### **APPENDIX A**

### **ROAD DESIGN AND CONSTRUCTION STANDARDS FOR THE TOWN OF HEBRON**

### I. ROAD DESIGN STANDARDS

The purpose of these standards is to ensure safe vehicular and pedestrian travel on streets, public or private. Proper design requires the blending of safe roadway layout and grade with minimization of impacts on the existing terrain and environment. These standards are further intended to be flexible in consideration of different traffic volumes and terrain conditions.

### A. <u>Arrangement of Streets</u>

The streets in a subdivision shall be coordinated with other existing or planned streets. Streets shall be logically related to the topography to assure suitable lots, reasonable grades and safe intersections.

### B. <u>Rights-of-Way</u>

No street or highway right-of-way shall be less than fifty (50) feet in width, and may be required to be more if a greater width is warranted in the opinion of the Board. The apportioning of the street widths among roadway, sidewalks, and possible grass strips shall be subject to the approval of the Board.

### C. <u>Dead-end Streets/Cul-de-Sacs</u>

The maximum length of any dead-end street shall be one-half (1/2) mile unless permission is granted by the Board.

Dead-end streets shall be equipped with a cul-de-sac at the closed end. The shape of the cul-de-sac shall be either circular or nearly circular, with a minimum road radius of fifty-seven (57) feet and a minimum right-of-way of seventy (70) feet. The maximum grade through a cul-de-sac shall be five percent (5%). To facilitate snow plowing, islands in cul-de-sacs shall not be allowed.

### D. <u>Intersections</u>

Street intersections shall have a minimum angle of intersection of sixty (60) degrees, with a preferable angle being ninety (90) degrees. The property line radius at intersections shall be no less than twenty (20) feet.

### E. <u>Street Names</u>

1. Streets that extend or are in alignment with streets of abutting or neighboring properties shall bear the same names of existing streets within the Town of Hebron.

- 2. Other street names shall be approved by the Planning Board in a review process, after consultation with the Selectmen.
- 3. Precautions shall be taken to ensure street names are not duplicated or so similar to other street names as to cause confusion.

# F. <u>Existing Street Conditions</u>

Where a subdivision requires expenditures by the Town to improve existing streets to conform to minimum requirements, the Planning Board may disapprove such subdivision as being premature or scattered.

## G. <u>Minimum Design Requirements</u>

- Construction standards shall be generally in accordance with the *Standard* Specifications for Road and Bridge Construction, State of New Hampshire, Department of Transportation<sup>1</sup>. The Planning Board will also require as a minimum the following roadway design and construction specifications:
  - a. Sight distance: two-hundred (200) feet;
  - b. Right-of-way Width: fifty (50) feet;
  - c. Roadway Width: twenty (20) feet;
  - d. Shoulder Width (each side): four (4) feet, with one-fourth (1/4) inch per foot pitch (2.5%);
  - e. Centerline Curve Radius: Minimum: one-hundred-fifty (150) feet;
  - f. Profile Grade: Maximum: ten percent  $(10\%)^2$ ;
  - g. Profile Grade: Minimum: five-one-hundredths percent (.05%);
  - h. Minimum Platform @ Road Intersections: seventy-five (75) feet at no greater than two percent (2%) grade;
  - i. Minimum Pavement Radius @ Road Intersections: thirty (30) feet.
  - j. Minimum Road Crown: one-fourth (1/4) inch per one (1) foot of width (2.5%) on each side of the centerline.
- 2. The road design shall include:
  - a. center-line profiles;

<sup>&</sup>lt;sup>1</sup> <u>http://www.nh.gov/dot/bureaus/highwaydesign/specifications/index.htm</u>

- b. cross sections;
- c. two (2) foot contour lines and/or elevations to the extent of cut-and-fill;
- d. drainage flow and design data;
- e. temporary stakes along the center line of any proposed roadway.
- 3. The Planning Board shall have the right and authority to increase design standards in those cases where it deems it necessary for the public health, safety, and general welfare, including but not limited to where streets have the potential for extension through to other lands or other potential street networks or for streets serving commercial/industrial areas,.

## H. <u>Steep Grades</u>

Where roadway profiles exceed five percent (5%), special consideration will be given to drainage, sedimentation and erosion protection. This may require curbing and special measures such as rip-rap or other erosion protection. In no case shall grades exceed two percent (2%) within at least seventy-five (75) feet of an intersection.

## I. <u>Superelevation</u>

Where superelevation is deemed necessary by the Planning Board, the design shall conform to the recommendations of AASHTO (American Association of State Highway and Transportation Officials) for the proposed rate of superelevation, and appropriate documentation and calculations to demonstrate the safety and adequacy of the proposal shall be provided.

## II. CONSTRUCTION STANDARDS

All road construction shall follow N.H. state guidelines for erosion control. Public or private subdivision streets (including the roadbed, drainage structures and underground utilities) shall be:

- constructed in strict accordance with the detailed engineering plans and specifications prepared by a New Hampshire licensed professional civil engineer for the subdivider/developer;
- accepted as being complete and approved by the Planning Board;
- documented through periodic inspections of work in progress by designated agent(s) of the Planning Board;
- paid for by the subdivider/developer.

<sup>&</sup>lt;sup>2</sup> When Centerline Curve Radii within ten percent of the minimum are combined with Profile Grades within ten percent of maximum, one or the other shall be improved by twenty percent to preserve safety.

# A. <u>Subgrade</u>:

- 1. All trees and roots shall be stripped to below the base course of pavement and shoulders for the full width of the pavement and shoulders. All soft spots, peat, organic material, spongy soil, and other unsuitable materials shall be removed and replaced by material approved by the Board or its agent. The subgrade fill or backfill shall be compacted in lifts not exceeding twelve (12) inches in depth.
- 2. Boulders and/or ledge shall be removed to a depth of twelve (12) inches below the subgrade level. After removal to this depth they shall be covered by a fill material approved by the Board or its agent and graded and compacted to the subgrade level.

## B. <u>Base Course</u>:

- 1. Bank-run gravel and aggregate with stones not exceeding six (6) inches in size shall be spread over the entire width of the proposed pavement and shoulders to a depth of twelve (12) inches. Six (6) inches of crushed gravel aggregate not to exceed one-and-one-half (1 1/2) inches in size shall be spread on top of the twelve (12) inch base course.
- 2. The bank-run gravel and crushed gravel each shall be placed in lifts not exceeding six (6) inches.
- 3. All base course materials shall conform to NH DOT Specifications
- C. <u>Compaction</u>: Roadway subgrade and base courses shall be compacted to ninety-five percent (95%) of maximum density proctor method in accordance with AASHTO T-99.

## D. <u>Pavement Materials</u>:

- 1. Base Course of two (2) inches conforming to Type B of the NHDOT Specifications;
- 2. "Wearing Course" conforming to Type F of the NHDOT Specifications.
- **E.** All slopes shall be graded, loamed, mulched and seeded (or a recognized equivalent). No slope, cut or fill shall be greater than two (2) horizontal to one (1) vertical (2:1) in ledge, or three (3) horizontal to one (1) vertical (3:1) in all other materials.
- **F**. All proposed drainage facilities and culverts shall be installed. Natural watercourses shall be cleaned and increased in size where necessary to take care of storm runoff.

Drainage swales at least three (3) feet in width and sixteen (16) inches in depth at its midpoint below centerline grade shall be constructed in the street right-of-way on both sides of the paved roadway. Drainage facilities must be adequate to provide for the removal of storm water to prevent flooding of the pavement, erosion of adjacent surfaces, and direct flow into natural water courses. Roadway drainage shall be sized to accommodate the fifty (50) year rain event; internal drainage shall be sized to accommodate the fifty (50) year rain event.

**G.** The recommendations of the Planning Board or its agent(s) shall be followed regarding locations of culverts, drainage, and type and quality of fill and subfill.