

UNIVERSITY OF OREGON
NORTH CAMPUS CONDITIONAL USE PERMIT PROJECT
Draft Conceptual Utility Infrastructure Analysis

Prepared for:
Cameron McCarthy Landscape Architects LLP
160 E Broadway
Eugene, OR 97401
(541) 485-7385

University of Oregon
Campus Planning and Facilities Management Department
1295 Franklin Boulevard
Eugene, OR 97403
(541) 346-2319

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Engineering | Surveying | Consulting

BHEGroup, Inc.
940 Willamette Street, Suite 310
Eugene, OR 97401
541.686.8478
www.bhegroupinc.com

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INTRODUCTION

This memo provides a broad level evaluation of the utility infrastructure within the UO North Campus Riverfront Area. The study area includes the area north of the railroad tracks, extending from the Hilyard Street right-of-way (at the west) to the east end of Millrace Drive (at the east). The focus of this evaluation is stormwater, sanitary sewer, and water systems. A brief overview of existing steam, power, communications, and natural gas utilities within the study area is also included.

STORMWATER

Existing Drainage Patterns

Stormwater runoff from the project area predominantly drains via sheet flow and ultimately enters the Willamette River. The land slope within the study area is generally flat, with localized depressions throughout. A significant amount of stormwater is expected to infiltrate into the underlying soil. In areas where infiltration rates are low (see below for further discussion), runoff likely ponds at the ground surface before migrating overland to the River. The area in the vicinity of the Riverfront Parkway roadway extension is collected in a piped public storm drain system, described further as "Destination A" below.

Regulatory Requirements

Stormwater management requirements are set forth by Eugene Code Section 9.6790-9.6796 and the Eugene Stormwater Management Manual (2014 edition is current). The following is a summary of the requirements:

- **Treatment for Pollution Reduction:** Runoff from new or redeveloped impervious surfaces must be treated for pollution reduction. Treatment methods must be selected in the following order:
 - Priority 1: Onsite Infiltration using Vegetated / Low Impact Development (LID) Methods.
 - Priority 2: Onsite Filtration using Vegetated / Low Impact Development (LID) Methods.
 - Priority 3: Onsite Mechanical Treatment with Payment of 50% LID Fee.
 - Priority 4: No Onsite Treatment with Payment of 100% LID Fee (for Offsite Mitigation)

Onsite infiltration must be utilized where feasible. Lower priority methods may be utilized if required due to site constraints, poor infiltration rates, shallow groundwater, steep topography, or space constraints. The LID SDC fee is a significant cost, and is used to encourage onsite treatment using LID methods.

- **Flow Control:** The site is located entirely within the Willamette River Basin, which has not historically experienced flooding problems. As such, prescriptive flow control or detention requirements do not apply. However, detention may be appropriate for certain localized areas where the receiving storm drain system does not have the capacity to accept additional flows.
- **Source Control:** Source control standards include prescriptive design criteria for activities that present a risk of point source pollution, such as loading areas, trash collection areas, and storage of bulk materials. These standards will apply to future development projects as applicable. The source control standards also apply to land with suspected or known contamination. Refer to the Environmental Issues section, below for further discussion.

Stormwater Management Goals / Strategies

- Pervious Surfaces: Pervious surfaces should be maximized and impervious surfaces should be minimized to the maximum extent practical. Synthetic turf subgrades should remain pervious unless precluded by unstable fill material or soil contamination issues.
- Sheet Flow and Filter Strips: Sheet flow drainage patterns should be utilized where feasible to maintain existing drainage patterns, particularly adjacent to the Millrace and the River. Utilizing sheet flow allows stormwater to be managed at the ground surface instead of piping underground, which can minimize system depth and space requirements. Stormwater treatment for long linear impervious surfaces, such as bike paths or walkways can be addressed by maintaining sheet flow and using narrow filter strips (grass or vegetation) along the edge of the path.
- Vegetated / Low Impact Development (LID) Systems: To the maximum extent feasible runoff from new or redeveloped impervious surfaces will need to be treated using vegetated / LID treatment systems. Examples of LID systems include vegetated planters, basins, swales, and filter strips. Basins, swales, and planters are vegetated depressions/reservoirs that allow settling and/or filtration of stormwater. These facilities may be constructed with vertical walls or curbs, or may have graded side slopes. Smaller decentralized LID systems can be used to limit system depth, and can be easily integrated with site landscaping and architecture. Larger more centralized LID systems may be appropriate in certain areas, depending on grading and site constraints.
- Onsite Infiltration: Onsite infiltration should be used where feasible and can result in Systems Development Charge (SDC) credits, Stormwater User Fees reductions, and can reduce the cost of stormwater infrastructure. Infiltration systems may be integrated with surface Vegetated / LID treatment systems, such as basins or planters. Subsurface infiltration systems such as soakage trenches may also be appropriate. Groundwater is sufficiently deep to allow for shallow surface infiltration systems (basins or planters) or shallow subsurface systems such as soakage trenches. Drywells are not likely practical due to groundwater separation requirements. Deposits of fill and environmental issues may preclude onsite infiltration in certain areas of the site, as discussed in the Soils and Groundwater section below.
- Mechanical Treatment: In areas where vegetated / LID systems are not feasible, onsite mechanical treatment may be utilized. Mechanical systems can be cost effective, flexible, and can save space, but require payment of significantly higher SDCs.
- Athletic Fields:
As noted above, synthetic turf subgrades should remain pervious where possible. Synthetic turf fields are exempt from treatment requirements as long as the subgrade interface remains pervious. Creating an impervious subgrade interface (i.e. liner or cement amendment) may trigger treatment requirements, which would impact available space. Due to the large surface areas, synthetic turf fields can provide significant opportunities for storage (detention) and infiltration of stormwater runoff.
- Roadways and Parking Lots: Policy 10 of the Campus Plan includes goals for stormwater management on the UO campus. These goals emphasis providing treatment for areas receiving

vehicle traffic. Future development projects should promote visible stormwater treatment for roadway and parking lot areas to reinforce this goal.

System Availability and Capacity

Stormwater should be disposed of onsite to the maximum extent feasible using onsite infiltration systems, as noted above. Refer to the Soils and Groundwater section, below, for further discussion about infiltration opportunities and limitations. Piped stormwater conveyance systems will likely be required to accommodate overflow from infiltration systems, or provide primary conveyance in areas where infiltration is not feasible due to soil conditions or other factors. Piped conveyance systems will discharge to existing public or private storm drainage infrastructure or waterways. The following is a summary of the possible destination points throughout the site.

- **Riverfront Parkway System (Destination A):** In the late 1990's, Riverfront Parkway was extended under the railroad tracks to the north, to a point near the south end of the Autzen footbridge. As part of that project, a 15" public storm drain system was extended along the roadway to the northwest end of the road. This system drains east and south to a public stormwater pump station located at the northwest corner of the Millrace Drive and Riverfront Parkway intersection. From the pump station, stormwater is pumped through a 14" force main, discharging at an outfall on the south bank of the Millrace under the Riverfront Parkway Bridge.

The public storm drain is approximately 13' below the ground surface at the upstream end of the system near Autzen footbridge, and could be extended to the east and west of Riverfront Parkway to accommodate future development. Refer to locations "A" locations on Figure 1 for possible future connection points. City staff is presently confirming the original design parameters for the pump station to establish the intended basin boundary for the pump station.

It should be noted that the Riverfront Parkway pump station and surrounding land surface is within a depression, and is below the base flood elevation at the adjacent Willamette River and below the water surface elevation of the Millrace. Drainage for this area relies entirely on the pumping systems and there is no overland conveyance route for floodwater to escape. Because of this, special care should be taken when extending the Riverfront Parkway storm drain system to the area north of the railroad tracks, to ensure that flood risks for the depressed area south of the track are not worsened. Grading modifications north of the railroad tracks should be designed with similar precautions.

- **Autzen Bridge Outfall (Destination B):** There is a 10" private storm drain system located along the eastern edge of the existing athletic fields (Refer to location "B" on Figure 1). This storm drain receives drainage from several catch basins along the eastern edge of the athletic fields, and may receive subdrainage from the fields. The 10" pipe discharges through an outfall at the south bank of the River, approximately 80' west of the Autzen footbridge. This line should be considered for future development in the vicinity of the existing fields, but may be limited due to depth and size.
- **Millrace Outfall (Destination C):** The Millrace serves as a stormwater conveyance route for roughly 670 acres of land south of the railroad tracks. The primary discharge from the Millrace occurs through a dam control structure located just south of the railroad tracks, north of the Franklin Boulevard and East 11th Avenue intersection. From this location, drainage travels north under the railroad tracks to an open channel. The open channel passes through a 48" culvert at the bike path, and then discharges to the Willamette River to the north. The Millrace does not receive

any piped drainage from the land north of the railroad tracks, but receives some overland drainage.

For future development, a new piped outfall or piped connection to the Millrace may be a possibility. Connecting to the 48" culvert at the bike path crossing may provide an opportunity to establish a storm drainage discharge point without impacting land below the ordinary high water line.

- Hilyard Outfall (Destination D): Just to the west of the project area, there is short dead-end spur from Hilyard Street, terminating in a cul-de-sac at the north side of the railroad tracks. There is an existing 12" piped public storm drain system that provides drainage for the public right-of-way north of the railroad tracks. This storm drain discharges through an outfall at the south bank of the River, just north of the cul-de-sac.

The City has developed a concept plan to establish a roundabout at the location of the existing cul-de-sac, which will provide access to the EWEB Riverfront property, and possible access to the western edge of the UO Riverfront property. Public storm drain infrastructure will likely be extended as part of the roundabout project, and may provide a destination point for stormwater generated from future development in this zone.

- Possible Future Outfalls to the Willamette River (Destination E): Additional outfalls to Willamette River may be required depending on the extent that onsite infiltration and existing piped systems can be utilized. Discharges to the Willamette River are regulated by the City of Eugene under their MS4 permit. However, new outfalls will likely be subject to review under an Oregon DSL / U.S. Army Corps of Engineers Joint Fill/Removal permit process. The City of Eugene Standards Review process is also required for work within Water Resources Conservation areas. Some outfalls to wetlands or waterways may be subject to the stringent NOAA / NMFS stormwater design standards. Exemptions to NOAA flow control requirements may apply, depending on agency interpretation and the classification of the River at the point of discharge.

Soils and Groundwater

- Soils: Based on City of Eugene and Natural Resource Conservation Service (NRCS) mapping, the soils throughout the site would be expected to consist of sandy and gravelly soils with relatively high infiltration rates, with Hydrologic Soil Group (HSG) classification of A or B. However, geotechnical boring log data, available from the 1990 Riverfront Research Park Environmental Site Assessment (ESA), indicates differing conditions. Specifically, relatively thick deposits of fill are present in the area north of the railroad tracks, between Riverfront Parkway (on the east) and the Millrace (on the west). Fill deposits range from 5'-15' deep, and are predominantly 9' deep. Fill material in this area consists of silt with some sand and gravel, and may have significantly lower infiltration rates than the native sand and gravel soils.
- Groundwater: Monitoring well data presented in the 1990 ESA indicates seasonal high groundwater depth ranges from 10'-15' within the study area. Oregon Water Resources Department well log data indicates a similar depth to groundwater within the study area.
- Future Investigation: Future development projects will need to include geotechnical investigation, infiltration testing, groundwater measurement, and engineering studies to determine if and where infiltration is feasible.

Environmental Considerations

There have been historic environmental issues throughout the study area, including releases of laboratory wastes, petroleum hydrocarbons, and coal gas tar. Investigation and remediation activity has occurred since the time of the 1990 Environmental Site Assessment. DEQ records indicate the site has a “Partial No Further Action” status.

If onsite stormwater management (infiltration) systems are pursued with future development, DEQ and an environmental professional should be consulted to ensure stormwater infiltration does not worsen movement of pollutants within groundwater.

FLOODPLAIN

Special Flood Hazard Areas are located within the study area. The approximate limits of the Floodway, 100-year Floodplain (Zone AE), and 500-year Floodplain (Zone X) are depicted on the attached Figure 2. Figure 2 also shows the approximate Base Flood Elevation contours.

SANITARY SEWER

Existing gravity-fed public sanitary sewer infrastructure is readily available for the proposed building sites north of the railroad tracks and east of the Millrace, but gravity-fed sanitary sewer is not readily available for the building sites west of the Millrace. The potential sanitary sewer destination points are shown on Figure 3 and summarized below:

- Riverfront Parkway System (Destination A): An 8” sanitary sewer line was extended to a point near the south end of the Autzen Footbridge as part of the project to extend Riverfront Parkway north of the railroad tracks in the late 1990s. This line is approximately 14’ deep and would be expected to serve buildings within a radius of approximately 700’. The line may be sufficiently deep to serve the area north of the railroad tracks and west of the Millrace, but could not be extended west of the Millrace without a pump station.

The existing 8” sanitary sewer drains south to a public pump station located at the intersection of Riverfront Parkway and Millrace Drive. The pump station is located immediately adjacent to the storm drain pumping station described above. The existing pipes and pumping station are expected to have adequate capacity to serve the proposed building sites north of the railroad tracks. Further coordination with City staff is necessary to confirm the capacity of the pump station.

- East 8th Avenue System (Destination B): This destination point is an existing 8” public sanitary sewer line within East 8th Avenue, which currently terminates at the intersection of Hilyard and East 8th Avenue, southwest of the railroad tracks. There is an existing 4” pressure sewer that extends across the railroad tracks to a point within the existing cul-de-sac. The existing 8” public sewer at the intersection of Hilyard and East 8th Avenue is approximately 6’ below the ground surface and is not likely sufficiently deep to provide gravity-fed drainage for the proposed building sites. Pumping systems would likely be required to utilize this destination point. The 4” pressure sewer in the cul-de-sac may be a viable destination point for pumped sanitary sewer system.
- Broadway / Franklin System (Destination C): This alternative would extend a new sanitary sewer crossing under the railroad tracks from the 18” sanitary sewer system that runs west within Broadway and Franklin. Two potential connection points and boring locations are shown in Figure 3. This alternative would involve easements and railroad crossings, which may present

challenges. Further investigation is needed to determine the elevation and condition of the existing 18" line and verify feasibility of this alternative.

WATER

Public water mains are available within close proximity to the proposed building sites at the west and east ends of the Riverfront area. Possible future connection points are shown on Figure 4 and summarized below:

- Riverfront Parkway System (Connection A): An existing dead-end 10" public (EWEB) main extends to a point near the south end of the Autzen footbridge. The dead-end main connects to a 10" looped system extending within Riverfront Parkway and Millrace Drive. Due to the long dead-end configuration, stagnation will likely be a concern in this line until consumption rates become high enough to provide adequate circulation. We understand EWEB and UO have discussed the possibility of utilizing the abandoned steam line as a conduit for a new main extending across the length of the Riverfront property. Creating a looped connection between the Riverfront Parkway and Alder / Hilyard systems would likely alleviate stagnation concerns.
- Alder / Hilyard System (Connection B): There is an existing 16" public (EWEB) main extending from Alder to the old EWEB steam plant. This line crosses the railroad tracks north and west of the Alder Street alignment. At the north side of the tracks, the main extends into, or very close to UO property before extending to the west within the railroad right-of-way. Potential future connections could occur at the north side of the railroad crossing or the Hilyard Street right-of-way if access near the railroad crossing is problematic.

Based on past pressure/flow test data in the area, the static pressure within the public system is expected to range between 68-72 psi, depending on the time of day. Both the Riverfront Parkway and East 8th Avenue systems are expected to produce adequate fire flows. However, flow test information should be obtained to confirm available pressures and flows.

OTHER UTILITIES

Natural Gas

Natural gas does not currently extend to the north side of the railroad tracks within the study area. At the east side of the site, the NW Natural main extends through Riverfront Parkway and Millrace Drive, but is capped just north of Millrace Drive. At the west side of the site, a NW Natural stub extends to the north side of the railroad tracks within the Hilyard Street right-of-way. NW Natural has expressed interest in extending a loop north of the railroad tracks between the Riverfront Parkway system and the stub at Hilyard Street. Refer to Figure 5 for natural gas mapping.

Power

Two major existing underground public (EWEB) power lines extend through the study area, as shown on Figure 5. A 12kV feeder extends from the EWEB old steam plant site to the south side of Autzen footbridge, and then splits, and extends north across the footbridge, and south across the railroad tracks. A 115 kV transmission line extends from the old EWEB steam plant, along the north edge of the railroad tracks to a point just north of the Central Power Station, where it turns south and crosses under the railroad tracks. Large vaults (9'x13') with access manholes are placed intermittently along the underground power runs.

Relocation of the underground EWEB power lines is not anticipated and vaults are expected to remain in place. Redevelopment of land over the power lines should match existing grades where possible. Where grades must be modified, the grades should be raised and not lowered. Vault lids will need to be adjusted to grade.

Further coordination with UO staff and EWEB is needed to determine the preferred location(s) for extending power to the proposed building sites and athletic fields.



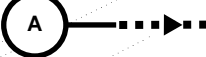
Fiber Optic and Communications

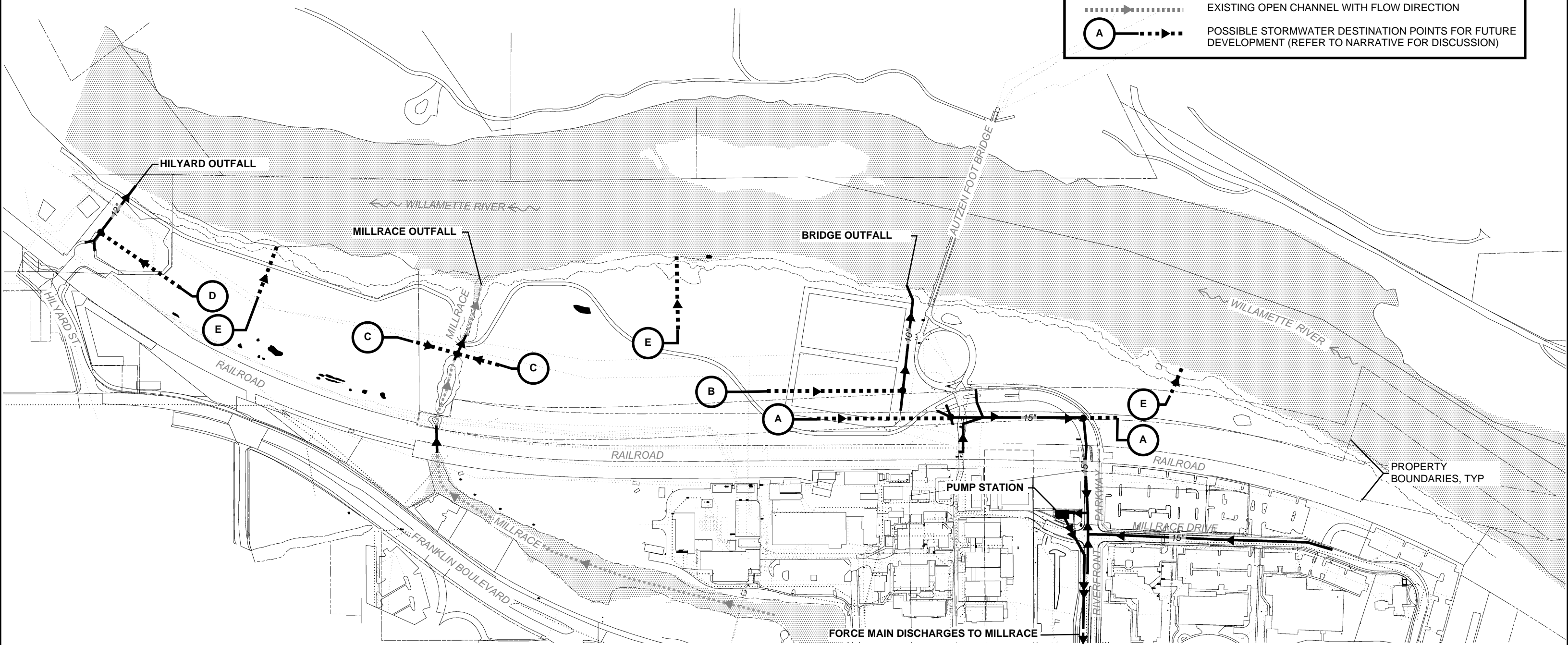
Major fiber optic and communications lines within the project area are depicted in are depicted in Figure 5. A major EWEB fiber optic line runs parallel to the 115 kV transmission line north of the railroad tracks. The status and use of other communications lines north of the railroad tracks are unknown.

EWEB Steam


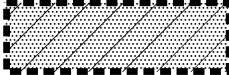

An EWEB steam corridor extends through the site, as shown in Figure 5. The steam system is no longer active, but some of the pipes within the corridor are being utilized as conduits for other purposes. EWEB intends to maintain the easement for the steam corridor.

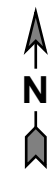
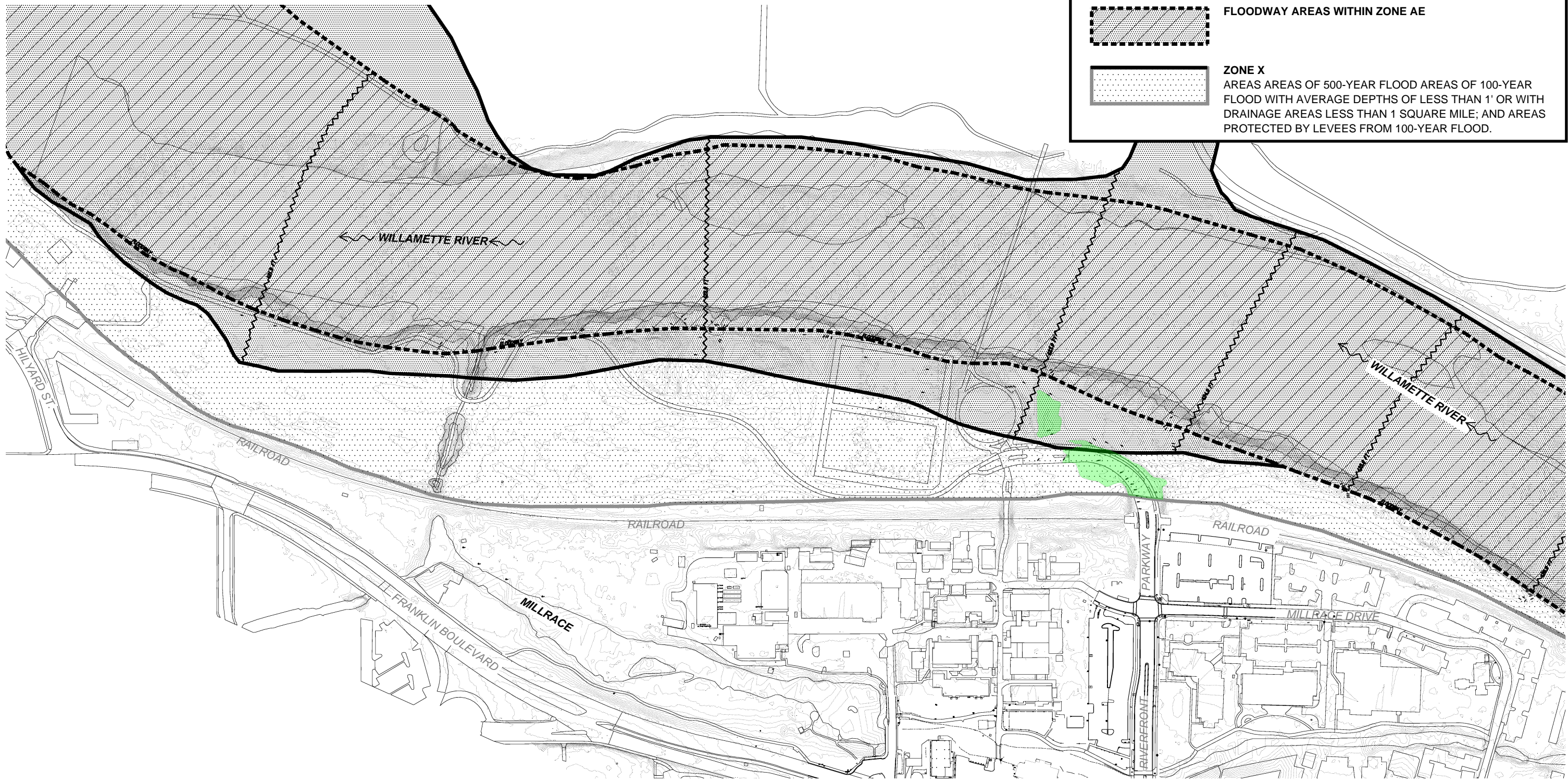
LEGEND

-  EXISTING STORM DRAIN PIPE WITH FLOW DIRECTION
-  EXISTING OPEN CHANNEL WITH FLOW DIRECTION
-  POSSIBLE STORMWATER DESTINATION POINTS FOR FUTURE DEVELOPMENT (REFER TO NARRATIVE FOR DISCUSSION)






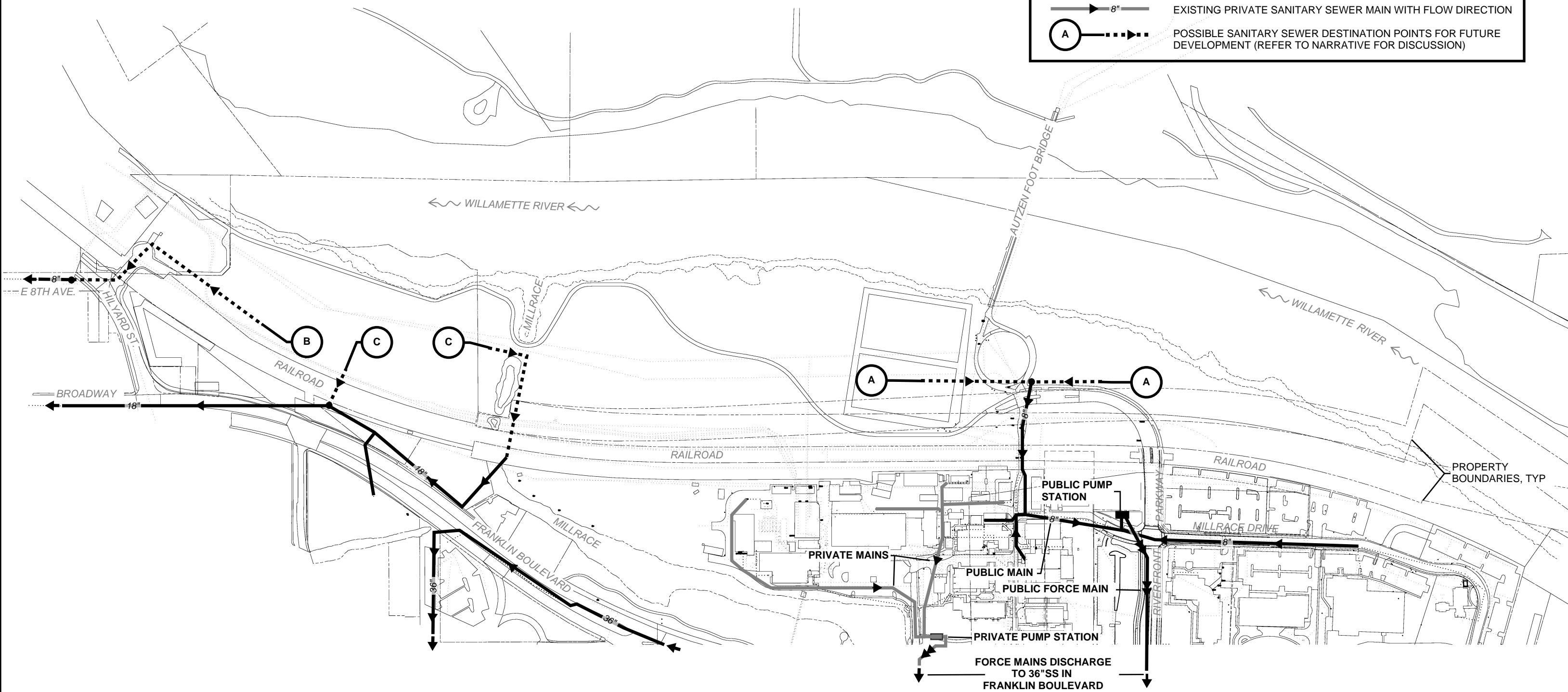
LEGEND

-  **ZONE AE**
BASE FLOOD ELEVATIONS DETERMINED
-  **FLOODWAY AREAS WITHIN ZONE AE**
-  **ZONE X**
AREAS AREAS OF 500-YEAR FLOOD AREAS OF 100-YEAR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1' OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD.



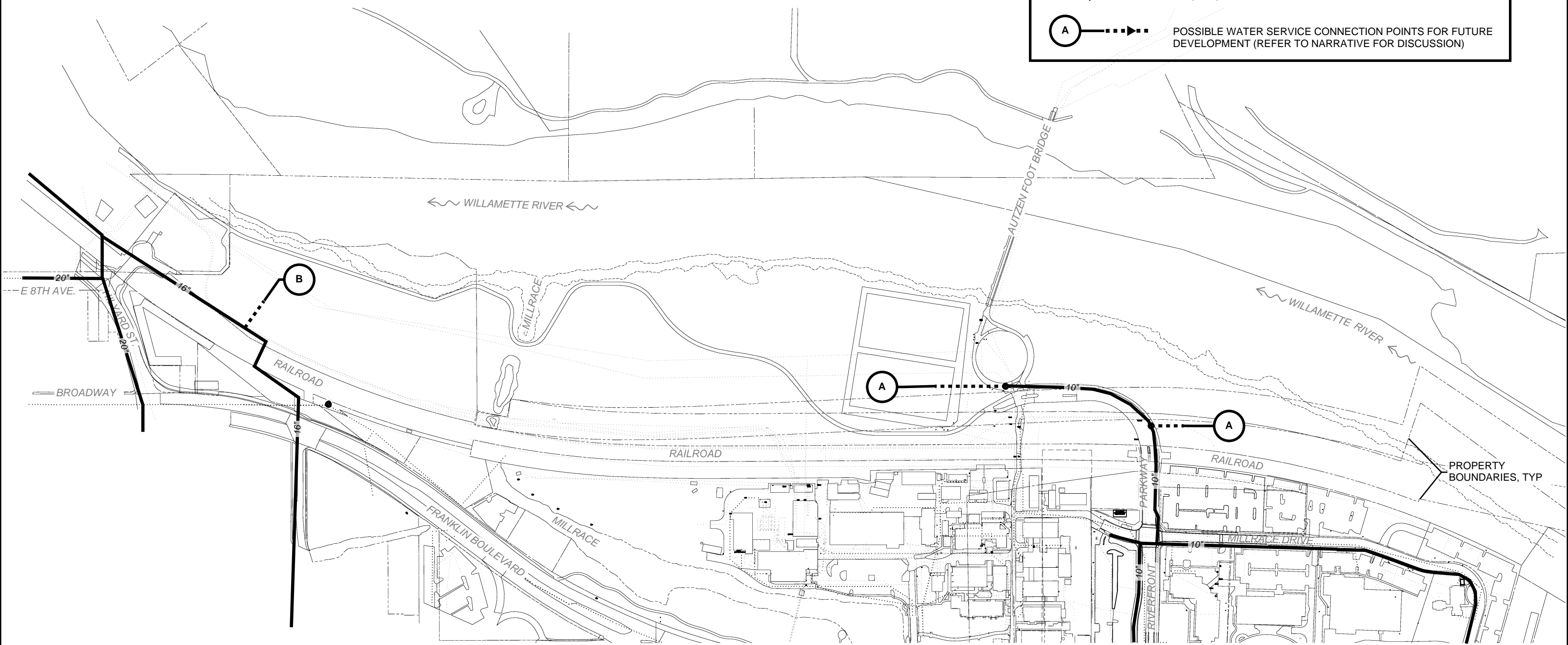
LEGEND

-  8" EXISTING PUBLIC SANITARY SEWER MAIN WITH FLOW DIRECTION
-  8" EXISTING PRIVATE SANITARY SEWER MAIN WITH FLOW DIRECTION
-  POSSIBLE SANITARY SEWER DESTINATION POINTS FOR FUTURE DEVELOPMENT (REFER TO NARRATIVE FOR DISCUSSION)



LEGEND

- 10" — EXISTING WATER MAIN
- A — POSSIBLE WATER SERVICE CONNECTION POINTS FOR FUTURE DEVELOPMENT (REFER TO NARRATIVE FOR DISCUSSION)



LEGEND

- **STM (EWEB)** EWEB STEAM CORRIDOR. ABANDONED, WITH POSSIBLE REPURPOSE.
- **12kV (EWEB)** EWEB POWER
- **FO (EWEB)** EWEB FIBER
- **COMM** COMMUNICATIONS
- **G** NATURAL GAS

