

Medina Pump Station Header Replacement

City of Medina
Feb. 13, 2023



King County

Department of
Natural Resources and Parks
Wastewater Treatment Division

Project Description

The Medina Pump Station Header Replacement Project is a critical asset replacement project which will replace key components of the Raw Sewage Pump (RSP) room.

Due to the age and design of the existing facility, operations and maintenance is unable to provide proper inspection, maintenance, or repair of the four RSPs and check valves at the station, because it is not possible to isolate the pumps.

This project will replace the pump room header and install new suction, discharge and check valves for each RSP, as well as installation of a pipe fitting to provide permanent bypassing capability to the station.

The design of these new components includes connections and isolation valves previously used only at treatment plants and will allow for the ability to isolate and repair sections, rather than entire systems, and without having to drain the force main to bypass the station for repairs in the future.

The Medina Pump Station Header Replacement Project is scheduled for construction in the dry season this year, during two to four weeks, in July and August 2023.



Project Urgency

The pipes are in critical need of replacement. The wall thickness of the header pipe inside of the station is “paper thin and in imminent threat of failure.”

King County’s goal is to complete this project as a critical asset replacement project with the ability to control the level of impact to the local community.

This work needs to be completed during the dry season.

During construction, the work that will be visible to the community includes:

- Use of temporary bypass pumps for approximate two weeks, directly outside of the pump station, and within the footprint of the facility.
- To install the permanent bypass, the 1.5-mile force main will be drained into the wet well at the station and hauled by septage haulers for release at Wilburton Siphon. This is expected to take 6-8 hours during a single night in the dry season.

Project Urgency

If the work is delayed, and an emergency repair becomes necessary, the ability to control the impacts and duration of the work will be lost.

A failure of pipes or pumps would likely flood the station and require months of repair and restoration to return the station to operation. In this case, the result would be a larger, more disruptive project requiring a longer-term bypass project while the station is restored.

Significant impacts to the community could include:

- Wastewater overflows into Lake Washington.
- Noise and traffic impacts, due to septage haulers 24/7 until a bypass is installed.



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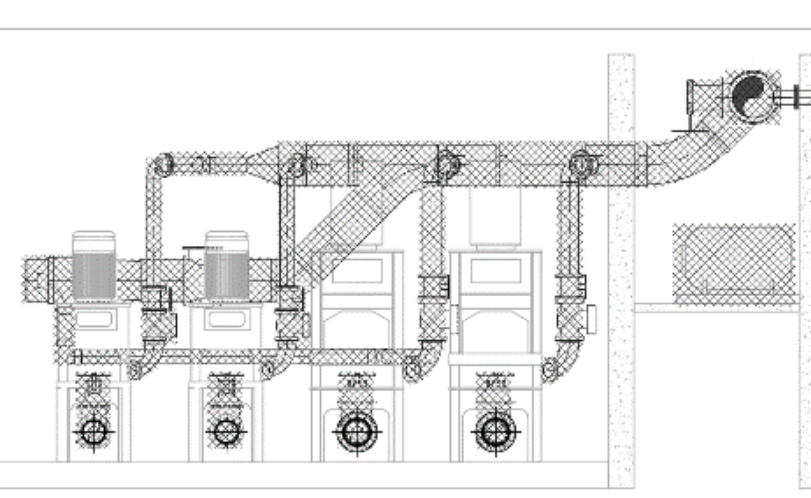
Project Scope

- Replace existing plug valves, check valves, flow meter and associated pipe inside station
- Install permanent bypass connection inside station
- Maintain temporary bypass system for two weeks while piping and valves are being replaced outside station

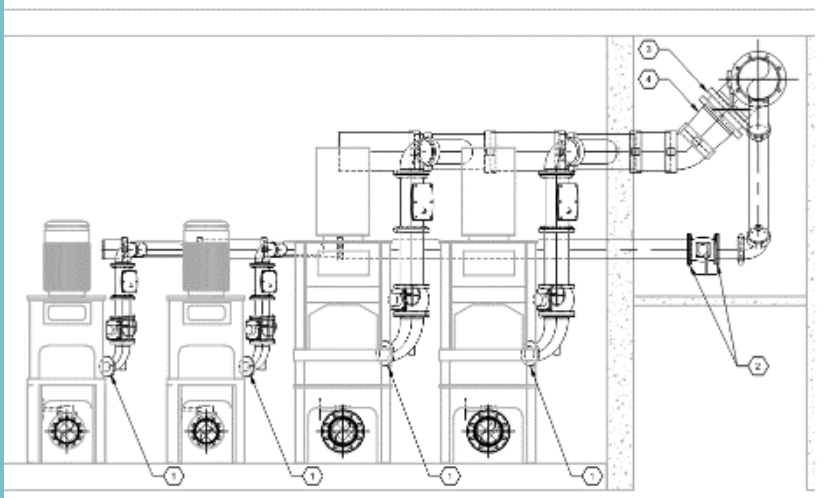
Project Scope



Project Scope



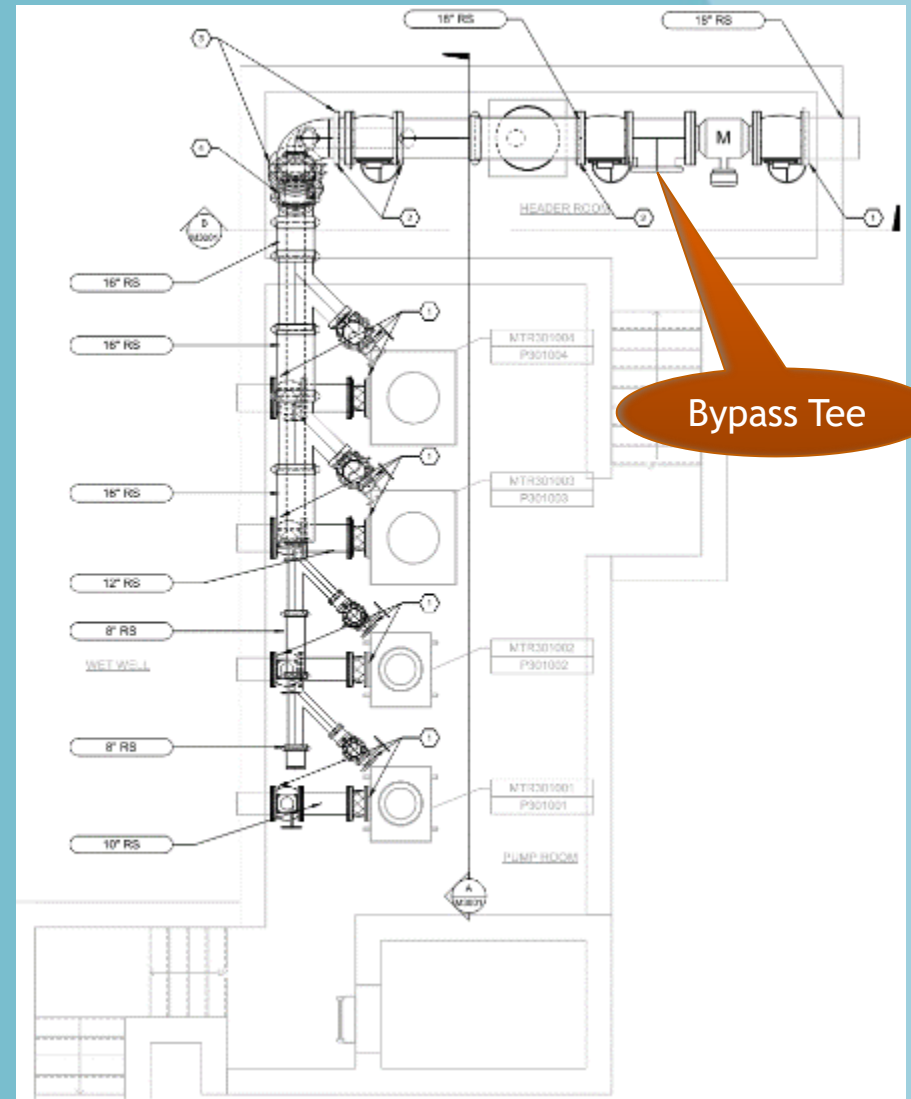
Existing Piping



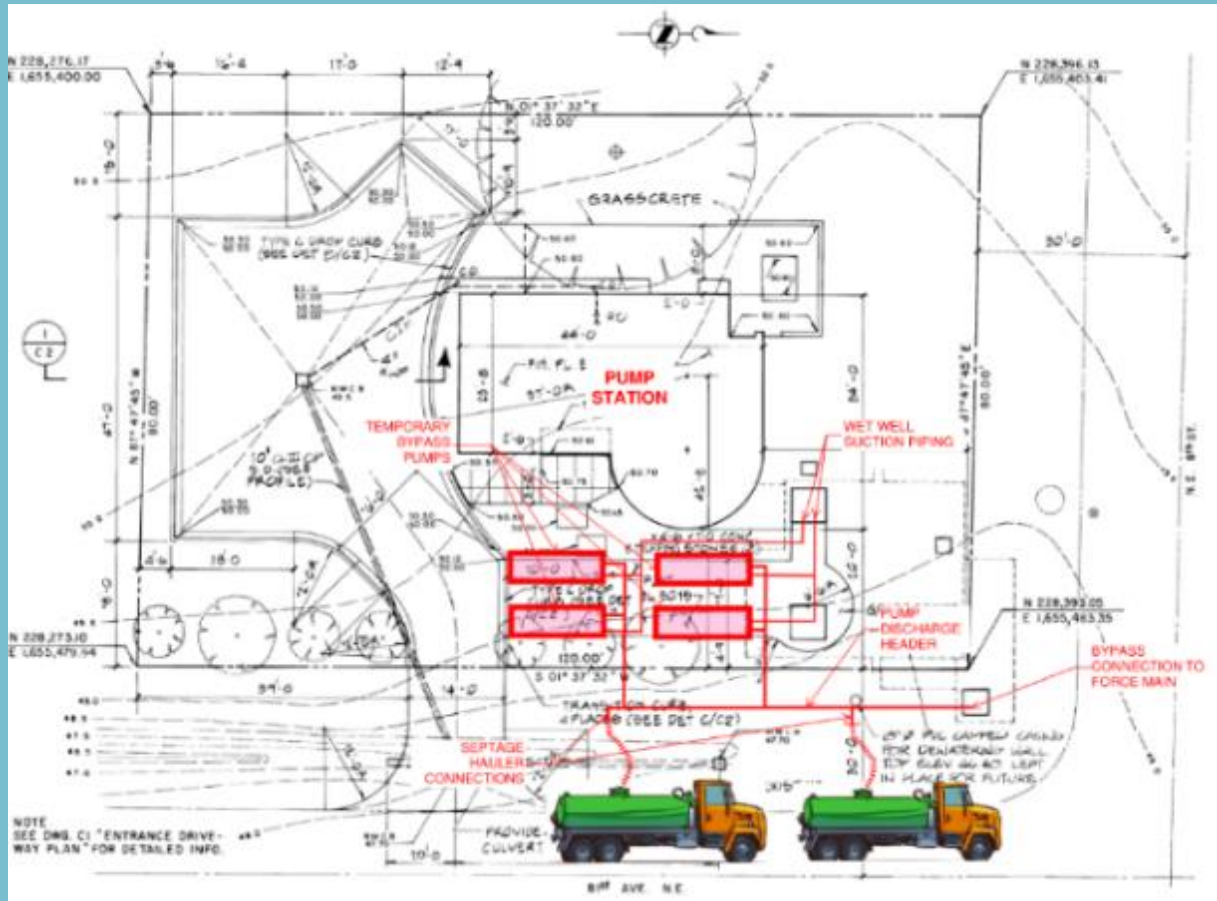
New Piping

Station Bypass

- Install tee to allow for bypass
- Will require single night's work for 6-8 hours



Station Bypass



Bypass Pumping

- Approximately two weeks
- Four pumps
- Running one most of the time to keep the pump station operational and avoid wastewater overflows



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Medina Municipal Code (MMC) sound level limits

District of Sound Source	District of Receiving Property (day ¹ /night ²)	
	Residential	Commercial
Residential	55/45	57/47
Commercial	57/47	60/50

Source: MMC Section 8.06.110 and MMC Section 08.06.111

1. Daytime hours are between 7:00 AM and 10:00 PM on weekdays and 9:00 AM and 10:00 PM on weekends.
2. Nighttime hours are between 10:00 PM and 7:00 AM on weekdays and 10:00 PM and 9:00 AM on weekends.



Zoning surrounding the Medina Pump Station



Receiving Property	Sound Limit (day/night)
North	57/47
East	
South	60/50
West	

EXISTING SOUND LEVELS

Measured Hourly Leq Sound Levels, dBA

Sound levels were measured continuously at one location near the pump station from Nov. 15 - 22, 2022, to document the existing sound environment near the site.

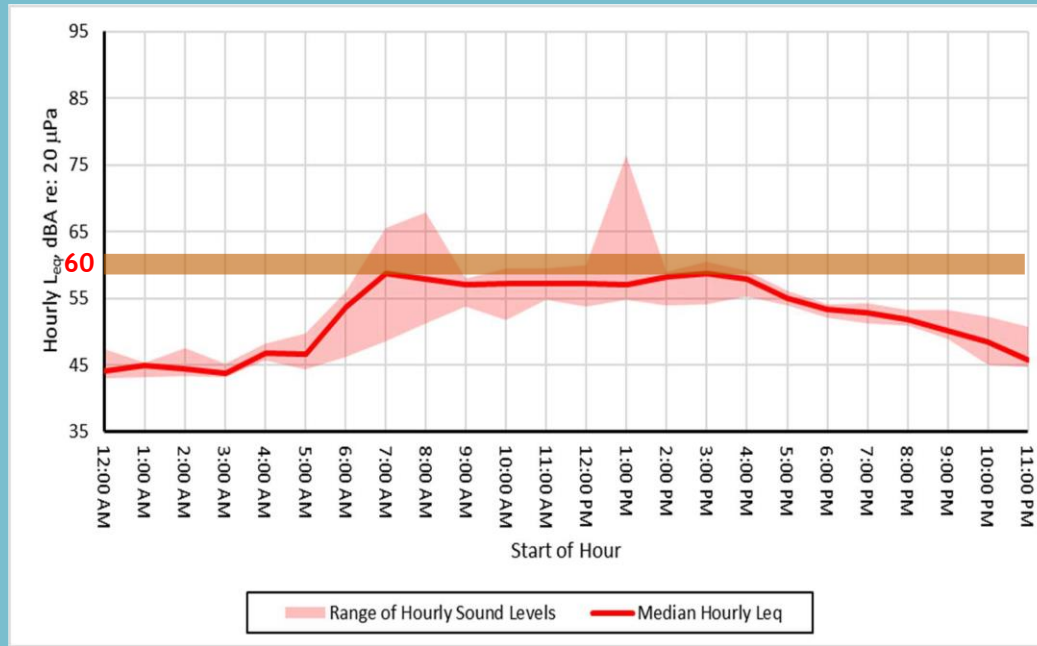


Table 4. Measured Hourly Sound Levels, Leq, dBA

Time	Minimum	Maximum	Median
Daytime	49	76	57
Nighttime	43	56	46

Noise Generating Equipment

The use of temporary bypass pumps for approximately two weeks, directly outside of the Medina Pump Station, and within the footprint of the facility. Four pumps will be installed, however it is anticipated that only one pump will run most, if not all, of the time. If there is a significant rain event, a second pump may come on for a short time. Two pumps will provide full redundancy in the event one or more of the temporary pumps fail.

Sound Levels

Sound levels were predicted at the nearby residential properties and buildings from each of the pumps considered in this analysis.

Godwin Pumps	Code	Property Line		Building	
		North	East	North	East
Daytime (1 pumps)	57 DBA	58	63	58	58
Daytime (2 pumps, if needed)	57 DBA	59	66	59	61
Nighttime (1 pump)	47 DBA	58	63	58	58

Pioneer Pumps	Code	Property Line		Building	
		North	East	North	East
Daytime (1 pumps)	57 DBA	63	67	62	62
Daytime (2 pumps, if needed)	57 DBA	64	70	63	63
Nighttime (1 pump)	47 DBA	63	67	62	62



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Mitigation

- Planned construction during the dry season, to reduce flows into the system
- Planning construction during the summer when the adjacent elementary school will be closed
- Selecting a quieter pump to reduce noise levels
- Requesting that the City of Bellevue not flush the lake lines during the night of the bypass to reduce flows
- Including “no idling” language into the construction contract for the septage haulers during the installation of the permanent bypass
- Notifying neighbors as soon as possible

