



DEPARTMENT OF COMMUNITY DEVELOPMENT
PLANNING - BUILDING INSPECTIONS – ZONING
ENVIRONMENTAL SERVICES DIVISION



CRAFS® – Control Outlets for Silt Fences
Southampton Solar Project – Southampton County Virginia

CRAFS® – The Corrugated Retention and Filtration System for Sediment Control in Critical Areas with Trouble Conditions where Temporary Retention measures are needed

Southampton County Erosion and Sediment Control Administrator/Author:

Regan H. Prince, Environmental Specialist
Barton Grover, Environmental Compliance Officer (Illustrations/Editing)
Community Development Office, 207 West Second Avenue, Franklin, Virginia 23851

Dominion Energy:

William Watson and James Boswell, Project and Construction Managers
5000 Dominion Boulevard, Glen Allen, Virginia 23060

General Contractor:

Signal Energy Constructors: Seth Medina, Randy Palmer, John Mackey
2034 Hamilton Place Boulevard, 4th floor, Chattanooga, Tennessee 37421

Grading and SWPPP Contractor:

Sukut Construction: Tim Pape and Eric Gruenewald
4010 West Chandler Avenue, Santa Ana, California 92704

Civil Engineer Consultant:

Draper Aden Associates: Glen Custis, P.E.
8090 Villa Park Drive, Richmond, Virginia 23228

PROJECT DETAILS

The Southampton Solar Project consists of solar arrays in six locations in Southampton County, Virginia. The locations are on separate parcels which are not contiguous, but are in the same general area of the County. This project has designated separate disturbed areas as Pod A through F. The proposed project includes the following breakdown of disturbed area by Pod Areas: (See the attached Site location Map at end of Case Study)

Pod A: 663 acres	Pod D: 26.67 acres
Pod B: 208 acres	Pod E: 357 acres
Pod C: 22.6 acres	Pod F: 68 acres

Approximate total acreage: 1,400 acres

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In April 2017, the consultant engineer requested the use the CRAFS® Corrugated Retention and Filtration Systems (Patent No.: U.S. 9,677,243) for ease of installation and removal by the contractor in addition to overall increased effectiveness over the traditional stone outlet. The approval to use the CRAFS Product was granted by the Southampton County Erosion and Sediment Control Administrator.

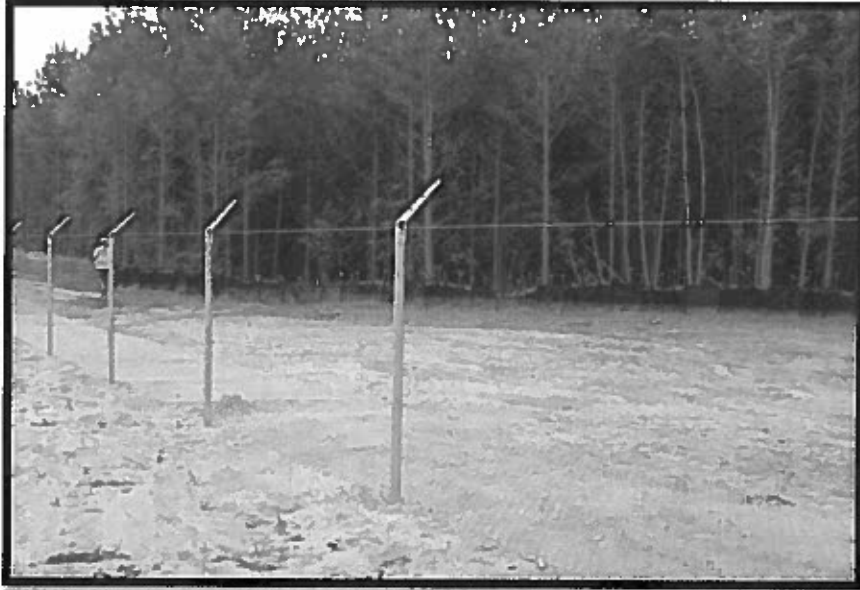
The area of the solar arrays will be graded only where required to meet slope requirements for solar arrays design standards. The project utilizes super silt fencing SSF (i.e.: chain-linked fencing with regular silt fencing attached to it) in combination with a SSF stone outlet check dams strategically placed at low areas in lieu of temporary sediment basins. The typical contributing drainage area to the SSF outlet ranges between 3 and 20 acres. **The total linear footage of super silt fencing equates to approximately 31 miles for this project!!**



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CRAFS® “System Lengths” Used:

The length of the CRAFS® unit was determined based on the similar process used for the traditional stone outlet. The length was based on the outlet design for the Temporary Sediment Trap in the Virginia Erosion and Sediment Control Handbook, 1992 Edition (Chapter 3) using 6 times the contributing drainage area to the Temporary Sediment Trap. **Therefore some CRAFS® can reach 150 feet in length.**



Anchoring the CRAFS® System:

CRAFS® structures utilize standard metal T posts for vertical stability and anchoring the system to the ground per manufacturer's recommendations. Due to the high volume of runoff and substantial amounts of sandy loam and clay material upstream of the CRAFS® units on this project, I recommended the placement of 6 inches of #57 stone (minimum) atop the upstream and downstream aprons of the CRAFS® structure to provide additional system stability.



Anchoring the CRAFS® (continued):

The placement of 6 inches of #57 stone was added to the CRAFS® unit for additional stability and velocity reduction of sediment laden runoff.



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CRAFS® and Smart Fence®:

Excessive grading and earthwork of Pod B revealed an extreme amount of clay material to achieve the required design requirements for the solar arrays. The earthwork created an 8-10 foot high flat plain area for the solar array area with a 1:5 slope to the CRAFS® and Smart Fence® combination. Both products performed very well together during the recent Nor'easter event across Southeastern Virginia in preventing the clay material from leaving the site. In addition to the cost savings and simplicity of installation, the CRAFS® product demonstrated exceptional sediment retention and "rapid filtration" functions not offered by the conventional stone outlets which were replaced throughout this project by the Corrugated Retention and Filtration Systems.



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CRAFS® and SmartFence® (continued):

Improved maintenance and enhanced Erosion and Sediment Control were achieved when SmartFence® was added to prevent a significant amount of clay material from leaving the construction site.



Inspection/Maintenance frequency:

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Inspection/Maintenance frequency:

The SWPPP inspections for the entire project are performed every 5 days by the SWPPP Inspection Team of 8 members which include contractors, consultants and county representatives. As of July 2017, the CRAFS® Product has performed extremely well during the intense summer storm events which produced 2 – 4 inches of rainfall for several days. No failures to the CRAFS® units were observed during the post inspection of significant rain producing events. Routine removal of sediment was required to ensure optimal performance of the CRAFS® Product in accordance with the Virginia Erosion and Sediment Control Handbook, 1992 Edition.

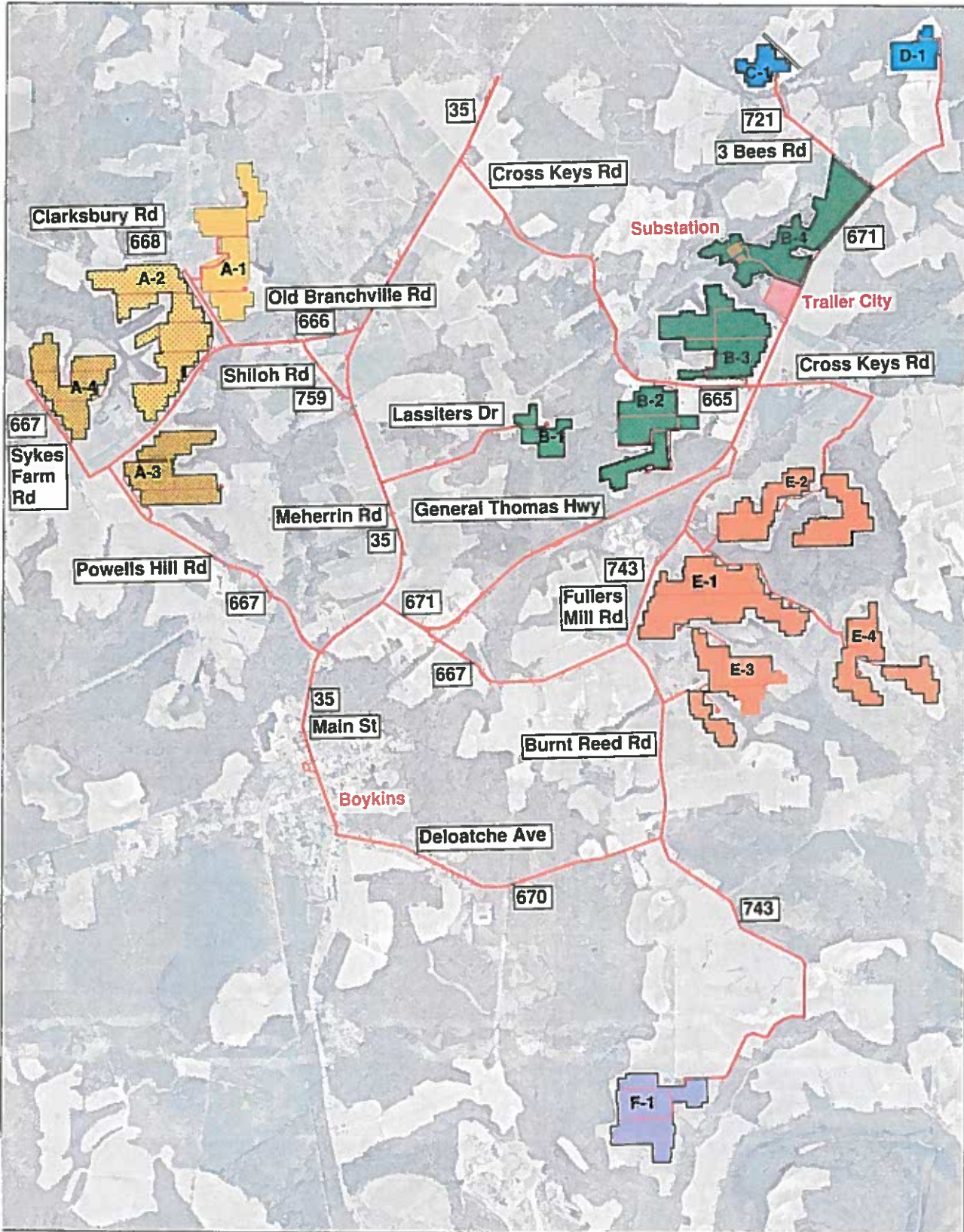


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SOUTHAMPTON SOLAR PROJECT

911 Addresses

POD A A-1 Blocks 1, 2, & 3 30047 Clarksbury Rd Boykins VA 23827 A-2 Blocks 4, 5, 6, 7, & 8 A-3 Blocks 12, 13, & 14 A-4 Blocks 9, 10, & 11	POD B B-4 Trailer City & Substation 20515 General Thomas Hwy Newsoms VA 23874 B-1 Block 15 B-2 Blocks 16, 17, & 18 B-3 Blocks 19, 20, 21, & 22	POD C C-1 Block 23 29343 3 Bees Rd Newsoms VA 23874 POD D D-1 Block 24 21103 General Thomas Hwy Newsoms VA 23874
POD E E-1 Blocks 29, 30, 31, 35, & 36 19684 Fullers Mill Rd Boykins VA 23827 E-2 Blocks 25, 26, 27, & 28 E-3 Blocks 37, 38, & 39 E-4 Blocks 32, 33, & 34	POD F F-1 Blocks 40, 41, & 42 33290 Burnt Reed Rd Boykins VA 23827	



Construction Photos and Videos:

Additional construction photos and videos for the Southampton Solar Project can be viewed on the City of Franklin website at:

<http://www.franklinva.com/government/departments/community-development/environmental-services-division/southampton-solar-panel-project/>

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Sukut Construction, Project Manager