



B O N O C O N S U L T I N G , I N C .

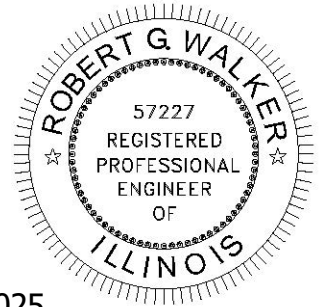
Initial Submittal September 17, 2025

Preliminary Stormwater Submittal

I hereby certify that the following preliminary stormwater submittal was prepared by me or under my direct personal supervision and that I am a duly licensed professional engineer under the laws of the state of Illinois.

A handwritten signature in blue ink, appearing to read 'R. Walker'.

Robert G. Walker, P.E.
License expires 11-30-2025



Bluestem Solar, Prairie Street

Narrative

My client is looking to develop a community solar farm in unincorporated Sugar Grove Township. Total property area is 138.95 acres and is currently mostly ag fields with a farm storage building and grain bin site near the existing entrance. An existing farm road runs south to two small ponds. The property has rolling topography.

Access to the site will be from the existing farm entrance to the property. A new pervious (CA-7) gravel road will provide maintenance and fire access to the site. Solar panels are laid out in a grid pattern.

Refer to engineering plans for existing and proposed grading and drainage.

A final stormwater management report will be prepared during final engineering.

Proposed Stormwater Management

Stormwater management is required by the Kane County Stormwater Ordinance.

Stormwater Detention is not required as there is less than 25,000 sq ft of new impervious area and the hydrologically disturbed area is under 3 acres. On-site gravel access roads are proposed to be pervious, using CA-7 clean crushed stone.

Stormwater Mitigation/BMPs are required. Kane County uses the Minnesota method to compensate for the hydrologically disconnected surfaces of the solar panels.

To determine the average horizontal length beneath the solar panel

Minnesota Disconnected Impervious Area Calculations for Solar Panels

Average Horizontal Length Beneath the Panel

Ahnway Series Bi-55-520 to Bi-55-550 Solar Panels

Length	2272 mm	7.45 ft
Width	1133 mm	3.72 ft
Spacing		10.00 ft
Max Angle	60 degrees	1.04719755 radians
Min Angle	0 degrees	0 radians

$$Z = (\cos(\text{max angle}) \times \text{length} + \cos(\text{min angle}) \times \text{length}) / 2$$

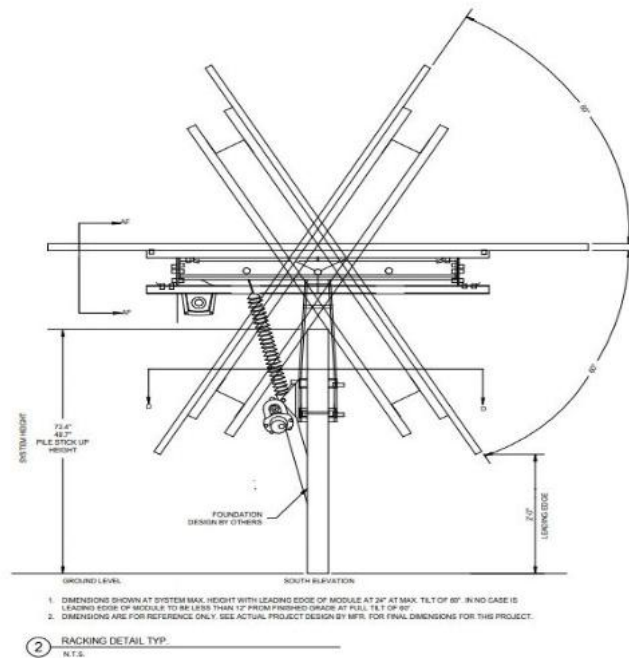
$$Z = 5.59 \text{ ft}$$

$$\text{Impervious Area of Solar Panel} = Z \times \text{Width}$$

$$\text{Imp Area} = 20.78 \text{ sq ft}$$

$$\text{Pervious Area per Solar Panel} = (\text{Length} + \text{Spacing}) \times \text{Width}$$

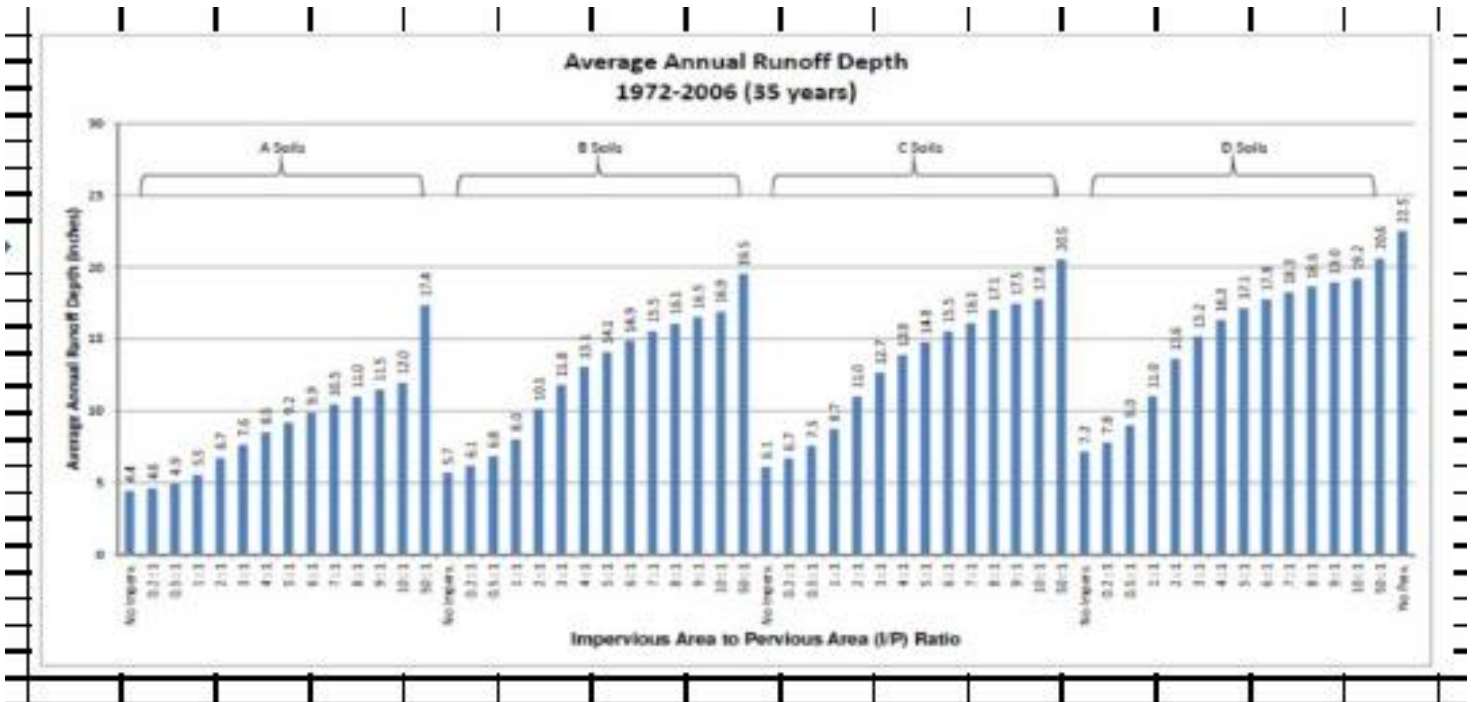
$$\text{Perv Area} = 64.88 \text{ sq ft}$$



To determine the water quality volume per panel

This spreadsheet makes calculations for an individual solar panel.

Enter values in blue cells			
Soil	C		select from dropdown; determine soil on site
I/P ratio	0.320		calculated
Term	Value	Units	
Pervious area	64.88	square feet	user entered; determine on site
Impervious area (area of solar panel)	20.78	square feet	user entered; determine on site
Runoff depth from pervious areas	6.10	inches	default = 4.4 for A soil, 5.7 for B, 6.1 for C, 7.2 for D
Redirected runoff depth from solar panel (called average annual runoff depth)	7.10	inches	determine from plot called Average annual runoff depth →
Runoff depth from solar panel	22.50	inches	default = 22.5 inches
Performance goal	1.00	inches	
SUMMARY			
Pre-disconnection			
Runoff from impervious	39	ft3	calculated
Runoff from pervious	33	ft3	calculated
Total runoff	72	ft3	calculated
Post-disconnection			
Total runoff	51	ft3	calculated
Total runoff reduced	21	ft3	calculated
Runoff from pervious	33	ft3	calculated
Runoff from impervious	18	ft3	calculated
Adjusted impervious	9.441	square feet	calculated
Performance Goal Summary			
Performance goal	1.73	ft3	calculated
BMP volume credit (BMP volume credit)	0.94	ft3	calculated
% of performance goal achieved	54.6	%	calculated
Remaining water quality volume to be treated (per panel)	0.79	ft3	calculated
Pervious area = (Y + Z) * W; where W is the width of the solar panel and Z is the average horizontal distance of the panel			
Impervious area = Z * W; where W is the width of the solar panel and Z is the average horizontal distance of the panel			



To determine the water quality volume for the site, multiply by the number of panels

Minnesota Disconnected Impervious Area Calculations for Solar Panels

Bluestem Road Solar Panels

Total	39,096 panels counted	
Water Quality Volume To Be Treated Per Panel from MN spreadsheet		0.77 cu ft
BMP Volume for Panels (MN method)		30,104 cu ft
Impervious area (equipment pads)		4770 sq ft
BMP Volume = 1" x Imp Area		398 cu ft
Total BMP Volume Required		30,501 cu ft
		0.70 ac-ft

North BMP - Bioswale - excavate down ~ 702 elevation to hold water

Drain by likely existing field tile
Field tile to be confirmed with tile survey
Captures ~ 15% site area
Stores ~ 15% volume required (0.1 ac-ft)

NE BMP - Bioswale - Berm up ~ 711 elevation to hold water

Drain by likely existing field tile
Field tile to be confirmed with tile survey
Captures ~ 5% site area
Stores ~ 5% volume required (0.05 ac-ft)

East BMP - Bioswale - berm up ~ 675 elevation to hold water

Drain by likely existing field tile
Field tile to be confirmed with tile survey
Captures ~ 35% site area
Stores ~ 35% volume required (0.25 ac-ft)

SE BMP - Bioswale - excavate down ~ 661 elevation to hold water

Drain by likely field tile
Field tile to be confirmed with tile survey
Captures ~ 15% site area
Stores ~ 15% volume required (0.1 ac-ft)

SW BMP - Bioswale - excavate down ~ 660 elevation to hold water

Drain by likely field tile
Field tile to be confirmed with tile survey
Captures ~ 15% site area
Stores ~ 15% volume required (0.1 ac-ft)

West BMP - Bioswale - berm up ~ 662 elevation to hold water

Drain by likely field tile
Field tile to be confirmed with tile survey
Captures ~ 20% site area
Stores ~ 20% volume required (0.15 ac-ft)

NW BMP - Bioswale - excavate down ~ 707 elevation to hold water

Drain by likely field tile
Field tile to be confirmed with tile survey
Captures ~ 15% site area
Stores ~ 15% volume required (0.15 ac-ft)

The proposed BMPs to be sized and final engineered with building permit plans.

Floodplain

There is no known floodplain on or near the subject property.

Wetlands

A wetland delineation study has been done for the property. Two small wetlands are located along the shorelines of both ponds. Both will be avoided with the construction of the solar farm.

Drain Tile Survey

There is no known drain tile on the subject property. Pattern drain tile is likely in this location. A drain tile survey will be required with final engineering and building permit.

Overland Flood Routes

There will be minimal site grading. All existing overland flood routes will be maintained.

Erosion Control

The final engineering plans must include appropriate soil erosion and sedimentation control (SESC) measures in compliance with the Kane County Stormwater Ordinance and Illinois EPA regulations. A cover crop is recommended to maintain a minimum 80% vegetative cover.

As the disturbed area exceeds 1 acre, the project will require the submission of a Notice of Intent (NOI) to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) permit.