



**Tertiary Filtration
Rehabilitation
Fairfax County
Contract # 16058-001**

Noman M. Cole, Jr.
Pollution Control Plant
9399 - J Richmond
Highway
Lorton, VA 22079



**Figure 1. Backwash Pump Station Electrical Room:
New Switchboard & Variable Frequency Drives**

Ulliman Schutte Construction
(General Contractor)
9111 Springboro Pike
Miamisburg, OH 45342

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Cynergy performed a \$1,796,005 contract for the Ulliman Schutte Construction Company. All work took place throughout an existing wastewater treatment plant that remained in full operation. Cynergy's work took place within several existing locations; DD Filter Facility, NN Building, G building, and the New EE Facility Electrical Room and Pump Room

Five total sequential shutdowns were conducted for the DD Filter Facility to install improvements and conduct commissioning, of two filters at a time, to revamp ten filters. **Before an outage could begin, the specified gravity filters and pumps were shut down in order to isolate, drain, and hose down the wastewater and sludge within each basin.** Each filter required demolition of communication and power conduit for existing valves. All valves and instruments were demolished and replaced with new instrumentation controls.

A new building was constructed for the backwash pump station called the EE Facility. Within the new electrical room, of the EE Facility, Cynergy installed an 800-amp Switchboard, four 80HP variable frequency drives, lighting, panelboards, and conduit down to the pump rooms which extended outside towards the filter tanks where new site lighting was installed. In order to keep the plant operational an 800-amp NEMA-3R non-walk-in enclosed Switchboard Bypass was installed to provide temporary power to the S building and the main pumps. One of the most complex features of this project was logistics necessary to perform the number of outages and LO/TO to keep the plant

operational, while installing new equipment. Feeders were installed through existing and new manholes/duct-banks to connect an existing DC-20 switchboard. A detailed construction sequence was developed and had to be approved by the owner before any outage could begin. Once the Switchboard within the EE Facility was energized, the Temporary Bypass Switchboard could be disconnected and removed.

The sites existing Plant Wide Process Control System (PWPCS) was renovated to include new fiber optic communication cable to extend to the rehabilitated portions of the plant to monitor controls. Cynergy Electric installed new speakers, and telephones to connect to the existing PA System. Our associates completed all grounding requirements and coordinated a complete lightning protection system for the new EE backwash pump station facility.



Figure 2. Conduits going through floor chase from new EE Pump Room to Electrical Room

Principle features of the project included:

- 800-amp 480Y277 Volt Switchboard NEMA 1
- 800-amp Temporary Switchboard-Bypass NEMA 3R
- Four 480 Volt 80HP Variable Frequency Drives
- PA/Fiber Additions & Modifications
- New Indoor, Emergency & Site Lighting
- New Panelboards, Safety Switches, and Large Pull-Boxes
- New Grounding System
- Demolition of Conduit & Controls
- Installation of New Conduit, Wire & Instrumentation Controls

Miscellaneous installation items included a temporary generator, panelboards and load-centers, duct-bank conduit and supports, a dry-type transformer, a Mini Power Center, surge protective devices, control circuits, and fireproofing, etc. Cynergy completed all power connections for mechanically installed motors, pumps, fans, heat trace, and heaters. Our team coordinated with an engineering firm to provide detailed 2D and 3D CAD electrical conduit and wiring layout drawings to show all feeder and control conduit designations to and from each piece of equipment.

Commissioning, operational demonstration of all systems and field testing were a large component in the project. Third party testing was provided for all NETA required testing on equipment, ground systems and cables. Factory field services were provided for the switchgear, variable frequency drives and control systems. Hands on training and operation and maintenance manuals were provided for all operational systems. Other items provided by Cynergy were construction scheduling, quality control, safety and security which were important elements of the entire project.



Figure 3. DD Building Filter Instrumentation Controls