



Conceptual Design Report Haverstraw Water Supply Project

Prepared for

United Water New York

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Section 5. Treatment Facility Layout

5.1 Introduction

As previously discussed, the plant will be constructed in three phases. During the first phase, the design capacity of the treatment facility will be 2.5 mgd. The facility will be expanded to a total capacity of 7.5 mgd in two subsequent, equal incremental expansion phases.

This chapter presents the plant layout options. Conceptual level building sizes, location, and profiles are also included.

5.2 Plant Layout

5.2.1 Location

The location of the plant has not yet been finalized. However, the proposed site layouts provided in this document are based on the plant being constructed in the Town of Haverstraw, to the west of Haverstraw Bay County Park and to the northwest of the town's existing wastewater treatment plant. An aerial view of the site is shown in Figure 5-1.

At this location, the proposed water treatment plant is bordered by two railroads: the Railroad Spur to U.S. Gypsum (southeast of the plant – not in use) and the Consolidated Rail Corporation (west of the plant).



Figure 5-1 Aerial View of the Water Treatment Plant Location in Haverstraw

5.2.2 Site Survey

Atzl performed a site survey of the proposed water treatment plant location and the Haverstraw Landfill area. The survey information can be found in Appendix F.

5.2.3 Geotechnical Information

A geotechnical report has not been issued since the site location has not been finalized. UWNYP conducted a preliminary geotechnical investigation at the proposed site. Subsequently, two deep borings were drilled in February 2008 at the treatment plant site location in order to collect geotechnical data to be used for the preliminary foundation design. The geotechnical data for the February 2008 borings are available in Appendix G.

5.2.4 Plant Layout Options

Four alternative layouts have been developed for the water treatment plant. These layouts are based on site grading, building dimensions and process flow. The liquid process schematics is shown in Figure 5-2. Factors such as operator access and aesthetics have also been considered. The layouts consider facilities needed for plant production of 7.5 mgd. In general, all options are similar. However, the location of a road on the west side of the plant will make it more difficult for future plant expansion. For phased construction, the east side of the buildings would be built during the first phase and then the west side during the second phase. Another element that will have major impact on selection of the site layout is the architectural design and considerations. Each of the options is described below.

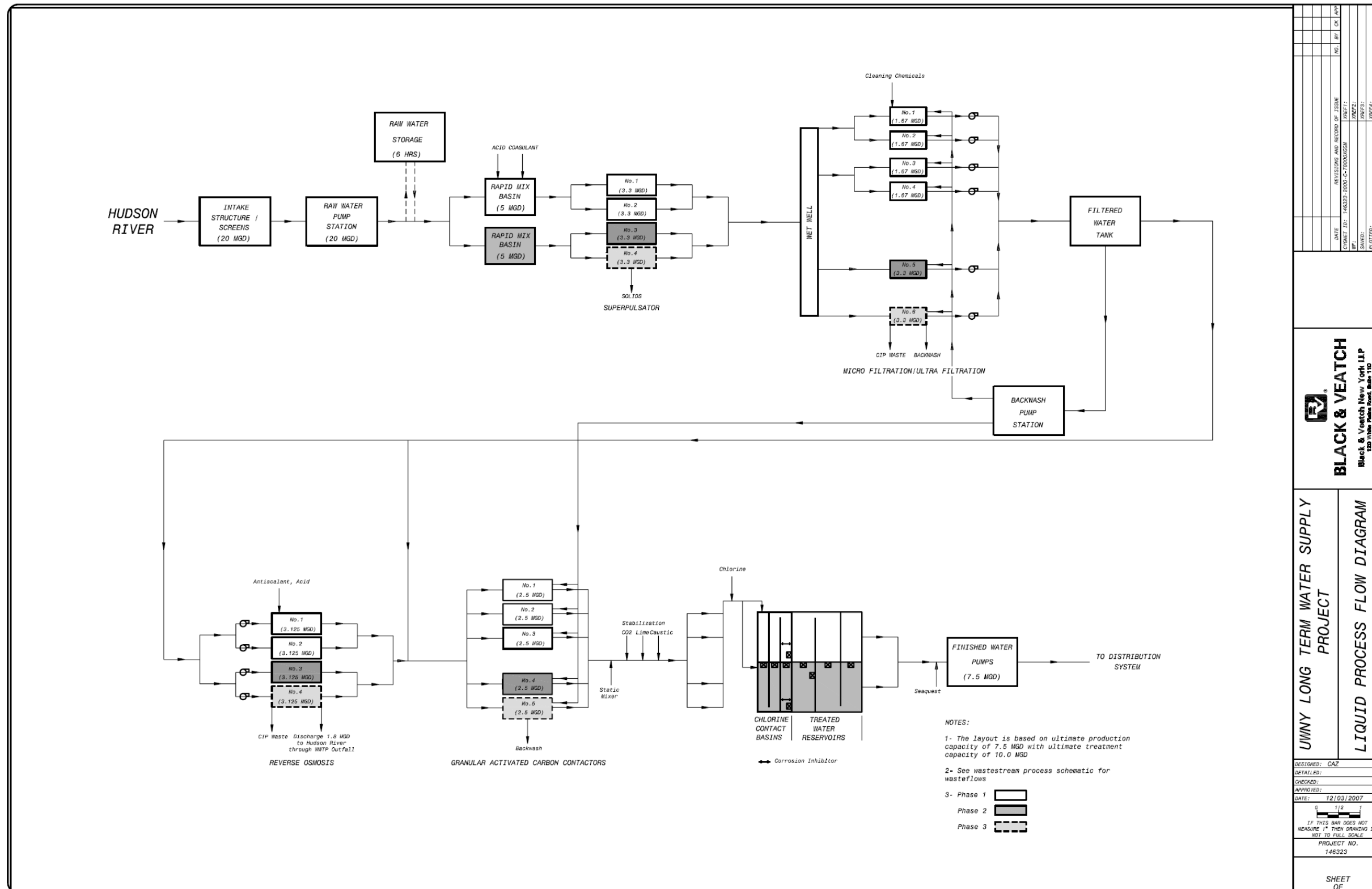


Figure 5-2 Liquid Flow Schematic

5.2.4.1 Option 1: Plan and Profile

Plan and profile drawings for Option 1 are provided in Figure 5-3 and Figure 5-4. This option utilizes the natural grades of the site. The administration building is located at the plant entrance (south side of the plant). The Superpulsator® building is laid out in a rectangular shape with the four treatment trains parallel to one another.

Advantages:

- Decreased fill volume
- Fewer retaining walls
- Stream-lined yard piping
- Administration building is the first sight upon entering the plant
- Chemical feed building is centrally located

Disadvantages:

- Plant located at low elevations (looking down from access road)
- Difficult to design finished water pump station on top of treated water reservoir

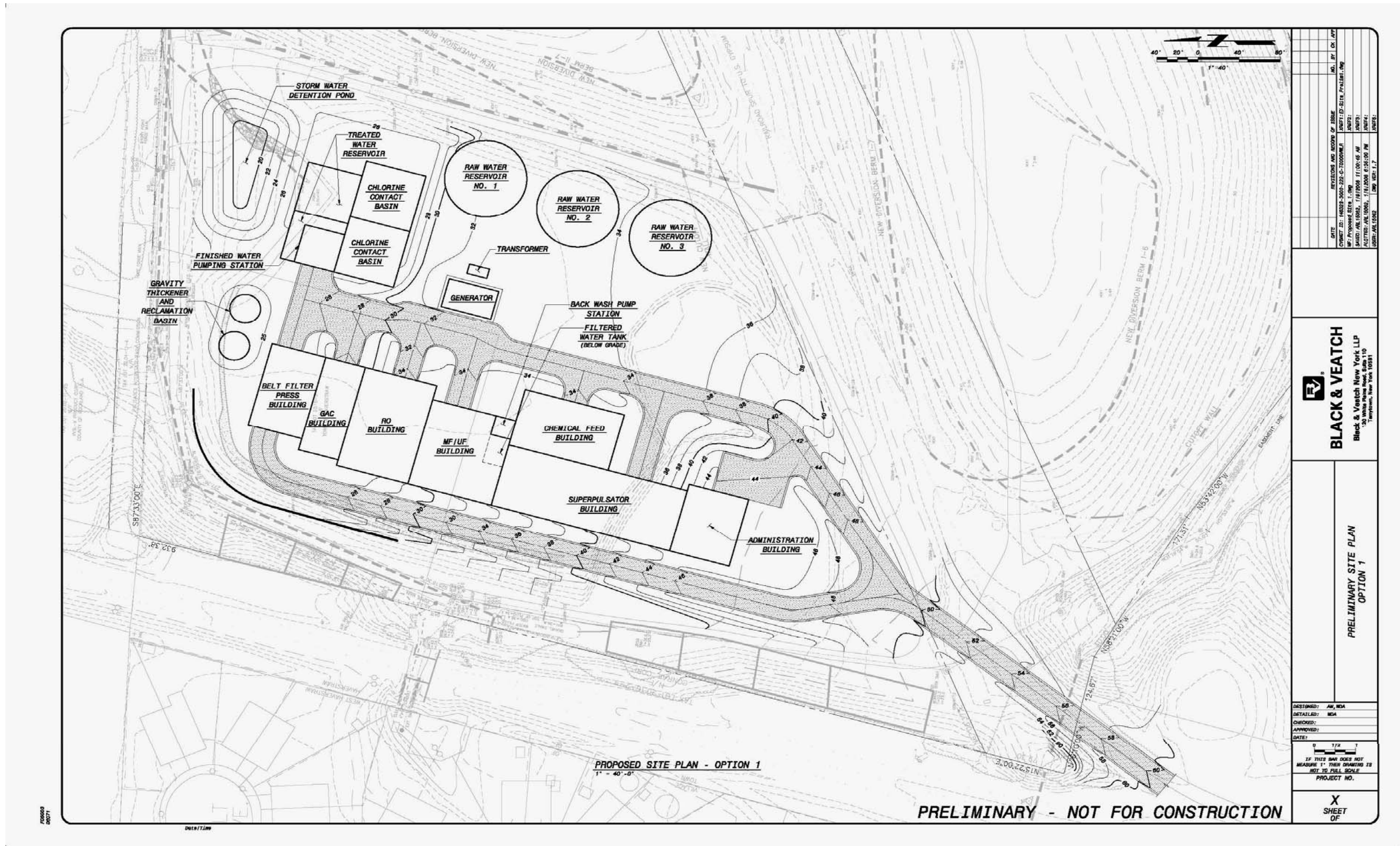
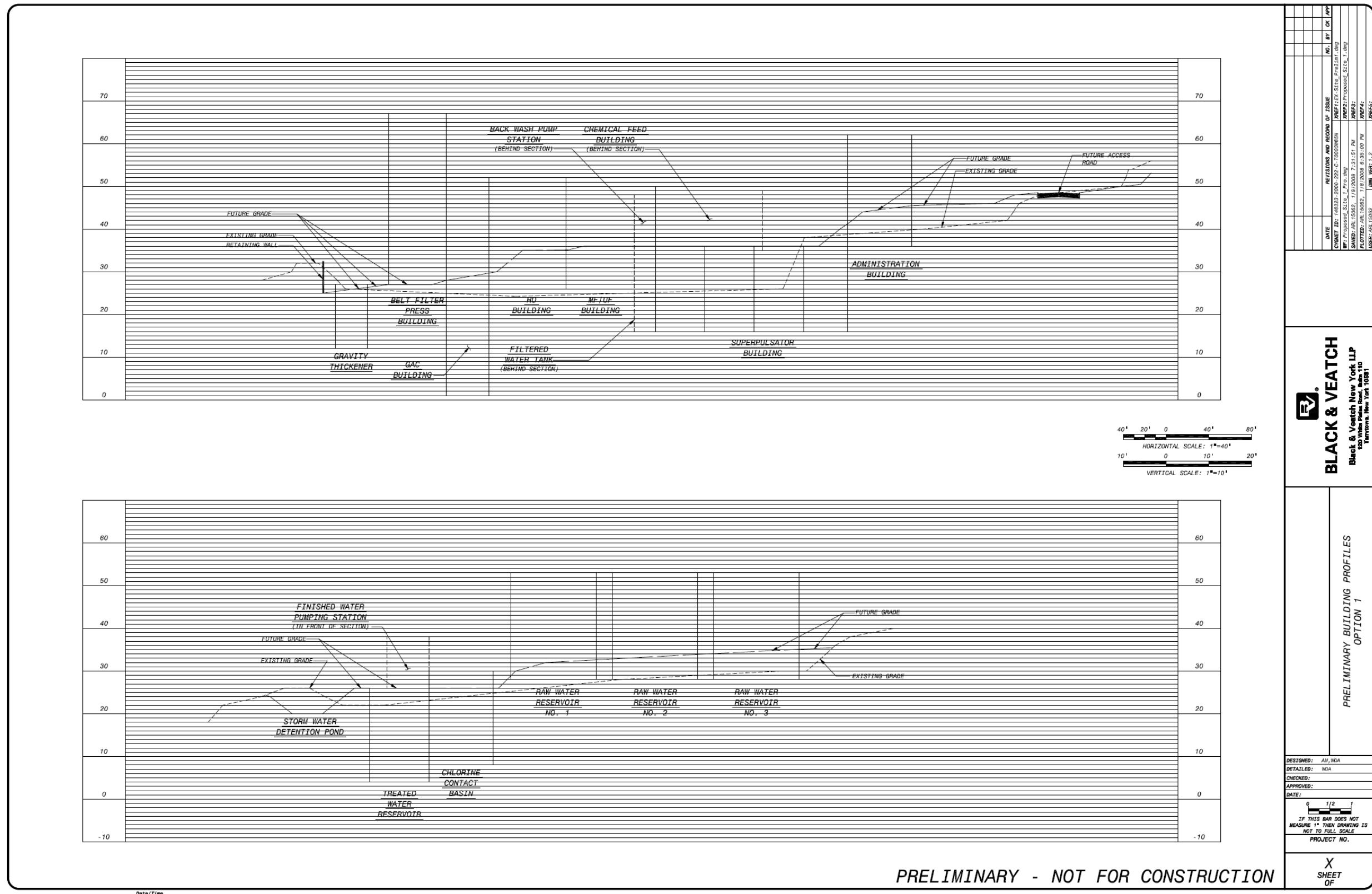


Figure 5-3 Option 1 Plan View



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Figure 5-4 Option 1 Profile View

5.2.4.2 Option 2: Plan and Profile

Plan and profile drawings for Option 2 are provided in Figure 5-5 and Figure 5-6. This option requires regrading of a majority of the site. The administration building has been shifted and the parking area for the administration building is located at the plant entrance (south side of the plant). The Superpulsator® building is laid out in a square shape to allow phased construction of this building.

Advantages:

- Easier for phased construction
- Stream-lined yard piping
- Plant at a higher elevation

Disadvantages:

- Increased fill volume
- More retaining walls
- Parking area is first sight when entering plant
- Chemical feed building is not centrally located
- Difficult to design finished water pump station on top of treated water reservoir

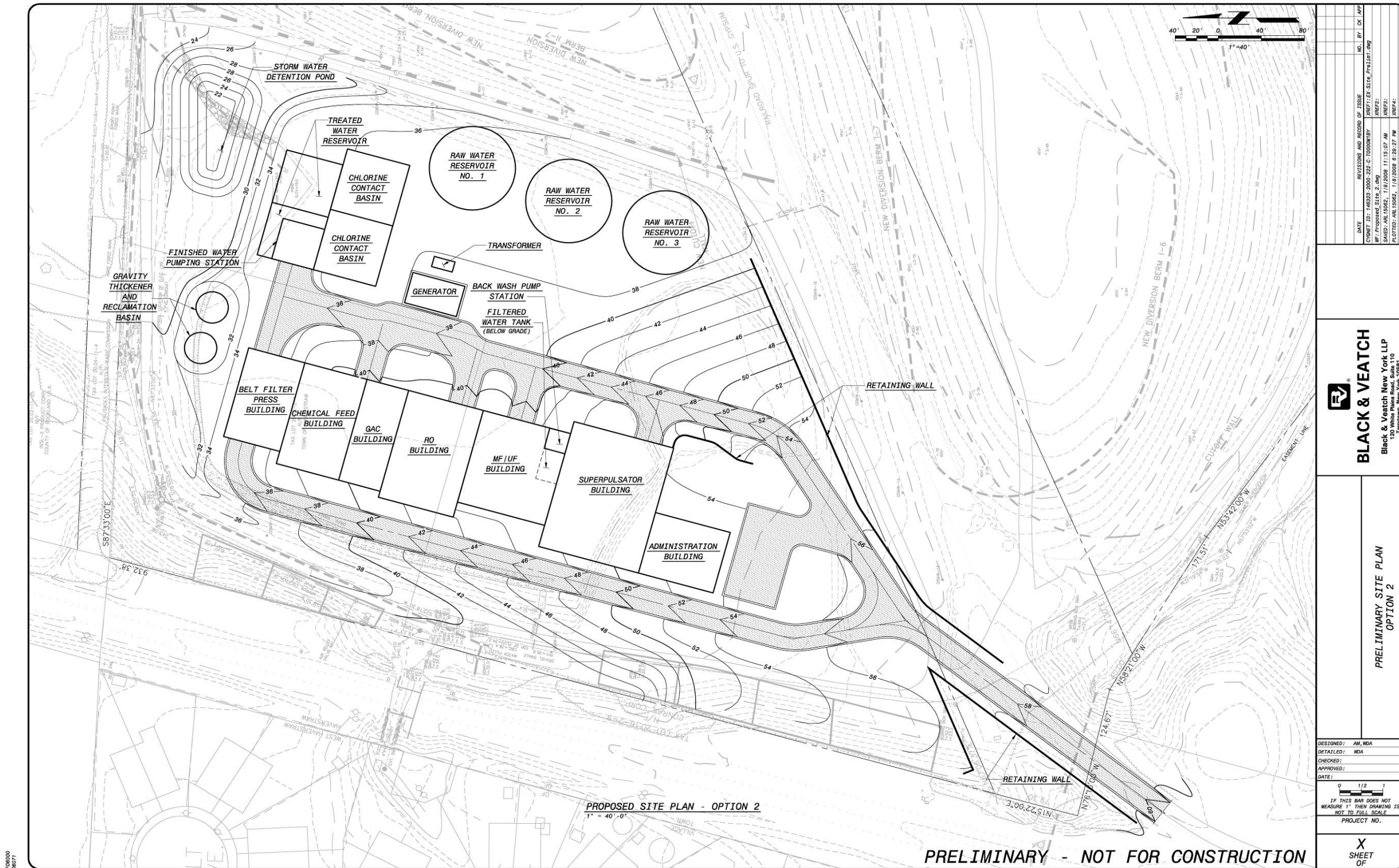
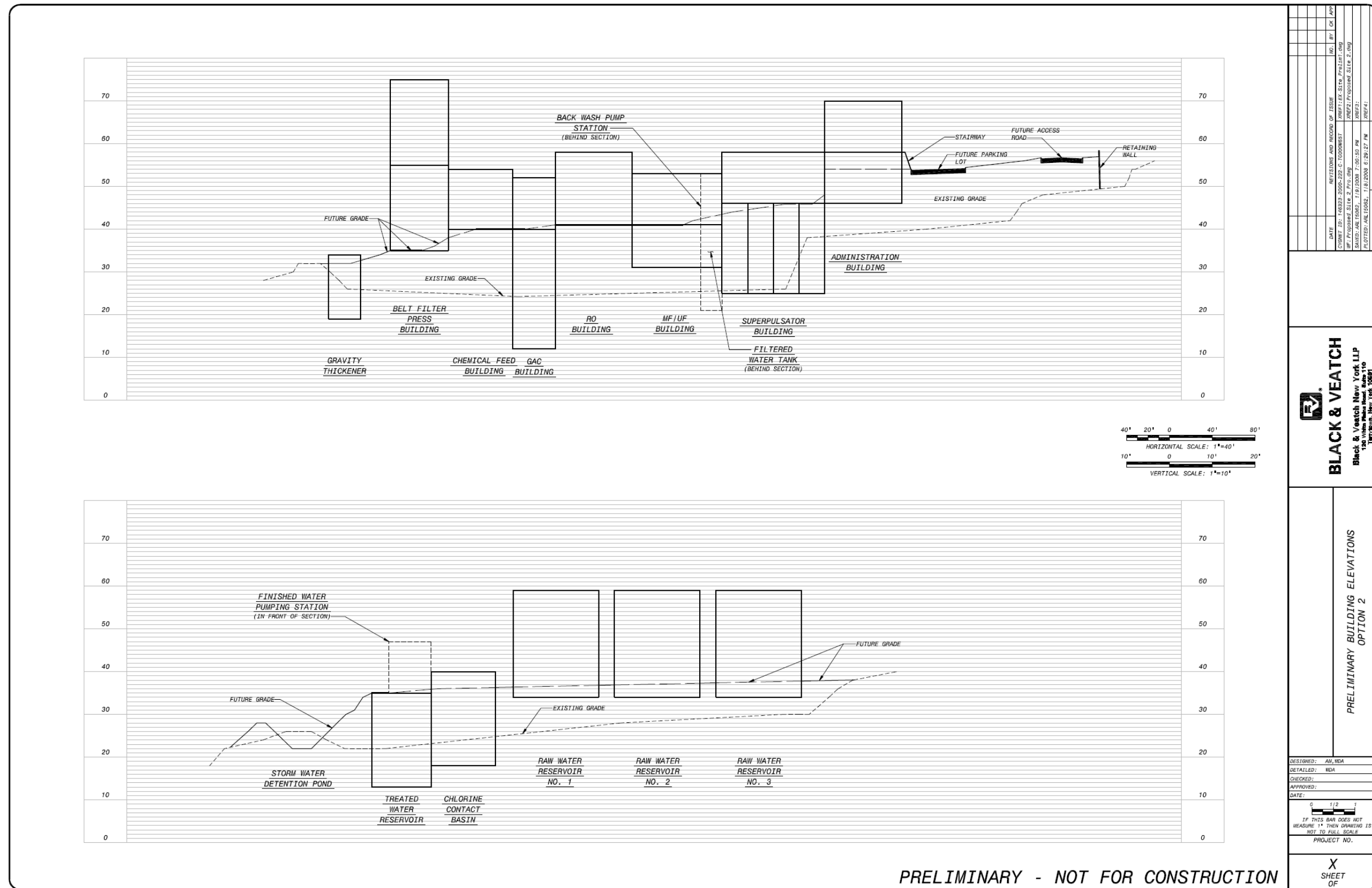


Figure 5-5 Option 2 Plan View



PRELIMINARY - NOT FOR CONSTRUCTION

Figure 5-6 Option 2 Profile View

5.2.4.3 Option 3: Plan and Profile

Plan and profile drawings for Option 3 are provided in Figure 5-7 and Figure 5-8. This option also utilizes the natural grades of the site. The administration building is located to the east side of the plant site. The raw water storage tanks are located at the southeast of the plant site. The Superpulsator® building is laid out in a square shape. There is only one access drive down the center of the plant site. The administration building is a single story structure.

Advantages:

- Decreased excavation volume
- Fewer retaining walls
- Stream-lined yard piping
- Chemical feed building is centrally located

Disadvantages:

- Not aesthetically pleasing; first sight upon plant entrance is raw water reservoirs
- Building access limited to one side
- Finished water pumping station not on top of the treated water reservoir

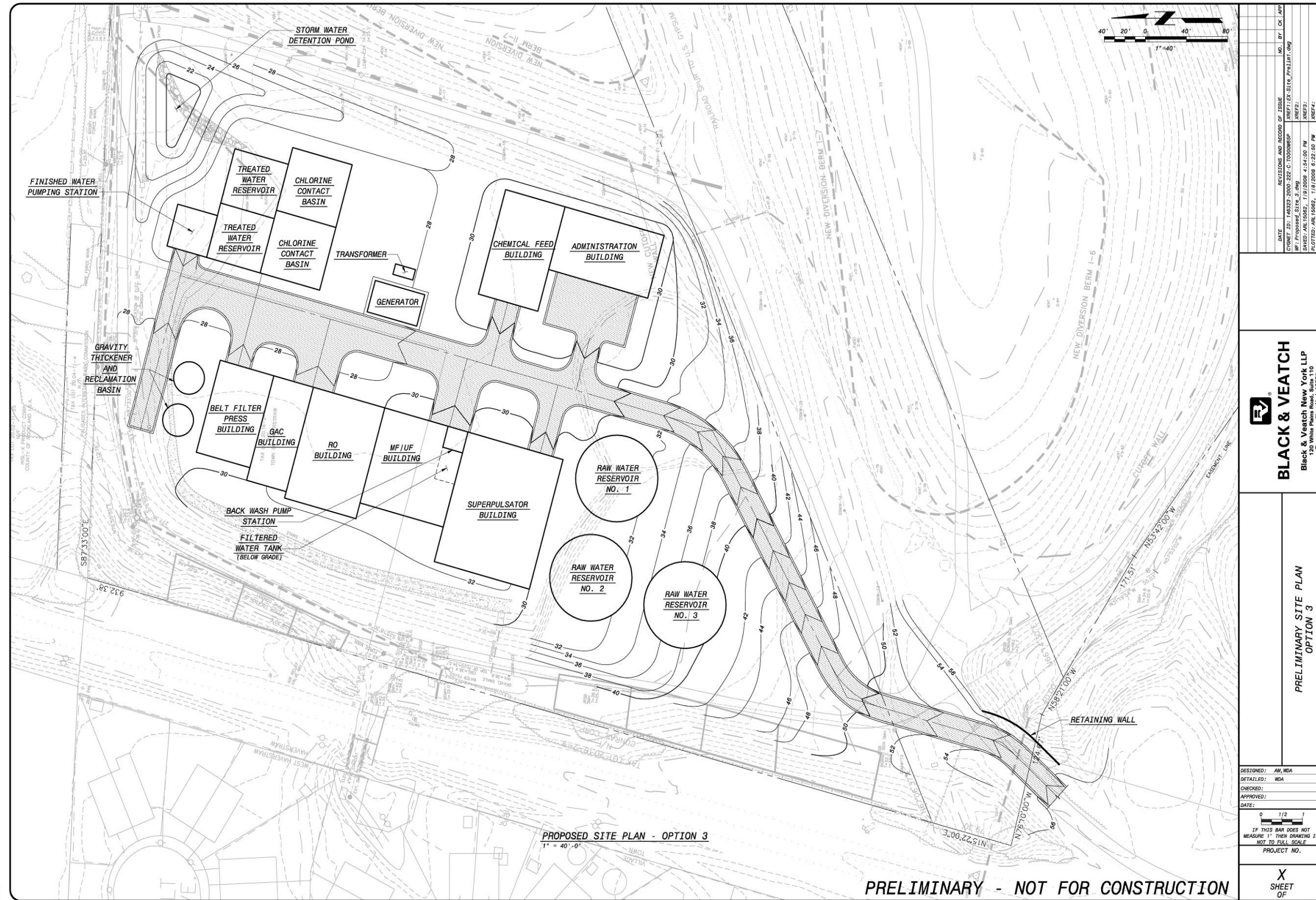
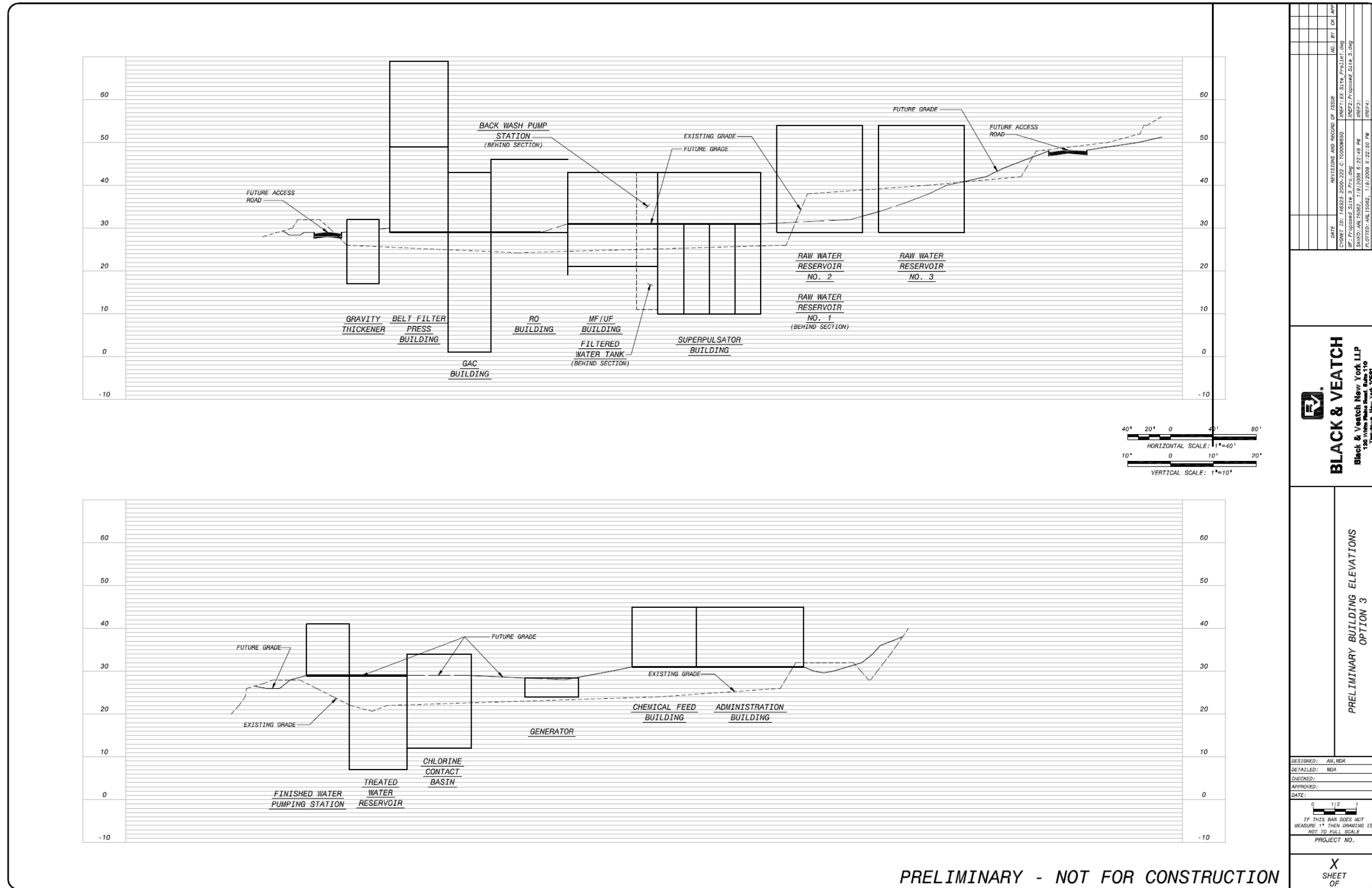


Figure 5-7 Option 3 Plan View



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BLACK & VEATCH
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 110 West 47th Street
 New York, New York 10036

PRELIMINARY BUILDING ELEVATIONS
 OPTION 3

DESIGNED: AM, NEM
 DETAILED: NEM
 CHECKED:
 APPROVED:
 DATE:

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.

X
 SHEET
 OF

Figure 5-8 Option 3 Profile View

5.2.4.4 Option 4: Plan and Profile

Plan and profile drawings for Option 4 are provided in Figure 5-9 and Figure 5-10.

This option utilizes the natural grades of the site. The administration building is located at the plant entrance (south side of the plant). The Superpulsator® building is laid out in a square shape.

Advantages:

- Less fill volume than other options
- Fewer retaining walls
- Stream-lined yard piping
- Multiple access to main process buildings
- Access road more level than other options
- Finished water pumping station not on top of the treated water reservoir

Disadvantages:

- Plant located at the lowest elevation compared to other options
- Most site excavation
- Parking area is first sight when entering plant
- Chemical feed building is not centrally located

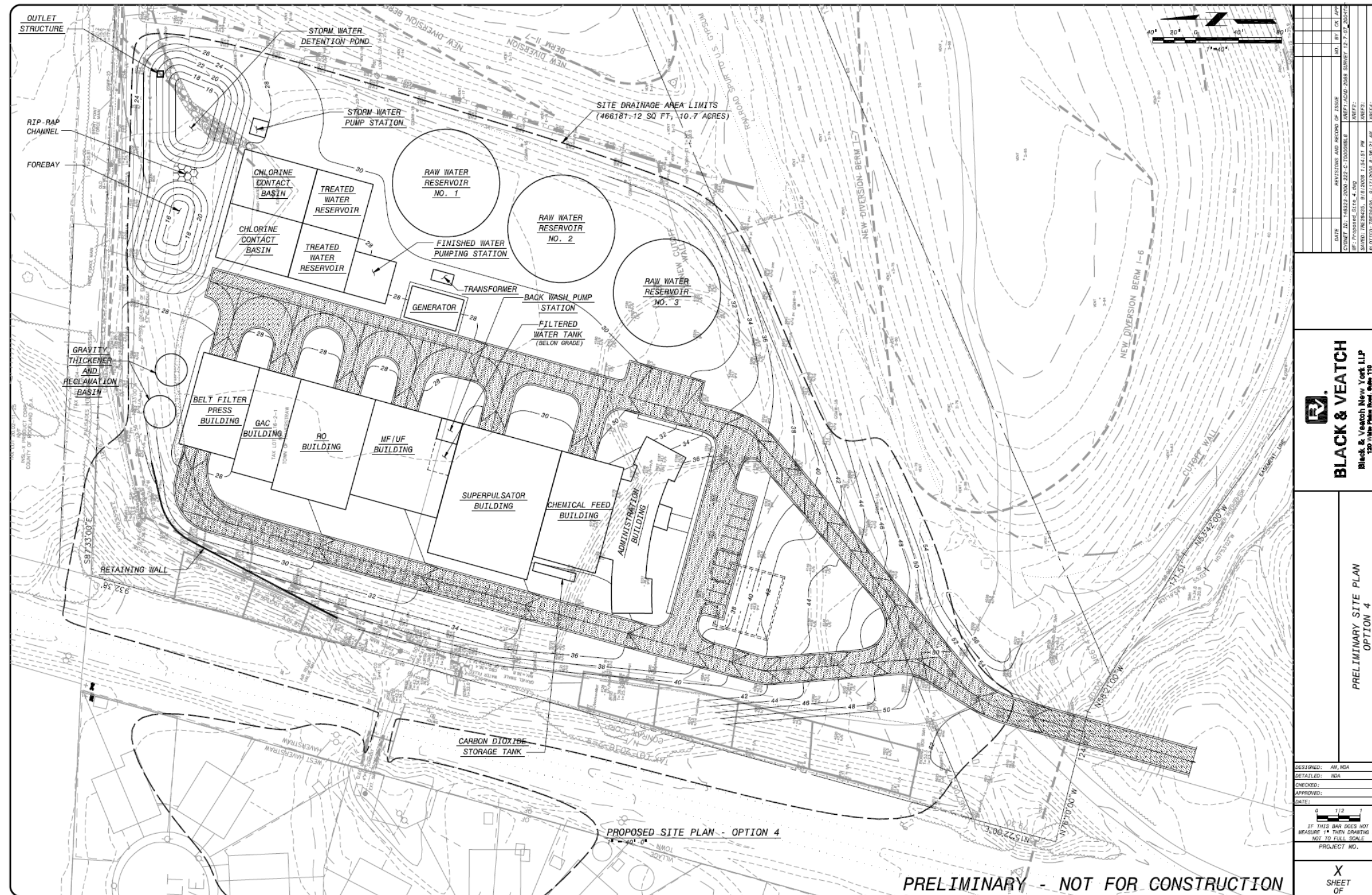


Figure 5-9 Option 4 Plan View

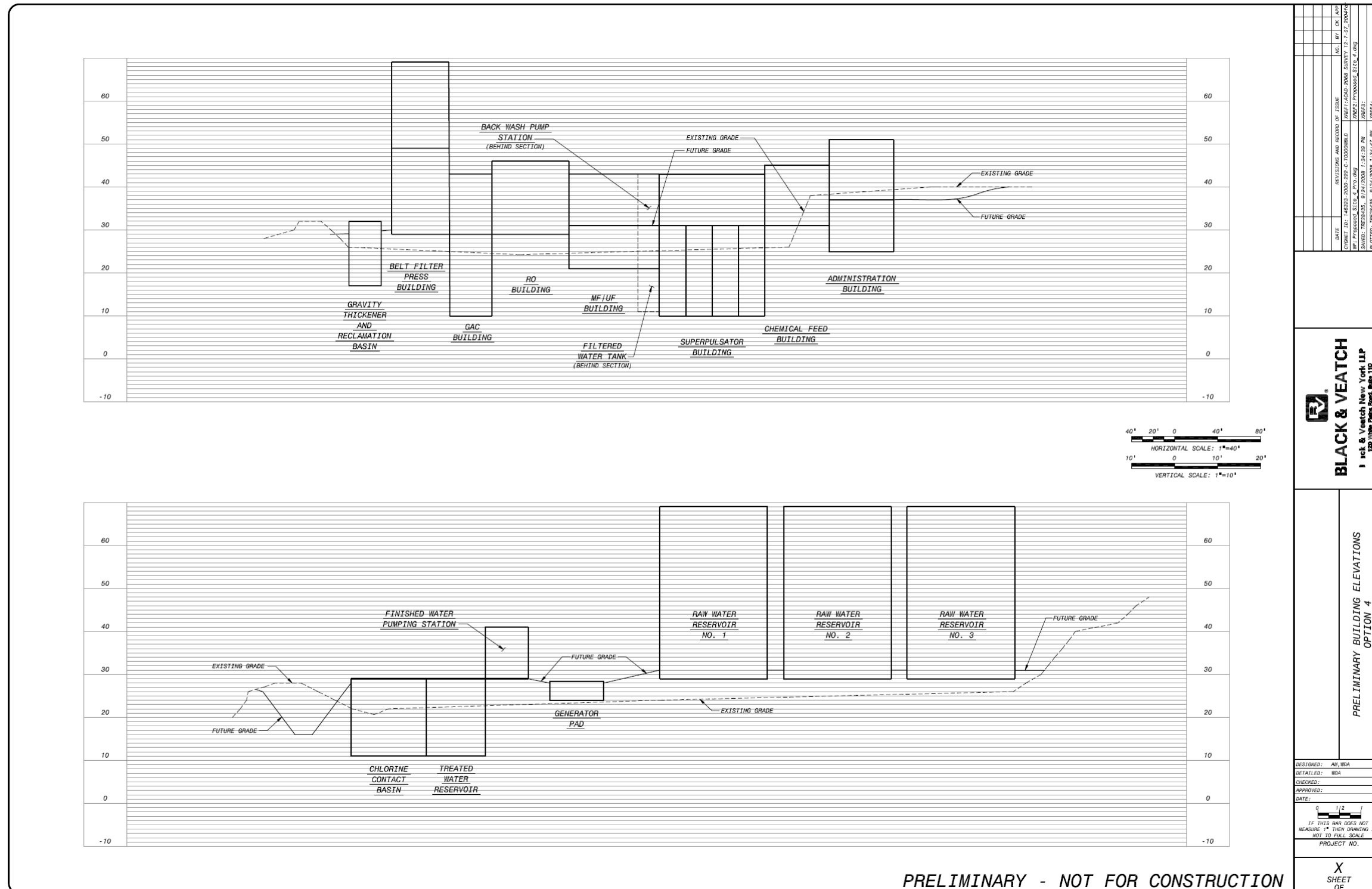


Figure 5-10 Option 4 Profile View

PRELIMINARY - NOT FOR CONSTRUCTION

5.2.5 Recommendations

For the site layout options discussed in this section, buildings were located adjacent to one another in order to minimize yard piping and utilize the available site. The site layouts resemble process flow pattern and consider going by gravity from an upstream train to the next downstream train where applicable.

Option 4 was selected as the most feasible site layout. It utilizes natural grade and is more aesthetically pleasing than the other options. This layout provides better operator access from building to building and requires less fill material.