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August 10, 2018

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**Subject: Knowlton Farms Solar Development – Phase 3, 44 Estabrook Ave.  
Special Permit, Site Plan, Stormwater Management Regulations and  
Wetland Regulations Review**

Dear Joe and Maria:

We received the following documents on August 8, 2018:

- Correspondence from Meridian Associates to the Grafton Town Planner and the Grafton Conservation Agent dated August 3, 2018 re: "Special Permit, Site Plan, Stormwater Management Regulations, and Wetland Regulations Review, 44 Estabrook Avenue [Phase Three], Grafton, MA."
- Correspondence from Meridian Associates to Grafton Conservation Commission dated August 3, 2018 re: "44 Estabrook Avenue, Grafton, Massachusetts."
- Plan set entitled Knowlton Farms Solar Development, 44 Estabrook Avenue [Phase Three] dated June 12, 2018 and revised August 3, 2018, prepared by Meridian Associates, Inc. for BlueWave Capital, LLC. (14 sheets)
- Bound document entitled Stormwater Analysis & Calculations Report, 44 Estabrook Avenue, Grafton, Massachusetts dated June 12, 2018 and revised August 3, 2018, prepared by Meridian Associates, Inc. for BlueWave Capital, LLC.

Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans' conformance with applicable "Grafton Zoning By-Law" amended through May 14, 2018; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices on behalf of the Planning Board. GEI has also been requested to review and comment on the documents' conformance with applicable Conservation Commission "Regulations Governing Stormwater Management" dated May 2013 and "Regulations for the Administration of the Wetlands By-Law" dated May 2014 on behalf of the Conservation Commission. As part of our initial review GEI visited the site on July 18, 2018.

This letter is a follow-up to our previous review letter dated July 26, 2018. For clarity, comments from our previous letter are *italicized* and our comments to the design engineer's responses are depicted in **bold**. Previous comment numbering has been maintained.

Our comments follow:

**EXHIBIT 18**

**RECEIVED**

**AUG 13 2018**

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### Zoning By-Law

1. *The Board may wish to inquire about the applicant's intentions for employee parking during the construction phase of the project. Estabrook Avenue is a narrow road; on-street parking could affect vehicular traffic, especially for larger vehicles such as emergency vehicles. No vehicle parking should occur along Estabrook Avenue. (§1.3.3.1)*  
**Acknowledged.** On Sheet 3 a note was added to not permit employee parking on Estabrook Avenue during the construction phase of the project. Additionally, Sheet 8 and Sheet 10 now include a proposed location for employee parking west of the solar array. This location will require a temporary crossing of the swale once the swale is constructed. The parking area will be usable until the fences are installed, at which time parking will have to occur elsewhere on the site.
2. *The plans were prepared at a scale of 1" = 50' instead of 1" = 40'. The plans were legible, and we were able to read them and have no issue with the plan scale. However, we defer to the Planning Board if the scale of 1" = 50' is acceptable to the Board. (§1.3.3.3.d)*  
**No further comment required.**
3. *The locus map on the cover sheet needs to identify the site's location. (§1.3.3.3.d.8)*  
**Acknowledged.** The locus map now identifies the site's location.

### Regulations Governing Stormwater Management

4. *The hydrology computations must be prepared using precipitation amounts from the NRCC Cornell data. Data for a 24-hour storm event (not a one-day storm event) must be used. (§6.B.3.b)*  
**Acknowledged.** The hydrology computations have been revised using precipitation amounts from the NRCC Cornell data for a 24-hour storm event.
5. *The plans do not show the locations for construction-phase parking. (§7.B.2.f)*  
**Acknowledged.** On Sheet 3 a note was added to not permit employee parking on Estabrook Avenue during the construction phase of the project. Additionally, Sheet 8 and Sheet 10 now include a proposed location for employee parking west of the solar array. This location will require a temporary crossing of the swale once the swale is constructed. The parking area will be usable until the fences are installed, at which time parking will have to occur elsewhere on the site.
6. *Pertinent information in the "Construction Sequencing" section of the project narrative should be inscribed on the plans for the benefit of the contractor. Particular consideration should be given to limiting the discharge of runoff to exposed soils. (§7.B.2.h & §7.B.2.i)*  
**Acknowledged.** Sheet 8 now includes the "Construction Sequencing" section of the project narrative.
7. *The plans don't address the storage of construction-phase waste materials. Of particular concern is the storage of waste packaging material and the potential for windblown trash. (§7.B.2.j)*

**Acknowledged.** On Sheet 8, notes were added to address debris and litter removal from BMPs and the storage of construction-phase waste materials.

#### **Regulations for the Administration of the Wetlands Bylaw**

8. *The width of the top of the berms for the sedimentation basins is six feet as measured between the highest proposed topographic contours. Furthermore, if the berms are constructed to the elevations presented in the hydrology computations (416.5 and 418.5 feet) then the tops of the berms will only be three feet wide. The minimum width of the embankments is ten feet. (§V.B.5.h.2)*

**Acknowledged.** The top width of the berms for the sedimentation basin has been increased to 10 feet.

9. *The discharge-ends of the two culverts at the eastern sedimentation basin are proposed where the existing ground is at elevation 414; the pipe inverts at the culvert ends will be approximately 0.75 feet to 1.0 feet below the ground surface. Excavation of the areas down-slope of the pipe ends would be required so the pipes could be free-draining. Such excavations may extend into the 25-foot "No Disturb Zone." (§V.B.5.h.7 & §V.C.5.a)*

**Acknowledged.** The outlet of the eastern sedimentation basin was raised and reconfigured.

10. *The design team may want to evaluate whether there is an area suitable for replication that is closer to the impacted wetland areas. There are two areas of wetland impacts – adjacent to Flags 2 – 10 and adjacent to Flags 156 – 161. The replication area is proposed adjacent to Flags 167 – 173. The replication area is removed from the stream reach where the impacts will occur, but it is not clear that there is a better location for the replication area than the currently-proposed location.*

**Acknowledged.** The design engineer responded that moving the replication area closer to the stream is not practical and provided reasonable justification from an engineering perspective.

#### **Hydrology Review & MassDEP Stormwater Management**

11. *GEI reviewed the hydrology computations and found them to be in order except as noted in the following comment.*

**The revised hydrology computations are in order.**

12. *Considering the estimated seasonal high groundwater at test pit TP-3, sedimentation basin 21P needs to be modeled with a starting water surface at the lowest outlet pipe elevation to account for times when the storage below the lowest outlet will not be available for a storm event.*

**Acknowledged.** Sedimentation basin 21P was raised and the layout revised, and the hydrology modeling was updated accordingly. The revisions are in order.

13. *In the post-development hydrology computations, the sedimentation basins were modeled as having storage one-foot below their lowest proposed topographic contour and a half-foot higher than their highest proposed topographic contour; the elevation information on the plans needs to be consistent with that in the hydrology computations.*

**Acknowledged.** The post-development hydrology computations have been revised.

14. *The scales (1"=100') and scale bars on the Pre- and Post-development Drainage Plans are incorrect and need to be revised.*

**Acknowledged.** The scale bars on the Pre- and Post-Development Drainage Plans have been revised.

15. *Compliance with the MassDEP Stormwater Standards and Stormwater Handbook is reasonable except as noted in the following two comments.*

**No further comment required.**

16. *The riprap aprons at the pipe ends are proposed to be five feet long by five feet wide. Calculations need to be provided to demonstrate that the riprap aprons were adequately sized.*

**Acknowledged.** The outlet pipes and riprap aprons were reconfigured to reduce discharge velocities. The revisions are reasonable.

17. *The hydrology computations show that during a 100-year storm event there will only be 0.6 to 0.7 feet of freeboard (distance between the peak water surface and the top of the berm) in the sedimentation basins during a 100-year storm event. At least one foot of freeboard needs to be provided.*

**Acknowledged.** The hydrology computations were revised such that one-foot of freeboard will be available during a 100-year storm event.

#### **General Engineering**

18. *On Sheet 4, the vehicle turnaround is located within the fenced area. Consideration should be given to providing a turnaround outside of the fenced area or relocating the fence to allow emergency vehicles to turn around without having to open the gate if they don't otherwise enter the fenced area. If not already done, the Planning Board may wish to solicit comments from the Grafton Fire Department.*

**Acknowledged.** The proposed vehicle turnaround is now located outside of the proposed fence.

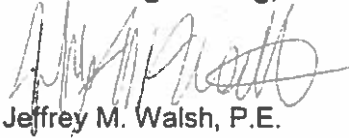
#### **General Comments**

19. *More than one acre of land will be disturbed. Per the National Pollutant Discharge Elimination System (NPDES) Phase II administered by the Environmental Protection Agency (EPA), preparation of a Storm Water Pollution Prevention Plan (SWPPP) and filing of a Notice of Intent (NOI) with the EPA (different than a MADEP Wetlands Protection Act NOI) will be required prior to the start of construction.*

**No further comment required.**

We trust this letter addresses your review requirements. Feel free to contact this office if you have any questions or comments.

Very truly yours,  
**Graves Engineering, Inc.**



Jeffrey M. Walsh, P.E.  
Vice President

cc: David Kelley, P.E.; Meridian Associates