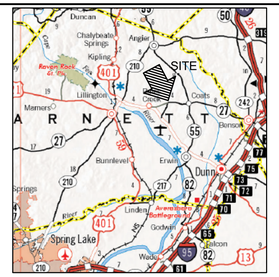


VICINITY MAP
NO SCALE

Construction Plans

Buies Creek Solar
Solar Power Generation Facility

1887 Leslie Campbell Road
Lillington, NC 27546

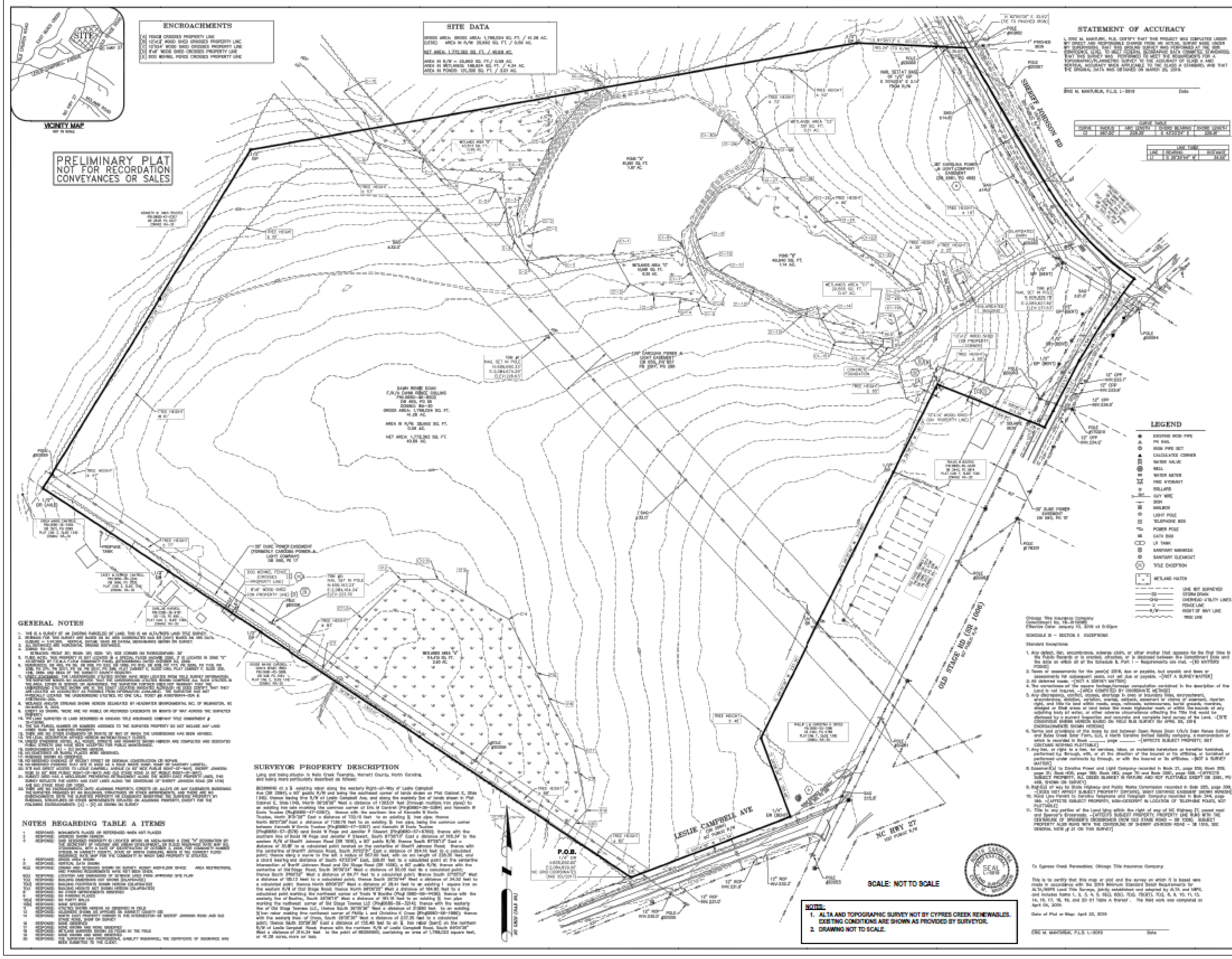
Pure Power Contractors, Inc.

2812 Gray Fox Road
Monroe, NC 28110
(704) 756-9276

CROWLEY
Professional Engineers

1233 Heritage Links Drive, Wake Forest, North Carolina 27587
(919) 625-6755
NC Firm # C-4468, TX Firm # 12613

SHEET	DESCRIPTION
C0	Cover
C1	Site Survey
C2	Existing Conditions Plan
C3	Demolition Plan
C4	Site Plan
C5	Erosion Control Plan
C6	Erosion Control Notes
C7	Fencing Plan
C8	Landscape Plan
C9	Design Notes
C10	Access Road Details
C11	Access Road Details
D1	Standard Details
D2	NCDEQ Specifications
D3	NCG01 Requirements
DW	Driveway Permit Exhibit



BALLENTINE ASSOCIATES, P.A.

BUIES CREEK
SOLAR FARM PARCEL
1887 LESLIE CAMPBELL AVE., LILLINGTON, NC
NEILLS CREEK TOWNSHIP, HARNETT COUNTY, NORTH CAROLINA
ALTA/NSPS LAND TITLE SURVEY

JOB #: 217017.08
DATE: 12 APR 19
SCALE: 1"=60'
DRAWN BY: E.M.M
REVIEWED BY: E.M.M

SHEET
1–1

CROWLEY
Professional Engineers
1233 Heritage Links Drive, Wake Forest, North Carolina 27587
(919) 625-6755
NC Firm # C-2151, TX Firm # 12613

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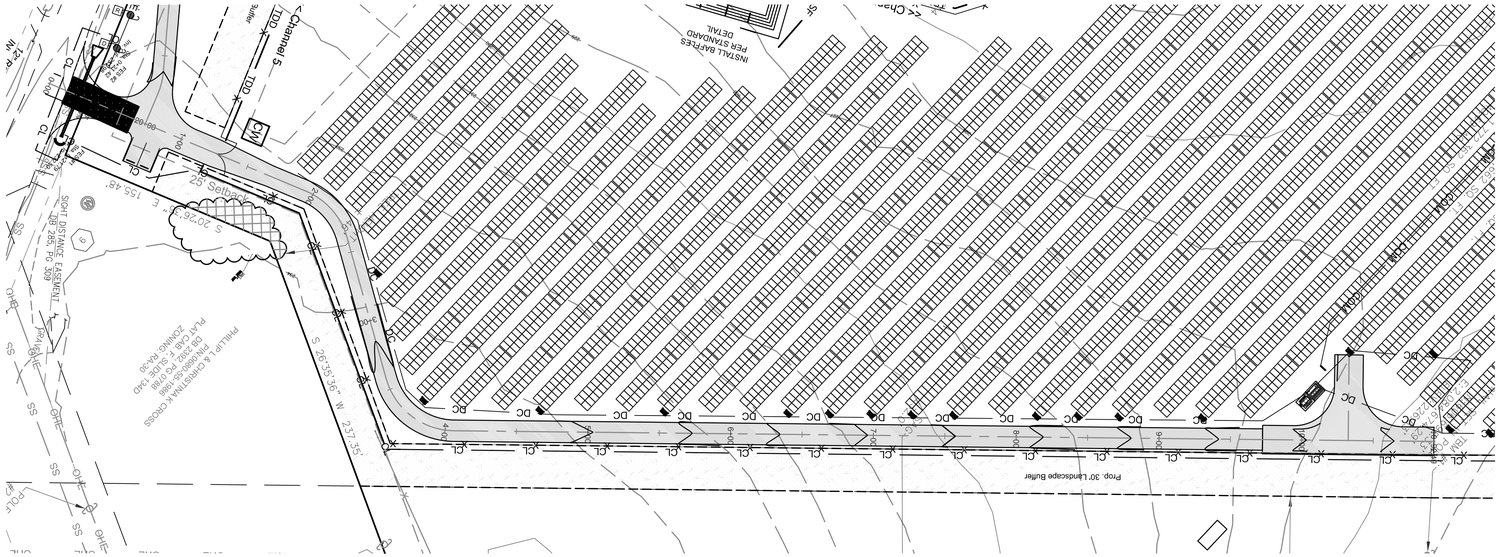
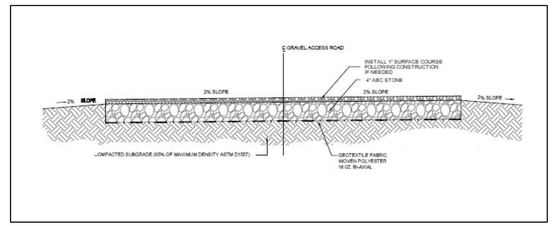
Site Survey
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

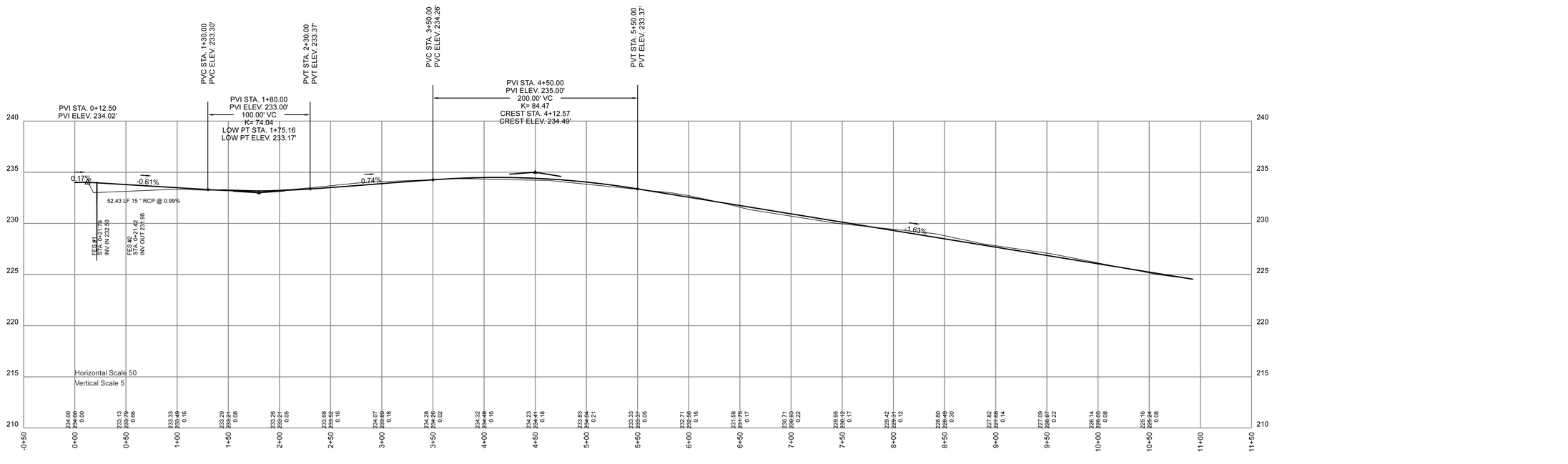
Job No. HS
Dwg No.
C1





ACCESS ROAD SECTION

NO SCALE



Horizontal Scale

50 0 25 50 100 200

Vertical Scale

5' 0' 3' 5' 10' 20'

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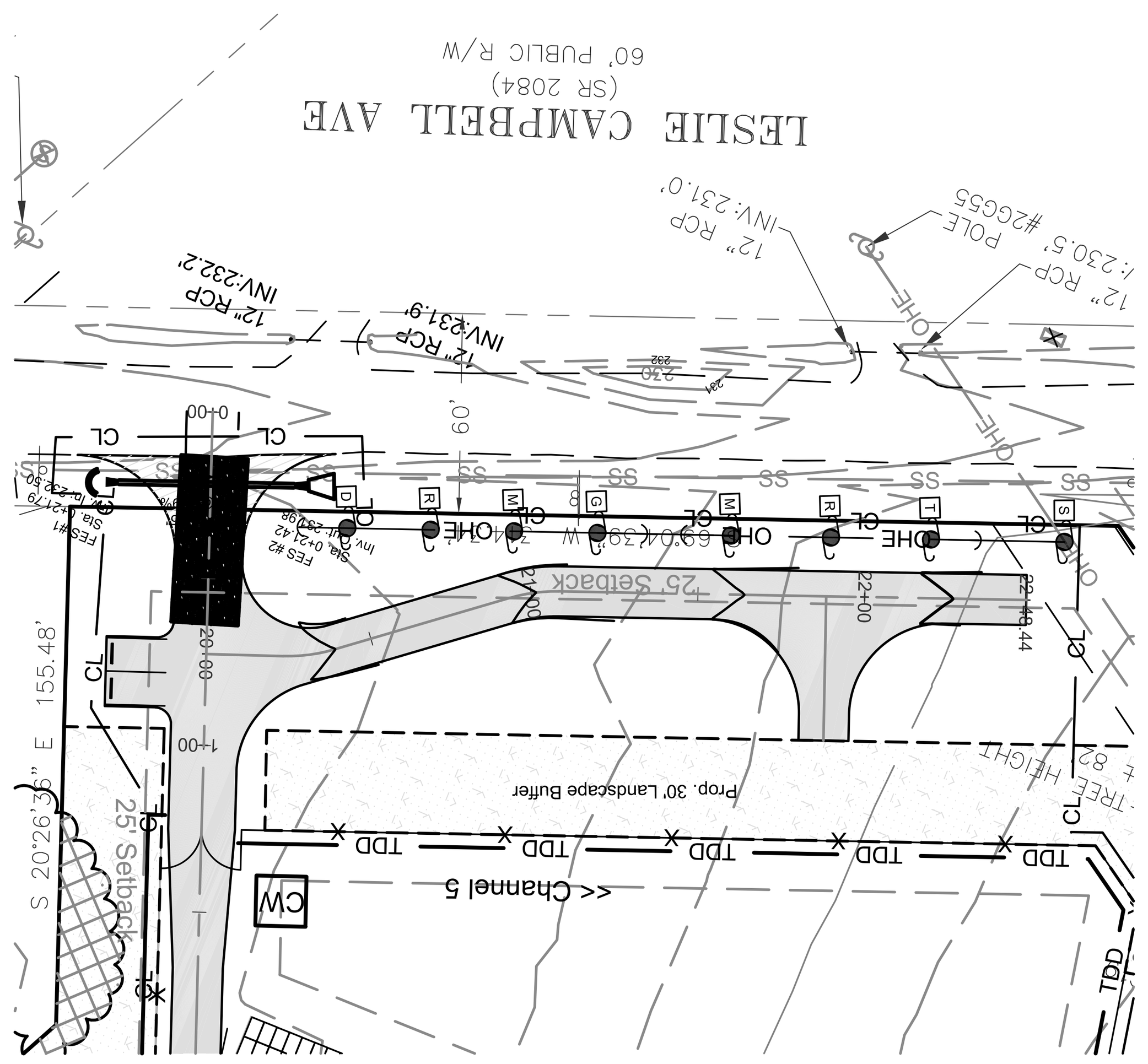
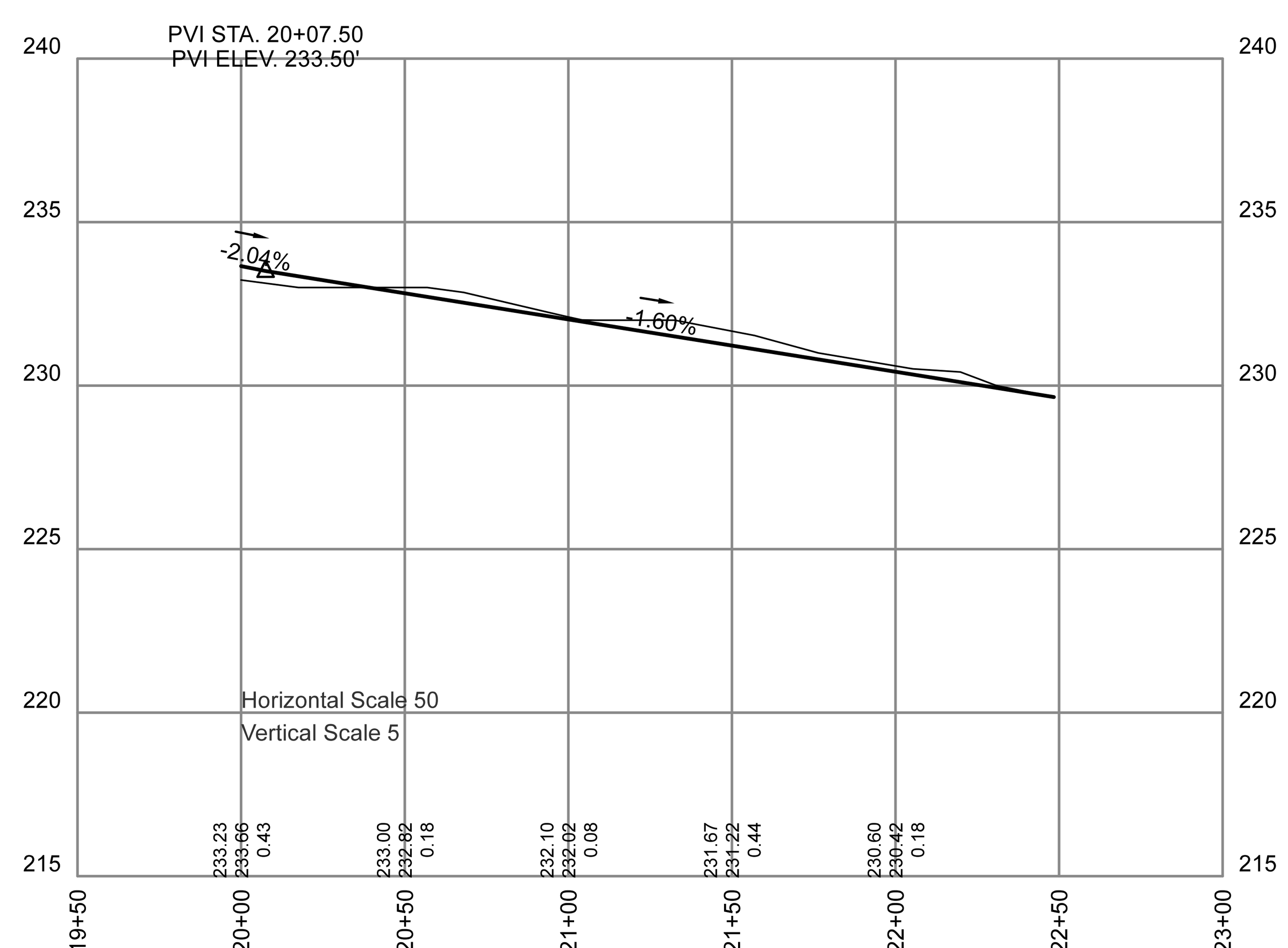
Access Road Details

Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C10



Storm Drainage Calculations																							
Structure		A	Length of	Height of	tc	Storm	C	Q	Q	Slope	n=	Calc.	Pipe	Vfull	Pipe	Invert In	Inv. Out	CB Top	Dissipator Pad				
From	To	Inlet Area	Watershed	Watershed	Time of Conc.	Intensity 10	For Inlet Area	Flow (Q=CIA)	Total Flow			Pipe Size	Size		Length	Elev.	Elev.	Elev.	Stone Size	Pad Thickness	Zone	Pad Width	Pad Length
		(ac)	(ft)	(ft)	(min)	(in/hr)		(cfs)	(cfs)	(ft/ft)		(in)	(in)	(ft\sec)	(ft)	(ft)	(ft)	(ft)	(in)	(in)		(ft)	(ft)
FES 1		0.25	250	4	5	7.20	0.50	0.9	0.9	0.0099	0.0120	7.0	15	49.1	52.43	232.50		NA					
	FES 2																231.98		2	4	2	2.5	7.5



Horizontal Scale

50 0 25 50 100 200

Vertical Scale

5' 0' 3' 5' 10' 20'

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7	Date	Comment	By
8	Date	Comment	By

NORTH CAROLINA PROFESSIONAL SEAL 20629 ENGINEER MICHAEL A. CROWLEY

Access Road Details

Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS

Dwg No. C11

Graphic Scale

60' 0' 30' 60' 120' 240'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20629 MICHAEL A. CROWLEY

CROWLEY Professional Engineers
1233 Heritage Links Drive, Wake Forest, North Carolina 27587
(919) 625-6755
NC Firm # C-2151, TX Firm # 12613

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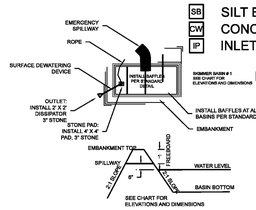
7	Date	Comment	By
8	Date	Comment	By

Existing Conditions
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C2

LINE AND SYMBOL LEGEND

SFO	SILT FENCE OUTLET
FES	OUTLET DISSIPATOR
INLET PROTECTION FES	
— CL — CL — CL — CL	CLEARING LIMITS
— SF — SF — SF — SF	SILT FENCE
— TDD - TDD - TDD - TDD	TEMPORARY DIVERSION
— X — X — X — X	PERIMETER FENCE
SB	SILT BAG
CW	CONCRETE WASH PIT
IP	INLET PROTECTION



SILT FENCE OUTLET SHALL BE PROVIDED DOWNSTREAM OF SKIMMER OUTLETS. AREA SHALL BE SEEDED AND JUTE MESH INSTALLED ON BASIN SLOPES UPON INSTALLATION.

AREA TO BE CLEARED AND GRUBBED
SEE EARTHWORK NOTES
12.56 AC.

EROSION CONTROL PLAN
CLEARING LIMITS

HATCHED AREA DENOTES
AREA TO BE CLEARED TO
REDUCE MODULE SHADING.
DO NOT GRUB, TREE REMOVAL
ONLY. 0.49AC.

HATCHED AREA DENOTES
AREA TO BE CLEARED TO
REDUCE MODULE SHADING.
DO NOT GRUB. TREE REMOVAL
ONLY. 0.02AC.

Graphic Scale
60' 0' 30' 60' 120' 240'

CROWLEY
Professional Engineers
1233 Heritage Links Drive, Wake Forest, North Carolina 27587
(919) 625-6755
NC Firm # C-2151, TX Firm # 12613

ENGINEERING SEAL NORTH CAROLINA 2018 CROWLEY Inc.

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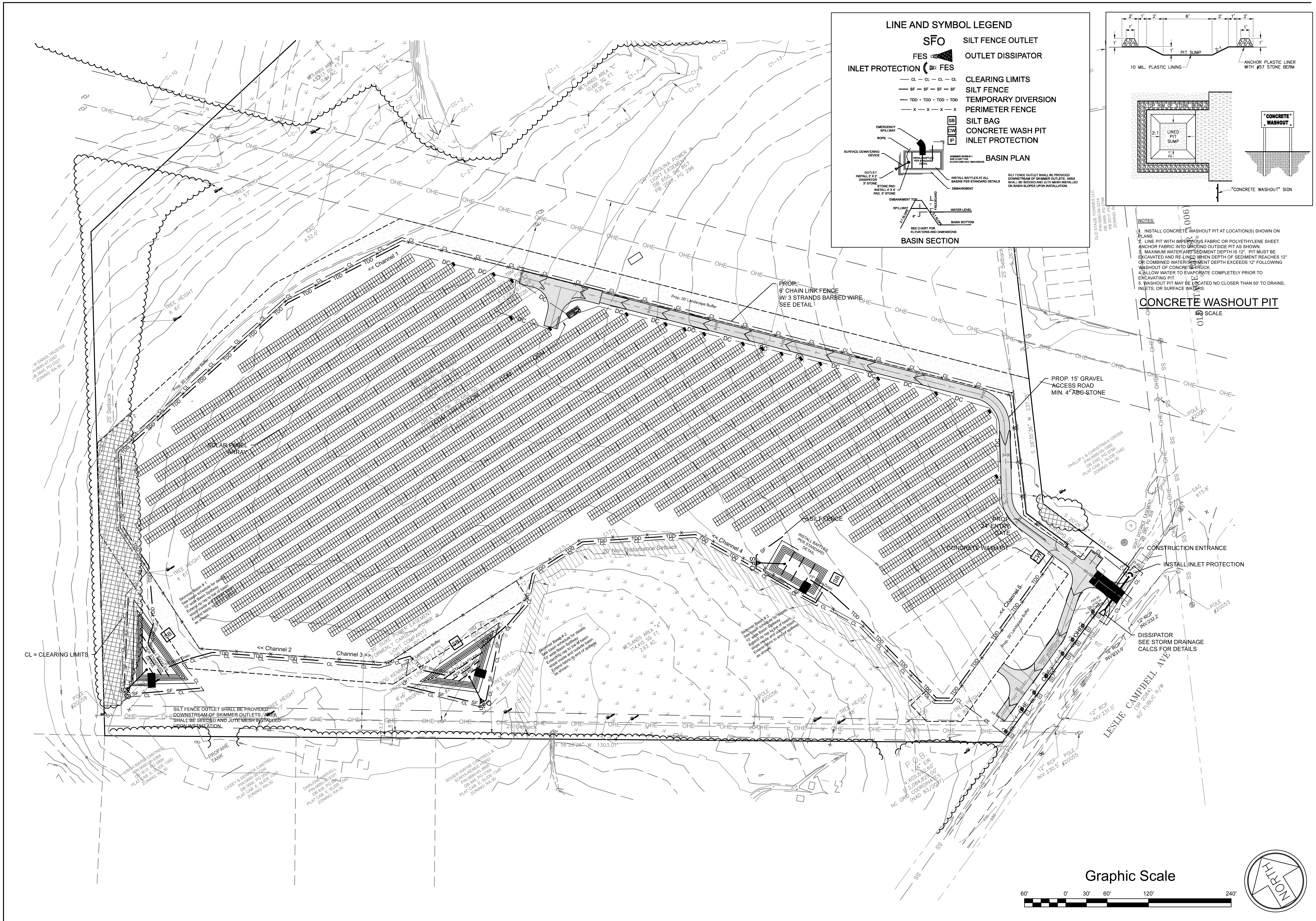
NORTH CAROLINA PROFESSIONAL SEAL 20629 ENGINEER MICHAEL A. CROWLEY

Demolition Plan
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C3



NOTES:

1. INSTALL CONCRETE WASHOUT PIT AT LOCATION(S) SHOWN ON PLANS.
2. LINE PIT WITH IMPERVIOUS FABRIC OR POLYETHYLENE SHEET. ANCHOR FABRIC INTO GROUND OUTSIDE PIT AS SHOWN.
3. MAXIMUM WATER AND SEDIMENT DEPTH IS 12". PIT MUST BE EXCAVATED AND RE-LINED WHEN DEPTH OF SEDIMENT REACHES 12" OR COMBINED WATER/SEDIMENT DEPTH EXCEEDS 12" FOLLOWING WASHOUT OF CONCRETE TRUCK.
4. ALLOW WATER TO EVAPORATE COMPLETELY PRIOR TO EXCAVATING PIT.
5. WASHOUT PIT MAY BE LOCATED NO CLOSER THAN 50' TO DRAINS, INLETS, OR SURFACE WATERS.

CONCRETE WASHOUT PIT

NO SCALE

CROWLEY
Professional Engineers
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20629 MICHAEL A. CROWLEY

Erosion Control Plan

Buies Creek Solar

Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C5

GENERAL SITE DEVELOPMENT AND EARTHWORK NOTES

CLEARING AND GRUBBING

1. Areas to be graded shall be cleared of vegetation.
2. Where grading and/or tree clearing is required, grubbing shall be performed to remove organic materials and roots greater than 1 inch to a minimum depth of 6-inches below grade, unless otherwise specified on the plans or by the project geotechnical engineer.
3. Where tree removal is required, stumps shall be removed or ground down to below grade.
4. Complete removal of stumps and soil compaction shall be performed as needed to install piles within specified tolerances.
5. In select locations to be identified by the Geotechnical Engineer, additional grubbing, undercutting, replacement of undercut material with suitable fill, and compaction may be required.
6. Following removal of trees, stumps, and following grubbing operations, site shall be graded smooth of all ruts to prevent ponding of water. Site may require compaction. Disturbed areas to be seeded within 7 days in accordance with erosion control permits.

DISPOSAL OF UNUSABLE SOILS

1. Generally, suitable excavated material shall be wasted on site.
2. Suitable material shall be graded and compacted to allow proper site drainage.
3. Excess excavated material in amounts exceeding what can be incorporated into the project without causing drainage issues or excessive grade changes, at the direction of the owner or engineer shall be removed from the site.
4. Excess excavated material shall be disposed of offsite at a suitably permitted (by State or local municipality) location unless otherwise approved by owner.

PROOF ROLLING

Following stripping and rough grading, exposed surfaces are to be proof rolled in the presence of the project geotechnical engineer to assess sub-grade suitability. Unsuitable areas shall be undercut and replaced with clean suitable fill.

EROSION CONTROL

1. Temporary erosion control devices shall be provided as shown on the approved, permitted plans for control of erosion and runoff during construction.
2. Additional erosion control measures may be necessary during construction. At the direction of the engineer, owner, or local permitting authority, additional measures shall be installed as needed or directed.
3. Permanent erosion control measures to control surface runoff including but not limited to riprap, temporary and permanent seeding, headwalls, or sod, shall be provided as indicated on the plans or as required by owner or local permitting authority.

EXISTING UNDERGROUND FACILITIES

1. Existing utilities and site features have been identified to the extent possible and are shown on the approved plans. Some items, including underground utilities, may not be shown on the plans but may be encountered during construction. Contractor shall be responsible for location and identification of all existing utilities and site features prior to construction and shall provide protection for all existing utilities and site features during construction. Engineer shall be notified of all existing utilities or site features encountered prior to construction so that any adjustments to the work may be completed.
2. Contractor shall close any existing wells in accordance with all State and local requirements.

EXCAVATION

1. Contractor shall be responsible for dewatering and shoring of excavations.
2. All excavations shall be completed and supported in such a manner as to prevent flooding or ponding of water and damage to or interference with other portions of the project or stored equipment/materials.
3. Excavation shall include removing and disposing of unsuitable materials as indicated above.
4. Unsuitable material shall be wasted on site or disposed of offsite in an appropriately permitted area, as indicated above.
5. Grading of cuts, fills, and drainage ditches shall be provided as required.
6. At the direction of the owner, engineer, or permitting authority, all excavations shall be closed at night. In no case shall excavations be left open overnight on public rights of way.

GRADING

1. It is the responsibility of the contractor to adhere to all permitting requirements including pre-construction notification, monitoring of rainfall, completion of self-inspection logs, etc. as required by the permitting authority.
2. Finish grading shall prevent pooling of water and promote positive surface drainage away from equipment and structures or as indicated on the plans.
3. Grading tolerances shall be in conformance with racking manufacturer's requirements.
4. Unless otherwise directed on the plans, post construction site drainage patterns shall essentially match pre-construction patterns.

FILL

1. Fill materials shall be clean suitable fill approved for use by project geotechnical engineer.
2. Areas to be backfilled shall be prepared by removing unsuitable materials.
3. The bottom of excavations shall be examined for loose or soft areas. Unsuitable materials shall be fully excavated and backfilled with compacted fill.
4. Areas below foundations shall be over excavated to the depth below the bottom of foundation as specified by the project geotechnical engineer and backfilled with clean fill material.
5. Areas below pavement shall be over excavated to the depth below the bottom of pavement specified by the project geotechnical engineer and backfilled with approved fill material.
6. Fill shall be placed in layers of uniform thickness of six (6) to eight (8) inches or as recommended by the project geotechnical engineer.
7. Fill material shall be monitored for optimum moisture content to achieve appropriate compaction, within -2 percent to +4 percent of optimum moisture content, or as directed by the project geotechnical engineer. Compaction shall be monitored by project geotechnical engineer.
8. Contractor is responsible for verifying acceptability of excavated soils for fill and for providing suitable fill material from other sources.

COMPACTION

1. Compaction of fill materials shall be carried out as soon as practicable after deposition of fill materials.
2. Fill shall be compacted to the densities appropriate for the design requirements, fill type, and depths of layers, and as directed by the project geotechnical engineer.
3. Structural fill supporting foundations, roads, and parking areas shall be compacted to a minimum of 95 percent of the modified proctor maximum dry density, in accordance with ASTM D1557.
4. Embankments, dikes, and backfill surrounding structures shall be compacted to a minimum of 95 percent of the modified proctor maximum dry density, in accordance with ASTM D1557.
5. General backfill shall be compacted to at least 85 percent u of the modified proctor maximum dry density, in accordance with ASTM D1557 unless otherwise directed by the project geotechnical engineer.

SITE RESTORATION

All disturbed areas shall be stabilized and re-vegetated as required as indicated on the project plans and in accordance with erosion control permits. Site stabilization timelines and seeding materials are specified on the approved project plans. It is highly recommended that the site be graded smooth, with seed and mulch applied immediately following driving of piles and prior to installation of panels.

TESTING AND INSPECTIONS

1. Testing and inspections shall be completed by the project geotechnical engineer. Field density tests shall be performed at the frequencies determined by the project geotechnical engineer or for guidance in accordance with the following:

Testing frequencies

Testing Area	Frequency / CY per Test
Structural Fill and Foundation Subgrades	250 (or 1600 ft2 of each lift, once per work shift, or one per foundation, whichever is more frequent)
Backfill Surrounding Structures	Same as above
Roads, Shoulders, and Parking Lots	650
General Backfill	1800 or as required by project geotechnical engineer

2. Areas not meeting compaction requirements shall be retested, excavated, recompacted, and retested at the discretion of the project geotechnical engineer.
3. Daily reports shall be compiled by the project geotechnical engineer and maintained on site.
4. Testing and inspections of structures shall be in accordance with state building codes and other licensing requirements.
5. Concrete test cylinders shall be taken at the minimum rate of one set per day, but not less than once for each 150 cubic yards for slabs, foundations, or walls.
6. Concrete test cylinder sets for paving shall be taken at the minimum rate of one set per day, but not less than once for each 150 cubic yards, nor less than once for every 5,000 square feet.
7. As a minimum, one set of cylinders shall be taken for each equipment foundation, with the exception that one set of cylinders may be made for each concrete truck load where multiple small foundations are poured from a single load.
8. Test procedures shall be in accordance with the appropriate ASTM standards.
9. Test reports shall be compiled by the project geotechnical engineer and maintained on site.

STABILIZATION TIMEFRAMES
(Effective Aug. 3, 2011)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

Sediment Basin Design

TRAP: For drainage areas < 1 acre; Min. volume = 3,600 cf per acre disturbed; Min. area = 435 sf per Q10 cfs; Weir Equation: L=Q/CH^3/2; L/W: 2:1

SKIMMER: For drainage areas < 10 acres; Min. volume = 1,800 cf per acre disturbed; Min. area = 325 sf per Q10 cfs; Weir Equation: L=Q/CH^3/2; L/W: 2:1 - 6:1

RISER: For drainage areas > 10 acres; Min. volume = 1,800 cf per acre disturbed; Min. area = 435 sf per Q10 cfs; Weir Equation: L=Q/CH^3/2; L/W: 2:1

Basin Number	Drainage Area	Disturbed Area	Runoff Coefficient	Rainfall Intensity	Flow Q_{10}	Basin Type Req'd	Basin Shape	Volume Req'd	Surface Area Req'd	Width at WL	Length at WL	L/W	Water Depth (2 ft min)	Basin Side Slope	Bottom Width	Bottom Length	Volume Provided	Surface Area Provided	Top of Embankment	Spillway Elevation	Water Level Elevation	Bottom Elevation	Basin Depth	Weir Length	Skimmer Drawdown	Skimmer Size	Orifice Diameter
	(ac)	(ac)		(in/hr)	(cfs)			(cf)	(sf)	(ft)	(ft)	(x:1)	(ft)	X:1	(ft)	(ft)	(cf)	(sf)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days)	(in)	(in)
1	4.6	4.6	0.3	7.22	9.96	SKIMMER	USER DEFINED	8280	3238	USER	USER	2	3	2	USER	USER	11787	4611	221	220.0	219.5	216.5	4.5	10	3	3	1.6
2	5.5	5.5	0.3	7.22	11.91	SKIMMER	USER DEFINED	9900	3872	USER	USER	2	3	2	USER	USER	10762	4357	222	221.0	220.5	217.5	4.5	11	3	3	1.6
3	2.8	2.8	0.3	7.22	6.06	SKIMMER	Redangular	5040	1971	32	64	2	3	2	20	52	4632	2048	227	226.0	225.5	222.5	4.5	10	3	3	1.0

Channel Design Calculations

Channel	Drain Area, ac	Channel Length, ft	Channel Drop, ft	C	I, in/hr	Flow Q, cfs	Channel Slope, ft/ft	n	Side Slope:1	Bottom Width, ft	Depth of Flow, ft	Velocity fps	Shear Stress PSF	Liner	Allowable Shear Stress PSF
1	2.3	796	2	0.3	7.22	5.0	0.0025	0.020	3.00	2.0	0.63	2.05	0.10	Jute Mesh	3
2	2.3	188	1	0.3	7.22	5.0	0.0053	0.020	3.00	2.0	0.52	2.69	0.17	Jute Mesh	3
3	2.5	145	1	0.3	7.22	5.4	0.0069	0.020	3.00	2.0	0.51	3.03	0.22	Jute Mesh	3
4	3	425	4	0.3	7.22	6.5	0.0094	0.020	3.00	2.0	0.51	3.56	0.30	Jute Mesh	3
5	2.8	491	6	0.3	7.22	6.1	0.0122	0.020	3.00	2.0	0.47	3.84	0.35	Jute Mesh	3

CROWLEY Professional Engineers
1233 Heritage Links Drive, Wake Forest, North Carolina 27587
(919) 625-6755
NC Firm # C-2151 ; TX Firm # 12613

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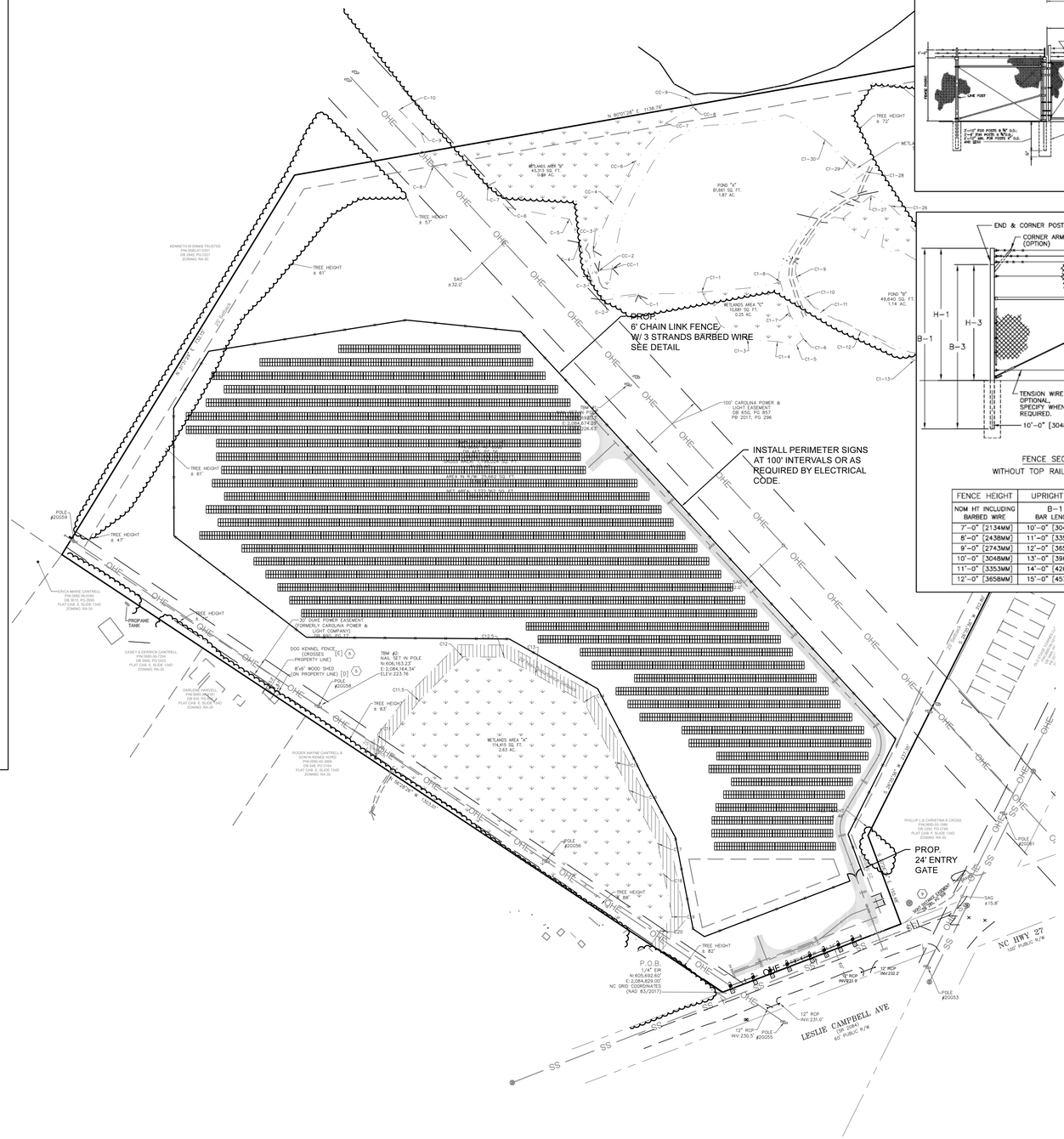
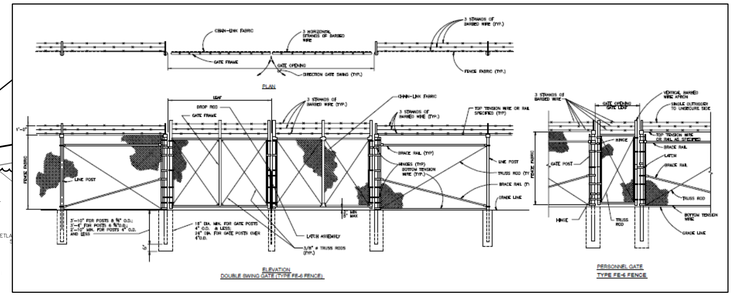
Erosion Control Notes
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

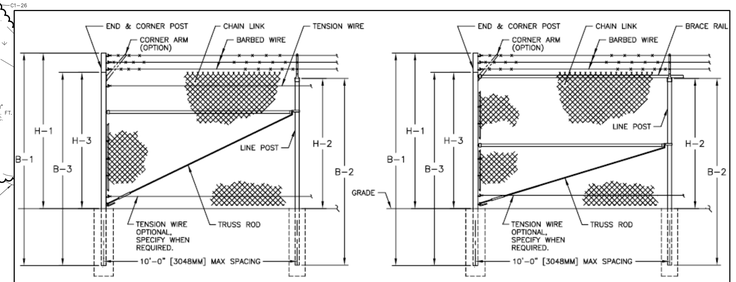
Job No. HS
Dwg No. C6

PERIMETER FENCE SIGNAGE REQUIREMENTS

1. Signage shall meet local regulations and code requirements plus provide adequate safety and property protection information. Owner signage shall be provided at all gate entrances.
2. Signage shall meet requirements of the permitted version of all applicable NEC, OSHA, NESC, ANSI, and local regulations. Signage shall be per code requirements and provide adequate safety and property protection information.
3. The physical size of the sign, size of lettering, colors, symbols, materials and distance between signs shall meet the requirements of:
   a. OSHA 1926
   b. OSHA 1910.303
   c. OSHA 1910.335
   d. NESC
   e. ANSI Z535.1
   f. ANSI Z535.2
   g. ANSI Z535.3
   h. ANSI Z535.4
4. Signs and mounting methods shall be designed for permanent outdoor placement and shall be weather resistant. At a minimum, fence signage shall be at least 10 inches wide by 7 inches high and placed at eye level when on fencing. Spacing between signs shall meet the OSHA, NESC, and ANSI requirements stated above. Signs shall include a safety symbol and a word message "No Trespassing / High Voltage / Warning" posted on the fence. Signage shall also indicate that trespassers will be prosecuted and cite applicable ordinance/ laws and penalties that will be imposed on violators. Text shall read in English.







FENCE SECTION ELEVATION
WITHOUT TOP RAIL & WITH BARBED WIRE

FENCE SECTION ELEVATION
WITH TOP RAIL & WITH BARBED WIRE

FENCE HEIGHT	UPRIGHT END & CORNER POSTS		LINE POSTS		CORNER POSTS WITH CORNER ARM	
NOM HT INCLUDING BARBED WIRE	B-1 BAR LENGTH	H-1 HEIGHT ABOVE GRADE	B-2 BAR LENGTH	H-2 HEIGHT ABOVE GRADE	B-3 BAR LENGTH	H-3 HEIGHT ABOVE GRADE
7'-0" [2134MM]	10'-0" [3048MM]	7'-0 5/8" [2150MM]	8'-8" [2642MM]	5'-8 7/8" [1749MM]	9'-0" [2743MM]	6'-0 5/8" [1845MM]
8'-0" [2438MM]	11'-0" [3353MM]	8'-0 5/8" [2454MM]	9'-8" [2946MM]	6'-8 7/8" [2054MM]	10'-0" [3048MM]	7'-0 5/8" [2150MM]
9'-0" [2743MM]	12'-0" [3658MM]	9'-0 5/8" [2759MM]	10'-8" [3251MM]	7'-8 7/8" [2359MM]	11'-0" [3353MM]	8'-0 5/8" [2454MM]
10'-0" [3048MM]	13'-0" [3962MM]	10'-0 5/8" [3064MM]	11'-8" [3556MM]	8'-8 7/8" [2664MM]	12'-0" [3658MM]	9'-0 5/8" [2759MM]
11'-0" [3353MM]	14'-0" [4267MM]	11'-0 5/8" [3369MM]	12'-8" [3861MM]	9'-8 7/8" [2969MM]	13'-0" [3962MM]	10'-0 5/8" [3064MM]
12'-0" [3658MM]	15'-0" [4572MM]	12'-0 5/8" [3674MM]	13'-8" [4166MM]	10'-8 7/8" [3273MM]	14'-0" [4267MM]	11'-0 5/8" [3369MM]

GENERAL SITE FENCING NOTES

1. The site property lines shall be identified with appropriate signage and fence.
2. Contractor shall install security fencing along the perimeter of the site.
3. All gates shall have tamper proof gate hinges and hardware.
4. Gates along site perimeter shall have heavy duty bolt cutter resistant padlocks.
5. Chain link fence member sizes and materials shall conform to ASTM 1043F Class 1C, with minimum 1.2 oz. galvanized coating, and increased where site is exposed to corrosive conditions.
6. Fence design shall comply with the specifications of NEC 110.31 "Enclosure for Electrical Installations", latest revision and as specified by the project electrical engineer. See electrical plans for details.
7. All fence posts, fencing fabric, bracing, wire, and hardware to be galvanized.
8. Fencing structures must be electrically grounded as required for overhead crossings or other electrical hazards in accordance with the requirements of the NEC and project electrical engineer. See electrical plans for details.
9. Fence fabric to be 2 3/8" diamond, 9-gauge chain link.
10. Thickness of coated fence fabric wire must be 0.1875" minimum.
11. Fence to include top and bottom 9-gauge coil tension wire.
12. Unless otherwise specified by the local municipality, owner, or approved conditional or special use permit, height of fence shall be 6' with three strands of barbed wire totaling a minimum combined height of 7'.
13. Fence post diameter shall be 4" for gates and corners, 2.5" for terminal posts, and 2" for line posts. Posts shall be minimum schedule 40.
14. Terminal and gate posts shall be 10' length.
15. Corner and gate posts shall be encased in concrete as recommended by manufacturer, client, geotechnical engineer, or structural engineer. Line post foundations shall be as determined by a qualified structural engineer to support loads.
16. Vehicle gates shall be 24' width unless otherwise specified by client, or as shown on approved special or conditional use permit. Personnel gate openings to be no less than 3'.
17. All vehicle gates to be double swing lockable gates with center post. Center post shall lower into galvanized pipe sleeve installed in concrete between the two swinging gates.
18. Top rail shall utilize sharp anti-climb spikes such as barbed wires or equivalent, as specified by client or as permitted by local municipality.
19. Fence shall include slats or other visual barrier where required by approved special or conditional use permit and shall be designed to withstand appropriate wind load for installation location.

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CROWLEY Professional Engineers
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NC Firm # C-2151, TX Firm # 12613

NO	DATE	REVISION DESCRIPTION	BY
1	03/17/2020	50% Review, AFP Plans	MAC
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7	Date	Comment	By
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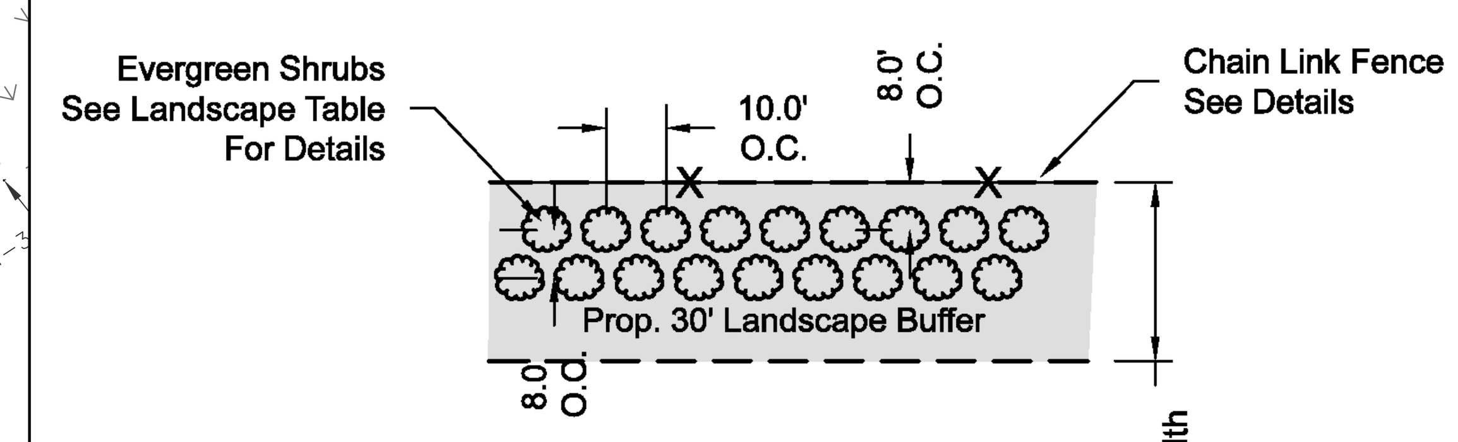
NORTH CAROLINA PROFESSIONAL SEAL 20629 ENGINEER MICHAEL A. CROWLEY

Fencing Plan
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

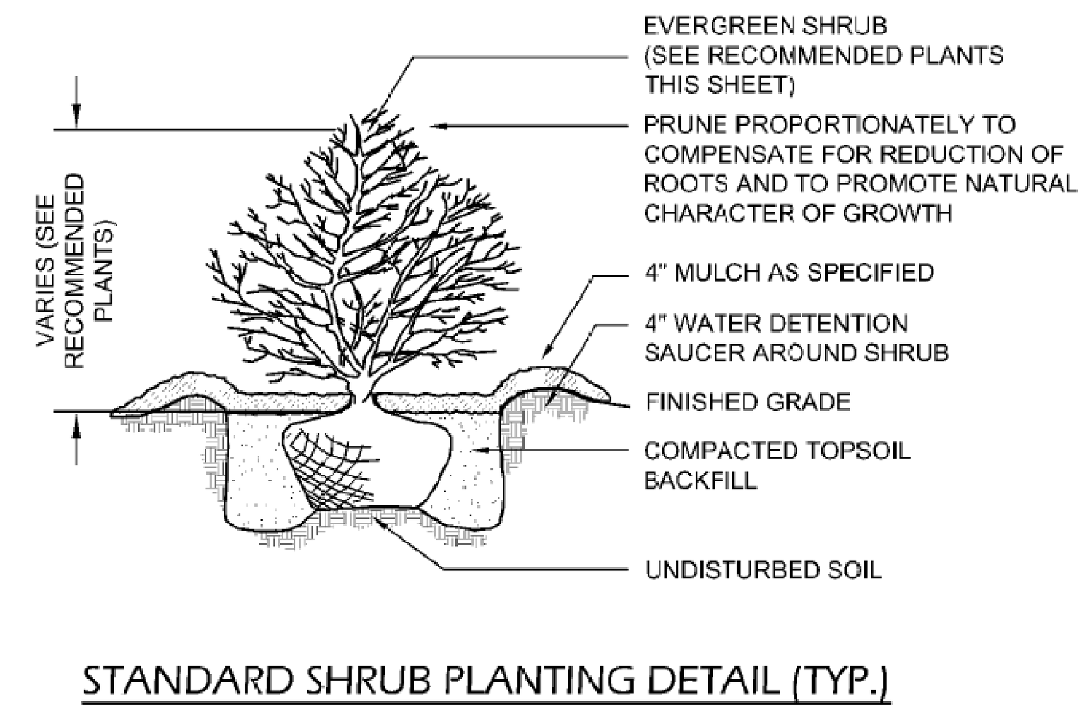
Job No. HS
Dwg No. C7

LANDSCAPE PLANT LIST								
Key	Quantity	Botanical Name	Common Name	Remarks	Height	Spread	Root	Caliper
Shrubs								
Area 1								
WM	62	Myrica Cerifera	Wax Myrtle		18"		3 gal	
Area 2								
WM	518	Myrica Cerifera	Wax Myrtle		18"		3 gal	

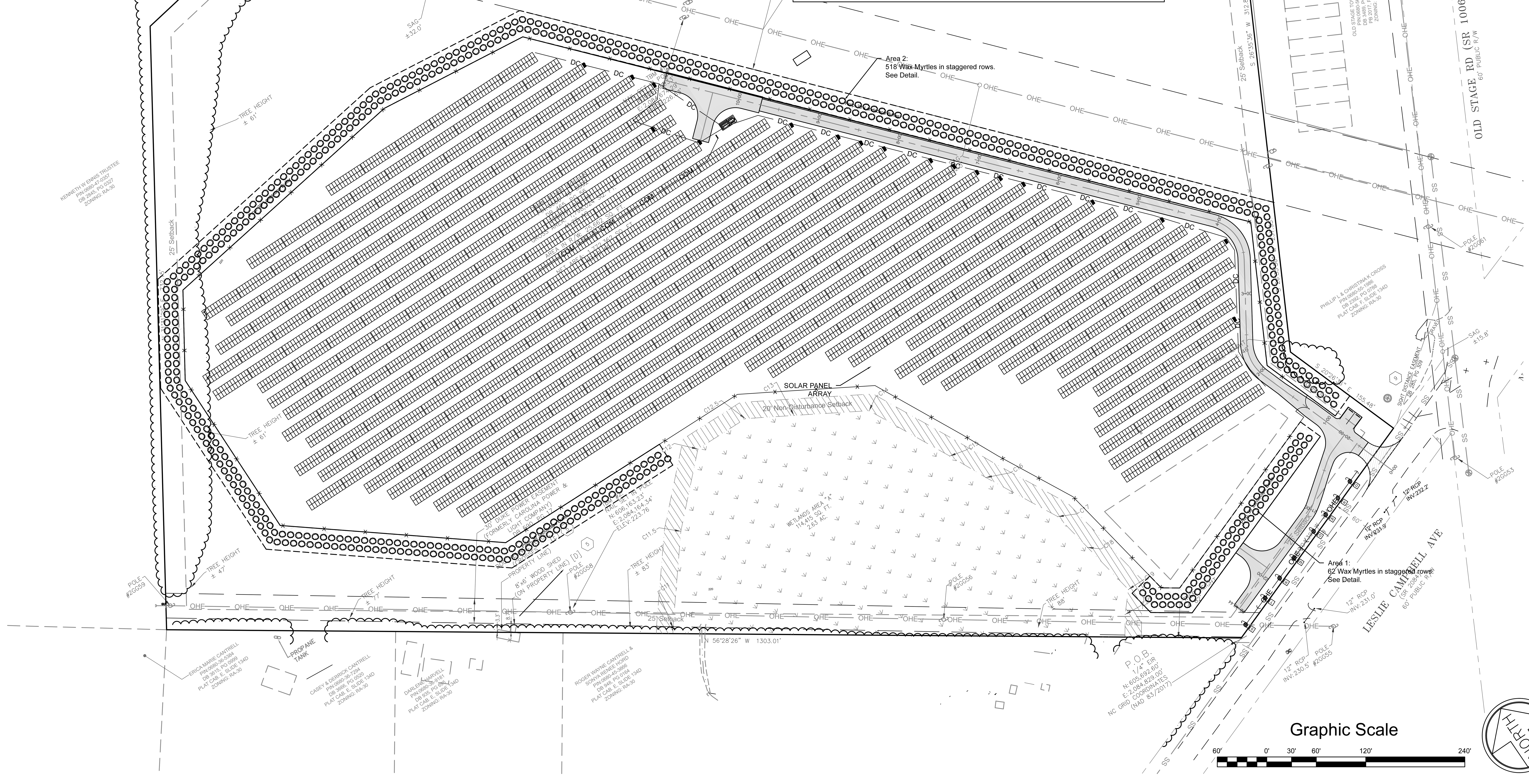


Landscape Buffer Notes:
1. Buffer to be 30' wide from perimeter fence.
2. Buffer plantings shall be 2 staggered rows of evergreen shrubs capable of growing to a height of 6' in three years.

NOTES:
1) ALL SHRUB BEDS SHALL BE RAISED 6" - 8" ABOVE ADJACENT GRADE, AND TILLED WITH SOIL CONDITIONER
2) ALL SHRUB BEDS IN PARKING ISLANDS ONLY SHALL BE RAISED 12" ABOVE ADJACENT GRADE AND TILLED WITH SOIL CONDITIONER



STANDARD SHRUB PLANTING DETAIL (TYP.)
(NOT TO SCALE)



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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20629 MICHAEL A. CROWLEY

Landscape Plan
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C8

Construction Sequence

1. Obtain land disturbance permit and schedule a preconstruction meeting with erosion control inspector. A 48-hour notice is required for scheduling preconstruction meeting.
2. Install construction entrance and remainder of erosion control devices. Upon completion of installation, seed, mulch, and anchor erosion and sedimentation control measures.
3. Temporary Diverssion to be stabilized within 7 days. Shhe NCG01 stabilization requirements. Diversions requiring matting or armoring as shown on channel caclulations shall be lined or armored within 7 days.
4. Begin site construction. Generally spoil material shall be placed on upslope side of all excavations, and excavations shall be backfilled in the same day.
5. Disturbed areas shall be stabilized as construction is completed or brought up to finished grade. Disturbed areas shall be stabilized with vegetation, stone base course, concrete, etc. See detail sheet for seeding schedule.
6. Once site vegetation has been established, remove silt fence, temporary basins and any remaining erosion control measures.
7. All disturbed areas to be stabilized and groundcover should be achieved within 7 or 14 working days following completion or in accordance with NCG01 stabilization requirements and/or per NPDES construction storm water general permit NCG010000.

Erosion Control Notes

1. All land disturbing activities shall be conducted in accordance with NCDENR or (local permitting authority) erosion control standards.
2. All temporary erosion control measures shall be maintained in proper working condition throughout the construction period.
3. Additional erosion control measures and/or modifications to proposed measures may be necessary depending on actual site conditions.
4. See detail sheets for erosion control device construction details.
5. All slopes on temporary sediment basins shall be seeded and covered with jute mesh.

Notification of Combined Self-Monitoring and Self-Inspection Form:

The sedimentation pollution control act was amended in 2006 to require that persons responsible for land-disturbing activities inspect a project after each phase of the project to make sure that the approved erosion and sedimentation control plan is being followed. Rules detailing the documentation of these inspections took effect October 1, 2010.

To simplify documentation of self-inspection reports and NPDES self-monitoring reports, DWQ and DENR developed a combined form. The self-inspection program is separate from the weekly self-monitoring program of the NPDES storm water permit for construction activities. The focus of the self-inspection report is the installation and maintenance of erosion and sedimentation control measures according to the approved plan. The inspections should be conducted after each phase of the project, and continued until permanent ground cover is established. The form can be accessed at:
http://portal.ncdenr.org/web/lr/erosion

Erosion & sedimentation control measures shall be inspected to ensure that they are operating correctly. Self-inspection records must be maintained for each inspection event and for each measure. At a minimum, inspection of measures must occur every 7 calendar days and within 24 hours after any storm event > 0.5in rain/24hr. Records of inspections for previous 30 days shall remain on site and available for agency inspectors during normal work hours. *Ref: section ii.b.3 of the NPDES permit*

Site Specific Construction Sequence

1. Obtain land disturbance permit and schedule a preconstruction meeting with erosion control inspector.
2. Install construction entrance.
3. Install all silt fence.
4. Install basins per schedule. Stabilize all side slopes within 7 days. Install basins, stone pad, outlet dissipator, and silt fence outlets as shown on plan. Install baffles and spillway. Install spillway on undisturbed earth where possible.
5. Install diversion ditches per channel schedule. Stabilize side slopes within 7 days. Install entrance dissipatr into basins as shown on plan.
6. Begin clearing. Stockpile debris within limits of disturbance. Burn or grind cleared debris as permitted.
7. Begin construction. Note additional measures may be necessary as construction progresses or at direction of Engineer, Inspector, or as site conditions dictate.
8. Adjust location of diversions as necessary during construction to maintain flow around constructed facilities.
9. Maintain all devices as shown on maintenance schedule.
10. It is recommended that site be seeded following installation of piles.
11. All disturbed areas to be stabilized and groundcover should be achieved within 7 or 14 working days following completion or in accordance with NCG01 stabilization requirements and/or per NPDES construction storm water general permit NCG010000.
12. Erosion control devices to be removed following inspection of construction area and verification of site stabilization.
13. When site is stabilized, grade, seed, and mulch temporary diversions. Leave silt fence in place.
14. When diversion areas are stabilized, remove skimmer, and spillway. Remove sediment from basin and spread in area away from discharge points, preferebly in the center of the site. Immediately seed and mulch. Leave silt fence around basins in place.
15. When areas upstream of basins are stable, remove basins, immediately seed and mulch. Leave silt fence in place.
16. When basin areas are stable, remove remaining silt fence on site, construction entrance, and concrete wash pit. Seed and mulch all bare areas.
17. Note that permanaent fencing, where conflicts with erosion control devices may occur, may not be installed until site is stabilized and devices are removed.
18. It is not anticipated that borrow material is required for construction of this site. However, if borrow material is required, it may only be sourced from a legally operated mine or other approved source. Any soil waste that leaves the site may be transported only to a legally operated mine or separately permitted construction site. Disposal at any other site will need a revision to the permit for thsi facility.
19. Development of this plan will not impact any wetlands, streams, buffers, or protected areas. Therefore no USACE 404 or DWR 401 permits are required.

Seedbed Preparation

1. Chisel compacted areas and spread topsoil three inches deep over adverse soil conditions, if available.
2. Rip the entire area to six inches deep.
3. Remove all loose rock, roots, and other obstructions leaving surface reasonably smooth and uniform.
4. Apply agricultural lime, fertilizer and superphosphate uniformly and mix with soil (see mixture).
5. Continue tillage until a well-pulverized, firm reasonably uniform seedbed is prepared four to six inches deep.
6. Seed on a freshly prepared seedbed and cover seed lightly with seeding equipment or cultipack after seeding.
7. Mulch immediately after seeding and anchor mulch.
8. Inspect all seeded areas and make necessary repairs or reseedings within the planting season, if possible. If stand should be over 60% damaged, re-establish following the original lime, fertilizer and seeding rates.

Temporary Seeding
Late Winter - Early Spring

Seeding mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding dates
Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Permanent Seeding Recommendations -- Coastal Plain Region

Common Name	Scientific Name	Cultivars	Type*	Percentage of Mix	Optimal Planting Dates	Soil Drainage Adaptation	Shade Tolerance	Height
Switchgrass	Panicum virgatum	**Blackwell** -- well drained **Shelter** -- well drained **Kanlow** -- poorly drained **Carthage** -- well drained	Warm Season	10-15%	Dec. 1 - Apr. 1	Cultivar Dependent	Poor	6
Switchgrass	Panicum virgatum	**Alamo** -- poorly-drained	Warm Season	10-15%	Dec. 1 - May 1	Cultivar Dependent	Poor	6
Indiangrass*	Sorghastrum nutans*	**Rumsey, Osage, Cheyenne**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	6
Indiangrass*	Sorghastrum nutans*	**Lometa**	Warm Season	10-30%	Dec. 1 - May 1	Well-drained to Droughty	Poor	6
Big Bluestem	Andropogon gerardii	**Earl**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	6
Little Bluestem	Schizachyrium scoparium	**Cimarron**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	4
Sweet Woodreed	Cinna arundinacea		Warm Season	1-10%	Dec. 1 - Apr. 1	Poorly-drained to Well-drained	Moderate	5
Rice Cutgrass	Leersia oryzoides		Warm Season	5-25%	Dec. 1 - Apr. 1	Poorly-drained	Poor	5
Redtop Panicgrass	Panicum rigidulum		Warm Season	10-20%	Dec. 1 - Apr. 1	Well-drained	Poor	3.5
Beaked Panicgrass	Panicum anceps		Warm Season	10-20%	Dec. 1 - Apr. 1	Poorly-drained	Moderate	3.5
Eastern Gammagrass	Tripsacum datyoides		Warm Season	5-10%	Dec. 1 - Apr. 1	Well-drained to Poorly-drained	Poor	4.5
Purple top	Tridens flavus		Warm Season	5-10%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	2.5
Indian Woodoats	Chasmanthium latifolium		Cold Season	1-10%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Well-drained to Droughty	Moderate	4
Virginia Wildrye	Elymus virginicus		Cold Season	5-25%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Well-drained to Droughty	Moderate	3
Rough Bentgrass	Agrostis scabra		Cold Season	10-20%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Poorly-drained	Poor	2.5
Soft Rush	Juncus effusus		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	4
Shallow Sedge	Carex lurida		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	3
Fox Sedge	Carex vulpinoidea		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	3
Leathery Rush	Juncus coriaceus		Wetland	2-5%	Dec. 1 - Apr. 15	Poorly-drained	Poor	2

* Only Lometa in eastern coastal plain (Plant Hardiness Zone 8).
* Pick at least four species, including one from each type.

GENERAL FOUNDATION NOTES

1. Foundations for equipment and structures shall comply with the following:
   A. All conc rete foundations and reinforcing steel shall be designed in accordance with applicable ACI and ASTM standards.
   B. All concrete foundations for owner-supplied equipment shall meet owner's requirements and specifications as applicable.
   C. All foundations shall be designed and built specifically to accommodate the equipment to be mounted on the foundation, based on design loads, dimensions, weight distribution, height, seismic zone, and manufacturer's specifications.
2. A structural analysis of all foundations shall be provided, with appropriate Professional Engineers seal, demonstrating that the design conforms to applicable standards and codes.
3. Contractor shall take enough borings to determine the existing subsurface conditions, per guidance provided below. The table of explorations are provided as guidelines and may be subject to site specific conditions; varying types of soils across the same parcel of land may require specific studies of each soil type.
4. Foundations and supports shall be designed to withstand 100-year storm conditions and associated scour and/ or frost heave, as applicable.
5. Minimum strength of concrete shall confom1 to the requirements shown in Table 4-2.
6. Reinforcing steel shall be ASTM A615/A 615M Grade 60 (420) deformed billet-steel bar, unfinished.
7. Steel welded wire reinforcement shall be ASTM A185/A185M, plain type, flat sheets with 6x6 minimum mesh size and W5xW5 minimum wire gauge, unless otherwise specified by owner or structural engineer.
8. Tie wire shall be annealed, minimum 18 gauge.
9. Mechanical couplers shall be capable of developing 160 percent of the specified yield strength of the bar and shall develop a minimum of 10 times the yield point of the connected reinforcing bars.
10. All oil-filled step-up transformer and medium voltage pad-mount transformer foundations:
    A. Shall be reinforced concrete and shall have an integral spill containment area per IEEE 980.
    B. The spill containment requirement may be waived by owner if using vegetable oil-based fluid such as Cargill Envirotemp FR3, as allowable by local municipality
    C. Containment area shall contain a sump for removal of liquids by portable pump.
    D. A Spill Prevention, Control, and Countermeasures Plan shall be provided where greater than 1,320 gallons of oil are contained on site, regardless of type.
    E. Ground wires shall be embedded in foundations and stubbed at their final location to prevent tripping hazard.
11. Reinforced concrete structures shall be designed and constructed in accordance with ACI 318, Building Code Requirements for Reinforced Concrete.
12. Concrete work shall conform to the requirements of ACI 301, Specifications for Structural Concrete.
13. Concrete production, proportioning, placing, formwork, reinforcing, joints and embedded items, repair, curing, and protection shall all be in accordance with applicable ACI standards and specifications.
14. Testing and frequency of testing shall be provided in accordance with the requirements of ACI and applicable ASTM standards.
15. Minimum concrete strength for various structures shall be as below:

Item	28-day strength, psi
Sub-grade leveling slab	2,000
Electrical duct bank encasement	2,000
Electrical flowable fill	500
Paving concrete	4,000
Foundations and structural concrete	3,000

Reinforcing bars shall be deformed bars conforming to ASTM A615, Grade 60.
Welded wire fabric shall conform to ASTM A185.
Cement shall be Portland cement conforming to ASTM C150, as required by soil conditions.

FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND

D103.2 Grade.

Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the fire chief.

D103.3 Turning radius.

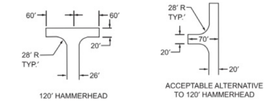
The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends.

Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
Over 750	Special approval required	



120' HAMMERHEAD — ACCEPTABLE ALTERNATIVE TO 120' HAMMERHEAD

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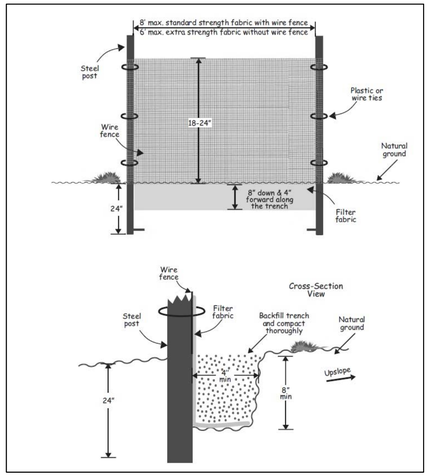
NORTH CAROLINA PROFESSIONAL SEAL 20629 ENGINEER MICHAEL A. CROWLEY

Design Notes
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. C9



SILT FENCE

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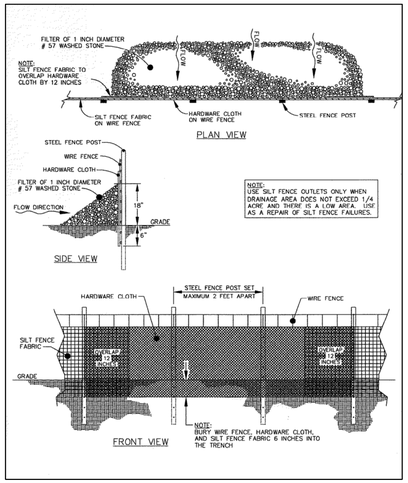

SILT FENCE OUTLET

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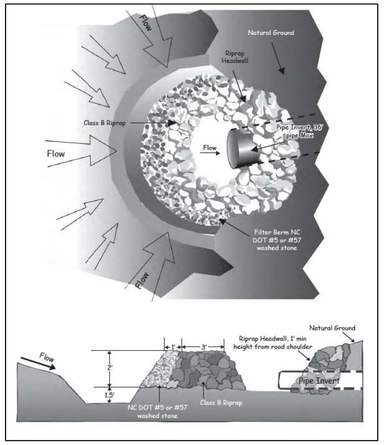

ROCK INLET PROTECTION

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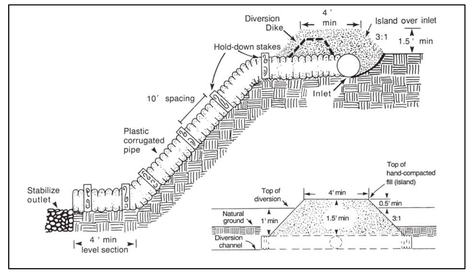

SLOPE DRAIN DETAIL

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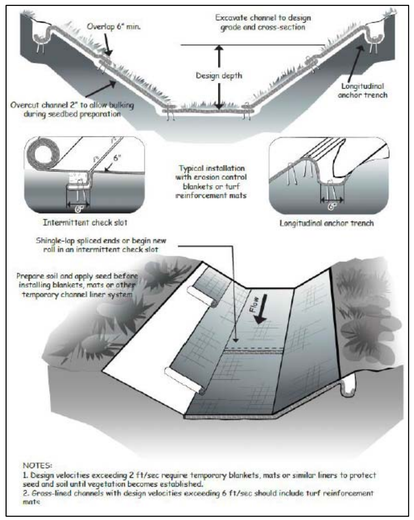

EROSION CONTROL BLANKET INSTALLATION DETAIL

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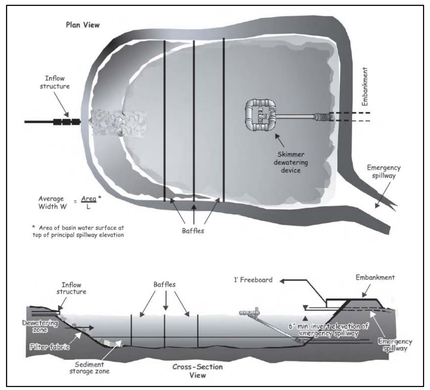

SKIMMER BASIN

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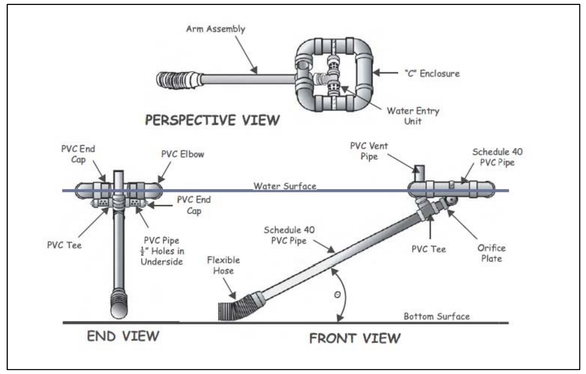

SURFACE DISCHARGE (SKIMMER) DETAIL

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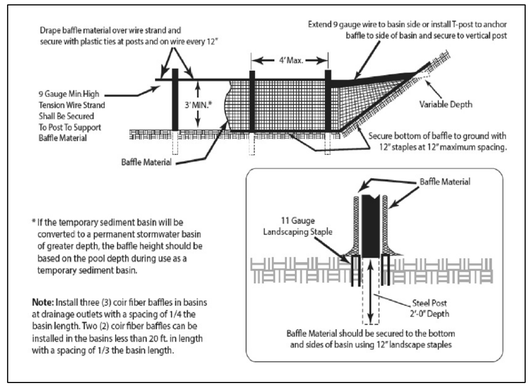

POROUS BAFFLE DETAIL

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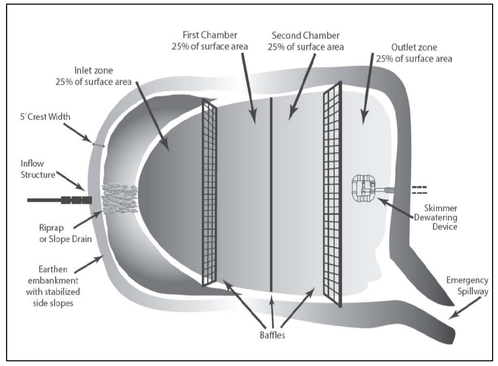

BAFFLE INSTALLATION

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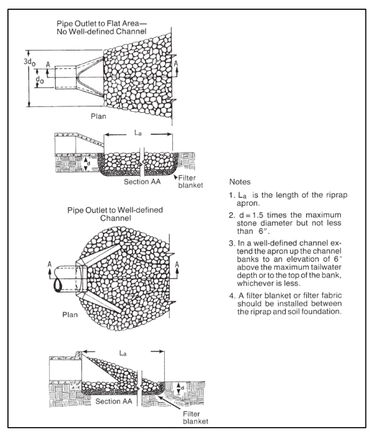

STANDARD DISSIPATOR PAD

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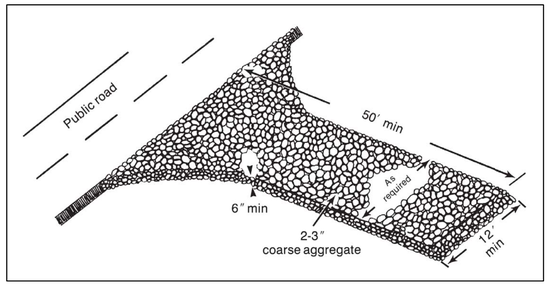
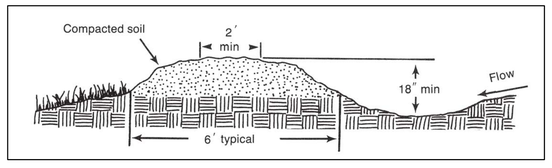


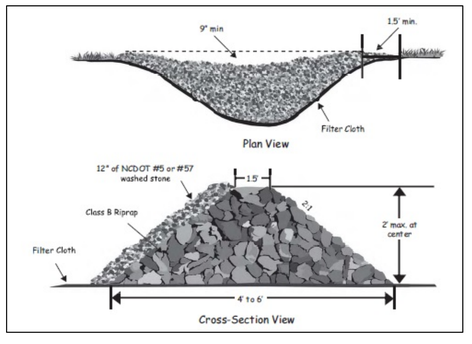
CONSTRUCTION ENTRANCE

NO SCALE



DIVERSION DITCH

NO SCALE



CHECK DAM

NO SCALE

NO.	DATE	REVISION DESCRIPTION	BY
1	03/17/2020	50% Review /EP Plans	MAC
2	03/25/2020	90% Review Comments	MAC
3	Date	Comment	By
4	Date	Comment	By
5	Date	Comment	By
6	Date	Comment	By
7	Date	Comment	By
8	Date	Comment	By

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Standard Details
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. D1

Temporary Sediment Trap

Construction Specifications

1. Clear, grub, and strip the area under the embankment of all vegetation and root mat. Remove all surface soil containing high amounts of organic matter, and stockpile or dispose of it properly. Haul all objectionable material to the designated disposal area.

2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.

3. Construct the outlet section in the embankment. Protect the connection between the riprap and the soil from piping by using filter fabric or a keyway cutoff trench between the riprap structure and soil.

- Place the filter fabric between the riprap and the soil. Extend the fabric across the spillway foundation and sides to the top of the dam; or
- Excavate a keyway trench along the center line of the spillway foundation extending up the sides to the height of the dam. The trench should be at least 2 feet deep and 2 feet wide with 1:1 side slopes.

4. Clear the pond area below the elevation of the crest of the spillway to facilitate sediment cleanout.

5. All cut and fill slopes should be 2:1 or flatter.

6. Ensure that the stone (drainage) section of the embankment has a minimum bottom width of 3 feet and maximum side slopes of 1:1 that extend to the bottom of the spillway section.

7. Construct the minimum finished stone spillway bottom width, as shown on the plans, with 2:1 side slopes extending to the top of the over filled embankment. Keep the thickness of the sides of the spillway outlet structure at a minimum of 21 inches. **The weir must be level and constructed to grade to assure design capacity.**

8. Material used in the stone section should be a well-graded mixture of stone with a d_{50} size of 9 inches (class B erosion control stone is recommended) and a maximum stone size of 14 inches. The stone may be machine placed and the smaller stones worked into the voids of the larger stones. The stone should be hard, angular, and highly weather-resistant.

9. Discharge inlet water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (*References: Runoff Control Measures and Outlet Protection*).

10. Ensure that the stone spillway outlet section extends downstream past the toe of the embankment until stable conditions are reached and outlet velocity is acceptable for the receiving stream. Keep the edges of the stone outlet section flush with the surrounding ground, and shape the center to confine the outflow stream (*References: Outlet Protection*).

11. Direct emergency bypass to natural, stable areas. Locate bypass outlets so that flow will not damage the embankment.

12. Stabilize the embankment and all disturbed areas above the sediment pool and downstream from the trap immediately after construction (*References: Surface Stabilization*).

13. Show the distance from the top of the spillway to the sediment cleanout level (1/2 the design depth) on the plans and mark it in the field.

14. Install porous baffles as specified in Practice 6.65, *Porous Baffles*.

Maintenance

Inspect temporary sediment traps at least weekly and after each significant (½ inch or greater) rainfall event and repair immediately. Remove sediment, and restore the trap to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Place the sediment that is removed in the designated disposal area, and replace the part of the gravel facing that is impaired by sediment.

Check the structure for damage from erosion or piping. Periodically check the depth of the spillway to ensure it is a minimum of 1.5 feet below the low point of the embankment. Immediately fill any settlement of the embankment to slightly above design grade. **Any riprap displaced from the spillway must be replaced immediately.**

After all sediment-producing areas have been permanently stabilized, remove the structure and all unstable sediment. Smooth the area to blend with the adjoining areas, and stablize properly (*References: Surface Stabilization*).

Pipe Inlet Protection

Construction Specifications

1. Clear the area of all debris that might hinder excavation and disposal of spoil.

2. Install the Class B or Class 1 riprap in a semi-circle around the pipe inlet. The stone should be built up higher on each end where it ties into the embankment. The minimum crest width of the riprap should be 3 feet, with a minimum bottom width of 11 feet. The minimum height should be 2 feet, but also 1 foot lower than the shoulder of the embankment or diversions.

3. A 1 foot thick layer of NC DOT #5 or #57 stone should be placed on the outside slope of the riprap.

4. The sediment storage area should be excavated around the outside of the stone horseshoe 18 inches below natural grade.

5. When the contributing drainage area has been stabilized, fill depression and establish final grading elevations, compact area properly, and stabilize with ground cover.

Maintenance

Inspect rock pipe inlet protection at least weekly and after each significant (½ inch or greater) rainfall event and repair immediately. Remove sediment and restore the sediment storage area to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Place the sediment that is removed in the designated disposal area and replace the contaminated part of the gravel facing.

Check the structure for damage. Any riprap displaced from the stone horseshoe must be replaced immediately.

After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and provide permanent ground cover (*Surface Stabilization*).

Dissipator Pad

Construction Specifications

1. Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.

2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.

3. Filter cloth, when used, must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap so the top layer is above the downstream layer a minimum of 1 foot. If the damage is extensive, replace the entire filter cloth.

4. Riprap may be placed by equipment, but take care to avoid damaging the filter.

5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.

6. Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather-resistant and well graded.

7. Construct the apron on zero grade with no overfill at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.

8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.

9. Immediately after construction, stabilize all disturbed areas with vegetation (Practices 6.10, *Temporary Seeding*, and 6.11, *Permanent Seeding*).

Maintenance

Inspect riprap outlet structures weekly and after significant (1/2 inch or greater) rainfall events to see if any erosion around or below the riprap has taken place, or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

Silt Fence

Construction Specifications

MATERIALS

1. Use a synthetic filter fabric of at least 95% by weight of polyolefins or polyester, which is certified by the manufacturer or supplier as conforming to the requirements in ASTM D 6461, which is shown in part in Table 6.62b.

Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120° F.

2. Ensure that posts for sediment fences are 1.25 lb/linear ft minimum steel with a minimum length of 5 feet. Make sure that steel posts have projections to facilitate fastening the fabric.

3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

CONSTRUCTION

1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.

2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)

3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.

4. Support standard strength filter fabric by wire mesh fastened securely to the **upslope** side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have minimum 50 pound tensile strength.

5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Support posts should be driven securely into the ground a minimum of 24 inches.

6. Extra strength filter fabric with 6 feet post spacing does not require wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have minimum 50 pound tensile strength.

7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (Figure 6.62a).

8. Place 12 inches of the fabric along the bottom and side of the trench.

9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.

10. Do not attach filter fabric to existing trees.

SEDIMENT FENCE INSTALLATION USING THE SLICING METHOD

Instead of excavating a trench, placing fabric and then backfilling trench, sediment fence may be installed using specially designed equipment that inserts the fabric into a cut sliced in the ground with a disc (Figure 6.62b).

Installation Specifications

1. The base of both end posts should be at least one foot higher than the middle of the fence. Check with a level if necessary.

2. Install posts 4 feet apart in critical areas and 6 feet apart on standard applications.

3. Install posts 2 feet deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

4. Install posts with the nipples facing away from the silt fabric.

5. Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. Also, each tie should be positioned to hang on a post nipple when tightened to prevent sagging.

6. Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

7. No more than 24 inches of a 36 inch fabric is allowed above ground level.

8. The installation should be checked and corrected for any deviations before compaction.

9. Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first, and then each side twice for a total of 4 trips.

Maintenance

Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.

Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly.

Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.

Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

Silt Fence Outlet Construction Specifications

1. Uniformly grade a shallow depression approaching the inlet.

2. Drive 5-foot steel posts 2 feet into the ground surrounding the inlet. Space posts evenly a maximum of 4 feet apart.

3. Surround the posts with wire mesh hardware cloth. secure the wire mesh to the steel posts at the top, middle, and bottom. Place a 2-foot lap of wire mesh under the gravel for anchoring.

4. Place clean gravel (NCDOT #5 or #57 stone) on a 2:1 slope with a height of 16 inches around the wire and smooth to an even grade.

Maintenance

1. Inspect at least once a week and after each rainfall. Check for erosion, piping, and displacement. Make any required repairs immediately.

2. Clean wire mesh of any debris to provide adequate flow for next rainfall event.

3. Remove sediment deposits as necessary to provide adequate storage volume for next rain.

4. Remove silt fence and unstable sediment deposits and bring area to grade and stabilize after the contributing drainage area has been properly stabilized.

Skimmer Basin

Construction Specifications

1. Clear, grub, and strip the area under the embankment of all vegetation and root mat. Remove all surface soil containing high amounts of organic matter and stockpile or dispose of it properly. Haul all objectionable material to the designated disposal area. Place temporary sediment control measures below basin as needed

2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.

3. Shape the basin to the specified dimensions. Prevent the skimming device from settling into the mud by excavating a shallow pit under the skimmer or providing a low support under the skimmer of stone or timber.

4. Place the barrel (typically 4-inch Schedule 40 PVC pipe) on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe. Place the fill material around the pipe spillway in 4-inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from the firm contact with its foundation when compacting under the pipe haunches.

Place a minimum depth of 2 feet of compacted backfill over the pipe spillway before crossing it with construction equipment. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

5. Assemble the skimmer following the manufacturers instructions, or as designed.

6. Lay the assembled skimmer on the bottom of the basin with the flexible joint at the inlet of the barrel pipe. Attach the flexible joint to the barrel pipe and position the skimmer over the excavated pit or support. Be sure to attach a rope to the skimmer and anchor it to the side of the basin. This will be used to pull the skimmer to the side for maintenance.

7. Earthen spillways—Install the spillway in undisturbed soil to the greatest extent possible. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of the spillway. The spillway should be lined with laminated plastic or impermeable geotextile fabric. The fabric must be wide and long enough to cover the bottom and sides and extend onto the top of the dam for anchoring in a trench. The edges may be secured with 8-inch staples or pins. The fabric must be long enough to extend down the slope and exit onto stable ground. The width of the fabric must be one piece, not joined or spliced; otherwise water can get under the fabric. If the length of the fabric is insufficient for the entire length of the spillway, multiple sections, spanning the complete width, may be used. The upper section(s) should overlap the lower section(s) so that water cannot flow under the fabric. Secure the upper edge and sides of the fabric in a trench with staples or pins. Adapted from "A Manual for Designing, Installing and Maintaining Skimmer Sediment Basins." February, 1999. J. W. Faircloth & Son,).

8. Inlets—Discharge water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (References: *Runoff Control Measures and Outlet Protection*).

9. Erosion control—Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (References: *Surface Stabilization*).

10. Install porous baffles as specified in Practice 6.65, *Porous Baffles*.

11. After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and stabilize properly (References: *Surface Stabilization*).

Maintenance

Inspect skimmer sediment basins at least weekly and after each significant (one-half inch or greater) rainfall event and repair immediately. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one-half the height of the first baffle. Pull the skimmer to one side so that the sediment underneath it can be excavated. Excavate the sediment from the entire basin, not just around the skimmer or the first cell. Make sure vegetation growing in the bottom of the basin does not hold down the skimmer.

Repair the baffles if they are damaged. Re-anchor the baffles if water is flowing underneath or around them.

If the skimmer is clogged with trash and there is water in the basin, usually jerking on the rope will make the skimmer bob up and down and dislodge the debris and restore flow. If this does not work, pull the skimmer over to the side of the basin and remove the debris. Also check the orifice inside the skimmer to see if it is clogged; if so remove the debris.

If the skimmer arm or barrel pipe is clogged, the orifice can be removed and the obstruction cleared with a plumber's snake or by flushing with water. Be sure and replace the orifice before repositioning the skimmer.

Check the fabric lined spillway for damage and make any required repairs with fabric that spans the full width of the spillway. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the skimmer and pool areas.

Freezing weather can result in ice forming in the basin. Some special precautions should be taken in the winter to prevent the skimmer from plugging with ice.

Temporary Slope Drain

Construction Specifications

A common failure of slope drains is caused by water saturating the soil and seeping along the pipe. This creates voids from consolidation and piping and causes washouts. Proper backfilling around and under the pipe "haunches" with stable soil material and hand compacting in 6-inch lifts to achieve firm contact between the pipe and the soil at all points will eliminate this type of failure.

1. Place slope drains on undisturbed soil or well compacted fill at locations and elevations shown on the plan.

2. Slightly slope the section of pipe under the dike toward its outlet.

3. Hand tamp the soil under and around the entrance section in lifts not to exceed 6 inches.

4. Ensure that fill over the drain at the top of the slope has minimum dimensions of 1.5 feet depth, 4 feet top width, and 3:1 side slopes.

5. Ensure that all slope drain connections are watertight.

6. Ensure that all fill material is well-compacted. Securely fasten the exposed section of the drain with grommets or stakes spaced no more than 10 feet apart.

7. Extend the drain beyond the toe of the slope, and adequately protect the outlet from erosion.

8. Make the settled, compacted dike ridge no less than 1 feet above the top of the pipe at every point.

9. Immediately stabilize all disturbed areas following construction.

Maintenance

Inspect the slope drain and supporting diversion after every rainfall, and promptly make necessary repairs. When the protected area has been permanently stabilized, temporary measures may be removed, materials disposed of properly, and all disturbed areas stabilized appropriately.

Porous Baffle

Construction Specifications

MATERIALS

1. Use matting made of 100% coconut fiber (coir) twine woven into high strength matrix with the properties shown in Table 6.65a.

2. Staples should be made of 0.125 inch diameter new steel wire formed into a "U" shape not less than 12 inches in length with a throat of 1 inch in width. The staples anchor the porous baffles into the sides and bottom of the basin.

3. Ensure that steel posts for porous baffles are of a sufficient height to support baffles at desired height. Posts should be approximately 1-3/8" wide measured parallel to the fence, and have a minimum weight of 1.25 lb/linear ft. The posts must be equipped with an anchor plate having a minimum area of 14.0 square inches and be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.

4. Use 9-gauge high tension wire for support wire.

Coir Fiber Baffle Material Property Requirements	
Thickness	0.30 in. minimum
Tensile Strength (Wet)	900 x 680 lb/ft minimum
Elongation (Wet)	69% x 34% maximum
Flow Velocity	10-12 ft/sec
Weight	20 oz/SY (680 g/m²) minimum
Minimum Width	6.5 feet
Open Area	50% maximum

CONSTRUCTION

1. Grade the basin so that the bottom is level front to back and side to side.

2. Install the coir fiber baffles immediately upon excavation of the basins.

3. Install posts across the width of the sediment trap (Practice 6.62, *Sediment Fence*).

4. Steel posts should be driven to a depth of 24 inches and spaced a maximum of 4 feet apart. The top of the fabric should be a minimum of 6 inches higher than the invert of the spillway. Tops of baffles should be a minimum of 2 inches lower than the top of the earthen embankment.

5. Install at least three rows of baffles between the inlet and outlet discharge point. Basins less than 20 feet in length may use 2 baffles.

6. Attach a 9 gauge high tension wire strand to the steel posts at a height of 6 inches above the spillway elevation with plastic ties or wire fasteners to prevent sagging. If the temporary sediment basin will be converted to a permanent stormwater basin of a greater depth, the baffle height should be based on the pool depth during use as a temporary sediment basin.

7. Extend 9 gauge minimum high tension wire strand to side of basin or install steel T-posts to anchor baffle to side of basin and secure to vertical end posts as shown in Figure 6.65b.

8. Drape the coir fiber mat over the wire strand mounted at a height of 6 inches above the spillway elevation. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners. Anchor the matting to the sides and floor of the basin with 12 inch wire staples, approximately 1 ft apart, along the bottom and side slopes of the basin.

9. Do not splice the fabric, but use a continuous piece across the basin

10. Adjustments may be required in the stapling requirements to fit individual site conditions.

Maintenance

Inspect baffles at least once a week and after each rainfall. Make any required repairs immediately.

Be sure to maintain access to the baffles. Should the fabric of a baffle collapse, tear, decompose, or become ineffective, replace it promptly.

Remove sediment deposits when it reaches half full, to provide adequate storage volume for the next rain and to reduce pressure on the baffles. Take care to avoid damaging the baffles during cleanout, and replace if damaged during cleanout operations. Sediment depth should never exceed half the designed storage depth.

After the contributing drainage area has been properly stabilized, remove all baffle materials and unstable sediment deposits, bring the area to grade, and stabilize it.

Temporary Sediment Basin

Construction Specifications

1. Site preparations- Clear, grub, and strip topsoil from areas under the embankment to remove trees, vegetation, roots, and other objectionable material. Delay cleaning the pool area until the dam is complete and then remove brush, trees, and other objectionable materials to facilitate sediment cleanout. Stockpile all topsoil or soil containing organic matter for use on the outer shell of the embankment to facilitate vegetative establisment. Place temporary sediment control measures below the basin as needed.

2. Cut-off trench- Excavate a cut-off trench along the center line of the earth fill embankment. Cut the trench to stable soil material, but in no case make it less than 2 feet deep. The cut-off trench must extend into both abutments to at least the elevation of the riser crest. Make the minimum bottom width wide enough to permit operation of excavation and compaction equipment, but in no case less than 2 feet. Make side slopes of the trench no steeper than 1:1. Compaction requirements are the same as those for the embankment. Keep the trench dry during backfilling and compaction operations.

3. Embankment- Take fill material from the approved areas shown on the plans. It should be clean mineral soil, free of roots, woody vegetation, rocks, and other objectionable material. Scarify areas on which fill is to be placed before placing The fill material must contain sufficient moisture so it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Place fill material in 6 to 8 inch continuous layers over the entire length of the fill area and compact it. Compaction may be obtained by routing the construction hauling equipment over the fill so that the entire surface of each layer is traversed by at least one wheel or tread track of heavy equipment, or a compactor may be used. Construct the embankment to an elevation 10 percent higher than the design height to allow for settling.

4. Conduit spillways- Securely attach the riser to the barrel or barrel stub to make a watertight structural connection. Secure all connections between barrel sections by approved watertight assemblies. Place the barrel and riser on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe or anti-seep collars. Place the fill material around the pipe spillway in 4-inch layers, and compact it under and around the pipe to at least the same density as the adjacent embankment. **Care must be taken not to raise the pipe from firm contact with its foundation when compacting under the pipe haunches.** Place a minimum depth of 2 feet of compacted backfill over the pipe spillway before crossing it with construction equipment. Anchor the riser in place by concrete or other satisfactory means to prevent flotation. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

5. Emergency spillway- Install the emergency spillway in undisturbed soil. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of the emergency spillway.

6. Inlets- Discharge water into the basin in a manner to prevent erosion. Use diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (*References: Runoff Control Measures and Outlet Protection*).

7. Erosion control- Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (*References: Surface Stabilization*).

8. Install porous baffles as specified in Practice 6.65, Porous Baffles.

9. Safety- Sediment basins may attract children and can be dangerous. Avoid steep side slopes, and fence and mark basins with warning signs if trespassing is likely. **Follow all state and local requirements.**

Maintenance

Inspect temporary sediment basins at least weekly and after each significant (1/2 inch or greater) rainfall event and repair immediately. Remove sediment and restore the basin to its original dimensions when it accumulates to one-half the design depth. Place removed sediment in an area with sediment controls.

Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the riser and pool area.

Compost Sock

Construction Specifications

INSTALLATION

1. Materials used in the compost sock must meet the specifications outlined above and in Practice 6.18, Compost Blankets.
2. Compost socks should be located as shown on the erosion and sedimentation control plan.
3. Prior to installation, clear all obstructions including rocks, clods, and other debris greater than one inch that may interfere with proper function of the compost sock.
4. Compost socks should be installed parallel to the toe of a graded slope, a minimum of 10 feet beyond the toe of the slope. Socks located below flat areas should be located at the edge of the land-disturbance. The ends of the socks should be turned slightly up slope to prevent runoff from going around the end of the socks.
5. Fill sock setting uniformly with compost to the desired length such that logs do not deform.
6. Oak or other durable hardwood stakes 2" X 2" in cross section should be driven vertically plumb, through the center of the compost sock. Stakes should be placed at a maximum interval of 4 feet, or a maximum interval of 8 feet if the sock is placed in a 4 inch trench. See Figure 6.66b. The stakes should be driven to a minimum depth of 12 inches, with a minimum of 3 inches protruding above the compost sock.
7. In the event staking is not possible (i.e., when socks are used on pavement) heavy concrete blocks shall be used behind the sock to hold it in place during runoff events.
8. If the compost sock is to be left as part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation using the seeding specification in the erosion and sedimentation control plan.
9. Compost socks are not to be used in perennial or intermittent streams.

Maintenance

Inspect compost socks weekly and after each significant rainfall event (1/2 inch or greater). Remove accumulated sediment and any debris. The compost sock must be replaced if clogged or torn. If ponding becomes excessive, the sock may need to be replaced with a larger diameter or a different measure. The sock needs to be reinstalled if undermined or dislodged. The compost sock shall be inspected until land disturbance is complete and the area above the measure has been permanently stabilized.

DISPOSAL/RECYCLING

Compost media is a composted organic product recycled and manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the compost media may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the compost media on site reduces removal and disposal costs compared to other sediment control devices. The mesh netting material will be extracted from the media and disposed of properly. The photodegradable mesh netting material will degrade in 2 to 5 years if left on site. Biodegradable mesh netting material is available and does not need to be extracted and disposed of, as it will completely decompose in approximately 6 to 12 months. Using biodegradable compost socks completely eliminates the need and cost of removal and disposal.

Clear Water Diversion

Construction Specifications

1. Remove and properly dispose of all trees, brush, stumps, and other objectionable material. Fill and compact, to natural ground level or above, all ditches and gullies that will be crossed by machinery.

2. Disk the base of the dike before placing fill.

3. Ensure that the constructed cross section meets all design requirements.

4. Compact the dike by tracking with construction equipment.

5. Ensure that the top of the dike is not lower at any point than the design elevation plus the specified settlement after it has been compacted.

6. Leave sufficient area along the dike to permit machine re-grading and cleanout.

7. Immediately seed and mulch the dike after its construction, and stabilize the flow portion in accordance with design requirements.

Maintenance

Inspect diversion dikes once a week and after every rainfall. Immediately remove sediment from the flow area and repair the dike.

Check outlets, and make timely repairs as needed to avoid gully formation. When the area above the temporary diversion dike is permanently stabilized, remove the dike, and fill and stabilize the channel to blend with the natural surface.

Temporary Diversion

Construction Specifications

1. Remove and properly dispose of all trees, brush, stumps, and other objectionable material.

2. Ensure that the minimum constructed cross section meets all design requirements.

3. Ensure that the top of the dike is not lower at any point than the design elevation plus the specified settlement.

4. Provide sufficient room around diversions to permit machine regrading and cleanout.

5. Vegetate the ridge immediately after construction, unless it will remain in place less than 30 working days.

Maintenance

Inspect temporary diversions once a week and after every rainfall. Immediately remove sediment from the flow area and repair the diversion ridge. Carefully check outlets and make timely repairs as needed. When the area protected is permanently stabilized, remove the ridge and the channel to blend with the natural ground level and appropriately stabilize it.

Check Dam

Construction Specifications

1. Place stone to the lines and dimensions shown in the plan on a filter fabric foundation.

2. Keep the center stone section at least 9 inches below natural ground level where the dam abuts the channel banks.

3. Extend stone at least 1.5 feet beyond the ditch bank (Figure 6.83b) to keep water from cutting around the ends of the check dam.

4. Set spacing between dams to assure that the elevation at the top of the lower dam is the same as the toe elevation of the upper dam.

5. Protect the channel after the lowest check dam from heavy flow that could cause erosion.

6. Make sure that the channel reach above the most upstream dam is stable.

7. Ensure that other areas of the channel, such as culvert entrances below the check dams, are not subject to damage or blockage from displaced stones.

Maintenance

Inspect check dams and channels at least weekly and after each significant (1/2 inch or greater) rainfall event and repair immediately. Clean out sediment, straw, limbs, or other debris that could clog the channel when needed.

Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam. Correct all damage immediately. If significant erosion occurs between dams, additional measures can be taken such as, installing a protective riprap liner in that portion of the channel (Practice 6.31, *Riprap-line and Paved Channels*).

Remove sediment accumulated behind the dams as needed to prevent damage to channel vegetation, allow the channel to drain through the stone check dam, and prevent large flows from carrying sediment over the dam. Add stones to dams as needed to maintain design height and cross section.

Construction Entrance

Construction Specifications

1. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.

2. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.

3. Provide drainage to carry water to a sediment trap or other suitable outlet.

4. Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

Maintenance

Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

Rolled Erosion Control Product

Construction Specifications

Construction

Even if properly designed, if not properly installed, RECP's will probably not function as desired. Proper installation is imperative. Even if properly installed, if not properly timed and nourished, vegetation will probably not grow as desired. Proper seed/vegetation selection is also imperative.

Grade the surface of installation areas so that the ground is smooth and loose. When seeding prior to installation, follow the steps for seed bed preparation, soil amendments, and seeding in *Surface Stabilization*, 6.1. All gullies, rills, and any other disturbed areas must be fine graded prior to installation. Spread seed before RECP installation. (**Important**: Remove all large rocks, dirt clods, stumps, roots, grass clumps, trash, and other obstructions from the soil surface to allow for direct contact between the soil surface and the RECP.)

Terminal anchor trenches are required at RECP ends and intermittent trenches must be constructed across channels at 25-foot intervals. Terminal anchor trenches should be a minimum of 12 inches in depth and 6 inches in width, while intermittent trenches need be only 6 inches deep and 6 inches wide.

Installation for Slopes— Place the RECP 2-3 feet over the top of the slope and into an excavated end trench measuring approximately 12 inches deep by 6 inches wide. Pin the RECP at 1 foot intervals along the bottom of the trench, backfill, and compact. Unroll the RECP down (or along) the slope maintaining direct contact between the soil and the RECP. Overlap adjacent rolls a minimum of 3 inches. Pin the RECP to the ground using staples or pins in a 3 foot center-to-center pattern. Less frequent stapling/pinning is acceptable on moderate slopes.

Installation in Channels— Excavate terminal trenches (12 inches deep and 6 inches wide) across the channel at the upper and lower end of the lined channel sections. At 25-foot intervals along the channel, anchor the RECP across the channel either in 6 inch by 6 inch trenches or by installing two closely spaced rows of anchors. Excavate longitudinal trenches 6 inches deep and wide along channel edges (above water line) in which to bury the outside RECP edges. Place the first RECP at the downstream end of the channel. Place the end of the first RECP in the terminal trench and pin it at 1 foot intervals along the bottom of the trench.

Note: The RECP should be placed upside down in the trench with the roll on the downstream side of the bench.

Once pinned and backfilled, the RECP is deployed by wrapping over the top of the trench and unrolling upstream. If the channel is wider than the provided rolls, place ends of adjacent rolls in the terminal trench, overlapping the adjacent rolls a minimum of 3 inches. Pin at 1 foot intervals, backfill, and compact. Unroll the RECP in the upstream direction until reaching the first intermittent trench. Fold the RECP back over itself, positioning the roll on the downstream side of the trench, and allowing the mat to conform to the trench.

Then pin the RECP (two layers) to the bottom of the trench, backfill, and compact. Continue up the channel (wrapping over the top of the intermittent trench) repeating this step at other intermittent trenches, until reaching the upper terminal trench.

At the upper terminal trench, allow the RECP to conform to the trench, secure with pins or staples, backfill, compact and then bring the mat back over the top of the trench and onto the existing mat (2 to 3 feet overlap in the downstream direction), and pin at 1 foot intervals across the RECP. When starting installation of a new roll, begin in a trench or shingle-lap ends of rolls a minimum of 1 foot with upstream RECP on top to prevent uplifting. Place the outside edges of the RECP(s) in longitudinal trenches, pin, backfill, and compact.

Anchoring Devices—11 gauge, at least 6 inches length by 1 inch width staples or 12 inch minimum length wooden stakes are recommended for anchoring the RECP to the ground.

Drive staples or pins so that the top of the staple or pin is flush with the ground surface. Anchor each RECP every 3 feet along its center. Longitudinal overlaps must be sufficient to accommodate a row of anchors and uniform along the entire length of overlap and anchored every 3 feet along the overlap length. Roll ends may be spliced by overlapping 1 foot (in the direction of water flow), with the upstream/upslope mat placed on top of the downstream/downslope RECP. This overlap should be anchored at 1 foot spacing across the RECP. When installing multiple width mats heat seamed in the factory, all factory seams and field overlaps should be similarly anchored.

Maintenance

1. Inspect Rolled Erosion Control Products at least weekly and after each significant (1/2 inch or greater) rain fall event repair immediately.
2. Good contact with the ground must be maintained, and erosion must not occur beneath the RECP.
3. Any areas of the RECP that are damaged or not in close contact with the ground shall be repaired and stapled.
4. If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.
5. Monitor and repair the RECP as necessary until ground cover is established.

ENGINEERS, Inc. SEAL NORTH CAROLINA 2018

CROWLEY
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(919) 625-6755
NC Firm # C-2151 ; PE Firm # 12613

NO.	DATE	REVISION DESCRIPTION	BY
1	03/17/2020	50% Review: RFP Plans	MAC
2	03/25/2020	90% Review Comments	MAC
3	Date	Comment	By
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5	Date	Comment	By
6	Date	Comment	By
7	Date	Comment	By
8	Date	Comment	By

NCDEQ Specifications

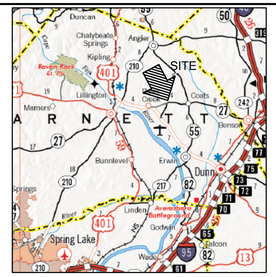
Buies Creek Solar

Pure Power Contractors, Inc.

Lillington, Harnett County, North Carolina

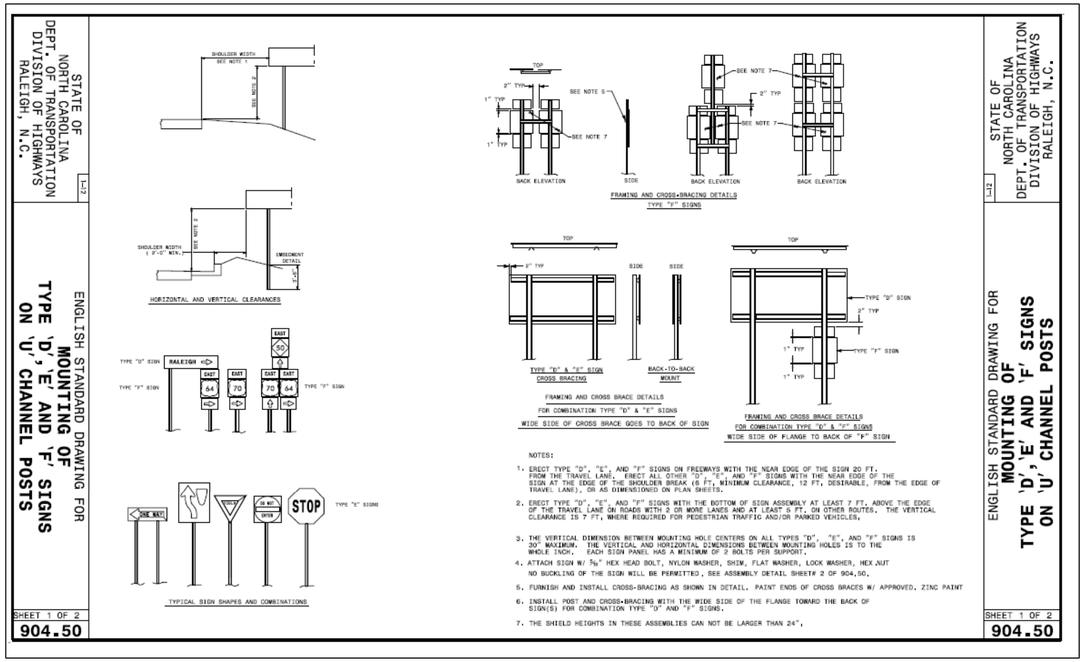
Job No. HS

Dwg No. D2



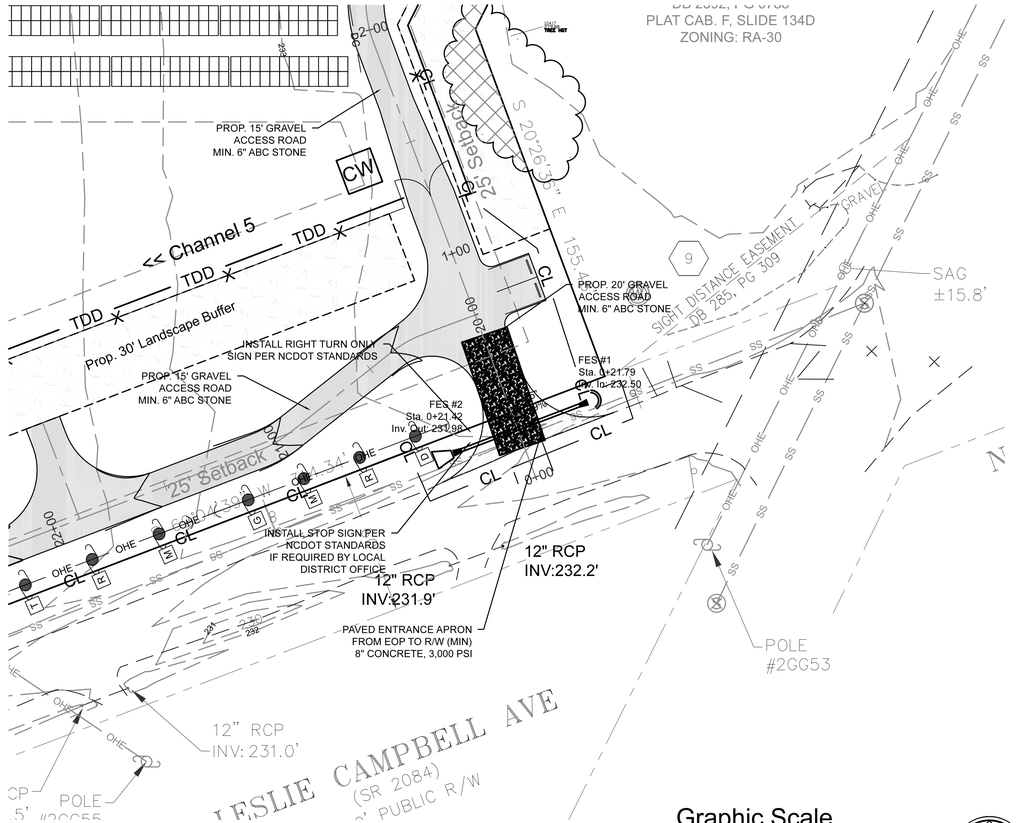
VICINITY MAP
NO SCALE

SIGHT DISTANCE (ft) PER 10 MPH OF ARTERIAL DESIGN SPEED FOR APPROPRIATE ARTERIAL WIDTH OF CROSSING			
Design Vehicle Crossing the Arterial	Two Lanes	Four Lanes	Six Lanes
Passenger Vehicle	100	120	130
Single Unit Truck	130	150	170
WB-50 Tractor Trailer	170	200	210



ENTRANCE DETAIL

AS SHOWN



Graphic Scale

30' 0' 15' 30' 60' 120'

NORTH

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6	Date	Comment
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Driveway Permit Exhibit
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. DW

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

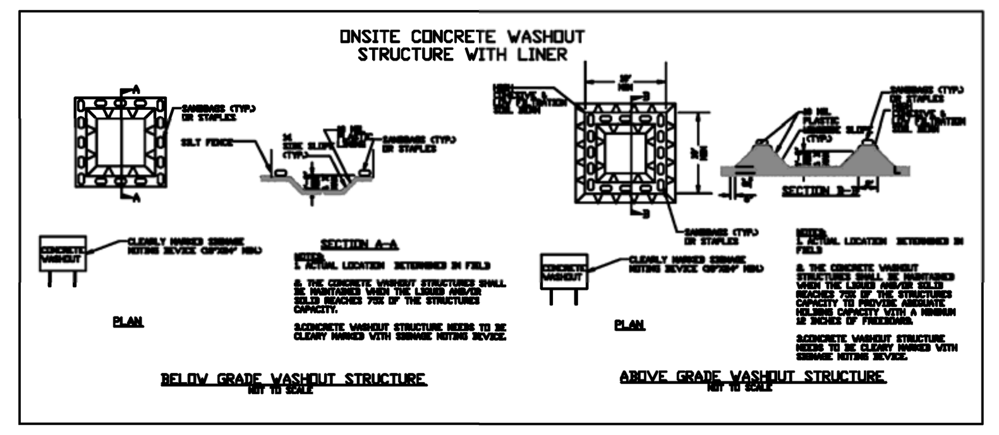
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA
Environmental Quality



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (anc this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDCs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NORTH CAROLINA
Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20629 MICHAEL A. CROWLEY

NCG01 Requirements
Buies Creek Solar
Pure Power Contractors, Inc.
Lillington, Harnett County, North Carolina

Job No. HS
Dwg No. D3