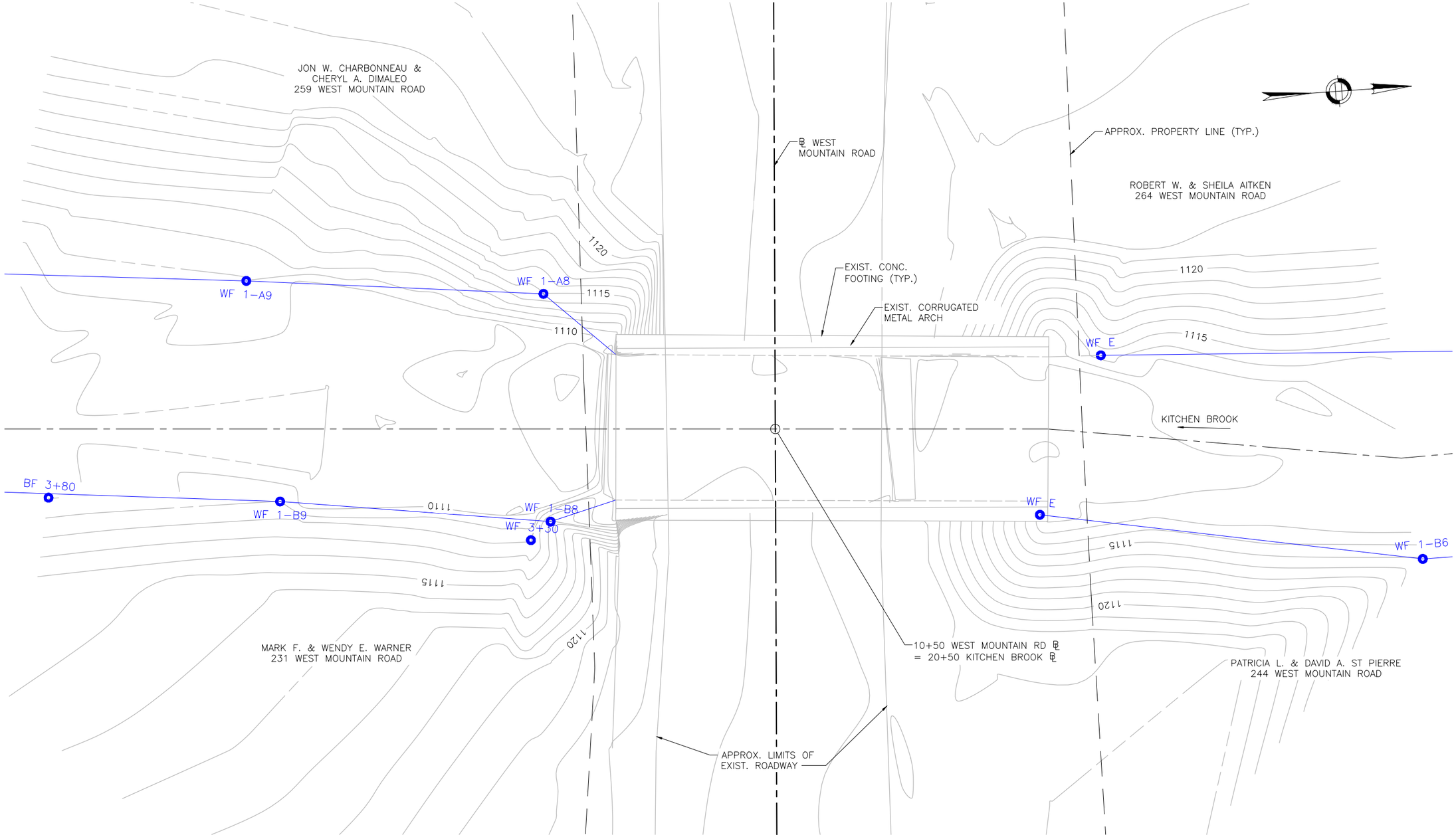

EXISTING CONDITIONS PLAN

0 5 10 15

SCALE: 1" = 5'

C10024 Permit Plans.dwg Plotted on 4-Feb-2025 12:11 PM

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

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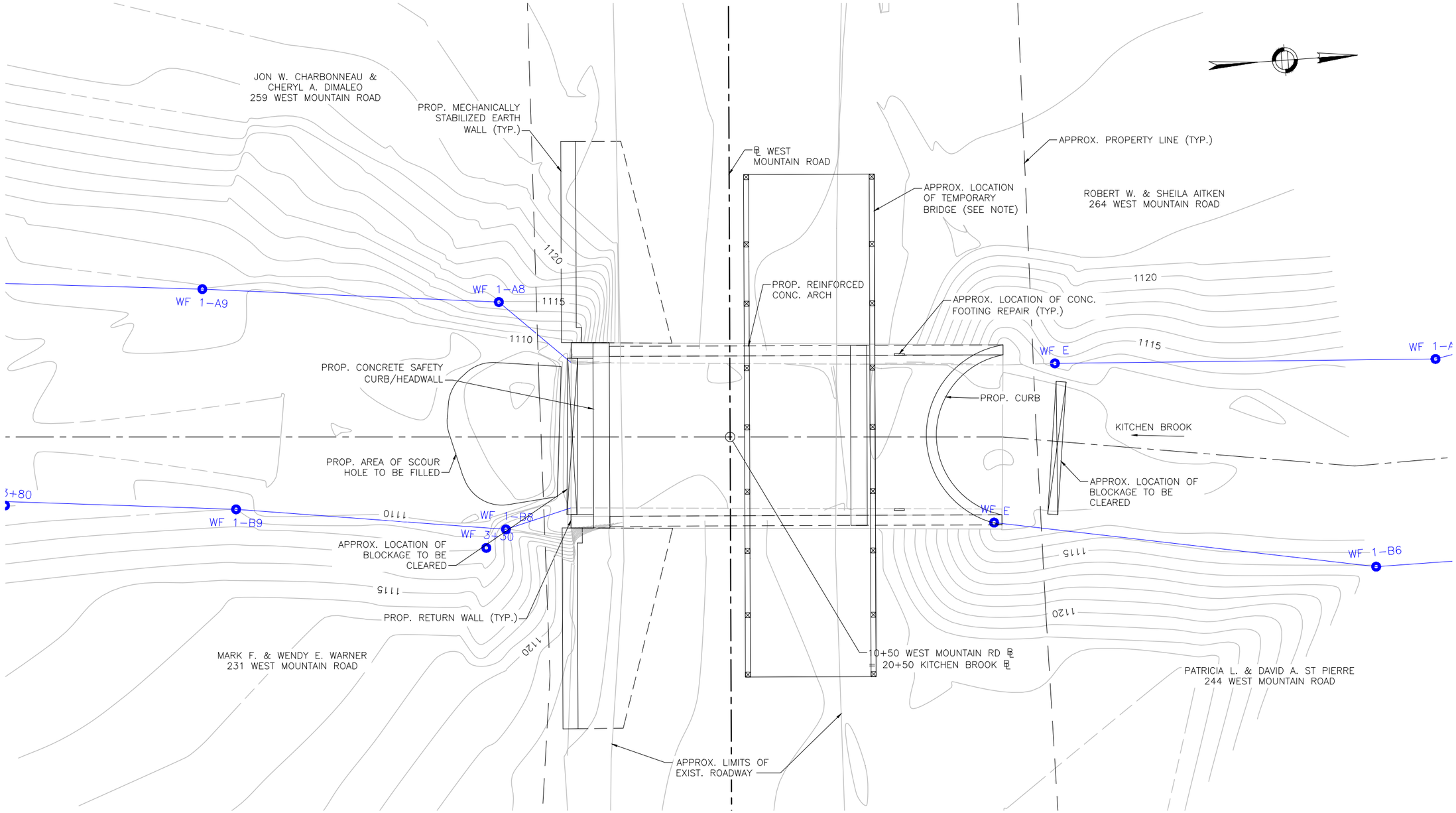
EXISTING CONDITIONS



PROPOSED CONDITIONS PLAN

0 5 10 15

SCALE: 1" = 5'

NOTE: TEMPORARY BRIDGE IS WITHIN PERMANENT CONSTRUCTION LIMITS AND SHALL HAVE NO ADDITIONAL ENVIRONMENTAL IMPACTS

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

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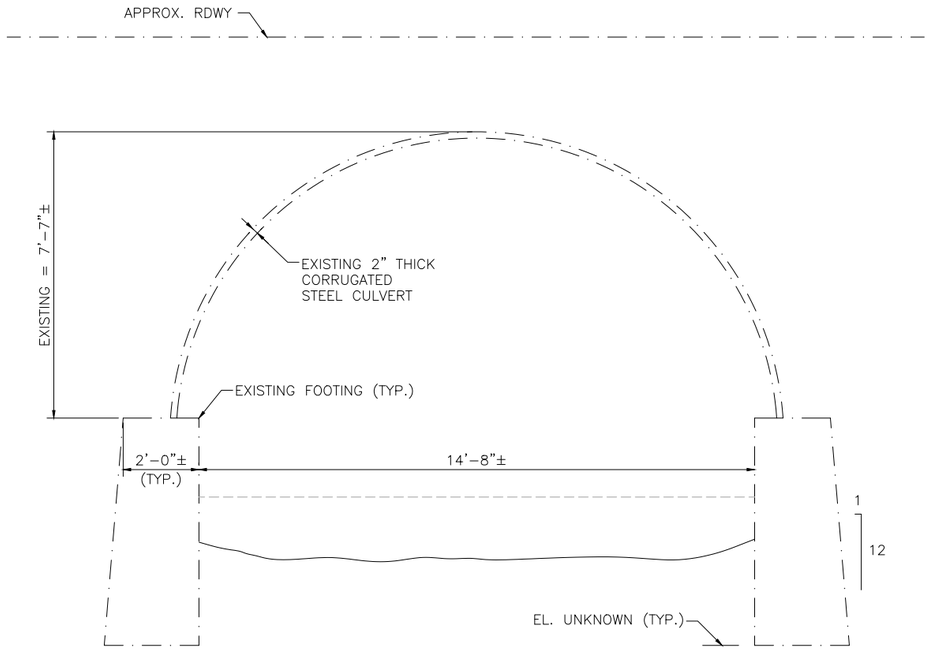
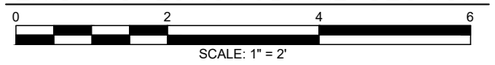
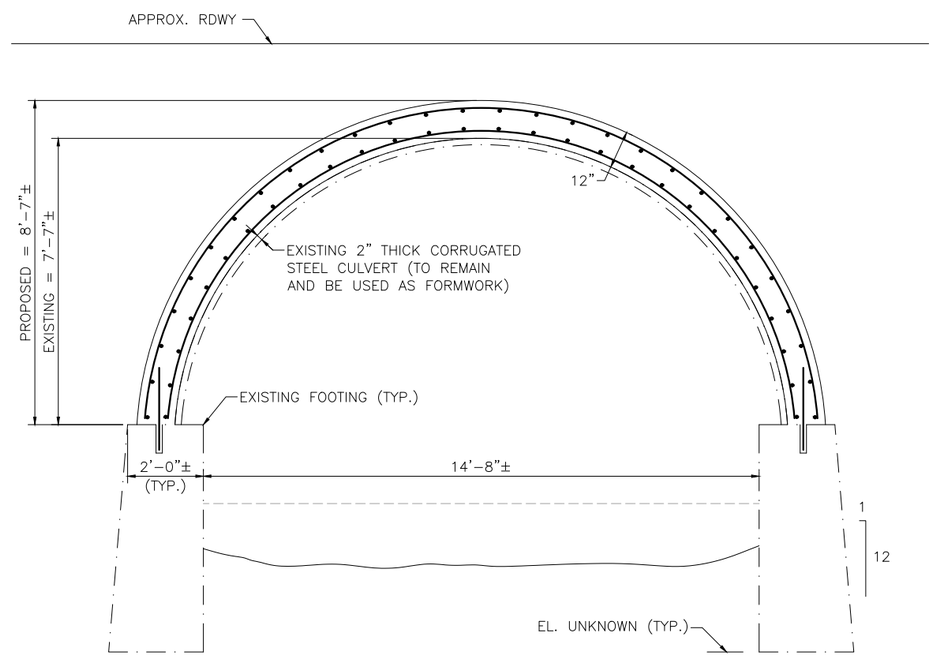
PROPOSED CONDITIONS

SHEET 3 OF 10

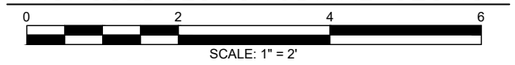


EXISTING LONGITUDINAL SECTION





PROPOSED LONGITUDINAL SECTION



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CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

LONGITUDINAL SECTIONS

SHEET 4 OF 10

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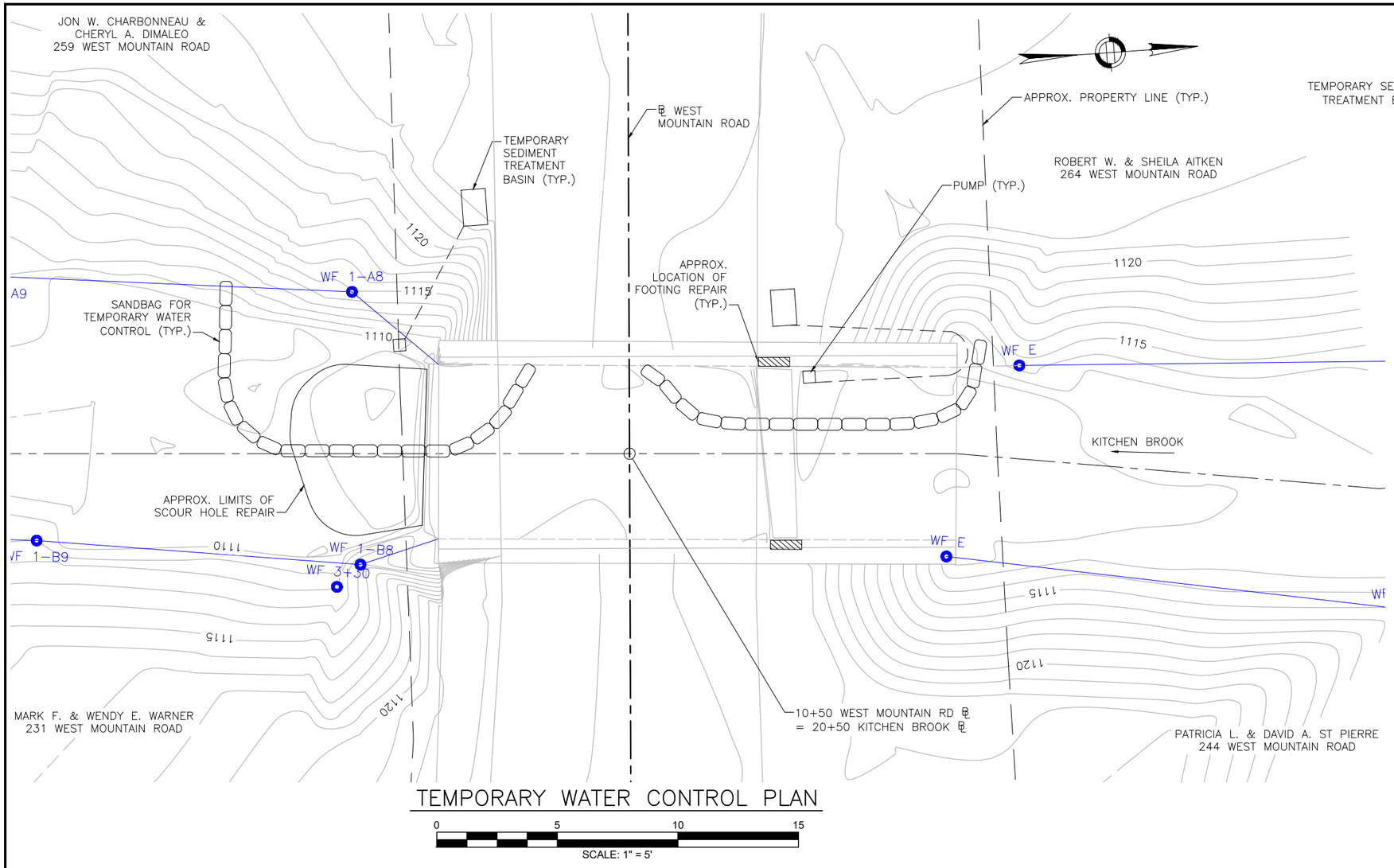
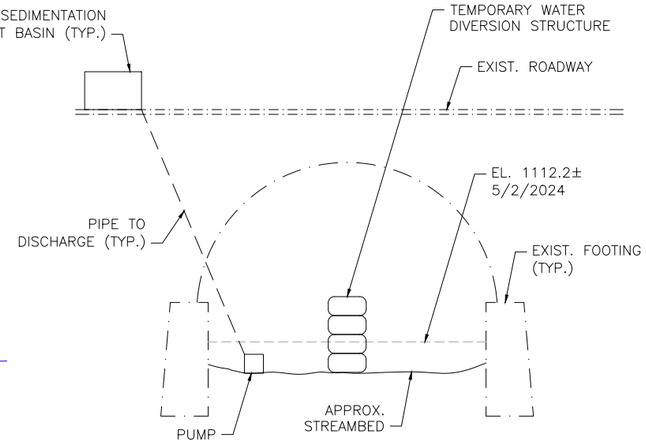


TEMPORARY WATER CONTROL PLAN

0 5 10 15

SCALE: 1" = 5'



DEWATERING ELEVATION

0 4 8 12

SCALE: 1" = 4'

TEMPORARY WATER CONTROL NOTES:

1. TEMPORARY WATER CONTROL SHALL BE ESTABLISHED TO PERMIT THE CONCRETE FOOTING REPAIRS, SCOUR HOLE REPAIR, AND WINGWALL CONSTRUCTION TO BE PERFORMED IN THE DRY.
2. THE TEMPORARY WATER CONTROL PLAN AND DEWATERING ELEVATION SHOWN ARE CONCEPTUAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD A PROPOSED WATER DIVERSION AND DEWATERING PLAN FOR APPROVAL PRIOR TO CONSTRUCTION.
3. THE PLAN AND ELEVATION SHOWN IN FOR WORK ON THE WEST HALF OF THE STREAM. ONCE WORK IS COMPLETED ON THE WEST SIDE OF THE STREAM THE DIVERSION SHALL BE RESTAGED TO COMPLETE WORK ON THE EAST SIDE OF THE STREAM.
4. ALL DEWATERING AND RELATED EARTHWORK SHALL BE CONDUCTED IN SUCH A MANNER AS TO PREVENT SILTATION OR CONTAMINATION OF THE WATERWAY. THE PUMPING DISCHARGE SHALL BE PUMPED TO A SETTLING BASIN BEFORE BEING DISCHARGED INTO THE WATERWAY.

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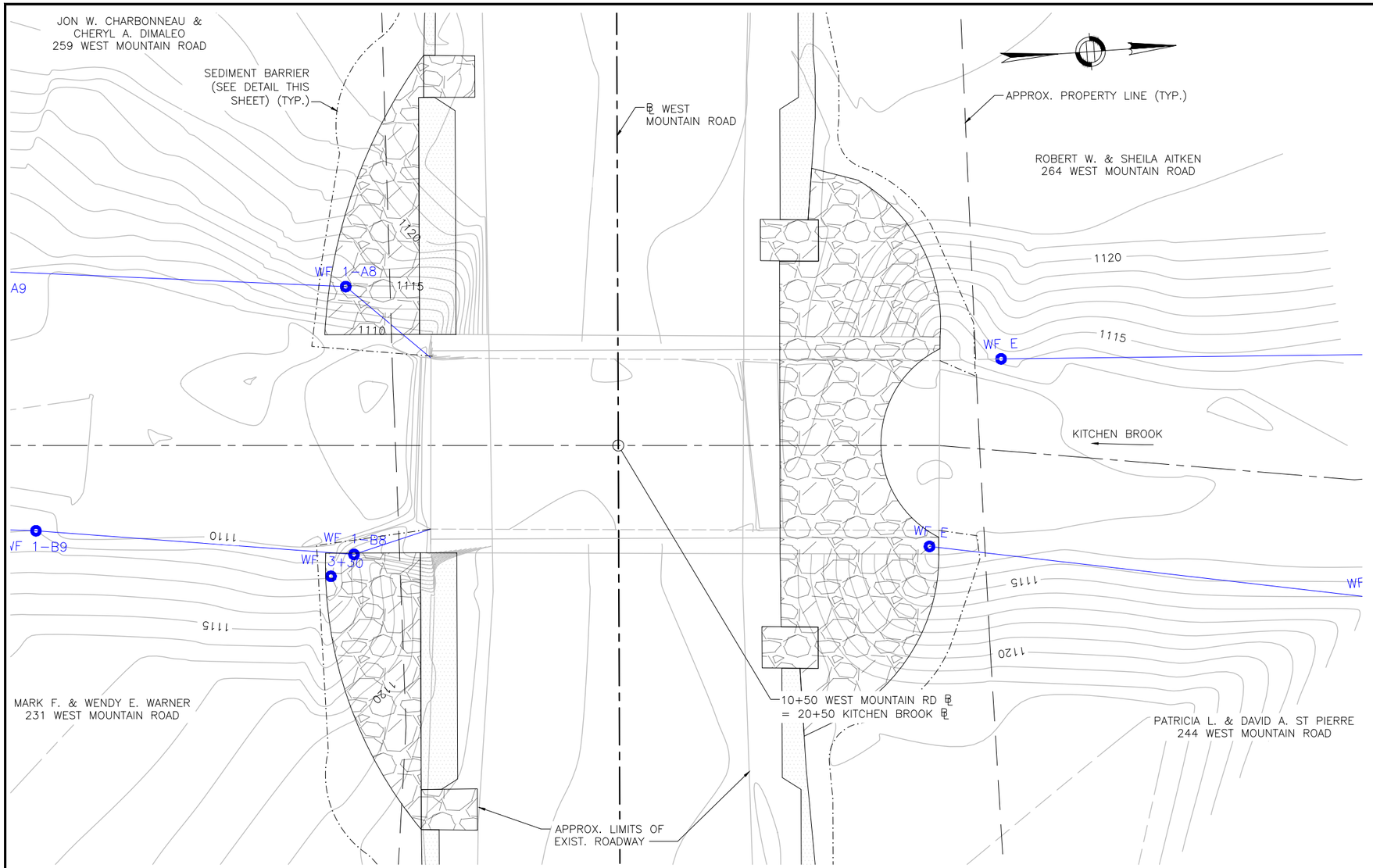


EROSION CONTROL AND REVEGETATION PLAN

0 5 10 15

SCALE: 1" = 5'

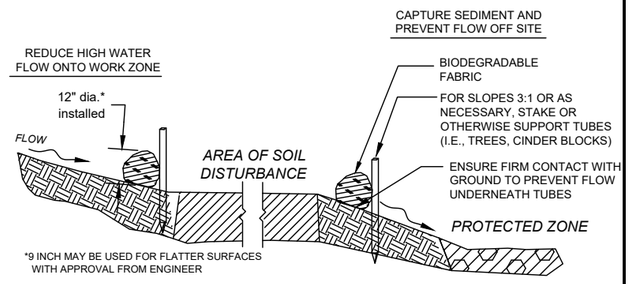
LEGEND:

= MODIFIED ROCK FILL

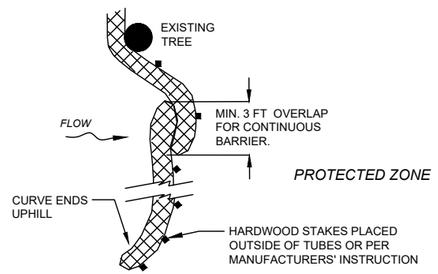
= COMPOST BLANKET AND SEED

EROSION CONTROL AND REVEGETATION NOTES:

1. THE SEDIMENT CONTROL BARRIERS SHALL BE INSTALLED IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS AND AS REQUIRED SO THAT NO EXCAVATED OR DISTURBED SOIL CAN ENTER MITIGATION AREAS, ADJACENT WETLANDS OR WATERWAYS. THE CONTRACTOR SHALL ENSURE THAT THE SEDIMENT CONTROL BARRIER ADEQUATELY CONTROLS SILTATION AND RUNOFF. NO WORK SHALL TAKE PLACE OUTSIDE THE BARRIERS.
2. THE PROPOSED AREA OF COMPOST AND SEEDING SHALL CONSIST OF A $\frac{1}{2}$"–1" THIN MULCH BLANKET OVER PREPARED SOIL TO PROVIDE TEMPORARY SOIL STABILIZATION AND ORGANIC MATTER FOR PLANT GROWTH. GRASS SEED SHALL BE BROADCAST IN CONJUNCTION WITH THE COMPOST BLANKET.



SECTION



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLAN VIEW

SEDIMENT BARRIER – COMPOST FILTER TUBE

NOT TO SCALE

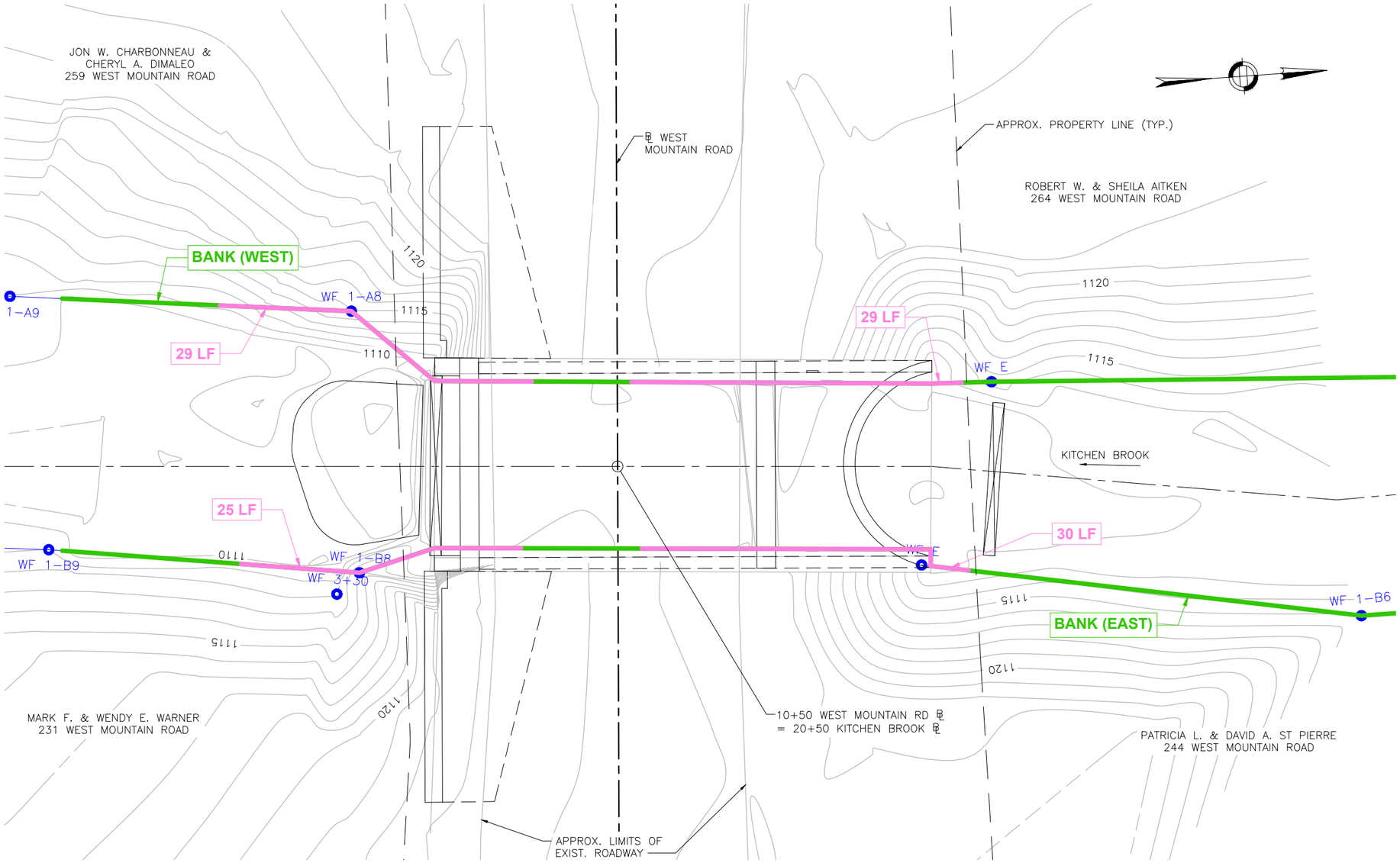
GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

Gill Engineering Associates, Inc. 63 Kendrick Street Needham, MA 02494 781-355-7100 www.gill-eng.com

EROSION CONTROL AND REVEGETATION DETAILS



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

BANK IMPACTS

PERMANENT: 0 LF

TEMPORARY: 113 LF

LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

BANK IMPACT PLAN

SHEET 7 OF 10

Gill Engineering Associates, Inc. 63 Kendrick Street Needham, MA 02494 781-355-7100 www.gill-eng.com

LAND UNDER WATERWAYS AND WATERBODIES (LUWW) IMPACTS

PERMANENT: 138 SF

TEMPORARY: 570 SF

LAND DREDGED: 0 CF

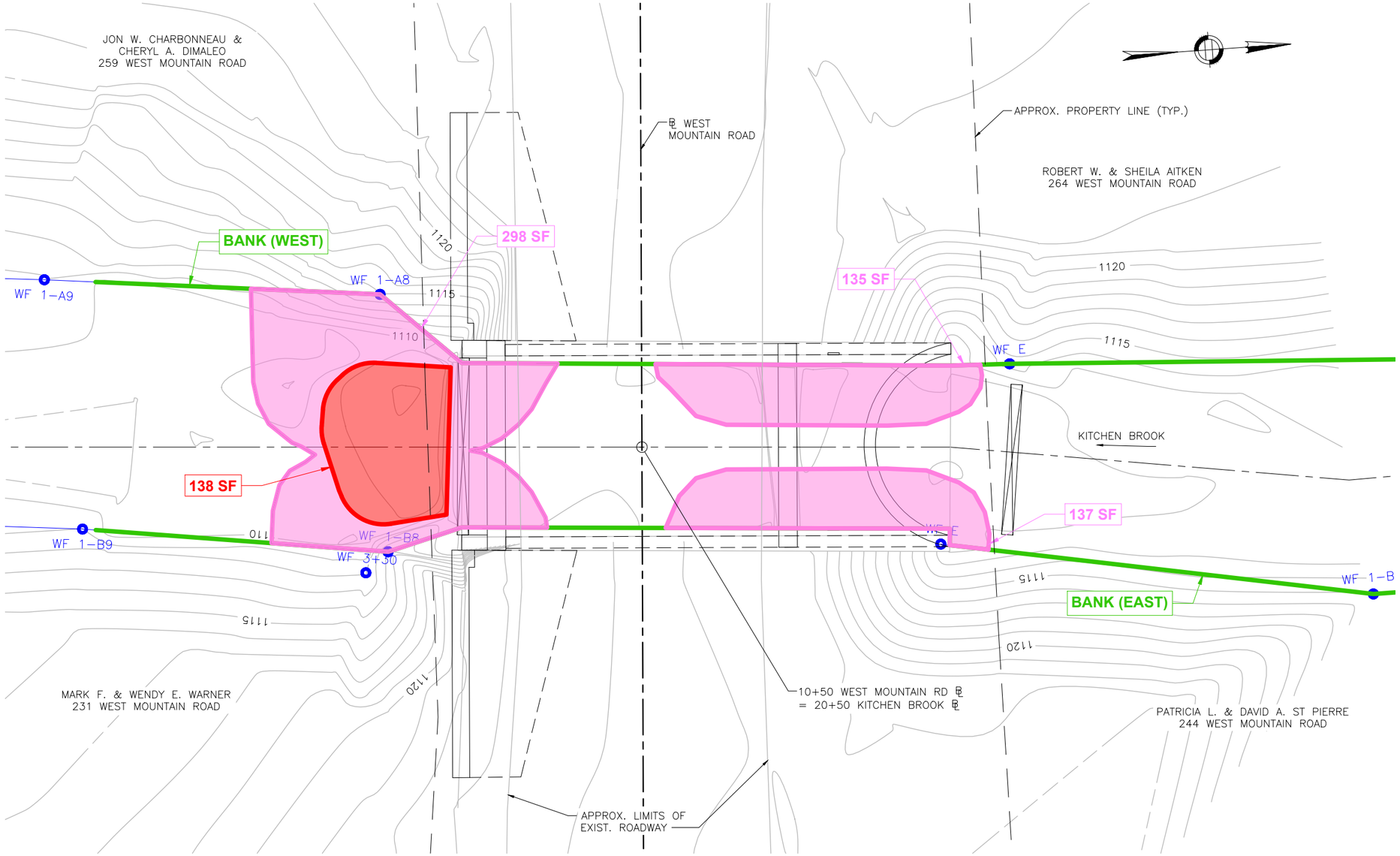
LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

LUWW IMPACT PLAN

SHEET 8 OF 10

Gill Engineering Associates, Inc. 63 Kendrick Street Needham, MA 02494 781-355-7100 www.gill-eng.com

RIVERFRONT AREA IMPACTS

PERMANENT: 429 SF

TEMPORARY: 1,112 SF

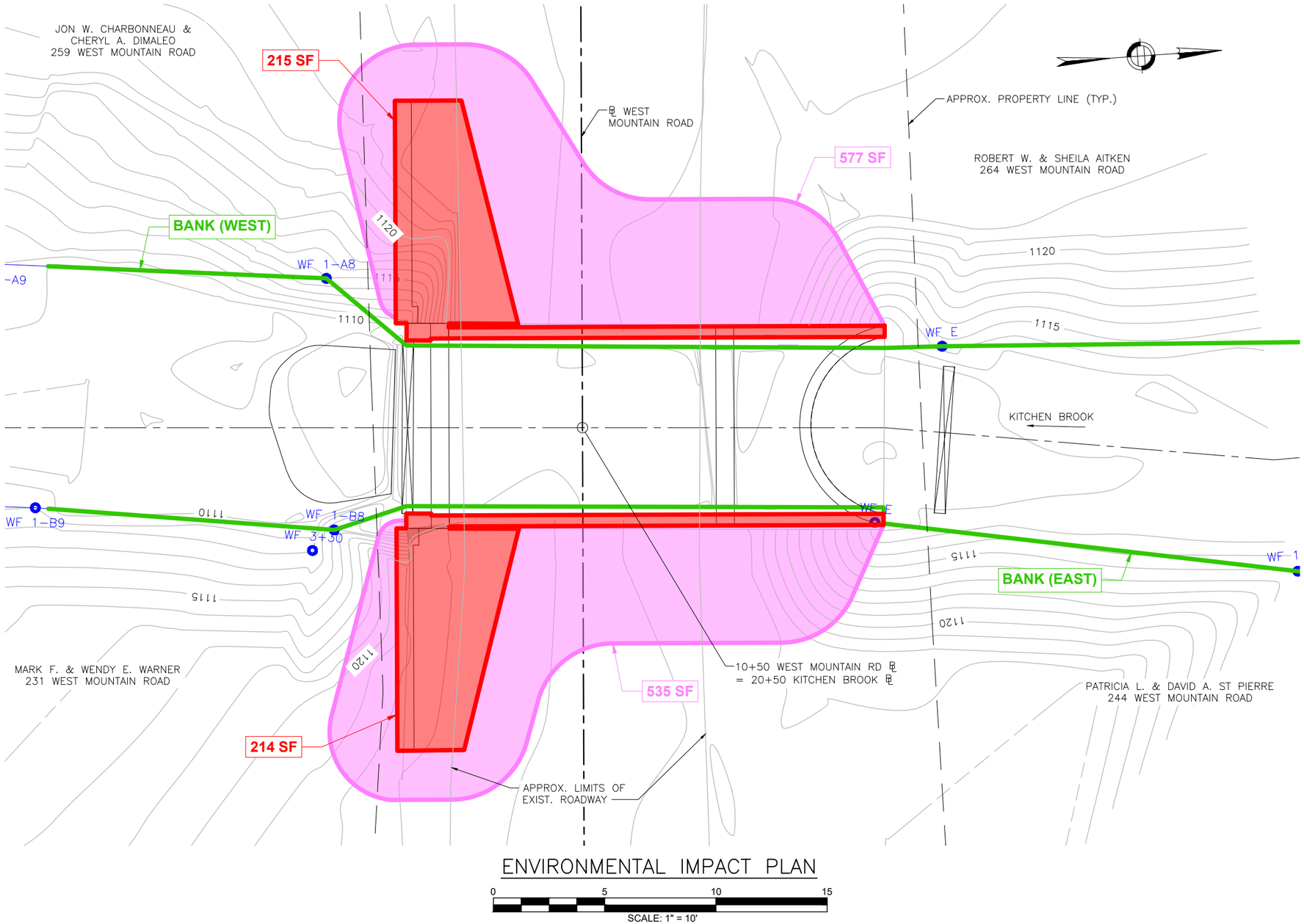
LEGEND

EXISTING BANK:

EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 10'

C10024 Permit Plans.dwg Plotted on 4-Feb-2025 12:24 PM

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

RIVERFRONT AREA IMPACT PLAN

SHEET 9 OF 10

Gill Engineering Associates, Inc. 63 Kendrick Street Needham, MA 02494 781-355-7100 www.gill-eng.com

BORDERING LAND SUBJECT TO FLOODING IMPACTS

PERMANENT: 42 SF

TEMPORARY: 102 SF

LEGEND

EXISTING BANK:

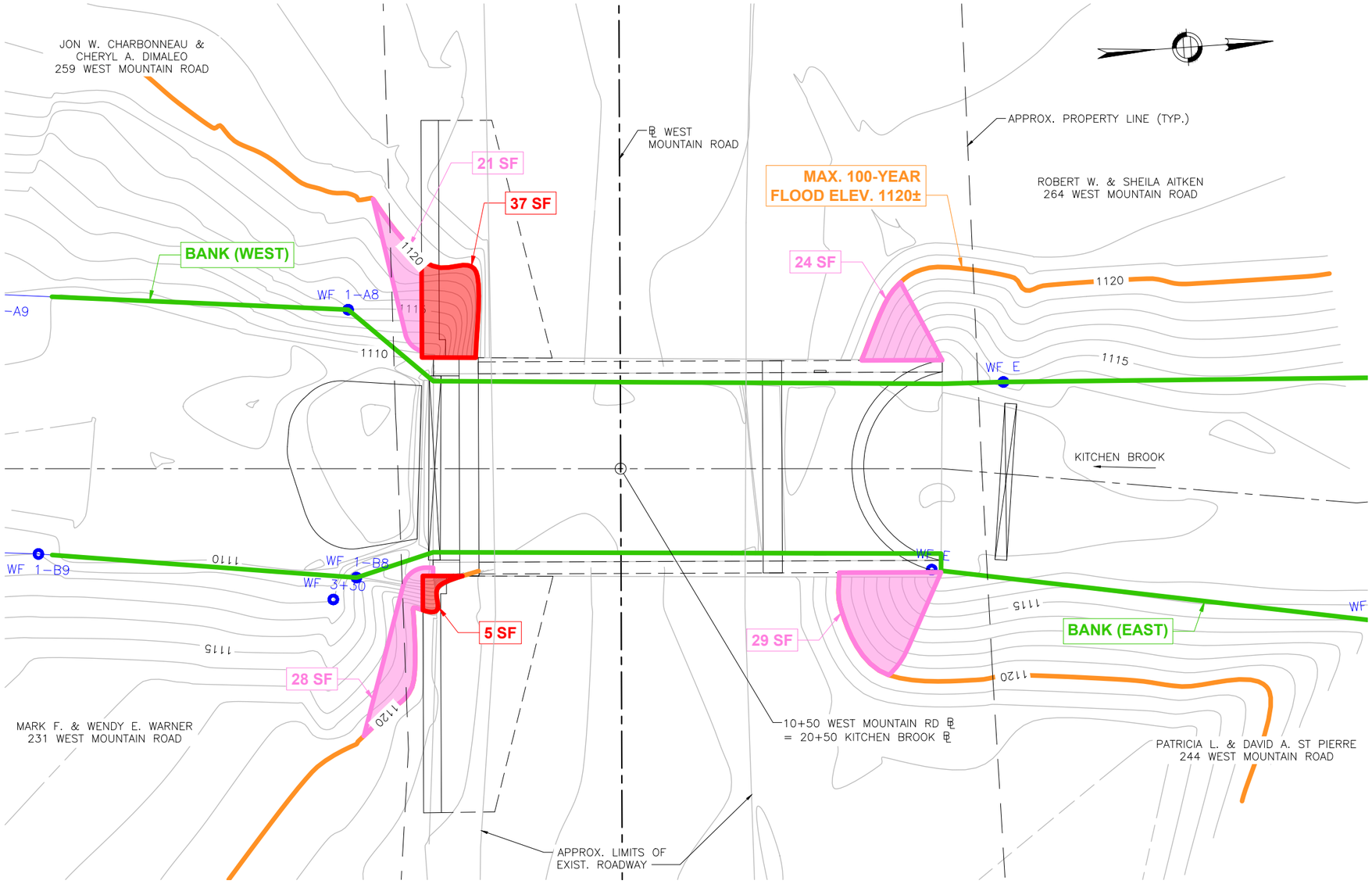
EXISTING WETLAND:

PERMANENT IMPACT:

TEMPORARY IMPACT:

100-YR FLOOD ELEVATION:

NOTE: 100-YEAR FLOOD ELEVATION SHOWN ON THESE PLANS IS BASED ON HYDRAULIC OUTPUT RESULTS FROM A HYDRAULIC STUDY FOR THE EXISTING CULVERT DONE BY GILL ENGINEERING.



ENVIRONMENTAL IMPACT PLAN

0 5 10 15

SCALE: 1" = 5'

GILL ENGINEERING

CULVERT STRENGTHENING – PERMIT PLANS
TOWN OF CHESHIRE

CULVERT STRENGTHENING OF WEST MOUNTAIN ROAD OVER KITCHEN BROOK

BLSF IMPACT PLAN

SHEET 10 OF 10

Gill Engineering Associates, Inc. 63 Kendrick Street Needham, MA 02494 781-355-7100 www.gill-eng.com

Attachment B – Project Narrative

Overview

The purpose of this project is to strengthen a structurally deteriorating corrugated metal pipe culvert. The project is located between 259 and 264 West Mountain Road in the town of Cheshire, MA. The structure spans over Kitchen Brook, a perennial stream that originates several miles north on the Mount Greylock State Reservation. The strengthening shall consist of a reinforced concrete arch formed over the existing arch and placed on the existing concrete abutments.

Site Description

West Mountain Road is oriented west-to-east and provides 2 lanes of traffic. It is classified as a Rural Local Road with an average daily traffic of 350 as of 2020. The surrounding area consists of residential homes with some trees and vegetation. At the project site, Kitchen brook is lain with sandy soil and cobblestones. The slopes upstream and downstream of the bridge contain debris and are overgrown with low lying heavy vegetation. The stream site drainage area mostly consists of forest and grassland with some residential development.

Local Geology

According to the USGS map of the area, the site geology contains a mix of sand, some silt, some clay with pebbles, cobble, boulder clasts, and some large surface boulders. The area has shallow bedrock with till generally less than 10 to feet 15 feet thick. See Attachment C for the map.

Existing Structure

The existing 18'-2½" diameter corrugated steel pipe culvert extends a length of 42'-5" and was originally constructed in 1970. The out-to-out width of the roadway is 34'-8¼" with varying slope and concrete headwalls on either side. The existing corrugated steel pipe is supported by concrete footings. The existing structure is beginning to show signs of deterioration, including loss of section to the culvert, and failing headwalls.

Proposed Structure

The proposed structure consists of the existing concrete footings with a reinforced concrete arch placed over the existing corrugated steel pipe arch with concrete headwalls and mechanically stabilized earth wingwalls along the South side of the road. Repairs will be made on the existing concrete footings in (2) locations and a scour hole on the downstream side of the culvert will be filled with natural stream channel material. Gravel borrow will be placed over the concrete arch and overlain with an HMA wearing surface that matches the approaches. Plans for the proposed structure can be found in Attachment D.

Construction Sequence

A sediment control barrier shall be placed around the perimeter of the work zone prior to the start of construction. In order to complete this project without closing the roadway, a temporary bridge and staged construction will be utilized in order to maintain a single lane of alternating traffic for the duration of construction. During the first stage of construction, a single alternating traffic lane will be maintained on the south side of the road while a temporary bridge is installed on the north side of the road. During Stage 2 of construction, traffic will be shifted on to the temporary bridge and the existing roadway will be excavated down to the existing culvert. The proposed reinforced concrete arch will then be cast over the existing pipe, the South headwall shall be constructed and a portion of the backfill and HMA wearing surface installed so that one lane of traffic can be opened. During Stage 3 of construction the temporary bridge shall be removed, the North headwall shall be constructed and the remaining portion of the backfill and HMA wearing surface shall be installed.

Temporary Water Control

Temporary water control shall be established to permit the concrete footing repairs, scour hole repair, and wingwall construction to be performed in the dry. Once construction is complete the temporary water control system will be removed. All dewatering and related earthworks shall be constructed in such a manner as to prevent siltation or contamination of the waterway. The pumping discharge shall be pumped to a settling basin before discharged into the waterway.

Revegetation

Where possible, a compost blanket with seeding is proposed on the area of disturbed ground. This area shall consist of a ½"-1" thin mulch blanket over prepared soil to provide temporary soil stabilization and organic matter for plant growth. Grass seed shall be broadcast in conjunction with the compost blanket.

Environmental Impacts

Banks:

The temporary water control system will have no permanent impact on the banks and will only temporarily direct water away from areas with required construction.

Land Under Waterbodies and Waterways:

The scour hole repair on the downstream side of the bridge will be a permanent impact to the land under Kitchen Brook. However, the proposed repair will fill in the scour hole with natural streambed material that matches the material upstream and downstream of the scour hole. The repair will provide continuity of the streambed and will have a positive impact on the stream. The remaining areas that will be sectioned off for temporary water control will be temporarily impacted but once construction is completed, natural stream flow will be restored and the areas shall remain unchanged.

Riverfront Area:

Since the riverfront area exceeds the project limits, all project limits adjacent to the stream are considered to be within the riverfront area. Permanent impacts to the riverfront area are considered to be where the 12" proposed concrete arch will be placed and the limits of the mechanically stabilized earth retaining walls on the south side of the bridge. Both areas of new construction will have minimal impacts to the surrounding environment. The remainder of the project limits in the riverfront area consist of area that will be excavated and backfilled to permit construction and should be restored to relatively similar conditions as it was prior to construction.

Bordering Land Subject to Flooding:

The 100-year flood elevation shown on the plan was obtained from a hydraulic analysis performed by Gill Engineering Inc. and is the maximum for the project area, upstream and downstream of the bridge. The project limits that overlap with the flood plain are limited to the corners of the proposed structure and do not raise any flood concerns.

Attachment C – Response from MHC

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Culvert Strengthening of C-10-024 West Mountain Road over Kitchen Brook

Location / Address: West Mountain Road

City / Town: Cheshire

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

RC.76160
1/28/25

Joshua Dorin Date
Preservation Planner
Massachusetts Historical Commission

Project Proponent

Name: Madison Sullivan

Address: 63 Kendrick St

City/Town/Zip/Telephone: Needham, MA 02494 781-355-7100

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Massachusetts Department of Transportation	Municipal Small Bridge Program

Project Description (narrative):
The scope of work is to strengthen the existing culvert by casting a reinforced concrete arch over the existing corrugated metal pipe arch and to make repairs to the existing concrete footings. Constrictions to the stream channel will also be cleared and mechanically stabilize earth walls will be installed on the South side of the roadway. See Attachment A for more details.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.
The project scope does not include demolition of any existing buildings. The only demolition required for this project is of the existing guardrails and the existing stone retaining walls on the South side of the roadway.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.
The project scope does not include rehabilitation of any existing buildings but does include the rehabilitation of the existing culvert.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).
The project scope does include the construction of a reinforced concrete arch placed over the existing metal arch and the construction of concrete headwalls and mechanically stabilized earth retaining walls.

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

There are no known historic or archaeological properties known to exist within the project area.

What is the total acreage of the project area?

Woodland	.03 acres	Productive Resources:	
Wetland	acres	Agriculture	acres
Floodplain	acres	Forestry	acres
Open space	acres	Mining/Extraction	acres
Developed	.03 acres	Total Project Acreage	acres

What is the acreage of the proposed new construction? .06 acres

What is the present land use of the project area?

The project limits are on a local road in a rural area. The surrounding area consists of some residential are and some forested area.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

See Attachment C.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: _____ Date: 1/7/2025

1/7/2025

Name: Madison Sullivan

Address: 63 Kendrick Street

City/Town/Zip: Needham, MA 02494

Telephone: 781-355-7100

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

Attachment D – Project Notification email to BUAR

Madison Sullivan <msullivan@gill-eng.com>

Project Notification Form for Culvert Strengthening on West Mountain Road over Kitchen Brook

1 message

Madison Sullivan <msullivan@gill-eng.com> Tue, Jan 7, 2025 at 4:11 PM
To: david.s.robinson@mass.gov
Cc: John Phelps <jphelps@gill-eng.com>, cenae-r@usace.army.mil

Dear Regulatory Review,

I hope this email finds you well.

The Town of Cheshire is proposing to strengthen the culvert on West Mountain Road that crosses over the Kitchen Brook in the Town of Cheshire, Massachusetts. We respectfully request your review of the proposed project to determine any impacts to historic properties and cultural resources. Please find a completed Project Notification Form with plans of the proposed work attached.

Please send responses to this notification directly to the USACE via email: cenae-r-ma@usace.army.mil or address mail responses to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

Please feel free to contact me with any questions you may have.

Best,
Madison Sullivan

--
Madison Sullivan
Assistant Engineer | Gill Engineering
63 Kendrick Street | Needham, MA 02494

West Mountain Road over Kitchen Brook Project Notification Form - Copy.pdf
8901K

Attachment E –Project Notification email to Wampanoag Tribe of Gay Head THPO

Madison Sullivan <msullivan@gill-eng.com>

Project Notification Form for Culvert Strengthening on West Mountain Road over Kitchen Brook

1 message

Madison Sullivan <msullivan@gill-eng.com> Tue, Jan 7, 2025 at 4:13 PM
To: thpo@wampanoagtribe-nsn.gov
Cc: John Phelps <jphelps@gill-eng.com>, cenae-r@usace.army.mil

Dear Regulatory Review,

I hope this email finds you well.

The Town of Cheshire is proposing to strengthen the culvert on West Mountain Road that crosses over the Kitchen Brook in the Town of Cheshire, Massachusetts. We respectfully request your review of the proposed project to determine any impacts to historic properties and cultural resources. Please find a completed Project Notification Form with plans of the proposed work attached.

Please send responses to this notification directly to the USACE via email: cenae-r-ma@usace.army.mil or address mail responses to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

Please feel free to contact me with any questions you may have.

Best,
Madison Sullivan

--
Madison Sullivan
Assistant Engineer | Gill Engineering
63 Kendrick Street | Needham, MA 02494

West Mountain Road over Kitchen Brook Project Notification Form - Copy.pdf
8901K

Attachment F– Project Notification email to Mashpee Wampanoag Tribe THPO

Madison Sullivan <msullivan@gill-eng.com>

Project Notification Form for Culvert Strengthening on West Mountain Road over Kitchen Brook

1 message

Madison Sullivan <msullivan@gill-eng.com> Tue, Jan 7, 2025 at 4:14 PM
To: 106review@mwtribe-nsn.gov
Cc: John Phelps <jphelps@gill-eng.com>, cenae-r@usace.army.mil

Dear Regulatory Review,

I hope this email finds you well.

The Town of Cheshire is proposing to strengthen the culvert on West Mountain Road that crosses over the Kitchen Brook in the Town of Cheshire, Massachusetts. We respectfully request your review of the proposed project to determine any impacts to historic properties and cultural resources. Please find a completed Project Notification Form with plans of the proposed work attached.

Please send responses to this notification directly to the USACE via email: cenae-r-ma@usace.army.mil or address mail responses to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

Please feel free to contact me with any questions you may have.

Best,
Madison Sullivan

--
Madison Sullivan
Assistant Engineer | Gill Engineering
63 Kendrick Street | Needham, MA 02494

West Mountain Road over Kitchen Brook Project Notification Form - Copy.pdf
8901K

Attachment G – Project Notification email and response from Stockbridge-Munsee Community Band of Mohican Indians THPO

Madison Sullivan <msullivan@gill-eng.com>

Project Notification Form for Culvert Strengthening on West Mountain Road over Kitchen Brook

8 messages

Madison Sullivan <msullivan@gill-eng.com> Tue, Jan 7, 2025 at 4:15 PM
To: thpo@mohican-nsn.gov
Cc: John Phelps <jphelps@gill-eng.com>, cenae-r@usace.army.mil

Dear Regulatory Review,

I hope this email finds you well.

The Town of Cheshire is proposing to strengthen the culvert on West Mountain Road that crosses over the Kitchen Brook in the Town of Cheshire, Massachusetts. We respectfully request your review of the proposed project to determine any impacts to historic properties and cultural resources. Please find a completed Project Notification Form with plans of the proposed work attached.

Please send responses to this notification directly to the USACE via email: cenae-r-ma@usace.army.mil or address mail responses to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

Please feel free to contact me with any questions you may have.

Best,
Madison Sullivan

--
Madison Sullivan
Assistant Engineer | Gill Engineering
63 Kendrick Street | Needham, MA 02494

West Mountain Road over Kitchen Brook Project Notification Form - Copy.pdf
8901K

thpo <thpo@mohican-nsn.gov> Tue, Jan 7, 2025 at 4:33 PM
To: "msullivan@gill-eng.com" <msullivan@gill-eng.com>

Your message

To: thpo
Subject: Project Notification Form for Culvert Strengthening on West Mountain Road over Kitchen Brook
Sent: Tuesday, January 7, 2025 4:15:58 PM (UTC-05:00) Eastern Time (US & Canada)

was read on Tuesday, January 7, 2025 4:32:36 PM (UTC-05:00) Eastern Time (US & Canada).

thpo <thpo@mohican-nsn.gov> Wed, Jan 8, 2025 at 2:11 PM
To: "cenae-r@usace.army.mil" <cenae-r@usace.army.mil>
Cc: John Phelps <jphelps@gill-eng.com>, Madison Sullivan <msullivan@gill-eng.com>

Thank you for the notice regarding the proposed Culvert Strengthening on West Mountain Road over Kitchen Brook Project, Cheshire, Berkshire County, MA.

The Stockbridge-Munsee Tribal Historic Preservation Office has no issue with the project moving forward with the following standard stipulations:

- If previously undocumented archaeological resources are encountered, please contact me promptly and follow the Inadvertent Discovery Policy on the Stockbridge-Munsee Community website: https://www.mohican.com/mt-content/uploads/2022/09/smc-inadvertent-discovery-policy.pdf.
- Please give due attention to the incidental or routine movement of heavy machinery both inside and outside the stated area of potential effects (APE) that may cause unintended or inadvertent impacts to cultural resources.
- Should the proposed work be altered to expand beyond the current scope of work and/or APE, we ask to be notified.

Regards,

Jeff

Jeffrey C Bendremer Ph.D., RPA

Tribal Historic Preservation Officer

Stockbridge-Munsee Community

Tribal Historic Preservation Extension Office

86 Spring St.

Williamstown, MA 01267

413-884-6029 (o)

715-881-2254 (c)

www.mohican.com

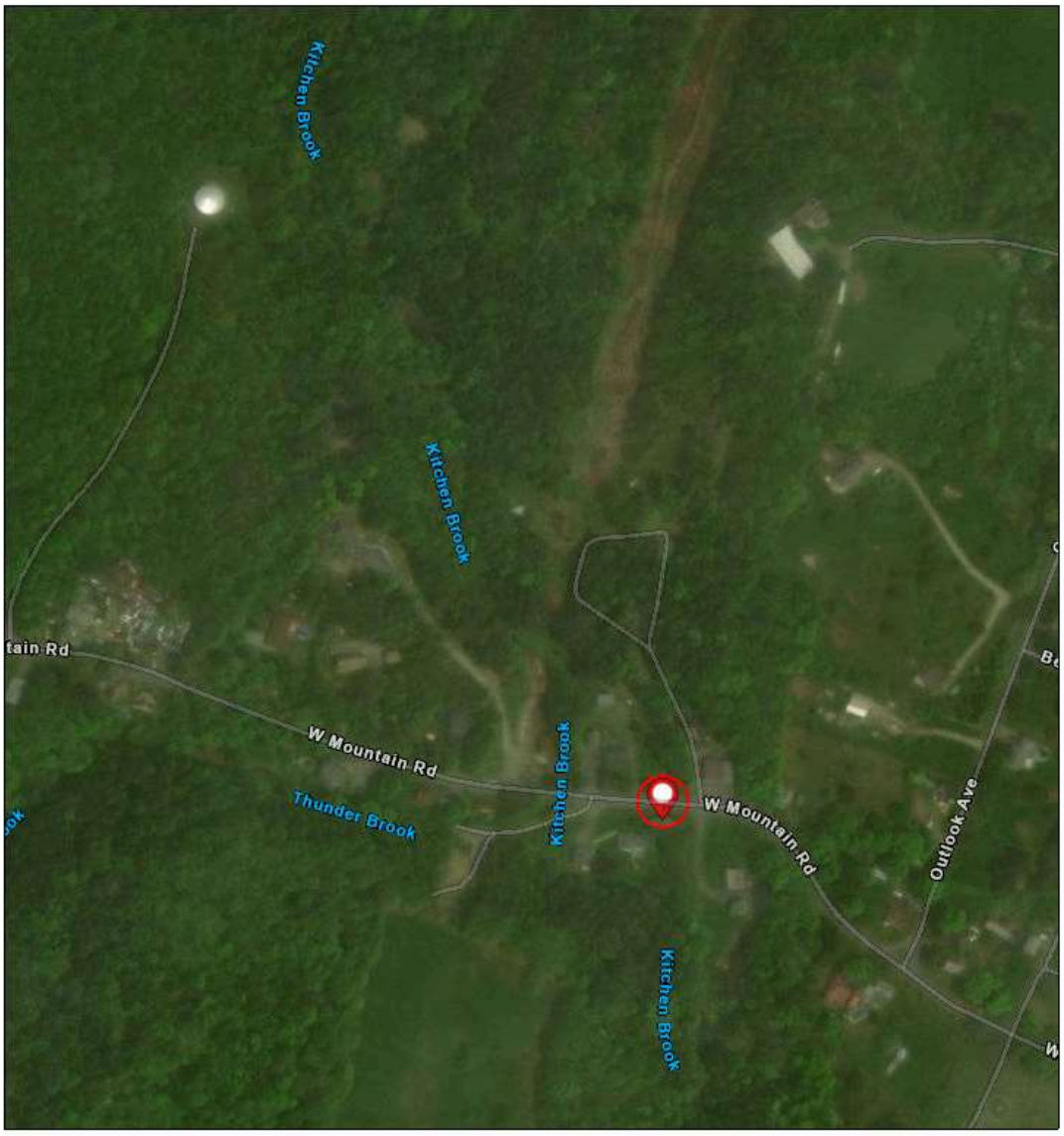
Attachment H – ESA Section 7 Map Printout

Drawn Action Area & Overlapping S7 Consultation Areas

Area of Interest (AOI) Information

Area : 0.18 acres

Feb 13 2025 10:49:02 Eastern Standard Time



1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	0	0	N/A
Shortnose Sturgeon	0	0	N/A
Atlantic Salmon	0	0	N/A
Sea Turtles	0	0	N/A
Atlantic Large Whales	0	0	N/A
In or Near Critical Habitat	0	0	N/A

Attachment I – USFWS Map Printout

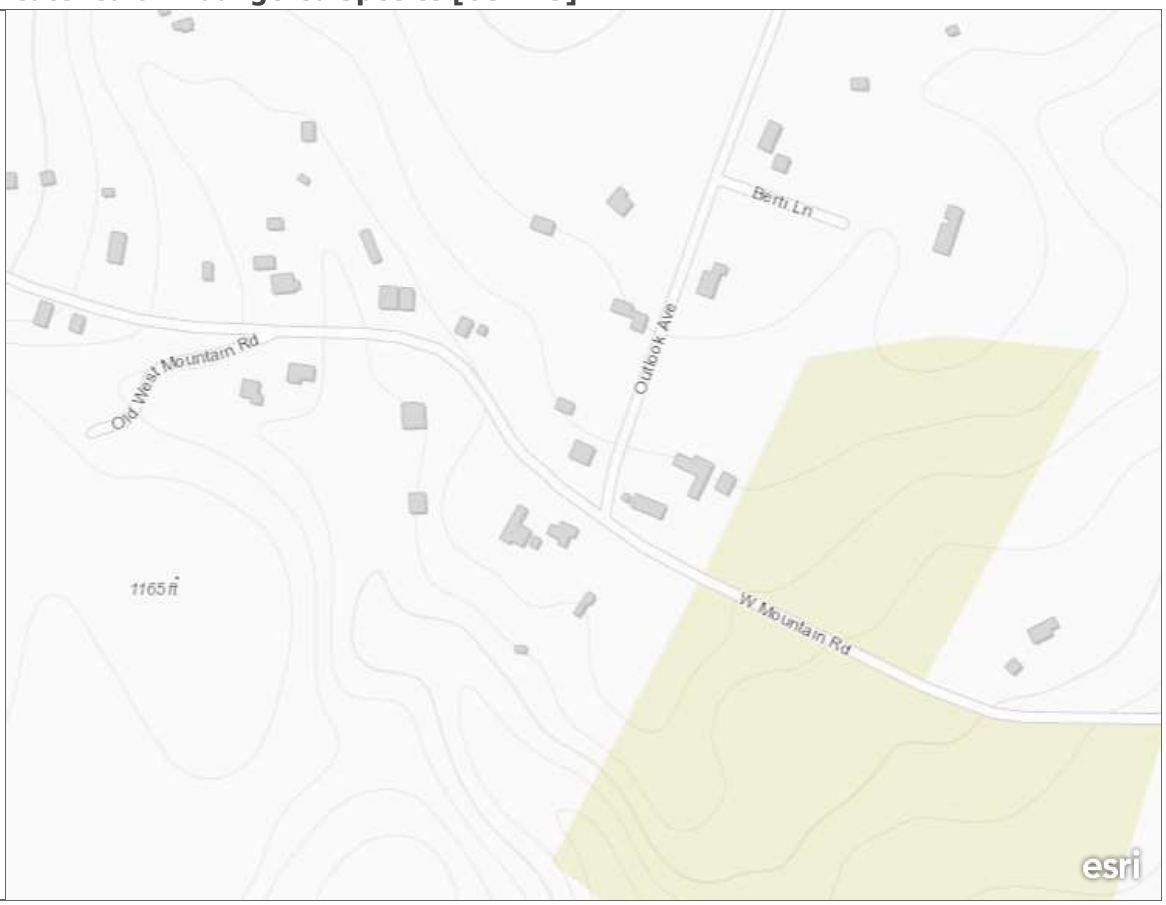
Critical Habitat for Threatened & Endangered Species [USFWS]

Final Polygon Features

Final Linear Features

Proposed Polygon Features

Proposed Linear Features



A specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

Attachment J – IpaC Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: 01/16/2025 16:56:47 UTC
Project Code: 2025-0043340
Project Name: C-10-024

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2025-0043340
Project Name: C-10-024
Project Type: Bridge - Maintenance
Project Description: Strengthening of Existing Metal Pipe Arch Culvert
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.5642389,-73.17253355652679,14z

Counties: Berkshire County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Cheshire town
Name: Madison Sullivan
Address: 63 Kendrick Street
City: Needham
State: MA
Zip: 02494
Email msullivan@gill-eng.com
Phone: 7813557100

Attachment K – IPaC D-Key Technical Assistance Letter with Supporting Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: 01/22/2025 19:48:10 UTC
Project code: 2025-0043340
Project Name: C-10-024

Federal Nexus: no
Federal Action Agency (if applicable): Cheshire town

Subject: Technical assistance for 'C-10-024'

Dear Madison Sullivan:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on January 22, 2025, for 'C-10-024' (here forward, Project). This project has been assigned Project Code 2025-0043340 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not bbe complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office***

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the following effect determination(s):

Species	Listing Status	Determination
Northern Long-eared Bat (*Myotis septentrionalis*)	Endangered	NLAA
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	NLAA

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2025-0043340 associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

C-10-024

2. Description

The following description was provided for the project 'C-10-024':

> Strengthening of Existing Metal Pipe Arch Culvert

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.5642389,-73.17253355652679,14z

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   No

6. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

   Automatically answered
   No

7. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

   No

8. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

   No

9. Will the action cause effects to a bridge?

   Note: Covered bridges should be considered as bridges in this question.

   No

10. Will the action result in effects to a culvert or tunnel at any time of year?

    Yes

11. Does the culvert or tunnel equal or exceed 23 feet (7.0 meters) in length?

    Yes

12. Do the interior dimensions of the culvert or tunnel **equal or exceed 3.0 feet (0.9 meters) in height (minimum height for tricolored bat)**?

    Yes

13. Has a site-specific culvert assessment following USFWS guidelines been completed?

    Note: For information on conducting a bridge/structure assessment, please see Appendix K in the USFWS' Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines at:https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines Additional resources can be found at: https://www.fws.gov/media/bats-and-transportation-structures-references-and-additional-resources and a training video is located at: https://www.youtube.com/watch?v=iuFwkT7q8Ws.

    Yes

    SUBMITTED DOCUMENTS

    - *appendix-d-bridge-culvert-bat-assessment-form-march-2022.pdf https://ipac.ecosphere.fws.gov/project/FLH7XQOXGVEB7HMMNLMKJ7ASTE/projectDocuments/155891596*

14. Was evidence of bat use found during the bridge/structure (e.g., culvert) assessment?

    No

15. Did you coordinate with your local Ecological Services Field Office (ESFO) and receive approval of culvert assessment results? If NO, please contact the appropriate local ESFO before completing this determination key.

    Yes

16. Are trees present within 1000 feet of the action area?

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

17. Does the action include the intentional exclusion of bats from a building or structure?

    Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    No

18. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

19. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

20. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic permanently or temporarily on one or more existing roads?

    Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    No

21. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

22. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    Note: For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    No

23. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

24. Will the action include drilling or blasting?

    No

25. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    No

26. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    No

27. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

28. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

29. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    No

30. Will the proposed action result in the use of prescribed fire?

    Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

    No

31. Does the action area intersect the northern long-eared bat species list area?

    Automatically answered
    Yes

32. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

    Automatically answered
    No

33. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

34. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
    If unsure, answer "Yes."

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

35. Does the action area intersect the tricolored bat species list area?

    Automatically answered
    Yes

36. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

37. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    No

38. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
    (If unsure, answer ""Yes."")

    Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (Tillandsia usneoides), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines.

    Yes

39. Do you have any documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Cheshire town
Name: Madison Sullivan
Address: 63 Kendrick Street
City: Needham
State: MA
Zip: 02494
Email msullivan@gill-eng.com
Phone: 7813557100

Attachment L – NOAA EFH Mapper Report

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 42º 33' 53" N, Longitude = 74º 49' 32" W
Decimal Degrees: Latitude = 42.565, Longitude = -73.174

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH

No additional Essential Fish Habitats (EFH) were identified at the report location.

Pacific Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
All EFH species have been mapped for the Greater Atlantic region, **Atlantic Highly Migratory Species EFH**, Bigeye Sand Tiger Shark, Bigeye Sixgill Shark,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.
****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**

Caribbean Sharpnose Shark,
Galapagos Shark,
Narrowtooth Shark,
Sevengill Shark,
Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

Attachment M – Order of Conditions

Gill Engineering is in the process of filing an NOI with the MassDEP/Conservation Commission and obtaining an Order of Conditions. We will pass this along as soon as it is available.

Attachment N – Fluvial Assessment and Wetland Delineation

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Amherst Office
15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

February 28, 2023

Dawood Engineering, Inc.
Attn: Keith Barnes
325 Wood Road, Suite 109
Braintree, MA 02184
Via Email: *keith.barnes@dawood.net*

Re: Wetland/Watercourse Delineation
Kitchen Brook Culvert Replacement, West Mountain Road, Cheshire, MA
SWCA Project #: 73429

Dear Mr. Barnes:

SWCA Environmental Consultants (SWCA), in cooperation with Dawood Engineering (Dawood), conducted a wetland/watercourse delineation and fluvial assessment at the location of a proposed culvert replacement over Kitchen Brook on West Mountain Road in Cheshire, Massachusetts on February 15, 2023. The purpose of the assessment was to confirm the presence or absence of jurisdictional wetlands within 100 feet of the culvert (the assessment area), water course resource areas within 200 feet of the culvert, and to evaluate existing geomorphological conditions 300 feet upstream and 300 feet downstream of the culvert, including substrate analysis and field bankfull width estimates. Surveyors with Dawood were not present on the day of these evaluations; however, they will conduct stream cross-section and longitudinal profiles as well as topographic survey upstream and downstream of the culvert. These data will be used to assists the engineers in determining an appropriate culvert size for replacement. Stream corridor assessments follow methods adapted from Rosgen (1996). Figures illustrating the site are included in Appendix A. Photographs representing these assessments are included in Appendix B.

Kitchen Brook is a perennial stream with headwaters originating in New Ashford at Rounds Rock in the Mount Greylock State Reservation, flowing southeast to the Hoosic River, 0.5 mile south of Cheshire. Kitchen Brook is named because the basin near its head was called ‘The Kitchen’ for the Kitchen Brook Dolomite of the early Cambrian age. Culvert C10024-AB2-MUN-BRI is located at West Mountain Road, west of Outlook Avenue and North Street (Route 8) in Cheshire. Kitchen Brook flows from north to south at the crossing. The surrounding landscape consists of agricultural, undeveloped forested areas, and residential land uses. Kitchen Brook is mapped by the Massachusetts Department of Fish and Wildlife (MA DFW) as a Cold Water Fisheries resource (MA DFW 2022).

The culvert is in poor condition and consists of an arched galvanized corrugated steel culvert with concrete abutments (Photo 7, Appendix B). The North Atlantic Aquatic Connectivity Collaborative (NAACC) Data Center Stream Continuity Portal completed an inspection on January 13, 2021, noting the culvert was built in 1970 and is experiencing settlement of the field stone headwall (see Photo 5, Appendix B), roadway settlement (Photo 3), rusting, culvert

perforations, active leaking, and failing galvanized coating, for example (NAACC 2010). The benthic elevation drops 50 inches from the culvert outfall to the stream bottom at a scour pool. A 12-inch berm located at the culvert outfall could contribute to an aquatic disconnection in low-flow conditions, where aquatic macroinvertebrates and fish cannot pass through the culvert (Photo 6). Elevation drops at culvert outlets additionally worsen scour pools, leading to increased erosion and infrastructure damage, as evidenced at the Kitchen Brook culvert. The stream banks are eroded, and the stream is downcutting (see Photos 1, 8, 9, 14, and 15).

Kitchen Brook is illustrated on the most recent United States Geological Survey (USGS) topographic map with a solid blue line, indicating the stream is perennial [per 310 CMR 10.58(2)(a)(1)(a)]. Figure 1 illustrates the site location on a USGS topographic map. Figure 2 illustrates the site on an orthophotograph. Figure 3 illustrates the site is within flood zone A, the 100-year floodplain, on a Firmette (Federal Emergency Management Agency [FEMA] 1982).

Kitchen Brook is located within the Hoosic River watershed. SWCA ran a USGS StreamStats analysis by selecting a sub-watershed delineation point downstream of the culvert. The resulting StreamStats analysis calculates the sub-basin drainage area to be ±3.37 square miles (StreamStats Report, Appendix C). The stream channel type is a Rosgen B-4, a gravel-dominated (but with sections of coble), single-threaded stream with a riffle-pool morphology, within a colluvial valley, occasionally on well vegetated stable alluvial fans (Rosgen 1994, 1996). Bedform morphology, which may be influenced by debris constrictions and local confinement, typically produce scour pools, small rapids, and falls. Streambank erosion and channel aggradation/degradation process rates are normally low within these stream types.

Land use within the vicinity of the culvert is residential, with thin riparian vegetation other than maintained residential lawn. Trees are therefore sparse, but include eastern hemlock (*Tsuga canadensis*), Norway maple (*Acer platanoides*), white ash (*Fraxinus americana*), elm (*Ulmus americana*), blue spruce (*Picea pungens*), paper birch (*Betula papyrifera*), black birch (*Betula lenta*), and black cherry (*Prunus serotina*). Morrow's honeysuckle (*Lonicera morrowii*), Japanese knotweed (*Reynoutria japonica*), striped maple (*Acer pensylvanicum*), and intermediate wood fern (*Dryopteris intermedia*) are common in the understory along the riparian corridor. Residential areas associated with West Mountain Road abut the Brook upstream and downstream of the culvert, and much of the riparian corridor within the assessment area open canopied.

WETLAND AND WATERCOURSE DELINEATION

SWCA performed a delineation using a multiple parameter method approach following the Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40) (WPA) and its implementing regulations (310 CMR 10.00 et seq.), Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act (Massachusetts Department of Environmental Protection [MA DEP] 1995) and the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (v 2.0) (U.S. Army Corps of Engineers [USACE] 2012). SWCA examined soils, evidence of hydrology, vegetation, and bankfull indicators to identify limits of the federal and/or state definition of a jurisdictional wetland, and bankfull indicators to identify limits of the stream bank and the Mean Annual High Water (MAHW). Hydric soils and hydrophytic vegetation were able to be evaluated since ground conditions were not frozen and evidence of hydrology was observed. Figure 4 illustrates a site sketch with the resource areas flagged in the field; Dawood surveyors collected the locations of waterbody flags on February 15, 2023. SWCA delineated watercourses ±200 feet upstream and downstream of the culvert, and wetland boundaries ±100 feet upstream and downstream of the culvert as seen in Table 1.

Bank/Mean Annual High Water for the perennial Kitchen Brook (Stream 1) is denoted with blue flagging tape as:

- Stream 1-A1 to 1-A14 (right descending stream bank)
- Stream 1-B1 to 1-B14 (left descending stream bank)

Perennial Streams have a 200-Riverfront Area beginning at the MAHW mark.

Bank/Mean Annual High Water for the perennial Thunder Brook (Stream 2) is denoted with blue flagging tape as:

- Stream 2-A1 to 1-A2 (right descending stream bank)
- Stream 2-B1 to 1-B2 (left descending stream bank)

Perennial Streams have a 200-Riverfront Area beginning at the MAHW mark.

Photographs illustrating these areas and a stream dataform are included with this report (Appendices A and C, respectively).

Kitchen Brook is an upper perennial stream (Cowardin et al. 1979) with a bedform morphology indicative of a riffle/pool configuration, and a moderately well-developed floodplain (minorly terraced), despite stream downcutting and steep, eroding banks within the assessment area. Benthic material is well distributed in size but is dominated by gravel, with some boulders, cobbles, and sand.

The MAHW line of Kitchen Brook (Stream 1) was flagged on site as stated above. Figure 4 illustrates a site sketch of the resource areas flagged in the field. As set forth at 310 CMR 10.54(2)(a-c), Bank is defined as, 'the portion of land surface which normally abuts and confines a waterbody. It occurs between a waterbody and a vegetated bordering vegetated wetland and adjacent floodplain, or, in the absence of these, it occurs between a waterbody and an upland. The upper boundary of a Bank is the first observable break in slope or the MAHW level, whichever is *lower*. The lower boundary of the Bank is the Mean Annual Low Water (MALW) level.'

Kitchen Brook has a 200-foot Riverfront Area (RFA) extending outward 200-feet from the MAHW line on each side of the stream. The WPA regulations at 310 CMR 10.58(2)(a) state, "A Riverfront Area is the area of land between a river's MAHW line measured horizontally outwards from the river with a parallel line located 200-feet away." The RFA may include other resource areas or their buffer zones. The RFA does not have a buffer zone. Thunder Brook (Stream 2) joins Kitchen Brook ±200 feet downstream of the culvert

Table 1. Watercourses identified within the Survey Area at the West Mountain Road/Kitchen Brook Culvert Replacement

Stream ID	Stream Jurisdiction	Stream Flag Sequence*	Comments
Stream 1	Perennial	1-A1 to 1-A14 (RDB) 1-B1 to 1-B14 (LDB)	Kitchen Brook
Stream 2	Perennial	2-A1 to 2-A2 (RDB) 2-B1 to 2-B2 (LDB)	Thunder Brook

**RDB = Right Descending Streambank; LDB = Left Descending Streambank*

As set forth in 310 CMR 10.55(a-c), a Bordering Vegetated Wetland (BVW) is defined as, "area(s) where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants, 50% or more of the vegetational community consists of wetland indicator species, and the ground surface water regime and the

vegetational community which occurs in each type of freshwater wetland area specified in [the WPA].” No BVWs were observed within the assessment area.

The verification of the wetland and watercourse boundaries can only be definitively determined by the local Conservation Commission, by MA DEP, USACE, or Superior Court on appeal. Any proposed work within the streams or the 200-foot RFA would require filing a Notice of Intent from the Town of Cheshire Conservation Commission and MA DEP Land Under Water is also present (below the Mean Annual Low Water mark in Kitchen Brook) but was not separately delineated as it is within the limits of the MAHW line. As set forth in 310 CMR 10.56(2)(a-c), “Land Under Waterbodies and Waterways is the land beneath any creek, river, stream, pond, or lake. Said land may be composed of organic muck or peat, fine sediment, rocks or bedrock.” Land Under Water is the resource area below Mean Annual *Low* Water.

Please note that SWCA’s field effort was limited to identifying wetlands and watercourses; other state wetland resource areas, such as Bordering Land Subject to Flooding (BLSF), which coincides with the FEMA 100-year Flood Zone, also exist on site. SWCA recommends the engineer illustrate the limit of BLSF on the plans using the appropriate elevation.

Kitchen Brook is also jurisdictional under the U.S. Clean Water Act. Any work proposed within a federally jurisdictional resource will also require filing with the USACE for approval. If work within Kitchen Brook is below the MAHW mark, a Water Quality Certificate, a U.S. Army Corps General permit, or a Self-Verification Form may be required.

STREAM STATISTICS

SWCA ran a StreamStats analysis using a subwatershed drainage area delineation point immediately downstream of the culvert on West Mountain Road (statistical analysis results are attached to this letter, Appendix D). The drainage area is estimated to be 3.37 square miles with an estimated bankfull streamflow statistic of 240 cubic feet per second (cfs). The watershed drainage area has a mean basin elevation of 1,950 feet above sea level. The majority of the watershed drainage area within this reach is estimated to be forested (93.7%) with 1.57% wetlands and 0.7% developed (urban) land. The StreamStats estimated bankfull width is 30.2 feet, the bankfull depth is estimated to be 1.59 feet, the bankfull area is 47.7 square feet, and the bankfull streamflow value is 240 cfs.

Stream Bankfull Width Field Estimates

In addition to StreamStats analyses, SWCA collected field bankfull width estimates at 50-foot intervals for a distance of 300 feet upstream and 300 feet downstream of the culvert, including reference reach areas. Bankfull dimensions ranged from 17 feet to 23 feet. SWCA collected a total of 14 field bankfull width measurements. Of these, six are considered reference reaches with an average field bankfull width estimate to be 19.7 feet (6 meters). These are presented in Table 2 below. Dawood surveyed the locations of the Bankfull Stations and will illustrate those locations and elevations on the site plans.

Massachusetts General Stream Crossing Design Standards require a minimum channel width 1.2 times the bankfull width (Division of Ecological Restoration [DER] 2012). Taking the average reference reach field bankfull widths (n=6), the minimum recommended culvert size would be 23.7-feet wide (19.72-feet x 1.2). If we average all field bankfull widths (n=14), the minimum recommended culvert opening would be 24.09 feet (20.08 x 1.2). Therefore, we recommend a culvert with a minimum of 24-foot-wide opening to avoid channel constriction during normal bankfull flows.

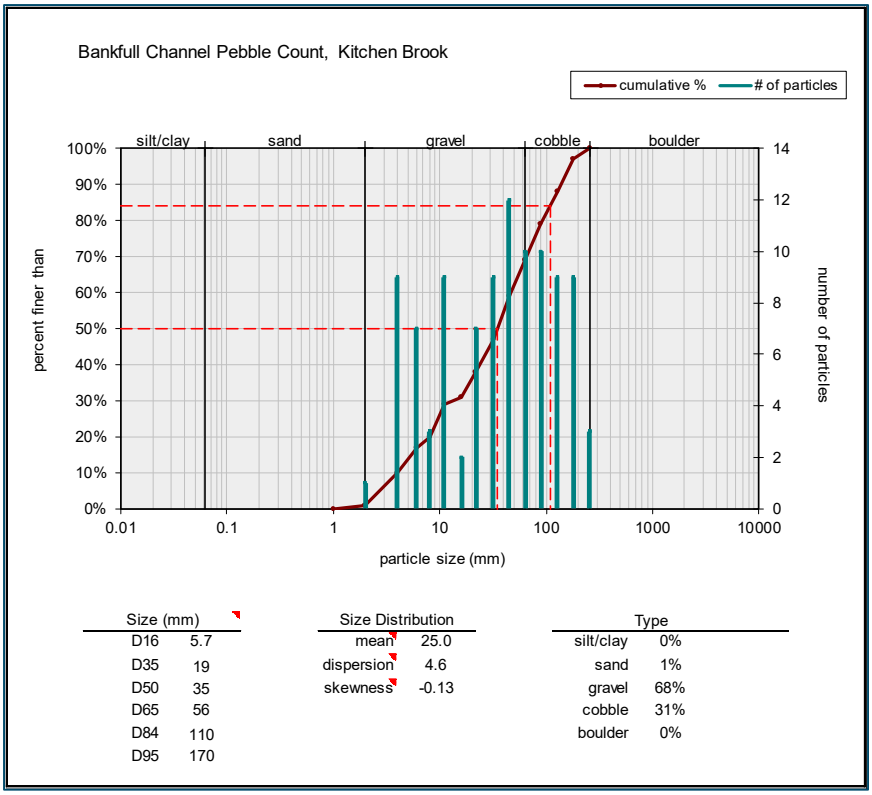
Table 2. Field Bankfull Width Estimates 300 feet upstream and 300 feet downstream of the West Mountain Road Culvert at Kitchen Brook, February 15, 2023

Kitchen Brook, West Mountain Road, Cheshire, MA - Field Bankfull Width					
Bankfull Station ID	***Bankfull Station Loc***	***Width (feet)***	***Width (inches)***	***Width (m)***	***Notes***
1	0+00	21	252	6.4	300' upstream from culvert (start of survey area): Reference Reach; Run; Water Depth 8"
2	0+50	20	240	6.09	Reference Reach; Pool; Water Depth 14"
3	1+00	19	228	5.79	Riffle; Bank erosion; Water Depth 9"
4	1+50	17	204	5.18	Run;Bank erosion; Water Depth 8"
5	2+00	20	240	6.09	Pool; Erosion on LDB at A-wetland; Water Depth 14"
6	2+50	17	204	5.18	Riffle; Water Depth 7"
7	3+00	16	192	4.87	At upstream end of culvert: Riffle; Water Depth 6"
8	3+36	23	276	7.01	At downstream end of culvert: Plunge pool; Water Depth 40" with additonal 12" berm (total drop >50")
9	3+86	24	288	7.31	Riffle; Water Depth 8"
10	4+36	19.66	236	5.99	Run; Water Depth 13"
11	4+86	20.66	248	6.29	Reference Reach; Run; Water Depth 11"
12	5+36	18	216	5.48	Reference Reach; Run; Thunder Brook junction; Water Depth 9"
13	5+86	21.33	256	6.5	Reference Reach; Riffle; Water Depth 11"
14	6+36	19.5	234	5.94	Reference Rach; Pool; Water Depth 12"

Bankfull Substrate Analysis

We performed material analyses (Wolman Pebble Count, Wolman 1954) at the study stream and analyzed the data to better describe river morphology and structure. The materials analysis shows the D50 = 35 mm (1.37 inches), or very coarse gravel comprising the majority of the substrate material. No silt/clay was collected; 1% of the material collected was comprised of sand, 68% was gravel, 31% was cobble, and 0% was boulder. Table 3 below presents the results of the particle analysis. Benthic particle analysis data are included in Appendix E.

Table 3. Wollman Pebble Count results for the Bankfull Width at a reference riffle at Kitchen Brook associated with the West Mountain Road Culvert Replacement



ADDITIONAL CONSIDERATIONS

SWCA reviewed the assessment reach for other potential sensitive environmental resource area constraints. The stream reach is located within a mapped Coldwater Fisheries Resource Waters (MA DFW 2022). Cold Water Fisheries Resources are considered important habitat for a number of cold water species, including trout (such as brook trout [*Salvelinus fontinalis*], for example). Precautions to avoid erosion, sedimentation, thermal loading, and excessive use of hard bank structures such as riprap, should be considered during the design and construction phase of this work to protect downstream Cold Water Fisheries Habitats.

The culvert is not located within Priority Habitat for Rare Species or Estimated Habitat for Rare Wildlife (NHESP 2021); however, a portion of Kitchen Brook upstream of the culvert is within Priority Habitat for Rare Species (outside the Limit of Work (Figure 5, Appendix A). No Areas of Environmental Concern (ACEC 2009) or Outstanding Resource Waters (ORWs 2010) are located within the work area; however, there are two ORWs nearby, including the Kitchen Brook Public Water Supply Watershed (upstream of the work area) and Thunder Brook retired Public Water Supply Watershed (associated with Thunder Brook).

Bordering Land Subject to Flooding (BLSF) typically coincides with the 100-year flood zone (see 310 CMR 10.57(2)(a)3). Digital data are not available for Franklin County. However, SWCA created a FEMA Flood Insurance Map (FEMA Firmette 1980) to determine whether BLSF is located within the Assessment Area. Portions of the assessment area are within BLSF (Figure 3). No digital FIRM data are available for this portion of the state; however, paper maps illustrate some of the work area is within the 100-year flood zone. SWCA recommends the engineers

illustrate the limits of BLSF on project plans and RFA on the plans. The Town of Cheshire does not administer a Wetland Protection Bylaw.

SUMMARY

SWCA completed a jurisdictional wetland and watercourse delineation to supplement the detailed survey data for a culvert replacement located on the West Mountain Road over Kitchen Brook in Cheshire, Massachusetts of February 15, 2023. We identified two perennial streams within 200 feet of the culvert and no BVWs within 100 feet of the culvert. The work is within BLSF. We are providing the delineation data in this letter. Based on our field bankfull estimates collected at 50-foot intervals for 300-feet upstream and downstream of the crossing, we recommend a culvert opening with a minimum of 24 feet to avoid channel constriction during normal bankfull flows. Dawood will additionally collect longitudinal profiles of the stream and topographic stream cross section survey at 25-foot intervals for a distance of 75-feet upstream and 75-feet downstream from the culvert. These data will be used to determine an appropriate culvert size for replacement. If SWCA can provide further assistance in relation to this culvert replacement project, please contact me at cmcdonough@swca.com or via direct office phone at 413-658-2063.

Sincerely,

Christin McDonough, M.S
Professional Wetland Scientist (PWS)
Certified Wildlife Biologist (CWB)

ATTACHMENTS:

Figure 1. USGS Topographic Map of Site
Figure 2. Orthophotograph of Site
Figure 3. FEMA Floodplain Map
Figure 4. Wetland/Watercourse Delineation Site Sketch
Figure 5. Natural Heritage and Endangered Species Program Areas & Outstanding Resource Waters

Appendix A. Figures
Appendix B. Photographs Representing Site
Appendix C. Stream Dataform
Appendix D. StreamStats Report (Basin Characteristics, Peak Drainage Statistics, and Bankfull Statists)
Appendix E. Particle Analysis

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APPENDIX A:

Figures

WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 1. USGS Topographic Map

● Project Location

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N

1:24,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 1,000 2,000 Feet
0 250 500 Meters

SWCA
ENVIRONMENTAL CONSULTANTS

WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 2. Aerial Map

Project Location

Road

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N

1:1,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 50 100 Feet

0 10 20 Meters

SWCA
ENVIRONMENTAL CONSULTANTS

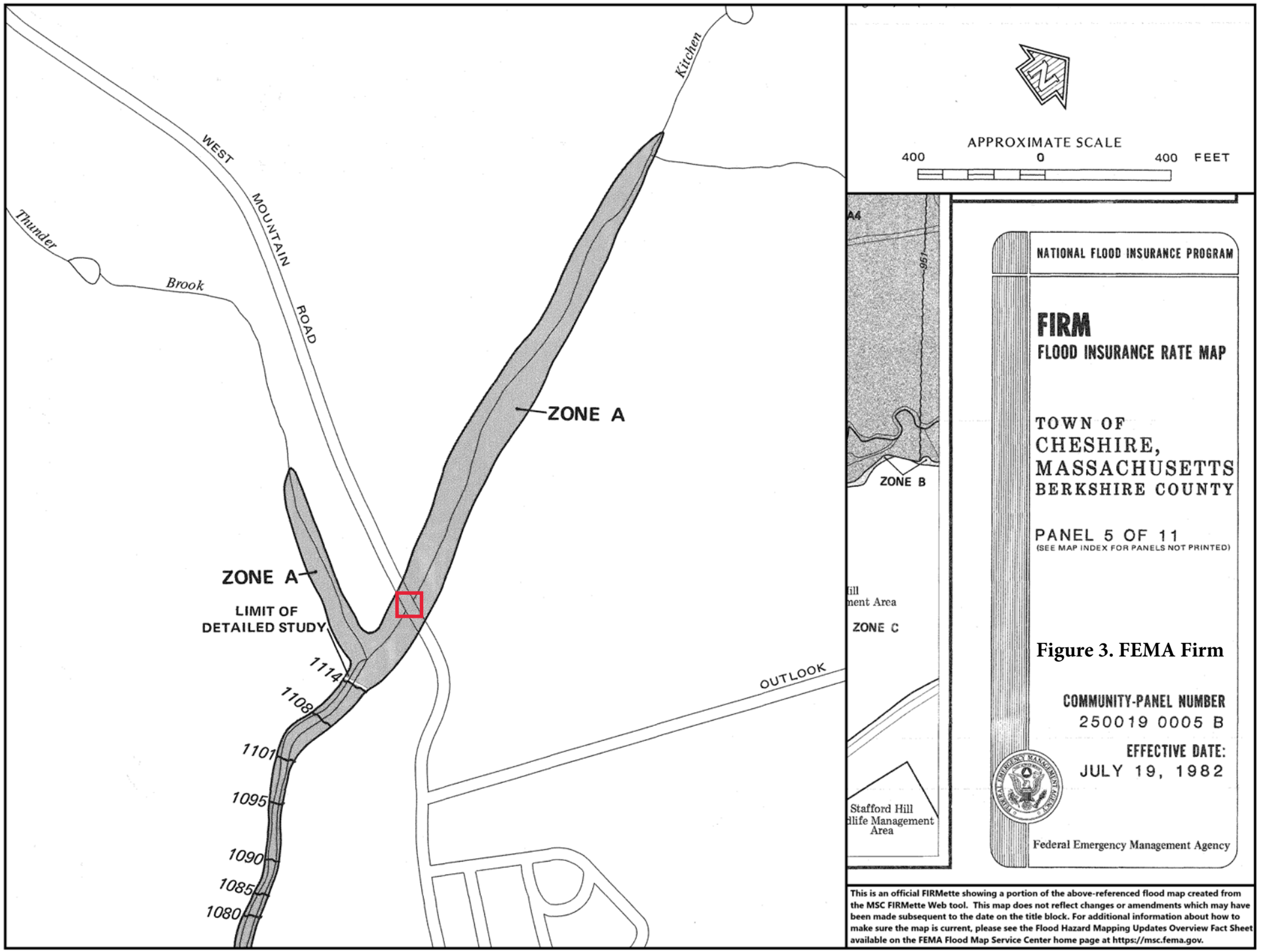
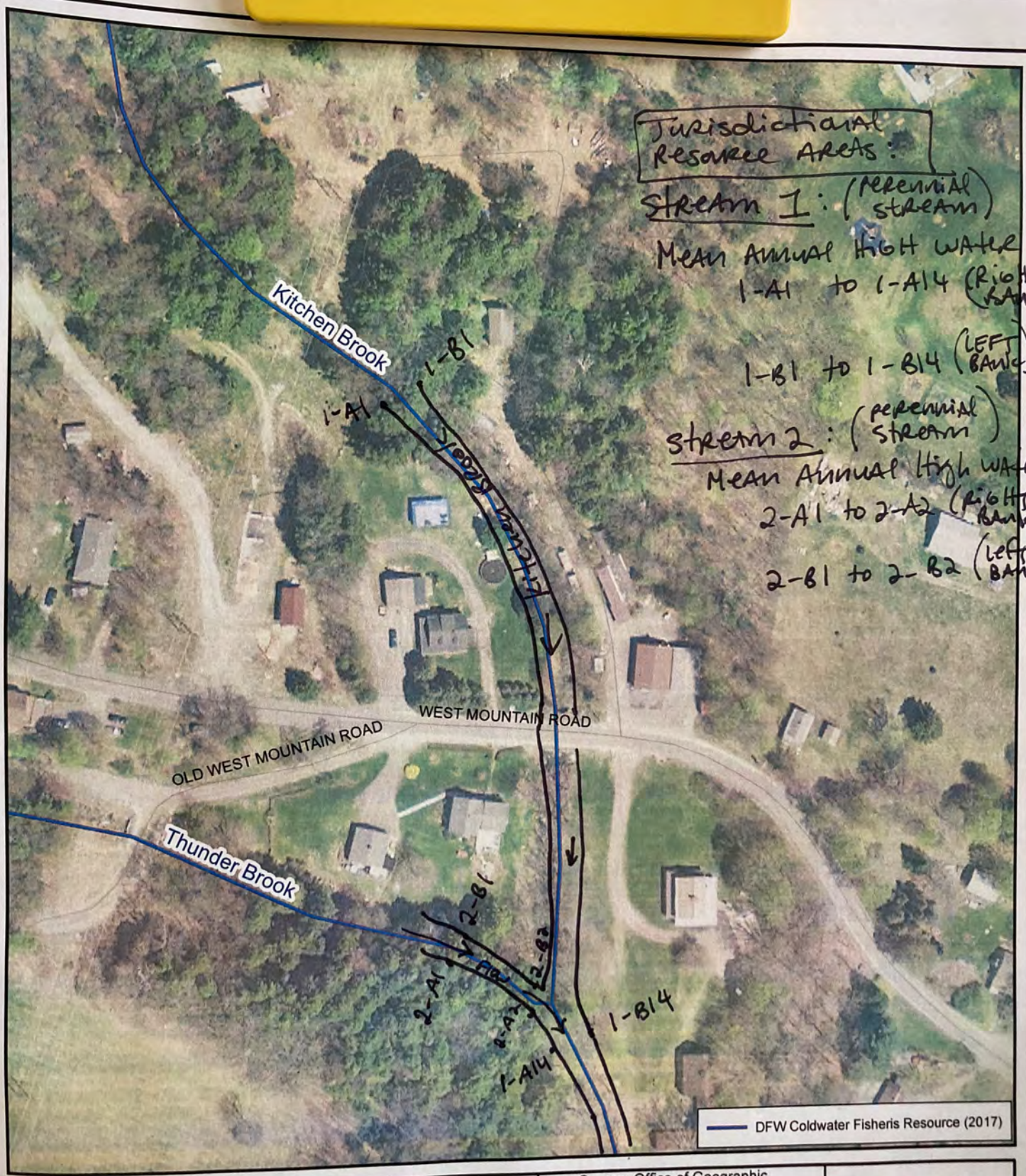


Figure 3. FEMA Firm



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Field Figure

Culvert Replacement
West Mountain Road
Cheshire, MA

10 Feb 2023

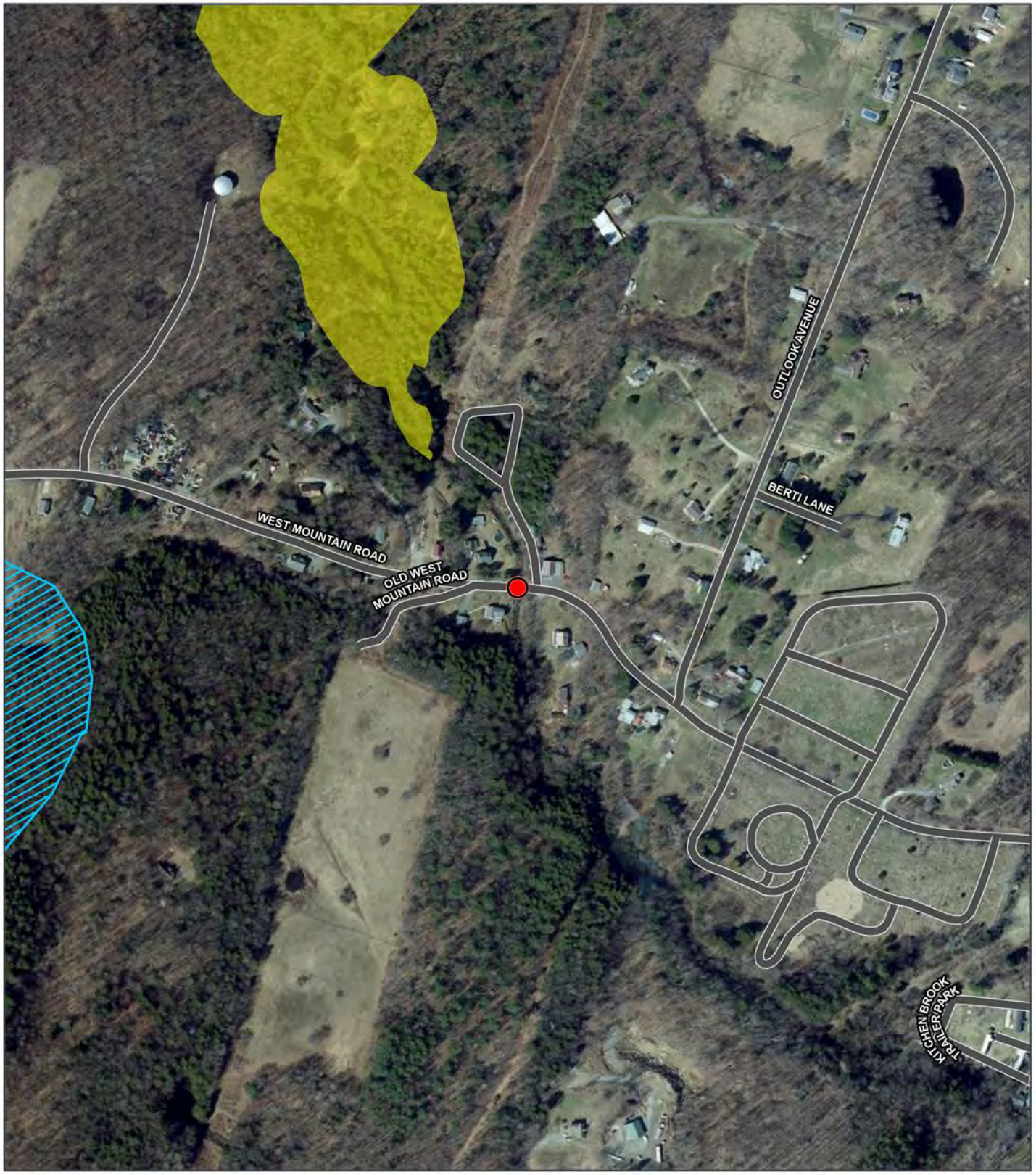
Data Source: Office of Geographic Information (MassGIS)

USGS Color Ortho Imagery (2013/2014)
MassDEP Wetlands (2017)
SSURGO Database

0 105 210 Feet

N

Latitude 42° 33' 52" N
Longitude 73° 10' 25" W



WEST MOUNTAIN ROAD CULVERT REPLACEMENT

Figure 5. NHESP Habitats and Outstanding Resource Waters

Project Location
Road
Priority Habitats of Rare Species
Outstanding Resource Waters

Cheshire, MA
USGS 7.5' Quadrangle: Cheshire
73.1736°W 42.5646°N

N
1:5,000

Base Map: Esri ArcGIS Online, accessed February 2023

Updated: 2/21/2023
Project No. 73033

0 200 400 Feet
0 50 100 Meters

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APPENDIX B:

Photographs

Photo 1: View facing upstream from the road crossing on West Mountain Road over Kitchen Brook. Note the stream downcutting and bank erosion. *Photo taken February 15, 2023*

Photo 2: View facing downstream from the road crossing on West Mountain Road over Kitchen Brook. Note the thin riparian vegetation. *Photo taken February 15, 2023*

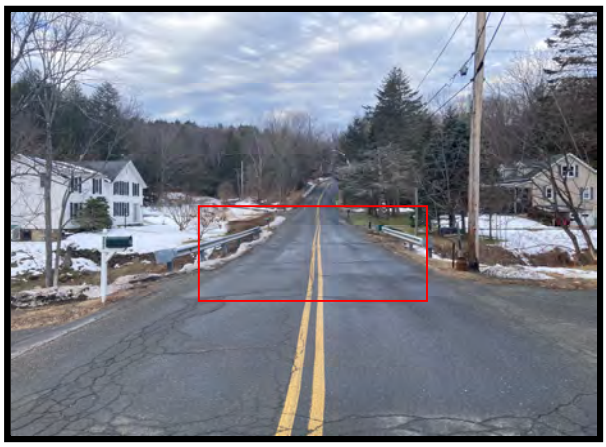

Photo 3: View facing west on West Mountain Road showing the road slumping at the crossing with Kitchen Brook. There are no mature trees within the Limit of Work. *Photo taken February 15, 2023*

Photo 4: View facing downstream showing the culvert inlet. Note the stream downcutting and steep, eroding banks. *Photo taken February 15, 2023*

Photo 5: View facing upstream showing the culvert outfall. Note the berm at the outfall (arrow) and concrete debris on the left descending stream bank. Also, note the condition of the field stone headwall (arrow). *Photo taken February 15, 2023*

Photo 6: View facing upstream showing the elevational drop at the outfall, which has led to a 50-inch-deep scour pool. *Photo taken February 15, 2023*

Photo 7: View facing downstream within Kitchen Brook showing the culvert. *Photo taken February 15, 2023*

Photo 8: View facing upstream from the culvert inlet. Note the stream downcutting and eroding steam banks. *Photo taken February 15, 2023*

Photo 9: Overhanging roots and exposed roots along the eroding banks provide wildlife habitat (as seen at 1-A5). *Photo taken February 15, 2023*

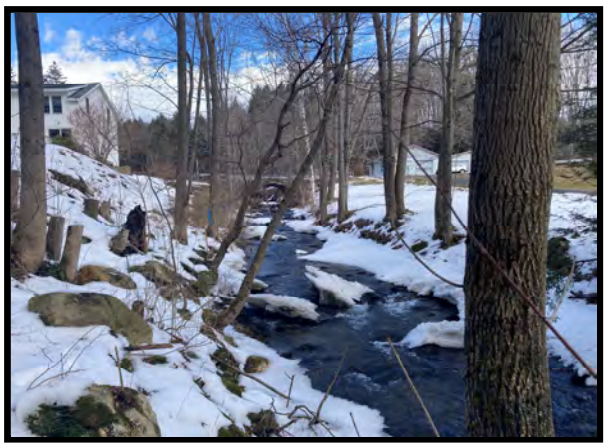

Photo 10: View facing upstream from 1-A13, showing the culvert outlet in the distance. Note the thin riparian vegetation. *Photo taken February 15, 2023*

Photo 11: View facing downstream from 1-A-13. *Photo taken February 15, 2023*

Photo 12: View facing upstream at Thunder Brook from the junction with Kitchen Brook. *Photo taken February 15, 2023*

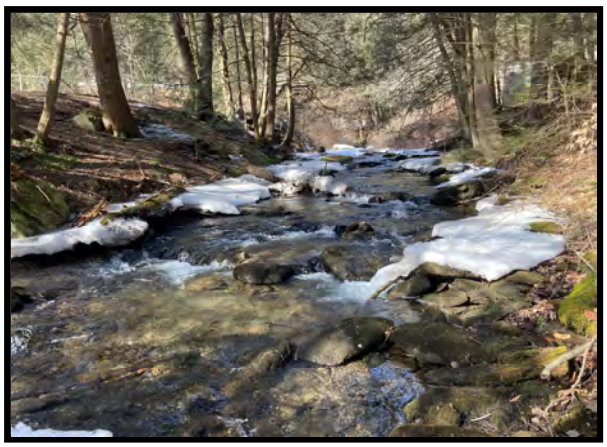

Photo 13: View facing upstream at Bankfull Station 0+00 showing reference reach section of Kitchen Brook. *Photo taken February 15, 2023*

Photo 14: View facing the right descending stream bank at Bankfull Station 1+50, showing the stream downcutting and bank erosion. *Photo taken February 15, 2023*

Photo 15: View facing downstream at Bankfull Station 1+50. Note the bank erosion and stream downcutting. *Photo taken February 15, 2023*

Photo 16: View facing upstream showing the culvert outlet and the limit of work area. Note no mature trees are located within the work area. *Photo taken February 15, 2023*

Photo 17: View facing upstream from Bankfull Station 6+36 (300 feet downstream from the culvert at West Mountain Road). *Photo taken February 15, 2023*

Photo 18: View facing upstream from the culvert outlet showing the decaying headwall. *Photo taken February 15, 2023*

APPENDIX C:

Dataforms

Waterbody Physical Characterization Data Sheet

Client: Dawood	Date: 02.15.23
Investigators: C. McDonough & M. Borenstein (SWCA)	
Project: Culvert C10024	
State: MA	County: Berkshire	Township: Cheshire
Waterbody Name: Kitchen Brook	
Feature ID: Bankfull Station 0+00	Weather or Recent Event: warm (58 F), partly clear
Milepost/Station N/A	
or Lat/Long: 42.564643 N/ -73.173598 W	

Waterbody type: __Lake __Pond __River ✓Stream __Stormwater *Check all that apply*

Flow type: ✓ Perennial __ Intermittent __ Ephemeral __ Ag. Ditch __ Road Ditch __ Swale __ Erosional Feature

Flow speed: ✓ Fast __ Moderate __ Slow __ Stagnate __ No flow

Origin: __Spring __Culvert __Wetland ✓Outside LOW

Sinuosity/Condition: __ Sinuous ✓Channelized __Braided __ Dam __ Piped __ Manmade *Check all that apply*

Degradation: __ Bank erosion ✓Downcutting __ Sedimentation __ Livestock/Manure __ Waste discharge pipe

Water quality: __ Odors– Sewage/Petrol __ Surface oils __Turbid– Slightly/Very __ Trash ✓ Clear __ Algae __ No water

Surrounding landuse ✓ Forested __ Fallow Field __ Pasture __ Ag. Field ✓ Residential __ Commercial __ Industrial __ Other

Top of Bank Width: 23 Ft

OHWM: 21 Ft ___ NA/Swale

Water Width: 20 Ft

Water Depth: _____ Ft 14 Inches

Bank height: 5 Left Bank Ft 4 Right Bank Ft *at CL crossing facing downstream*

Canopy Cover: __ Open __ Covered ✓ Partial

Dominant vegetation: Japanese knotweed*
Morrow's honeysuckle

Left Descending Bank Slope: __ Vertical __ 1:1 ✓ 2:1 __ 3:1 __ 4:1

Right Descending Bank Slope: ✓ Vertical __ 1:1 __ 2:1 __ 3:1 __ 4:1

Substrate: 0 % Bedrock 5 % Boulder 0 % Channery 35 % Cobble 50 % Gravel 10 % Sand
0 % Silt 0 % Clay 0 % Sediment

Organics: 1 Detritus– sticks, leaves, wood ____ Muck/Mud– black, fine organics 0 Marl– gray, shell fragment

Stream Morphology: ✓ Riffle and Run sequences ✓ Shallow Pool ✓ Deep Pool ___ Flat *Check all that apply*

Habitat: __Sand Bar __Gravel Bar __Mud Bar __Overhanging Veg ✓Bank Roots __Adj Wetland __Abutt Wetland

In-Stream Veg: ___ Submergent ___ Emergent ___ Algae

Riparian zone: ✓ Trees ✓ Shrubs/Saplings ✓ Herbaceous ___ Significant bare area

Aquatic organisms: *Observed:* ✓ Fish ✓ Minnows ✓ Frogs ✓ Salamanders ✓ Turtles
Odonates Other

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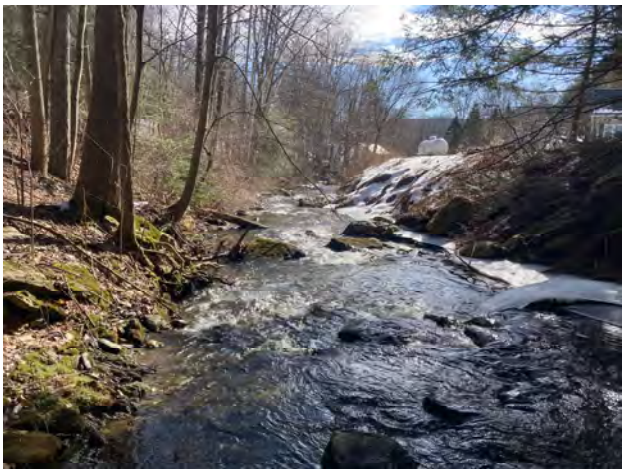
Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Feature ID: 0+00

View facing upstream at Bankfull Station 0+00, which is at a reference ereach



View facing downstream at Bankfull Station 0+00

View facing the right descending stream bank at Bankfull Station 0+00

View facing the left descending stream bank at Bankfull Station 0+00

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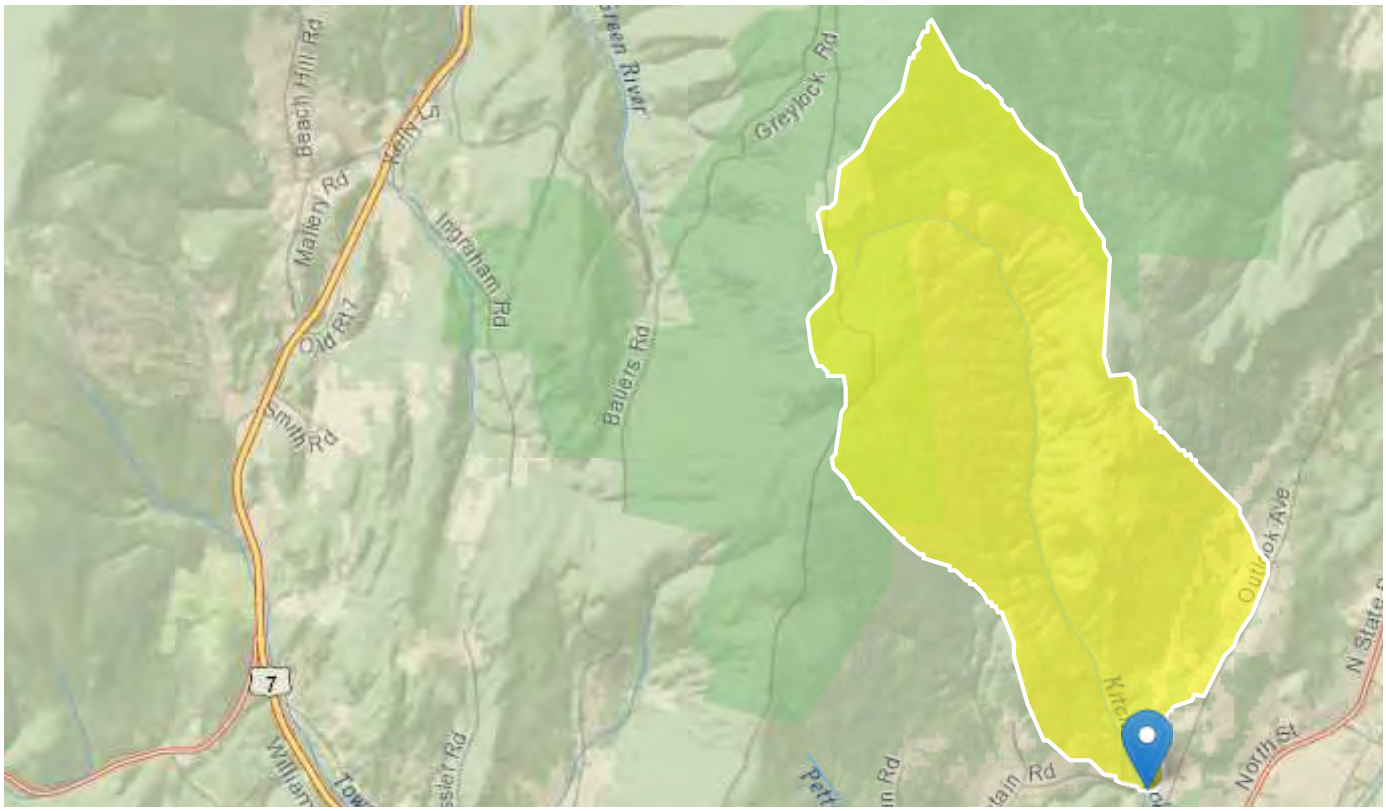
APPENDIX D:

StreamStats Analysis Report

StreamStats Report - Kitchen Brook, Cheshire, MA

Region ID: MA
Workspace ID: MA20230216152329680000
Clicked Point (Latitude, Longitude): 42.56449, -73.17356
Time: 2023-02-16 10:23:49 -0500



Sub-basin delineation point selected immediately downstream of culvert, south side of West Mountain Road, Cheshire, Massachusetts

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
ACRSDFT	Area underlain by stratified drift	0	square miles
BSLDEM10M	Mean basin slope computed from 10 m DEM	24.672	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	19.255	percent

Parameter Code	Parameter Description	Value	Unit
CAT1ROADS	Length of interstates lmtd access highways and ramps for lmtd access highways, includes cloverleaf interchanges (USGS Ntl Transp Dataset)	0	miles
CAT2ROADS	Length of sec hwy or maj connecting roads; main arteries & hwys not lmtd access, usually in the US Hwy or State Hwy systems (USGS Ntl Transp Dataset)	0	miles
CAT3ROADS	Length of local connecting roads; roads that collect traffic from local roads & connect towns, subdivisions & neighborhoods (USGS Nat Transp Dataset)	0	miles
CAT4ROADS	Length of local roads; generally paved street, road, or byway that usually have single lane of traffic in each direction (USGS Ntnl Transp Dataset)	4.65	miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	61764.5	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	927716.7	meters
CROSCOUNT1	Number of intersections between streams and roads, where the roads are interstate, limited access highway, or ramp (CAT1ROADS)	0	dimensionless
CROSCOUNT2	Number of intersections between streams and roads, where the roads are secondary highway or major connecting road (CAT2ROADS)	0	dimensionless
CROSCOUNT3	Number of intersections between streams and roads, where roads are local conecting roads (CAT3ROADS)	0	dimensionless
CROSCOUNT4	Number of intersections between streams and roads, where roads are local roads (CAT4ROADS)	6	dimensionless
CRSDFT	Percentage of area of coarse-grained stratified drift	0	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	343	feet per mi
DRFTPERSTR	Area of stratified drift per unit of stream length	0	square mile per mile
DRNAREA	Area that drains to a point on a stream	3.37	square miles
ELEV	Mean Basin Elevation	1950	feet
FOREST	Percentage of area covered by forest	93.7	percent
LAKEAREA	Percentage of Lakes and Ponds	0.09	percent
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	0.7	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.0917	percent
LFPLENGTH	Length of longest flow path	4.14	miles
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless
MAXTEMPC	Mean annual maximum air temperature over basin area, in degrees Centigrade	11.6	degrees C
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	62585	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	925115	feet
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	0	percent
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	52.1	inches
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	6.28	miles
WETLAND	Percentage of Wetlands	1.57	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.16	512
ELEV	Mean Basin Elevation	1950	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0	percent	0	32.3

Peak-Flow Statistics Disclaimers [Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

Statistic	Value	Unit
50-percent AEP flood	253	ft^3/s
20-percent AEP flood	445	ft^3/s
10-percent AEP flood	612	ft^3/s
4-percent AEP flood	871	ft^3/s
2-percent AEP flood	1100	ft^3/s
1-percent AEP flood	1350	ft^3/s
0.5-percent AEP flood	1630	ft^3/s
0.2-percent AEP flood	2060	ft^3/s

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	ASEp
7 Day 2 Year Low Flow	0.335	ft^3/s	0.0792	1.36	49.5	49.5
7 Day 10 Year Low Flow	0.182	ft^3/s	0.035	0.881	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	ASEp
50 Percent Duration	3.3	ft^3/s	1.48	7.33	17.6	17.6
60 Percent Duration	2.06	ft^3/s	0.737	5.72	19.8	19.8
70 Percent Duration	1.29	ft^3/s	0.471	3.5	23.5	23.5
75 Percent Duration	1.01	ft^3/s	0.377	2.67	25.8	25.8
80 Percent Duration	0.915	ft^3/s	0.274	3.02	28.4	28.4
85 Percent Duration	0.746	ft^3/s	0.224	2.44	31.9	31.9
90 Percent Duration	0.59	ft^3/s	0.173	1.97	36.6	36.6
95 Percent Duration	0.4	ft^3/s	0.101	1.53	45.6	45.6
98 Percent Duration	0.255	ft^3/s	0.0566	1.09	60.3	60.3
99 Percent Duration	0.19	ft^3/s	0.0383	0.888	65.1	65.1

Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

August Flow-Duration Statistics

August Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	19.255	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

August Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	Pll	Plu	SE	ASEp
August 50 Percent Duration	0.729	ft^3/s	0.216	2.42	33.2	33.2

August Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Bankfull Statistics

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	24.672	percent	2.2	23.9

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.07722	59927.7393

Bankfull Statistics Disclaimers [Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	30.2	ft
Bankfull Depth	1.59	ft
Bankfull Area	47.7	ft^2
Bankfull Streamflow	240	ft^3/s

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	25.2	ft
Bieger_D_channel_depth	1.59	ft
Bieger_D_channel_cross_sectional_area	40.6	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	35.5	ft
Bieger_P_channel_depth	1.8	ft
Bieger_P_channel_cross_sectional_area	64.3	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	19	ft
Bieger_USA_channel_depth	1.56	ft
Bieger_USA_channel_cross_sectional_area	32.9	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit

Statistic	Value	Unit
Bankfull Width	30.2	ft
Bankfull Depth	1.59	ft
Bankfull Area	47.7	ft^2
Bankfull Streamflow	240	ft^3/s
Bieger_D_channel_width	25.2	ft
Bieger_D_channel_depth	1.59	ft
Bieger_D_channel_cross_sectional_area	40.6	ft^2
Bieger_P_channel_width	35.5	ft
Bieger_P_channel_depth	1.8	ft
Bieger_P_channel_cross_sectional_area	64.3	ft^2
Bieger_USA_channel_width	19	ft
Bieger_USA_channel_depth	1.56	ft
Bieger_USA_channel_cross_sectional_area	32.9	ft^2

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)
Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_

Probability Statistics

Probability Statistics Parameters [Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	0	percent	0	100
FOREST	Percent Forest	93.7	percent	0	100

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Disclaimers [Perennial Flow Probability]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Probability Statistics Flow Report [Perennial Flow Probability]

Statistic	Value	Unit
Probability Stream Flowing Perennially	0.929	dim

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.37	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 1]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	8600	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.13.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX E:

Particle Analysis

Channel Material

This Worksheet

Three types of data can be accommodated to the right on this sheet:

1. Individual stand alone pebble count for:
   > riffle surface,
   > channel bed or
   > bankfull channel.

2. Weighted pebble counts representing the channel surface with samples taken separately from distinct features or depositional areas.
   > bed features (riffle, pool, etc),
   > bed surface and bank surface,
   > facies or patches of distinct grain size.

3. Bulk sieve analysis for:
   >point bar samples,
   >bed sub-pavement or
   >bank material.

Surface material from this worksheet is linked to the Dimension worksheet where it is used to estimate roughness. Individual or weighted samples will link. If no bed surface is entered, riffle surface is used and then the bankfull channel.

Shape factor and Largest Particle may be entered far to the right of this worksheet.

Reference Reach

Stream:	Kitchen Brook
Watershed:	Hoosic River Watershed
Location:	West Mountain Road, Cheshire
Latitude:	42.5644
Longitude:	-72.8267
County:	Berkshire
Date:	February 15, 2023
Observers:	CM (SWCA)
Channel Type:	B3
Drainage Area (sq.mi)	0.28

Channel Materials	Channel Surface			BkF Channel
D16 (mm)	5.7	---	---	5.7
D35 (mm)	19	---	---	19
D50 (mm)	35	---	---	35
D65 (mm)	56	---	---	56
D84 (mm)	110	---	---	110
D95 (mm)	170	---	---	170
mean (mm)	25.0			25.0
dispersion	4.6			4.6
skewness	-0.13			-0.13
Shape Factor	---			
% Silt/Clay	0%	---	---	0%
% Sand	1%	---	---	1%
% Gravel	68%	---	---	68%
% Cobble	31%	---	---	31%
% Boulder	0%	---	---	0%
% Bedrock		---		
% Clay Hardpan		---		
% Detritus/Wood		---		
% Artificial		---		
Largest Mobile (mm)	---			

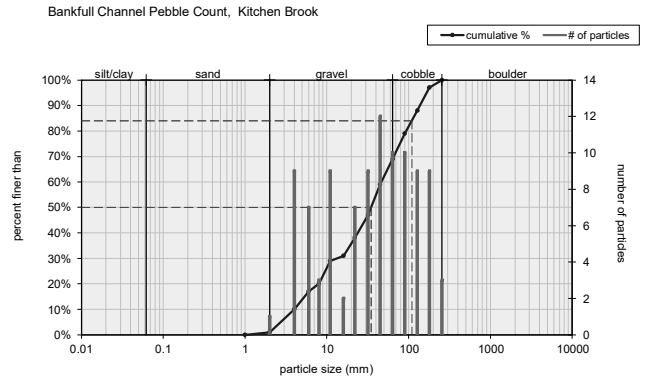
1) Individual Pebble Count

Two individual samples may be entered below. Select sample type for each.

Bankfull Channel

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	
very coarse sand	1 - 2	1
very fine gravel	2 - 4	9
fine gravel	4 - 6	7
fine gravel	6 - 8	3
medium gravel	8 - 11	9
medium gravel	11 - 16	2
coarse gravel	16 - 22	7
coarse gravel	22 - 32	9
very coarse gravel	32 - 45	12
very coarse gravel	45 - 64	10
small cobble	64 - 90	10
medium cobble	90 - 128	9
large cobble	128 - 180	9
very large cobble	180 - 256	3
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
total count:		100

Note: upstream from culvert

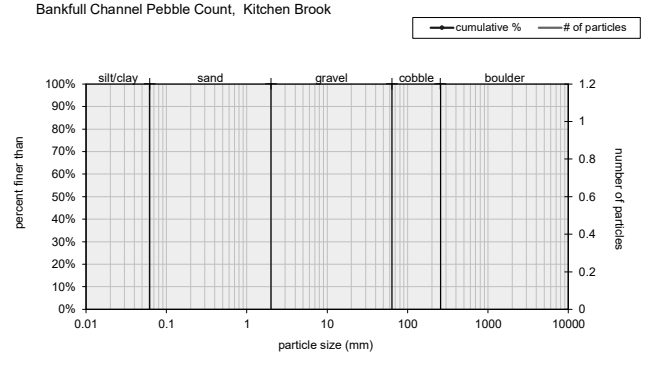


Size (mm)		Size Distribution		Type	
D16	5.7	mean	25.0	silt/clay	0%
D35	19	dispersion	4.6	sand	1%
D50	35	skewness	-0.13	gravel	68%
D65	56			cobble	31%
D84	110			boulder	0%
D95	170				

Bankfull Channel

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	
very coarse sand	1 - 2	
very fine gravel	2 - 4	
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		0
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
total count:		0

Note:



Size (mm)			Size Distribution		Type	
D16	---	3.4	mean	---	silt/clay	---
D35	---	12	dispersion	---	sand	---
D50	---	17	skewness	---	gravel	---
D65	---	20			cobble	---
D84	---	29			boulder	---
D95	---	39				