

# ROAD CONSTRUCTION REGULATIONS

## ***SECTION 1: Authority and Purpose***

Pursuant to the authority vested in the Planning Board by the legislative body of the Town of Wolfeboro and in accordance with the provisions of RSA 674:35 and 674:43 of the New Hampshire Revised Statutes Annotated, as amended, the Planning Board adopts the following regulations governing the development of roads as part of a subdivision of land or site plan application in the Town of Wolfeboro, New Hampshire.

These regulations are designed to accomplish the purposes set forth in RSA 674:36 and 674:44 and for the purposes of protecting the health, safety, convenience, and economic and general welfare of our citizens.

These regulations supersede the road construction standards within Subdivision Regulations and Site Plan Review Regulations, Town of Wolfeboro, New Hampshire, adopted 14 November, 2000, as amended prior hereto, and such prior regulations are hereby rescinded.

## ***SECTION 2: Title***

These regulations shall be known and cited as the ROAD CONSTRUCTION REGULATIONS OF TOWN OF WOLFEBORO, NEW HAMPSHIRE.

## ***SECTION 3: GENERAL STANDARDS***

### **3.01) STREET LAYOUT, PLAN, AND CONSTRUCTION**

The layout of all proposed streets shall provide for the continuation of the principal streets in an adjoining subdivision, if applicable. When the adjoining property is undeveloped, proper consideration of future development potential shall be given with respect to future continuous alignments. Safe access to all abutting lots shall be provided. Due consideration to topography, drainage and other natural features shall be given when laying out streets. The general street development plan shall be approved prior to the construction of any phase of the plan. The proposed street plan shall show all work necessary to connect and complete improvements and utilities between the proposed street(s) and any non-improved connecting street in an existing subdivision. All streets and related improvements shall be constructed in conformance with the standards described herein. Typical roadway sections, based on expected average daily traffic volume (ADT), are illustrated in *Figure One*. Typical geometric and structural guidelines based on ADT, are illustrated in *Figure One*.

**3.02) BOUNDARY MARKER**

A permanent, iron boundary pin, reinforced concrete marker or stone marker, as shown in *Figure Two*, shall be placed at the edge of each roadway boundary on the periphery and at all curves and arc points.

**3.03) BENCHMARKS**

At least one benchmark shall be set as part of any new road construction. All Benchmarks shall be placed in reference to a permanent U.S.G.S. point location.

**3.04) STREET NAMES**

Proposed street names shall not duplicate any existing street names within the Town. The Police and Fire Department shall grant preliminary approval to any proposed Street name. Street names shall be subject to Planning Board approval. Upon completion of a street, the names shall be posted by the developer on a sign of a type approved by the Dept. of Public Works.

**3.05) TRAFFIC CONTROL SIGNS**

All streets shall have such street signs as are necessary and approved by the Police Department and the Department of Public Works to provide for safe and efficient movement of all vehicles. Signs shall conform with the standards of the industry as set forth in the Manual for Uniform Traffic Control Devices for Streets and Highways. The cost of all traffic control signs shall be the responsibility of the developer.

**3.06) CUL-DE-SACS**

Cul-de-Sacs shall not service more than 10 lots. When undeveloped parcels adjoin roads ending in a Cul-de-Sac, a reserve strip shall be provided for possible future extension of the road network. Any reserve strip shall be depicted on the approved plan and deeded in a manner that shall permit the future extension of the road network. A master plan of the remaining land shall be required to insure that the reserve strip can be later converted to a road. The reserve strip to the adjacent property shall have a preliminary profile prepared and the alignment and layout of this extension shall conform with the balance of the subdivision regulations. The Planning Board reserves the right to require a statement from the developer's engineer stating that the reserve strip conforms with all Wolfeboro Road Construction Standards and Subdivision Regulations.

Cul-de-Sacs shall be allowed in accordance with the specifications listed in items 4.11 and 4.12 of these standards. The center line of all Cul-de-Sacs shall be aligned with the center line of the street. These standards are illustrated in *Figure Three*. A landscaped island in the center of the Cul-de-Sac may be required at the discretion of the Planning Board. When required, said island shall be sized to provide a street width of no less than 20' around the island. Hammerhead turnarounds on dead-end streets may be permitted at the discretion of the Planning Board. When proposed, the design of these facilities will be subject to the approval of the Public Works and Fire Departments.

**3.07) BRIDGES**

On stream crossings spanning ten (10) or more feet, the bridge structure shall be designed to HS-25 loading (AASHTO specifications, hereby incorporated into these regulations by reference). All bridge designs shall include a hydraulic and hydrologic analysis. The minimum roadway width on bridges shall be 24 feet. Greater street widths, depending on the volume of traffic anticipated, may be required at the discretion of the Planning Board. Bridge railing shall be required in accordance with NHDOT standards.

**3.08) ALLEY WAYS**

Alley ways shall not be permitted unless part of a Traditional Neighborhood Development as defined the Institute for Transportation Engineers, Traditional Neighborhood Development Street Design Guidelines, Published June 1997.

**3.09) SIDEWALKS, PEDESTRIAN WAYS, AND BICYCLE PATHS**

Sidewalks, pedestrian ways, and bicycle paths may be required at the discretion of the Planning Board. When required, sidewalks shall be constructed in accordance with the specifications listed herein. Proposed designs of pedestrian ways and bicycle paths will be subject to the approval of the Planning Board. Sidewalks are defined as those walkways adjacent to traveled roadways. Pedestrian ways and bicycle paths may or may not be adjacent to traveled roadways.

**3.10) CURBS AND GUTTERS**

Street curbing and gutters shall be required in areas serviced by the municipal storm water collection system and elsewhere at the discretion of the Dept. of Public Works. When required, curbing shall be constructed in accordance with the specifications listed herein unless otherwise agreed to by the Planning Board.

**3.11) DRIVEWAYS AND OTHER ACCESSES**

Driveways and other accesses to the local street network or proposed streets shall be constructed in accordance with the "State of New Hampshire Department of Transportation Policy and Procedure for Driveways and Other Accesses to the State Highway System", NHDOT 1992. The grade of all driveways shall not exceed 6 percent for a distance sufficient to accommodate expected vehicle storage. Driveways shall be defined in accordance with the definitions given in the Institute of Transportation Engineers Guidelines for Driveway Design and Location, 1985. Both of these documents are hereby incorporated into these regulations by reference.

**3.12) UTILITIES**

Utility poles shall be within the roadway Right of Way (ROW) line and in no case shall be placed in the ditch line. A minimum of eight feet (8'-0") of clearance shall be provided between the edge of a roadway and the faces of a utility pole except in Downtown or TND where the minimum clearance shall be six inches (6"). When possible, water and sewer mains, storm drains and other underground utilities shall be constructed outside the road surface area and preferably, outside the ditch line, but within the Right of Way (ROW). All underground utilities shall be installed in accordance with the New Hampshire Dept. of Environmental Services Standards for Sewer construction, Storm Water Construction, and Water System Construction. All other utilities shall

be installed in compliance with the applicable industry standards in place at the time of construction.

**3.13) FUTURE UTILITIES**

A feasible layout for all future utilities within the subdivision and on adjacent land (when applicable), relative to natural features, shall be provided by the developer.

**3.14) CLEARING AND GRUBBING**

All trees and brush, stumps, large roots, loam, forest litter, sod, muck, silt and other unsuitable material beneath the proposed road bed shall be removed. Under no circumstances shall any wood, brush, or any other unsuitable material be placed under or allowed to remain within the limits of the subgrade area.

**3.15) CUT AND FILL IN STREET CONSTRUCTION**

Excavation of roadbeds shall consist of removing earth or ledge to a depth of 24" below the finished roadbed grade (subgrade) shown on the final profile; i.e., below the required road base. Filled roadbeds shall be formed by spreading successive layers of fill material not greater than 12" in depth. Fill standards set forth in section 209 of the "Standard Specifications for Road and Bridge Construction" NHDOT, 1990 are adopted by reference. Each layer shall be compacted to a density of at least 95% of maximum density before another layer is begun. The maximum density determination will be made as specified in AASHTO T 99 (Standard Proctor Test). Material containing loam, organic soil, forest litter, wood, roots, or other substances that will not provide a stable bed or embankment will not be acceptable for the construction of fills. Broken ledge may be used in layers in fills over 4' in thickness. The voids in each layer shall be filled with earth or spalls. Broken ledge shall not be placed within 2' below the finished subgrade. Ledge fragments, or boulders larger than 1/8 cubic yard shall not be used within 2' of the finished subgrade. The subgrade shall be at least two (2) feet above the estimated Seasonal High Water Table.

Side slopes cut in soil above the finished roadway shall not exceed a ratio of 3' horizontal to 1' vertical and shall be graded, loamed (4" compacted), and seeded in conformance with "Standard Specifications for Roadway and Bridge Construction, NHDOT, 1990", Section 644. Side slopes in ledge above the finished roadway shall not exceed a ration of 1' horizontal to 2' vertical. Embankment slopes away from the edge of the finished roadway shall not be constructed at a ratio steeper than 4' horizontal to 1' vertical unless the length of the grade is greater than 10'. If the horizontal length of the grade exceeds 10', a ratio of 3' horizontal to 1' vertical may be used. W beam guard rail may be required by the Dept. of Public Works.

**3.16) ROADWAY GRADES**

Roadway grades shall be constructed in conformance with the standards provided herein (see items 4.05 and 4.06).

**3.17) GRADE STAKES**

The developer or his engineer shall be responsible for placing grade stakes at 50' intervals adjacent to the road course where there are abrupt changes in grade and at 100' intervals where a more level contour is present. Each stake shall be securely placed where it will not be disturbed by construction. Each stake will indicate a station number, its offset from the center line of the street, and the extent of cut or fill to the finished center line grade. Grade stakes shall be preserved until the completion of the roadway. If grade stakes are removed or damaged to the extent that they cannot be read by the appropriate Town official or agent, it will be the responsibility of the design engineer to replace them.

**3.18) EROSION CONTROL**

All construction and/or development activities shall incorporate design standards for erosion and sedimentation control which, at a minimum, reflect the recommendations of the publication "Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire" by the Rockingham County Conservation District, prepared for the Department of Environmental Services in cooperation with the USDA Soil Conservation Service, August, 1992 and of the publication "Best Management Practices for Urban Stormwater Runoff" by the New Hampshire Department of Environmental Services, Water Supply and Pollution Control Division, Wastewater Engineering Bureau, January, 1996. The proposed Erosion and Sediment Control plans shall be included as part of the Road Construction Plans.

**3.19) DRAINAGE**

All drainage systems will be designed based on a pre and post construction runoff analysis. All streets shall be provided with drainage facilities (closed storm drain system, where appropriate, or culverts and ditches) to allow for the removal of storm water and prevent flooding of the pavement and erosion of adjacent surfaces. Construction of such facilities shall be in accordance with "Standard specifications for Roadway and Bridge Construction, NHDOT, 1990", Sections 603, 604, and 605 hereby incorporated into these regulations by reference. No water from adjacent lots shall be allowed to run across street surfaces, but shall be directed into catch basins or ditches and piped underground in a pipe of a size approved by the Dept. of Public Works. Standing water in culverts or above the sump in catch basins shall not be permitted.

**3.20) LANDSCAPING**

Upon completion of any development or development phase, all esplanade or planting strip areas adjacent to streets have a minimum of 4" (compacted depth) loam installed. Loam shall be screened ( 2" apparent opening), friable, free of stumps, roots and all other unsuitable materials deleterious to seed germination and plant survival. Loam shall not be spread when the material is wet. At a minimum, these areas shall be seeded with a high quality grass seed in conformance with " Standard Specifications for Roadway and Bridge Construction, NHDOT, 1990", Section 644 -658.



**3.21) CLEAN-UP**

Before acceptance, a street shall be cleaned up, by whatever means necessary, so that it is left in a neat and presentable condition. Construction related debris of all kinds, both natural and man-made shall be completely removed from the ROW. Once all contributing upslope areas have been permanently vegetated, remove trapped sediment from catch basin sumps and or drywells and remove all temporary erosion and sediment control measures installed to meet the standards prescribed herein. All work shall be performed in compliance with the Wolfeboro Zoning Ordinance and any conditions established by the Planning Board.

**3.22) INSPECTIONS**

In order to ensure that streets are constructed in accordance with the standards prescribed herein, the Town reserves the right to inspect any aspect of street construction at any time during the construction process and prior to acceptance of the roadway. At a minimum, streets will be inspected by the Town or its agent prior to placement of subgrade materials, after compaction of subgrade material (density or compaction testing shall be provided by the developer), after the installation of drainage improvements, during placement of base course materials, during the installation of binder and wear course of pavement. All underground utilities shall be inspected and approved prior to paving. Cut or fill slopes shall also be subject to inspection and approval.

The developer will be responsible for notifying the Town or designated agent at each of the construction phases. Failure of the developer to notify the Town official or agent at each of these construction phases will result in a delay of the release of the financial surety posted to cover such work. The developer shall request Town inspection of street construction at the appropriate times during the construction phase, as outlined in the inspection schedule listed below. Requests must be made at least seven working days prior to the desired inspection. All costs for inspections will be borne by the developer. No work beyond the phase to be inspected shall be performed prior to that inspection and approval by the Public Works Department

The Town official or agent responsible for street inspection shall establish and maintain a record of each inspection. Copies of these records shall be forwarded to the Planning Board so that it is able to monitor the progress. These records shall contain, but are not limited to, the date of inspection, the street or street segment inspected, identified by station, lot line or other reasonable means, conditions found, and action taken (approval or disapproval). Reasons for disapproval must be supplied to the developer, in writing, within 72 hours of the inspection.

The following inspection schedule shall be used to insure that all phases of construction are performed to Town standards:

- ⇒ Clearing and Grubbing
- ⇒ Subgrade
- ⇒ Drainage
- ⇒ Gravel Base
- ⇒ Paving:
  - Binder course

Wear course  
⇒ Monumentation and Signage

**3.23) SAFETY**

The Planning Board reserves the right to modify proposed street plans for the purpose of enhancing the safety of the traveled way. Potential modifications include, but are not limited to, removing obstructions, adding W beam guard rails in areas where steep slopes exist (greater than 3' horizontal to 1' vertical) or are created, and requiring additional warning signs. The appropriate Town official or agent may act for the Planning Board under this paragraph.

**3.24) TRAFFIC IMPACT STUDIES**

Traffic Impact Studies may be required as part of any development application, at the discretion of the Planning Board. The Planning Board reserves the right to retain the services of an outside agency for the purposes of reviewing any traffic impact analysis submitted. All cost for additional studies shall be borne by the applicant.

**3.25) ACCEPTANCE**

No road shall be accepted by the Town until it has been inspected by the appropriate Town official or agent and found to be constructed in accordance with the specifications prescribed herein or additionally prescribed or agreed to by the Planning Board and approved by the Board of Selectmen.

**SECTION 4: STREET CONSTRUCTION STANDARDS**

<u>ITEM</u>	<u><sup>1</sup>ESTIMATED AVG. DAILY TRAFFIC VOLUME</u>		
	<u>1-200vpd/201-1000vpd/1000vpd +</u>		
4.01) Minimum right of way width:	50'	60'	60'
4.02) Minimum pavement width:	20'	22'	24'
4.03) Minimum shoulder width:	2'	3'	4'
4.04) Center of street to ditch line:	18'	22'	24'
4.05) Maximum grade:	12%	10%	10%

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<sup>1</sup> Estimated Average Daily Traffic Volume shall be based on the ADT represented in the Institute for Transportation Engineer's Trip Generation Manual, Sixth Addition.

ITEM<sup>1</sup>ESTIMATED AVG. DAILY TRAFFIC VOLUME  
1-200vpd/201-1000vpd/1000vpd +

- 4.06) Base course depth:  
(traveled way and shoulders)

gravel	12"	14"	18"
crushed gravel	4"	6"	6"
TOTAL base depth	18"	20"	24"

- 4.07) Paving, roads and shoulders:  
(if paved shoulders required)  
Hot bituminous pavement<sup>2</sup>

base (binder course)	2"	2.5"	2.5"
top (wearing course)	1"	1.5"	1.5"

- 4.08) Shoulder type: gravel paved paved

- 4.09) Road crown: 1/4"to3/8"/1' 1/4"to3/8"/1' 1/4"to3/8"/1'

- 4.10) Maximum Cul-de-Sac length: 1,800' 1,800' 1,800'

- 4.11) Minimum Cul-de-Sac diameter:

pavement diameter to center line	100'
property line diameter	138'

- 4.12) Minimum tangent length  
between reverse curves:

0'	150'	200'
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- 4.13) Vertical curves (minimum length):

The minimum vertical curve length required shall be governed by the design speed of the proposed roadway and determined by multiplying the algebraic difference in the two tangent grades times the "K" factors listed below (AASHTO specifications, hereby incorporated into these regulations by reference). The result of this calculation is expressed in feet. This calculation is illustrated in *Figure Five*.

<sup>1</sup> Estimated Average Daily Traffic Volume shall be based on the ADT represented in the Institute for Transportation Engineer's Trip Generation Manual, Sixth Addition.

<sup>2</sup> Gravel roads shall be permitted for subdivisions with private roads serving a maximum of 10 lots at build-out.



		<u>DESIGN SPEED (MPH)</u>			
		<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>
4.14)	"K" factor for crest:	10	20	30	50
	"K" factor for sag:	20	30	40	50
4.15)	Minimum center line curve radii: (no super-elevation)	90'	150'	230'	310'
4.16)	Curb type:	per DEPT. OF PUBLIC WORKS			
4.17)	Sidewalk construction width:	5' minimum			
4.18)	Minimum sidewalk distance from curb face:	6'			
4.19)	Street lighting:				
	Upon the recommendation of Dept. Of Public Works, the Planning Board may require street lighting at every intersection and commercial and industrial driveway. Mid-block lighting, lighting on curves and lighting of residential driveways may also be required as deemed necessary or appropriate by the Planning Board. All street lighting will be installed in conformance with the standards developed by the Illuminating Engineering Society of North America, hereby incorporated into these regulations by reference. Residential subdivision lighting shall be of pedestrian scale (a maximum height of 15 feet) and have lights bulbs that provide full spectrum lighting.				

## SECTION 5: RESIDENTIAL STREET INTERSECTION CONSTRUCTION STANDARDS

5.01)	Maximum grade (vertical alignment) on intersection approach:	3% within 50' of intersection
5.02)	Maximum grade (vertical alignment) within intersection area:	2%
5.03)	Minimum angle of intersections:	60 degrees
5.04)	Intersection control:	
	Intersections shall be controlled in accordance with the standards specified in the State of New Hampshire Manual on Traffic Control Standards, Statutes, and Policies, 1992, hereby incorporated into these regulations by reference.	
5.05)	Minimum center line offset of adjacent (T-Type) intersections:	200'
5.06)	Minimum tangent length approaching intersection: (approaches)	50' (on local road

- 5.07) Minimum property line radii at intersection: 15'
- 5.08) Minimum curb radius: 10'
- 5.09) Minimum intersection sight distance  
Intersections where the minor approach is controlled by a stop sign shall be provided a minimum sight distance (onto the street intersected) relative to the speed of the major 2 street intersected. Standards for these relationships are as follows:

#### **REQUIRED SIGHT DISTANCE FROM MINOR APPROACH**

Sight distance shall be proposed be the design engineer in compliance with the Standards and Recommendations of the Institute for Transportation Engineers (ITE) and American Association of State Highway and Transportation Officials (AASHTO)

Intersections that are stop-controlled on all approaches or signalized shall be provided with adequate stopping sight distance (on each approach) relative to the speed allowed on the approach.