

SECTION 2.0

NHDES Standard Wetland Permit Application

Section 2.1

Standard Wetland Permit Application



STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division / Land Resources Management
[Check the Status of your Application](#)



RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: Granite State Landfill, LLC **TOWN NAME:** Dalton/Bethlehem

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the [Waiver Request Form](#).

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))
Please use the [Wetland Permit Planning Tool \(WPPT\)](#), the Natural Heritage Bureau (NHB) [DataCheck Tool](#), the [Aquatic Restoration Mapper](#), or other sources to assist in identifying key features such as: [Priority Resource Areas \(PRAs\)](#), [protected species or habitats](#), coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Does the property contain a PRA? If yes, provide the following information:	<input type="radio"/> Yes <input checked="" type="radio"/> No
<ul style="list-style-type: none"> • Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHFG) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. padding: 5px;"><input type="radio"/> Yes <input checked="" type="radio"/> No • Protected species or habitat? padding: 5px;"><input checked="" type="radio"/> Yes <input type="radio"/> No <ul style="list-style-type: none"> ○ Common loon, Marsh horsetail, Greater yellow ○ If yes, species or habitat name(s): lady's-slipper ○ NHB Project ID #: NHB23-3333 • Bog? padding: 5px;"><input type="radio"/> Yes <input checked="" type="radio"/> No • Floodplain wetland contiguous to a tier 3 or higher watercourse? padding: 5px;"><input type="radio"/> Yes <input checked="" type="radio"/> No • Designated prime wetland or duly-established 100-foot buffer? padding: 5px;"><input type="radio"/> Yes <input checked="" type="radio"/> No • Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone? padding: 5px;"><input type="radio"/> Yes <input checked="" type="radio"/> No 	
Is the property within a Designated River corridor? If yes, provide the following information:	<input checked="" type="radio"/> Yes <input type="radio"/> No
<ul style="list-style-type: none"> • Name of Local River Management Advisory Committee (LAC): Ammonoosuc River • A copy of the application was sent to the LAC on Month: 12 Day: 14 Year: 2023 	

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	<input type="radio"/> Yes <input checked="" type="radio"/> No
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Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="radio"/> Yes <input checked="" type="radio"/> No
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For stream crossing projects, provide watershed size (see WPPT or Stream Stats):	128
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SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))
Provide a description of the project and the purpose of the project, the need for the proposed impacts to jurisdictional areas, an outline-of the scope of work to be performed, and whether impacts are temporary or permanent.

See attached.

SECTION 3 - PROJECT LOCATION
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS: **Douglas Drive**

TOWN/CITY: **Dalton/Bethlehem**

TAX MAP/BLOCK/LOT/UNIT: **Dalton (406/2.1, 406/3) Bethlehem (406/1, 406/2)**

US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME:
 N/A

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))		
If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: Granite State Landfill, LLC		
MAILING ADDRESS: 1855 Vermont Route 100		
TOWN/CITY: Hyde Park	STATE: VT	ZIP CODE: 05655
EMAIL ADDRESS: John.Gay@casella.com		
FAX:	PHONE: 802-651-5454	
ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically. JG		
SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))		
<input type="checkbox"/> N/A		
LAST NAME, FIRST NAME, M.I.: Keith, Barry H.		
COMPANY NAME: B.H. Keith Associates		
MAILING ADDRESS: PO Box 326		
TOWN/CITY: Freedom	STATE: NH	ZIP CODE: 03836
EMAIL ADDRESS: bhkeith1@netzero.net		
FAX:	PHONE: 603-539-8343	
ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically. BHK		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))		
If the owner is a trust or a company, then complete with the trust or company information.		
<input type="checkbox"/> Same as applicant		
NAME: Douglas Ingerson, Jr. d.b.a. J.W. Chipping		
MAILING ADDRESS: 104 Douglas Drive		
TOWN/CITY: Bethlehem	STATE: NH	ZIP CODE: 03574
EMAIL ADDRESS:		
FAX:	PHONE: 603-444-0676	
ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically.		

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):
In accordance with Env-Wt 400 (Delineation and Classification of Jurisdictional Area, Classification of Projects), the delineation, classification of jurisdictional areas was conducted by Certified Wetland Scientist, Barry H.Keith, pursuant to Env-Wt 406.01(a-c). See Wetlands Mapping Plans. Vernal pools were documented and assessed in accordance with Env-Wt 406.01(d). See Vernal Pool Assessment report. Water courses were delineation in accordance with Env-Wt 406.04. The limits of bank and the ordinary high water mark for perennial streams and the ordinary high water mark for intermittent streams were determined and delineated on to the Wetlands Mapping Plans. Stream assessment was done using the Stream Visual Assessment Method Version 2 and was evaluated pursuant to Env-Wt 900. Wetland classifications (Env-Wt 406.06), using the federal classification method, are depicted on the Wetlands Mapping Plans. The project is classified as a "Major Impact" project (Env-Wt 407). The project is not within any designated or known (Env-Wt 408) Priority Resource Areas, as defined under Part Env-Wt 103.66.

The project is applicable (Env-W 524.01) under Part Env-Wt 524 rules as an industrial development by meeting the design requirements (Env-Wt 524.04(a-f). Specifically, the project provides for stormwater treatment in non-jurisdictional areas to maintain surface water quality; is not in an area that would impact public or private water supplies, source water protection areas or fisheries; restores the hydrologic connectivity associated with Douglas Drive and maintains surface water drainage patterns and maintains fish and wildlife habitat.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#) and the [Wetlands Permitting: Avoidance, Minimization and Mitigation fact sheet](#). For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the [Avoidance and Minimization Checklist](#), the [Avoidance and Minimization Narrative](#), or your own avoidance and minimization narrative.

*See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation [pre-application meeting](#) must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: 11 Day: 16 Year: 2023

N/A - Mitigation is not required)

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: I confirm submittal.

N/A – Compensatory mitigation is not required)

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/ivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent (PERM.) impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary (TEMP.) impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERM. SF	PERM. LF	PERM. ATF	TEMP. SF	TEMP. LF	TEMP. ATF
Wetlands	Forested Wetland	228,419		10,320	5,557		
	Scrub-shrub Wetland	159,576		22,819	14,508		
	Emergent Wetland	53,478		3,757	1,239		
	Wet Meadow						
	Vernal Pool	2,294					
	Designated Prime Wetland						
	Duly-established 100-foot Prime Wetland Buffer						
Surface	Intermittent / Ephemeral Stream		956				
	Perennial Stream or River		910				
	Lake / Pond						
	Docking - Lake / Pond						
	Docking - River						
Banks	Bank - Intermittent Stream						
	Bank - Perennial Stream / River						
	Bank / Shoreline - Lake / Pond						
Tidal	Tidal Waters						
	Tidal Marsh						
	Sand Dune						
	Undeveloped Tidal Buffer Zone (TBZ)						
	Previously-developed TBZ						
	Docking - Tidal Water						
TOTAL		443,767	1,866	36,896	21,304		

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

<input type="checkbox"/>	MINIMUM IMPACT FEE: Flat fee of \$400.
<input type="checkbox"/>	NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION: Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).
<input checked="" type="checkbox"/>	MINOR OR MAJOR IMPACT FEE: Calculate using the table below:
	Permanent and temporary (non-docking): 501,967 SF × \$0.40 = \$200,786.80
	Seasonal docking structure: SF × \$2.00 = \$
	Permanent docking structure: SF × \$4.00 = \$
	Projects proposing shoreline structures (including docks) add \$400 = \$
	Total = \$200,786.80
	<i>The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$200,786.80</i>

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

<input type="checkbox"/> Minimum Impact Project	<input type="checkbox"/> Minor Project	<input checked="" type="checkbox"/> Major Project
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SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: <i>JK</i>	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: <i>JK</i>	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials: <i>JK</i>	<p>The signer understands that:</p> <ul style="list-style-type: none"> The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> Deny the application. Revoke any approval that is granted based on the information. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1.
Initials: <i>JK</i>	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER): <i>[Signature]</i>	As to Section 14 Block 4 Only	PRINT NAME LEGIBLY: <i>As to Section 14 Block 4 Only</i> Douglas Ingerson, Jr.	DATE: 11/22/23
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): <i>[Signature]</i>		PRINT NAME LEGIBLY: John Gay	DATE: 11/30/23
SIGNATURE (AGENT, IF APPLICABLE): <i>[Signature]</i>		PRINT NAME LEGIBLY: Barry H. Keith	DATE: 11/30/23

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE: <i>[Signature]</i>	PRINT NAME LEGIBLY: Nancy Crosby
TOWN/CITY: DALTON	DATE: 12-14-23

*Mary Jackson
Bethlehem*

*MARY JACKSON
12/14/23*

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

irm@des.nh.gov or (603) 271-2147

29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

des.nh.gov

SECTION 2 of Section 2.1 NHDES Form W-06-012 – Project Description (Env-Wt 311.04(i))

Provide a description of the project and the purpose of the project, the need for the proposed impacts to jurisdictional areas, an outline of the scope of work to be performed, and whether impacts are temporary or permanent.

a. Description of the Project and Its Purpose

The Granite State Landfill, LLC (“GSL”) proposes the construction of a state-of-the-art commercial landfill in Dalton, New Hampshire, to be a successor to the North Country Environmental Services, Inc. (“NCES”) landfill in Bethlehem, New Hampshire, after it exhausts its permitted capacity. The new facility will provide disposal capacity for municipalities and customers currently directing waste to NCES for disposal while also providing a disposal resource for other waste generators in New Hampshire and New England.

The estimated disposal capacity provided by the GSL facility over its projected life is 10.75 million cubic yards. At an estimated waste density of 1,520 pounds per cubic yard, GSL will provide capacity for about 8,170,000 tons of waste. The estimated GSL capacity would provide about 18 years of disposal at the projected fill rate of 600,000 annual cubic yards. The disposal capacity at GSL will not only provide uninterrupted service for those more than 50,000 customers throughout 170 New Hampshire communities currently relying on the NCES landfill facility in Bethlehem for disposal, it will also mean that New Hampshire residents will not face increased costs caused by transporting their waste greater distances. In addition, it is important to consider that with the closure of NCES, the customers using that facility will all be looking for new disposal capacity within the same timeframe. The landfill capacity offered by GSL would provide an additional option for disposal for these customers, as well as others in New Hampshire. More options for disposal can help to lessen or avoid escalating tip fees not only because it will help to dampen demand pressures, but also because more options can oftentimes incentivize lower pricing.

The New Hampshire Department of Environmental Services 2020-2021 Biennial Solid Waste Report estimates that New Hampshire’s disposal capacity may fall short of projected disposal need starting in 2034 and such shortfall is expected to range between about 950,000 tons in 2035 to about 990,000 tons by 2041 assuming that the Turnkey facility reaches the end of its currently permitted capacity and that no additional capacity is permitted. By offsetting upcoming closures with new capacity, New Hampshire businesses and residents can rely upon sustainable environmental and economic benefits provided by stability in the marketplace. With the other solid waste disposal facilities in the state already taking the maximum amount of waste they are allowed to take under their permits, it is unclear where the waste now going to the NCES facility would be disposed. GSL is poised to serve as a successor to NCES and its customers to provide continuous service in the North Country. Indeed, the total of towns and cities utilizing the disposal services of NCES, either directly or through affiliated or unaffiliated intermediaries has recently increased from a historical number of 154 to 170 due to acquisitions. Because GSL is located less than ten miles away from the NCES landfill, GSL is well-positioned to provide the same quality service to these cities and towns after the NCES facility closes.

b. The Need for Proposed Impacts to Jurisdictional Areas/Temporary and Permanent Impacts

The proposed GSL facility will impact approximately 11.5 acres of wetlands. This includes permanent impacts to 10.2 acres for landfill and infrastructure improvements (largely consisting of forested wetland, including an additional approximately 0.9 acres of after-the-fact impacts), approximately 956 linear feet of intermittent stream, and approximately 910 linear feet of perennial stream. The proposed wetland impacts have been minimized by evaluating a number of on- and off-site alternatives and have been identified as the minimum needed to establish a new, modern lined landfill in New Hampshire. This location in Dalton was specifically selected based on an alternative analysis that considered wetland impacts. Land development includes establishment of the landfill footprint, as well as development of ancillary features involving upgrades to the Route 116 entrance to the facility, upgrades to Douglas Drive in the area leading to the landfill infrastructure area, and construction of the perimeter road, and perimeter berm. The project will also result in temporary impacts to a total of approximately 0.5 acres of wetlands limited only to small areas that may be disturbed during construction. *See also* Table 8.1, summarizing wetland impacts by cover type and town and identifying temporary and permanent impacts.

Each of these improvements is needed to construct, operate, and support landfill operations and provide the benefits that the facility will bring to New Hampshire, and the impacts are described as follows.

- Impacts associated with Route 116 widening are required consistent with State Highway design criteria to maintain safe movement of trucks entering and exiting a public highway.
- Impacts associated with improvements to Douglas Drive are needed to facilitate safe and efficient truck access to the landfill. Improvements to Douglas Drive include approximately 0.9 acres of after-the-fact (presently existing) impacts. In addition, impacts on Douglas Drive include improvements to a perennial stream crossing by replacing existing culverts with appropriately sized culverts that restore wildlife crossings.
- Minor impacts associated with the infrastructure area are needed to provide sufficient area for the buildings, scales, and equipment (maintenance garage, equipment storage) necessary to operate the landfill. There are no additional impacts associated with the leachate and landfill gas management systems apart from those already described for the roadway improvements.
- Within the landfill footprint, perimeter road, and berm, impacts to wetlands are necessary to provide an adequate contiguous area for the needed waste disposal capacity.
- Wetland impacts associated with perimeter berms and access roads are needed to construct, support, and access the landfill cells.

The placement of the landfill and associated infrastructure and roadways was designed based on the alternative analysis presented in Section 7.3 and intended to minimize avoidable impacts to wetlands. For example, the landfill footprint primarily impacts forested wetlands with fewer principal functions and values that are generally disconnected from higher value wetlands closer to Alder Brook. The remaining 11.5 acres of wetland impacts and 1,856 linear feet of stream

impacts described in this permit application are the minimum impacts required in order to construct and operate the facility.

These jurisdictional areas must be modified to support and facilitate this project, which will add significant value to New Hampshire residents and solid waste management strategies. In accordance with applicable law, the applicant has considered how impacts are being avoided and minimized to the extent possible and whether alternative solutions are viable for the project. *See generally* Section 7. GSL considered seven alternative landfill concept designs at the Dalton site to determine whether they would avoid and minimize wetland impacts while meeting the project's purpose.

As described in Section 7.3 of the Application, the applicant conducted state-wide searches in New Hampshire and Massachusetts for the project. After applying screening criteria, no suitable sites were identified in Massachusetts. Site-specific criteria identified four potential sites in New Hampshire. After numerous site visits, the Dalton site was ranked highest as a candidate land because it had the best access to a state highway, no downgradient sensitive receptors, the most compatibility with surrounding land use, and a supporting landowner. Regulatory considerations in the State of Maine and State of Vermont precluded consideration of those states for this project (*see* Section 7.1 and 7.3).

c. Outline of Scope of Work to Be Performed

Approximately 11.5 acres of wetlands (10.2 acres of permanent, 0.5 acres of temporary, and 0.9 acres of after-the-fact wetlands) will be impacted within the footprint of the landfill and associated infrastructure. GSL anticipates filling these wetlands sequentially over a period of 10 years as the project develops.

Upon approval from NHDES Waste Management Division (WMD) through one or more Type II permit modifications, GSL expects to begin construction of the Douglas Drive improvements and components of the site infrastructure area in 2025. GSL would subsequently begin construction of the first landfill cell with expectations that operations can begin around the time the NCS landfill is filled in 2027/2028.

The expected work and sequencing for construction would include:

- Solid Waste Permit modification for initial construction approval (2025)
- Erosion controls and stormwater infrastructure (2025)
- Improvements at site entrance and NH Route 116 (2025)
- Improvements to Douglas Drive (2025/2026)
- Roadway, Infrastructure Area, Stage 1, Cell 1 earthwork (2025/2026)
- Landfill berms and access roads (2026)
- First landfill cell (Stage 1, Cell 1) – 16.1-acre lined landfill footprint (2026/2027)
- Leachate and landfill gas conveyance piping and other utilities (2026/2027)
- Stage 1, Cell 1 Operations (2028)
- Stage 1, Cells 2 & 3 (2031/2034)
- Remaining wetland filling of Stage 2 footprint (2033)

- Stage 2, Cells 1/2/3 (2037/2040/2043)

Wetlands that will be permanently impacted by filling and covering with landfill liner systems will first have vegetation removed, then be filled. These wetland soils are proposed to be replaced with a granular fill and compacted and graded to promote sheet flow and infiltration of precipitation. Temporary wetland impacts include work required to install culverts throughout Douglas Drive. Approximately 956 linear feet of intermittent stream and 198 feet of perennial stream (including channel and each bank lengths) will be filled similar to the permanent wetland impacts described above. In addition, 711 feet of perennial stream will be impacted in the form of restoring a natural channel and improving culverts at an existing crossing of Douglas Drive.

The landfill has been designed and sequenced such that waste excavation should not be required as each stage of the landfill is developed. The project intends to fill the wetlands as cell development progresses from south to north, and GSL will extend primary and secondary leachate piping to the new stages as they are developed. As shown on the fill sequencing plans (Sheet 13-19 in Section 14.1), a new internal access road will be built into the waste within each cell to access active waste disposal areas as cell development progresses. These internal access roads will be filled over when operating in the subsequent cell. External access to new cells will be from extensions to the perimeter road as the landfill is developed. Stage I wetland fills are expected to be completed during cell development. A key component of the Stage II wetland filling will be to divert stormwater away from existing wetland areas to limit the opportunity for them to recharge. To accomplish this, the design diverts surface water from upland areas away from filled wetlands to stormwater infrastructure with berms and swales. Internal swales to the Stage II area may also be necessary for stormwater removal.

The enclosed plan set (*see* Section 14.1) includes sheets that detail proposed landfill and stormwater infrastructure construction, including infiltration basins, stormwater ponds, and lined rain gardens needed for each of the landfill development sequences. As shown on the enclosed plans, perimeter erosion controls such as silt fencing, compost sock, or mulch berms (see erosion and sedimentation control details and notes) will surround all disturbed areas. GSL will employ wetlands specialists, presumed to be B.H. Keith Associates, Normandeau Associates and/or Horizons Engineering to observe and monitor the wetlands filling operations and to provide guidance and input on field modifications to ensure that the filling operations are occurring in compliance with approved permits and with minimal impact to surrounding wetland resources. Refer to Section 14.1 for design plans.



**RESIDENTIAL, COMMERCIAL, AND
INDUSTRIAL DEVELOPMENT
PROJECT-SPECIFIC WORKSHEET
FOR STANDARD APPLICATION**
Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



RSA/Rule: RSA 482/ Env-Wt 524

APPLICANT LAST NAME, FIRST NAME, M.I.: **Granite State Landfill, LLC**

This worksheet summarizes the criteria and requirements for a Standard Permit for “Residential, Commercial, and Industrial Development”, one of the 18 specific project types in Chapter Env-Wt 500. In addition to the project-specific criteria and requirements on this worksheet, all Standard Dredge and Fill Applications must meet the criteria and requirements listed in the Standard Dredge and Fill Application form (NHDES-W-06-012).

SECTION 1 - APPLICABILITY (Env-Wt 509.02(b); Env-Wt 524.01)

The information in this worksheet applies to residential, commercial, and industrial development projects, including associated roadways, in non-tidal wetlands.

Do **not** use this worksheet if the project is located in a coastal (tidal) area.

SECTION 2 - APPROVAL CRITERIA FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.02)

An application for a residential, commercial or industrial development project must meet the following criteria:

- The project must meet the applicable criteria established in Env-Wt 300;
- An off-site alternatives analysis is conducted for any project that will result in more than one acre of permanent wetland impacts;
- The project avoids and minimizes impacts to wetlands, watercourses, and sensitive and valuable wetlands in accordance with Env-Wt 313.03;
- The project complies with the design criteria specified in Env-Wt 524.04 and the construction criteria specified in Env-Wt 524.05; and
- Compensatory mitigation is provided for any new residential, commercial, or industrial development in a Priority Resource Area.

SECTION 3 - APPLICATION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.03)

- For all projects requiring subdivision approval, a plan prepared and stamped by a land surveyor licensed in the State of New Hampshire pursuant to RSA 310-A showing existing and proposed topography and the location of all proposed lot lines;
- For all projects requiring subdivision approval, the following clearly delineated on the plan required above: the boundaries of all wetlands and surface waters and the footprint of all proposed impacts;

- For minor and major projects requiring subdivision approval, wetlands classifications clearly indicated in accordance with Env-Wt 400 on the plan required above; and
- For a project that is associated with one or more phases of a multi-phase subdivision, a project impact plan that also shows all wetlands on remaining property proposed for future phases of development.

Please note that permits for subdivisions of 4 or more lots shall not be effective until the permittee records the permit with the appropriate registry of deeds and a copy of the registered permit has been received by the department.

An application for a residential, commercial or industrial development project must include the following information:

- If the project includes components that are subject to multiple project-specific requirements in Chapter Env-Wt 500, a narrative statement and plan that describes how each project-specific component meets the requirements of the applicable part in Chapter Env-Wt 500 and how the project as a whole impacts jurisdictional areas.

See attached narrative

SECTION 4 - DESIGN REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.04)

In addition to meeting the applicable design requirements established in Env-Wt 300, a residential, commercial, or industrial development project must be designed to meet the following criteria:

- The project complies with all applicable requirements of Env-Wt 400, Env-Wt 700, Env-Wt 800, Env-Wt 900, and other applicable project-specific criteria in Chapter Env-Wt 500;
- The project does not use wetlands or surface waters to serve as stormwater or water quality treatment to mitigate impacts;
- The project provides setbacks and water quality protection measures sufficient to protect private and public drinking water supplies, source water protection areas, and fisheries;
- The project maintains or restores hydrologic connections to maintain flows necessary to preserve adjacent wetland and riparian functions;
- The project maintains existing fishery spawning, feeding, or cover habitat and fish passage necessary to maintain fishery or habitat or populations; and
- The project maintains existing wetland-dependent wildlife habitat and its associated migratory pathways, reproductive sites, and associated wetland complex or wetland community system.

irm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO BOX 95, Concord, NH 03302-0095

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SECTION 5 - CONSTRUCTION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 525.05)

In addition to meeting all applicable construction standards specified in Env-Wt 307 and other applicable project-specific standards in Chapter Env-Wt 500, the following requirements apply to residential, commercial, or industrial development projects:

- A construction notice shall be filed with the department at least 48 hours prior to commencing work; and
- All work shall be conducted in accordance with the approved plan.

SECTION 6 - CLASSIFICATION OF RESIDENTIAL AND COMMERCIAL OR INDUSTRIAL DEVELOPMENT PROJECTS (Env-Wt 524.06)

Residential and commercial or industrial development projects shall be classified under Env-Wt 407 and as follows:

(a) A project shall be a minimum impact project only if:

- (1) All stream-crossing components of the project meet the requirements for minimum impact classification specified in Env-Wt 903;
- (2) All other components of the project meet the requirements for minimum impact classification specified in Env-Wt 407 and this chapter;
- (3) The project is not part of a new subdivision of 4 or more lots; and
- (4) The project does not meet the criteria listed in (d) below.

(b) A project shall be an expedited minimum impact project only if:

- (1) It is a minimum impact project to construct a new subdivision of 3 lots or less;
- (2) The applicant has attended a pre-design submission meeting with the department at least 7 days prior to application submission and included department feedback in the design plan; and
- (3) The project does not meet the criteria listed in (d) below.

(c) A project shall be a minor impact project if the project does not meet the criteria listed in (d) below and if any of the following apply:

- (1) Any single stream-crossing component of the project meets the requirements for minor impact classification specified in Env-Wt 903;
- (2) The project is part of a new subdivision of 4 or more lots;
- (3) Any single component of the project meets the requirements for minor impact classification specified in Env-Wt 407, Env-Wt 903, or Chapter Env-Wt 500; or
- (4) No component of the project meets the requirements for major impact classification specified in Env-Wt 407, Env-Wt 903, or Chapter Env-Wt 500.

(d) A project shall be a major impact project if:

- (1) The project exceeds the minor impact criteria;
- (2) The project requires mitigation or meets the requirements for major impact classification specified in Env-Wt 407, Env-Wt 903, or any other associated project classification that is part of the overall project; or
- (3) The project is elevated based on an aggregation undertaken by a developer or is part of a series of developments under Env-Wt 400.

Granite State Landfill, LLC
Residential, Commercial, and Industrial Development
Project-Specific Worksheet for Standard Application – Attached Narrative

Application Requirements For Residential, Commercial, And Industrial Development Projects Narrative (Section 3 of Form NHDES-W-06-067)

The project includes components that are subject to two project-specific requirements: stormwater ponds and stream crossings.

Stormwater Ponds: As shown on the plans in Section 14, the project includes construction and maintenance of stormwater ponds which are consistent with the definition of “active man-made ponds” in Env-Wt 519.02. Consistent with the requirements of Env-Wt 510.03(c), the ponds will not be created by construction of a dam, berm, or dike within a watercourse or other surface water, or diversion of a watercourse. Consistent with the requirements of Env-Wt 510.03(d), the stormwater ponds will not be used for water quality treatment or pre-treatment. Further, consistent with the requirements of Env-Wt 519.03(e), the ponds will not be constructed in existing wetlands.

Stream Crossings: The proposed project will improve the existing access road (Douglas Drive) by widening and installing new pavement along the length from NH Route 116 through the infrastructure area – approximately 1.25 miles, and replacing the existing culverts with larger, appropriately sized culverts consistent with the requirements of Env-Wt 904.02. Stream crossing worksheets are included in Section 2.5 of the Wetlands Application.

Section 2.2

NHDES Application Filing Fee (check)

Date	Invoice	Memo	Orig. Amt	Amt. Due	Amount
11/28/2023	11/24/23 Wetland Application F	Wetland Application Fee - Gran			200,786.80
					200,786.80



PLEASE DETACH AND RETAIN FOR YOUR RECORDS

THE FACE OF THIS CHECK HAS A SECURITY VOID BACKGROUND PATTERN AND MICROPRINT BORDERS - DO NOT CASH IF THE WORK VOID IS VISIBLE

TAC (TM) D 23893675-423329-5E11-48 11/28/2023 12:08:23 9233094 200786.80



Casella Waste System, Inc.
 P.O Box 866
 Rutland Vermont 05702

Bank of America

52-153
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DATE 11/28/2023

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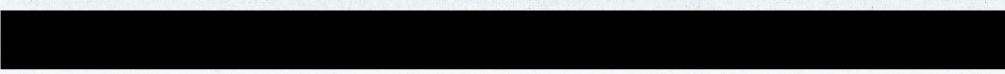
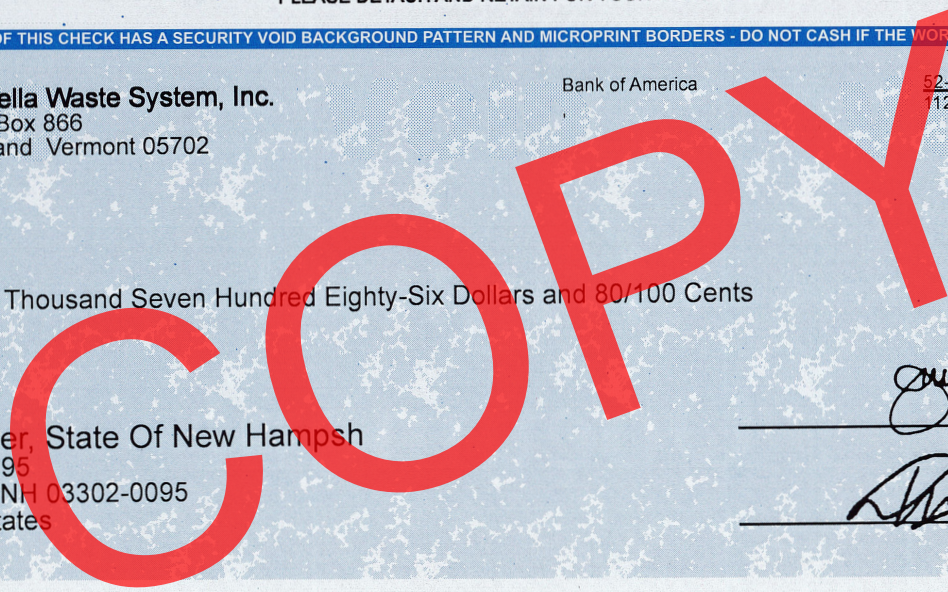
PAY Two Hundred Thousand Seven Hundred Eighty-Six Dollars and 80/100 Cents

TO
 THE
 ORDER
 OF

Treasurer, State Of New Hampsh
 PO BOX 95
 Concord NH 03302-0095
 United States

[Signature]

[Signature]



Section 2.3

Property Owner's Letter of Consent

Douglas Ingerson
104 Douglas Drive
Dalton, NH 03598

November 23, 2023

To whom it may concern:

Granite State Landfill, LLC intends to file permit applications with state and federal authorities as part of its efforts to construct and operate a commercial landfill. These applications affect parcels of land that are owned either by me in my personal capacity or by my company J.W. Chipping Corp. By my signature below, I affirm that I am aware of these permit applications and do not object to their filing.

Sincerely, 

Douglas Ingerson
Individually and d/b/a Chick's Sand & Gravel
President, J.W. Chipping Corp.

Section 2.4

NHDOT Correspondence

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

District 1, 641 Main St, Lancaster, NH 03584
District 2, 8 Eastman Hill Road, Enfield, NH 03748
District 3, 2 Sawmill Rd, Gilford, NH 03249

District 4, 19 Base Hill Road, Swanzey, NH 03446
District 5, 16 East Point Drive, Bedford, NH 03110
District 6, PO Box 740, Durham, NH 03824

APPLICATION FOR DRIVEWAY PERMIT

Pursuant to the provisions of **Revised Statutes Annotated, Chapter 236, Section 13** (printed on reverse of application) and amendments thereto, and **Declaratory Ruling 2000-01**, permission is requested to: **Alter 1** driveway entrance(s) to my property on the **North** side of **NH Route 116** the **Town of Bethlehem** at a location which will meet the requirements for safety specified in said statutes.

The driveway entrance(s) requested is (are) for access to: **Industry**

Describe nature and size of industry, business or subdivision: **Proposed solid waste disposal facility and existing enterprises previously permitted (Mining, Drag Strip & Precast Concrete Plant)**

7 Feet East of Utility Pole Number: PSNH 331 82

825 Feet West of West Forest Lake Road

Town Tax Map # **406** and Lot # **001**

As the landowner (or designated applicant) I agree to the following:

1. To construct driveway entrance(s) only for the bonafide purpose of securing access to private property such that the highway right-of-way is used for no purpose other than travel.
 2. To construct driveway entrance(s) at permitted location(s).
 3. To construct driveway entrance(s) in accordance with statutes, rules, standard drawings, and permit specifications as issued by the New Hampshire Department of Transportation.
 4. To defend, indemnify and hold harmless the New Hampshire Department of Transportation and its duly appointed agents and employees against any action for personal injury and/or property damage sustained by reason of the exercise of this permit.
 5. To furnish and install drainage structures that are necessary to maintain existing highway drainage and adequately handle increased runoff resulting from the land development and obtain all easements thereto.
 6. I am the owner or a duly authorized agent of the owner of the parcel upon which the driveway will be constructed. I have provided accurate and complete title and subdivision information concerning the parcel to the Department. I understand that the Department is relying on this information in considering this application and that the Department does not perform independent title research or make judgments about title or access disputes.
- For new driveway(s), include copy of current deed and, if not the same, previous deed dated prior to July 1, 1971 of the parcel. If this parcel is part of a larger tract subdivided after July 1, 1971, then provide complete subdivision plans and deed history dating back to at least July 1, 1971.
 - Attach sketch or plan showing existing and proposed driveway(s) and the adjacent highway indicating distance to town road, town line, or other readily identifiable feature or landmark and also to the nearest utility pole (including pole numbers)



Signature of Landowner (Applicant)

Douglas Ingerson

Printed Name of Landowner

Date:

10-3-23

104 Douglas Drive

Mailing Address

Dalton, NH 03598

Town/City, State, Zip Code

Telephone

603-616-6378 cell

Number(s)

Contact/Agent, if not **John Gay, Casella Waste Systems, Inc. john.gay@casella.com,
Landowner: **(802) 236-5973****

FOR OFFICE USE ONLY:

GPS N = _____ GPS W = _____

Section: _____ Width: _____ Speed: _____

Right of Way: _____ Drainage: _____ SLD: _____

Conditions: _____

Permit Number Assigned: _____

§ 236:13 Driveways and Other Accesses to the Public Way. – I. It shall be unlawful to construct, or alter in any way that substantially affects the size or grade of, any driveway, entrance, exit, or approach within the limits of the right-of-way of any class I or class III highway or the state-maintained portion of a class II highway that does not conform to the terms and specifications of a written permit issued by the Commissioner of transportation.

II. Pursuant to this section, a written construction permit application must be obtained from and filed with the department of transportation by any abutter affected by the provisions of paragraph I. Before any construction or alteration work is commenced, said permit application shall have been reviewed, and a construction permit issued by said department. Said permit shall:

- (a) Describe the location of the driveway, entrance, exit, or approach. The location shall be selected to most adequately protect the safety of the traveling public.
- (b) Describe any drainage structures, traffic control devices, and channelization islands to be installed by the abutter.
- (c) Establish grades that adequately protect and promote highway drainage and permit a safe and controlled approach to the highway in all seasons of the year.
- (d) Include any other terms and specifications necessary for the safety of the traveling public.

III. For access to a proposed commercial or industrial enterprise, or to a subdivision, all of which for the purposes of this section shall be considered a single parcel of land, even though acquired by more than one conveyance or held nominally by more than one owner:

- (a) Said permit application shall be accompanied by engineering drawings showing information as set forth in paragraph II.
- (b) Unless all season safe sight distance of 400 feet in both directions along the highway can be obtained, the commissioner shall not permit more than one access to a single parcel of land, and this access shall be at that location which the commissioner determines to be safest. The commissioner shall not give final approval for use of any additional access until it has been proven to him that the 400-foot all season safe sight distance has been provided.
- (c) For the purposes of this section, all season safe sight distance is defined as a line which encounters no visual obstruction between 2 points, each at a height of 3 feet 9 inches above the pavement, and so located as to represent the critical line of sight between the operator of a vehicle using the access and the operator of a vehicle approaching from either direction.

IV. No construction permit shall allow:

- (a) A driveway, entrance, exit, or approach to be constructed more than 50 feet in width, except that a driveway, entrance, exit, or approach may be flared beyond a width of 50 feet at its junction with the highway to accommodate the turning radius of vehicles expected to use the particular driveway, entrance, exit or approach.
- (b) More than 2 driveways, entrances, exits or approaches from any one highway to any one parcel of land unless the frontage along that highway exceeds 500 feet.

V. The same powers concerning highways under their jurisdiction as are conferred upon the commissioner of transportation by paragraphs I, II, III and IV shall be conferred upon the planning board in cities and towns in which the planning board has been granted the power to regulate the subdivision of land as provided in RSA 674:35, and they shall adopt such regulations as are necessary to carry out the provisions of this section. Such regulations may delegate administrative duties, including actual issuance of permits, to a highway agent, board of selectmen, or other qualified official or body. Such regulations, or any permit issued under them, may contain provisions governing the breach, removal, and reconstruction of stone walls or fences within, or at the boundary of, the public right of way, and any landowner or landowner's agent altering a boundary in accordance with such provisions shall be deemed to be acting under a mutual agreement with the city or town pursuant to RSA 472:6, II (a).

VI. The commissioner of transportation or planning board shall retain continuing jurisdiction over the adequacy and safety of every existing driveway, entrance, exit, and approach to a highway, whether or not such access was constructed or installed pursuant to a permit under this section, and, unless the access is a public highway, the owners of property to which the access is appurtenant shall have continuing responsibility for the adequacy of the access and any grades, culverts, or other structures pertaining to such access, whether or not located within the public right of way. If any such access is or becomes a potential threat to the integrity of the highway or its surface, ditches, embankments, bridges, or other structures, or a hazard to the safety of the traveling public, by reason of siltation, flooding, erosion, frost action, vegetative growth, improper grade, or the failure of any culvert, traffic control device, drainage structure, or any other feature, the commissioner of transportation or planning board or their designee may issue an order to the landowner or other party responsible for such access to repair or remove such hazardous condition and to obtain any and all permits required therefor. The order shall describe the hazard, prescribe what corrective action or alteration in the location or configuration of such access shall be required, and set a reasonable time within which the action shall be completed. Such an order shall be sent by certified mail, and shall be enforceable to the same extent as a permit issued under this section. If the order is not complied with within the time prescribed, the commissioner or planning board or their designee may cause to be taken whatever action is necessary to protect the highway and the traveling public, and the owner or other responsible party shall be civilly liable to the state or municipality for its costs in taking such action.

§ 236:14 Penalty. – Any person who violates any provision of this subdivision or the rules and regulations made under authority thereof shall be guilty of a violation if a natural person, or guilty of a misdemeanor if any other person; and, in addition, shall be liable for the cost of restoration of the highway to a condition satisfactory to the person empowered to give such written permission.

Section 2.5

Stream Crossing Worksheets



WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

SECTION 1 - TIER CLASSIFICATIONS	
Determine the contributing watershed size at USGS StreamStats .	
Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.	
Size of contributing watershed at the crossing location: <input type="text" value="82"/> acres	
<input checked="" type="checkbox"/> Tier 1: A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.	
<input type="checkbox"/> Tier 2: A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.	
<input type="checkbox"/> Tier 3: A tier 3 stream crossing is a crossing that meets any of the following criteria: <ul style="list-style-type: none"> <input type="checkbox"/> On a watercourse where the contributing watershed is more than 640 acres. <input type="checkbox"/> Within a designated river corridor unless: <ul style="list-style-type: none"> a. The crossing would be a tier 1 stream based on contributing watershed size, or b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT. <input type="checkbox"/> Within a 100-year floodplain (see Section 2 below). <input type="checkbox"/> In a jurisdictional area having any protected species or habitat (NHB DataCheck). <input type="checkbox"/> In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the Wetlands Permit Planning Tool (WPPT) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas. 	
<input type="checkbox"/> Tier 4: A tier 4 stream crossing is a crossing located on a tidal watercourse.	
SECTION 2 - 100-YEAR FLOODPLAIN	
Use the FEMA Map Service Center to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:	
<input checked="" type="checkbox"/> No: The proposed stream crossing <i>is not</i> within the FEMA 100-year floodplain.	
<input type="checkbox"/> Yes: The proposed project <i>is</i> within the FEMA 100-year floodplain. Zone = <input type="text" value=""/> Elevation of the 100-year floodplain at the inlet: <input type="text" value=""/> feet (FEMA El. or Modeled El.)	
SECTION 3 - CALCULATING PEAK DISCHARGE	
Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): <input type="text" value="131 SITE/7.1 CULVERT CFS"/>	Calculation method: <input type="text" value="SCS TR-20"/>
Estimated bankfull discharge at the crossing location: <input type="text" value="10.1"/> CFS	Calculation method: <input type="text" value="Mannings Formula"/>

lrn@des.nh.gov or (603) 271-2147

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➔ **Note: If tier 1, then skip to Section 10** ➔

SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES

For tier 2, tier 3 and tier 4 crossings only.

Bankfull Width: <input style="width: 50px;" type="text"/> feet	Mean Bankfull Depth: <input style="width: 50px;" type="text"/> feet
Bankfull Cross Sectional Area: <input style="width: 50px;" type="text"/> square feet (SF)	

SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH

For tier 2, tier 3 and tier 4 crossings only.

Describe the reference reach location: <input style="width: 100%;" type="text"/>
Reference reach watershed size: <input style="width: 50px;" type="text"/> acres

Parameter	Cross Section 1 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Cross Section 2 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Cross Section 3 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Range
Bankfull Width	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Bankfull Cross Sectional Area	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF
Mean Bankfull Depth	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Width to Depth Ratio	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Max Bankfull Depth	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Flood Prone Width	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Entrenchment Ratio	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes

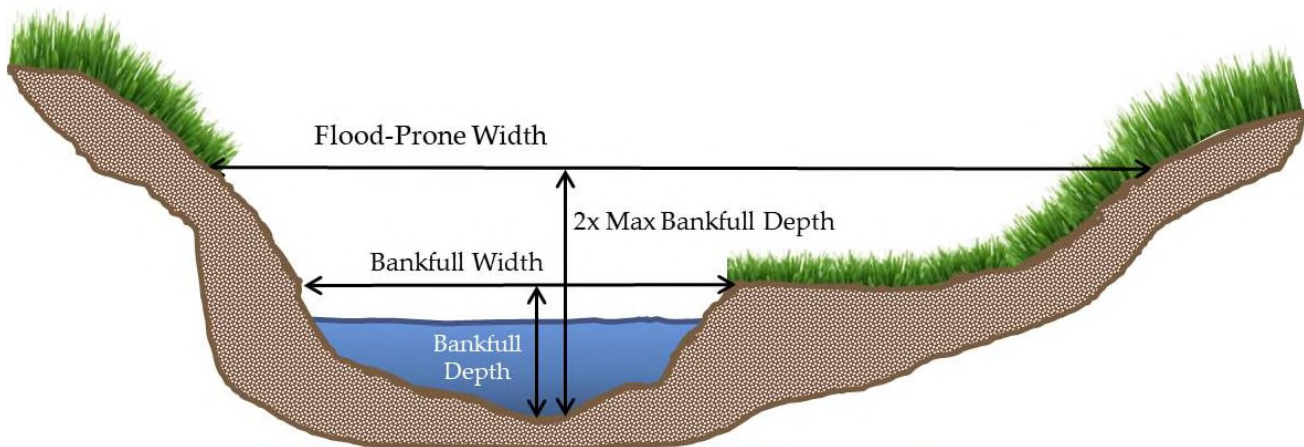


Figure 1: Determining the Reference Reach Attributes.

SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION

For tier 2, tier 3 and tier 4 crossings only.

Average Channel Slope of the Reference Reach: <input style="width: 50px;" type="text"/>
Average Channel Slope at the Crossing Location: <input style="width: 50px;" type="text"/>

SECTION 7 - PLAN VIEW GEOMETRY

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

For tier 2, tier 3 and tier 4 crossings only.

Sinuosity of the Reference Reach: <input style="width: 50px;" type="text"/>
Sinuosity of the Crossing Location: <input style="width: 50px;" type="text"/>

SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	█ %
% of reach that is boulder:	█ %
% of reach that is cobble:	█ %
% of reach that is gravel:	█ %
% of reach that is sand:	█ %
% of reach that is silt:	█ %
SECTION 9 - STREAM TYPE OF REFERENCE REACH	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	█

Refer to Rosgen Classification Chart (Figure 2) below:

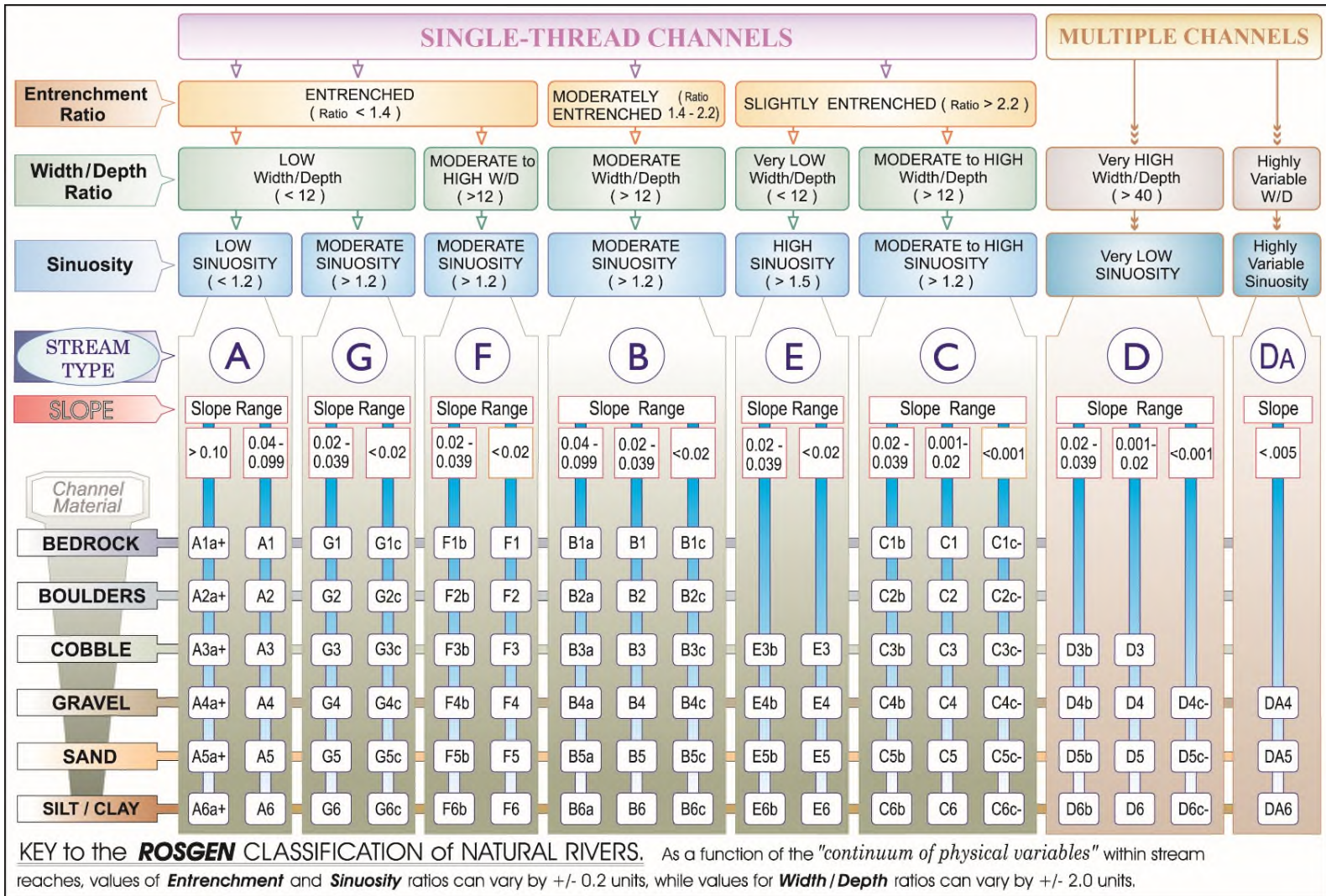


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

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SECTION 10 - CROSSING STRUCTURE METRICS

Existing Conditions	Existing Structure Type: <input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input checked="" type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input type="checkbox"/> Other: <input type="text"/>				
	Existing Crossing Span: <input type="text"/> feet <i>(perpendicular to flow)</i>	Culvert Diameter: 1.25 feet Inlet Elevation: El. 110.25 feet			
	Existing Crossing Length: 38 feet <i>(parallel to flow)</i>	Outlet Elevation: El. 1108.1 feet Culvert Slope: 0.057			
Proposed Conditions	Proposed Structure Type:	Tier 1	Tier 2	Tier 3	Alternative Design
	Bridge Span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Closed-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Open-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Proposed Structure Span: 12 feet <i>(perpendicular to flow)</i>	Culvert Diameter: <input type="text"/> feet Inlet Elevation: El. 1110.25 feet			
	Proposed Structure Length: 43.2 feet <i>(parallel to flow)</i>	Outlet Elevation: El. 1110 feet Culvert Slope: 0.0058			
Proposed Entrenchment Ratio:* <input type="text"/> <i>For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.</i>					

* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

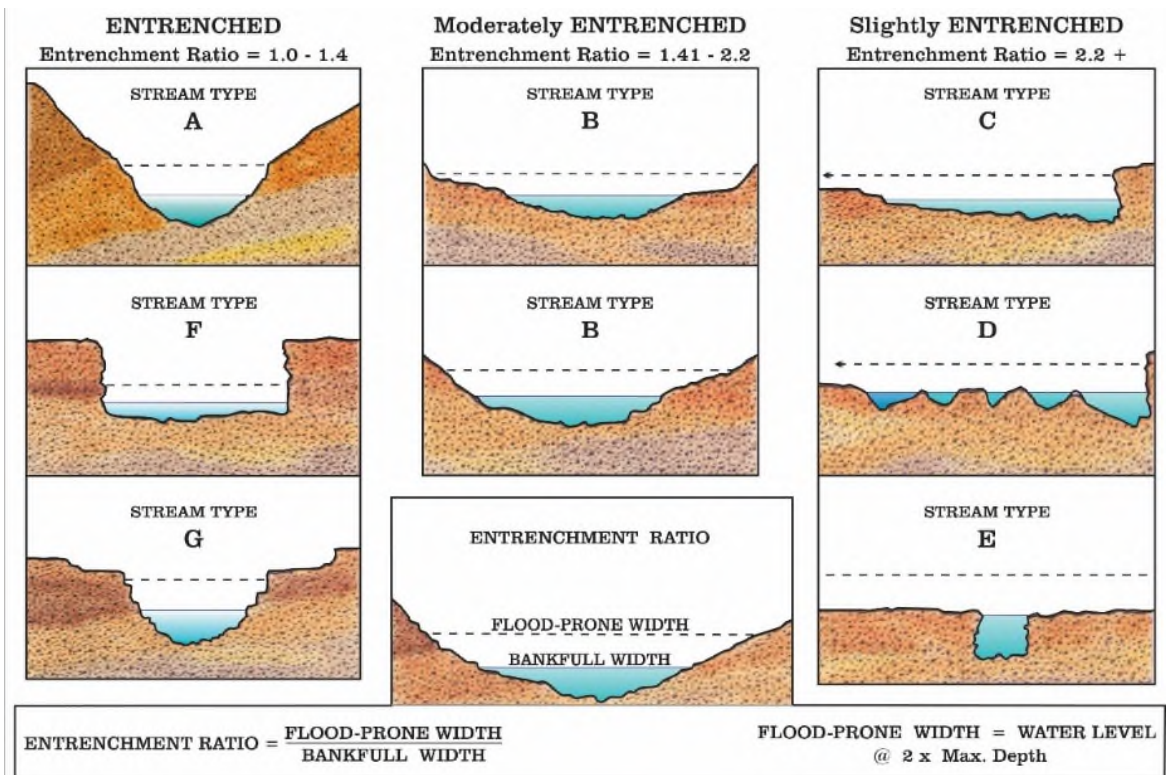


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	1113.19	1111.99
Flow velocity at outlet in feet per second (FPS):	5.78	4.64
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		75.1
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		54.8
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
<i>For tier 2, tier 3 and tier 4 crossings only.</i>		
Crossing Structure Openness Ratio* = <input type="text"/>		
* Openness box culvert = (height x width)/length Openness round culvert = (3.14 x radius ²)/length		
SECTION 13 - GENERAL DESIGN CONSIDERATIONS		
Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.		
All stream crossings shall be designed and constructed so as to:		
<input checked="" type="checkbox"/> Not be a barrier to sediment transport.		
<input checked="" type="checkbox"/> Prevent the restriction of high flows and maintain existing low flows.		
<input checked="" type="checkbox"/> Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.		
<input checked="" type="checkbox"/> Not cause an increase in the frequency of flooding or overtopping of banks.		
<input checked="" type="checkbox"/> Maintain or enhance geomorphic compatibility by:		
a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and		
b. Preserving the natural alignment of the stream channel.		
<input checked="" type="checkbox"/> Preserve watercourse connectivity where it currently exists.		
<input checked="" type="checkbox"/> Restore watercourse connectivity where:		
a. Connectivity previously was disrupted as a result of human activity(ies), and		
b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.		
<input checked="" type="checkbox"/> Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.		
<input checked="" type="checkbox"/> Not cause water quality degradation.		
SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA		
Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.		
<input checked="" type="checkbox"/> The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.		
SECTION 15 - ALTERNATIVE DESIGN		
NOTE: If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in Figure 3 , then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.		
<input type="checkbox"/> I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.		

Env-Wt 903.04 Information Required for All Stream Crossing Standard Permit Applications

- a. *On the USGS map or updated data based on LiDAR required by Env-Wt 311.06, the following:*
- The approximate boundaries of the contributing watershed;*
 - The boundaries of the contributing watershed were delineated using LIDAR mapping and considering proposed grading for the landfill as part of the project. See attached watershed figure.**
 - The size of the contributing watershed; and*
A contributing watershed of 82 acres was determined using the above-referenced maps.
 - Identification of the stream tier based on watershed size;*
The size of the contributing watershed results in a Tier 1 designation for the stream crossing.
- b. *Plans showing the following:*
- The scale, a north arrow, and at least 3 cross-sections outside of the construction disturbance area that are representative of the stream system away from the area of direct influence by the crossing;*
Not applicable for a Tier 1 stream
 - Clearing limits showing all proposed work areas;*
See Sheet 16 of the Design Drawings showing the clearing limits for the culvert and approach road.
 - For both the existing structure, if any, and the proposed structure, the following:*
 - Location;*
See Sheets 3 and 36 of the Design Drawings for the proposed structure location. See Sheet 2 for the existing culvert location.
 - Type;*
The proposed culvert is a four-sided concrete box culvert with 24 inches of embedment. See Sheet 36 of the Design Drawings.
 - Dimensions; and*
The dimensions of the proposed culvert are 12-ft wide by 6-ft tall by 47'-4" long, see Sheet 36 of the Design Drawings.
 - Inlet and outlet invert elevations;*
The proposed culvert invert elevations are 1110.25 ft (inlet) and 1110.00 (outlet). See Sheet 36 of the Design Drawings.
 - The extent of channel excavation and filling;*
See Sheet 36 of the Design Drawings.
 - Road locations, including road edges, centerline, and boundaries of the right-of-way;*
See Sheet 36 of the Design Drawings for road locations and edges. The crossing is a private road with no public right-of-way.

6. *Proposed channel work including bank erosion control features, grade control, and channel linings; and*
See Sheet 36 of the Design Drawings for bank erosion control features.
 7. *For the proposed structure, cross-sections showing the water surface elevation resulting from the applicable design storm, with bed material and backfill zones;*
See Sheet 30 of the Design Drawings for cross-sections showing the water surface elevation resulting from the applicable design with bed materials and backfill zones shown.
- c. *Existing crossing metrics, including:*
1. *Existing riparian zone, including the extent and type of existing vegetation surrounding or in the stream bank; and*
The riparian zone is about 20 feet wide. Cover types are 75% trees, 15% shrubs, 5% herbaceous, and 5% bare. See Stream Visual Assessment Protocol in Section 9.2.
 2. *Existing tailwater control, including its location and materials, and pool configuration;*
None known.
- d. *The dewatering system, as follows:*
1. *Estimates of the maximum flow anticipated during construction, including any summer storm estimates;*
Contractor is to determine means and methods for all temporary structures and operations, such as determining maximum stream flows during construction flows. See Water Diversion Notes on Sheet 34 of the Design Drawings.
 2. *The hydraulic calculation for the bypass pipe or channel size, length, and gradient;*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 3. *Location, height, and width of the diversion dam;*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 4. *Sump locations, including estimate of necessary flow and sump capacity;*
See response to d.1. and Foundation Notes on Sheet 34 of the Design Drawings.
 5. *Backwater prevention method; and*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 6. *Sediment treatment plan with methods, release point, and extent;*
See response to d.1. Additionally, they will need to include their methods of treating sediment resulting from their construction activities. See Erosion Control Notes on Sheet 48 of the Design Drawings and the Dewatering Filter Bag Detail, with notes, on Sheet 44.
- e. *Erosion and pollution controls, as follows:*
1. *Any additional methods of controlling erosion;*
 2. *A soil stabilization plan, including but not limited to where to cover stockpiles and place straw bales; and*
 3. *Pollution control methods for pumps, fuel stations, and equipment storage;*

Contractor is to determine means and methods for erosion and pollution controls and to submit an erosion control plan to Engineer for review.

f. *The number and location of footings, if any, and the following for each:*

The ends of the culvert will have precast concrete cutoff blocks installed under the culvert to prevent scouring and undermining of the culvert.

g. *A narrative explaining why the cross-sections identified pursuant to (b)(7), above, are representative;*

Cross Sectional Geometry under Section 5 of the Stream Crossing Worksheet is not required for Tier 1 crossings. Water surface elevations on Sheet 36 are based on hydraulic modeling.

h. *The design features used to improve aquatic organism passage and the expected distance, in linear feet, of downstream and upstream improvement for aquatic organism passage or fish passage;*

The proposed structure will maintain passage of aquatic organisms upstream and downstream by reconstructing a natural bottom inside of the box culvert reusing stream bed material from the channel excavation. Forested upland buffer adjacent to the stream and wetlands will be maintained to the extent practicable. See Design Drawings 34 and 36.

i. *The hydraulic capacity of the proposed crossing, in terms of flood frequency event, and of the existing crossing, if any; and*

The hydraulic capacity of the proposed culvert is 54.8 cfs for the 50-year storm event and 75.1 cfs for the 100-year storm event. See the attached DES Stream Crossing Worksheet.

j. *The following channel information at the crossing and for the reference reach:*

1. *The classification of the stream using the Rosgen classification system as described in Applied River Morphology by Dave Rosgen, 1996, available as noted in Appendix B, at the crossing and upstream and downstream of the crossing;*
2. *Bankfull width;*
3. *Bankfull depth (mean);*
4. *Entrenchment ratio;*
5. *Sinuosity; and*
6. *Flood-prone width.*

Items 1 through 6 not applicable for Tier 1 streams.



WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau



RSA/Rule RSA 482-A/ Env-Wt-900

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

SECTION 1 - TIER CLASSIFICATIONS	
Determine the contributing watershed size at USGS StreamStats .	
Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.	
Size of contributing watershed at the crossing location: 54 acres	
<input checked="" type="checkbox"/> Tier 1: A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.	
<input type="checkbox"/> Tier 2: A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.	
<input type="checkbox"/> Tier 3: A tier 3 stream crossing is a crossing that meets any of the following criteria: <ul style="list-style-type: none"> <input type="checkbox"/> On a watercourse where the contributing watershed is more than 640 acres. <input type="checkbox"/> Within a designated river corridor unless: <ul style="list-style-type: none"> a. The crossing would be a tier 1 stream based on contributing watershed size, or b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT. <input type="checkbox"/> Within a 100-year floodplain (see Section 2 below). <input type="checkbox"/> In a jurisdictional area having any protected species or habitat (NHB DataCheck). <input type="checkbox"/> In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the Wetlands Permit Planning Tool (WPPT) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas. 	
<input type="checkbox"/> Tier 4: A tier 4 stream crossing is a crossing located on a tidal watercourse.	
SECTION 2 - 100-YEAR FLOODPLAIN	
Use the FEMA Map Service Center to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:	
<input checked="" type="checkbox"/> No: The proposed stream crossing <i>is not</i> within the FEMA 100-year floodplain.	
<input type="checkbox"/> Yes: The proposed project <i>is</i> within the FEMA 100-year floodplain. Zone = <input style="width: 50px;" type="text"/> Elevation of the 100-year floodplain at the inlet: <input style="width: 50px;" type="text"/> feet (FEMA El. or Modeled El.)	
SECTION 3 - CALCULATING PEAK DISCHARGE	
Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 75.5 SITE CFS	Calculation method: SCS TR-20
Estimated bankfull discharge at the crossing location: 56.3 CFS	Calculation method: Mannings Formula

➔ **Note: If tier 1, then skip to Section 10** ➔

SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES

For tier 2, tier 3 and tier 4 crossings only.

Bankfull Width: <input style="width: 50px;" type="text"/> feet	Mean Bankfull Depth: <input style="width: 50px;" type="text"/> feet
Bankfull Cross Sectional Area: <input style="width: 50px;" type="text"/> square feet (SF)	

SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH

For tier 2, tier 3 and tier 4 crossings only.

Describe the reference reach location: <input style="width: 100%;" type="text"/>
Reference reach watershed size: <input style="width: 50px;" type="text"/> acres

Parameter	Cross Section 1 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Cross Section 2 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Cross Section 3 Describe bed form <input style="width: 50px;" type="text"/> <i>(e.g. pool, riffle, glide)</i>	Range
Bankfull Width	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Bankfull Cross Sectional Area	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF	<input style="width: 50px;" type="text"/> SF
Mean Bankfull Depth	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Width to Depth Ratio	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Max Bankfull Depth	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Flood Prone Width	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet	<input style="width: 50px;" type="text"/> feet
Entrenchment Ratio	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes

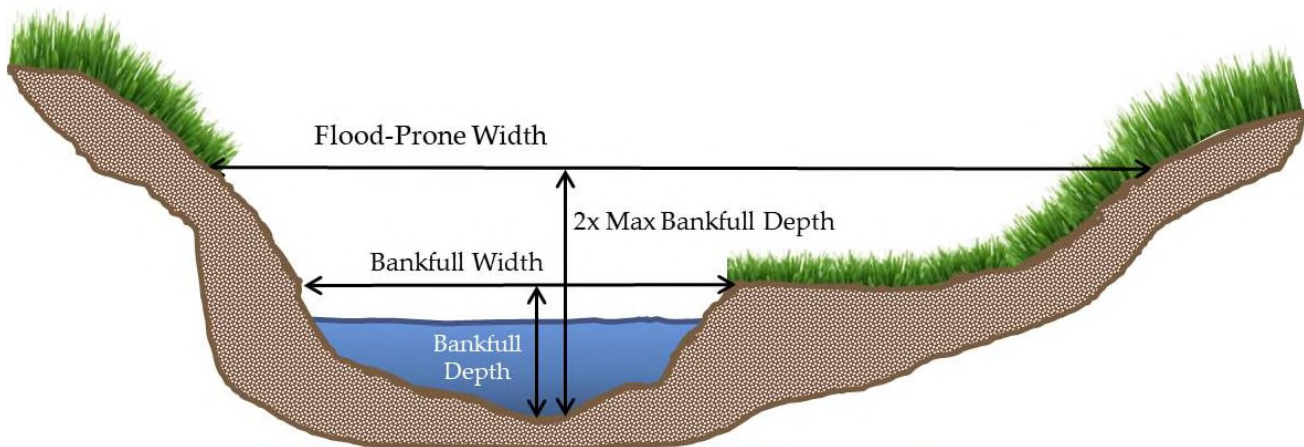


Figure 1: Determining the Reference Reach Attributes.

SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION

For tier 2, tier 3 and tier 4 crossings only.

Average Channel Slope of the Reference Reach: <input style="width: 50px;" type="text"/>
Average Channel Slope at the Crossing Location: <input style="width: 50px;" type="text"/>

SECTION 7 - PLAN VIEW GEOMETRY

Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

For tier 2, tier 3 and tier 4 crossings only.

Sinuosity of the Reference Reach: <input style="width: 50px;" type="text"/>
Sinuosity of the Crossing Location: <input style="width: 50px;" type="text"/>

SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	█ %
% of reach that is boulder:	█ %
% of reach that is cobble:	█ %
% of reach that is gravel:	█ %
% of reach that is sand:	█ %
% of reach that is silt:	█ %
SECTION 9 - STREAM TYPE OF REFERENCE REACH	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	█

Refer to Rosgen Classification Chart (Figure 2) below:

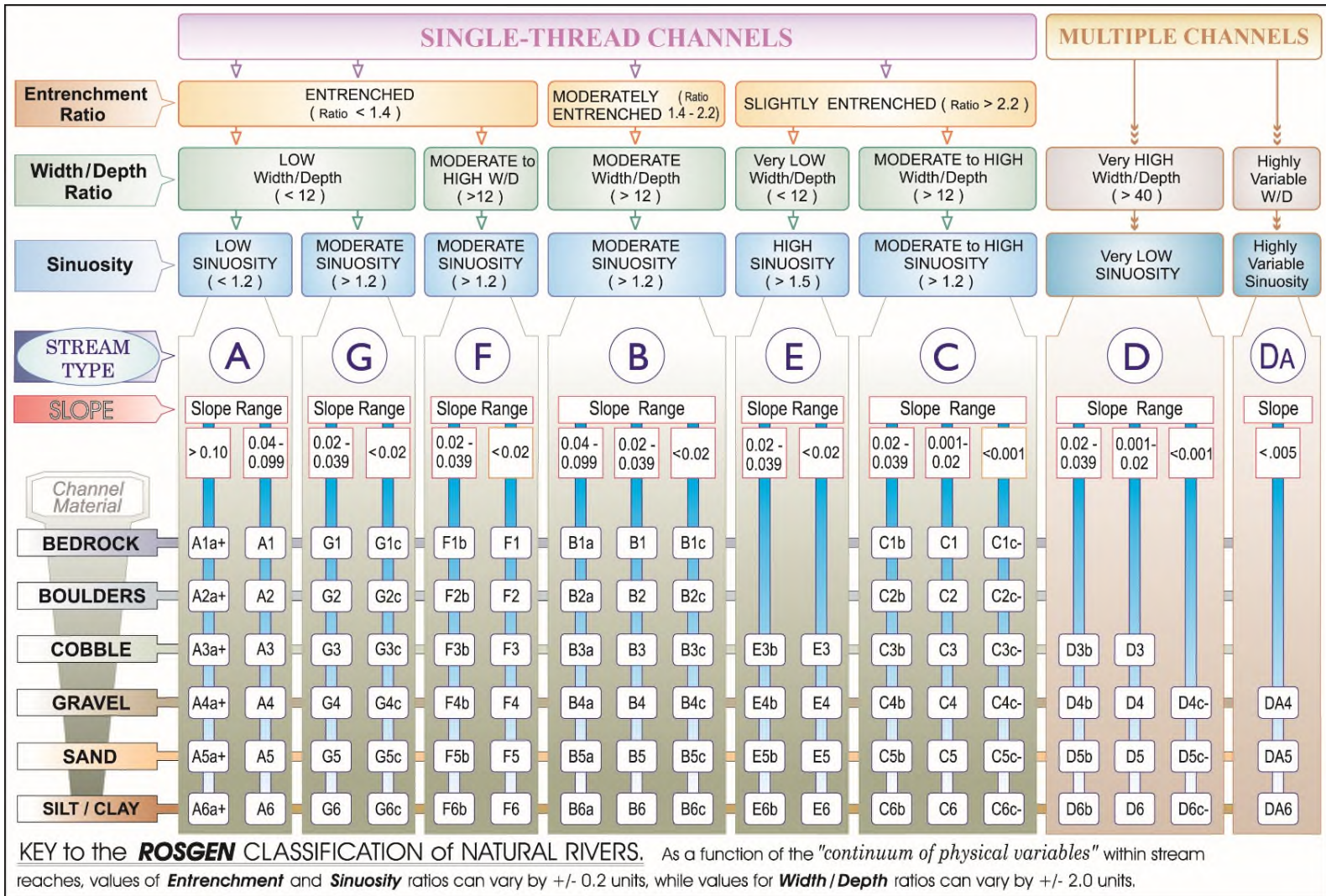


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

SECTION 10 - CROSSING STRUCTURE METRICS

Existing Conditions	Existing Structure Type: <input type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input checked="" type="checkbox"/> Other: None					
	Existing Crossing Span: <i>(perpendicular to flow)</i>	N/a feet	Culvert Diameter:	N/A feet		
	Existing Crossing Length: <i>(parallel to flow)</i>	N/A feet	Inlet Elevation:	El. N/A feet		
Proposed Conditions	Proposed Structure Type:		Tier 1	Tier 2	Tier 3	Alternative Design
	Bridge Span		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Closed-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Open-bottom Culvert		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Proposed Structure Span: <i>(perpendicular to flow)</i>	5 feet	Culvert Diameter:	feet		
	Proposed Structure Length: <i>(parallel to flow)</i>	53 feet	Inlet Elevation:	El. 1126 feet		
Proposed Entrenchment Ratio:*		Outlet Elevation:	El. 1125 feet			
Proposed Entrenchment Ratio:*			Culvert Slope:	0.019		
<i>For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.</i>						

* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

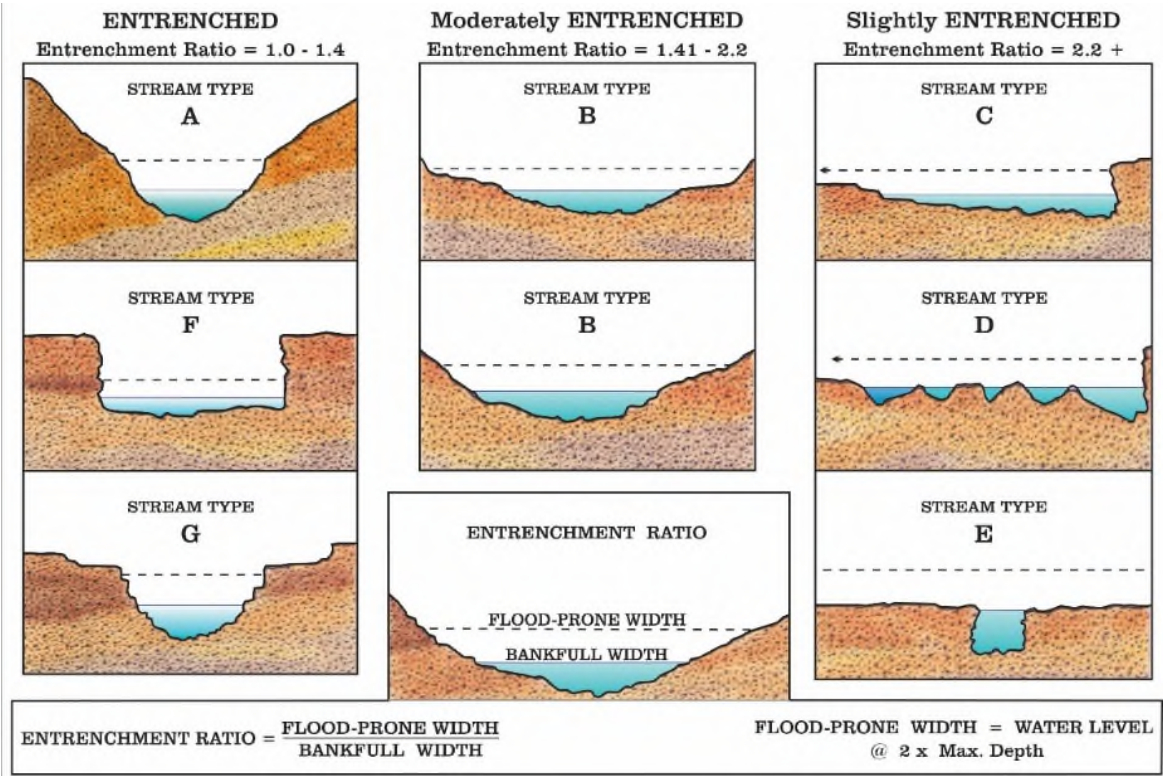


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	N/A	1128.45
Flow velocity at outlet in feet per second (FPS):	N/A	6.85
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		75.5
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		54.8
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
<i>For tier 2, tier 3 and tier 4 crossings only.</i>		
Crossing Structure Openness Ratio* = <input type="text"/> * Openness box culvert = (height x width)/length Openness round culvert = (3.14 x radius ²)/length		
SECTION 13 - GENERAL DESIGN CONSIDERATIONS		
Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.		
All stream crossings shall be designed and constructed so as to:		
<input checked="" type="checkbox"/> Not be a barrier to sediment transport.		
<input checked="" type="checkbox"/> Prevent the restriction of high flows and maintain existing low flows.		
<input checked="" type="checkbox"/> Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.		
<input checked="" type="checkbox"/> Not cause an increase in the frequency of flooding or overtopping of banks.		
<input checked="" type="checkbox"/> Maintain or enhance geomorphic compatibility by:		
a. Minimizing the potential for inlet obstruction by sediment, wood, or debris, and		
b. Preserving the natural alignment of the stream channel.		
<input checked="" type="checkbox"/> Preserve watercourse connectivity where it currently exists.		
<input checked="" type="checkbox"/> Restore watercourse connectivity where:		
a. Connectivity previously was disrupted as a result of human activity(ies), and		
b. Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both.		
<input checked="" type="checkbox"/> Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.		
<input checked="" type="checkbox"/> Not cause water quality degradation.		
SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA		
Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.		
<input checked="" type="checkbox"/> The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.		
SECTION 15 - ALTERNATIVE DESIGN		
NOTE: If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in Figure 3 , then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.		
<input type="checkbox"/> I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.		

Env-Wt 903.04 Information Required for All Stream Crossing Standard Permit Applications

- a. *On the USGS map or updated data based on LiDAR required by Env-Wt 311.06, the following:*
1. *The approximate boundaries of the contributing watershed;*
The boundaries of the contributing watershed were delineated using LIDAR mapping and considering proposed grading for the landfill as part of the project. See attached watershed figure.
 2. *The size of the contributing watershed; and*
A contributing watershed of 54 acres was determined using the above-referenced maps.
 3. *Identification of the stream tier based on watershed size;*
The size of the contributing watershed results in a Tier 1 designation for the stream crossing.
- b. *Plans showing the following:*
1. *The scale, a north arrow, and at least 3 cross-sections outside of the construction disturbance area that are representative of the stream system away from the area of direct influence by the crossing;*
Not applicable for a Tier 1 stream
 2. *Clearing limits showing all proposed work areas;*
See Sheet 16 of the Design Drawings showing the clearing limits for the culvert and approach road.
 3. *For both the existing structure, if any, and the proposed structure, the following:*
 - (a) Location;
See Sheets 3 and 35 of the Design Drawings for the proposed structure location. There is no existing structure at this location.
 - (b) Type;
The proposed culvert is a four-sided concrete box culvert with 24 inches of embedment. See Sheet 35 of the Design Drawings.
 - (c) Dimensions; and
The dimensions of the proposed culvert are 6-ft wide by 5-ft tall by 53-ft long. See Sheet 35 of the Design Drawings.
 - (d) Inlet and outlet invert elevations;
The proposed culvert invert elevations are 1126.00 ft (inlet) and 1125.00 (outlet). See Sheet 35 of the Design Drawings.
 4. *The extent of channel excavation and filling;*
See Sheet 35 of the Design Drawings.
 5. *Road locations, including road edges, centerline, and boundaries of the right-of-way;*
See Sheet 35 of the Design Drawings for road locations and edges. The crossing is a private road with no public right-of-way.

6. *Proposed channel work including bank erosion control features, grade control, and channel linings; and*
See Sheet 35 of the Design Drawings for bank erosion control features.
 7. *For the proposed structure, cross-sections showing the water surface elevation resulting from the applicable design storm, with bed material and backfill zones;*
 8. **See Sheet 30 of the Design Drawings for cross-sections showing the water surface elevation resulting from the applicable design with bed materials and backfill zones shown.**
- c. *Existing crossing metrics, including:*
1. *Existing riparian zone, including the extent and type of existing vegetation surrounding or in the stream bank; and*
The riparian zone is about 20 feet wide. Cover types are 75% trees, 15% shrubs, 5% herbaceous, and 5% bare. See Stream Visual Assessment Protocol in Section 9.2.
 2. *Existing tailwater control, including its location and materials, and pool configuration;*
None known.
- d. *The dewatering system, as follows:*
1. *Estimates of the maximum flow anticipated during construction, including any summer storm estimates;*
Contractor is to determine means and methods for all temporary structures and operations, such as determining maximum stream flows during construction flows See Water Diversion Notes on Sheet 21 of the Design Drawings.
 2. *The hydraulic calculation for the bypass pipe or channel size, length, and gradient;*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 3. *Location, height, and width of the diversion dam;*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 4. *Sump locations, including estimate of necessary flow and sump capacity;*
See response to d.1. and Foundation Notes on Sheet 34 of the Design Drawings.
 5. *Backwater prevention method; and*
See response to d.1. and Water Diversion Notes on Sheet 34 of the Design Drawings.
 6. *Sediment treatment plan with methods, release point, and extent;*
See response to d.1. Additionally, they will need to include their methods of treating sediment resulting from their construction activities. See Erosion Control Notes on Sheet 48 of the Design Drawings and the Dewatering Filter Bag Detail, with notes, on Sheet 44.
- e. *Erosion and pollution controls, as follows:*
1. *Any additional methods of controlling erosion;*
 2. *A soil stabilization plan, including but not limited to where to cover stockpiles and place straw bales; and*
 3. *Pollution control methods for pumps, fuel stations, and equipment storage;*

Contractor is to determine means and methods for erosion and pollution controls and to submit an erosion control plan to Engineer for review.

f. *The number and location of footings, if any, and the following for each:*

The ends of the culvert will have precast concrete cutoff blocks installed under the culvert to prevent scouring and undermining of the culvert. Also, the wing walls will have footing/cutoff blocks installed under them to support the walls and to prevent scouring and undermining.

g. *A narrative explaining why the cross-sections identified pursuant to (b)(7), above, are representative;*

Cross Sectional Geometry under Section 5 of the Stream Crossing Worksheet is not required for Tier 1 crossings. Water surface elevations on sheet 35 are based on hydraulic modeling.

h. *The design features used to improve aquatic organism passage and the expected distance, in linear feet, of downstream and upstream improvement for aquatic organism passage or fish passage;*

The proposed structure will maintain passage of aquatic organisms upstream and downstream by reconstructing a natural bottom inside of the box culvert reusing stream bed material from the channel excavation. Forested upland buffer adjacent to the stream and wetlands will be maintained to the extent practicable. See Design Drawings 34 and 35.

i. *The hydraulic capacity of the proposed crossing, in terms of flood frequency event, and of the existing crossing, if any; and*

The hydraulic capacity of the proposed culvert is 54.8 cfs for the 50 year storm event and 75.5 cfs for the 100 year storm event. See the attached DES Stream Crossing Worksheet.

j. *The following channel information at the crossing and for the reference reach:*

1. *The classification of the stream using the Rosgen classification system as described in Applied River Morphology by Dave Rosgen, 1996, available as noted in Appendix B, at the crossing and upstream and downstream of the crossing;*
2. *Bankfull width;*
3. *Bankfull depth (mean);*
4. *Entrenchment ratio;*
5. *Sinuosity; and*
6. *Flood-prone width.*

Items 1 through 6 not applicable for Tier 1 streams.

Section 2.6

Army Corps of Engineers Appendix B – Secondary Impacts Checklist



**US Army Corps
of Engineers**®
New England District

**Appendix B
New Hampshire General Permits
Required Information and USACE Section 404 Checklist**

USACE Section 404 Checklist

1. Attach any explanations to this checklist. Lack of information could delay a USACE permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 3 for information on single and complete projects.
4. Contact USACE at (978) 318-8832 with any questions.
5. The information requested below is generally required in the NHDES Wetland Application. See page 61 for NHDES references and Admin Rules as they relate to the information below.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See the following to determine if there is an impaired water in the vicinity of your work area. * https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/ https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment https://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to tidal SAS, prime wetlands, or priority resource areas? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www4.des.state.nh.us/NHB-DataCheck/ .		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres?	X	
2.6 What is the area of the previously filled wetlands?	1.0	
2.7 What is the area of the proposed fill in wetlands?	10.5 acres	
2.8 What % of the overall project sire will be previously and proposed filled wetlands?	11.5%	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www4.des.state.nh.us/NHB-DataCheck/ . USFWS IPAC website: https://ipac.ecosphere.fws.gov/	X	

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?	X	
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?	X	
3.5 Are stream crossings designed in accordance with the GC 31?	X	
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		n/a
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the RPR Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 37 GC 14(d) of the GP document**	X	
6. Minimal Impact Determination (for projects that exceed 1 acre of permanent impact)	Yes	No
Projects with greater than 1 acre of permanent impact must include the following: <ul style="list-style-type: none"> • Functional assessment for aquatic resources in the project area. • On and off-site alternative analysis. • Provide additional information and description for how the below criteria are met. 		
6.1 Will there be complete loss of aquatic resources on site?		X
6.2 Have the impacts to the aquatic resources been avoided and minimized to the greatest extent practicable?	X	
6.3 Will all aquatic resource function be lost?		X
6.4 Does the aquatic resource (s) have regional significance (watershed or ecoregion)?		X
6.5 Is there an on-site alternative with less impact?		X
6.6 Is there an off-site alternative with less impact?		X
6.7 Will there be a loss to a resource dependent species?		X
6.8 Are indirect impacts greater than 1 acre within and adjacent to the project area?	X	
6.9 Does the proposed mitigation replace aquatic resource function for direct, indirect, and cumulative impacts?	X	

*Although this checklist utilizes state information, its submittal to USACE is a federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.