

11/15/04

**Engineering Checklist for Subdivision Review**  
**(Based on Subdivision Regulations of September, 2002)**

August, 2004

**General:**

- \_\_\_ Locus plan at 1" = 1000'.
- \_\_\_ Subdivision plans at 1" = 40', or such other scale as the Planning Board may accept.
- \_\_\_ Vertical Datum to reference North American Vertical Datum of 1988 (NAVD 88).
- \_\_\_ Horizontal orientation to be tied and referenced to the Mansfield GIS Horizontal Control Monuments (North American Datum of 1983, NAD 83).
- \_\_\_ Plan shall contain a minimum of 2 benchmarks.
- \_\_\_ Property lines shown with metes and bounds and abutting property owners.
- \_\_\_ Permanent monuments installed at no fewer than 3 lot corners of each lot within approved subdivision.
- \_\_\_ Wetlands delineation, streams and ponds within 200 ft.
- \_\_\_ Elevations and limits of 100-year flood zone.
- \_\_\_ Major features of land, including trees 24" in caliper.
- \_\_\_ Existing and proposed contours at 2' intervals.
- \_\_\_ Roadway profiles to show sewer and drainage with inverts and water.
- \_\_\_ Existing and proposed utilities, especially water, gas and electric are to be addressed.
- \_\_\_ Location and logs of borings, test holes, and/or perc tests.
- \_\_\_ Stamp of P.E. and P.L.S.

**Sewers:**

- \_\_\_ The minimum slope is to be 0.004.
- \_\_\_ The maximum slope for 8" PVC is to be 0.055.
- \_\_\_ The drop across SMH's is to be a minimum of 0.1' with a maximum of 0.5'.
- \_\_\_ Minimum diameter is to be 8".
- \_\_\_ Minimum cover 3' in street, but deeper recommended to avoid lateral interferences with water lines.
- \_\_\_ Sewer manholes in roadway pavement (not sidewalk or grass shoulder).
- \_\_\_ Details of manhole, chimneys, drop manholes with outside drop, service laterals, water crossings, trench section, and clay dams are to be provided.
- \_\_\_ Maximum manhole separation is 300'.
- \_\_\_ Drop MH's, 8' maximum drop, 2' minimum, but prefer 6' drops.
- \_\_\_ MH with inside drop is to be 5' minimum.
- \_\_\_ More than 20' deep MH is to have an intermediate platform and a caged ladder, and manholes to a minimum of 5' diameter.
- \_\_\_ Can basement elevation be served by gravity? Is slope adequate or is a grinder pump needed?
- \_\_\_ Water supply piping: 10' horizontal distance to sewer. At crossings, the water is to be 18" over sewer.
- \_\_\_ Watertight manhole covers in easements, within Zone 2 of well, or within 100' of BVW (per DEP).

- \_\_\_ Clay dams to be provided every 300' and/or between each MH. When within 100' of wetlands, clay dams to be provided every 150' and/or between each MH. Dams are to be shown on profile, and detail provided.
- \_\_\_ Angles between inlet and outlet pipes at MHs to be  $\geq 90^\circ$ .
- \_\_\_ Sewer main to extend a minimum of  $\frac{1}{2}$  way across any lot served.
- \_\_\_ Each lot, vacant or developed, is to be provided with a lateral.

#### Force Mains:

- \_\_\_ Minimum diameter 3", unless otherwise justified by applicant
- \_\_\_ Air relief at high point.
- \_\_\_ Drain valve manholes at low points.
- \_\_\_ Velocity 3-6 fps.
- \_\_\_ Thrust block details to be provided.
- \_\_\_ Termination at separate manhole, and gravity feed into sewer line.
- \_\_\_ Pump station calculations and details.

#### Roadway:

- \_\_\_ Has access roadway been paved within 5 years (if so, DPW waiver required).
- \_\_\_ Leveling area of 3% for 75' for residential subdivision; 2% for 100' for all other subdivisions.
- \_\_\_ Adequate vertical curves
- \_\_\_ Typical cross-section
- \_\_\_ Underdrain in cut areas
- \_\_\_ Guardrail: Applicant's Engineer to justify guardrail need per AASHTO requirements, including limits. Guardrail to be within 2' of curb unless otherwise approved.
- \_\_\_ Check metes and bounds
- \_\_\_ Granite and concrete bounds are to be shown.
- \_\_\_ Property monuments are to be shown (3 corners of each lot).
- \_\_\_ Monuments for cross-country easements are to be shown.
- \_\_\_ Temporary construction entrance detail is to be provided.
- \_\_\_ Street offsets  $< 150'$  are not allowed.
- \_\_\_ Minimum centerline radii recommended for minor street: 150'; Secondary street: 200'; Major street: 400'.
- \_\_\_ Intersection angle  $> 60^\circ$ , preferably  $90^\circ$
- \_\_\_ Intersection radii  $> 30'$
- \_\_\_ Minimize cuts and fills, and retaining walls; avoid combination of steep grades/sharp curves.
- \_\_\_ R.O.W.: Minor and Secondary Streets, 50'; Major and such Secondary Streets, 60'
- \_\_\_ Pavement width to be shown on the plan view. (MINIMUM WIDTH FOR RESIDENTIAL CORROUND IS 18 FT)
- \_\_\_ Grades: 2% leveling for 100'
  - .5% minimum
  - Maximum:

	Low Density	High Density
Minor Street	9%	5%
Secondary Street	6%	5%
Major Street	5%	5%

- \_\_\_ Provide sight distance and show lines of sight at intersections based on speed limit, and in no case < 250' in each direction.
- \_\_\_ Are improvements to adjacent streets required?
- \_\_\_ Easements: 20' wide minimum, access and utility or drainage easement including waterways. Easements to be graded to accommodate access with gravel surface when appropriate.
- \_\_\_ Sidewalks, both sides unless waived by the Planning Board, with handicap ramps as necessary.
- \_\_\_ Driveway cuts shall be shown on the plan.
- \_\_\_ Driveways: minimum width 10'.
- \_\_\_ Driveway aprons shall be paved with Portland cement concrete from the roadway gutter line through the back edge of the sidewalk.
- \_\_\_ Road cross-section: 12" gravel, 2" binder, 1.5" top.
- \_\_\_ Curbing to be 6" high
- \_\_\_ Vertical granite curbing along each side of roadway (type VA4)
- \_\_\_ Granite curbing to extend 8' beyond radius
- \_\_\_ Handicap ramps on sidewalks of 1:12 maximum slope
- \_\_\_ Utilities are not to be installed in island within cul-de-sac. Also, utilities such as gas and electric are to stay in their relative location behind the curb around the circle.

### Drainage:

- \_\_\_ Minimum depth is to be 3', except 2 1/2' is allowed at CB.
- \_\_\_ Street drainage to be designed for 25-year storm event, cross culverts to be designed for the 100-year storm event
- \_\_\_ Overall hydrology for stormwater shall show 2(3.4"), 10(4.8"), 25(5.6"), and 100(7.0") year storm events, using Type III, TR-55-24 Hour Storm.
- \_\_\_ Pipe to be class III RCP, 12" minimum, minimum V = 3 fps
- \_\_\_ Lots to be graded to protect streets and other lots.
- \_\_\_ Drainage ditches and swales are to be analyzed for capacity, and be and within easements.
- \_\_\_ Flow across intersections is not allowed.
- \_\_\_ Maximum distance between DMH's is 300', and CB's is 360'.
- \_\_\_ Drain manholes in roadway (not sidewall or grass shoulder)
- \_\_\_ CB is to be installed at the entrance of the road or at cul-de-sac, depending on slopes.
- \_\_\_ CB's not to be located at driveway curb cut out.
- \_\_\_ CB's not to be located on curved granite curbing.
- \_\_\_ CB's to connect to MH's, not CB's.
- \_\_\_ CB's to have a minimum 4' sump.
- \_\_\_ Pipe from CB is to have a minimum slope of 1% and a minimum size of 12".
- \_\_\_ Drainpipe is not to be at the same elevation as sewer or water, and have a 6" minimum clearance at crossings.

- \_\_\_ Sub-drains to be provided in roadway cut sections.
- \_\_\_ Outlets to have adequate size and area of rip rap.
- \_\_\_ Rip rap outlets to have filter fabric beneath stone.
- \_\_\_ Spot grades to be provided at outlets to verify elevation.
- \_\_\_ Angles between inlet and outlet pipes at MH is to be  $\geq 90^\circ$
- \_\_\_ No. of pipes vs. MH diameter is to be analyzed to ensure structurally sound MH, for >3 pipes
- \_\_\_ CB's with traps to be 5' diameter inside minimum.
- \_\_\_ Cascade frames and grates when road slope >4%.
- \_\_\_ Pipe crowns: inlet equal or higher than outlet.
- \_\_\_ Details: DMH's, CB's, headwalls, rip rap areas, trench sections, drop inlets, wetlands crossing
- \_\_\_ Check first flush sizing of drainage structures.

#### Detention Basins/Infiltration:

- \_\_\_ Retention basins shall only be allowed in the water supply protection areas.
- \_\_\_ Detention facilities, retention basins, infiltration systems no less than 100 feet (100') from subdivision boundary line.
- \_\_\_ Design storm events: 2, 10, 25 and 100 year.
- \_\_\_ Roadway network to be capable of discharging, 100 year event flow to basin, under surcharged conditions.
- \_\_\_ Provide note on plan for the 100-year storm elevation basin(s).
- \_\_\_ Program for future stormwater system operation and maintenance to be provided.
- \_\_\_ Comply with DEP's Stormwater Management Policy.
- \_\_\_ Test pit logs and location, with estimated high groundwater (24 hour notice for witnessing).
- \_\_\_ Permeability tests locations and results for infiltration (24 hour notice for witnessing) (use F.O.S. of 2.0 on field permeability rate for design).
- \_\_\_ Rip rap emergency overflow
- \_\_\_ Access for maintenance
- \_\_\_ Provide padlock on detention basin gate, keyed to match DPW's master for gates
- \_\_\_ Inspection port at center of infiltrator rows; w/ metal, water gate type, covers
- \_\_\_ Note provided to keep all sediment out of proposed infiltration area, and not used until CB's and drainage system is installed and functional.
- \_\_\_ Infiltration structures, leaching pits, etc. are to have filter fabric (4 oz) over top and down sides of stone.

#### General Utilities:

- \_\_\_ All utilities are to be installed at time of initial construction.
- \_\_\_ Minimum cover per Subdivision Rules and Regulations.
- \_\_\_ To be extended to limits of subdivision.
- \_\_\_ Street lights to conform to type and style in general use in Town, unless specified by Planning Board.
- \_\_\_ Fire Hydrant provided every 500' on one side of each street.

**Subdivision Definitive Plan Content:**

- \_\_\_ Statement for ways to stay private or be public
- \_\_\_ Summary of waivers requested
- \_\_\_ Environmental Assessment Report
- \_\_\_ Drainage calculations and plan with program for maintenance of detention basin(s)
- \_\_\_ Access through another Town?
- \_\_\_ Sheet size 24" x 36" with 40' scale
- \_\_\_ Index sheet and plan of entire subdivision
- \_\_\_ Title, North Arrow, Locus, abutters
- \_\_\_ Streets, ways, road names, lots, easements, public or common areas
- \_\_\_ Open space provided? 1 acre of open space is required for each 20 units or fraction thereof
- \_\_\_ Metes and bounds of roads and lots with bounds
- \_\_\_ Existing ways, pavements and ROW widths
- \_\_\_ Notes on ZBA variance(s) or exception(s)
- \_\_\_ Contour Plan: topo at 2' contours, high water mark and special designation of contour 4' above it, USC&GS elevations (1929), Flood boundaries, major features of land as existing; 4' contours above high water mark
- \_\_\_ Roadway Plan and Profile: existing, L, C, R, proposed centerline, 40' horizontal/4' vertical scale,  $\geq 2$  benchmarks/plan, grades every 50', 25' on vertical curve, intersections, sidewalks, bikeways, etc., street trees, gradients in %
- \_\_\_ Utility Plan and Profile: water system, sewer system, storm drain system, 100-year high water mark, soil tests, other utilities
- \_\_\_ Storm Drainage Plan: DMH's, CB's, swales, ditches, etc., surface elevations, depth of water, 100 year storm elevations in basins
- \_\_\_ Soil Erosion and Control Plan: existing features, topo, soil characteristics, proposed changes, control measures, sequence of work