Berkshire Design Group

January 26, 2021

Pelham Conservation Commission
351 Amherst Road
Pelham, MA 01002

RE: 18-22 Amherst Road, Pelham, MA

Dear Commission Members:

The following is in response to DEP's letter dated January 4, 2021 regarding Home City Development's application for 18-22 Amherst Road in Pelham.

1. The design will be changed to retain the existing stormwater discharge to the BVW. Approximately 10' of the existing 15" CMP and the outlet will be retained. The remainder of the existing 15" CMP will be replaced with a 15" HDPE. A coupling (such as MarMac) will be used to connect the dissimilar pipes.

2. This project is being submitted as a redevelopment project under 310 CMR 10.58 (5).

3. The project is providing mitigation per 310 CMR 10.58(5)(g) in the form of permanent conservation land which will protect roughly 6.87 acres of land (299,257 sf). Of this land, approximately 25,485 sf is located on the south side of Amethyst Brook and would be potentially available for future development. An additional 22,332 sf of existing riverfront area is proposed for restoration in the way of revegetating existing degraded areas and restoration seeding in current lawn areas closest to the brook.
   1- The project is proposing a reduction in impervious areas however the area may not be considered "significant".
   2- Indigenous plant species are proposed in restoration areas on the site.
   3- Stormwater management for the entire project includes deep sump catch basins and water quality units for TSS removal, and underground detention/infiltration facilities to provide recharge and detention prior to discharge to the vegetated buffers and the brook. Current outfalls, including the existing swale to Amethyst Brook and the drainage outlet from the existing garage roof are re-used. Roofs and walkways not captured into stormwater facilities are directed to grass swales or are conveyed through disconnected roof downspouts.
   The stormwater management plan results in reduced peak flows for the site when compared to existing conditions. Whereas no TSS removal is provided at the existing site, for the proposed site, TSS removal is provided for all driveways and parking areas with deep sump catch basins and three Stormceptor water quality units. And whereas no recharge is provided at the existing site, the proposed plan provides for recharge of approximately 10,000 sf of the redeveloped impervious area as well as the entire new proposed impervious area.
4. The compliance form for the underground stormwater chambers will be completed and filed in accordance with the UIC requirements.
5. The proposed site development includes 28,660 sf of redeveloped impervious area and 13,200 sf of new impervious area. The design provides for full compliance of stormwater standards for the new impervious area and improvements to the redeveloped impervious area including TSS removal and recharge (see 3 above).
6. So noted.

7. Three hydrodynamic separators, Stormceptor 450i units, are proposed to provide TSS removal for the driveway and parking areas. The following table provides a summary of the areas treated and the TSS removal calculated for the water quality storm by the Manufacturer.

Contribution impervious area	**Area**	**% TSS removal calculated (OK 110 distribution)**	**Downstream Stormwater infiltration/detention**
Upper parking lot and upper driveway	0.24 acres	93	R-Tank system 1
Remaining driveway	0.15 acres	94	R-Tank system 2
Lower parking areas	0.27 acres	92	R-Tank system 2

Because Massachusetts does not provide guidance for hydrodynamic separators, we generally ask the manufacturer to size the unit and provide their calculations for removal. For Pelham, assuming a 1" water quality storm, the manufacturer (Contech) calculated TSS removals over 80%.

Since Massachusetts stopped funding MA STEP there is no longer a means for obtaining an approval for hydrodynamic separators in Massachusetts. A review of the literature provides a wide range of TSS removal in studies and regulations. A 2008 comprehensive study by the University of Florida found efficiencies from 52% to 88% with varied drainage area sizes and a particle size distribution developed by the New Jersey Corporation for Advanced Technology (NJCAT). On the regulatory side, TSS removal efficiencies from 50% to 80% are published.

Higher TSS removal efficiencies are generally attributed to small tributary drainage areas. The proposed design does just that, incorporating three units with drainage areas varying from 0.15 to 0.27 acres. Since these units are rated for 0.38 acres, we would expect high removal rates from the designed tributary areas. Based on the research presented, it is our opinion that the selected water quality units provide more than 80% removal. With deep sump catch basins in advance of the units, the TSS removal efficiency would be even higher.

As requested, the TSS removal worksheet is attached. Because Massachusetts does not provide guidance for the water quality units, the TSS removal published by the state of Rhode Island (75%) is used in these calculations. Each discharge point at the proposed site includes the following treatment train: pretreatment is provided by deep sump catch basins and the Stormceptor water quality units; the runoff is then directed to underground storage chambers where a portion of the runoff is infiltrated, and the remainder detained to reduce the peak flow discharge.

Using deep sump catch basin with a TSS removal rate of 25% and the Rhode Island published TSS removal rate of 75% for the Stormceptor water quality unit, the overall TSS removal prior to entering the underground system is calculated at 81% (see attached).