

For these reasons, the subject property should qualify for a special exception to be served by a private grinder pump station and force main.

3. Design Standards

The analysis was conducted in conformance with the following standards:

- New Castle County Department of Public Works (NCCDPW) Sewer Design Policy No. 7, May 1, 2012 (last revised August 16, 2024)
- Recommended Standards for Wastewater Facilities ("Ten State Standards"), 2014 edition.

4. Pump Station Design Flows

The pump station will convey flow from the proposed guard shack and bathrooms located on the southern corner of the proposed warehouse. Table 1 shows the average and peak daily flows for the pump station.

Table 1. Pump Station Design Flows

Description	Average Daily Flow (GPD)	Peak Factor	Peak Hourly Flow (GPD)	Peak Hourly Flow (GPM)
Southern Warehouse Bathrooms	1,050	4	4,200	2.9
Guard Shack	350	4	1,400	1.0
TOTAL	1,400	4	5,600	3.9

5. Pump Station Design

The design for the pump station was based on a Myers duplex submersible grinder pump package. The pump station wet well will be a 36-inch diameter fiberglass basin with a concrete anti-flotation base. The wet well is sized to have sufficient volume to allow no more than six pump starts per hour in accordance with NCCDPW Sewer Design Policy No. SS 7. The recommended pump is a WGX20 series, Model WX20-43, with a 4-inch impeller, and a 2 HP motor operated at 3450 RPM. The design point for the pump station is 27.5 gpm at 20.9 feet TDH. Pump station calculations and system curve are included in **Attachment A**.

6. Force Main Design

The force main is sized to provide a minimum cleansing velocity of 2.0 feet per second at the design pump flow rate in accordance with NCCDPW Sewer Design Policy No. SS 7. **Table 2** shows the size and velocity of the proposed force main.

Table 2. Force Main Sizing and Velocity

Design Pump Flow Rate (GPM)	2" HDPE DR 11 I.D. (inches)	Pipe Velocity (ft/sec)
27.5	1.92	3.05

The total length of the force main will be approximately 634 feet. In-line cleanouts will be provided at 400-foot maximum intervals along the force main. The force main will be installed with direct bury tracer wire and metallic locator tape to facilitate locating the underground pipelines. Soil markers will also be set at regular intervals on the ground surface above the force mains in non-paved areas. The force main will discharge to SMH-101 of the proposed on-site sanitary sewer system.

Should you have any questions concerning this memo or require any further information, please feel free to contact me.

Respectfully,
VERDANTAS



Ryan K. Minnick, P.E.
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