

---

January 03, 2024

Ms. Jean Bubon, AICP  
Town Planner  
Sturbridge Planning Board  
301 Main Street First Floor  
Sturbridge, MA 01566

**Re: Peer Review #2 - Stormwater and Zoning Compliance Review  
Sturbridge PV, LLC – 200 Haynes Street (Formerly 200 Route 15), Sturbridge, MA  
CMG ID 2023-218**

Dear Jean,

CMG is providing this letter report detailing our engineering peer review of the stormwater management system design and Application for Site Plan Approval Submission #2 for the proposed Large-Scale Ground-Mounted Solar Energy Facility located at 200 Haynes Street, Sturbridge, MA” (the “Site”).

The project is located on a 13.92 +/- Acre parcel within the “Special Use” zoning district and includes ground mounted solar voltaic arrays, a gravel access road, associated utilities, and an on-site stormwater management system. The proposed project limits are within the Town of Sturbridge Conservation Commission’s 200-FT wetland buffer zone and 500-FT buffer zone of areas with 8% slope or greater to areas subject to protection.

CMG is in receipt of the following documents:

- BSC Group Response Letter entitled “Proposed Photovoltaic System, 200 Haynes Street, Response to Peer Review, Fire Department & Public Comments”, date 11/20/23.
- Site Plan entitled “Ground-Mounted Photovoltaic System, 200 Route 15, Sturbridge, MA” plans, prepared by BSC Group – 349 Main Street, West Yarmouth, MA 02673, dated 8/1/2023, revise date 11/15/23.
- Stormwater Management Report entitled “Stormwater Report – Ground-Mounted Photovoltaic System, 200 Route 15, Sturbridge, MA” prepared by BSC Group – 349 Main Street, West Yarmouth, MA 02673, dated April 2023, revise date November 2023.

CMG is providing the following follow-up technical comments for the Board’s consideration based on general good engineering practice, MA DEP Stormwater Management Standards, the Town of Sturbridge Planning Board Stormwater Management Regulations (revised date 9/12/17), Town of Sturbridge Planning Board Rules and Regulations (revised date 9/12/17),

Town of Sturbridge Zoning Bylaws (revised 6/5/2023), Town of Sturbridge Wetland Regulations (§365 of Sturbridge Town Bylaws), and the Wetlands Protection Act (310 CMR 10.00):

### **General Engineering & Stormwater Management Design Comments**

1. CMG recommends Applicant coordinate proposed site access with the Sturbridge Fire Department to determine if emergency apparatus can enter and exit the site safely. A truck turn diagram for the Sturbridge Fire Department's apparatus should be provided.

*BSC 11/20/23 Response: A diagram showing a Sturbridge Fire Department's apparatus is now included in the plan set using vehicle tracking for Civil 3D.*

#### **CMG Comment #2: Comment Acknowledged.**

**CMG recommends Applicant provide the Planning Board with written approval from Sturbridge Fire Department the proposed emergency access is adequate and all Fire Department comments are addressed.**

2. Site Grading Plan is difficult to read due to the 1" = 60' scale and does not provide existing elevation contour labels or contour labels on all proposed grading areas.

*BSC 11/20/23 Response: Plans were prepared at a scale of 1"=60' because it is desirable to see the entire site on one sheet, rather than two. It has the added benefit of reducing unnecessary paper. However, we do recognize that it is more difficult to read. In an effort to accomplish both, we have modified the site plans to a scale of 1"=50' and also added a sufficient number of contour labels to ease the review of the plans. A waiver from 3.01B.2 to allow presentation of site plans, at the submitted scale.*

**Waiver Request #1 - Applicant is requesting a waiver for Planning Board consideration. CMG finds the 1" = 50' scale is adequate for review of the proposed grading and drainage for this project.**

3. A portion of the proposed solar voltaic panels are proposed within the limits of the proposed steep grades (associated with the Infiltration Basin). Please verify constructability of the panels along this slope.

*BSC 11/20/23 Response: The location of proposed solar voltaic panels has been shifted outside of the 3:1 slope to the maximum extent possible. The portion of the panels that remains within the 3:1 slope shall be constructed in a way to ensure stability.*

**CMG Comment #2: CMG recommends the Planning Board consider a condition of approval requiring the Applicant provide a panel foundation design stamped by a licensed structural or geotechnical engineer for the panels to be located within the 3:1 slope area prior to construction.**

4. CMG recommends all proposed slopes on the Grading Plan be labelled to identify 2:1 and 3:1 slopes.

*BSC 11/20/23 Response: Callouts have been included in the drainage and grading plans so specify the 3:1. There are no longer any portions of the site that are graded at a 2:1 slope.*

**Comment Addressed**

5. There is no proposed drain pipe or accompanying design calculations to accommodate existing runoff flow through the Haynes Street roadside swale underneath the proposed driveway apron.

*BSC 11/20/23 Response: Please see updated design and calculations, a 12" RCP culvert is now implemented below the driveway apron to catch runoff flow toward the street.*

**CMG Comment #2: A 15" diameter RCP culvert is noted on Sheet 5 and in the Stormwater report which differs from the 12" RCP culvert noted on other plan sheets. Additionally, it doesn't appear Subcatchment 9S accounts for the existing pavement surface on Haynes Street which also discharges to this roadside drainage swale. CMG recommends calculations and plans be revised to account for the entire contributing watershed runoff to the roadside drainage swale as necessary to properly size the pipe.**

6. Driveway apron construction detail should be provided. More grading detail of this area should also be shown to determine if guard rails are necessary adjacent to the drainage swale on either side of the entrance.

*BSC 11/20/23 Response: Spot grades have been added to the driveway apron, it will meet the grade of the existing roadway. Guardrails shall not be necessary as the slopes off of the driveway are not greater than 3:1. The grading plan now shows the existing and proposed profile of the driveway.*

**CMG Comment #2: A driveway apron construction detail should be provided to detail the proposed pavement sawcut limits, clearly define the limits of paving, and pavement transition between the existing roadway and driveway apron.**

7. Applicant to obtain a Street Entrance Permit from the Department of Public Works.

*BSC 11/20/23 Response: A Street Entrance Permit shall be submitted to the Department of Public Works prior to the start of construction.*

**Condition of Approval for Planning Board consideration.**

**CMG Comment #2: CMG also recommends the existing gravel driveway and 12" culvert located to the South be removed and the drainage ditch be re-shaped, loamed, and seeded in this area as it will no longer be utilized to access the Site.**

8. Applicant needs to accurately locate the nearby adjacent septic system at the Sturbridge Crossing Condominium property on Bentwood Drive and verify the distance to the proposed infiltration basin. Proposed Site Infiltration Basin #1 appears to be located approximately 80 feet from the condominium's property line greater than the Massachusetts Stormwater Standards setback requirement of 50 ft. and 310 CMR 15.211 Title V Setback for stormwater infiltration = 25 ft.

*BSC 11/20/23 Response: There is no obligation on the part of the Applicant to locate the existing soil absorption system that is located on an abutting parcel of land, which is not under the control of the Applicant. The proposed infiltration basin is located 72.0 feet away from the property line at its closest point, and therefore complies fully with the setback requirements of both Title V and also the MA Stormwater Management Standards. No further action is necessary in this regard.*

**Comment Addressed**

9. Site plans show a proposed 7' height chain link fence. CMG recommends a gate detail also be provided.

*BSC 11/20/23 Response: A gate detail has been added to the site plans.*

**CMG Comment #2: Gate detail and chain link fencing should provide the same type of black vinyl coated chain link fencing as requested by the Planning Board.**

10. Planting Plan notes planting of trees and shrubs in certain areas but does not provide planting details and/or planting list or schedule.

*BSC 11/20/23 Response: The planting of trees is not proposed at this time. We feel that the site will be sufficiently screened, as indicated on the Planting Plan. Upon construction, if the Town Planner determines that screening is insufficient, trees will be provided at that time, as necessary. Tree planting details have been added to the site plans.*

**CMG Comment #2: Project proposes tree cutting to within 50 FT of the southern property line abutting a residential use and does not provide a 200 FT landscape buffer. Therefore, CMG recommends some form of additional landscape screening and/or tree plantings be proposed to mitigate the visual impacts of the proposed solar facility and stormwater basin which border the Southern residential property line (Also see Comment #31).**

**Stormwater Standard 1:** *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or water of the Commonwealth.*

11. How will runoff from the first 90 +/- ft. of the proposed access driveway apron be routed and treated to prevent runoff flow into the Haynes Street roadway gutter line.

*BSC 11/20/23 Response: The proposed access drive is crowned, directing runoff to the proposed grassed channels on either side of the driveway.*

**CMG Comment #2: Proposed grass swales should be called out on the Grading & Drainage plan sheets and a construction detail provided.**

12. Site's interior gravel access road appears to be super elevated with proposed catch basin locations on the high side of the road. Catch basins should be located on the low side in order collect roadway runoff. In addition, CMG recommends catch basin grates be constructed with concrete collars and a detail provided for all locations within the gravel access road.

*BSC 11/20/23 Response: Catch basins have been relocated to the low side of the road.*

**CMG Comment #2: Catch basin grates should be constructed with concrete collars and a construction detail provided for all locations within the gravel access road. The area downgradient of Catch Basin CB-3 should be bermed to prevent larger storms from bypassing and running towards the property to the South as the gravel driveway will not have a curb.**

**Stormwater Standard 2:** *Stormwater management systems shall be designed so that post development peak discharge rates do not exceed pre-development peak discharge rates.*

13. Stormwater report indicates very small increases to post-development peak rate discharge at several stormwater outfalls during the 2-year and 10-year storm events. CMG recommends Engineer reduce all post-development discharge rates to be equal to or below pre-development conditions.

*BSC 11/20/23 Response: The stormwater design has been modified. There are no longer increases anticipated for any of the design storms.*

**Comment Addressed**

14. Rational method pipe sizing calculations are not included in the submitted stormwater report for the proposed drain pipes.

*BSC 11/20/23 Response: Rational method pipe sizing calculations are included in the Stormwater Report.*

**CMG Comment #2: The culvert sizing calculations provided in Stormwater Report Section 7.06 do not provide the correct design flow rate necessary to evaluate proper culvert sizing (Also See Comment #5).**

**Stormwater Standard 3:** *Loss of annual recharge of groundwater shall be eliminated or minimized.*

15. Subcatchment Area 1S does not appear to account for the proposed concrete equipment pads. The HydroCAD model, required recharge volume calculations, and required water quality volume calculations should be revised to incorporate the increase in impervious area.

*BSC 11/20/23 Response: The concrete equipment pads have been relocated and are no longer within sub catchment area 1S. They are now within sub catchment area 5S and have been accounted for in the HydroCAD model.*

**Comment Addressed**

16. The engineer shall revise the Grading Plan to include elevations associated with test pit locations.

*BSC 11/20/23 Response: The grading plan now includes elevations associated with test pit locations.*

**Comment Addressed**

17. Estimated seasonal high groundwater elevations in proximity to the infiltration BMP's cannot be determined due to the scale and lack of existing contour labels on the Grading Plan.

*BSC 11/20/23 Response: The scale of the drawings has been modified to 1"=50'. Multiple contour labels have been added to the plans for ease of review.*

**CMG Comment #2: Applicant shall provide the Estimated seasonal high groundwater (ESHGW) elevations for each infiltration area to document the bottom of each area is a minimum of 2 ft. higher than ESHGW. Infiltration basin #1 detail on Sheet 8 of 9 provides a bottom elevation but no ESHGW notation and no individual cross-section details are provided for each of the three (3) drywell areas.**

18. Infiltration basin side slopes appear to be greater than 3:1.

*BSC 11/20/23 Response: Infiltration basin #1 side slopes are graded at 3:1.*

**CMG Comment #2: Grading plan notes a 3:1 slope, however, the Infiltration Basin #1 construction detail on Sheet 8 of 9 notes a 6:1 slope.**

19. The top of berm elevation for Infiltration Basin #1 is unclear. A minimum 1 ft. of freeboard must be provided during the 100-year storm event. Calculations indicate top of berm = 705 with peak elevation during 100-year storm = 704.4.

*BSC 11/20/23 Response: The top of berm elevation for infiltration basin #1 is 706.0', the peak elevation during the 100-year storm is 704.79' which provides 1.21' of freeboard.*

**CMG Comment #2: Comment remains. Construction detail on Sheet 8 of 9 notes Infiltration Basin #1 Top Elevation = 705.0.**

**Stormwater Standard 4:** *Stormwater management systems shall be designed to remove 80% of the average annual post construction load of Total Suspended Solids (TSS).*

20. Section 2.04 of the submitted stormwater report includes a required water quality volume calculation which utilizes a rainfall depth of 0.5". Section 7.03 of the same report includes a water quality volume calculation which utilizes a rainfall depth of 1-inch due to the presence of soils with rapid infiltration rates. CMG is in agreement with the calculation utilized in Section 7.03. The stormwater report should be revised to include the correct WQv calculation in both sections.

*BSC 11/20/23 Response: A rainfall depth of 1-inch has been utilized in both calculations.*

**Comment Addressed**

**Stormwater Standard 5:** *Land uses with higher potential pollutant loads (LUHPPL), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.*

Not Applicable – CMG is in agreement the Site is not considered a LUHPPL.

**Stormwater Standard 6:** *Stormwater discharges within a Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area.*

Not Applicable – CMG is in agreement the project is not a critical area

**Stormwater Standard 7:** *Redevelopment Projects*

Not Applicable – Site is not a redevelopment project.

**Stormwater Standard 8:** *Construction period erosion and sedimentation control*

21. The Site is > 1 Acre therefore an NPDES SWPPP is required to be submitted prior to construction. CMG recommends the Planning Board make this a condition of approval.

*BSC 11/20/23 Response: The Applicant is aware of the NPDES Phase II requirements and will comply fully.*

**Condition of Approval for Planning Board consideration.**

22. Inlet protection for the proposed catch basins shall be included in the Soil & Sediment Control Plan.

*BSC 11/20/23 Response: Inlet protection will be installed in all new catch basins upon installation. The Erosion and Sediment Control Plan (Sheet 7) has been modified accordingly and a detail has been added to Sheet 8.*

**Comment Addressed**

23. Slope stabilization measures, such as an erosion control blanket, shall be implemented for 3:1 slope or greater. The slope for the cut associated with the proposed infiltration basin cannot be determined on the provided 1"=60' scale plan. Slope stabilization measures such as rip-rap armoring may be necessary for slopes steeper than 2:1.

*BSC 11/20/23 Response: Erosion control blankets are now proposed for all proposed 3:1 slopes. There are no proposed 2:1 slopes.*

**Comment Addressed**

24. Due to the presence of relatively steep slopes, CMG recommends the engineer include silt fence backing as part of the erosion control compost filter sock.

*BSC 11/20/23 Response: Silt fence backing will be provided for the compost filter sock, as recommended by CMG.*

**CMG Comment #2: Detail provided on Sheet 8 is not adequate as it only shows the Siltsoxx and doesn't correctly illustrate the additional silt fence installation.**

25. Erosion and Sediment control plan should provide properly sized temporary sediment basins and swale locations to control sediment laden runoff during construction.

*BSC 11/20/23 Response: Suggested location(s) of temporary sediment basins and swales have been added to the Erosion & Sediment Control Plan (Sheet 3).*

**CMG Comment #2: Temporary sediment basins sizing calculations and proposed grading should be provided to insure constructability and correct placement. In addition, the "Possible Construction Staging Area" and "Dewatering Sedimentation Trap" appear to be located on top of proposed Infiltration Area #1 as shown on Sheet 3 of 9. CMG does not recommend equipment and/or stockpiling be located directly on top of any proposed infiltration areas.**

**Stormwater Standard 9: Long term operation and maintenance plan**

26. Standard Met – a comprehensive long-term operation and maintenance plan is included as part of the submitted stormwater report.

*BSC 11/20/23 Response: No further comment*

**Comment Addressed**

**Stormwater Standard 10: Illicit discharges**

27. A signed Illicit Discharge Statement is not provided within the O&M Plan.

*BSC 11/20/23 Response: A signed Illicit Discharge Statement has been provided by the Applicant and appended to the O&M Plan.*

**CMG Comment #2: A signed Illicit Discharge Statement is not provided in the revised Stormwater Report provided to CMG. Stormwater Report Section 2.10 notes "A signed, illicit discharge compliance statement will be submitted prior to the start of construction."**

**Town of Sturbridge Zoning Bylaws (Article X Solar Energy Facilities):**

28. §300-10.3.B.(4) – Applicant proposes to utilize an anti-reflective coating on the solar panel’s front glass to mitigate glint and glare. Applicant should provide manufacturer’s specifications indicating the specific properties of the anti-reflective coating to document there will be “no” glare. Otherwise, CMG recommends a glare analysis be provided.

*BSC 11/20/23 Response: Please see the attached letter which specifies the glare/reflection required by the manufacturer.*

**Condition of Approval for Planning Board Consideration – Applicant is providing two documents entitled “Statement about modules’ reflection” date 11/07/23 and “Solar Glare Hazard and Evaluation Methodology” System Bulletin No 2 date October 2014 for Planning Board review and consideration.**

29. §300-10.5.A – The proposed equipment pads appear to be located within 100’ of the front property line setback.

*BSC 11/20/23 Response: The equipment pads have been relocated accordingly.*

**Comment Addressed**

30. §300-10.5.A – Applicant notes the solar field utilizes approximately 17% of the parcel’s square footage. Please provide additional supporting calculations as the limits of the proposed solar project appear to be larger than 17% of the site’s square footage. Only twenty percent (20%) of a parcel’s total square footage may be used for a solar facility.

*BSC 11/20/23 Response: Total Site Area = 8.42 acres (366, 775.2 sq.ft.), Total area of Solar Facility = 1.42 acres (61,852 sq.ft.),  $61,852\text{ sf} / 366,775\text{ sf} = 0.168 = 16.8\%$ .*

**CMG Comment #2: CMG recommends Applicant provide a figure to clarify the areas included in the 1.42 Acres specified as Total area of Solar Facility to document compliance with this section.**

31. §300-10.5.B –The project does not meet the 200’ buffer setback from a residential use for the Sturbridge Crossing Condominiums property located to the South.

*BSC 11/20/23 Response: The site plans have been revised accordingly.*

**CMG Comment #2: Project proposes tree cutting to within 50 FT of the southern property line abutting a residential use and does not provide a 200 FT landscape buffer. Therefore, CMG recommends some form of additional landscape screening and/or tree plantings be proposed to mitigate the visual impacts of the proposed solar facility and stormwater basin which border the Southern residential property line (Also see Comment #10).**

32. §300-10.6.A –Applicant states there will be no lighting for the project. CMG recommends Applicant verify if there will be security lighting and if so please provide a manufacturer’s cut sheet showing it will be a full cut-off dark sky compliant fixture.

*BSC 11/20/23 Response: Security lighting is not proposed. There will be no lighting of any kind.*

**Comment Addressed**



33. §300-10.6.E – CMG recommends a cut / fill analysis be provided to document proposed site grading impacts to the property.

*BSC 11/20/23 Response: Total Fill = 8,022.76 cubic yards, Total Cut = 8,492.38 cubic yards, Net Volume = 469.58 cubic yards of cut.*

**CMG Comment #2: CMG recommends the cut / fill information noted above also be noted on the Grading Plan Sheet 5 of 9.**

34. §300-19.3.B.3 – Applicant is requesting a waiver to not provide a traffic study for the proposed solar project as the project will not generate traffic to and from the subject parcel, with the exception of maintenance visits. CMG defers to the Planning Board regarding this waiver request.

*BSC 11/20/23 Response: No further comment.*

**Waiver Request #2 – CMG understands Planning Board is agreeable to granting a waiver to not require a traffic study.**

**Town of Sturbridge Planning Board Rules & Regulations:**

35. §3.01.B.2 – Site Plan Review applications shall include a site plan with a scale of one-inch equals 40 feet (Also See Comment #2).

*BSC 11/20/23 Response: As noted above, BSC shall submit a waiver from 3.01B.2 to allow presentation of site plans at the submitted scale.*

**Waiver Request #1 - for Planning Board consideration (Also See Comment #2).**

**Town of Sturbridge Wetlands Regulations (Chapter 365):**

36. §365-3.4.B & 365-6.2 – Tree cutting is proposed within the 100’ to 200’ wetland buffer along the north end of the project. Applicant should document compliance with this section based on discussions with the Conservation Commission.

*BSC 11/20/23 Response: The Applicant is aware of this requirement and has discussed the proposed tree clearing with the Conservation Agent.*

**Condition of Approval for Planning Board Consideration**

37. §365-3.7.A – The proposed surface stormwater basin does not contain a sediment forebay.

*BSC 11/20/23 Response: A sediment forebay is not necessary because there are no impervious surfaces conveying stormwater runoff to this facility.*

**Comment Addressed**

38. §365-3.7.C – Stormwater maintenance plans must be submitted to and approved by the DPW Director before the Sturbridge Conservation Commission will accept them.

*BSC 11/20/23 Response: Stormwater maintenance plans shall be submitted to the Sturbridge DPW Director.*

**CMG Comment #2: “Vehicle Washing Controls” section shown on the first page of the O&M Plan should be deleted**

**Condition of Approval recommendation for Planning Board consideration.**

39. §365-3.8.A – O&M Plan should be revised to note the Commission prohibits the use of pesticides, fertilizers and herbicides within the 100-foot buffer and prohibits the use of salts, quick release fertilizers and quick release herbicides within the 200’ buffer.

*BSC 11/20/23 Response: This has been stated in Section 5.0 of the Operation and Maintenance Plan.*

**Comment Addressed**

40. §365-7.6.B – Plan scale shall be 1”= 20’ or as appropriate (Also See Comment 2 & 35)

*BSC 11/20/23 Response: As noted above, BSC shall submit a waiver from 3.01B.2 to allow presentation of site plans at the submitted scale.*

**Waiver Request #1 - for Planning Board consideration (Also See Comment #2).**

**Additional Comments:**

41. All Site plans and reports must reference the correct Site address as “200 Haynes Street”.

Please contact me or Rob Lussier, EIT if you have any questions at (774) 241-0901.

Sincerely,  
CMG



David T. Faist, PE  
Principal Engineer



Robert Lussier, EIT  
Project Engineer II