Presentation to

Wastewater Advisory Committee

Ward Street and Columbus Park Headworks Design Progress

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Upgrades at MWRA Remote Headworks Facilities

Wastewater from the MWRA's Northern Service Area is collected at 3 remote headworks facilities before reaching DITP:

- Chelsea Creek Headworks
- Ward Street Headworks
- Columbus Park Headworks

Preliminary treatment at the headworks facilities involves grit and screenings removal, which prevents additional wear and maintenance issues at the DITP.

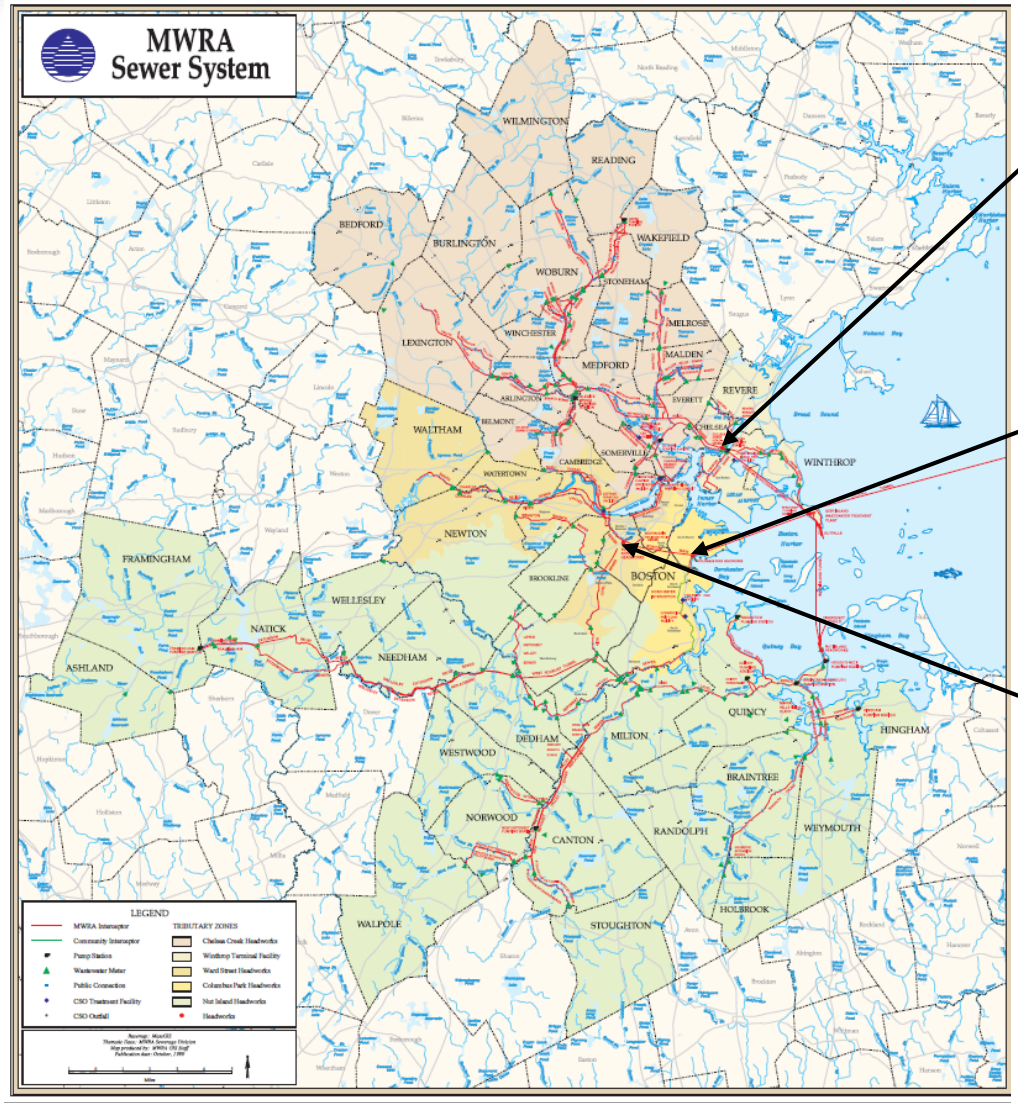
The overall project goal is to extend the service life of the remote headworks for the next 20-50 years.

Project scope includes:

- Improvements to meet current and anticipated codes and security requirements;
- Removal and replacement of equipment and systems at or nearing the end of their useful life:
  - replacement/automation of screenings and grit removal and conveyance systems,
  - replacement of influent and effluent gates and actuators,
  - new odor control and HVAC systems with added redundancy, and
  - upgrades to electrical and instrumentation systems

Contract 7429, Ward Street and Columbus Park Headworks Upgrade Design, was executed on January 21, 2021.

MWRA Remote Headworks Facilities



Chelsea Creek Headworks

- Combined and separated sewer systems. Northwest system tributary areas
- Peak Capacity (350 MGD); Avg. Flow (135 MGD)

Columbus Park Headworks

- Mostly combined sewer systems from Boston
- Peak Capacity (182 MGD); Avg. Flow (60 MGD)

Ward Street Headworks

- Mostly combined sewer systems from Cambridge Boston with flows from Brookline, Waltham, Newton & Watertown
- Peak Capacity (256 MGD); Avg. Flow (90 MGD)

Location Plan

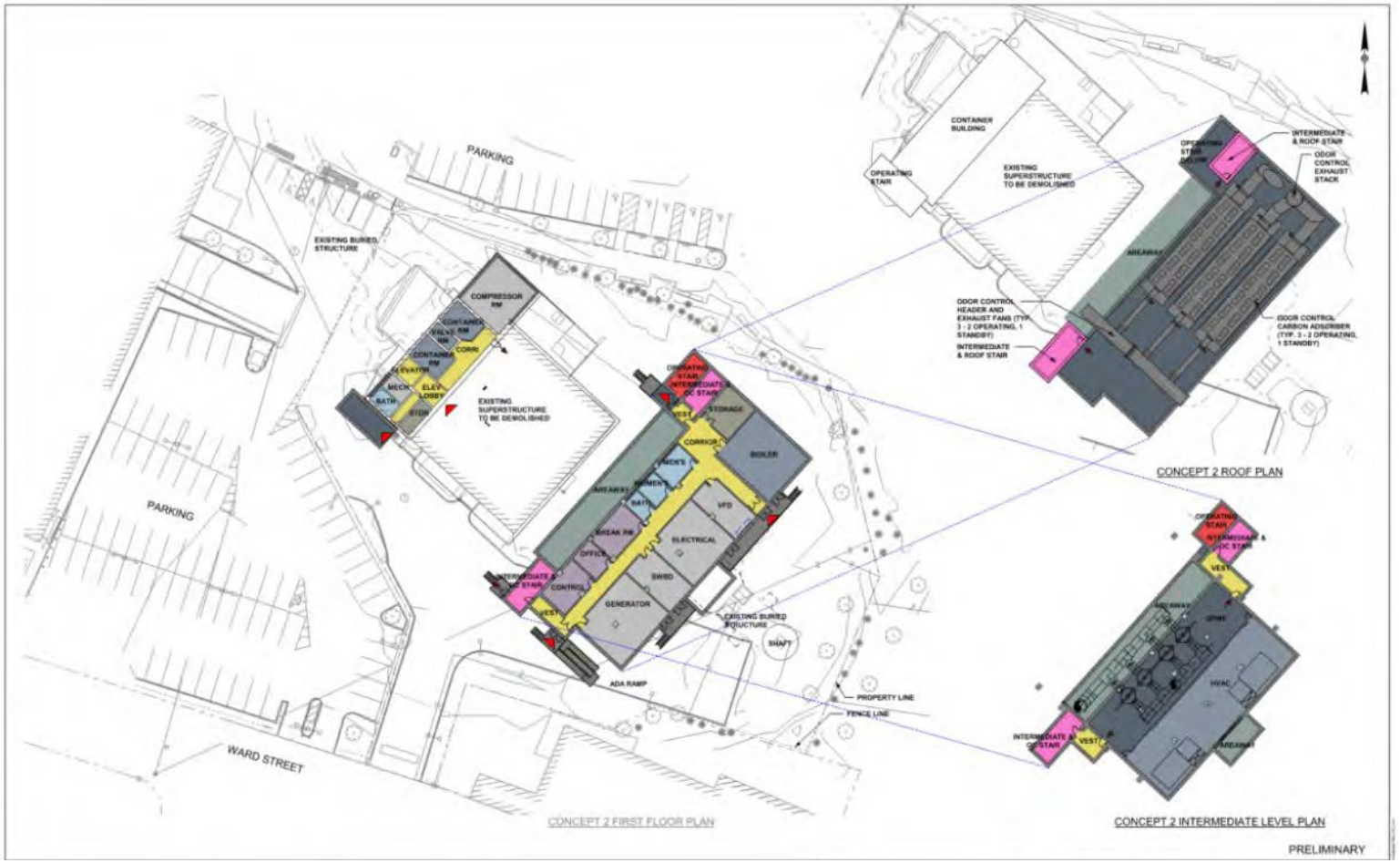
New Facility Evaluation

- An evaluation of the feasibility of building a new superstructure over the existing substructure at each location was performed, and found to be feasible:
  - A new building will be constructed over the underground structure to house functions currently located in the superstructure
    - This will allow new electrical, SCADA, compressed air, generator, odor control, HVAC and ancillary systems to be built before the old systems are demolished, minimizing the need for temporary systems.
    - Eliminates the need to relocate staff during construction

Existing Columbus Park Headworks

Existing Ward Street Headworks

Improved Layout at Completion of Construction



Building a new superstructure allows for a more efficient layout of equipment and systems.

Conceptual Rendering of New Superstructure (Ward St.)

- A new one-story Operations Building will be constructed over a new Intermediate Level (constructed over the existing grit channels).
- The Intermediate Level structure will house the odor control grease filters and makeup air handlers for the process areas.
- A new Container Building will be constructed to house the two roll-off grit and screenings containers, elevator and air compressors.
- The new activated carbon odor control system will be installed on top of the one-story Operations Building.

Existing Conditions and Sequencing

- Documentation of Existing Conditions
  - Facilities have been scanned using 360º Color Terrestrial 3D Laser Scanning with image documentation
    - 3D Revit models being developed from scans will be used for design
  - Each component to be identified as to its function, and whether it is active or abandoned

- Sequence of Construction will:
  - Identify items which have been abandoned and are to be demolished
  - Identify items which get replaced, either in their existing location or at a new location, and identify whether they need to remain active during construction
    - Identify acceptable down times for specific items, and timing of relocations/replacements
    - Identify need for temporary systems

Design Progress to Date
Ward Street and Columbus Park Headworks

- Investigations completed with results incorporated into the Design Report include:
  - New facility evaluation
  - Geotechnical and hazardous materials investigations
  - Hazardous building materials investigations
  - Hydraulic analysis
  - Concrete channel inspections
  - Noise monitoring
  - Area classification analysis
  - Evaluation of construction contract packaging for bidding

- Design Report
  - Currently under review
    - Workshop to be held on 1/13/23.

Catenary Screens and Extreme Wet Weather

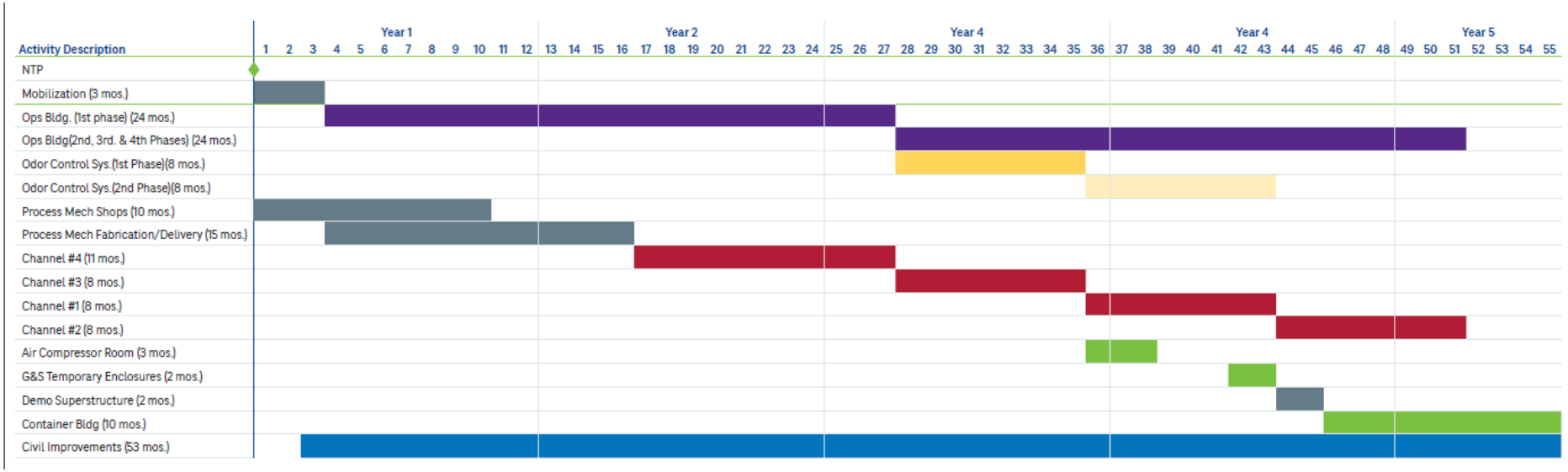
- During extreme wet weather events, the influent gates are “choked,” creating extremely high velocities between the gates and the catenary screens.

- A scale model will be used to evaluate installation of a planar baffle to dissipate these high velocities.

Clemson Engineering Hydraulics laboratory

Preliminary Schedule

- Contract 7429, Ward Street and Columbus Park Headworks Upgrade Design, was executed on January 21, 2021.
- Design Report received on December 16, 2022.
- Final Design Duration 24 months (requires a separate Notice to Proceed)
- Bidding – dependent on packaging and spacing of construction contracts
- Very Preliminary Construction Schedule: 55 months per facility



Related Construction: Shaft Access Improvements Project

- Installation of new pre-cast, removable concrete covers on shafts at Ward Street and Columbus Park Headworks
  - Removable covers will allow full access to shaft walls for further inspection and future rehabilitation
  - Interior grating will be removed, and new level sensors will be installed through the covers
  - Covers to be similar to those at DITP and Nut Island

Rendering of Improved Headworks Facility
Columbus Park Headworks