Town of Weathersfield, VT
Request for Construction Bids
Lottery Lane Aluminum Plate Box Culvert (16'6" x 8'6" x 50')

PROPOSAL OF _____ (hereinafter called

"BIDDER"), organized and existing under the laws of the State of _____,

doing business as _____.

The Town of Weathersfield, VT is accepting bids from contractors to replace a culvert on Lottery Lane located 300' +/- North of Rte. 131. The project includes the removal and replacement of the existing structure with associated channel improvements and bank stabilization. BIDDER hereby proposes to perform all work for the installation of a new box culvert on Lottery Lane in accordance with the attached Scope of Work and General Construction Notes and Requirements at the prices stated below.

SCOPE OF WORK

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization/demobilization	1	LS		
2	Construction Sign Package	1	LS		
3	Traffic Control Plan	1	LS		
4	Tree/brush removal	1	LS		
5	Installation/removal of silt fence	1	LS		
6	Erosion Control	1	ALL	$2,000	$2,000
7	Removal of Existing structure	1	LS		
8	Temporary drainage pipe/pumping	1	LS		
9	Aluminum Cuttoff Walls box/wingwalls	1	LS		
10	16'6" x 8'6" x 50' Alum Plate w/headwalls	1	LS		
11	8' aluminum wingwalls	4	EA		
12	Place and compact 12" coarse gravel	120	CY		
13	Place and compact 12" fine gravel	190	CY		
14	Fine Grading	1	LS		
15	Sloping	1	LS		
16	Type 3 rip-rap	40	CY		
17	Seeding/mulching	1	LS		
18	Guard Rails with 6' posts	56	LF		
19	Guard Rails with 8' posts	100	LF		
20	Guard Rail Anchors	4	EA		
21	Misc. cleanup	1	LS		
22	Boulders	10	CY		
23	Ledge Removal	10	CY		
24	Dewatering	1	LS		
25	Waste Block Dam	1	LS		
26	Payment & performance Bond	1	LS		
				TOTAL	$

NOTE: Refer to the attached description of items for further detail of pay items.
LS=Lump Sum, LF=Linear Foot, EA=Each, SF=Square Foot, SY=Square Yard, CY=Cubic Yard, LU=Lump Unit, TONS= English tons, ALL=Allowance

NOTE 1: Final payments will be based on the actual work completed per the bid tabulation.
NOTE 2: Pages 1-3 of Bids due by 11:00 AM on March 17, 2022 at the Weathersfield Town Hall, Attn: Town Manager. Envelopes are to be clearly labeled "**Lottery Lane Box Culvert RFB**".
NOTE 3: The road may be closed during construction.
NOTE 4: The highway department may have a stockyard area available to the contractor at the Highway Garage located on Stoughton Pond Road. This will be discussed in further detail.
NOTE 5: A non-mandatory pre-bid meeting will be held on site at 9:30 AM on Tuesday, March 8, 2022.

BIDDER hereby agrees to complete the work under the contract between July 1, 2022 and October 1, 2022. In the event the work is not completed by October 1, 2022, BIDDER agrees to pay as liquidated damages, the sum of four hundred ($400.00) dollars for each consecutive calendar day until work is complete unless a time extension is granted by the State of Vermont and Town of Weathersfield, VT.

By submission of the Bid, BIDDER certifies that bid has been arrived at independently, without consultation, commitment or agreement as to any matter relating to Bid with any other BIDDER or with any competition.

Contractors shall furnish all supervision, technical personnel, labor, materials, tools, appurtenances, equipment, traffic control, erosion control, and services required to replace the existing culvert as shown on three plan sheets entitled: "Lottery Lane Box Culvert" Project No. "Weathersfield_Lottery Lane", dated 02/21/22."

The plans are intended for construction by a Contractor with prior bridge/pre-cast culvert replacement experience. The Chosen Contractor shall list prior pre-cast culvert experience and may be required to provide references. The Chosen Contractor may be required to demonstrate that he or she consistently performs work using the highest quality of workmanship. The Chosen Contractor may be required to demonstrate that he or she owns or has access to the equipment required to perform this work.

The contract, if awarded, will be awarded to the least costly, best qualified and most responsible proposer. In determining the "least costly, best qualified and most responsible proposer," in addition to price, the following may be considered:

- The substantial performance of the proposer in meeting the specifications and other terms and conditions of the solicitation;
- The ability, capacity and skill of the proposer to provide the services required, and to do so within the time specified;
- The character, integrity, reputation, experience, financial resources and performance of the proposer under previous contracts with the municipality and elsewhere.

The Town reserves the right:
(1) to accept or reject any or all Bids in whole or in part and to accept other than the lowest price proposal;
(2) to amend, modify, or withdraw this Request for Bids;
(3) to require supplemental statements or information from bidders;
(4) to extend the deadline for responses to this Request for Bids;
(5) to waive or correct any irregularities in Bids received;
(6) to negotiate separately with one or more competing bidders; and
(7) to award the bid deemed in the best interest of the Town. All bids, upon submission, become the property of the Town.

GENERAL CONSTRUCTION NOTES

- All material to be installed in accordance with manufacturer's specifications and instructions.
- The State of Vermont specifications shall be adhered to, a summary of some of the pertinent ones are attached as **Additional Specifications**. Any reference to "Agency" or TOWN shall imply the Town of Weathersfield.
- Notify Digsafe at least 72 hours prior to construction.
- It shall be the contractor's responsibility to comply with OSHA and VOSHA requirements, maintain a safe job site, and protect the safety of the public.
- Contractor will stake out the ends of the proposed culvert with 10' and 20' offset stakes.

BOND REQUIREMENTS

The Chosen Contractor will be required to furnish a Performance Bond and a Payment Bond each in the amount of 100% of the contract price. Upon receipt of these two bonds, the Town will issue a Purchase Order or Agreement to the Chosen Contractor. The Purchase Order shall require the Chosen Contractor to warranty their work to be free from defects in material and workmanship for a period of one year from substantial completion. A Bid Bond is not required.

INSURANCE REQUIREMENTS

1. WORKERS' COMPENSATION: The CONTRACTOR is required to carry full and complete Workers' Compensation insurance for all employees engaged in work on this project. The same requirements for Workers' Compensation insurance shall apply to any subcontractor engaged on this project. The Chosen Contractor shall, prior to a Purchase Order being issued, produce a certificate of insurance demonstrating same to the Town. The Chosen Contractor shall keep said insurance, and the Town's additional insured status, in full force throughout the course of the project. This Certificate of Insurance does not have to be provided at the time bids are submitted.
2. GENERAL LIABILITY INSURANCE: The Chosen Contractor shall supply the Town with a Certificate of Insurance showing liability coverage no less than $1,000,000. The Chosen Contractor shall cause the Town to be made an additional insured on the Chosen Contractor's liability insurance, on a primary and non-contributing basis. The Chosen Contractor shall, prior to a Purchase Order being issued, produce a certificate of insurance demonstrating same to the Town. The Chosen Contractor shall keep said insurance, and the Town's additional insured status, in full force throughout the course of the project. This Certificate of Insurance does not have to be provided at the time bids are submitted.

_____ _____
(Signature of Bidder & Date) (Title of Bidder)

_____ _____
(Contractor) (Street/P.O. Box)

_____ _____
(Town, State, Zip) (Phone # / fax#)

Competent Contract Supervisor: _____ years exp.____

Contractor shall list below the successful completion of similar projects:
1. _____
2. _____
3. _____

Bid Submittal: Only submit Pages 1-3. Due March 17, 2022 at 11:00AM. Late bids will not be accepted. Bids may be mailed to the Town of Weathersfield, VT; 5259 US Route 5; Ascutney, VT 05030. Or they can be submitted in the mailbox located on the East side of the Town Hall – labeled "BALLOTS". Contractors may also bring the bids with them to the bid opening at the Town Hall at 11:00am.

ADDITIONAL CONTRACTOR REQUIREMENTS

The contractor must have the financial resources to obtain materials/equipment and supplies to complete the project and the necessary experience, organization, technical and professional qualifications, skills, equipment and facilities.

The Chosen Contractor shall provide Traffic Control Plan acceptable to the Town Engineer, including any required barricades, signs, and labor. All signs shall conform to MUTCD standards.

The Chosen Contractor shall be responsible for verifying and determining all utilities (above and below ground) within the project limits, and to take necessary precautions to protect utilities during construction. Any discrepancies or Contractor questions shall be brought to the Town Engineer's attention before the start of construction.

All work performed by the Chosen Contractor shall comply with all federal, state, and local regulations and requirements. The Chosen Contractor shall review and understand all applicable environmental permits and ensure that all construction conditions are met. The Chosen Contractor shall provide erosion control.

Shop drawings and design calculations for all pre-cast products stamped by a professional engineer licensed in the State of Vermont shall be submitted for review and approval by the Town's Engineer prior to fabrication. Shop drawings shall include all reinforcement, connection details, etc. for all pre-cast products

The omission from the plans and/or specifications of express reference to any labor or materials reasonably to be inferred there from and necessary for the proper execution of the work shall not relieve the Chosen Contractor from furnishing them of a kind in keeping with the general intent of the work. No responsibility is assumed by the Town Engineer or the Town for omissions or duplications by the Chosen Contractor or his subcontractors due to real or alleged error in arrangement of matter in specifications or in notes on the drawings.

The Town Engineer shall decide all questions which may arise as to the quality, quantity, acceptability, fitness and rate of progress of the several kinds of work and materials to be performed and furnished under the contract, and shall decide all questions which may arise as to fulfillment of the contract on the part of the contractor. The Town Engineer's determination and decision shall be final and conclusive as to any and all issues which may arise under the contract.

The Chosen Contractor shall be solely responsible for repairing or paying to repair any damage to private or public property sustained during and as a result of construction activities to original condition.

ADDENDUMS: Questions about this Request for Bid shall be directed by email solely to the Engineer - Everett Hammond through email at hammondeng@gmail.com. The last day for contractor questions shall be March 11, 2022 at 7:00pm. Addendum's if necessary will be emailed out to bidders of record (from the non-mandatory meeting) and posted on the Town's website (www.weathersfieldvt.org). The final Addendum will be emailed to the bidders of record (from the non-mandatory meeting) and posted by March 14, 2022.

Attachments to this Request for Bid: Hydraulic study, Aluminum Plate Box information from Lane Enterprises, geotechnical report and 5 plans sheets by Hammond Engineering (separate pdf). The Stream Alteration General Permit and Corp of Engineers Permit is not available at this time.

Description of pay Items

Item#	Description of work
1	**Mobilization/Demobilization:** This line item is inclusive of all bonds and insurances and is subsidiary to the contract.
2	**Construction Sign Package:** The contractor shall install road closure signs, detour signs and "No Pedestrian" signs. All other signs for complete road closures or partial road closures shall be installed by the contractor and conform to the MUTCD Standards.
3	**Traffic Control Plan:** A traffic control plan shall be submitted to the Town prior to the start of the project. Signs for complete closure shall be installed by the contractor and conform to MUTCD Standards. Additional information can be found in the 2009 edition of the MUTCD Manual (pages 649-651). http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part6.pdf.
4	**Tree/brush removal:** There is minimal tree/brush work which could be cut or removed with an excavator.
5	**Installation/removal of silt fence:** The limits of work within the wetlands identified on the plan shall be staked out with silt fence and keyed in with a small amount of ¾" natural stone. This will avoid disturbance of the wetlands. The silt fence shall be removed upon the establishment of vegetation, however the stone shall be scattered and left in place.
6	**Erosion Control (allowance):** An allowance has been carried in each bidders pay item for any erosion control above and beyond item 5 above (silt fence). Example, silt bags. Payments will be made on time and expense based on work completed.
7	**Removal of Existing structure:** The contractor shall remove and dispose of the existing culvert.
8	**Temporary drainage pipe/pumping:** The contractor shall provide a minimum 36" temporary piping and pumping (as needed) to maintain flow to the existing stream. This temporary piping shall be removed by the contractor after the new drainage structure is prepared to accept the stream. The temporary culvert shall be a minimum size of 36" diameter with sand bags equal to or greater than the top of pipe. The contractor may use a larger size to reduce flooding risks. This piping shall be removed by the contractor after the new drainage structure is prepared to accept the stream. The hydraulic study has been attached for use by the contractor.
9	**Aluminum cutoff walls box/wingwalls:** This shall be for the excavation, anchoring and placement of the cutoff walls for the precast 4-sided box culvert and wingwalls. Waste Concrete blocks shall not be used.
10	**16'6" x 6'8" x 50' Aluminum Plate Box w/ headwalls:** This work will include all work associated with the installation of the new precast 4-sided box culvert. The culvert shall be designed for the controlling HL-93 loading (with only 1.6' of cover); backed up by calculations and a shop drawings by a Vermont Professional Engineer and approved by the Project Engineer. The precast aluminum box culvert shall be supplied by the contractor and include: • Shop Drawing submittals of the box shall be submitted to the Engineer for approval. • Excavation • 2' aluminum cutoff walls under the box and wing consistent with the make of the box. • Bedding under the culvert: 10" of Coarse Dense Grade capped with 2" +/- of course surepak fine graded to within ¼" or less. If the bottom of the excavation is soft, than a layer of stabilization fabric may be used capped with 10" of 1.5" stone and 2" of ¾" stone. • 16'6" x 6'8" x 50' Aluminum Plate Box w/ headwalls - the inlet/outlet of the box shall be manufactured plumb. • 1' headwalls • Installation per the details on the drawings • Crane or excavator for placement (as necessary) • Hardware tying the precast sections together (2 per joint) • Metal or Concrete Weirs: A 12" wide x 12" high weir at the edge culvert tapering to 6" in the center of the culvert shall be installed at the inlet, outlet and every 8' throughout the bottom of the culvert.

	• Stream bed stone fill placement of material as follows: Natural backfill material found from the site shall be placed at a depth of 24" of each section. Prior to placing this material, an initial 8" layer of material with a maximum size of 3" shall be placed for protection of the bottom of the culvert. This shall be followed by a 16" layer of VT Type E2 stone as follows: 25% - with a maximum dimension of 2"; 50% with a least dimension of 18". • Granular backfill and compaction to 95% standard proctor. Granular backfill (VTRANS Specification 704.08A) shall be installed a minimum of 4' from the outside of the bottom of the box. This granular backfill envelope shall extend vertically up to the road gravel section. The granular backfill gravel quantities for this are included in this line item. Contractor shall submit gravel samples a minimum of 7 days prior to anticipated use. The Town will have these samples tested at their expense. Should the contractor submit a sample that fails the expense of the replacement sample shall be at the Contractors expense. • The outside of the box shall be covered with 2 layers of marafi 700X prior to backfilling. The fabric shall extend from the top of the box to within 1' of the bottom. All gravel and backfill materials to within 1.5' of the road surface shall be supplied by the CONTRACTOR. Gravel material with a maximum stone size of 2" shall be placed within a 4' width of the outside of the box culvert. NOTE: The culvert design was sized based on the BC-A-37 Aluminum Plate Box Culvert from Lane Enterprises. For convenience, their contact information has been included at the end of these specifications in a quote Kent Wusterbarth sent. This was only an estimate of the box and does not have the headwall or the wingwalls included. Contractors are free to use other vendors providing they meet the above size and loading with 1.4' of cover. SOIL BORINGS: Attached at the end of theses specifications is the boring location and data from M & W Soils Engineering.
11	**8' aluminum wingwall:** Contractor shall excavate and provide the aluminum wingwall and compaction to 95% standard proctor. The vertical joints of the wingwalls shall have a gap no greater than ¼" with 2 layers of road stabilization fabric installed in the vertical joint prior to backfilling. Crushed stone and granular backfill shall be installed behind the wingwall.
12	**Place and compact 12" coarse gravel:** Base crushed gravel shall be placed in all locations where the road is being widened or excavated. Gravel shall meet the State of Vermont Specifications 704.05A. Contractor shall submit gravel samples a minimum of 7 days prior to anticipated use. The Town will have these samples tested at their expense. Should the contractor submit a sample that fails the expense of the replacement sample shall be at the Contractors expense. Gravel shall be paid by the Cubic Yards compacted in place. It is estimated the following coarse gravel is needed: • 100' x 30' width x 1'/27 = 111 CY **USE 120 CY**
13	**Place and compact 12" fine gravel:** The final crushed gravel surface shall have 12" of compacted crushed gravel in locations where the road is being widened or excavated. The gravel shall be compacted to 95% standard proctor. Gravel shall meet the State of Vermont Specifications 704.05A. Contractor shall submit gravel samples a minimum of 7 days prior to anticipated use. The Town will have these samples tested at their expense. Should the contractor submit a sample that fails the expense of the replacement sample shall be at the Contractors expense. Gravel shall be paid by the Cubic Yards compacted in place. It is estimated the following coarse gravel is needed: • 175' x 28' width x 1'/27 = 182 CY **USE 190 CY**
14	**Fine Grading:** The final grades shall be as shown on the attached plans. The gravel surface shall be fine graded to within 1/2" of finish gravel grade.
15	**Sloping:** Sloping shall include cut and fill slopes on the project. Slopes shall be stabilized with ditching material in remote areas and topsoil in lawn areas prior to seeding and mulching.
16	**Type 3 rip-rap:** Rip-Rap shall be supplied and installed at the inlet, outlet ends of the box and along the toe of the stream as shown on the plan.

17	**Seeding/mulching:** Conservation mix shall be applied in all areas including the 7" – rip raped slope. The conservation max shall be covered with mulch, with the exception of the rip rap location.
18	**Guard Rails w/6' posts:** Steel Beam Guard Rail shall be installed as part of this project. Refer to VTRANS Detail Sheet G-1D for details. The guard rail over the box shall staked out prior to installation so that no more than two posts line up over the Box. The post over the box shall be hand dug to prevent damage to the box. The posts over the box shall be cut off a distance from 1' from the top of the culvert with a 6" x 6" galvanized bearing plate installed under the cutoff post.
19	**Guard Rails w/8' posts:** Steel Beam Guard Rail shall be installed as part of this project. Refer to VTRANS Detail Sheet G-1D for details. The guard rail over the box shall staked out prior to installation so that no more than two posts lines up over the Concrete Box. The post over the box shall be hand dug to prevent damage to the box. Anchors shall be installed.
20	**Guard Rail Anchors:** Anchors shall be installed as part of this project. Refer to VTRANS Detail Sheet G-1D for details.
21	**Misc. cleanup:** Cleanup of construction debris throughout the project.
22	**Boulders:** A boulder is defined as any rock larger than 1 CY. The borings do not indicate any boulders, however a small amount has been carried in the event boulders were missed or used as backfill. An estimate of 10 CY has been used. Boulders removed during excavation may be used on the project if approved by the engineer.
23	**Ledge Removal:** The borings do not indicate any ledge for this site, however a small amount has been carried in the event that there is a piece of ledge or an old abutment that needs to be hammered out.
24	**Dewatering:** Pumping from or dewatering of the excavation will be in conformance with the Contractor's sequence or schedule of operations. The discharge from any pumping operation, filtration system, or settling shall be contained in a silt bag prior to discharge into the wetlands. Due to the level of the groundwater, it is anticipated that the contractor will need more than 2 sump pits to dewater the project during the preparation of the base prior to the installation of the pipe.
25	**Waste Block Dam:** It is not anticipated that a cofferdam will be needed on this project. According to the Town of Weathersfield, the site dried up during the hot dry summer of 2020. In 2021, the stream dried up in July to the point that pumps could have been used to handle the stream. Due to the confined work limits of the site, this line item has been added in the event that additional measures are needed to hold back the soil in order to maintain the slopes during excavation from the inlet end to the center of the road. The waste blocks shown on the plan are from the inlet to the center of the road. They are 6' long x 3' wide x 1.5' tall for a total of 17 per level x 2 levels (3' height total) = 34 blocks. This line item shall be paid if warranted based on the percentage of blocks needed. Additional blocks be needed will be with the approval of the Engineer/Town.
26	**Payment & Performance Bond:** A bid bond will **NOT** be required at the time the bid is submitted. The contractor must submit a Payment & Performance Bond equal to 100% of the contract price with a corporate surety approved by the Town within 7 days after the NOTICE of AWARD is issued to the CONTRACTOR.

ADDITIONAL SPECIFICATIONS: SECTION 100

103.04 INSURANCE REQUIREMENTS. Insurance obtained by the Contractor to cover the below-listed requirements shall be procured from an insurance company registered and licensed to do business in the State of Vermont. All insurance coverage for property damage shall provide coverage for "Replacement" cost. Before the Contract is signed and becomes effective, the Contractor shall file with the Agency a certificate of insurance, in duplicate, executed by an insurance company or its licensed agent(s), on a form satisfactory to the Agency, stating that with respect to the Contract awarded, the Contractor carries insurance in accordance with the following requirements. Renewal certificates for keeping the required insurance in force for the duration of the Contract shall also be filed as specified above.

No warranty is made that the coverage's and limits listed herein are adequate to cover and protect the interests of the Contractor and any subcontractor for the Contractor's and any subcontractor's operations.
These are solely minimums that have been established to protect the interests of the State.

(a) Workers Compensation Insurance. With respect to all operations performed the Contractor shall carry Workers Compensation Insurance in accordance with the laws of the State of Vermont, 21 V.S.A. Chapter 9. The Contractor shall also ensure that all subcontractors carry Workers Compensation Insurance in accordance with 21 V.S.A. Chapter 9 for all work performed by them.

(b) Commercial General Liability Insurance. With respect to all operations performed by the Contractor and subcontractors, the Contractor shall carry Commercial General Liability Insurance on an occurrence form providing all major divisions of coverage, including but not limited to:

Premises - Operations
Independent Contractor's Protective
Products and Completed Operations
Personal Injury Liability
Property Damage
Collapse and Underground (CU) Coverage

Limits of coverage shall not be less than:
$1,000,000 Each Occurrence
$1,000,000 General Aggregate applying, in total, to this project only
$1,000,000 Products/Completed Operations Aggregate

The Contractor and/or subcontractors shall also carry Automobile Liability Insurance covering all motor vehicles.

SECTION 104 - SCOPE OF WORK

104.01 INTENT OF CONTRACT. The intent of the Contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the Plans, Specifications, and other provisions of the Contract.

104.02 ALTERATION OF PLANS OR CHARACTER OF WORK. To suit conditions disclosed as the work progresses, the Engineer may, make alterations in the design, in type of materials, in the quantities or character of the work or materials required, in the cross-sections, in dimensions of structures, in length of project, in locations, and any other ways deemed appropriate. Alterations will not constitute a change in other parts of the Contract or a waiver of any condition of the Contract, and shall not invalidate any of the provisions of the Contract Documents. Payment for work occasioned by changes or alterations will be made according to a change order. If the altered or added work is of sufficient magnitude to require additional time in which to complete the project, a time adjustment will be made.

104.03 EXTRA WORK. The Contractor shall perform extra or unforeseen work for which there is no quantity and price included in the Contract according to the Contract or as directed by the Engineer whenever it is deemed necessary or desirable by the Engineer in order to complete the work as contemplated; payment will be made through a change order.

SECTION 105 - CONTROL OF THE WORK

105.01 AUTHORITY OF THE ENGINEER.
(a) General. The Engineer shall decide all questions which arise concerning the quality and acceptability of materials furnished, the manner of performance of the work, the rate of progress of the work, and compliance with the requirements of the Contract; the Engineer shall decide all questions concerning interpretation of the Contract.

(b) Quantities; Orders; Disputes; Rejection of Materials, Work; Suspension of Work. The Engineer shall determine the amount and quantity of the work performed and materials furnished that are to be paid for under the Contract. The Engineer shall have authority to enforce and make effective decisions and orders the Contractor fails to carry out promptly. In case of any dispute arising between the Contractor and the Engineer as to materials furnished or the manner of performing the work, the Engineer has the authority to reject the materials and/or to suspend the work until the dispute is decided. The Engineer is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract Documents. The Engineer has authority to suspend the work or withhold payment of all estimates due the Contractor when necessary to secure proper compliance with the Contract.

(c) Performance of Work by Engineer; If the Contractor fails to perform work ordered by the Engineer, the Engineer may, upon written notice, proceed to perform the work as deemed necessary; the cost of the work will be deducted from any monies due or which may become due the Contractor under the Contract.
(d) Advice by Engineer. Advice given the Contractor by the Engineer shall not be construed as binding the Agency in any way, or releasing the Contractor from any obligations under the Contract.

105.03 PLANS AND WORKING DRAWINGS. A complete description of the work requires both the Plans, which are furnished to the Contractor by the Agency, and Working Drawings, which are submitted to the Agency by the Contractor or the Contractor's suppliers. The Plans and Working Drawings will be provided as follows:

(a) Contract Plans. The Agency will furnish Plans, consisting of general drawings and details that are necessary to give a comprehensive description of the construction contemplated. The Plans will show general features of all structures, alignment, grades, typical cross-sections, and specific cross-sections.
The Town will furnish the Contractor one copy of a signed set of half scale Plans and four complete half scale sets of Plans. Additional sets or partial sets requested by the Contractor or a subcontractor, Fabricator, or supplier will be furnished at cost. The Contractor shall keep one set of complete Plans available on the project at all times.

(b) Working Drawings.
(1) General. Certain items and construction activities require plans, drawings, procedures, and other information to document the Contractor's proposed actions to conform with Contract requirements. Drawings and procedures shall be submitted sufficiently in advance of the anticipated work to allow for review(s), comment(s), and correction(s). The cost of furnishing Working Drawings, including obtaining any necessary design or field measurements, shall be included in the Contract unit price for the item involved. When a Contract item requires calculations to be submitted, the calculations shall be included with the submittal of the Working Drawings. Manufacturer's engineering data for prefabricated materials, including that for falsework and forms, shall be submitted with each set of Working Drawings.

105.06 COOPERATION BY CONTRACTOR.
The Contractor shall:

(a) Plans and Specifications. Have available on the project at all times during the prosecution of the work one copy each of the Plans and Specifications;

(b) Competent Contractor Superintendent. Have on the project at all times a competent and reliable English-speaking Superintendent authorized to receive orders and to act for the Contractor. The Contractor shall make every effort to provide continuity in the position of Superintendent. However, the TOWN reserves the right to refuse or terminate the assignment of any Superintendent on the project.

(c) Competent Safety Officer. Have available on the project at all times during the prosecution of the work a competent and reliable English-speaking employee designated as the safety officer; this person shall be authorized to receive orders and issue binding directions concerning safety to all persons associated with the project who are employed by the Contractor, subcontractors or material suppliers. This individual shall be well versed in OSHA and VOSHA regulations, shall be capable of implementing a plan to conform to these regulations, and shall have the authority to stop construction operations on the project.

(d) Emergency Contacts. Furnish to the Engineer a list of addresses and telephone numbers of the Contractor's personnel who can be reached in an emergency. The Contractor shall alert certain personnel to stand by and shall inform the Engineer of any arrangements.

(e) Facilities; Information; Assistance; Samples; Control Points. Provide all reasonable facilities and furnish the information, assistance, and samples required by the Engineer or Inspector to properly inspect and test materials and quality of work; and cooperate in setting and preserving stakes, bench marks, and
other control points used in laying out the work.

(f) Foul Language: The contractor shall refrain from the use of foul language while working on this project, particularly when in earshot of the local residents.

105.07 COOPERATION WITH UTILITIES.
(a) General. The TOWN will notify all utility companies, pipeline owners, and other known parties affected and endeavor to have all necessary adjustments of the public or private utility fixtures, pipelines, and other appurtenances within or adjacent to the limits of construction made as soon as practical.

(b) Moving Utility Property; Owner's Expense. Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the owners at their expense, unless otherwise provided in the Contract.

(c) Utility Interference; No Claim for Delays. The Contractor acknowledges and understands that, at the time of bid submission, it has considered all of the permanent and temporary utility facilities or appurtenances in their present and/or relocated positions as shown on the Plans and evident at the site. Notwithstanding any other provision of law, case law, regulation, or the Contract, no additional compensation will be allowed for any delays, inconvenience or damage sustained by the Contractor due to any interference from utilities, utility companies, utility facilities, appurtenances, or the operation of moving them.

(d) Utility Relocation for Contractor's Convenience. Should the Contractor desire temporary changes of location of any utility facilities or appurtenances for convenience in performing the work, the Contractor shall satisfy the TOWN that the proposed relocation does not interfere with its own or other contractors' operations or the requirements of the work and does not cause an obstruction or a hazard to traffic. The Contractor shall be responsible for requesting such relocation work of a utility and/or other affected parties. Such relocation work shall be made solely at the Contractor's expense.

105.09 CONSTRUCTION STAKES.
(a) Initial Layout. Unless other methods of placing stakes are provided in the Contract, the Engineer will be responsible for setting sufficient points to establish the initial alignment and elevation of the proposed work; this shall include centerline offset stakes marked with centerline finish grades, offsets for establishing working points for any structures on the project, critical horizontal control points, and an adequate number of benchmarks for establishing vertical control. The Contractor shall check the proposed grades; any mistakes or errors identified shall be brought immediately to the attention of the Engineer, and adjustments will be made by the Engineer.

(b) Layout of Subgrade. Prior to fine-grading the subgrade for the box culvert, the Contractor/Engineer will recheck the offset stakes from which the Contractor shall set control. Any mistakes or errors identified shall be brought immediately to the attention of the Engineer, and adjustments will be made by the Engineer.

105.10 AUTHORITY AND DUTIES OF ENGINEER
(ENGINEER). As the direct representative of the TOWN, the Resident Engineer on a project has immediate charge of the engineering details of the project; is responsible for the administration and satisfactory completion of the project(s); has the authority to reject defective material, to suspend any work that is being improperly performed, and to withhold payment until defective work has been corrected. The Engineer has the authority to suspend work, or specific aspects of the work, if necessary to address a concern for safety of the workers or traveling public, or a serious environmental concern or violation. Notwithstanding any other provision of law, case law, regulation, or the Contract, no additional compensation shall be provided for any work suspensions of this sort.

104.07 FINAL CLEANING UP FOLLOWING COMPLETION OF PROJECT.
(a) Cleanup of Project. Upon completion of the work, before acceptance, and before final payment will be made, the Contractor shall satisfactorily and completely clean and remove from the right-of-way and grounds occupied by the Contractor in connection with the work all equipment, falsework, surplus and discarded materials, rubbish, temporary structures, buildings, tools, lumber, refuse, and other unsightly material.

(b) Restoration of Property. The Contractor shall restore in an acceptable manner satisfactory to the Engineer all property, both public or private, which has been damaged during the prosecution of the work; replace or renew any fences damaged; leave the waterways unobstructed; and leave the construction area in a neat and presentable condition throughout the entire length of the work.

(c) Drainage Structures and Ditches. The removal and disposal of silt, debris, and other material from drainage structures and ditches, whether deposited prior to or during construction under the Contract, shall be accomplished prior to acceptance of the project as ordered by the Engineer.

(d) Closure of Material Supply and Disposal Areas. Material supply areas shall be cleaned up to its original condition.

(e) Costs. Costs involved with final cleanup following completion of the project will either be paid for under specific pay items or be incidental to all other Contract items.

107.11 USE OF EXPLOSIVES.

General: The Contractor shall use the utmost care to protect life and property and, whenever directed by the Engineer, shall reduce the number and size of explosive charges. Blasting mats shall be used when required by regulation or deemed necessary. The Contractor shall notify each person, company, corporation, or public utility that owns, leases, or occupies property or structures near the site of the work of plans to use explosives; notice shall be given sufficiently in advance to enable people to take such steps to protect their property or structure from injury as they may deem necessary. Provision of notice shall not relieve the Contractor of responsibility for any damage resulting from the Contractor's blasting operations. All persons within the danger zone of blasting operations shall be warned, a warning whistle shall be sounded, and the zone cleared just prior to blasting. A sufficient number of flaggers shall be stationed outside the danger zone to stop all approaching traffic during blasting operations. Explosives shall be used only during daylight hours and shall be handled only by competent, trained workers; particular care shall be taken to ensure that no unexploded charges remain in the work area unattended and when constructions operations cease for the day. All explosives shall be stored securely, all storage locations shall be clearly marked "DANGEROUS-EXPLOSIVES," and all storage locations shall be supervised and controlled by a competent, trained person at all times. All explosives and highly flammable materials shall be stored and used in strict conformity with all Federal, State, and local laws, rules, and regulations. Attention is directed to VOSHA *Safety and Health Standards for Construction*, Subpart U, Blasting and the Use of Explosives.

Insurance: The Contractor acknowledges full responsibility and assumes full liability for any and all damage or injury to persons or property caused either directly or indirectly by the Contractor's or a subcontractor's use of explosives. The liability of the Contractor shall apply equally to damages or injury to persons or property whether said injury or damage occurs within or outside of the right-of-way. The cost of all precautionary measures shall not be paid for directly, but all costs therefore shall be included in the bid prices for the pay items under the Contract.

Warning Signs; Costs Incidental: Prior to blasting operations the Contractor shall install warning signs in conformance with the MUTCD. Warning signs shall be located in prominent positions at least 370 m (1200 feet) from the point of blasting and visible to any person approaching the blasting point. Payment for furnishing, erecting and maintaining warning signs shall be considered incidental to other items in the Contract.

Documentation of Structure Condition: It shall be the responsibility of the Contractor to document the existing condition of all structures that have potential for damage. This documentation shall be in the form of a video or pictures, with sufficient description, and shall be supplied to the Engineer prior to any blasting on the project. The costs of preparing this documentation will not be paid for directly, but shall be
considered incidental to all Contract items.

Blast Surveys: The Contractor shall monitor all blasts and provide a report to the Engineer that shall indicate the Peak Particle Velocity (PPV) of the blast. The PPV sensitivity as reported shall range from less than 0.5 mm/s (0.02 in/s) to more than 125 mm/s (5.0 in/s). The Engineer reserves the right to request more than one instrument to monitor the blasting if there is a need for monitoring in more than one direction from the blasting area. The costs of the monitoring and preparing the reports will not be paid for directly, but shall be considered incidental to all Contract items.

107.18 CONTRACTOR'S RESPONSIBILITY FOR WORK.
General: Until acceptance of the project by the Engineer the Contractor shall be responsible therefore and shall take every precaution against injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work before acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God, of a public enemy, or governmental authorities. For purposes of this paragraph the term work shall exclude Contractor owned, rented, or leased materials, equipment, and incidentals.

109.06 EXTRA AND FORCE ACCOUNT WORK. Extra work ordered and accepted as specified in Subsection 104.03 will be paid for on a unit price or lump sum basis under a Change Order. The Change Order will be made before the work is started. When the Engineer deems it impractical to handle any Extra Work ordered on a unit price or lump sum basis, a Supplemental Agreement will be made and the work will be ordered done and paid for on a force account basis as follows: Any additional costs for Public Liability Insurance and Property Damage Insurance that are required in the Contract will be allowed and reimbursed at the actual cost to the Contractor.

DIVISION 200: EARTHWORK

201.03 GRUBBING. Grubbing shall consist of removing and disposing of all stumps, roots, duff, grass, turf, debris, or other objectionable material within excavation limits, and within fill limits where the embankments are to be made to a depth less than 1.5 m (5 feet) below subgrade. Grubbing areas shall also include any other areas shown in the Contract Documents. The grubbing shall progress in such a manner to prevent erosion. The excavated section left below the

subgrade by removals shall be backfilled with approved excavated material or borrow and compacted to conform to the surrounding area.

SECTION 203 - EXCAVATION AND EMBANKMENTS
203.01 DESCRIPTION. This work shall consist of excavating and grading roadways, runways and railways (including the removal of slides), borrow pits, waterways, channels, intersections, approaches, and steps in hillside embankments; excavating unsuitable material from the construction area and beneath embankment areas, surfaces, and pavements; excavating selected material found in the construction area for specific use in the construction; constructing and removing detours shown on the Plans or directed by the Engineer; trimming and shaping of slopes; and disposing of all unsuitable or surplus excavated material. The work shall also consist of placing material in embankments and the grading of all material placed up to subgrade to the tolerance specified in the Plans. The work is classified as follows:

(a) Common Excavation. Common Excavation shall consist of the
removal of all material, which can be accomplished with normal excavating machinery, encountered in grading the project and not classified to be removed as Solid Rock Excavation, Muck Excavation, Channel Excavation, Excavation of Surfaces and Pavements, or Excavation for Structures. Excavation required beyond the finished slope neat lines for slope stabilization, removal of sod and unsuitable material other than muck located in embankment areas, removal and stockpiling of topsoil, and removal of unsuitable material existing at or below subgrade elevation in excavation areas is also classified as Common Excavation.

(b) Solid Rock Excavation. Solid Rock Excavation shall consist of the removal of hard igneous, metamorphic, or sedimentary rock that requires blasting or the use of rippers; detached rock; boulders; mortared stone masonry; or concrete each having a volume of 2 cubic yards or more; and portland cement concrete pavement including any bituminous surface overlay material, encountered in the limits of excavation.

203.09 DISPOSAL OF SURPLUS EXCAVATION AND WASTE MATERIAL.
It is the contractor's responsibility to locate a suitable location for the disposal of all surplus or waste material. Disposal of surplus or waste material will not be paid for directly but shall be considered as incidental work pertaining to the grading or excavation contract item from which the material was obtained.

208.01 COFFERDAMS DESCRIPTION. The following is a summary from VTRANS 2011 Standard Specifications. VTRANS full specifications including submittals by a professional engineer shall apply. This work shall consist of the construction, material excavation within, dewatering, maintenance and removal of cofferdams in accordance with the Contract Documents. The work will be classified as follows:

(a) Cofferdam. This item shall consist of providing a method for the purpose of constructing, in the dry, a specific foundation or other component of a structure in accordance with Contract requirements. This may involve the design, construction, maintenance, and removal of a watertight structure or may involve alternate methods of de-watering and stabilizing the specific site. Construction of foundation seals per Contract or as required per Contractor plans and schedule of operations is also within the scope of work for the Cofferdam item. The Contractor shall obtain any and all necessary permits or clearances for alternate methods. A cofferdam may have only two or three sides depending upon the particular location and the Contractor's design.

Cofferdam Excavation, Earth: This item shall consist of all material excavated within the pay limits as set forth in these specifications or indicated on the Plans except solid rock, mortared stone masonry, concrete, and boulders measuring 0.5 cubic meters (cubic yards) or more.

208.07 COFFERDAMS. The Contractor shall prepare detailed plans and a schedule of operations for each cofferdam specified in the Contract. Construction Drawings shall be submitted in accordance with VTRANS Specification Section 105.
Cofferdam construction shall conform to AASHTO Standard Specifications for Highway and Bridge Construction, Division II, Section 1.4. Cofferdam. The quantity to be measured for payment will be on a lump sum basis for each cofferdam specified on the Plans or in the Contract.

(b) Cofferdam Excavation, Earth. The quantity to be measured for payment will lump sum and included as part of the culvert excavation.

208.08 PUMPING. Pumping from or dewatering of the interior of any cofferdam enclosure shall be performed so that disturbance of the subsoil or freshly placed concrete will not occur. Dewatering of a sealed cofferdam will be in conformance with the Contractor's sequence or schedule of operations. Pumping during the construction of a foundation or other structural component shall be from a suitable sump separated from the concrete work.

301.05 SURFACE TOLERANCE. The surface of the compacted road subbase will be checked by the Engineer randomly at selected locations. The variation of the surface shall at no point exceed 2 inches. The required crown and superelevation shall be maintained. All humps or depressions exceeding the specified tolerances shall be corrected by reshaping or removing defective work and replacing it with new material as directed by the Engineer.

The maximum layer thickness for placement of any aggregate surface material shall be 12 inches after compaction. All layers shall be placed and compacted at approximately equal thickness. After each layer of surface material is placed, it shall be thoroughly compacted to a uniform density of not less than 95 percent of the maximum dry density determined by AASHTO T 99, Method C. Suitable and effective equipment, meeting the approval of the Engineer, shall be used to obtain a true and even surface during compaction. All holes or depressions found during the compacting shall be filled with additional material, reworked, and compacted. If required, water shall be uniformly applied over the aggregate material during compaction in an amount necessary to produce proper consolidation.

301.06 COMPACTION. Compaction of each layer shall continue until a density of not less than 95% of the maximum dry density has been achieved. Field density testing will be performed by the TOWN in at locations determined by the Engineer. Compaction operations shall proceed such that the target field density as determined in accordance with this Subsection is achieved. The contractor shall give the ENGINEER adequate time to allow for compaction testing.

301.07 METHOD OF MEASUREMENT. The quantity of subbase to be measured for payment will be the number of cubic yards of the type specified for use in the complete and accepted work, as determined by the plan dimensions of the compacted material.

END OF NARRATIVE

VERMONT

State of Vermont
Structures and Hydraulics Section
One National Life Drive
Montpelier, Vermont 05633-5001
vtrans.vermont.gov

[phone] 802-917-8487
[fax] 802-828-3566
[ttd] 800-253-0191

Agency of Transportation

TO: Meghan Brunk, District 2 Technician
Marc Pickering, District 2 Project Manager

CC: Scott Jensen, A.N.R. River Management Engineer

FROM: Cassidy Cote, Hydraulics Engineer
Elizabeth Laughlin, Structures and Hydraulics Intern

DATE: September 16, 2019

SUBJECT: Weathersfield TH-11, Lottery Lane, over unnamed stream tributary of North Branch Black River
Site location 270 feet north of VT-131
GPS coordinates: N 43.409260°, W 72.503205°

We have completed our hydraulic study for the above referenced site, and offer the following for your use:

Hydrology

The following physical characteristics are descriptive of this drainage basin:

Drainage Area	3.6 square miles
Avg. Drainage Basin Slope	7.0 %
Water Bodies and Wetlands (NLCD 2006)	1.3 %

Using the USGS hydrologic method, the following design flow rates were selected:

Annual Exceedance Probability (AEP)	Flow Rate in Cubic Feet per Second (cfs)	
43 %	160	
10 %	300	
4 %	400	Design Flow – Local Road
2 %	490	
1 %	580	Check Flow

Channel Morphology

The channel for this perennial stream is straight with an estimated local channel slope of 0.6-1.9%. Approximately 0.2 miles upstream of the structure, the channel runs through BR-11 beneath VT-131. Evidence of possible beaver activity was noted upstream, and incised channel banks were observed downstream. Wetlands are present on both sides of the crossing. Field measurements of bankfull width varied from 10 to 13 feet at a bankfull depth of 2 to 3.5 feet upstream and downstream of the structure.

The confluence of this brook with the North Branch Black River is 0.37 miles downstream of this structure. These hydraulic conditions indicate that the culvert in question may be affected by water backing up from the North Branch Black River during flood flows on that river. **Further analysis would be required to determine the extent of this possibility as this memo strictly addresses replacement options considering free flow conditions and environmental standards. Headwater depths may vary significantly as a result of backwater developed by the North Branch Black River and/or available floodplain storage.**

Existing Conditions

The existing structure is a corrugated metal pipe arch with a clear span of approximately 72.2 inches and a clear height of 44.4 inches, providing a waterway opening of 17.5 square feet. The inlet has observed scour, particularly on channel right, measuring 0.9 ft. below the inlet invert. An outlet scour pool is present downstream. Scour pools on both sides of the crossing have resulted in the presence of standing water through this crossing.

Our calculations, field observations and measurements indicate the existing structure does not meet current standards of the VTrans Hydraulic Manual nor does the existing structure meet state stream equilibrium standards for bankfull width (span length). The existing structure constricts the channel width, resulting in an increased potential for debris blockage. This complication is known to cause ponding at the inlet, increase stream velocity and scour at the outlet, and may lead to erosion and failure of channel banks. This structure results in water overtopping the roadway prior to the 43% AEP.

Replacement Recommendations

In sizing a new structure, we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards regarding span length and opening height, and allow for roadway grade and other site constraints. Please note that the tools implemented to produce these recommendations are most applicable to steeper gradient well defined streams. Due to the proximity of wetlands, a smaller structure than recommended may be adequate for this crossing, however this would require a more detailed study and/or input from regulators.

The low height from the streambed to the road may limit the replacement options to a box structure, as the roadway could have to be raised substantially for the pipe arch recommended below. This option is not recommended as an increase in roadway elevation could create a dam, thereby increasing the extent of flooding upstream. Manufacturers can provide specific recommendations regarding minimum and maximum fill heights and required pipe thickness. Based on the above considerations and the information available, we recommend any of the following structures as a replacement at this site:

- A concrete box with an inside opening span of 13 feet and minimum height of 7 feet. The box invert should be buried 2 feet. This will result in a clear height of 5 feet above streambed, providing 65 square feet of waterway area. Bed retention sills should be added in the bottom of the structure. Sills should be 12 inches high at the edges of the box and 6 inches high in the center, creating a V-shape across the full width of the box. Sills should be spaced no more than 8 feet apart throughout the structure with one sill placed at both the inlet and the outlet. The structure should be filled level to the streambed with E-stone, Type II, allowing flow to be kept above the surface, providing the conditions necessary for aquatic organism passage. **It is anticipated that the roadway profile will need to be raised to install this structure.** Using an elevated roadway, this structure results in a headwater depth of 5.3 feet at 4% AEP and 7.1 feet at 1% AEP.

- A pipe arch with a clear span of 154.4 inches and height of 99.7 inches. The invert should be buried 24 inches. This will result in a clear height of 75.7 inches above streambed, providing 64 square feet of waterway area. Bed retention sills need to be added and filled as described for the box above**. It is anticipated that the roadway profile will need to be raised to install this structure.** Using an elevated roadway, this configuration results in a headwater depth of 6.1 feet at 4% AEP and 8.3 feet at 1% AEP.

Note: *Any similar structure that fits the site conditions could be considered. Please contact the VTrans Hydraulics Section with alternatives that have significantly different inlet geometry so headwater depths may be calculated. Any structure with a closed bottom should have bed retention sills and a buried invert as described above.*

Stone Fill, Type II should be used to protect any disturbed channel banks or roadway slopes at the structure's inlet and outlet, up to a height of at least one-foot above the top of the opening. Stone fill should not constrict the channel or structure opening.

Prior to any action toward the implementation of any recommendations received from VTrans, stream type and structure size must be confirmed, and may be modified, by the VT ANR River Management Engineer to ensure compliance with state environmental standards for stream crossing structures. Regulatory authorities including the US Army Corps of Engineers may have additional concerns or requirements regarding this structure. This crossing is within a mapped FEMA flood insurance study floodplain.

General Comments

The new structure should be properly aligned with the channel, span the natural channel width, and be constructed on a grade that matches the channel. It is always desirable for a structure to have flared wingwalls, matched into the channel banks at the inlet and outlet, to smoothly transition flow and protect the structure and roadway approaches from erosion. It is also recommended that full height concrete headwalls be constructed at the inlet and outlet. Any closed bottom structure should be equipped with cutoff walls, extending a depth equal to the culvert rise, up to 4 feet below the streambed, or to ledge, to serve as undermining prevention.

Please note that while a site visit was made, these recommendations were made without the benefit of a survey and are based on limited information. The final decision regarding replacement of this structure must comply with state regulatory standards, and should take into consideration matching natural channel conditions, roadway grade, environmental concerns, safety, and other requirements.

Please contact us if you have any questions or if we may be of further assistance.

825 State Route 67 (518)885-4385

Ballston Spa, NY 12020

Quote Number:	Wusterbarth-018772
Sales Person:	Kent Wusterbarth
Phone:	(207)319-4695
E-Mail	KWusterbarth @lane-enterprises.com
Quote Date:	2022-02-09 20:54:21
Valid until:	03/09/2022

Customer	Job Information
Hammond Engineering	Lottery Lane Weathersfield
Everett Hammond	
5 Lincoln Street	Lottery Lane
Springfield, VT05156	Weathersfield, VT 05156

Quantity	Unit	Part Number	Quoted Line Item	Unit Price	Ext. Price
48.00	LF	BC-A-37	16'-6" x 6'-8" Aluminum Plate Box Culvert 0.150"/0.125" Thickness, Type II & VI Ribs, Invert w/ Toe Plates, Square Ends, HL-93 Loading, Cover Range 1.4' to 4.0', # 10,762. *No federal, state, municipal or other taxes are included in these prices. *Price includes galvanized bolts & nuts. *Prices are quoted FOB origin with freight allowed to jobsite. Corrugated metal culverts are flexible by nature and therefore derive structural stability from the strength and relative stiffness of the surrounding backfill material. It is the resulting soil-culvert interaction system that defines the ability of a flexible metal culvert to withstand the defined service loads. For this reason specifications addressing appropriate backfill material selection and compaction levels must be included in the project documents. In the absence of such documentation it is recommended that applicable standards published for flexible metal culverts are secured from ASTM or AASHTO. It shall be the responsibility of the owner and/or its agents (purchaser, engineer, contractor, et al.) to ensure proper backfill specifications and installation methods.	$917.67	$44,048.16

		Total	
		Subtotal:	$44,048.16
	Shipping Provider:	Shipping:	$0.00
		Total	$44,048.16
			Sales tax not included

Please note that availability for quoted materials will be extended beyond normal lead times due to raw material shortages and protracted production times. Lane's quotation is not an assurance of availability. Actual lead times will vary and will be addressed on a case by case basis.

Prices stated in this quotation are firm for all orders placed within 30 days of quote date and shipments within 60 days of quote date. Please review, verify and approve all item descriptions, specifications and quantities prior to acceptance. It is the customer's responsibility to ensure quantities and materials provided are in compliance with project specifications. Prices are based on Lane Enterprises furnishing all materials listed in this quotation. Prices are F.O.B. jobsite, pipe nested, our trucks, unless otherwise noted. All deliveries under $5000 in value are subject to a minimum delivery charge of at least $300. Terms are net 30 days with approved credit; otherwise C.O.D. We shall not be responsible for delays in shipment caused by issues beyond our control. No material returns accepted without prior approval. All returns subject to a minimum 35% re-stocking charge, plus applicable transportation charges. Special order or non-stock items are not subject to cancellation or return. Pick-up allowances do not apply to this quote. Watertight gaskets are not included in the above prices unless noted.

AASHTO M-145 - TABLE 2 (MODIFIED)				
GROUP CLASSIFICATION	A-1 A-2 (MODIFIED)			
SIEVE ANALYSIS, PERCENT PASSING:	A-1-A	A-1-B	A-2-4	A-2-5
NO. 10 (2.00 MM)	50 MAX	——	——	——
NO. 40 (0.425 MM)	30 MAX	50 MAX	——	——
NO. 100 (0.150 MM)	——	——	50 MAX	50 MAX
NO. 200 (0.075 MM)	15 MAX	25 MAX	20 MAX	20 MAX
CHARACTERISTICS OF FRACTION PASSING NO. 40 (0.425 MM)				
LIQUID LIMIT	——	——	40 MAX	41 MAX
PLASTICITY INDEX	6 MAX		10 MAX	10 MAX
USUAL TYPES OF SIGNIFICANT	STONE FRAGMENTS		SILTY OR CLAYEY	
CONSTITUENT MATERIALS	GRAVEL OR SAND		GRAVEL OR SAND	

ADDITIONAL REQUIREMENTS

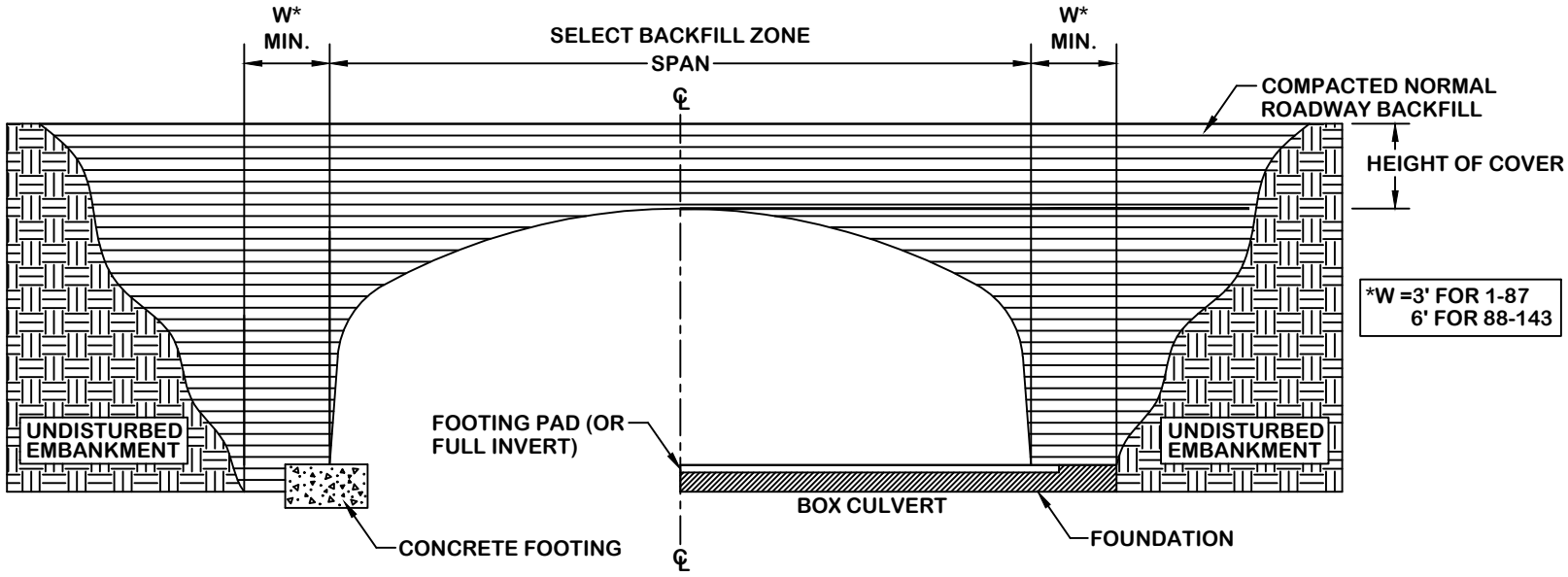
1. MATERIALS MUST BE DENSE GRADED. NO OPEN OR GAP GRADED MATERIAL IS ALLOWED.

2. FINE BEACH SANDS, WINDBLOWN SANDS, STREAM DEPOSITS EXHIBITING FINE, ROUNDED PARTICLES AND TYPICALLY SPECIFIED BY AASHTO AS A-3 MATERIALS ARE NOT ALLOWED.

3. ON-SITE MIXING OR BLENDING TO ACHIEVE SPECIFIED GRADATION IS NOT ALLOWED.

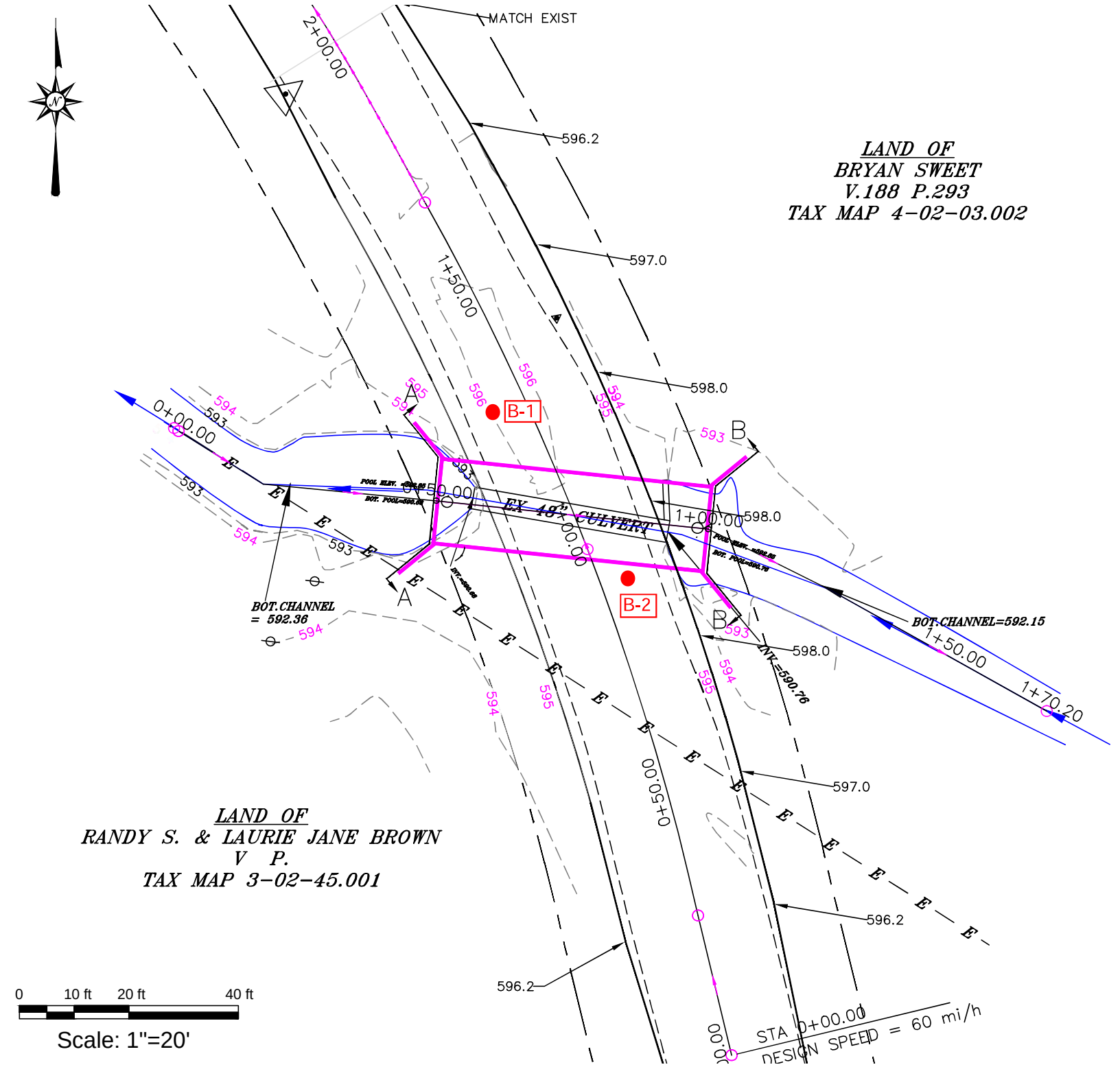
4. MAXIMUM PARTICLE SIZE MUST NOT EXCEED 3 INCHES. FOR A-2 MATERIALS MOISTURE CONTENT MUST BE BETWEEN -3% TO +2% OF OPTIMUM AS DEFINED BY AASHTO T-180. ALL SOIL CLASSIFICATIONS ARE LIMITED IN HEIGHT OF COVER AND STRUCTURE SHAPE APPLICATIONS AS FOLLOWS:

   A) A-1-A MATERIAL IS SUITABLE FOR ALL LONG SPAN SHAPES, SIZES, AND FILL HEIGHTS.
   B) A-1-B MATERIAL IS SUITABLE FOR USE WITH HIGH PROFILE ARCH AND PEAR SHAPED STRUCTURES TO A 12 FEET MAXIMUM FILL HEIGHT AND FOR USE WITH ELLIPTICAL AND LOW PROFILE ARCH STRUCTURES TO A 20 FEET MAXIMUM FILL HEIGHT.



LANE ENTERPISES, INC.
8271 MERCER STREET
PULASKI, PA 16143
PH:724-652-7747
FAX:724-652-0415

PROJECT NAME:	BOX CULVERT BACKFILL
DRAWN BY:	"TJG"
DATE:	6/18/2020



APPROXIMATE BORING LOCATIONS
LOTTERY LANE CULVERT REPLACEMENT

M&W SOILS ENGINEERING, INC

PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO:	Hammond Engineering 5 Lincoln Street Springfield, VT 05156 attn: Everett Hammond, PE	PROJECT NAME: LOCATION: M&W JOB #:	Lottery Lane Culvert Weathersfield, VT 12245-21	SHEET: DATE: HOLE #:	1 of 1 11-16-2021 B-1

Ground Water Observations	Augers-Size I.D.	4.25”	Surface Elevation:	
	Split Spoon	1.5"	Date Started:	11-16-2021
	Hammer Wt.	140#	Date Completed:	11-16-2021
~3’ at 0 Immed. hours (Wet Sample)	Hammer Fall	30"	Boring Contractor:	T&K Drilling
			Soils Engineer/Inspector:	Justin Mailloux

LOCATION OF BORING: Northwest Corner (~16’ from Centerline of Culvert, 6’ from Centerline of Road)

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample No.	Sample Pen. Inches	Sample Rec. Inches
0 - 2	25, 13, 17, 13	Moist		Brown fine to coarse Sand and Gravel, trace Silt.	1	24	11
2 - 4	8, 6, 2, 3	V. Moist	2’	Brown Silt and fine to medium Sand.	2	24	12
5 - 7	6, 12, 14, 21	Wet		Brown Silt and fine to medium Sand, over	3	24	11
			6’	Brown fine to coarse Sand and Gravel, trace Silt.			
7 - 9	17, 10, 10, 6	Wet		Brown fine to coarse Sand, little Gravel, trace to little Silt.	4	24	10
10 - 12	WOH, 2, 4, 6	Wet		Gray fine to coarse Sand, little Silt in layers.	5	24	14
15 - 17	7, 6, 7, 8	Wet		Gray fine to medium Sand, some Gravel, trace to little Silt.	6	24	20
				(Boring Terminated at 17’)			

Ground Surface to: 15’ Used: 4.25" Hollow Stem Augers

Earth Boring:	17’
Rock Coring:	0
Samples:	6
HOLE NUMBER:	B-1

Proportions Used		Cohesionless Density		Cohesive Consistency	
Trace	0 to 10%	0-10	Loose	0-4	Soft
Little	10 to 20%	10-30	Med Dense	4-8	Med Stiff
Some	20 to 35%	30-50	Dense	8-15	Stiff
And	35 to 50%	50+	Very Dense	15-30	V. Stiff

M&W SOILS ENGINEERING, INC

PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO:	Hammond Engineering 5 Lincoln Street Springfield, VT 05156 attn: Everett Hammond, PE	PROJECT NAME: LOCATION: M&W JOB #:	Lottery Lane Culvert Weathersfield, VT 12245-21	SHEET: DATE: HOLE #:	1 of 1 11-16-2021 B-2

Ground Water Observations	Augers-Size I.D.	4.25”	Surface Elevation:	
	Split Spoon	1.5"	Date Started:	11-16-2021
	Hammer Wt.	140#	Date Completed:	11-16-2021
~3’ at 0 Immed. hours (Wet Sample)	Hammer Fall	30"	Boring Contractor:	T&K Drilling
			Soils Engineer/Inspector:	Justin Mailloux

LOCATION OF BORING: Southeast Corner (~10’ from Centerline of Culvert, 6.5’ from Centerline of Road)

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample No.	Sample Pen. Inches	Sample Rec. Inches
0 - 2	16, 26, 18, 14	Moist		Brown fine to coarse Sand, some Gravel, trace Silt.	1	24	14
2 - 4	6, 4, 4, 6	V. Moist	2.5’	Brown fine to coarse Sand, some Gravel, trace Silt, over	2	24	14
		To Wet		Brown fine to medium Sand, little to some Silt.			
5 - 7	WOH, 1, 5, 11	Wet		Gray fine Sand, some Silt, with Organics.	3	24	15
7 - 9	12, 13, 12, 15	Wet		Gray fine Sand, some Silt, with Organics, over	4	24	19
			8’	Gray fine to coarse Sand and Gravel, little Silt.			
10 - 12	4, 7, 9, 11	Wet		Gray fine to coarse Sand and Gravel, trace Silt.	5	24	10
15 - 17	2, 4, 12, 12	Wet		Gray fine to coarse Sand, trace Silt.	6	24	8
				(Boring Terminated at 17’)			

Ground Surface to: 15’ Used: 4.25" Hollow Stem Augers

Earth Boring:	17’
Rock Coring:	0
Samples:	6
HOLE NUMBER:	B-2

Proportions Used		Cohesionless Density		Cohesive Consistency	
Trace	0 to 10%	0-10	Loose	0-4	Soft
Little	10 to 20%	10-30	Med Dense	4-8	Med Stiff
Some	20 to 35%	30-50	Dense	8-15	Stiff
And	35 to 50%	50+	Very Dense	15-30	V. Stiff

M&W SOILS ENGINEERING, INC

SOILS AND CONCRETE LABORATORY

159 East Street
PO Box 1466
Charlestown,NH 03603
603-826-5873

MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **LOTTERY LANE CULVERT**

Type of Material: Poorly graded sand w/gravel — Sample #: B1_7to9

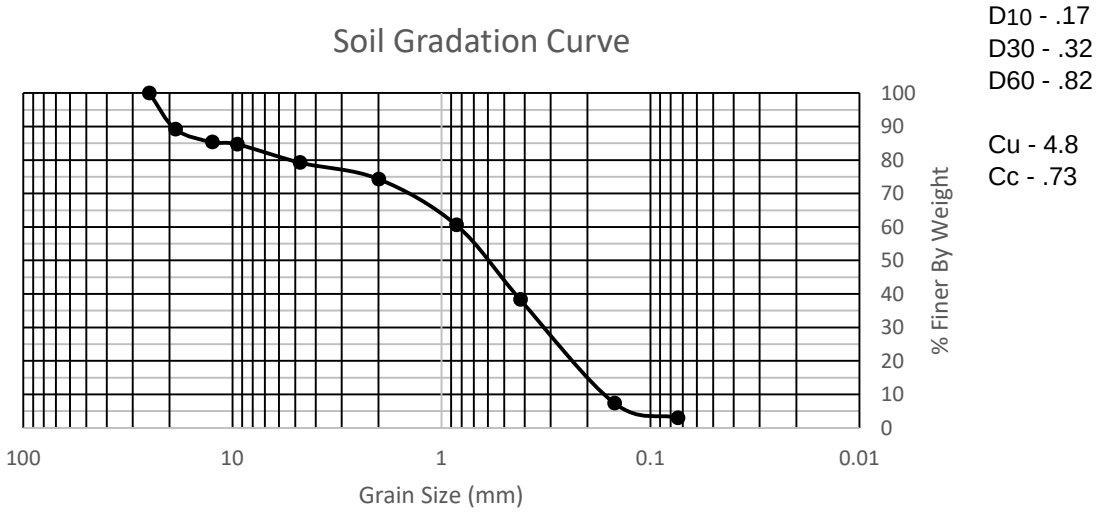
Source of Material: Boring B-1 — Date in Lab: 11-16-21

Sample from: 7 to 9 feet — Date Tested: 2-10-22

Report To: Everett Hammond — Technician: E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
1"	0.0	0.0	0.0	**100.0**	
3/4"	37.8	10.8	10.8	**89.2**	
1/2"	13.6	3.9	14.7	**85.3**	
3/8"	2.1	0.6	15.3	**84.7**	
4	19.3	5.5	20.8	**79.2**	
8	17.2	4.9	25.7	**74.3**	
20	48.1	13.7	39.4	**60.6**	
40	78.1	22.3	61.7	**38.3**	
100	108.3	30.9	92.6	**7.4**	
200	15.3	4.4	97.0	**3.0**	
pan	10.6	3.0	100.0	**0.0**	

Moisture Content: 18.9 %



D_{10} - .17
D30 - .32
D60 - .82

Cu - 4.8
Cc - .73

M&W SOILS ENGINEERING, INC

SOILS AND CONCRETE LABORATORY

159 East Street
PO Box 1466
Charlestown,NH 03603
603-826-5873

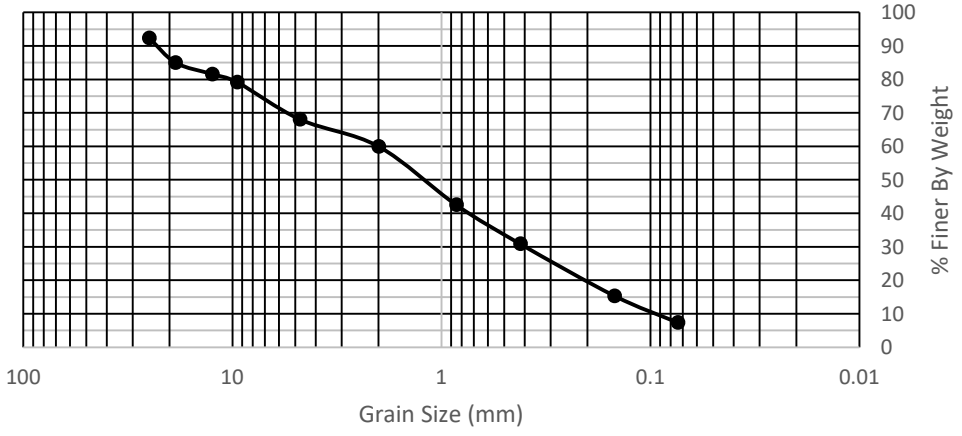
MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **LOTTERY LANE CULVERT**

Type of Material:	Poorly graded sand w/gravel and silt	Sample #:	B2_7to9
Source of Material:	Boring B-2	Date in Lab:	11-16-21
Sample from:	7 to 9 feet	Date Tested:	2-10-22
Report To:	Everett Hammond	Technician:	E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
1"	29.1	7.7	7.7	**92.3**	
3/4"	27.6	7.3	15.0	**85.0**	
1/2"	13.0	3.4	18.4	**81.6**	
3/8"	9.1	2.4	20.8	**79.2**	
4	42.0	11.1	32.0	**68.0**	
8	30.5	8.1	40.0	**60.0**	
20	66.0	17.5	57.5	**42.5**	
40	44.0	11.6	69.1	**30.9**	
100	58.8	15.6	84.7	**15.3**	
200	30.0	7.9	92.6	**7.4**	
pan	27.8	7.4	100.0	**0.0**	

Moisture Content: 15.9 %



D10 - .09
D30 - .39
D60 - 2

Cu - 22.2
Cc - .85