Shutesbury Solar - Phased Erosion & Sediment Control and Stormwater Construction Plan Narrative

The following narrative breaks down the construction, temporary and permanent stormwater management, erosion & sediment controls, cut/fill quantities, and duration/timeline per construction phase and is a description of what will take place per each construction phase as shown on the included plans.

Construction Sequence:

Overall Project Items:

1. All sedimentation and erosion control measures shall be in accordance with the "Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide For Planners, Designers, and Municipal Officials", published by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, latest edition.
2. Filter fabric sock, silt fence, and stone check dams will be inspected, replaced and/or repaired as necessary immediately following any significant rainfall (1/2-inch or greater per 24-hour period) or snow melt or loss of serviceability due to sediment accumulation. At a minimum, all erosion control measures will be observed weekly.
3. During construction phases, intercepted sediment will be returned to construction site.
4. Sediment control devices shall remain in place and be maintained by the contractor until areas upslope are stabilized by a suitable growth of grass. Once a suitable growth of grass has been obtained, any sediment deposits remaining in place after they are removed shall be dressed to conform to the existing grade, prepared, seeded, and mulched immediately.
5. All disturbed areas within each phase will be seeded with 2.5 lbs. red fescue and 0.5 lbs. rye grass per 1,000 square feet and mulched at a rate of 90 lbs. per 1,000 square feet or equivalent application of seed and mulch.
6. Should bare earth be exposed, a suitable binder such as Curasol or Terratack will be used on the hay mulch for wind control.
7. If the rye seeding cannot be completed by October 1st or if the rye does not make adequate growth by December 1st, hay mulch will be applied at 150 lbs. per 1,000 square feet.
8. Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions. For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that may have been brought to final grade must be stabilized. Mulch may not be spread on top of snow. All vegetated ditch lines that have not be stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by the department. Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

9. Inspect and repair erosion control measures daily in areas of active construction; otherwise weekly and before and after a rainfall event of ½ inch or greater within a 24-hour period and prior to completing stabilization measures. Remove accumulated sediment when it reaches 1/3 of the height of the barrier.
10. Repair work should be initiated upon discovery of the problem but not later than the end of the next Monday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).
11. Keep a log (report) summarizing the inspection(s) and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observation about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.
12. The log must be made accessible to department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.
13. Monitor public roads for signs of tracking or spilling of spoil material and clean-up as necessary.
14. Maintain all temporary erosion controls and sediment barriers until vegetation has been established over 90% of the area to be vegetated. Reseed sparsely vegetated areas as necessary.
15. Remove and properly dispose of all temporary erosion and sedimentation control measures within 30 days after all construction phases are completed and when the site is permanently stabilized.
16. Contractor will be responsible for following procedures found in the “Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide For Planners, Designers, and Municipal Officials” and the “Massachusetts Stormwater Handbook”, latest editions.

Pre-Construction Phase:

1. Establish tree removal & workspace limits; identify and mark sensitive receptors including natural resources and down gradient drainage infrastructure.
2. Install erosion and sediment control measures and associated work for tree removal and perimeter controls. Installation of erosion and sediment control measures shall be performed in accordance with the “Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide For Planners, Designers, and Municipal Officials”, published by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, latest edition.
3. Install and stabilize the construction entrance. Maintain the stabilized construction entrance until all disturbed areas are stabilized.
4. Clean and grub only as necessary for the installation of perimeter controls and controls directly up slope from wetland and vernal pool buffers. Install and maintain all perimeter sediment barriers and sediment barriers directly upslope from wetlands and vernal pool buffers, such as

silt fencing, construction fencing, and/or other approved erosion control barriers as shown on the drawings. Install rock filters #3-5 as shown on the drawings. Sediment barrier location and size may be adjusted in the field based on actual size conditions as deemed necessary to ensure proper function. If compost sock is chosen in lieu of silt fence, contractor shall reference the filter fabric sock sizing instruction on the drawings.

5. Perform tree removal operations for the entire site. No clearing and grubbing to occur at this time.
6. Within 7 days of the cessation of tree clearing activities in an area that will not be worked for more than 7 days, stabilize any exposed soil with mulch or other non-erodible cover. Stabilize areas within 75 feet of a wetland or waterbody within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.
7. Install construction fencing around proposed basin #3.

Pre-Construction Phase Schedule:
Total time: 70 days
Item 1: 5 days – Survey
Items 2-4: 5 days – ESC/Silt Fence/Construction Entrance/Perimeter Control Clearing & Grubbing
Items 5-6: 60 days – Tree Removal
Item 7: 5 days – Basin #3 Fence

Phase 1A:

1. Check the construction entrance for proper installation and maintenance. Repair as needed. The stabilized construction entrance shall remain in place until all disturbed areas are stabilized. (All phases)
2. Prior to clearing and grubbing, check all perimeter sediment barriers for proper installation and maintenance.
3. Clear timber and brush remaining from tree removal activities. Grub the non-buffer areas within this phase. No clearing shall occur beyond the areas so noted on the site plan. All stumps and roots shall be removed. Depressions left from stump removal shall be backfilled with gravel or loam. All vegetative matter and debris shall be removed from site and properly disposed prior to PV array installation.
4. Install phase specific erosion and sediment controls where shown on plans and as necessary.
5. Strip topsoil for the access drive and associated grading. Stockpile topsoil in accordance with the detail provided on the plan.
6. Grade the proposed access drive and swales #1-5.
7. Install culverts #1-3 and associated rip rap aprons.
8. Install rock filters #1 and #2 to protect culverts #1 and #2.
9. Install gravel access drive and compacted earth drive.
10. Install basin #1 and #2 outfall structures.
11. Install temporary swales from culvert #1 and #2 outfall to basin #1 and #2 outfall structures.
12. Install erosion control blankets on all 3:1 slopes resulting from grading operations.
13. Stabilize any necessary equipment storage and laydown areas with matting, crushed stone, or gravel subbase as necessary to minimize rutting and avoid ponding of stormwater.

14. Install construction fencing around proposed basins #1 and #2 where shown.
15. Strip topsoil for Phase 1A mass grading operations. Stockpile topsoil in accordance with detail provided on the plan.
16. Perform mass grading for Phase 1A only.
17. Install level spreaders within Phase 1A only.
18. Install perimeter security fence (full site).
19. Grade equipment pad area and install infiltration trenches.
20. Stabilize all bare ground areas with temporary seed (at a minimum) in accordance with the seeding tables provided on the plan.

Phase 1A Schedule*:

Total Time: 30 days
Items 3-17, 20: 30 days – Clearing & Grubbing/Grading/Access Drives/Swales/Basin Structures/Laydown Areas/Level Spreaders/Soil Stabilization
Item 18: 10 days – Security Fence
Item 19: 10 days – Equipment Pad
* Items can be handled concurrently

Phase 1A Earthwork:

Permanent Cut: 5,525.9 cubic yards
Permanent Fill: 1,712.7 cubic yards
Permanent Total: 3,813.2 cubic yards (cut)
Temporary Cut: 231.07 cubic yards
Temporary Fill: 0.27 cubic yards
Temporary Total: 230.8 cubic yards (cut)
Overall Total: 4,044.0 cubic yards (cut)

Phase 2A:

1. Work for this phase cannot start until the prior phase is complete and stabilized.
2. Prior to clearing and grubbing, check all perimeter sediment barriers for proper installation and maintenance.
3. Clear timber and brush remaining from tree removal activities. Grub the non-buffer areas within this phase. No clearing shall occur beyond the areas so noted on the site plan. All stumps and roots shall be removed. Depressions left from stump removal shall be backfilled with gravel or loam. All vegetative matter and debris shall be removed from site and properly disposed prior to PV array installation.
4. Install phase specific erosion and sediment controls where shown on plans and as necessary.
5. Strip topsoil for Phase 2A mass grading operations. Stockpile topsoil in accordance with detail provided on the plan.
6. Perform mass grading for Phase 2A only.
7. Install level spreaders within Phase 2A only.
8. Stabilize all bare ground areas with temporary seed (at a minimum) in accordance with the seeding tables provided on the plan.

Phase 2A Schedule*:

Total Time: 20 days

Items 3-8: 20 days – Grubbing/Grading/Level Spreaders/Soil Stabilization

* Items can be handled concurrently

Phase 2A Earthwork:

Permanent Cut: 281.18 cubic yards

Permanent Fill: 5,918.55 cubic yards

Permanent Total: 5,637.37 cubic yards (fill)

Phase 3A:

1. Work for this phase cannot start until Phase 2A is complete and stabilized.
2. Prior to clearing and grubbing, check all perimeter sediment barriers for proper installation and maintenance.
3. Clear timber and brush remaining from tree removal activities. Grub the non-buffer areas within this phase. No clearing shall occur beyond the areas so noted on the site plan. All stumps and roots shall be removed. Depressions left from stump removal shall be backfilled with gravel or loam. All vegetative matter and debris shall be removed from site and properly disposed prior to PV array installation.
4. Install phase specific erosion and sediment controls where shown on plans and as necessary.
5. Strip topsoil for Phase 3A mass grading operations. Stockpile topsoil in accordance with detail provided on the plan.
6. Perform mass grading for Phase 3A only.
7. Stabilize all bare ground areas with temporary seed (at a minimum) in accordance with the seeding tables provided on the plan.

Phase 3A Schedule*:

Total Time: 10 days

Items 3-7: 10 days – Grubbing/Grading/Soil Stabilization

* Items can be handled concurrently

Phase 3A Earthwork:

Permanent Cut: 113.93 cubic yards

Permanent Fill: 20.79 cubic yards

Permanent Total: 93.14 cubic yards (cut)

Phase 4A:

1. Work for this phase cannot start until Phase 3A is complete and stabilized.

2. Prior to clearing and grubbing, check all perimeter sediment barriers for proper installation and maintenance.
3. Clear timber and brush remaining from tree removal activities. Grub the non-buffer areas within this phase. No clearing shall occur beyond the areas so noted on the site plan. All stumps and roots shall be removed. Depressions left from stump removal shall be backfilled with gravel or loam. All vegetative matter and debris shall be removed from site and properly disposed prior to PV array installation.
4. Install phase specific erosion and sediment controls where shown on plans and as necessary.
5. Strip topsoil for Phase 4A mass grading operations. Stockpile topsoil in accordance with detail provided on the plan.
6. Perform mass grading for Phase 4A only.
7. Install level spreaders within Phase 4A only.
8. Stabilize all bare ground areas with temporary seed (at a minimum) in accordance with the seeding tables provided on the plan.

Phase 4A Schedule*:

Total Time: 10 days

Items 3-8: 10 days – Grubbing/Grading/Level Spreaders/Soil Stabilization

* Items can be handled concurrently

Phase 4A Earthwork:

Permanent Cut: 17.7 cubic yards

Permanent Fill: 520.42 cubic yards

Permanent Total: 502.72 cubic yards (fill)

Phase 5A:

1. Work for this phase cannot start until Phase 4A is complete and stabilized.
2. Prior to clearing and grubbing, check all perimeter sediment barriers for proper installation and maintenance.
3. Clear timber and brush remaining from tree removal activities. Grub the non-buffer areas within this phase. No clearing shall occur beyond the areas so noted on the site plan. All stumps and roots shall be removed. Depressions left from stump removal shall be backfilled with gravel or loam. All vegetative matter and debris shall be removed from site and properly disposed prior to PV array installation.
4. Install phase specific erosion and sediment controls where shown on plans and as necessary.
5. Strip topsoil for Phase 5A mass grading operations. Stockpile topsoil in accordance with detail provided on the plan.
6. Perform mass grading for Phase 5A only.
7. Remove temporary swales for basins #1 and #2.
8. Construct basins #1 thru #3.
9. Install erosion control blankets on all 3:1 slopes resulting from grading operations.
10. Stabilize all bare ground areas with temporary seed (at a minimum) in accordance with the seeding tables provided on the plan.

Phase 5A Schedule*:

Total Time: 20 days

Items 3-10: 20 days – Grubbing/Grading/Basins/Soil Stabilization

* Items can be handled concurrently

Phase 5A Earthwork:

Permanent Cut: 3,403.51 cubic yards

Permanent Fill: 1,269.12 cubic yards

Permanent Total: 2,134.39 cubic yards (cut)

B phase work can start once Phase 1A & 2A are complete. All A phases do not need to be complete before the start of B phase but the A phase for that section will need to be complete.

Phase 1B:

1. Install array racking.
2. Install array modules.
3. Install underground conduit.
4. Install DC & AC wiring.*
5. Install MV wiring.
6. Install pad and pad equipment.
7. Install overhead poles and wiring to Point of Interconnection (POI).
8. Stabilize all areas with permanent seeding, if not performed under Phase 1A, in accordance with the seeding tables provided on the plan.

* AC wiring may be handed until all panel installation is complete (Phase 5B)

Phase 1B Schedule*:

Total Time: 20 days

Item 1: 5 days – Racking

Item 2: 5 days – Modules

Item 3: 5 days – Underground Conduit

Item 4: 5 days – DC & AC Wiring*

Item 5: 10 days – MV Wiring

Item 6: 20 days – Install Pad & Pad Equipment

Item 7: 10 days – Overhead Poles / POI Wiring

Item 8: 5 days – Soil Stabilization

* Items can be handled concurrently

Phase 2B:

1. Install array racking.
2. Install array modules.
3. Install underground conduit.

4. Install DC & AC wiring.*
5. Stabilize all areas with permanent seeding, if not performed under Phase 2A, in accordance with the seeding tables provided on the plan.

   * AC wiring may be handed until all panel installation is complete (Phase 5B)

   Phase 2B Schedule*:

   Total Time: 10 days
   Item 1: 5 days – Racking
   Item 2: 5 days – Modules
   Item 3: 5 days – Underground Conduit
   Item 4: 5 days – DC & AC Wiring
   Item 5: 5 days – Soil Stabilization
   * Items can be handled concurrently

Phase 3B:

1. Install array racking.
2. Install array modules.
3. Install underground conduit.
4. Install DC & AC wiring.*
5. Stabilize all areas with permanent seeding, if not performed under Phase 3A, in accordance with the seeding tables provided on the plan.

   * AC wiring may be handed until all panel installation is complete (Phase 5B)

   Phase 3B Schedule*:

   Total Time: 10 days
   Item 1: 5 days – Racking
   Item 2: 5 days – Modules
   Item 3: 5 days – Underground Conduit
   Item 4: 5 days – DC & AC Wiring
   Item 5: 5 days – Soil Stabilization
   * Items can be handled concurrently

Phase 4B:

1. Install array racking.
2. Install array modules.
3. Install underground conduit.
4. Install DC & AC wiring.*
5. Stabilize all areas with permanent seeding, if not performed under Phase 4A, in accordance with the seeding tables provided on the plan.

   * AC wiring may be handed until all panel installation is complete (Phase 5B)

Phase 4B Schedule*:

Total Time: 10 days
Item 1: 5 days – Racking
Item 2: 5 days – Modules
Item 3: 5 days – Underground Conduit
Item 4: 5 days – DC & AC Wiring
Item 5: 5 days – Soil Stabilization
* Items can be handled concurrently

Phase 5B:

1. Install array racking.
2. Install array modules.
3. Install underground conduit.
4. Install DC & AC wiring.
5. Finish all electrical connections & testing.
6. Stabilize all areas with permanent seeding, if not performed under Phase 5A, in accordance with the seeding tables provided on the plan.
7. Install vegetative screening (full site).

Phase 5B Schedule*:

Total Time: 15 days
Item 1: 5 days – Racking
Item 2: 5 days – Modules
Item 3: 5 days – Underground Conduit
Item 4: 10 days – DC & AC Wiring
Item 5: 10 days – Electrical Work Finalization
Item 6: 5 days – Soil Stabilization
Item 7: 5 days – Vegetative Screening
* Items can be handled concurrently