ENERGY & SUSTAINABILITY COMMITTEE

MEMO

TO: Sherborn Zoning Board of Appeals (ZBA)
Jeremy Marsette, Town Administrator
Jeff Waldron, chair, Select Board

FROM: Michael Lesser on behalf of the Energy and Sustainability Committee (ESC)

DATE: November 1, 2023

RE: **Comments on Farm Road Homes (affordable housing project)**

This memo presents the ESC's sustainability and energy related comments and recommended conditions for the Farm Road Homes project. It should be noted that these comments are mostly also applicable to all residential and commercial projects in town. In the case of affordable housing, many of the building specifications noted should lead to lower ongoing operating and life-cycle costs and, therefore, result in better affordability.

Overall, to benefit the future project residents, the Energy and Sustainability Committee strongly recommends the following overlapping conditions marked by "→**".** Many of these conditions will also benefit neighbors and the region. We want to acknowledge that the project developer has expressed their interest in many of these conditions.

Water conservation and preserving water quality are particularly important to preserve this local and limited resource. Energy conservation is important for lowering the climate change impacts and meeting MA goals. Both are important for overall affordability as conservation measures have lower life cycle costs.

- ***Building Design***

→ It is important to note that address climate change, the developer is proposing to build homes that are **"all-electric", which will utilize efficient heat pumps for heating and cooling, and this should be required**. This commitment along with the new and pending energy code will lead to energy-efficient and low-carbon homes. The new code will also require energy conservation improvements.

→ Nonetheless, to the extent possible through the ZBA Comprehensive Permit process, the ESC **recommends that the developer also implement Passive House design or its elements to achieve greater energy conservation**. The Passive House design is well-established and vetted and will lead to lower life-cycle costs and greater affordability, (ii) achieve improved indoor air quality and (iii) ensure compliance with MA climate action targets for reduced carbon emissions. There are significant utility/Mass Save incentives to cover much of any additional initial design/soft costs as well as additional building costs relative to current code-minimum compliant construction. Furthermore, the possible higher building costs are decreasing and are nearly always covered by lower operating costs.

- ***Maximize Water Efficiency and Conservation***

Given exclusive use of limited local water resources that are shared by neighbors and the Town as a whole, both indoor and outdoor water use should be minimized. Therefore, it is strongly recommended that the ZBA weigh in with specific conditioning of water use with the following recommended conditions:

- **Indoor/In-Home Water Use**

→ Require meeting certification or compliance with meeting EPA "**WaterSense Labeled Homes** Program", which requires WaterSense labeled toilets, bathroom sink faucets and showerheads as well as no visible leaks. https://www.epa.gov/watersense/homes-specification#version2homes

→ However, toilets are one of the largest uses for water in the home and the WaterSense standards are currently under revision. There is a consensus that the best new practical standard is: **"require toilets with a flush rate of 1.28 gpf for both single flush and the full-flush mode of dual-flush toilets" – which the ESC recommends requiring to save local water resources**. This type of toilet is commonly available, and this standard is only a slight revision of the current one. (There are pushes ultra-high efficiency toilets of 1.1 gpf max, but there are reservations about this design and commercial availability.) https://www.epa.gov/watersense/residential-toilets

- **Outdoor/Landscaping Water Use and Overall Landscape Plan**

→ **Require a landscaping plan that focuses on drought resistant flora and low water use.** (As below for sustainability reasons, this plan should also involve plantings that are native, pollinator friendly and should not involve pesticide use and only organic slow release nitrogen fertilizer.)

→ **Require any irrigation systems to be subsurface** to the extent possible as these have been shown to substantially reduce water consumption, relative to aboveground sprinkler systems with timers and rain sensors.

- ***Appliances in Homes***

→ Require that, at a minimum, **all appliances should be at least Energy Star** rated to lessen energy use. In the case of washing machines, the Energy Star rating also helps with water conservation.

→ Require that **all cooktops should be induction** for energy savings; not to mention the superior cooking attributes of such technology.

→ Require **domestic hot water to be produced by heat pump water heaters**.

- ***Lighting***

Lighting is a major use of electricity, and the move to LED lighting has resulted in substantial energy savings. However, the marketplace has evolved whereby there is a large range in the efficiency of commercially available LED bulbs in terms of their lighting produced per unit of electricity, i.e. lumens/Watt, and a new standard is under preparation by the US DOE (possibly 120 lumens/Watt).

→ **Interior Lighting Efficiency:** Require that all built-in interior "down" lighting should have a minimum efficiency of 110 lumens/Watt based on what is currently commercially available. This condition has affordability and sustainability benefits.

→ **Outdoor/Exterior Lighting:** Require all street lighting and all exterior (house and landscaping if any) to be high efficiency LED (i.e. >110 lumens/Watt) with warm color (i.e. 3000K or less and preferably 2700K) with built-in timers for either reduced wattage or turning off from late night to early morning, motion detectors as desired, and photocells to prevent day-time use.

→ **Quantity of Lighting:** Though commonly done, the amounts interior and exterior/street lighting installed should strive to be at the low end of the applicable "IES Footcandle" Recommendations to avoid excess lighting and achieve greater energy conservation.

- ***Septic System***

→ Given that the system is large and relatively proximal to the water sources neighboring wells and extensive protected wetlands, **require programs to lessen the contaminant loading for the septic system.** These programs can include education, centralized collection for some hazardous materials, and testing of inflowing septage to detect materials hazardous to good system operations. Forthcoming recommendations from the Board of Health could elaborate on these options and/or the ESC can make more specific comments if needed.

→ Given the size of the septic system and its joint community use, require some sort of separate metering of its electricity use to enable monitoring its operations if the system involves pumping.

- ***Electric Vehicle (EV) Charging***

→ **in-Home Charging Stations**: As likely required by the new energy/building code, EV charging infrastructure should be installed at the time of construction and utilize currently available "Level 2" rapid charging stations for residential homes.

→ **Pre-wiring to support vehicle-to-home (V2H) and vehicle-to-grid (V2G) applications:** Electrical wiring to support V2H and V2G should be required so bidirectional electric feeds between EVs and other loads are available either at the time of construction or with minimal retrofitting as this technology becomes increasingly employed. These technologies stabilize the electric grid, provide power in the event of grid outage, and provide a source of revenue through the sale of electricity back to the grid.

- ***Solar Electricity***

→ **Maximize onsite solar-based electricity generation with no/minimal tree cutting.** As noted by the developer, a goal of the project design is to maximize onsite solar PV electricity production to meet the project's electricity needs and onsite generation is a means to do so at an attractive price.

This onsite solar production is recommended from a variety of sources, such as rooftop, canopy, and ground mounted. However, an important caveat is that any extensive tree cutting is not permitted as trees provide a range of environmental services that is greater than the solar electricity that could be gained. We recommend instead focusing on roof orientation relative to both the sun's annual arc and the local trees to maximize solar gain. As an alternative to tree cutting, there are off-site sources of renewable-based electricity that can also be utilized to meet the project's needs, such as the Town's upcoming Community Choice Aggregation. (It is noted that there are some environmental concerns about these sources as well, which are being addressed.)

If maximizing onsite renewable electricity production, by some chance, produces a surplus, this can be a source of revenue for the project through the sale of this surplus to other customers (and the Town of Sherborn could work with the developers to be such a customer).

- ***Battery Backup/Storage***

Utility incentives are making standalone battery storage and/or EV battery reverse feeding to homes and the grid financially attractive. Such storage also helps create a more resilient local electrical grid and avoid fossil-fuel generators. These technologies are fast becoming integrated with solar inverters and even electric vehicle charging stations. As such, these technology synergies should be investigated and employed if readily available and at competitive cost when compared with multiple separate pieces of equipment.

Battery backup through EV reverse feed: As above, we recommend either V2H or V2G EV charging stations if the technology is readily available at time of construction, and otherwise include upfront wiring preparation to integrate these technologies at a later date.

Financial incentives: Both battery storage and onsite EV batteries can be a source of revenue for the project and residents through incentives and payments from the grid operator as this stored electricity can be tapped during peak demand periods.

- ***Building Materials***

→ We encourage the use of low environmental impact materials, when reasonable. Examples of this may be locally sourced timber and insulation produced via processes that minimize greenhouse gas emissions.