

3 – ROADWAY STANDARDS

3.1 General

- A. For the purposes of these Standards, streets shall be classified as Local, Collector and Arterial.
- B. Any contractor, corporation, public utility, or person desiring to open a public way must comply with the Town's Excavation Permit policy including the Road Moratorium Excavation Fee and Life Cycle Maintenance Cost where applicable, and the associated standard operating procedures. Please refer to Town of Durham Web site and Excavation Permit Application.
- C. All trenches within the town right-of-way, and trenches on private property that are excavated for the purpose of test pits coordinated through the Engineering Division, that are at least 3 feet in depth and less than 15 feet in width, regardless of the length, shall be permitted through the Town's Excavation Permit policy.
- D. In an effort to protect the Town's investment in its infrastructure, excavations in newly constructed, reconstructed, rehabilitated, or overlaid pavements within public roads, sidewalks, or on Town property are prohibited for five years after the effective date of notice of completion or acceptance of the new, reconstructed, rehabilitated, or overlaid improvements. If an applicant chooses to puncture within a roadway under moratorium the applicant will be assessed a Moratorium Excavation Fee in addition to the Life Cycle Maintenance Cost. Please refer to Town of Durham Web site and Excavation Permit Application. The Street Moratorium Map can be found here <https://www.ci.durham.nh.us/publicworks/engineering-division>.
- E. All work in a public way shall be done in compliance with the minimum standards of Durham Public Works as set forth herein.

3.2 Design

- A. Street design minimum standards for Streets shall conform to the best accepted design practice as recommended by AASHTO, the Durham Road Regulations, and in consultation with Durham Public Works.
- B. Location and alignment shall conform to the requirements contained in these Standards.

- C. Boring or test pits shall be taken as determined by Durham Public Works. These shall show soil strata and high ground water elevations. Drought conditions shall be noted.
- D. The existing water table shall be located and particular attention given to changes in the present and in the possible future water table caused by the movement of earth and other construction work.
- E. The pavement cross section shall be designed to provide a 20-year life based on soil and traffic conditions. The minimum pavement cross section for residential streets shall be: 1.5 inches of Top Course material placed on 2.0 inches of Binder Course material founded on 4 inches of Dense Graded Crushed Stone on 8 inches of Gravel Subbase.

Pavement designs for all other roadways, or where high truck traffic is expected, shall be in accordance with NHDOT guidelines and the pavement cross section shall be approved by the Town Engineer and/or Director of Public Works.

- F. Electric, telephone, cable television cables and ducts shall be placed in the grass strip outside of the traveled way, on the opposite side of the centerline of the street as the water main.
- G. Street light standard locations shall be determined by Durham Public Works consistent with industry standards and best management practices.
- H. A note shall be placed on all plans stating “The Town of Durham Department of Public Works and Engineering Division shall be notified seventy-two (72) hours in advance of any roadway or municipal service construction. No portion of any utility shall be backfilled until approval for such backfilling is obtained from Durham Public Works. Such approval does not constitute acceptance of such utilities by the Town of Durham.”

3.3 Construction

3.3.1 Methods

- A. All trench repair work must be guaranteed and bonded as required in the Town’s Excavation Permit policy.
- B. All work shall be conducted in strict accordance with the latest OSHA regulations.
- C. Workmanship:
 - 1. The Permittee shall furnish all materials and conduct the job in an orderly, timely, quality-controlled manner.

2. The Permittee shall keep a competent foreman and sufficient competent employees to carry on the work with proper speed and in accordance with the requirements of law and other public authorities and to the reasonable satisfaction of Durham Public Works.
 3. The Permittee shall conduct the work in a manner that will not unreasonably interfere with other work being done by the Town, by contract or otherwise. If deemed necessary by Durham Public Works, the work done under these standards shall conform to the progress of said other work. The Permittee shall cooperate with the contractors or employees who may be doing work for the Town, and with public service corporations affected by the work in arranging for storage places, temporary support for structures, repairs, etc.
 4. All temporary repairs shall be properly maintained by the Permittee to assure good rideability conditions until permanent restoration has been made.
 5. Permanent pavement restoration shall be properly maintained to assure good rideability conditions until acceptance by Durham Public Works.
- D. The Permittee shall perform the necessary restoration beyond the limits of the street pavement, including lawns, shrubs, gardens, curbing, sidewalks, underdrains, separation fabrics, fences, walls, etc. Upon completion of the permanent repairs outside the limits of the street pavement, the Permittee shall notify Durham Public Works in writing that the permanent repairs and/or replacements have been completed, setting forth the date of completion. The Permittee shall maintain the repaired area outside of the pavement for a period of three (3) years after completion, with the exception that once proper horticultural growth has been established, no further horticultural maintenance will be required.
- E. All traffic control signs (i.e. STOP, YIELD, DO NOT ENTER, ONE WAY, NO PARKING, SPEED LIMIT, CURVE WARNINGS, etc.) approved by DPW for removal, relocation, replacement, etc. shall be immediately replaced by the Permittee, unless otherwise directed by the Town Engineer. No such traffic control sign shall be removed, relocated or replaced without the express approval of DPW.
- F. All traffic devices, signs, pavement markings or traffic loops disturbed, damaged, altered or removed by the Permittee shall be promptly replaced by the Permittee, unless otherwise directed by Durham Public Works, in accordance with Town and State of New Hampshire rules and regulations at the expense of the Permittee. The Permittee shall promptly repair all other damage caused by the work or

activities. Street markings (centerlines, crosswalks, stop bars, lane markings, etc.) and traffic loops shall be replaced no later than thirty (30) days after completion of work or as may be directed by the Town Engineer. If work disturbs centerlines or lane markings on primary streets, the Permittee shall place temporary reflective markers immediately after the pavement is placed.

3.3.1.1 Excavation

- A. No excavation shall remain open during non-working hours (5:00 p.m. to 7:00 a.m., or as identified in specific permit requirements). All excavations shall be backfilled and paved, or covered with steel plates as approved by DPW at the end of work each day. Steel plate use requires approval by the Town Engineer and/or Director of Public Works. Steel plates are generally not accepted.
- B. Length of Trench Opening:
 - 1. The maximum length of open trench permissible at any time shall be two hundred (200 feet) feet, and no greater length shall be opened for pavement removal excavation, construction, backfilling, repairing, or any other operation without the express written permission of the Town.
- C. Removal of asphalt pavement:
 - 1. All initial excavations into paved street surfaces shall be precut in a neat line with pavement breakers or saws. The initial cutting of the pavement shall be restricted to the area directly over the sidewalls of the proposed trench to be excavated, or as directed by Durham Public Works.
 - 2. Heavy duty pavement breakers may be prohibited by the Town when the use endangers existing substructures or other property.
 - 3. No irregular shapes will be allowed. No shape will be allowed that would prevent compaction equipment from adequately compacting all of the area. The shape of pavement cutouts shall be rectangular, or a combination of rectangular and square shapes unless otherwise agreed to by the Town and Permittee.
 - 4. Pavement edges shall be trimmed to a neat vertical face free of loose materials and neatly aligned with the centerline of the trench.
 - 5. Unstable pavement shall be removed over cave outs and overbreaks and the subgrade shall be treated as the main trench.
 - 6. The Permittee shall make every effort to avoid damage to existing pavement to remain. Any damage shall be promptly repaired by the Permittee.

- D. All material excavated from trenches and piled adjacent to the trench or in any street shall be piled and maintained in a manner that will not endanger those working in the trench, pedestrians or users of the streets, and so that as little inconvenience and obstruction as possible is caused to those using streets and adjoining property. The excavated material shall be hauled away from the site by the end of each working day.
- E. The Permittee shall secure the necessary permission and make all necessary arrangements for all required storage and disposal sites.
- F. When excavated material is laid along the side of the trench, it shall be kept trimmed. Whenever necessary in order to expedite the flow of traffic or to abate the dirt or dust nuisance, toe boards or bins may be required by Durham Public Works to prevent the spreading of dirt into traffic lanes. If any portion of the excavated material is allowed to be used as backfill, it shall be stockpiled separately from all other materials.
- G. Sections of sidewalks and curbs shall be removed to the nearest real joint or score line.
- H. Tunneling, boring or other methods may be required by Durham Public Works to avoid or minimize pavement removal.

3.3.1.2 Backfill

- A. Before backfilling, the Permittee shall notify Durham Public Works for inspection. Backfilling shall not occur without DPW approval.
- B. In unpaved areas, excavations shall be backfilled as directed by Durham Public Works with approved material thoroughly compacted in layers not to exceed twelve inches (12 inches) in thickness until flush with the surrounding ground surface. If the backfilled material settles, additional approved materials shall be installed by the Permittee, as required, to keep the surface even. After settlement is completed, the excavated area shall be left by the Permittee in as good a condition as before the work was started.
- C. Temporary sheeting and bracing used to support the side walls shall be removed, unless otherwise directed by Durham Public Works, as backfilling progresses. When backfilling has reached the bottom of a brace, the latter and its horizontal rafter shall be removed, and this procedure shall be repeated throughout the backfilling operation. The sheeting shall be pulled in short increments, care being taken to avoid significant lateral movements of the sides of the trench. During and after pulling the sheeting, the backfill in the space formerly occupied by the sheeting shall be compacted.

- D. Whenever water is found standing in the excavation area, the water shall be removed by pump or other means before backfilling operations may commence.
- E. Backfilling shall be performed as soon as practicable so that the least possible subsequent settling will occur. In most cases backfilling shall occur on the same day as the excavation was begun. If this is not feasible due to the complex nature of work, emergency, or unpreventable conditions, the Permittee shall notify Durham Public Works that same day, if not sooner, and take appropriate measures to protect public safety and infrastructure until work commences again the following day.
- F. Backfill in paved areas shall be granular gravel borrow, processed gravel, sand or crushed stone material placed to a depth of 1 foot over the utility. The backfill shall be spread in layers not exceeding eight inches (8 inches) in loose depth and thoroughly compacted, up to the pavement subgrade surface.
- G. Broken pavement, large stones, roots and other debris shall not be used in backfill. Unused excavated material shall be removed from the jobsite and disposed of in a manner that will minimize interference and obstruction with pedestrian and vehicular traffic. No material shall be left within the right-of-way once the repair and/or installation is complete.
- H. The Town will allow, and may in some cases require under certain conditions, as an alternate, Controlled Density Fill (CDF) under the following conditions:
 - 1. Only Type IE or 2E, Excavatable, Fill will be allowed.
 - 2. This material shall not be used for bedding material or in situations that will cause floating of the utility lines, or in the presence of cast iron or steel pipes.
 - 3. CDF placement in trenches shall be fully barricaded or police protected for a minimum of three (3) hours after the pour or until a set is reached that will prevent a hazard to animals or humans.
 - 4. CDF shall be placed up to the pavement subgrade surface.
 - 5. CDF shall be separated from gas lines with a minimum of six (6) inches of sand cover over the lines.

3.3.1.3 Pavement Patching

- A. Upon the completion of proper backfilling, the Permittee shall install pavement. The Permittee shall take all reasonable measures to complete pavement on the same day excavation work was begun especially for primary roads. If same day paving is not achievable due to complexity of work, emergency, or unpreventable

- conditions, or otherwise agreed to by Durham Public Works, the Permittee must make the roadway surface safe and passable by bringing the excavation up to match the adjacent grade with dense graded crushed stone or other approved method. Unpaved excavations must be inspected and maintained as necessary on a daily basis. No excavation will be allowed to go unpaved for a period longer than one week.
- B. The Permittee shall notify Durham Public Works 24 hours prior to beginning paving operations for inspection. All hot mixed asphalt paving must first be approved by Durham Public Works or designee as to depth and materials.
1. Notification of the anticipated timing of all paving activity must be acknowledged by Durham Public Works. Any notification delivered by facsimile machine must be preceded or followed up by a telephone conversation to assure its proper and timely receipt.
 2. Permittees shall endeavor to make a follow-up notification by 9:00 a.m. of each workday that paving is still anticipated. In the event of schedule changes or emergencies, the Permittee shall provide a minimum of one-hour notification to assure inspection availability.
 3. If a Town inspector is not able to be on site within 24 hours of the acknowledged anticipated start time of paving activity, the Permittee may be allowed to commence paving. Inspector may sample in-place material for specification compliance.
 4. Permittees who do not provide proper notification of paving activities may be subject to required removal and replacement of pavement for the purpose of inspection.
- C. The existing pavement shall be sawcut a minimum of twelve (12) inches beyond the initial excavation limits to expose a twelve (12) inch width of undisturbed soil.
- D. The temporary pavement, backfill and undisturbed soil shall be removed to the depth of the proposed pavement and disposed of off the site.
- E. The permanent pavement patch shall be a minimum of 3.5 inches (1.5 inches of Top Course material placed on 2 inches of Binder Course material). If the existing pavement has a thicker section, the depth of the pavement patch shall at a minimum match the existing pavement.
- F. Trench backfill shall be checked for compliance with 95 percent compaction requirement. If compaction is found to be less than 95 percent, trench shall be re-compacted before paving will be allowed.

- G. The Permittee will not be required to repair or replace damaged pavement existing prior to commencement of the work unless excavation operations result in small, unstable sections. These shall be removed and replaced as part of the work.
- H. Each course of hot-mixed asphalt shall be compacted separately, meeting the requirement of 95 percent minimum compaction of standard laboratory maximum theoretical density for the specific material.
- I. Mechanical compactors will be permitted for repairs less than 10 square yards. Repairs exceeding 10 square yards shall be rolled with an appropriately sized, power-driven, steel-wheeled roller to obtain specification density.
- J. All sawcut vertical faces of existing pavement shall be neat, free of loose materials, and tack coated with an approved asphalt emulsion by applying the emulsion material in conformance with NHDOT Standard Specifications Section 410, to fully cover the surfaces prior to pavement installation.
- K. A tack coat shall be applied to the previous course surface if the subsequent course is not immediately placed.
- L. All trenches shall have the joint between the old and new pavement sealed with an asphalt fiber crack sealer in conformance with NHDOT Standard Specifications Section 413.
- M. Hot mixed asphalt paving of trenches deemed by Durham Public works to be major excavation shall be paver applied, unless otherwise authorized by Durham Public Works.
- N. If two or more excavations are made for the same utility or client in the same construction season and are within six (6) feet of each other, edge to edge, they shall be permanently restored as one trench, including the pavement between excavations.
- O. The Permittee shall keep the pavement in acceptable condition until the end of the guarantee period.
- P. If cobblestones, granite, or brick pavers, or other material also exists within in the pavement section to be disturbed, the Permittee shall be required to replace those materials using the construction methods originally used to install those features.

3.3.2 Materials

All construction materials and methods shall conform to the requirements contained in the latest version of the New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction as amended, unless otherwise specified herein or approved by Durham Public Works.

Specific standard materials to be used shall be as described below and as shown on the Construction Details.

3.3.2.1 Gravel, NHDOT Item 304.2

- A. Gravel shall conform to NHDOT Standard Specification Section 304.

3.3.2.2 Crushed Gravel, NHDOT Item 304.3

- B. Crushed Gravel shall conform to NHDOT Standard Specification Section 304.

3.3.2.3 Curbing

- A. Granite curbing shall be Item 609.01
- B. Where transitions from vertical granite curb to either sloped granite edging or hot mix asphalt berm are being made, granite transition stones as shown in Construction Detail RS-5 shall be utilized.
- C. Where catch basins or drainage inlets are installed adjacent to a vertical curb or edging, granite inlet stones as shown in Construction Detail RS-5A shall be utilized.

3.3.2.4 Curb Ramps

- A. Refer to Section 4, Pedestrian Accessibility.

3.3.2.5 Bituminous Curb

- A. Bituminous Curb shall conform to NHDOT Standard Specification Section 609.3.2 and Construction Detail RS-6. (Type B 4" Reveal)

3.3.2.6 Retaining Walls

- A. Walls to be constructed within the Town Right-of Way shall be constructed in accordance with NHDOT Standard Specification Section 570.

3.3.2.7 Loam Borrow

- A. Loam Borrow shall conform to NHDOT Standard Specification Section 641. Loam shall have a finished depth of six (6) inches (minimum).

3.3.2.8 Seeding

- A. Seeding shall conform to NHDOT Standard Specification Section 644. Permittees shall be required to continually seed and water areas of loam until a satisfactory growth of grass is established.

3.3.2.9 Guard Rail

- A. Guard Rail shall be weathered steel with wood posts in conformance with NHDOT Standard Specification Section 606.

3.3.2.10 Street Signs

- A. Street signs shall conform to latest version of MUTCD.
- B. Signs shall be reflectorized aluminum in conformance with NHDOT Standard Specification Section 615.

3.3.2.11 Dust Control

- A. The Town may require dust control which shall consist of the application of calcium chloride. The contractor may also be required to furnish sprinkler trucks or hoses to wet down surfaces in lieu of applying calcium chloride.