

**Town of Epsom  
Board of Selectmen  
PO Box 10  
Epsom, NH 03234**

**DATE:** April 22, 2009

**FROM:** Keith A. Cota, PE  
Selectman/Planning Board Member

**SUBJECT:** Towle Farm Subdivision  
Goboro Road  
Tax Map R-13, Lot 36-1

**TO:** Epsom Planning Board

**MEMORANDUM**

Please accept the following comments on the revised layout for the above reference subdivision. The comments are in reference to plans prepared by Joseph M. Wichert entitled "Topographic Subdivision Plans for Towle Farm Estates" (revised March 31, 2009) and the engineering design plans for the proposed road system prepared by Northpoint Engineering, LLC entitled "Roadway Improvement Plan Prepared for Towle Farm Estates" (dated November 2008 w/ no revision date). It should be noted that no updated cross sections were provided with the road improvement plans and, thus, a limited the review of the planimetric and profile is being offered. Additional comments most likely will be forthcoming once the cross sections are provided.

Overall the layout of the roadway has improved over the initial design and has slightly altered the layout of some of the proposed 40 lots in the subdivision. Given the reduced lot dimensions within the cluster subdivision, the extensive wetland boundaries within the site and the difficult topography within the subdivision, the Planning Board should consider the constructability of each lot and to obtain sufficient site design information to ensure the new created lots can reasonably be built on without the need to seek appeals of the town's regulations or required additional wetland impacts. In addition, it should be the goal of the Board to not permit any portion of the protective well radius from extending outside each representative lot or be located with the area of the water quality treatment basins.

The following comments and recommendations are offered to the Planning Board in regards to the Joseph Wichert Subdivision Plans:

1. On plan sheet 1 of 6, the lot line between Lots 36-1-2 and 36-1-3 is missing;
2. Well protection radius is located within proposed town road on Lot 36-1-25;
3. Well protection radius on Lot 36-1-16 and Lots 36-1-32 to 34 are located outside the lot's boundaries;
4. Well protection radius for Lots 36-1-1, 36-1-35 and 36-1-36 are located within the proposed water quality treatment basins;

5. Due to the severe topographic terrain, it is recommended that cross-sectional driveway designs be provided for the following lots: 2, 3, 4, 8, 9, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31 and 36;
6. Due to the limitation of setbacks to property lines and wetlands, and because of the severe site topography, it is recommended that additional site design layout be provided on the several of the proposed lots to reasonable conclude the proposed lots can be built upon without zoning appeals to the local regulations. The layouts should include as a minimum the grading for driveway access, sighting of typical resident building (36' by 28' with 24' by 24' ft two car garage), and placement of a typical three bedroom septic system for on-site soil condition. The lots include 1, 7, 9, 10, 21, 22, 23, 24, 27, 28, and 37.

The following comments and recommendations are offered in consideration of Northpoint Engineering, Inc roadway improvement plans:

1. No cross sections were provided;
2. No guardrail calculations were provided to support the layout in compliance to AASHTO Roadside Design Guide. Several guardrail layouts appear too short for the "length of need" criteria based upon 30 mph;
3. No superelevation design was provided to support the horizontal layout, I recommend the superelevation layout be placed along the bottom of the profile sheets;
4. No subsurface utility layouts for power, telephone and/or cable are included on the plans;
5. No street signage plans provided (stop signs, warning signs, etc) in accordance to MUTCD;
6. No design location for the two cisterns are shown on the roadway improvement plans including the platform grading for access;
7. On Plan Sheets C2 through C7, no horizontal curve data was provided beyond the PC and PT notations;
8. The horizontal and vertical relationship is improved over the prior design layout (although not the best relationship, but, minimally, acceptable in my opinion);
9. No access panel provided for maintenance needs to the basins and level spreaders (a minimum of 15% access panel grade (12 ft wide) is recommended to be provided to allow maintenance vehicle access by Road Agent);
10. On Plan Sheets C2 and C7, the roadway grade will be climbing a relatively steep uphill grade of 8% from Station 55+00 to Station 44+50. Only one catch basin at Station 55+16, Rt. is proposed for receiving the 1200 ln ft of

pavement and overland flows within the narrow drainage ditches along both sides of the roadway. The amount of runoff to the catch basin at Station 55+16, Rt. will be greater than the grate capacity and result in overflows into the intersection and bypass of treatment basin located in the southeast corner of the new intersection. It is recommended a closed drainage system be considered starting near the top of the hill at Station 44+50, LT and RT with catch basin spacing of a minimum 400-foot intervals and to outlet into the aforementioned treatment system;

11. Several water quality treatment basins require concentrated ditch flows to sheet flow into the basins. This will result in the potential of erosion of ditches during high intensity storm events and need for increased long-term maintenance. It is recommended the ditch drainage is intercepted by attach basins and outlet into the treatment basins via closed drainage system.
12. The vertical elevations as referenced on Profile Sheet P3-6 appears to be referencing incorrect data;
13. Sight lines for several driveways should be reviewed at points of crest curves, and substantial excavation areas (i.e.: Lots 9,10, 12, 13, 14, 18, 19, 20 & 36);
14. The approach grade for the internal intersection of Lemuel Lane between Station 54+50 to Station 55+74 has a negative grade of 2% down into the intersection of the connector road between Station 6+50 to Station 7+50 and will result in sheet flow runoff into the intersection and will result in additional long-term maintenance; especially during winter freeze/thaw cycles. As a result this section of roadway would require increased deicing (salt applications). It is strongly recommended that the platform grade for this intersection include a positive grade (desirably 2%, but not less than 0.75%) downward from the connector road intersection to ensure the runoff will not inter the new intersection;
15. On Intersection Sight Distance Plan Sheet 1 of 1, the sight lines are shown for the maximum available sight distances. It appears the new location will accommodate minimum intersection sight distance for 30 mph design speed. Due to the new intersection location on Goboro Road, it is recommended that Goboro Road be widened along the south side to accommodate a improved shoulder width of eight feet to allow for bypassing vehicles and to improve the vehicle turning for single unit vehicles by widening the shoulder approaches to the intersection along the southerly side to 8 ft with a minimum of 25:1 pavement taper and to overlay (minimum of 1½ inches) for a distance of 400 feet each side of the intersection.

It appears the developer will be seeking several waivers to the subdivision design criteria as outlined by Dan's email of April 13th. Each one will need to be reviewed on its own merits and should be weighed with caution. I do recommend granting the waiver

for the placement of the guardrail at the edge of the shoulder instead of the travelway. This condition appears to be an error in our regulations and will need to be corrected at some point by the Planning Board.

Without a full review of the cross-sectional relationship at each of the embankment conditions, I would suggest we delay any action until the updated cross-sections can be provided and evaluated. Generally, a fill slope of less than 5 feet elevation grade difference at 3:1 could be allowed without compromising roadway safety. Any slope elevation greater than this change may result in increase compromise of long-term safety and will need to be carefully reviewed.

I would not recommend granting that the design layout of the driveways and culverts be waived due to the reasons noted in the email correspondence. The Planning Board needs to clearly understand that the lots can be safely accessed without causing undue drainage flows into the town's right-of-way. On wrongly placed driveway within a cut embankment can result in increased overland flows that exceed the town road's ditch and treatment basins. As a minimum, all driveways in cut sections should be shown where the most optimum location for the site's frontage. Should a future owner wish to change its location, then they will need to obtain approval by the town (Planning Board could designate the Road Agent as the agent for this purpose).

As for additional off-site improvements, the Planning Board will need to decide whether full improvements for a right turn lane at the Depot Road intersection with Rte 28 will be necessary and who shall pay of this minor improvement. It appears the State DOT supports formalizing the northbound right turn shoulder and feels the developer should be burdened with this cost. I concur.

Further discussion by the Planning Board will be necessary as to the process and timing for the granting of a "special use permit" the cluster development over conventional layout. This is required under our Zoning Regulations in Article III, Section H (Cluster Residential Developments), Part 8 (Special Use Permit). The developer has undertaken substantial level of engineering to date for the cluster layout and, should the Board not grant the special use permit, then this decision is appeal-able to the Zoning Board.

Finally, the Planning Board will need to understand how this developer proposed to build the whole development and whether phasing will be requested. If phasing is proposed, this will need to be evaluated as to maximum lengths of dead-end roadways and placement (and timing) for the two cisterns as recommended by the Epsom Fire Department.

I look forward to an in-depth review by our consultant engineering, SFC Engineering Partership, Inc. and their assessment of the revised design layout. I am confident, as agents of the town Planning Board; their assessment will pick up on many of the design concerns as noted above.