

Bryden/Stapleton Residence  
1801 Highway 421 N Wilmington NC

### **Rainwater System**

The rainwater system collects rainfall from the roof of the house. The water is filtered through a 32 micron downspout filter before being collected in two 1,200 hundred gallon tanks. The total storage capacity is approximately 2,200 hundred gallons. The water is moved from the tanks by a well pump into the house. As the water enters the house it passes through a 1 micron filter, a UV light, and a .325 micron filter. The resulting water is free of contaminates and is used for all household uses including drinking and bathing.

Maintenance on the system involves periodic cleaning of the downspout filter, changing the two sediment filters about every 10 to 12 months, and changing the UV light every year. Yearly maintenance costs about \$200 in materials. The system could be expanded with the installation of additional storage tanks.

### **Insulation/Ventilation**

The house has spray foam insulation in the floor and the ceiling and blown cellulose insulation in the 6 inch walls. This structure is “super-insulated” (also referred to as “encapsulated”) which is very energy efficient for heating and cooling. There is a full-time ventilation system which draws air from inside the house and mixes it with outside air. The mixture is approximately two parts interior air to one part outside air. The air then passes through an air filter before returning to the house interior.

### **Photovoltaic System**

The electric system on the house is a grid tied (Duke Progress Energy) solar system with battery storage. Excess solar production can be returned to the grid for a credit. For 2023, about \$300 was paid for grid supplied power in an all electric home.

The system: Size is 8.16 kWdc. Battery storage capacity is 20kWh. Estimated one year solar energy production is 11,146 kWh. Product warranty is 25 years (parts and labor). Installation was by Cape Fear Solar Systems in May of 2021. The system has an internet portal which provides complete system diagnostics and settings, history of system performance, and a real time view of system production.

Components: The photovoltaic system consists of 24 LG340 watt panels with micro inverters (roof mounted). The battery storage is 2 Enphase Encharge 10's with 3 batteries in each unit with a total storage capacity of 20kWh.