December 7, 2020

Curt Quitzau, PE
VHB, Inc.
1 Cedar Street, Suite 400
Providence, RI 02903

Re: King Street Properties Acquisitions, LLC – 111 Hospital Road (CFS-2) Level II Unified Permit Application (#D20-096)

Dear Mr. Quitzau,
We have completed our initial review of the above referenced application. Below are the comments from the DEC and MassDevelopment. Review comments on the site plan, stormwater, landscaping, and traffic study from our peer review engineers are being provided in separate letters.

Please Note: The applicant is encouraged to submit a response to comments using this electronic file. Responses should be added after each comment as individual paragraphs with italicized colored text. Responding in this manner will improve clarity and context of responses and will expedite review time.

Devens Engineering Comments:
General:

1. ***Based on the intended subdivision of 111 Hospital Road – all material related to the permitting and development of the CFS-2 building on "Lot 2" should be identified as "111 Hospital Road" and all material related to the permitting and development of the CFS-1 building on "Lot 1" should be identified as "117 Hospital Road" to avoid confusion between project documentation in the future.***
2. A significant amount of work is being conducted on the CFS-2 parcel which is being submitted on the CFS-1 application. Prior to start of work the CFS-1 parcel is going to be sold to a 3rd party to complete the work and lease the building back to CFS. Both sets of plans should add an overall draft level I plan showing the proposed parcel boundaries and any temporary permanent easements which will be needed for construction and access.
3. The "Impact Area" needs to be clearly identified on all plans on which it is visible along with a note stating "Restricted Area – No Access".
4. Confirm with Devens Engineering Department that approved property lines are shown on plans prior to endorsement by DEC.
5. All references to plan or deed transferring property from the United States to MassDevelopment should reference those recorded in the Worcester County Registry of Deeds (current references are to documents recorded in Middlesex). This entire project is located with Worcester County.

2020-11-04 - CFS Building 2 Level 2 Site Plans:
Sheet C-1.00

- Make indicated revisions to notes.

Sheet C-1.01

- Update proposed property lines for both parcels to reflect current configuration and show in heavier line weight so they are more visible. Property line between parcels needs to be shown as darker line.
- Line shown as Nashua R. is also the town/county boundary. Show both edges of the river and label the centerline as Town/County Boundary with town/county labels.
- Show sheet layouts in lighter, solid line to avoid confusion with proposed property lines.
- Identify areas where work on this parcel will be performed by others with a reference to the application submitted for the CFS-1 site (Lot 1).

Sheet C-2.00

- Suggest that the demo plan be broken into the sheets (as was done with the other disciplines) to more clearly show the work. Add limits of clearing and erosion control to these sheets. Add silt sacs to all existing CB's on-site which are not going to be removed until after any type of work on-site commences.
- See Notes to be added
- Show existing conditions on the CFS-1 site with work to be completed under that project or as part of the enabling plans for that site.
- Limits of pavement to be removed need to be more clearly designated.
- Add note to portions of municipal drainage system to be removed – "Do not damage or remove until relocated drain line has been constructed and has been accepted by MassDevelopment Engineering Dept. and DPW.
- Plan shows old zoning boundary limits – need to be updated and called out more clearly.
- Grant Housing "Impact Area" needs to be clearly called out on all plans with note indicating no access at any time.
- Oak-Maple Pesticide AUL limits to be shown and clearly called out on plans.
- Need to add reference to Oak-Maple and Grant Housing LUCIP areas

Sheet C-3.00

- What is the plan for construction vehicles to access the CFS-2 site once work for the CFS-1 site is substantially completed?
- Show areas of work on the CFS-2 site to be performed by others with reference to CFS-1 enabling work and development work plans and applications.
- Access to the former Spruce Street needs to be provided for access to municipal utilities being retained/relocated.

Sheet C-4.02

- Existing drainage system on "Beech Street" should be disconnected from remainder of municipal drain line prior to start of work. System should be removed or connected to on-site stormwater management facilities.

- Limits of clearing need to account for reasonable access for earth moving, placing and compacting activities and equipment as well as for access to inspect, clean-out and repair erosion control materials.

Sheet C-4.03

- The applicant is still working on plans for access to the 69kv power lines. Plans should not be endorsed without confirmation from the Devens Utilities Department that the access routes shown on the plans are acceptable.

Sheet C-5.01/5.02

- Clearly identify any utility work related to municipal utility systems.
- Add note regarding work on municipal utility systems.

Sheet C-7.00

- Turning movements need to include ingress and egress to/from the site at both driveways.
- Provide turning templates for various trucks to utilize the site as well as Devens fire and emergency vehicles.
- Turning movement plan should be prepared using worst case vehicle. If different vehicles are deemed "worst case" at various locations, all identified vehicles should be shown.
- Ingress and egress from loading docks should utilize the worst case vehicle anticipated to use each dock.

Sheet G-200

- Clearly delineate property line between parcels.

Additional comments may be provided following additional review, response to comments or provision of additional material. Failure to identify any items during this review which do not conform to applicable MassDevelopment Engineering standards does not relieve the owner, engineer or contractor from such requirements.

Devens Utilities Comments:

The locations and sizes of the water and sewer stubs left for the CFS-2 building in the CFS-1 plans do not always match and need to be better coordinated between the two projects.

water and sewer-related comments and questions on Utility Plan 1 – Dwg. C-5.01:

1. The water and sewer connection locations and pipe sizes need to be better coordinated between this CFS-2 project and the CFS-1 project. For example, two 10" water stubs were shown on CFS-1 plans for use on the CFS-2 project but it appears only one is being used. And two 8" sewer stubs were left but it appears the connecting CFS-2 sewer pipes may be 6" and one of the sewer stubs is not oriented in the proper direction to make the connection.

2. Not all pipe sizes are shown for water and sewer pipes, and pipe lengths and slopes are not shown for sewer pipes but should be.

3. 6" sewer pipe from CT building is labeled "non-sanitary" but is connected to the sanitary sewer line. What will be conveyed in this "non-sanitary" line?

4. The proposed sewer work must be done in a way that maintains sewer service to the existing customer Seven Hills that is currently served by the existing sewer pipe that will be relocated as part of this project and the CFS-1 project. This service maintenance will need to be coordinated between the CFS-1 and the CFS-2 projects.

Devens Environmental Comments:

1. **General** -- Please update all plans and the appropriate sections of the permit application to address the inclusion of the "Impact Area" in what the application describes as the "Property."

2. **Existing Easements, Covenants Restriction and Institutional Controls** –

   The statement "Soils transport within project areas for both the CFS Building 1 and CFS Building 2 will be coordinated within a single soils management plan applicable to both project teams" should be expanded upon to describe when the plan will be prepared and submitted to MassDevelopment for review. Such a plan must address:

   - The final Site-Specific 2016 Pesticides AUL (Applies only to the Oak and Maple Housing Areas)
     - the Soil Management Plan associated with the 2016 Pesticides AUL
     - the Health and Safety Plan associated with the 2016 Pesticides AUL
   - The Site-Specific Oak and Maple LUCIP Addendum (Currently being redrafted to extend its effect to include the entire Premises minus the Impact Area)
     - the NAUL associated with the Oak and Maple LUCIP Addendum
     - the Soil Management Plan associated with the Oak and Maple LUCIP Addendum
   - The 2011 Grant Housing Area LUCIP
   - The 2011 GERE associated with the Impact Area (only applies to the Impact Area)
   - The Devens Soil Management Policy (Applies Deven-wide)
   - The General Excavated Soil Management Plan, Devens Massachusetts, prepared by Haley & Aldrich, Inc. (November 1996), as amended in March 2000 (Applies Devens-wide)

3. **Earth Removal** – Please update this section to reflect the current (and proposed) status of Land Use Controls with respect to Soil Movement within the "Property" and Soil Movement to a location off of the "Property. If, as we understand, no soil will be moved to a location off the "Property," please state so in this section. Also, please add a statement regarding the prohibition of disturbing soil within the Impact Area.

4. **Appendix G, Soils Management Plan** – Please update this appendix to reflect the current (and proposed) status of Land Use Controls with respect to Soil Movement within the "Property" and Soil Movement to a location off of the "Property." If, as we understand, no soil will be moved to a location off the "Property," please state so in this appendix. Also, please add a statement regarding the prohibition of disturbing soil within the Impact Area.

DEC Staff Comments:

1. Ensure project addresses requirements of 974 CMR 4.11. Has the Applicant considered white roof or green roof options for reduced heat island, energy efficiency, stormwater management, open space/amenities? Better to consider now to include in design specs.
2. Provide details on any stacks or rooftop mechanicals that may extend above the 54' building height (zoning table says 58' – please clarify. Please confirm the height of the stack and anticipated emissions.
3. Provide size of emergency generator and fuel storage details. A SPCC Plan and Hazardous Materials Spill Response Plan will be required as a condition of approval.
4. Sound study and electromagnetic interference evaluation to be provided ASAP.
5. Has any visual analysis been conducted for the SPARC facility for the top of building and top of stack heights?
6. Erosion and sediment control plan comments:
    a. needs to include temporary sedimentation basins outside of proposed stormwater management system to ensure drainage is properly managed and contained on-site. We realize contractors will be responsible for establishing these as part of their CGP for the project but pre-planning is required to ensure temporary facilities are adequately sized for the volume of runoff to reduce the likelihood of any off-site impacts. Like construction laydown areas, these locations can be mobile depending on the stage of construction.
    b. Cleary distinguish between limits of clearing and types of erosion and sediment controls (where straw wattles are proposed and where silt fence reinforced with straw waddles).
    c. No tree removal should be occurring outside of the limits of disturbance.
    d. Show all controls between CFS-1 and CFS-2 (anti-tracking pads, protection of existing drainage infrastructure, etc…).
    e. Tree protection detail provided but plan does not show where is it being installed.
7. Provide all details for exterior site improvements such as utility pads, loading docks, all drainage structures, stairs, railings, duct banks, utilities, etc…
8. Lighting plan – highlight specific lighting specifications on lighting detail sheet.
9. Provide breakdown of FAR by use (Office 0.25; R&D 0.35; Ind.0.50)

Please provide any responses and supporting information by **December 14, 2020**. In the meantime, feel free to contact me with any questions.

Sincerely,

Neil Angus, AICP CEP, LEED AP
Environmental Planner
Devens Enterprise Commission

Nitsch Engineering

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December 4, 2020

Devens Enterprise Commission
c/o Mr. Neil Angus, AICP CEP, LEED AP
Environmental Planner
33 Andrews Parkway
Devens, MA 01434

RE: Nitsch Project #9419
King Street Properties
Commonwealth Fusion Systems
111 Hospital Road
Traffic Review Comments
Devens, MA

Dear Mr. Angus:

Nitsch Engineering has received copies of the Application For Level 2 – Unified Permit and associated Site Plans for both the proposed CFS-1 building and the proposed CFS-2 building at 111 Hospital Road in Devens, Massachusetts, dated November 5, 2020, prepared by Highpoint Engineering, Inc. and VHB, respectively. Since the Traffic Impact and Access Study submitted with both applications is the same document and evaluates the traffic impacts of both buildings together, this letter serves as our official traffic review comments for both applications. This letter summarizes our review of the traffic elements of the applications and plans, particularly the Access and Circulation section of the applications; the Traffic Impact and Access Study, dated November 2020, prepared by VHB; and the traffic elements of the Site Plans.

Based on Nitsch Engineering's review of the submitted documents, we have determined that the traffic study and method of analysis comply with industry practices and current transportation engineering standards in addressing the following key elements:

- Traffic Counts;
- Crash Analysis;
- 7-Year Build Horizon;
- Annual Background Growth Rate;
- Traffic Generated by Other Developments;
- Site-Generated Trips;
- HCM Capacity Analysis with delay, Level of Service (LOS), v/c ratios, and 50th and 95th percentile queues;
- Sight Distance Evaluation; and
- Transportation Demand Management.

However, based on Nitsch Engineering's review of the documents, we offer the following comments for consideration:

1. In describing the existing roadways, please include the functional classification. Also, per the MassDOT Road Inventory, none of the roadways in the study area are under local jurisdiction ("Unaccepted by city or town"). Please correct this information in the Roadways section.
2. The description of the intersection of Front Street at Hospital Road refers to the eastbound side of Hospital Road, but Hospital Road runs north-south. Please correct this information.
3. Were the adjustments to the 2020 count data for the COVID-19 pandemic (+23.7% in the AM, +9.4% in the PM, and +17.4% for ADT) calculated based on the 2015 count data *after* adjustment from 2015 to 2019 per the MassDOT Yearly Growth Rates table and adjustment for seasonal factor? Also, which Group was used for the yearly growth rates? Based on the MassDOT Road Inventory, these roadways fit the U4-U7 group since they are considered within an urbanized area (Boston), resulting in a cumulative adjustment of +7.9% from 2015 to 2019. For the same reason, the seasonal factors should use the U4-U7 group, which would indicate that April 2015 counts were above average, not below.

Please clarify whether adjustments were made to the 2015 data prior to comparison with the 2020 data, and please use the U4-U7 group for seasonal factors and yearly growth.

4. In the crash analysis, please indicate the average statewide crash rates, and please provide comparisons with the calculated intersection crash rates.
5. Please consider showing in the appendix the trip assignment at the study intersections for trips generated by other developments that was used in developing the No-Build condition traffic volumes.
6. In the Future Roadway Conditions Section, for Grant Road, the 2015 traffic volumes were grown by 1% per year to 2020. Why were MassDOT's Yearly Growth Rates not used instead?
7. Traffic Volume Data section states that "The weekday morning and evening peak periods are consistent with typical peak commuter traffic periods and coincide with the expected peak periods for traffic entering and exiting the proposed site." However, for trip generation, the peak hour of adjacent street traffic was used for the morning and evening peak hours, rather than the peak hour of the generator. Using the peak hour of the generator would result in higher numbers of trips and a more conservative analysis. Please explain why the peak hour of adjacent street traffic was used for the morning and evening peak hours, or update the trip generation using the peak hour of the generator.
8. Please consider discussing mode share for site-generated trips, even if only to state that all trips were assumed to be vehicular.
9. Table 4 (Trip Distribution) shows 11% for the Grant gateway and 6% for the Verbeck gateway. How do these correspond to the Devens Traffic Monitoring Program Trip Distributions figure in the appendix, which shows 14% for Gateway 10 and 3% for Gateway 12?
10. Please explain how the distribution between the two site driveways was determined.
11. The Level-of-Service and Delay Criteria section states that the HCM 2010 was used for the capacity analyses, but the Synchro output in the appendix for the unsignalized intersections indicate that HCM 6 methodology was used. Please correct this information in the report, and please ensure the footnote (2) matches the HCM edition used.
12. Please mention that Synchro was used for the capacity analyses and note which version.
13. Please consider including a table showing LOS designations for signalized and unsignalized intersections.
14. Please explain in the capacity analysis narrative that all PHFs were set to 0.92 for future (No-Build and Build) conditions per MassDOT guidelines.
15. Please describe the proposed lane configuration of the site driveways. Also, please show on the plans the proposed pavement markings, including centerlines and stop bars, for driveways.
16. In Table 7, please correct the desirable ISD West of Site Driveway to be 430 feet for both driveways.
17. The report states that CFS-2 will be 146,835 sf, but it is listed as 147,000 sf in both plan sets (Sheet G200 of both sets and Sheet C-1.01 of the CFS-2 plan set) with other building sizes not rounded to the nearest thousand. Please correct these sizes in either the plans or the report.
18. The Transportation Demand Management Program section states that the accompanying site plans outline where the designated preferential parking and hybrid/zero/low-emission vehicle parking will be located, but we were unable to find that information in either plan set. Please add this information to the plan sets.
19. For CFS-2 only: Please show the continuation of the fire truck path from the CFS-1 turning study to reach the CFS-2 building and to turn around.

We recommend that the Applicant review these comments and make appropriate revisions or additions prior to Devens Enterprise Commission approval of the traffic study.

We are available to discuss this review in person with the Applicant. If the Commission has any questions, please call.

Very truly yours,

Nitsch Engineering, Inc.

Adina Alpert, PE, ENV SP, PTOE
Senior Project Engineer

Approved By:

Fayssal Husseini, PE, PTOE, LEED GA
VP-Transportation

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December 7, 2020

Mr. Neil Angus
Devens Enterprise Commission
33 Andrews Parkway
Devens, MA 01434

Re: Commonwealth Fusion Systems - 2
Nitsch Project #9419 Task 35

Dear Neil,

IBI Placemaking has reviewed the landscape plans and site lighting for the Commonwealth Fusion Systems -2 Unified Permit submission. The naturalistic layout of the proposed planting demonstrates a sensitivity to the Devens landscape. The following comments are offered.

3.0: SITE PLAN
3.02: REQUIREMENTS

1. **3.02 (3) (b) 6 (a) states that "All existing landscape features, especially existing trees and woodland to remain, shall be shown on ALL site plan sheets.…Scattered trees to be preserved shall also be shown as well as all "specimen trees" (trees exceeding a minimum caliper of 12") within 100' of existing or proposed lot lines have been identified and indicated"**
    - The indication of the extent of the straw bale with silt fence erosion control barrier and the orange caution fence is not clear on the Site Preparation and Erosion Control Plan, and it is not clear if both systems occur together. Either system will adequately serve as tree protection fence for the adjacent woodlands; however, one of the two systems shall be in place for the duration of construction activity for proper tree protection. If areas along the property line exist where the straw bale with silt fence is not installed, the orange caution fence must remain in place for the duration of construction activity.
    - In areas of the property line where both the orange caution fence and the straw bale with silt fence are called for and tree clearing precedes the installation of the straw bale with silt fence, amend the note to call for the orange caution fence to remain in place until the straw bale with silt fence is installed.
    - Clarify the graphic representation of both straw bale with silt fence erosion control barrier and orange caution fence. Clarify the associated callouts to include the protection of adjacent wooded areas for the duration of construction activity and include on all plans.
    - The limit of tree clearing lines shown on the Site Preparation and Erosion Control Plan along most edges of the project are incorrect as the connection of proposed and existing contours cannot be accomplished with the right angles as shown. If slopes currently graded at 1:3 are steepened to accommodate revisions to the grading, these slopes will require reforestation (see item #6 below).

- Existing tree sizes are not shown on the plans north of Plum Street; identify those over 12" within 100' of the property line.
- Currently, no existing trees on the site are identified to remain or be protected. Should changes to the project identify trees for protection, identify tree protection fencing at 12" beyond the dripline on all of the plans (see item #5 below).

3.04: DESIGN STANDARDS

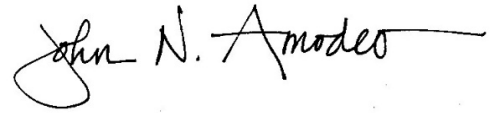
1. **3.04 (3) describes the requirements for site lighting levels and fixtures.**
   - Confirm that light will not extend beyond the property line on the photometric plan.
   - Indicate if any lighting is proposed to be set for the 11pm to 7am timeframe.
   - Provide information regarding energy efficiency measures such as timers and sensors that are proposed for incorporation into the lighting system.
2. **3.04 (8) (c) 2 calls for native plants.**
   - The native plant palette is rich and comprehensive. Replacement of the non-native *Ginkgo biloba* at this signature location on the site is recommended as a means of highlighting a native species. The planting mirrors the planting on the opposite side of the quad, where the same recommendation for substitution was made for CFS-1, suggesting further coordination between the two projects.
   - Given the genetic diversity and associated resilience that the straight species of any plant brings to the species and ecosystem, unless the native cultivar provides a necessary shorter height, as in the parking islands, the straight native species is preferred.
   - Composition of all seed mixtures shall be New England native species.
   - The composition of the wetland seed mix is not identified. Provide a list of species.
   - The composition of the meadow mix is not identified. Provide a list of species.
   - The composition of the native planting mix is not identified. Provide a list of species.
3. **3.04 (8) (c) 8 calls for trees within 20' of a road or paved area to be salt tolerant.**
   Adjust the locations of *Chionanthus virginicus*, White Fringetree, and *Cercis canadensis*, Eastern Redbud or replace them with other species in locations where they are located close to roadways due to their sensitivity to road salt.
4. **3.04 (8) (d) 2 calls for the preservation of all trees in setback areas with a minimum 12" caliper.**
   Indicate setback lines and identify all trees within the setback of a minimum 12" caliper.
5. **3.04 (8) (d) 4-7 describes in depth the care to be taken to ensure the survival of existing trees.**
   Currently, no existing trees on the site are identified to remain or be protected. Should changes to the project identify trees for protection, clear identification of the trees to remain and be protected and a description of the excavation methods within rootzones of trees to remain must be provided on the plans to ensure the survival of existing trees. Include a clearly defined tree protection fence located 12" beyond the drip-line of the trees to be protected on all plans to help ensure that this protection is provided.
6. **3.04 (8) (f) 3 requires any unpaved areas steeper than 1:3 to be planted with shrubs or groundcovers with fibrous root systems.**
   - Most of the west edge of the site is graded at slopes of 1:2. A meadow mix (see item #2 above regarding the mix**)** is called for in these areas. A 1:2 slope is too steep to maintain with the annual mowing required by meadows. Given the proximity to natural wooded areas at Devens, the height of the slopes and their steepness, the applicant should add a landscape management consultant to the team to advise on the interim slope

stabilization that does not require mowing as well as on reforestation of the slopes. The reforestation plan should consider the use of an appropriate seed mix, the planting of nut caches, seedlings, saplings and live stakes. Ensure that the plant palette includes woodland tree and shrub species appropriate to early and future successional growth for the naturally wooded slopes at Devens such as the shrub species of blueberry, rhododendron, winterberry, bayberry, shrub dogwoods, cranberry bush, spicebush, and native viburnums.

- A portion of the east side of the site adjacent to the location of the future office building is also graded at slopes greater than 1:3. As this area is not appropriate for reforestation, the slope should be eased to a maximum of 1:3 to allow for seasonal mowing of the meadow.

7. **3.04 (8) (f) 6 describes the limiting of construction activities to prevent soil compaction in future landscaped/natural areas.**
   Both the large temporary loam stockpile and storage area and a temporary siltation basin are proposed for the future quad area and will result in compacted soils. Describe the methods to be employed to decompact the soils.
8. **3.04 (8) (l) 1 describes the landscape treatment of building perimeters visible from a road or Residential or Open Space Zoning District.**
   The central portion of the east side of CFS-2 will be visible from the Open Space Zoning District. Provide a minimum of one shade tree or three ornamental/evergreen trees per 50 lineal feet of building façade within 50' of the building face. The incorporation of additional trees within the quad is recommended to further soften the building from the Open Space Zoning District, suggesting further coordination between the two projects.
9. **3.04 (8) (n) 1 calls for the landscape to be maintained in good condition.**
   - On the east side of CFS-2 ensure that the proposed evergreen and flowering trees are not located too close to the building to require regular pruning to keep the plant materials right-sized.
   - The substitution of the proposed lawn in the small triangular area adjacent to the CFS-2 parking area with Arctostaphylos uva-ursi is recommended.
   - The interplanting of red maples and ginkgos (see item #2 above for recommendation for substitution of ginkgos) on the north side of the quad mimics the planting design on the south side of the quad where the trees are planted within a paved plaza. The trees will not survive the construction of the proposed future plaza as shown in the master plan; confirm that these are temporary plantings.
   - The soils analysis identifies site soils as sandy, which will increase pressure for irrigation for establishment and drought mitigation. The favoring of native species adapted to sandy, well-drained soils is strongly suggested.
10. **3.04 (8) (n) 2 Landscape maintenance and water management plan.**
    - Include protocols for the maintenance of meadow, wetland and native planting areas in the landscape maintenance plan.
    - Include the snow storage areas designated by the winter plowing plan in the planting plans to ensure that the plantings within the snow storage areas are tolerant of road salt.

Sincerely,



John N. Amodeo, ASLA, LEED AP B+C

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December 7, 2020

Devens Enterprise Commission
c/o Mr. Neil Angus, AICP CEP, LEED AP
Environmental Planner
33 Andrews Parkway
Devens, MA 01434

RE: Nitsch Project #9419
Commonwealth Fusion (CFS-2)
Site Plan and Stormwater Review
Devens, MA

Dear Mr. Angus:

Nitsch Engineering received and reviewed the Site Plans (the Plans) entitled, "Commonwealth Fusion Systems Campus Building 2, 111 Hospital Road, Devens, Massachusetts", dated November 5, 2020, prepared by VHB. In addition, Nitsch Engineering has received and reviewed the following documents:

1. Level 2 Unified Permit Application, prepared by VHB, dated November 5, 2020;
2. Stormwater Report, prepared by VHB, dated November 5, 2020;
3. Level 2- Unified Permit, Checklist for Determination of Completeness, dated November 20, 2020;
4. Slope Evaluation at CFS-2, prepared by Haley and Aldrich, dated November 6, 2020.

Nitsch Engineering is providing comments with respect to the Site Plan and Stormwater Management in this letter. Please note that traffic and landscape review are being provided in separate letters.

PROJECT UNDERSTANDING

VHB, Inc., on behalf of Commonwealth Fusion Systems, has submitted Level 2 Unified Permit for the construction of a +/-147,000 sf fusion energy research and development facility (CFS-2) and associated site improvements. This application also seeks conceptual approval for the overall campus master plan (general size, location and layout) for future development phases. CFS- 2 will be home to a compact fusion device that will prove fusion can work as an power source. It will also include the equipment and instruments needed to operate, monitor and maintain the device. A concurrent application has been made for CFS-1 so that both buildings and associated site improvements can be reviewed independently while viewed together in context to one another and to the campus master plan as a whole.

The proposed CFS-2 project also includes the construction of the continuation of the access driveways and the construction of parking lots and utilities. The proposed stormwater strategy consists of a closed drainage network including catch basins, manholes, a subsurface infiltration system, and a surface infiltration basin. Proprietary water quality units, a sediment forebay and a rain garden are provided for pretreatment for the infiltration systems.

DEC REGULATORY CONFORMANCE

Based on Nitsch Engineering's review of the submitted documents and the above-referenced regulations, we offer the following comments for consideration:

DEC SITE PLAN REVIEW DESIGN STANDARDS

1. **974 CMR 2.07(2), Table 1** provides design standards by roadway classification. It is unclear if the proposed roadways would be classified as internal driveways or local roads. In either case, the pavement width for roadways on the CFS-1 site ranges between 25 and 45.5 feet, which exceeds the design widths for both classifications. Additionally, the pavement widths on the north, west, and south sides of the buildings is significantly higher (100+ feet in some locations). We understand there are

needs for truck access on all side of the building, however the Applicant should provide additional clarity on the truck routes and turning movements to justify the proposed pavement widths. Throughout the site, the Applicant should evaluate the potential to reduce impervious area and meet the appropriate design standards.

2. **974 CMR 2.07(1)f** requires water mains to form a continuous loop. In addition to the proposed water loop to serve the CFS-2 building, we note that the CFS-2 project is proposing a 300+ foot water line extension along the eastern project boundary that will be capped for future use.

3. **974 CMR 2.07(3)** requires traffic calming measures to be integrated into roadways. The Applicant should provide traffic calming measures accordingly, including reduced roadway width, raised intersections, signalized/raised crosswalks or speed humps. Given the wide expanses of paved areas around the CFS-2 facility, traffic calming measures along with appropriate striping and signage, will be critical for clear definition of pedestrian, bicycle, and vehicular circulation patterns.

4. **974 CMR 2.07(3)** requires cement concrete or vertical granite curbing (VGC). The Layout and Materials Plan specifies bituminous berm (BB) in the eastern portion of the site. The Applicant should review and address this requirement.

5. **974 CMR 3.04(3)(a)1.h** requires bicycle storage facilities for all developments. The Applicant has requested a waiver from this requirement, noting that bicycle storage parking is provided at the CFS-1 building. We note that there appear to be 15 proposed racks near the northwest corner of the CFS-1 building (Sheet L.100 of the CFS-1 plan set). Additional information is needed to determine if the number of bicycle storage spaces is adequate to serve both buildings.

6. **974 CMR 3.04(3)(a)1.d** requires reflective yellow or reflective white paint for parking lot striping. We note that the accessible parking space paint is proposed to be blue per the detail on Sheet C-8.02. A detail should be added for the standard spaces. The striping details should provided/updated for compliance with the requirements of 974 CMR 3.04(3)(a)1.d.

7. **974 CMR 3.04(4)(g)** requires standard “STOP” at the intersection of driveways with streets and roads. The Applicant should evaluate the intersections of the internal driveways to provide adequate signage for traffic safety.

8. **974 CMR 3.04(5)** requires that the Applicant shall obtain a letter from Fire Chief stating there is adequate access for fire equipment. This should be provided to the DEC.

9. **974 CMR 3.04(10)** requires that all proposed developments shall demonstrate that they have made reasonable efforts to consider and implement transportation demand management strategies early in the site planning and layout process. These include providing 5% of total parking spaces for each of the following: ridesharing, hybrid or zero/low-emitting vehicles, and hybrid/electrical vehicle plug-in/recharge stations. Understanding that limited parking is proposed on-site, the Applicant should clarify if designated spaces as noted above will be provided.

10. The existing Spruce Street continues beyond the proposed CFS-2 development in the northeast corner of the project site. The Applicant should clarify the proposed approach to coordinate with the existing road, including the limit of pavement removal and revegetation.

11. The project requires significant earth moving including two large mounds in the northern and eastern portions of the project site that are 10-15 feet tall in some locations to accommodate the excess cut on the site. The Applicant should clarify the intended use of these mounds (i.e. passive recreation or

other), the timeline for their use with respect to phasing, and evaluate how the scale will be reduced through grading or vegetation.

12. The construction of modular block retaining wall in a “cut” situation will require over-excavation for the geosynthetic reinforcement. The Applicant should review the required limit of disturbance related to the construction wall to reflect the limit of work on the grading plan. The plans indicate a tree line directly adjacent to the wall; this should be updated as required to reflect the over-excavation.

13. The soils on-site are noted as loamy sand/sand soils and therefore it will be critical to provide adequate slope stabilization during and immediately following construction. The Applicant should provide additional detail on how the proposed slopes will be stabilized/protected until the slope is fully vegetated (final stabilization).

14. In multiple locations, the proposed utility stubs provided by the CFS-1 site do not appear to be utilized for the CFS-2 project. These include an underground electrical feed, a sewer service connection, and a water service connection. These utility connections should be coordinated.

DEC STORMWATER DESIGN STANDARDS

15. **974 CMR 3.04(4)(b)** requires Stormwater Management options shall include green infrastructure and LID techniques, including but not limited to vegetated swales, rain gardens, bio-filtration landscape islands, rainwater harvesting, and pervious pavement, where feasible, to achieve infiltration/capture/reuse of stormwater runoff on-site. The proposed stormwater management design primarily uses a proprietary water quality structures for a large majority of the pretreatment prior to discharging to the underground infiltration system. While we appreciate that there is one rain garden and a sediment forebay, the Applicant should further evaluate incorporating LID techniques throughout the site for pretreatment. We note that there appear to be locations on the site where LID techniques may be appropriate, such as porous pavement on sidewalks or parking stalls, roadside swales, and additional bioretention basins in parking islands. The Applicant should review and address this requirement.

16. **974 CMR 4.08(2)(c)(vi)** requires all projects shall incorporate LID techniques for stormwater management to the maximum extent feasible. For projects proposing traditional closed drainage systems, the Applicant shall demonstrate to the satisfaction of the DEC why LID stormwater management design methods are not feasible. The Applicant should review and address this requirement.

17. **974 CMR 4.08(3)(a)** requires that biofiltration basins shall be the preferred method to reduce curbing, piping and structures and provide additional overland treatment and recharge. They shall be designed in accordance with the Handbook. The majority of the site is curbed with closed drainage, although there appear to be alternatives for reducing the curbing and utilizing adjacent vegetated areas for stormwater management. The Applicant should review and address this requirement.

18. **974 CMR 4.08(3)(b)** requires the post-development peak rate of stormwater discharge off-site shall not be greater than the pre-development peak rate of stormwater discharge for the 2, 10, 25, 50 and 100-year storm events from any point of discharge on the site. The Applicant should provide a comparison summary table for all drainage areas.

STORMWATER DESIGN AND CALCULATIONS

19. The Proposed Drainage Conditions (Figure 2) provides the watershed delineations for the proposed project. However, the extents of the drainage areas do not fully cover the limit of work. The drainage analysis should be updated to include all disturbed areas for the CFS-2 project, including the perimeter areas to the north and west that are proposed for significant earthwork. The HydroCAD model should also be updated as needed.

20. The proposed condition HydroCAD model did not provided a Routing Diagram or the detailed report for the 10-, 25-, and 50-year storm events. This information should be provided for additional review of the model results.

21. In addition to the site stormwater management plan, the CFS-1 and CFS-2 projects provide the relocation of an existing 30" dia. storm drainage pipe that is presumed to extend into the site from Hospital Road. In the CFS-1 application materials, the Applicant has noted that there is limited information about this drainage main and is concerned about the adequacy of the existing system. We concur with the Applicant the Hospital Road drainage system be cleaned, video-inspected, and dye-tested prior to construction to verify if drainage does discharge to the Property, and the limits of the contributing watershed to verify drainage pipe carrying capacity. This analysis may impact the size of the drainage line within the CFS-2 property boundary.

22. The invert out of DMH-702 is 4-foot higher than the invert to the structure. This should be reviewed and revised to provide positive drainage.

23. The detail for the proposed subsurface infiltration system indicates that the system will be comprised of StormTrap Double Trap chambers, which are stacked concrete chambers. It is unclear from the detail how this system will promote infiltration, only noting "infiltration opening in interior module only." The Applicant should clarify how this system will function and confirm that the HydroCAD modeling for the infiltration is appropriate for the system (i.e. infiltration footprint matches actual area for infiltration from Double Trap detail).

24. Roof water from the Motor Gen Building, the south portion of the CFS-2 building, and rain garden overflow do not require pre-treatment but are being treated by WQU-1. This is likely increasing the size of the water quality unit. The Applicant should evaluate alternative locations to infiltrate on-site closer to these sources to better align with the LID design requirements, reduce the size of the subsurface infiltration system, and reduce the size of the water quality unit.

25. As the rain garden/bioretention is proposed for pretreatment, they should include an underdrain and be lined to prevent infiltration. Infiltration at the rain garden should not be accounted for in the HydroCAD model.

26. The outlet of the overflow of the subsurface infiltration system appears to be above the elevation of the system. Also, the invert at the flared end section appears to be 5 feet higher than the proposed grade. Appropriate sediment and erosion protection should be provided for the flared end section and the extents of the rip rap shown in the detail should also be shown on the plans. It seems that the design of the flared end section could be altered to better align with the proposed grade and slope.

27. Please provided a detail for the sediment forebay. We note that the sediment forebay should be lined to prevent infiltration and achieve the required pre-treatment.

28. Please provided a detail of the swale at the north edge of the site.

29. The calculation for water quality sizing of the sediment forebay and rain garden do not appear to be in accordance with the requirements of the MA Stormwater Handbook, Volume 2, Chapter 2 which requires at a minimum, the volume of the sediment forebay to hold 0.1-inch/impervious acre to pretreat the water quality volume and rain gardens to capture and treat the required water quality volume (the first 0.5 inch or 1 inch of runoff) if intended to be used for water quality treatment. The Applicant should review and address this requirement.

30. Please provide documentation of the two (2) foot separation to ground water at Infiltration Basin 2. TP-22 appears to be in the location of Infiltration Basin 2 but only provides information to Elevation 261.5. ft. The bottom of the basin is at Elevation 260 ft.

31. The Master Plan Stormwater documentation was received for record but will require a separate submittal for each site for approval.

CONFORMANCE WITH THE MASSDEP STORMWATER STANDARDS

In accordance with **974 CMR 4.08(2)(a),** Nitsch Engineering reviewed the stormwater design and calculations for general conformance with the MassDEP Stormwater Standards. Based on this review, Nitsch Engineering offers the following comments:

32. **Standard 3** requires that the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook. Based on Hydraulic Soil Group (HSG) A soils, a recharge volume of 0.6 inches over the impervious area is required for the CFS-2 site. Although we believe there is likely enough recharge volume being provided to meet this requirement, the Applicant currently uses a combination of HSG A and B soils in the recharge calculation. The calculation should be updated to reflect the recharge volume requirement for HSG A soils.

33. **Standard 3** also required that to ensure the long-term operation of infiltration BMPs, pretreatment is required before discharge to an infiltration BMP. For infiltration of stormwater runoff from land uses with higher potential pollutant loads, discharges to the ground within an area with a rapid infiltration rate (greater than 2.4 inches per hour), at least 44% of the total suspended solids must be removed prior to discharge to the infiltration structure. The Stone Diaphragm does not meet the pretreatment requirements of 44% prior to infiltration. Therefore, the rain garden must be lined to prevent infiltration.

34. **Standard 8** is covered by a NPDES Construction General Permit but no SWPPP has been submitted. A SWPPP should be submitted to the DEC before land disturbance begins. The erosion and sediment control plans provided (Sheets C6.00-C6.03) provides minimal information, only covering a perimeter barrier and tree removal. Given the significant earth moving required for the CFS-2 project, additional detail should be provided on these plans including slope protection, inlet protection, diversion swales and sediment traps, construction entrance(s), and infiltration system footprint protection. We note that these strategies are covered within the notes on Sheet C6.00, but they should be depicted on the plans. Additionally, consideration should be given at the interface between the CFS-1 and CFS-2 project boundaries, as we understand that CFS-1 will be operational prior to the completion of CFS-2.

35. **Standard 10** prohibits illicit discharges to the stormwater management systems. The Illicit Discharge Statement should be provided and signed by the Engineer of Record.

If the Commission has any questions, please call.

Very truly yours,

Nitsch Engineering, Inc.

Paige Simmons, PE, LEED GA
Project Engineer

Approved By:

Jennifer Johnson, PE, CFM®, CPSWQ, LEED AP
Project Manager

JLJ/

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