

Bitter Lake Reservoir Improvements

Seattle Design Commission,
Presentation of Schematic Design

November 16, 2023

Introduction to Project

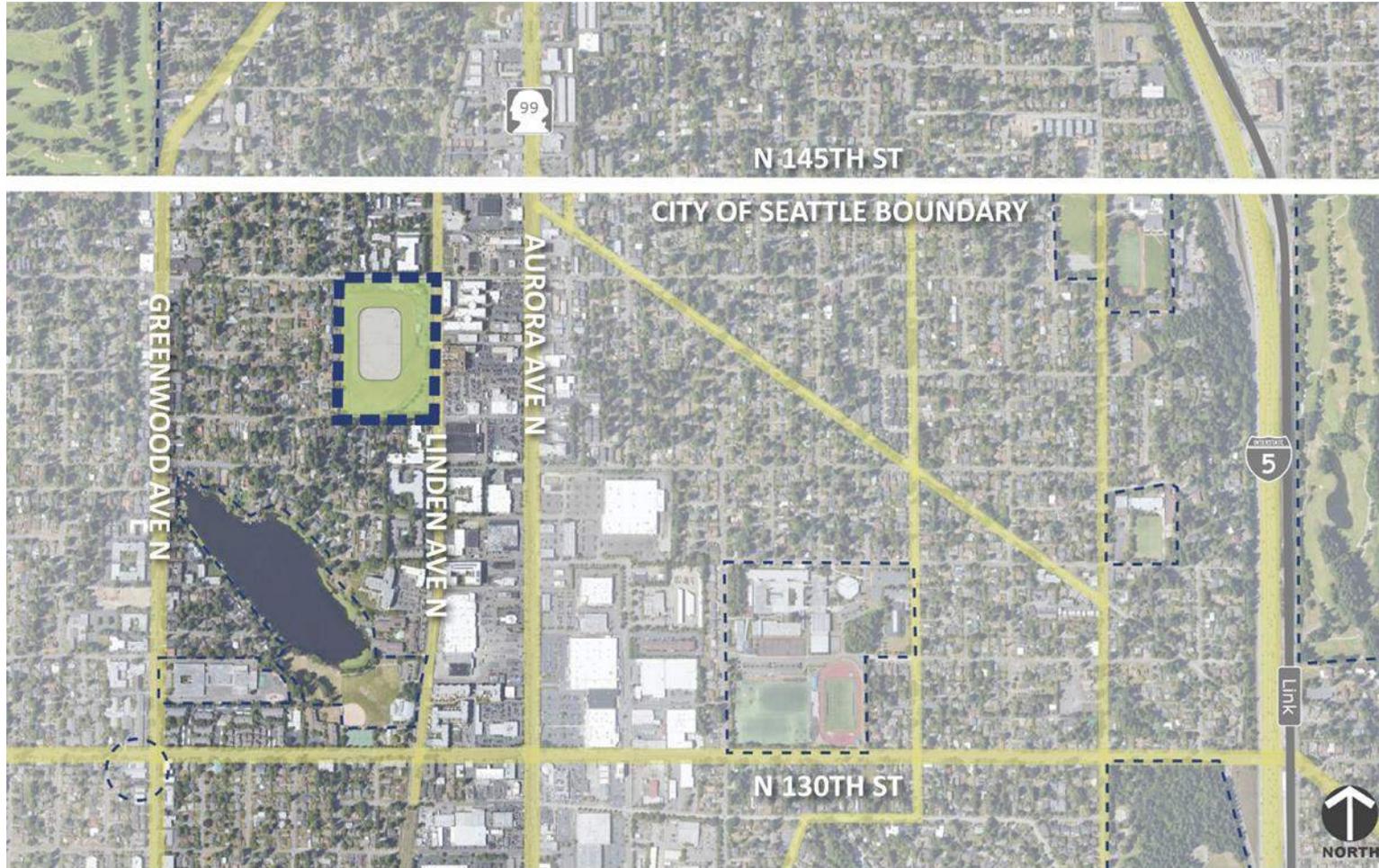
- Project address / location:
14141 Linden Ave N
- SDCI project number:
004462-22PA
- SDOT SIP reference number:
SUSIP0000677
- SEPA Checklist:
Scheduled completion: January 2024



LEGEND

- Bitter lake neighborhood
- Seattle city limits

Vicinity Map



KEY MAP



LEGEND

-  Bitter lake neighborhood
-  Seattle city limits

Project Goals

- Keep project affordable for SPU's rate payers.
 - Optimize project costs
 - ✓ Reservoir location and size
 - ✓ Minimize soil export
- Meet City Stormwater Code and other regulatory requirements.
- Provide asset security and promote community safety.

Project Goals *continued*

- Maintain active engagement with the Bitter Lake community throughout project design & construction.
- Incorporate Equity in project development
- Maximize development of additional Open Space within noted site and engineering constraints.
 - Example: Perform rough site grading only one time to benefit both projects.
- Integrate art that is meaningful for both the community and the utility into project designs.



Project Objectives

- Construct new 21-million-gallon (MG) seismically resilient drinking water storage reservoir.
- Coordinate new reservoir construction with SPR need for additional Open Space.
- Incorporate art into project in a meaningful way.

Project Scope & Budget

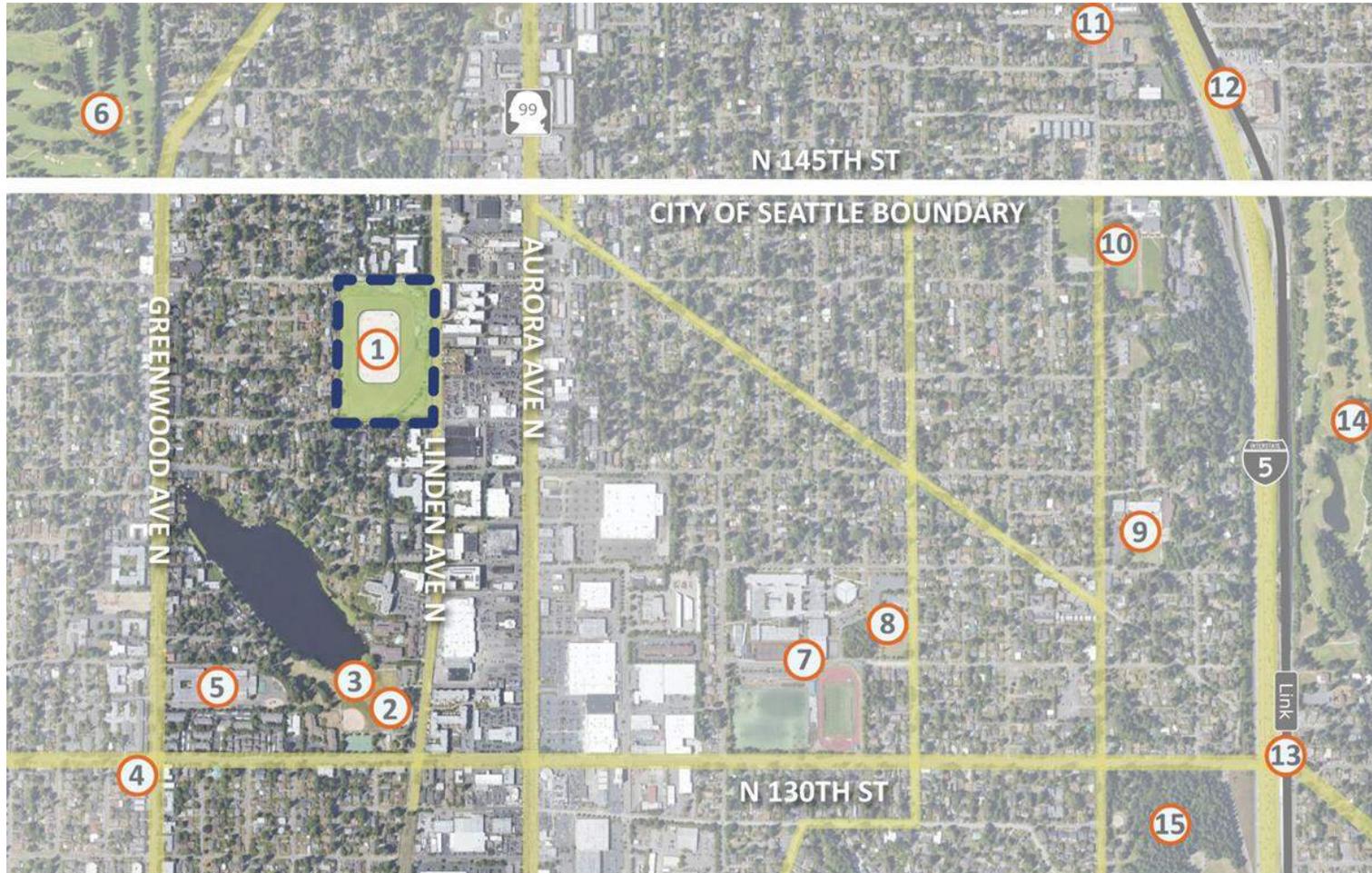
- Seattle Public Utilities
 - Scope: Design/Engineering and Construction of a new 21 MG prestressed concrete reservoir, including all required appurtenances, at the existing Bitter Lake Reservoir.
 - Budget: \$90M
- Seattle Parks & Recreation
 - Scope: Planning, Design, and Development of additional Open Space created by construction of Bitter Lake Reservoir Covering Improvements.
 - Budget: \$200K for 30% funded currently, additional \$600K for two years allocated, future funding in planning stages



CONTEXT



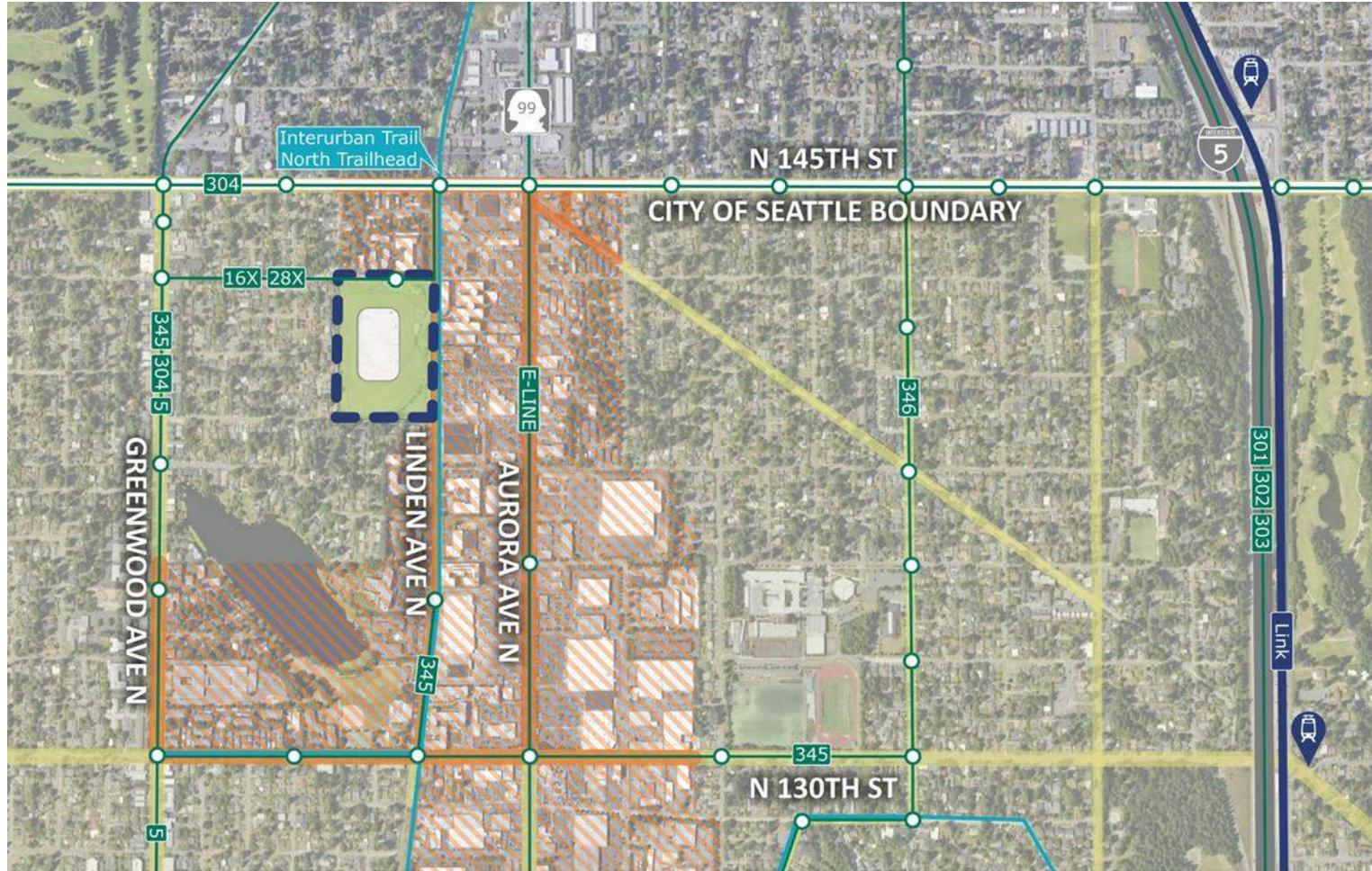
Vicinity & Site Context



KEY

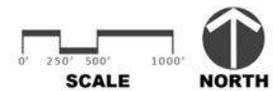
- 1 Bitter Lake reservoir (SPU)
- 2 Bitter Lake community center (SPR)
- 3 Bitter Lake Playfield (SPR)
- 4 Broadview Branch Library (SPL)
- 5 Broadview Thomson K-8 (SPS)
- 6 Seattle Golf Club (Private)
- 7 Ingraham High School (SPS)
- 8 Helene Madison Pool (SPR)
- 9 Lakeside Middle School (Private)
- 10 Lakeside High School (Private)
- 11 Twin Ponds Park (Shoreline)
- 12 Link Light Rail -145th Station
- 13 Link Light Rail -130th Station
- 14 Jackson Park Golf Course (SPR)
- 15 Northarces Park (SPR)

Site Context

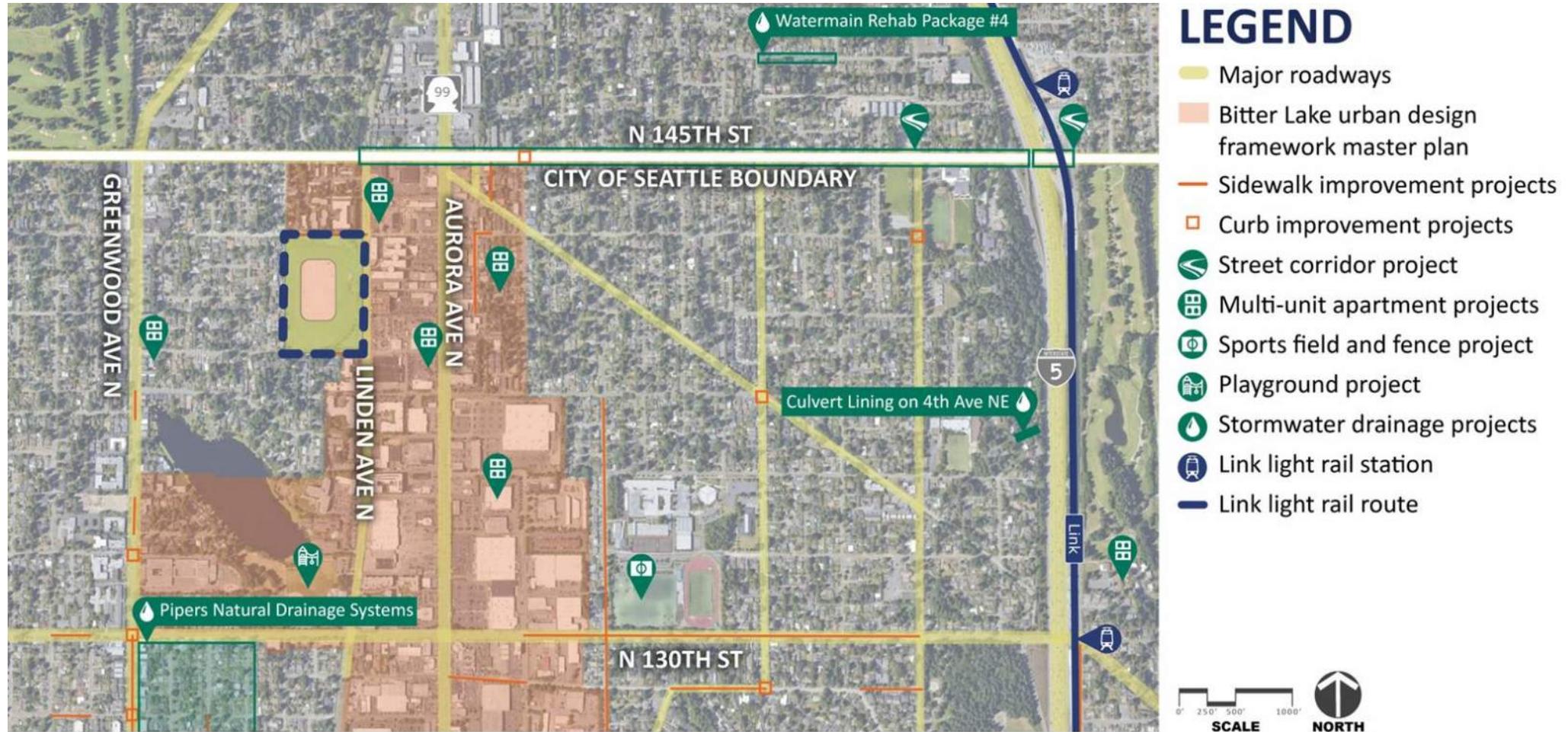


LEGEND

-  Urban village main
-  Urban village neighborhood
-  Urban village neighborhood access
-  Urban center connector
-  Neighborhood connector
-  Neighborhood yield street
-  Link light rail station
-  Link light rail route
-  Bus route
-  Bus stop
-  Bicycle route



Bitter Lake Neighborhood Projects



Bitter Lake Neighborhood, Demographics

Race

- 37% Black or African American
- 34% White
- 14% Asian
- 12% Hispanic or Latino

Languages

- 57% English
- 27% Other
- 10% Asian and Pacific Islander
- 6% Spanish

Census Tract 4.04, King County, Washington. Source: 2017 – 2021 American Community Survey 5-Year Narrative Profile

Note: Total population within the census block is 3,859.



Bitter Lake Neighborhood, Demographics

Income

- 46% (less than \$35K)
- 40% (\$35K-\$100K)
- 14% (more than \$100K)

Housing

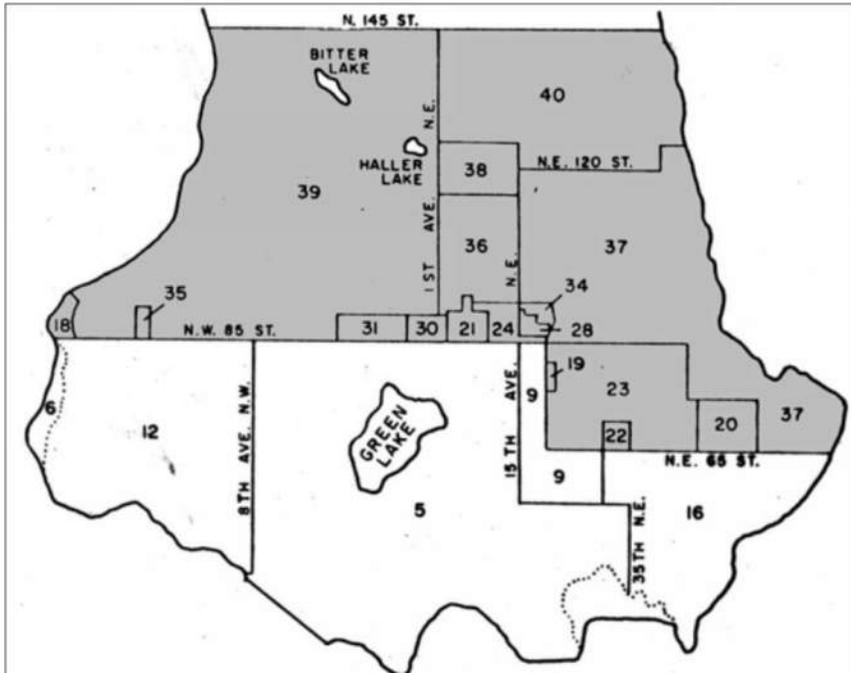
- 86% renter occupied
- 14% owner occupied

Census Tract 4.04, King County, Washington. Source: 2017 – 2021 American Community Survey 5-Year Narrative Profile

Note: Total population within the census block is 3,859.



Site History



Reservoir built 1957-1958
after northern annexation

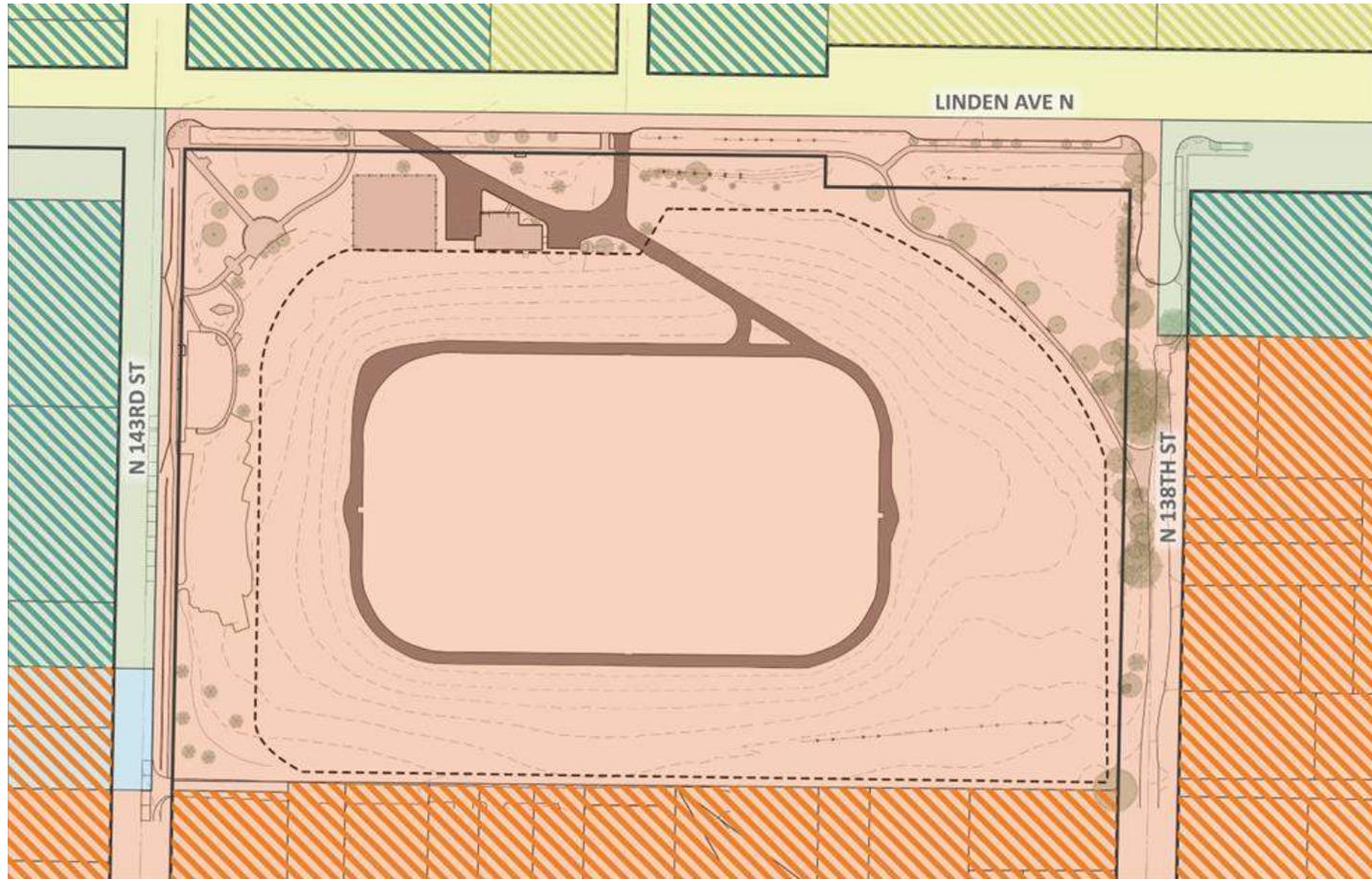


1999 Aerial (without covering)



2002 Aerial (with covering)

Site Zoning & Ownership



LEGEND

- Security fence
- Right-of-way
- Parcel boundary

Zoning

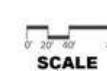
- C1-75(M) - commercial 1
- LR3 (M) - lowrise 3
- NR2 - neighborhood residential 3
- RSL (M) - neighborhood residential small lot

Property ownership

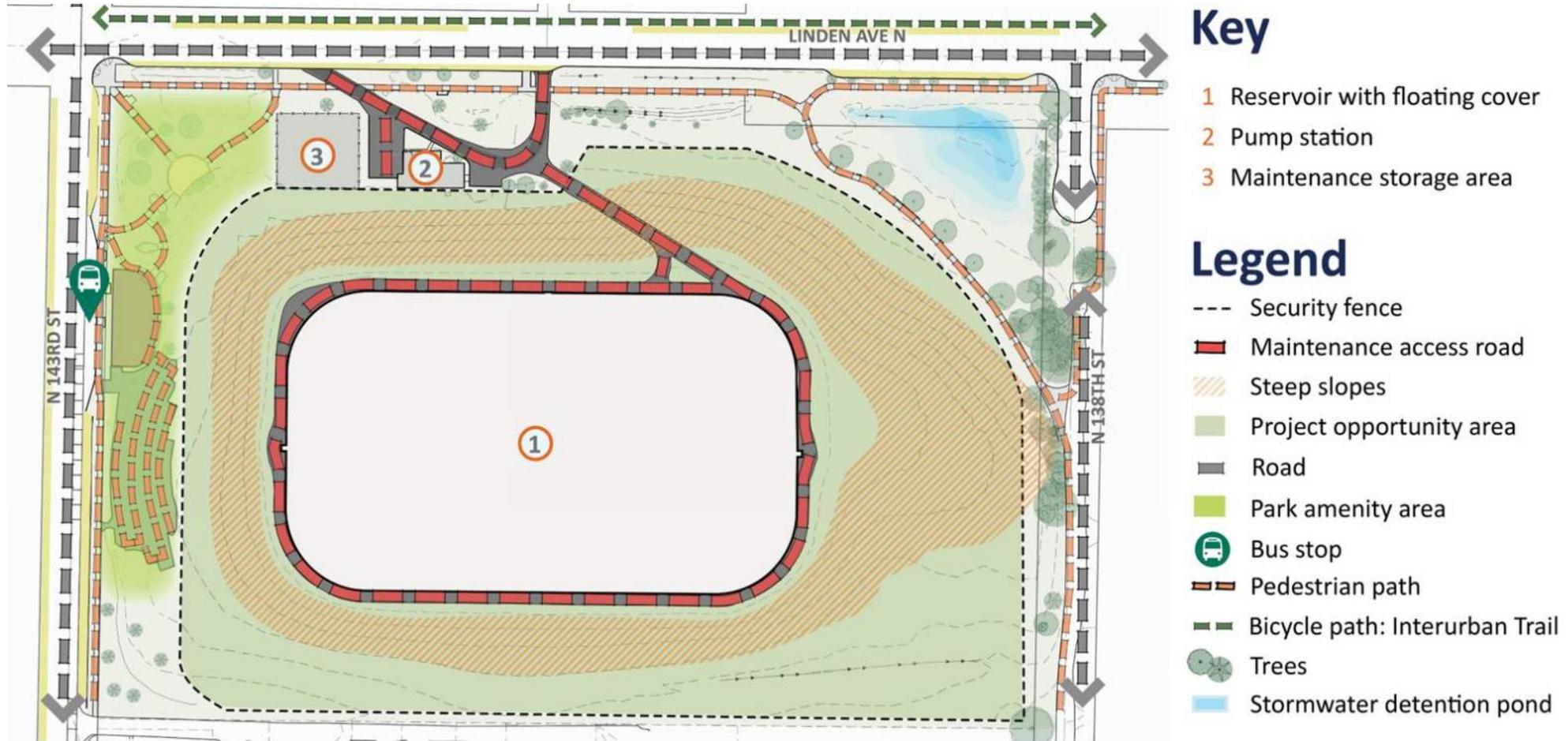
- Commercial properties
- Apartment properties
- Residential properties

AGREEMENTS

- MOA — Dept. of Neighborhoods
- MOA — Dept. of Parks and Recreation

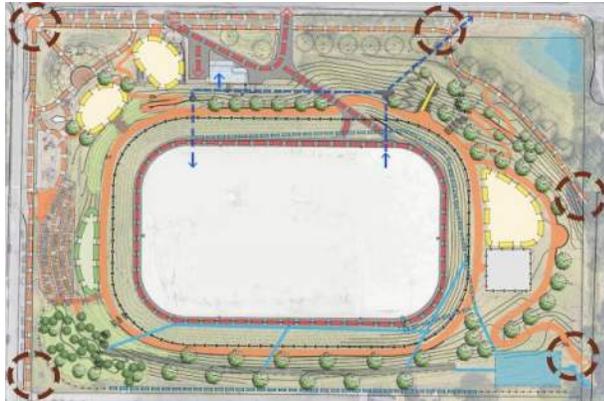


Site Constraints & Opportunities



Preliminary Conceptual Site Plans

Option 1, Floating Cover



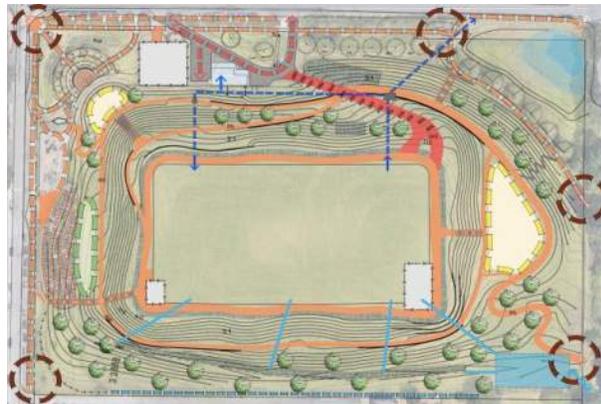
Option 2, Aluminum Roof



Option 3, Prestressed Conc Reservoir



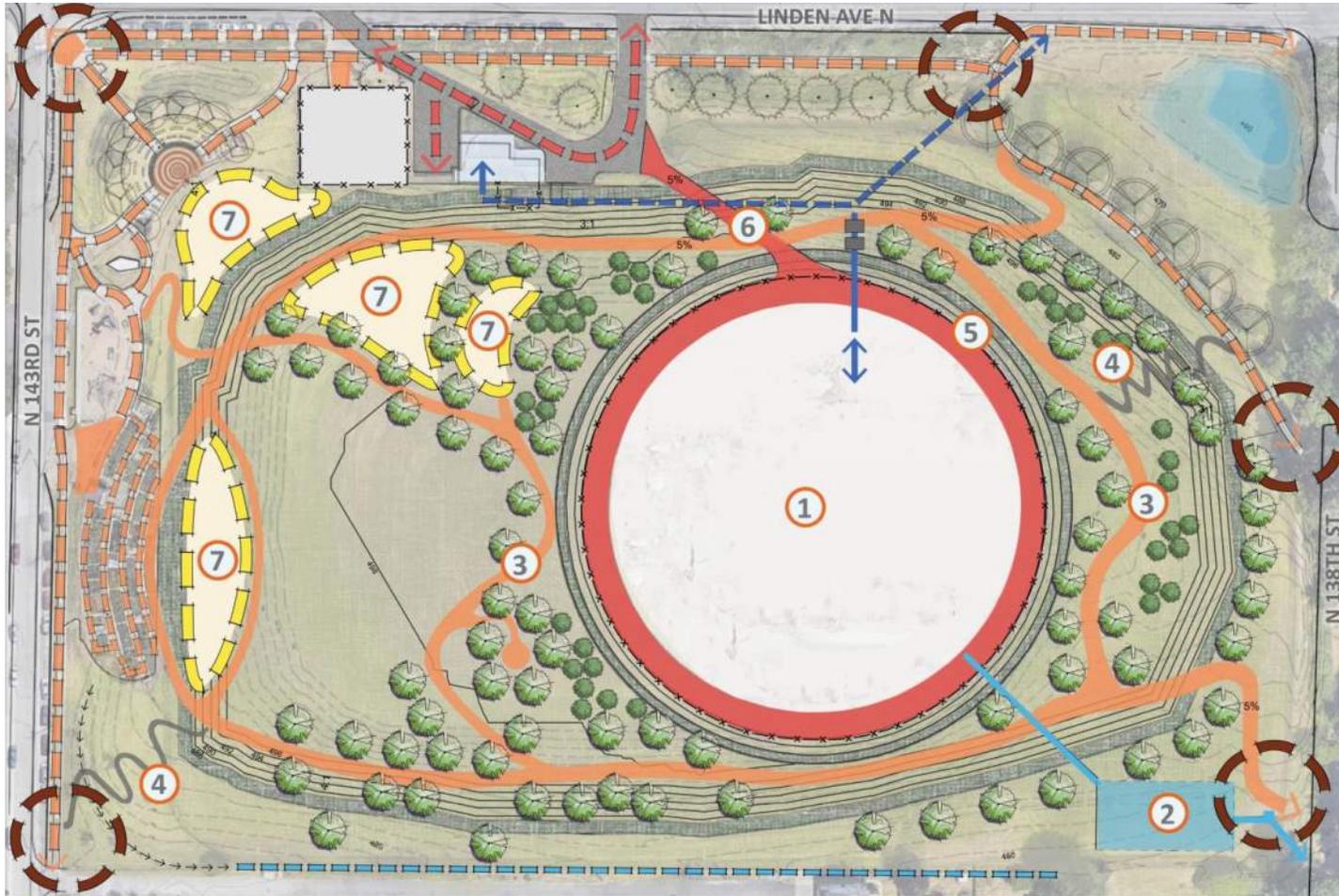
Option 4, Fully Buried Reservoir



LEGEND

- x-x Security fence
- - - Ex pedestrian path
- - - Ex water input/output
- - - Ex maintenance access road
- - - Programmable space
- - - Ex entrance
- - - Proposed pedestrian path
- - - Proposed secondary pedestrian path
- - - Maintenance access road
- - - Onsite detention output

Reservoir Option 3 - Preferred Option



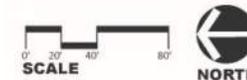
- Circular, prestressed concrete for increased seismic resiliency
- Partially buried for additional Open Space
- Site grading to minimize soil hauling

KEY

- 1 Circular reservoir, partially-buried
- 2 Detention structure
- 3 Proposed pedestrian path
- 4 Proposed secondary pedestrian path
- 5 Security fence
- 6 Maintenance access road
- 7 Programmable space

LEGEND

- Security fence
- Ex pedestrian path
- Ex water input/output
- Ex maintenance access road
- Programmable space
- Ex entrance
- Proposed pedestrian path
- Proposed secondary pedestrian path
- Maintenance access road
- Onsite detention output



Site Opportunities (SPU)

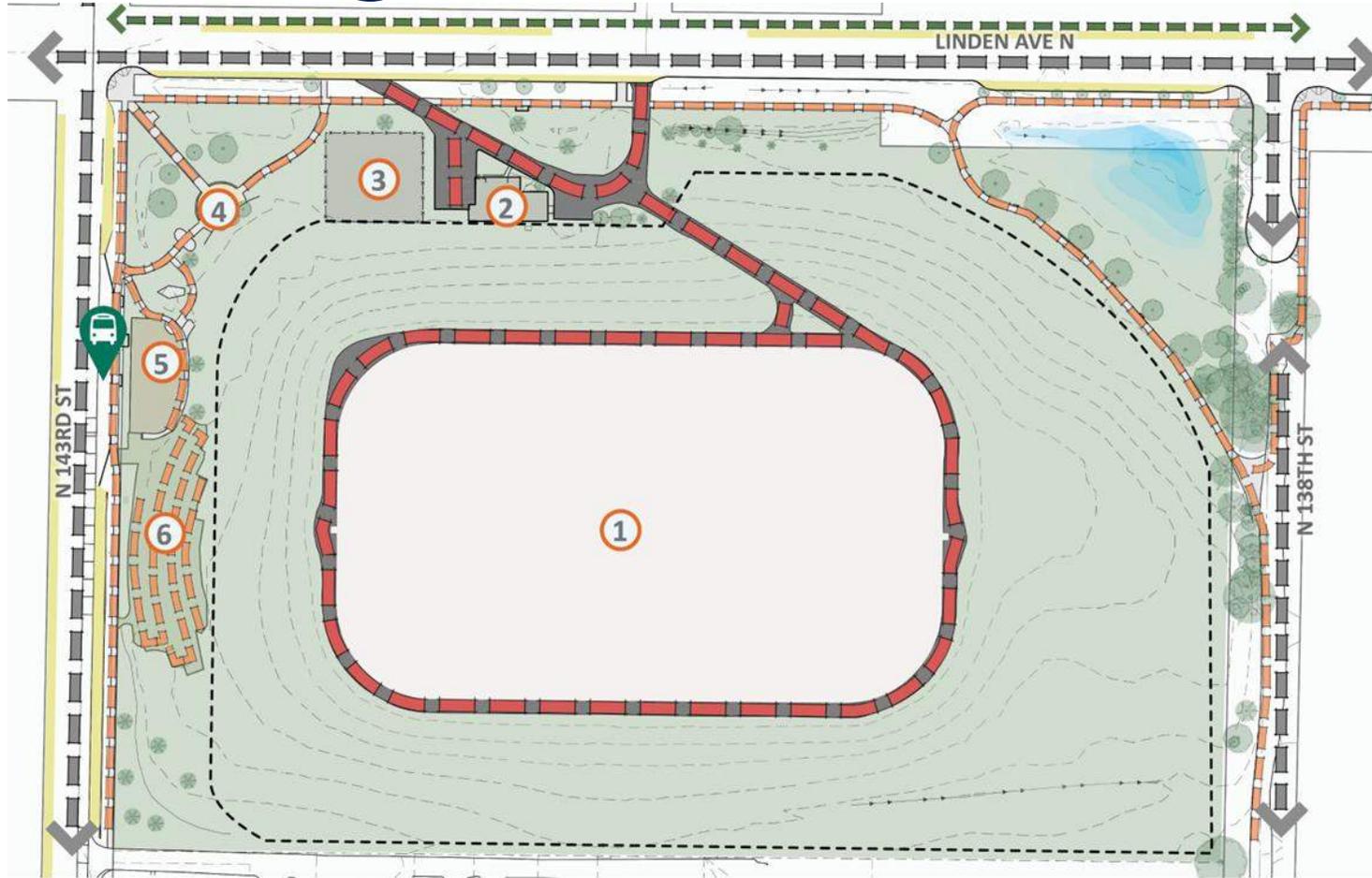
- Coordination between City Departments
 - SDOT, Improvements to project-adjacent streets
 - SPR, Creation of additional Open Space
 - ARTS, 1% for Art
- Community Engagement
 - Public input for Open Space improvements
 - Public input for Artwork
- Low Impact Stormwater Management
 - Deep infiltration, Underground Injection Control Well

Site Opportunities (SPR)

- Additional Open Space (currently ~25% of site, future ~75% of site)
 - Approximately 6 acres
- Transitions between existing park spaces and amenities into new open space.
- Accessibility improvements.
- Balancing desired park amenities with adjacent single family residential properties.
- Cultural expression through built environment, flexibility of spaces to respond to diversity of neighborhood.

SITE AND BUILDING PLANS

Existing Bitter Lake Reservoir Property

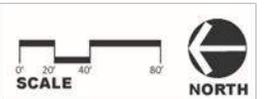


KEY

- 1 Reservoir with floating cover
- 2 Pump station
- 3 Maintenance storage area
- 4 Gathering space
- 5 Playground
- 6 P-patch

LEGEND

- Security fence
- Pedestrian path
- Bicycle path: Interurban Trail
- Maintenance access road
- Road
- Parking
- Bus stop
- Reservoir property
- Stormwater detention pond



Existing Bitter Lake Reservoir Property



Northeast perspective. Source: Google Earth.

Project Vision

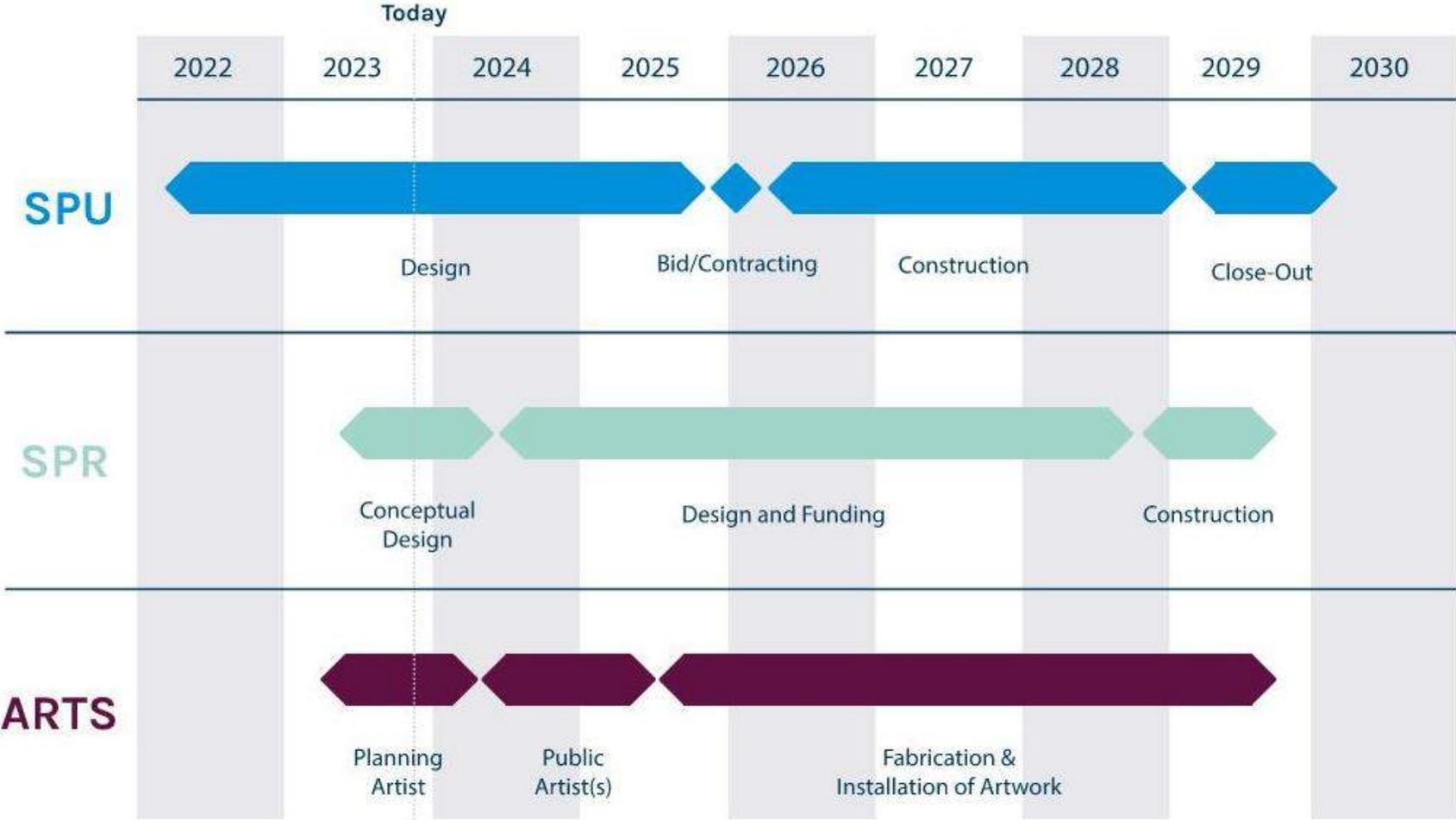
- Maintain the water system's storage requirements
- Continue to meet system water quality and water service regulations
- Create additional open space for the Bitter Lake community in coordination with Seattle Parks & Recreation (SPR)

Seattle Design Commission

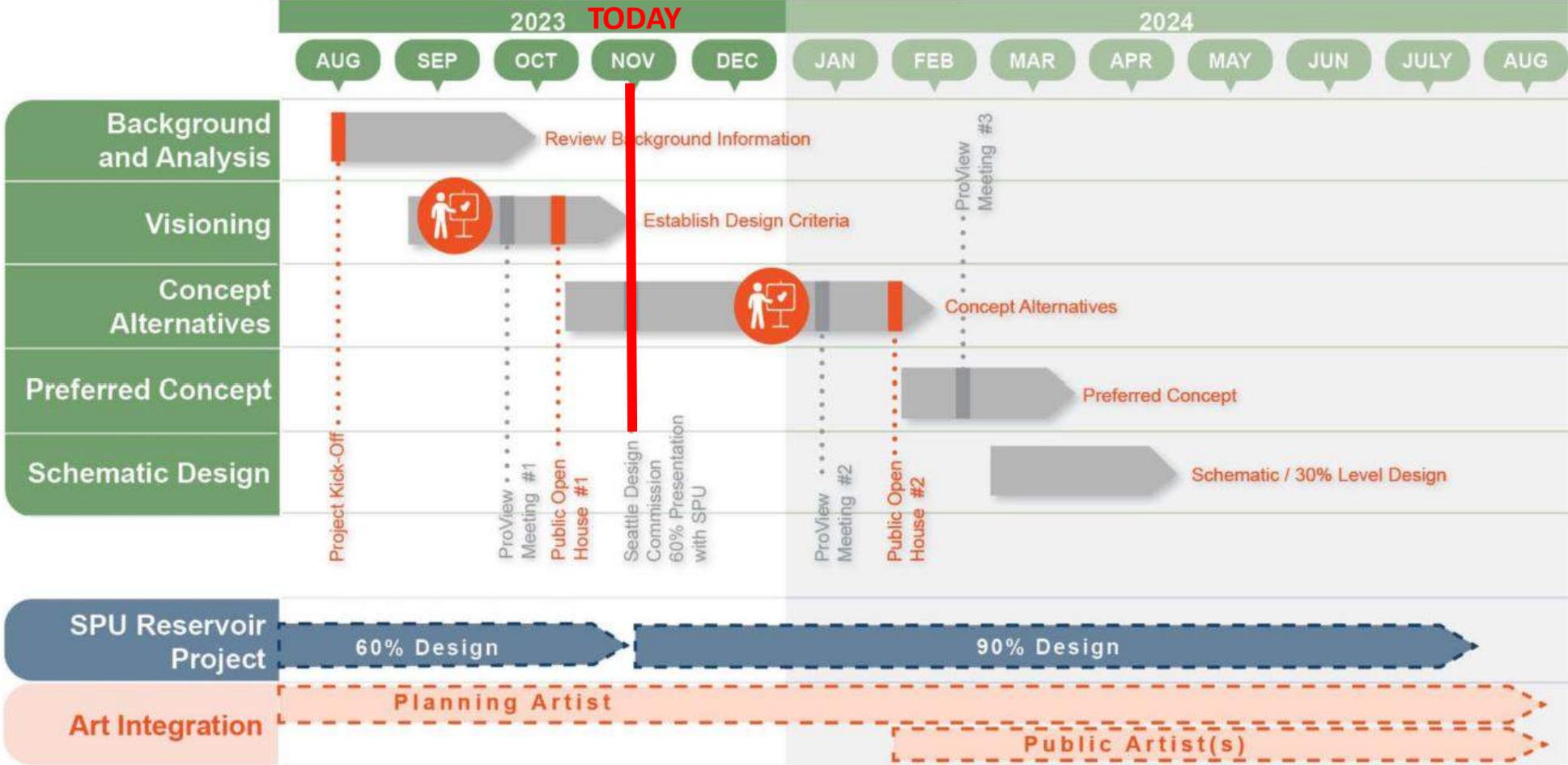
Concept Design Comments (02/16/2023)

1. Site & Topography
2. Architecture, materials, and massing
3. Engagement
4. Art Opportunities
5. Right-of-Way
6. Sustainability
7. Safety

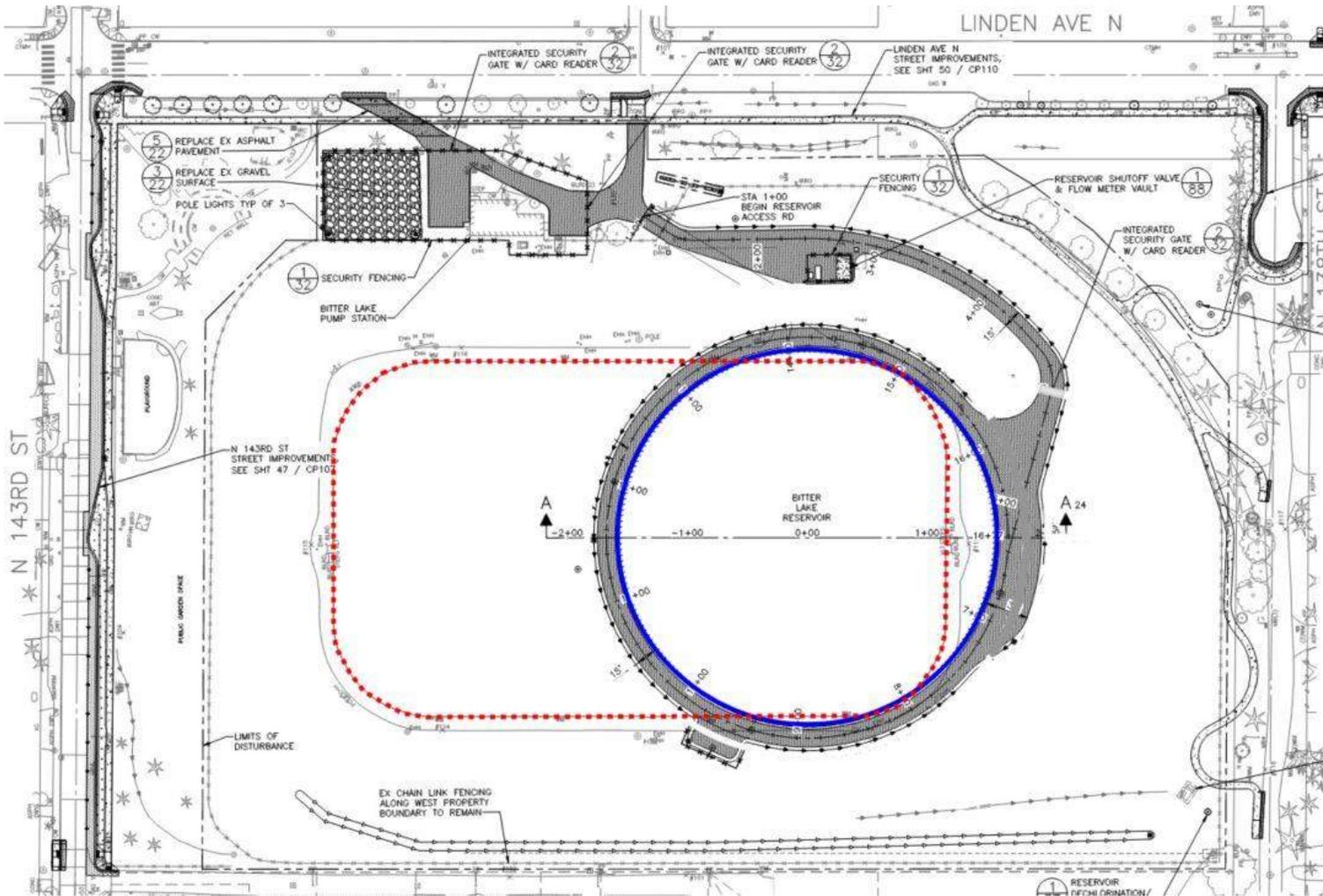
Coordinated Schedules



Coordinated Schedules (Parks)

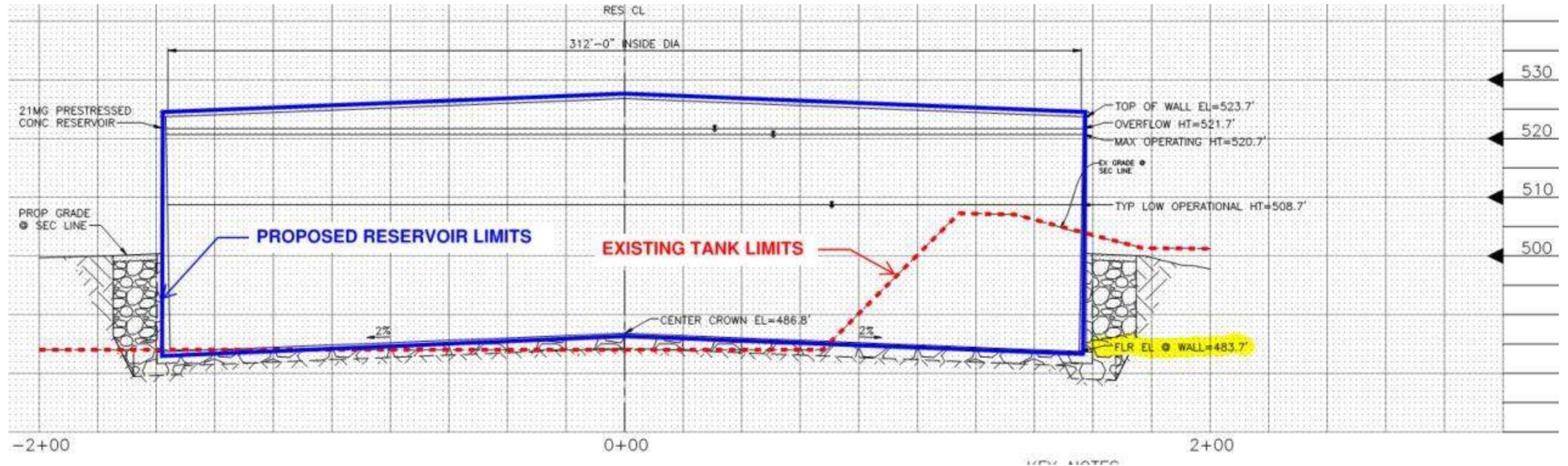


Site Constraints, Engineering Considerations



- Reservoir Location
- Minimize soil hauling, keep excavated materials on site
- Stormwater Management
 - Shallow Infiltration Restricted

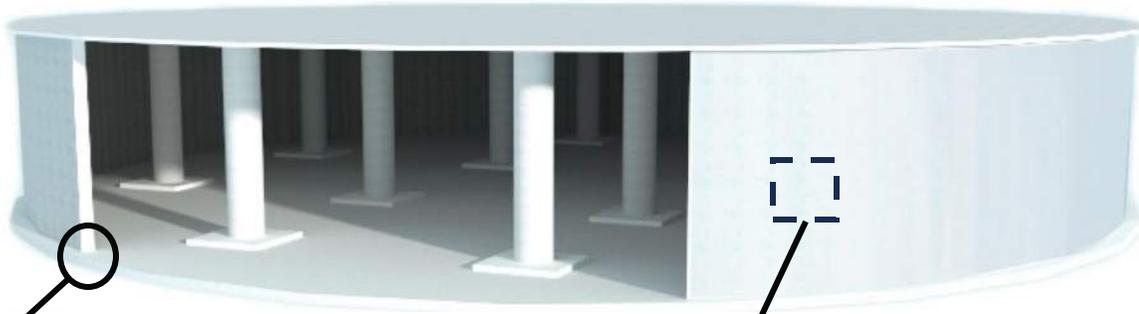
Site Constraints, Engineering Considerations



- Reservoir configuration to store 21 MG

- Hydraulic Elevations
 - Bottom elev. needs to remain the same

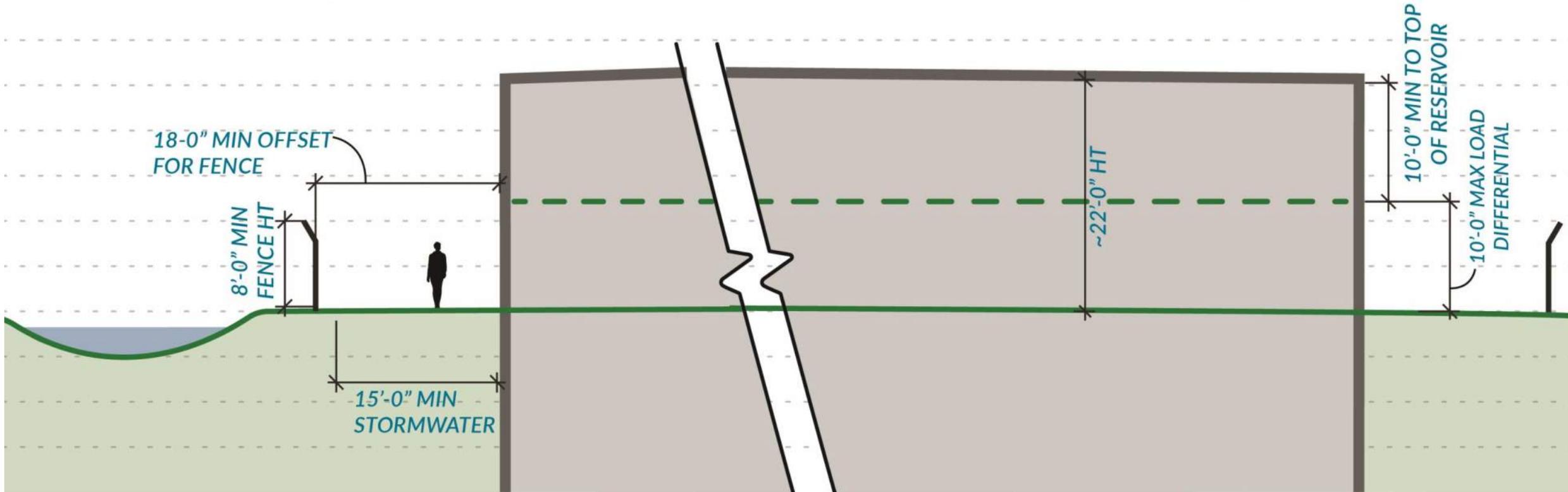
Site Constraints, Engineering Considerations



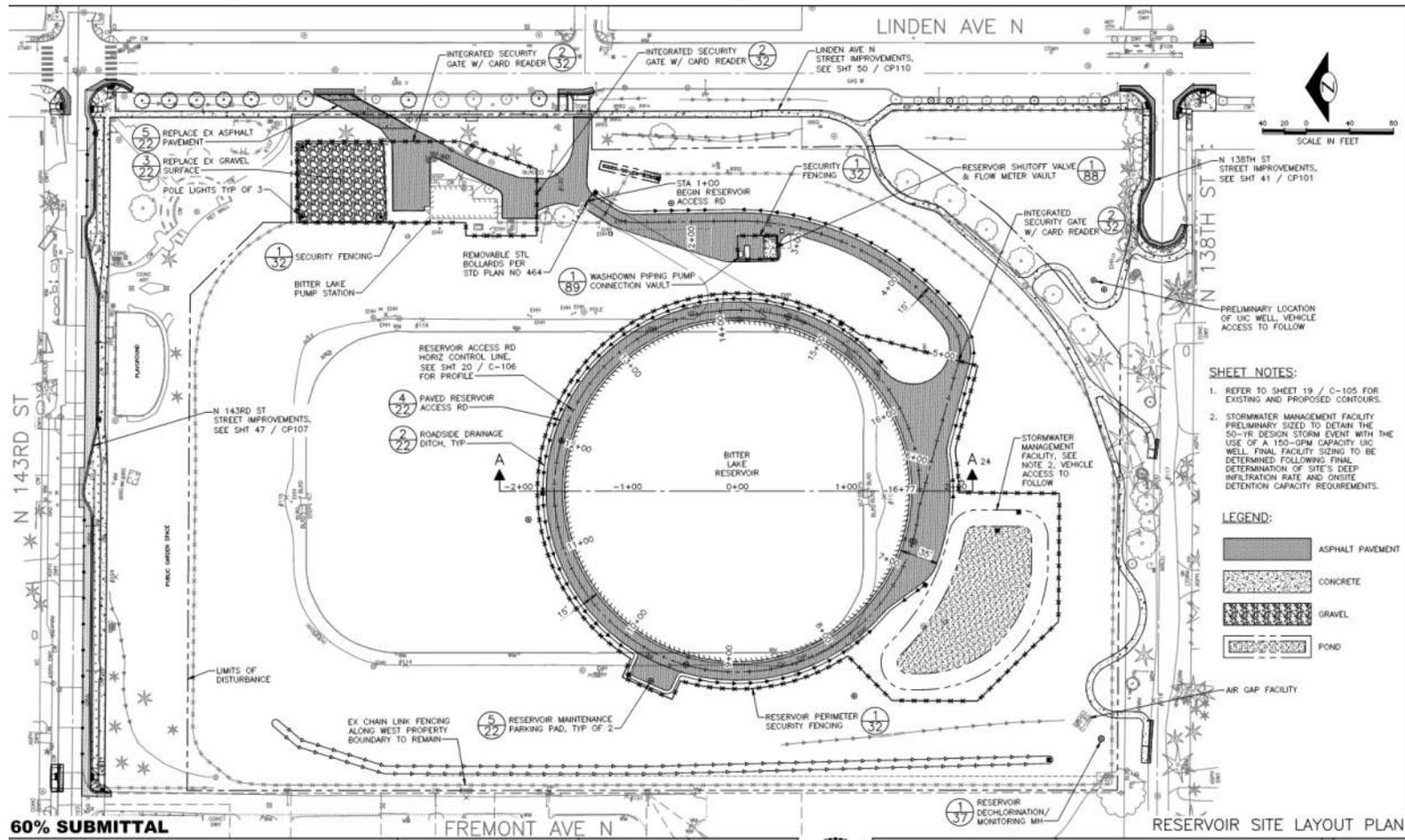
Seismic resiliency by design:

- AWWA D110, Type I tank
- Circular
- Prestressed with galvanized wire
 - Placed in permanent compression
 - Total wraps = 710
 - Over 135 miles in length
- "Floating" floor-to-wall connection

Site Constraints, Additional Considerations



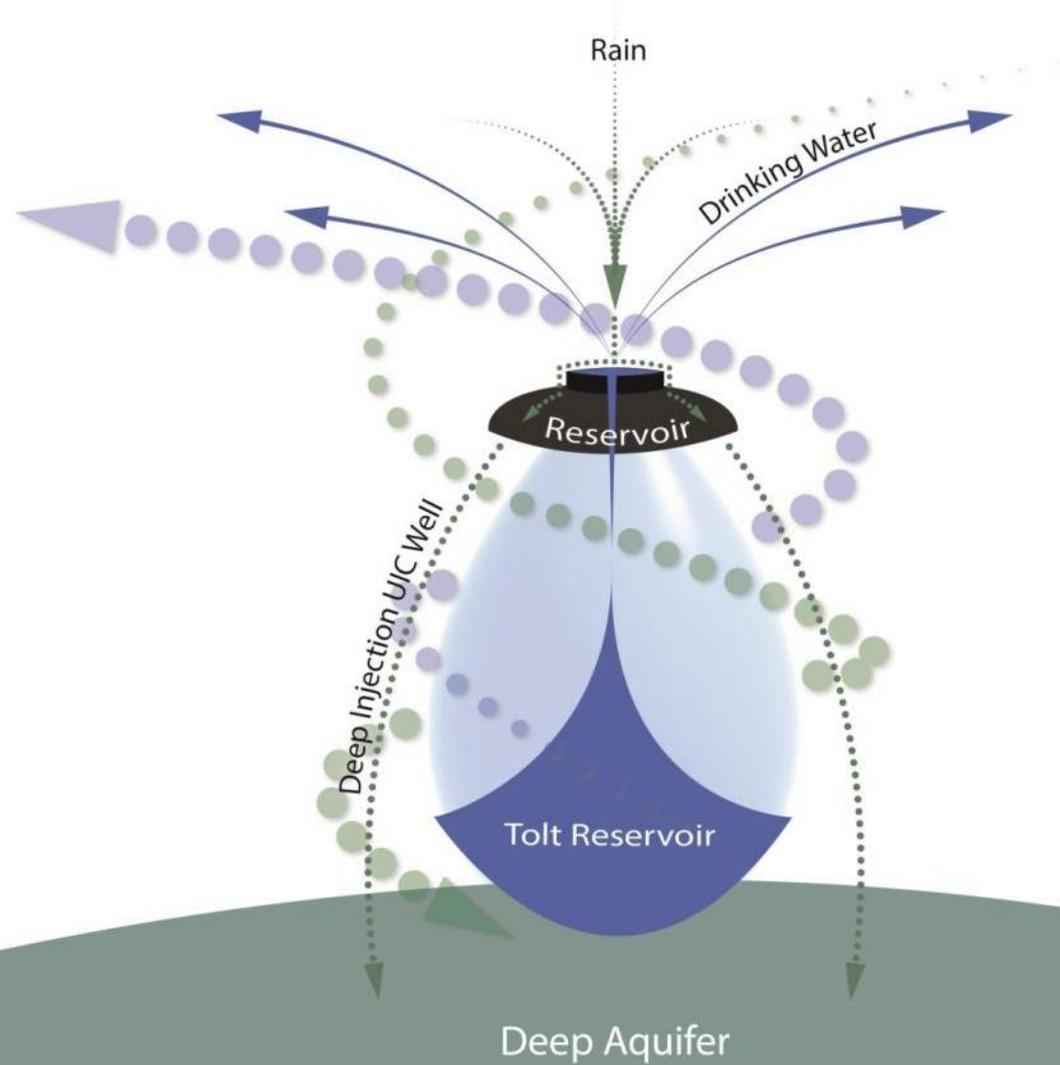
Engineering, 60% Design Overview



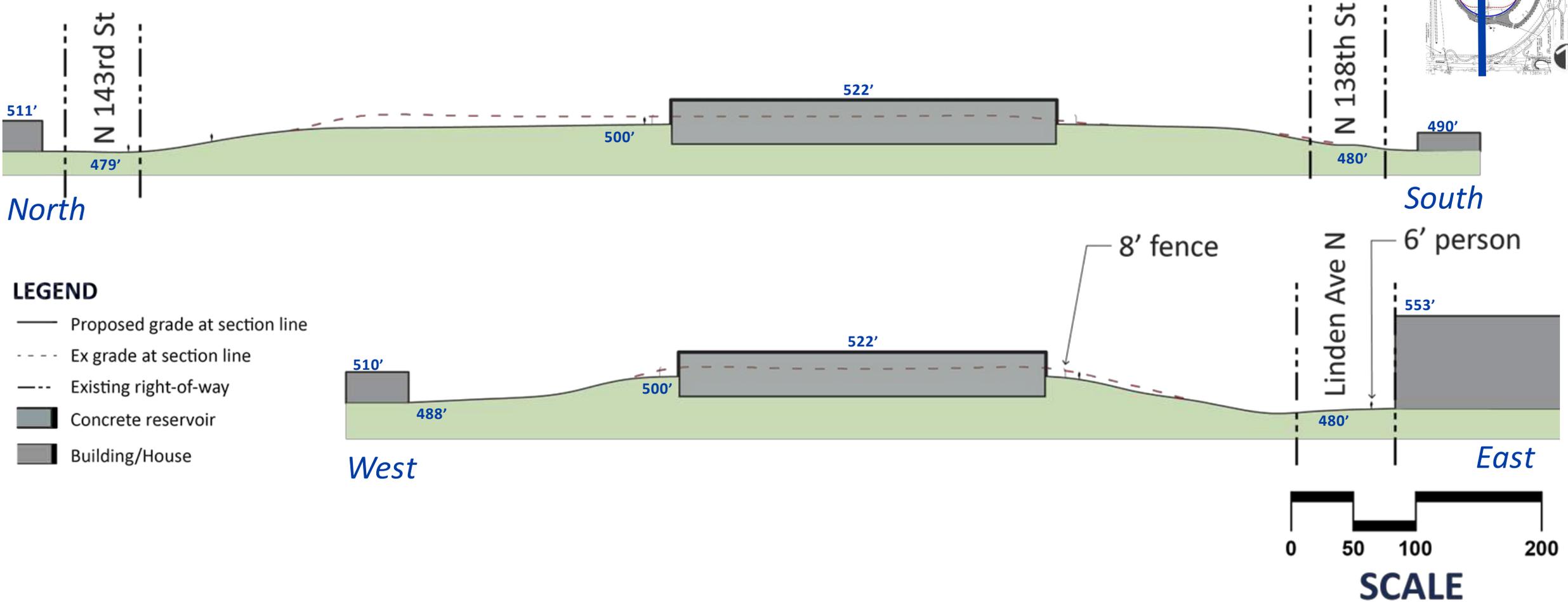
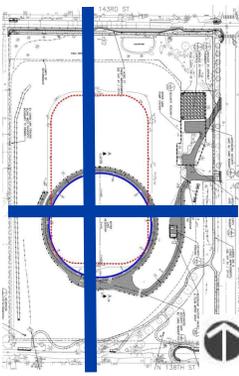
Concept Design Comments

- 1. Site & Topography**
2. Architecture, materials, and massing
3. Engagement
4. Art Opportunities
5. Right-of-Way
6. Sustainability
7. Safety

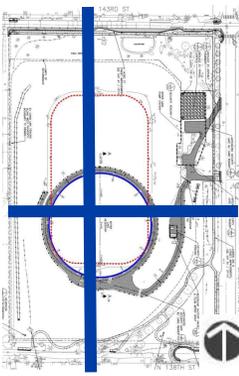
Story



Site Topography

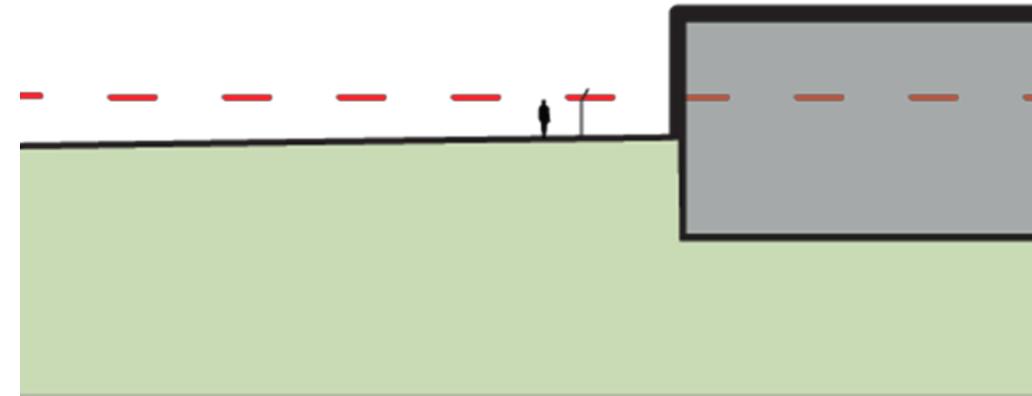
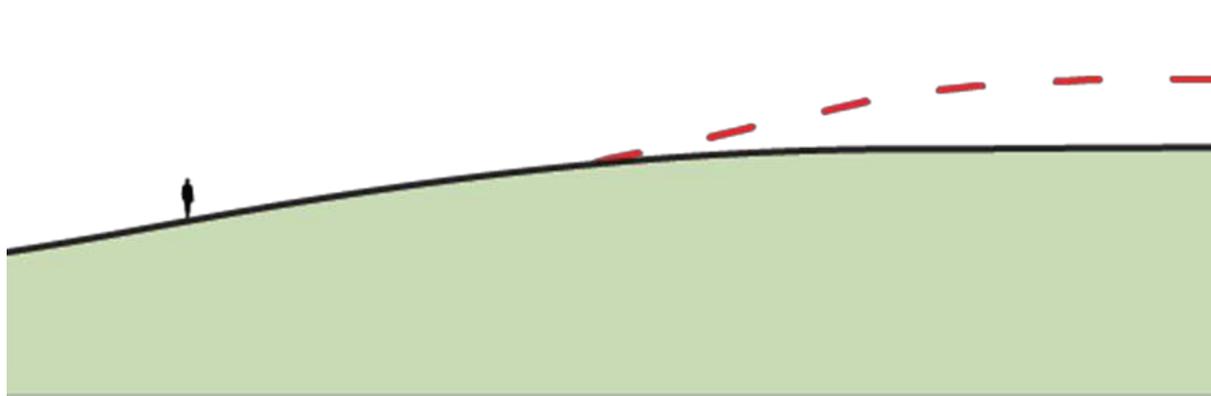
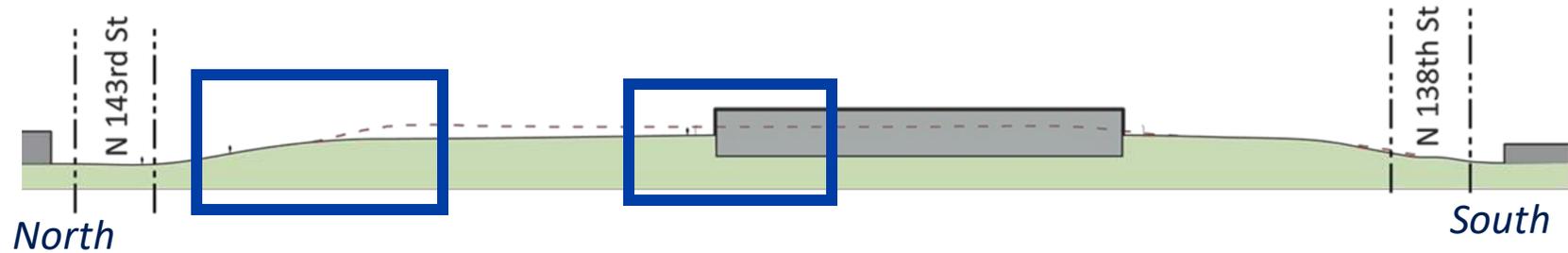


Site Topography

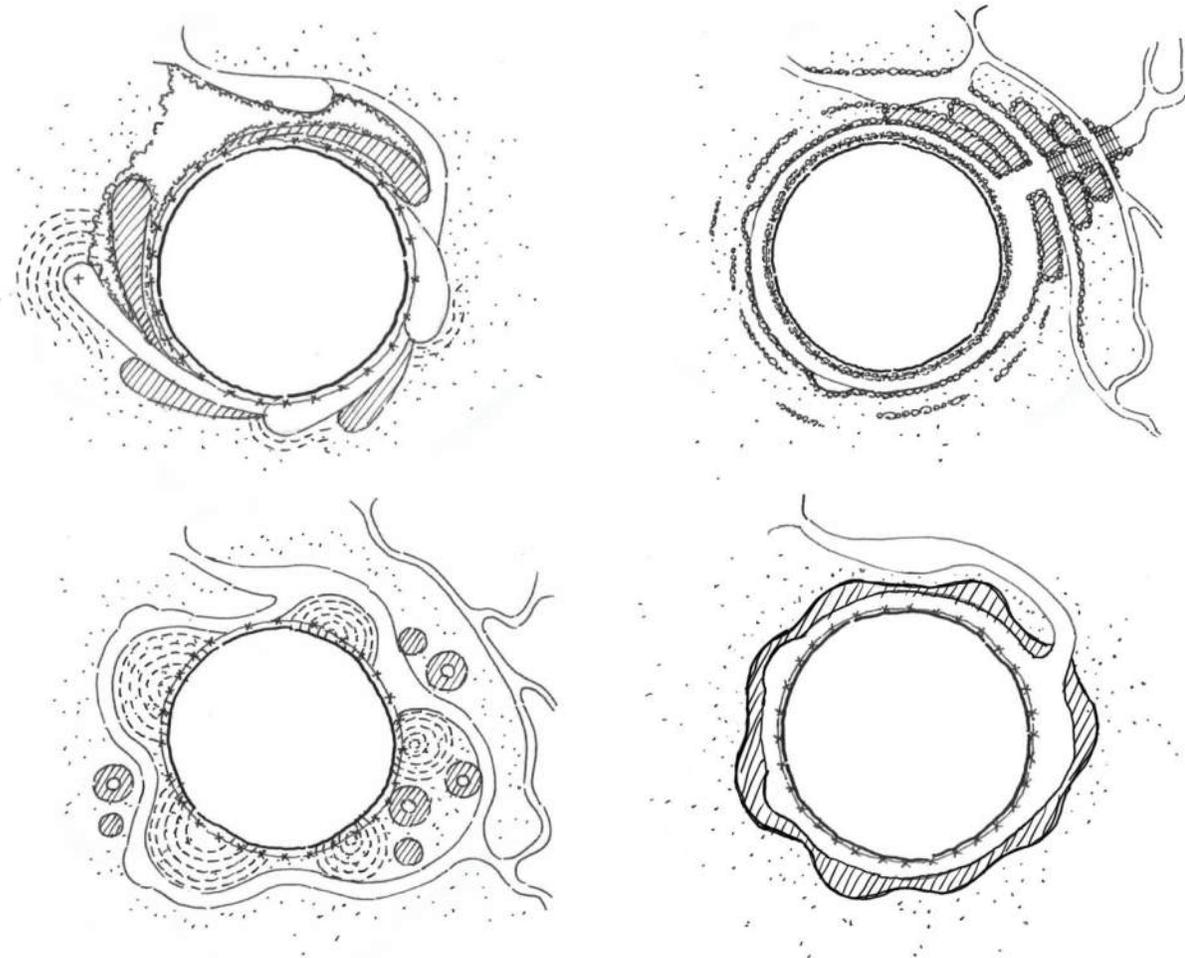


LEGEND

- Proposed grade at section line
- - - Ex grade at section line
- - - Existing right-of-way
- Concrete reservoir
- Building/House



Site Topography

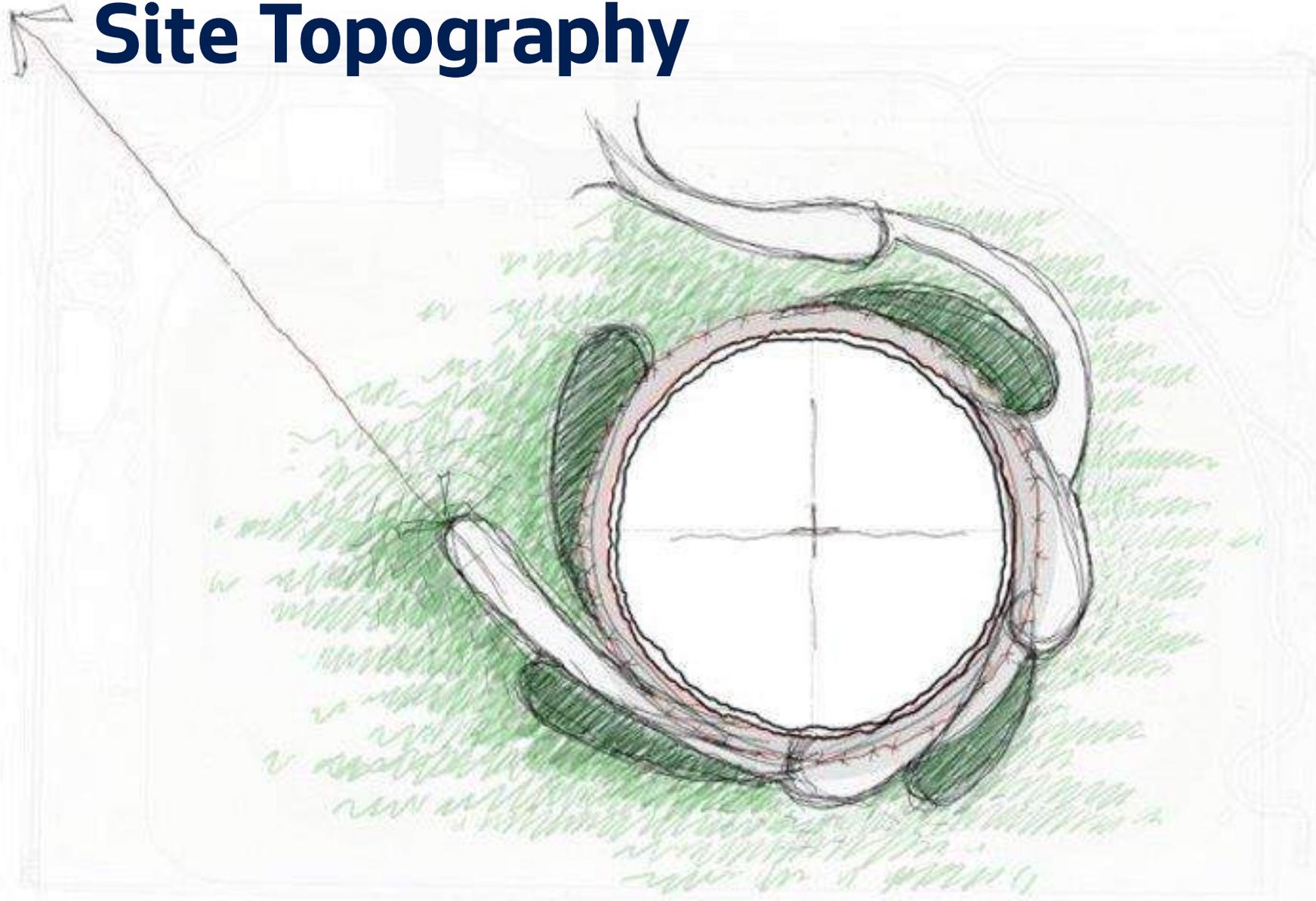


Preliminary sketches



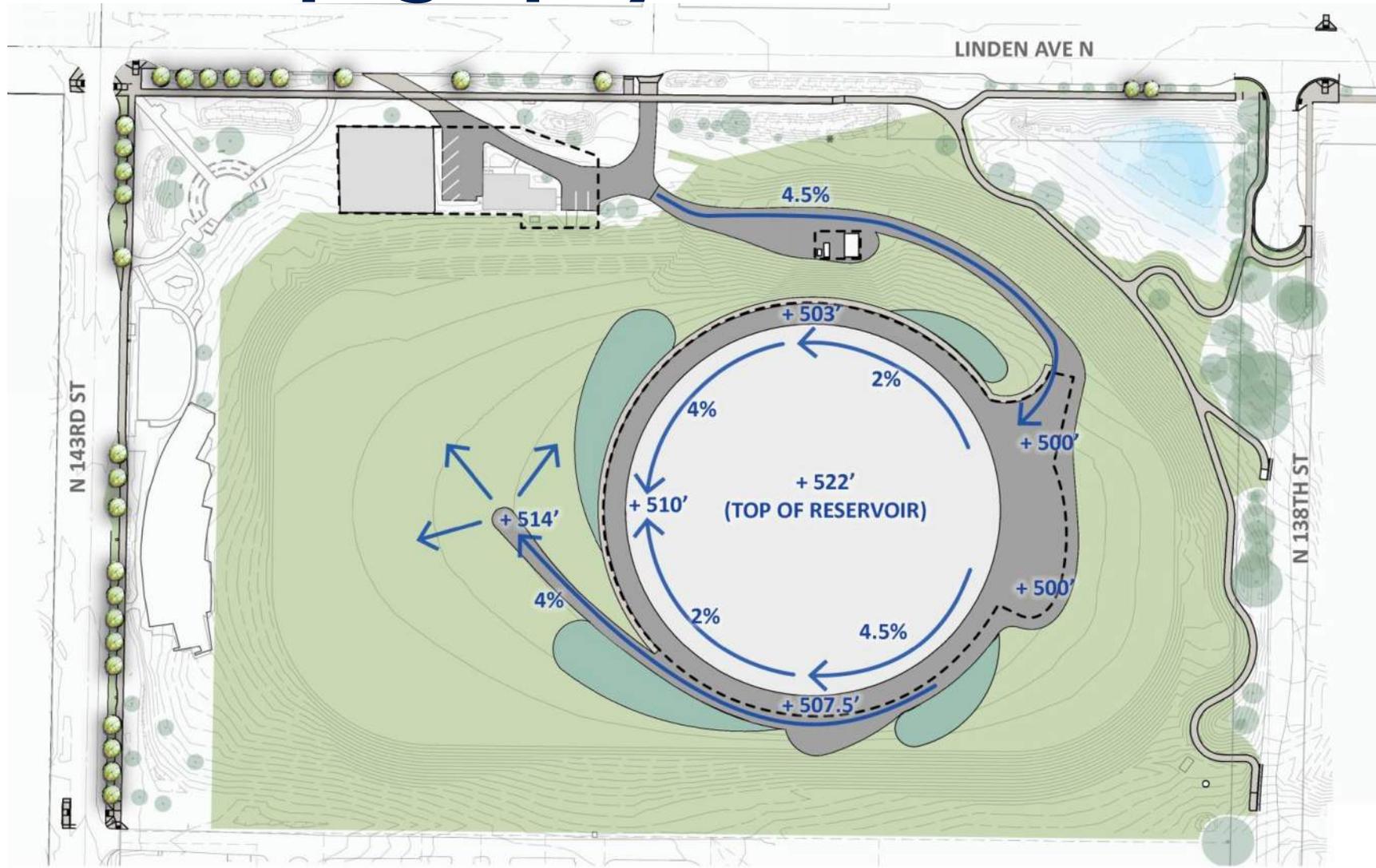
Inspiring images

Site Topography



- Celebrates movement of water
- Utilizes additional earthwork for varied topography
- Viewpoint oriented towards park and future connections
- Incorporates SPU security and access requirements

Site Topography



Site Concept



KEY

- 1 Circular reservoir, partially buried
- 2 Viewpoint

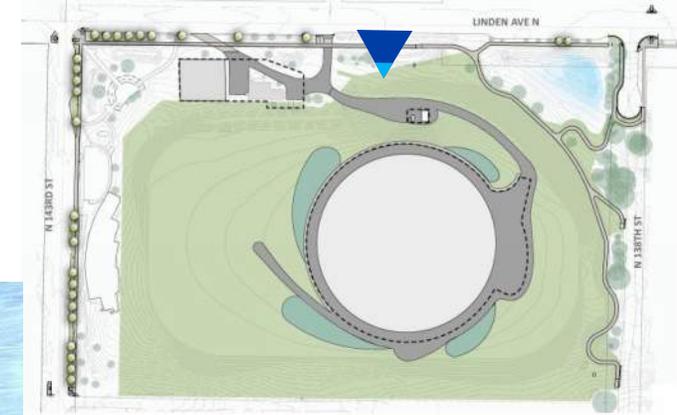
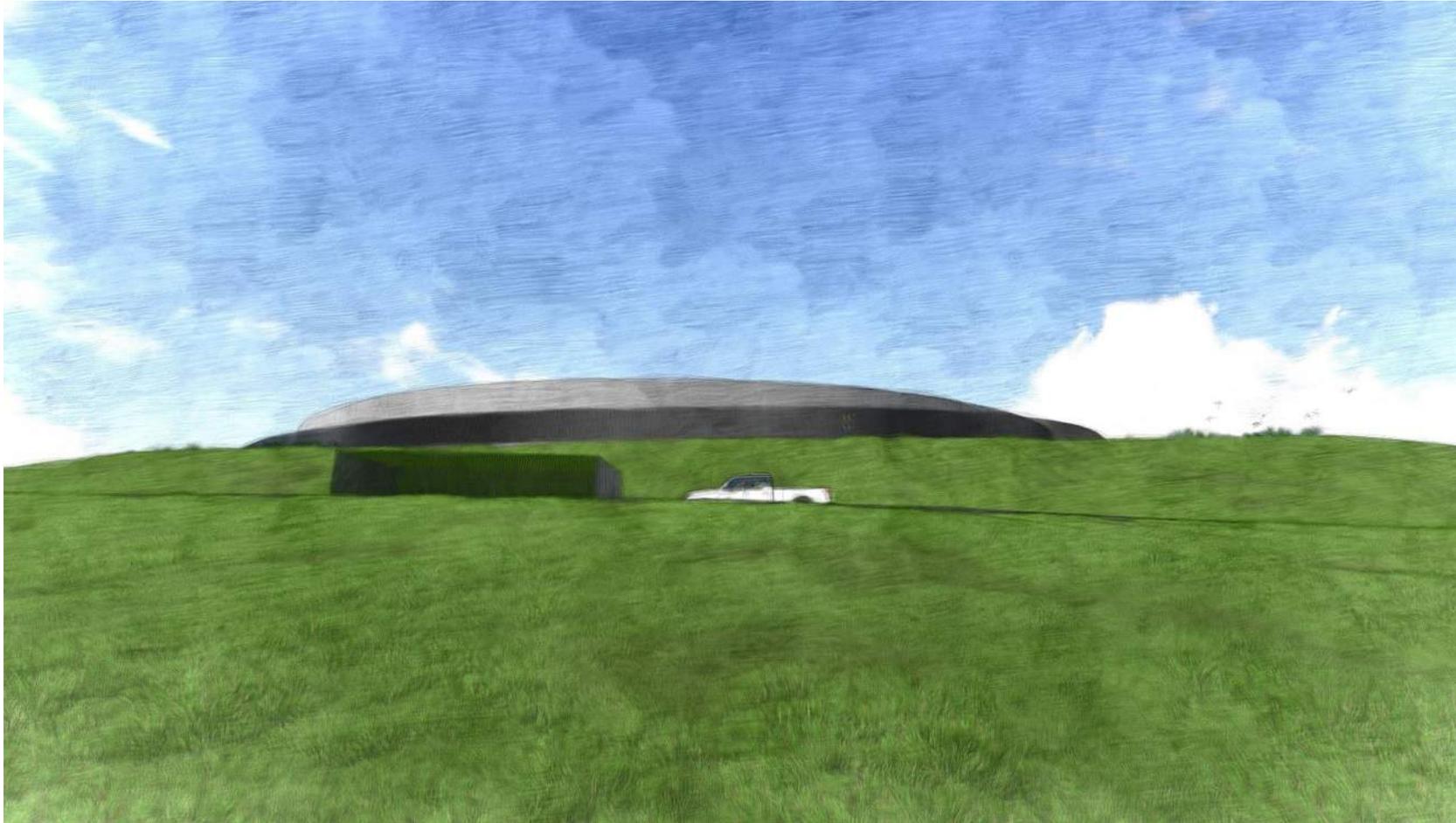
LEGEND

- Security fence
- Pedestrian path (ex & prop)
- Ex bicycle path
- Ex parking
- Ex road
- 🚌 Ex bus stop
- Asphalt paving
- Seeded lawn
- Bioretention planting
- Ex stormwater detention pond
- 🌳 Proposed trees

0' 20' 40' 80'
SCALE

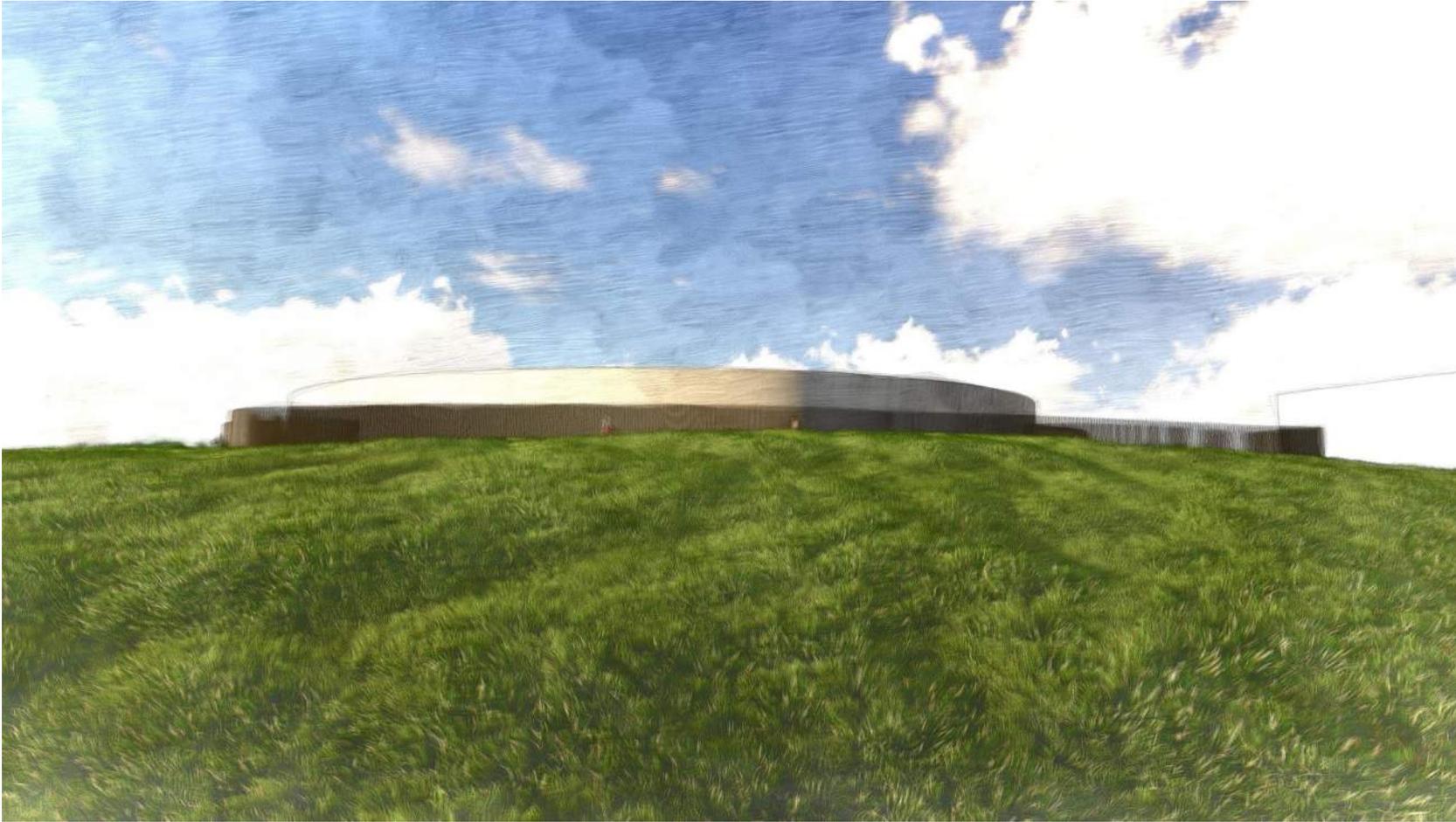


Visualizations



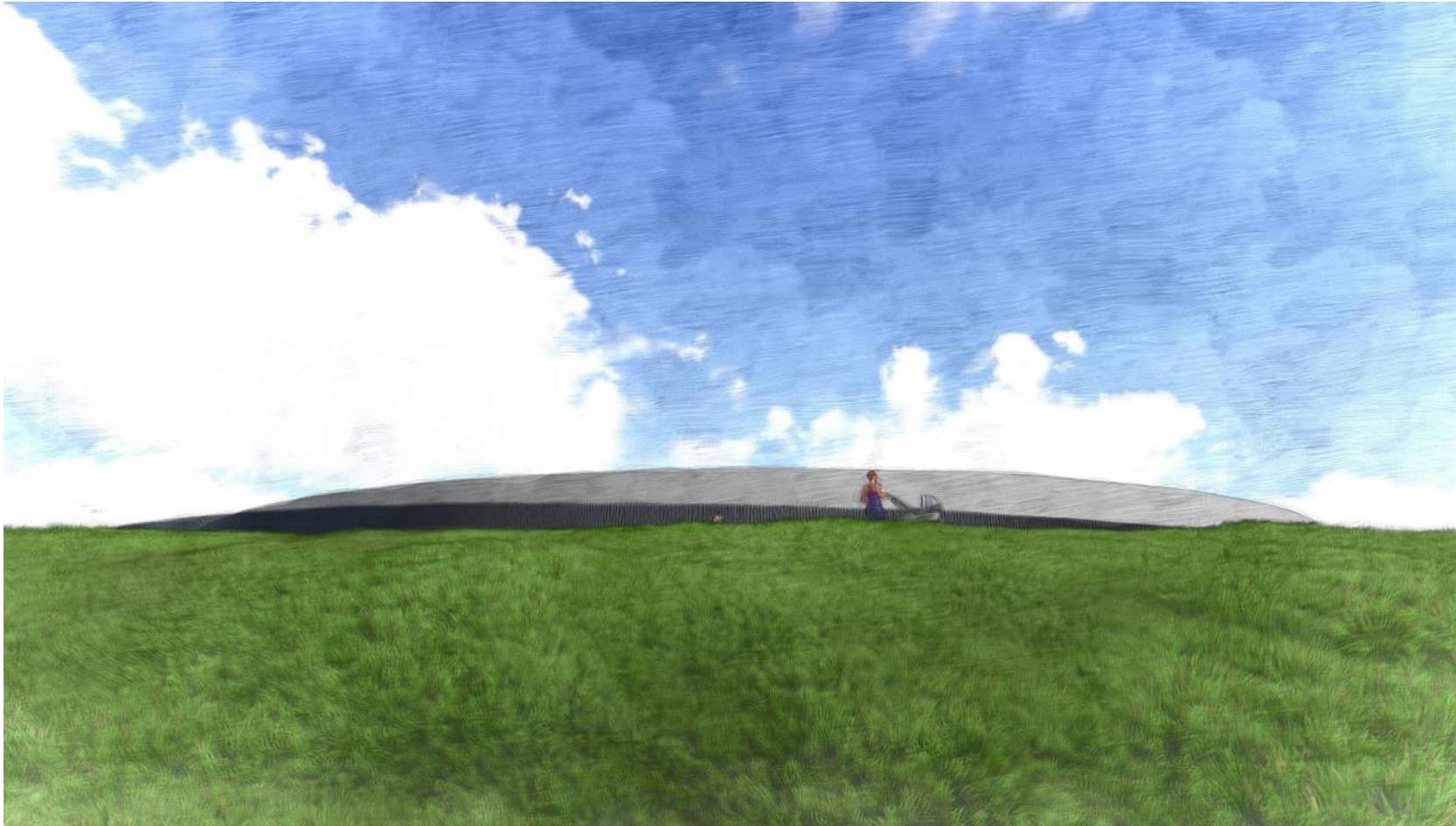
- View from east looking west

Visualizations



- View from south looking north

Visualizations



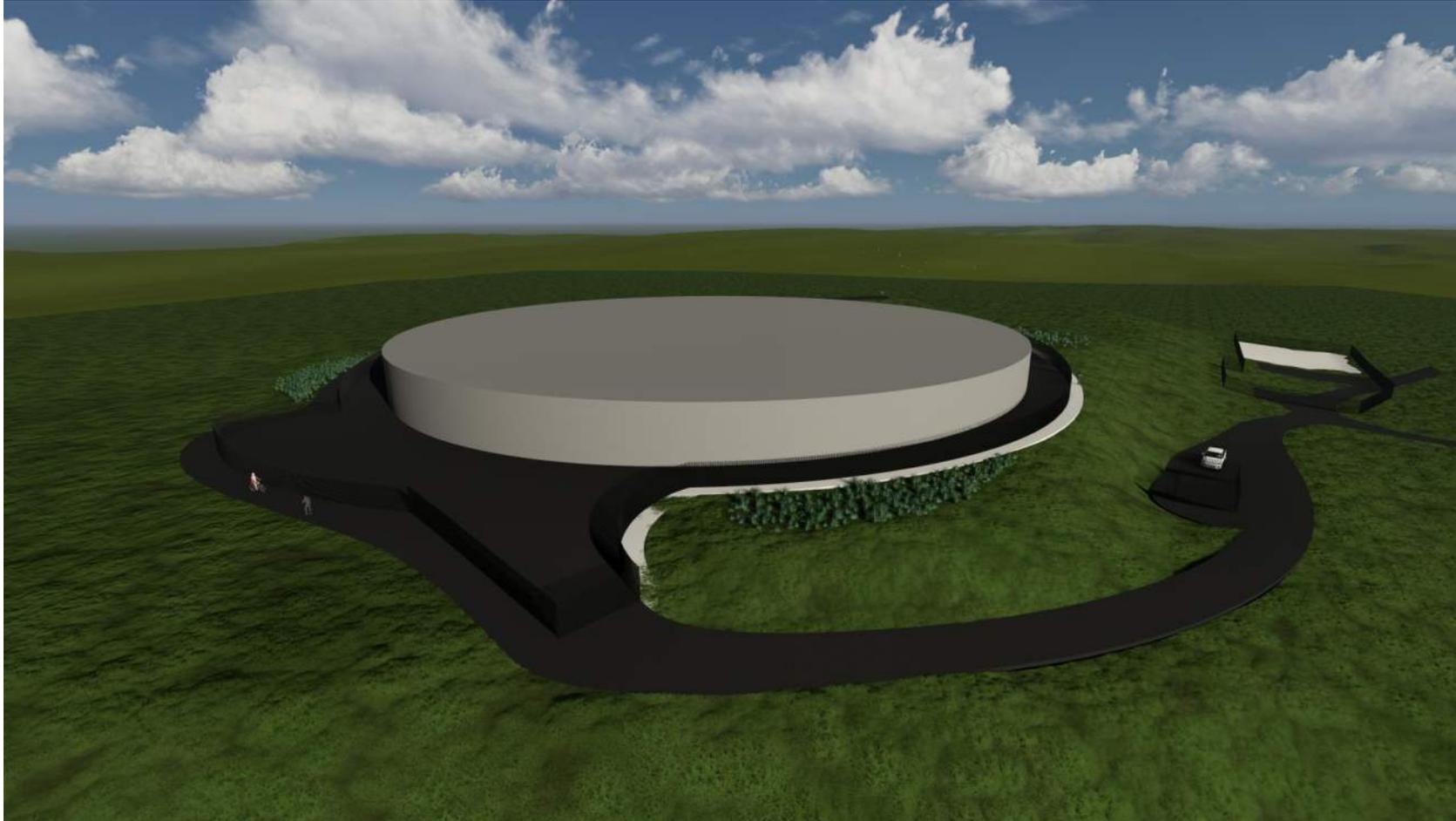
- View from west looking east

Visualizations



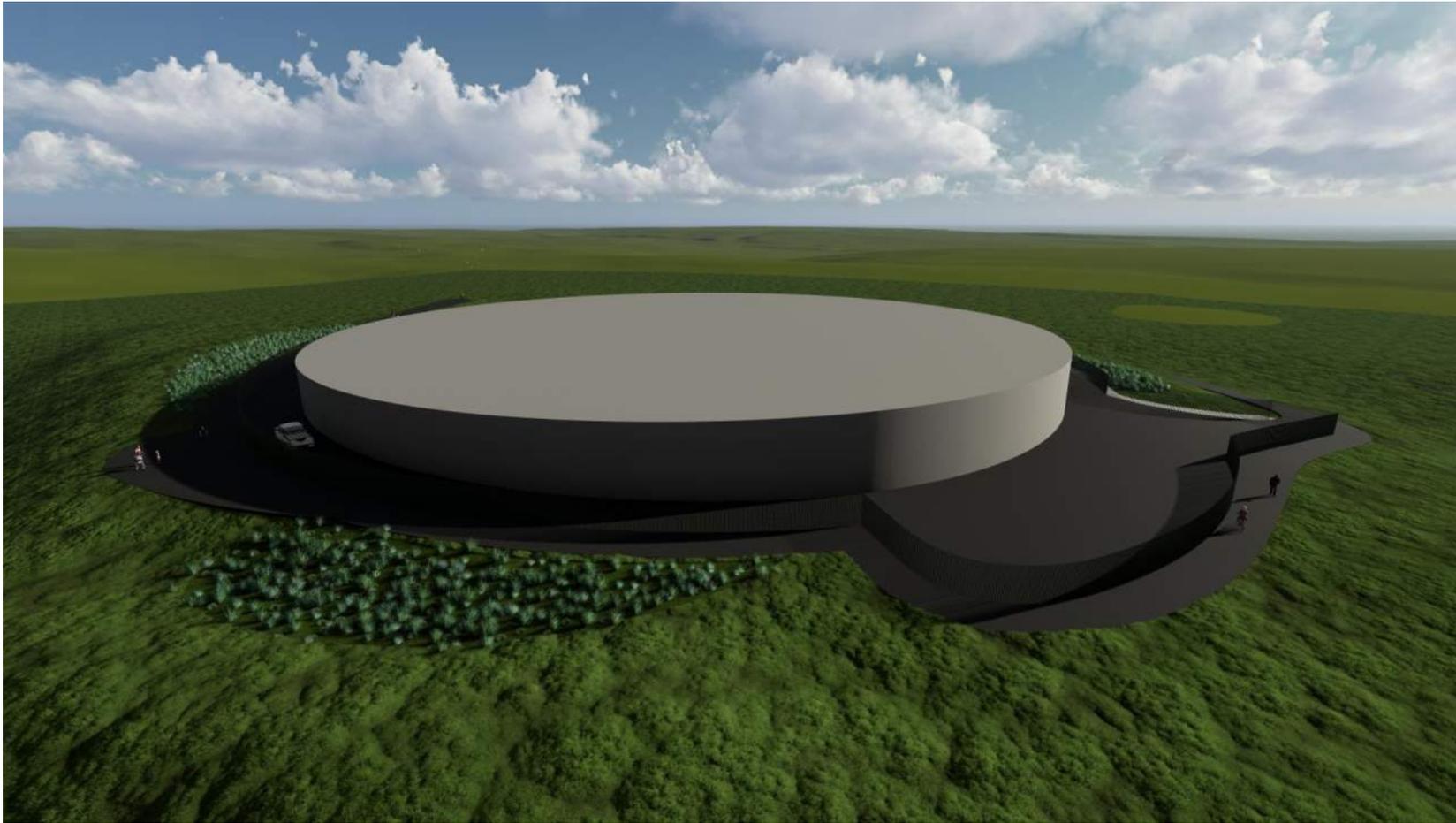
- View from north looking south

Visualizations



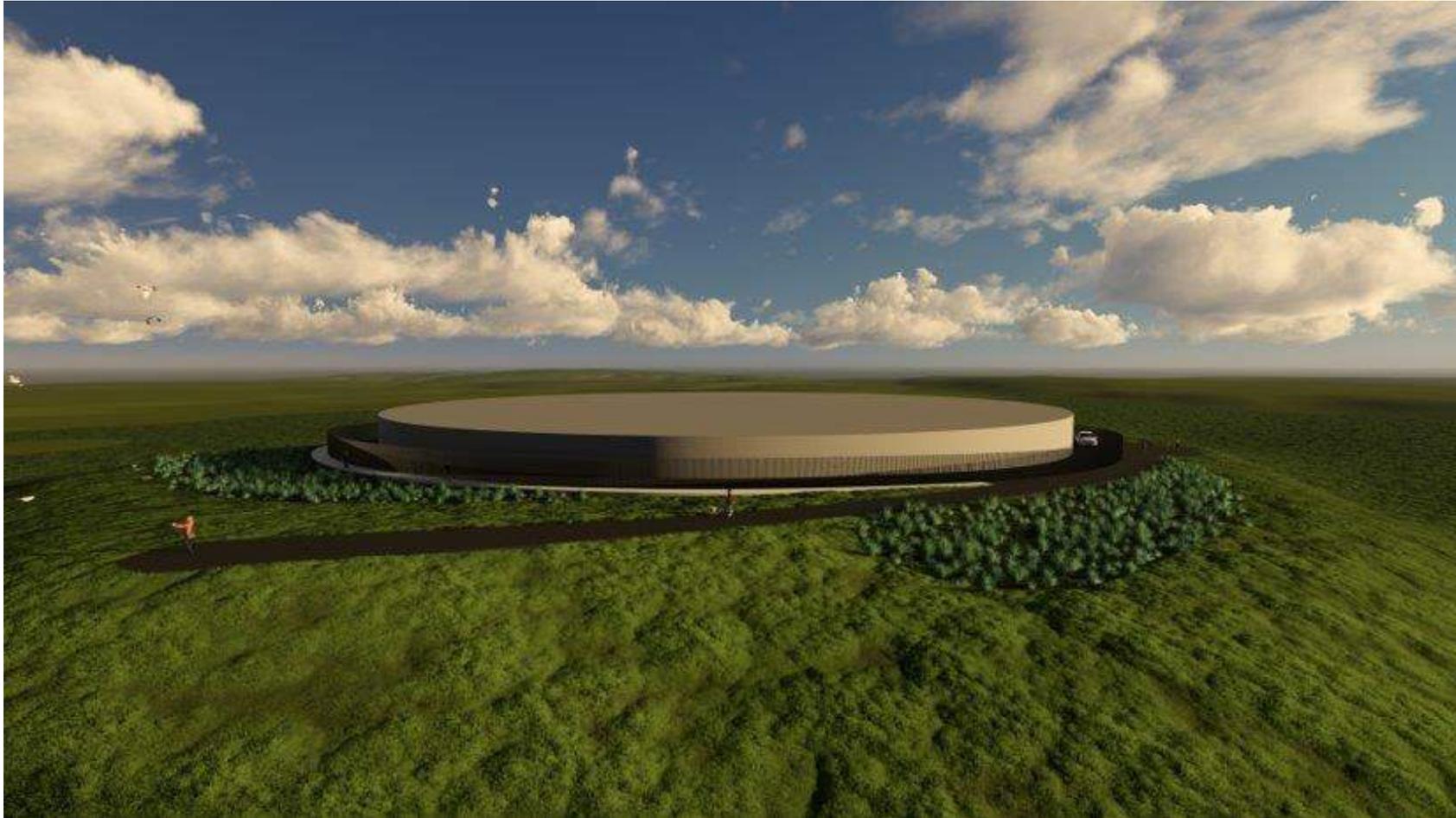
- Perspective from SE looking NW

Visualizations



- Perspective from SW looking NE

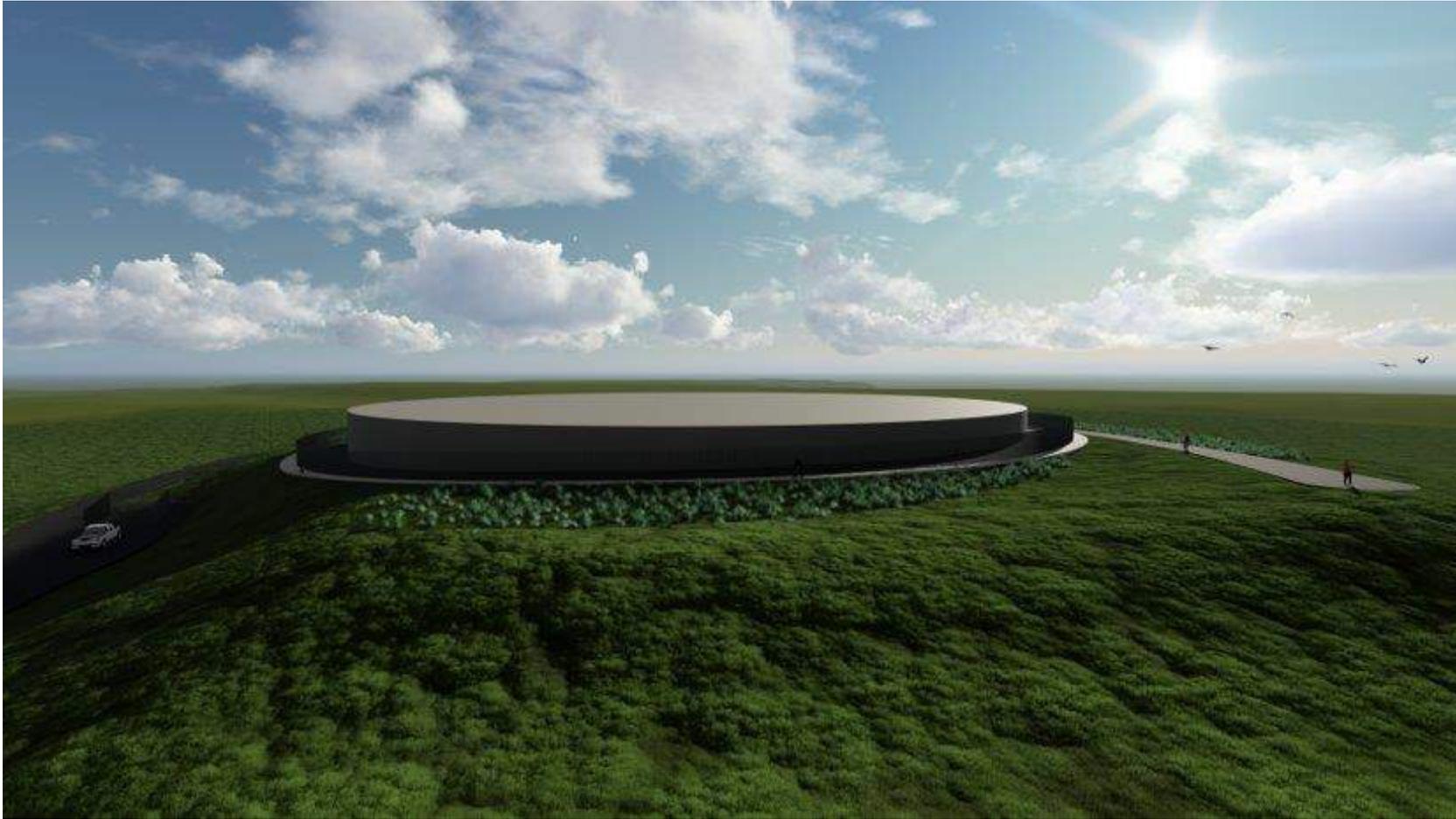
Visualizations



- Perspective from NW looking SE



Visualizations



- Perspective from NE looking SW

Visualizations

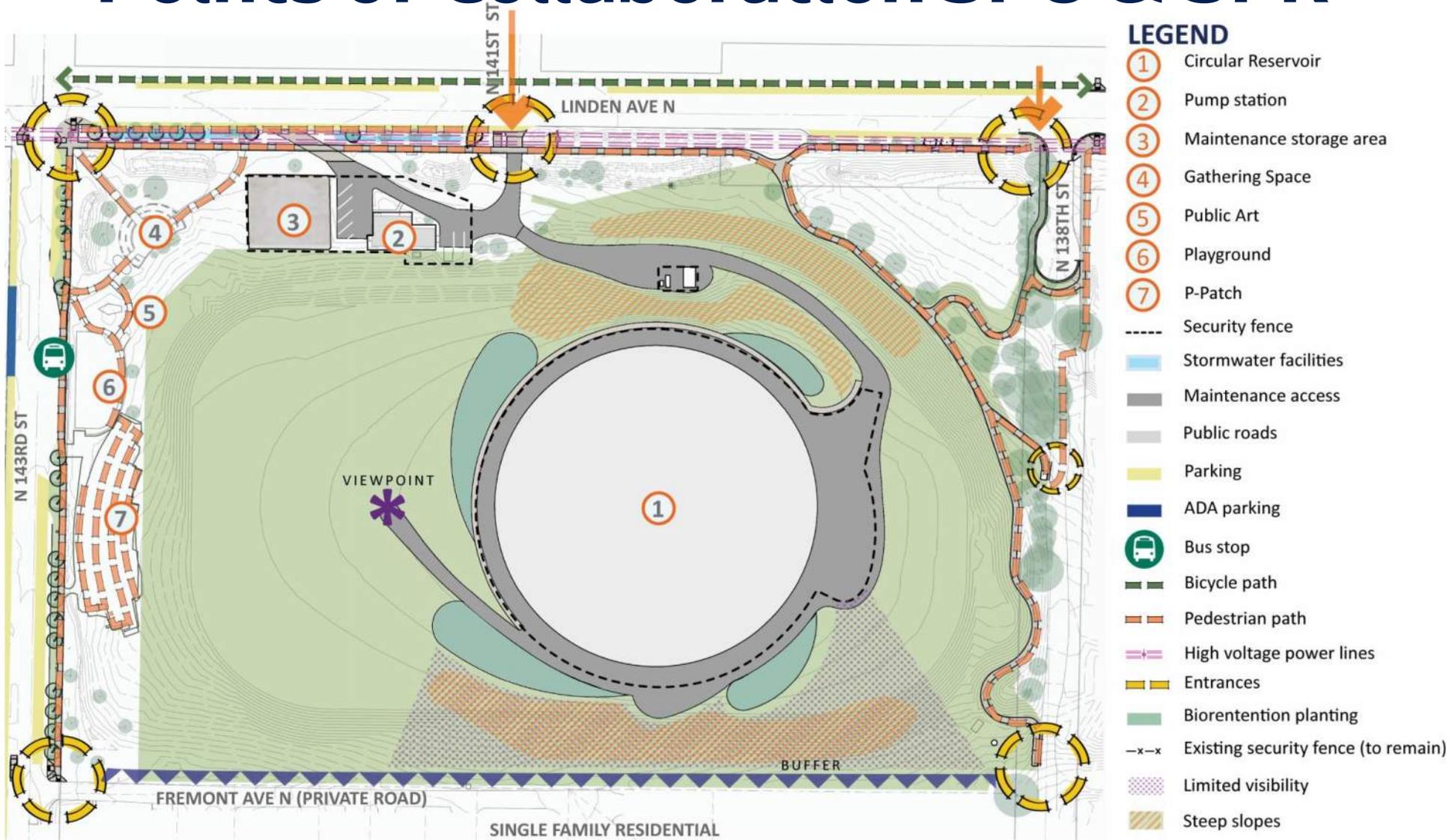


- Eye level from viewpoint looking to SW





Points of Collaboration SPU & SPR



- Clear understanding of available public areas
- Tight footprint for SPU project
- Schedules for design and construction
- Access and circulation
- Grading
- Community engagement
- Public art

Points of Collaboration SPU & SPR

Upcoming Public Open House

Potential Programming & Activities

Active Recreation Opportunities:

- Expand Playground/ play activities for kids
- Outdoor games (Ping-pong, chess, etc.)
- Sledding hill
- Berm Slide
- Kids adventure track
- Pump track/ BMX track
- Volleyball
- Disc golf
- Skatepark or looped track
- Rock climbing/bouldering wall
- Tennis
- Basketball
- Ball wall (for various ball games)
- Running loop around the reservoir/ formal track path (1/4 mile or 1/2 mile)



Passive Recreation Opportunities:

- Sensory garden / children's garden
- Flexible open lawn
- Outdoor classroom
- Interpretive signage
- Expand P-Patch
- Shelter/ BBQ
- Amphitheater/ event space
- Formal & informal seating
- Food Forest (e.g. like Beacon Hill)
- Natural meandering paths

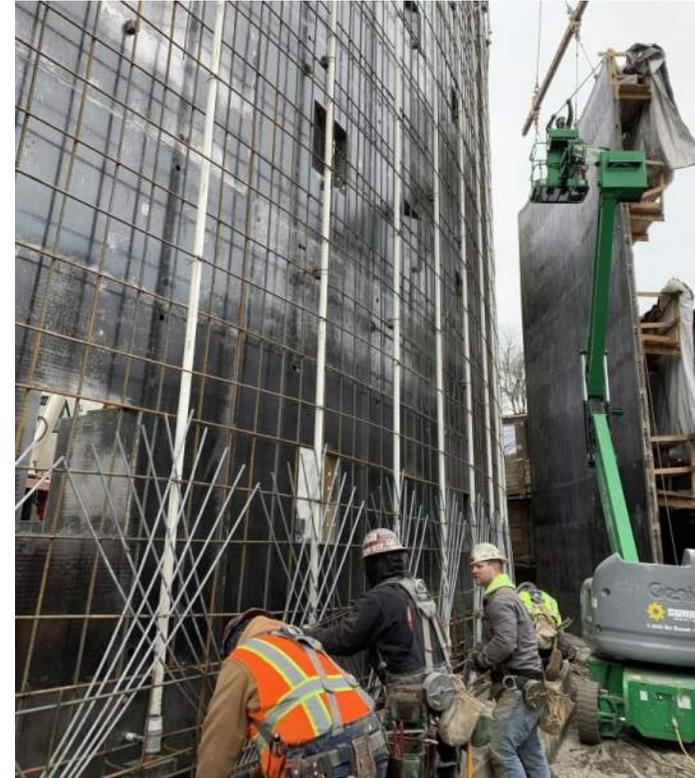
Concept Design Comments

1. Site & Topography
2. Architecture, materials, and massing
3. Engagement
4. Art Opportunities
5. Right-of-Way
6. Sustainability
7. Safety

Architectural / Structural Materials



Cast-in-place concrete construction



Seismic cabling & vertical prestressing

Architectural / Structural Materials



Shotcrete surfacing / Prestressing wire

Architectural / Structural Materials



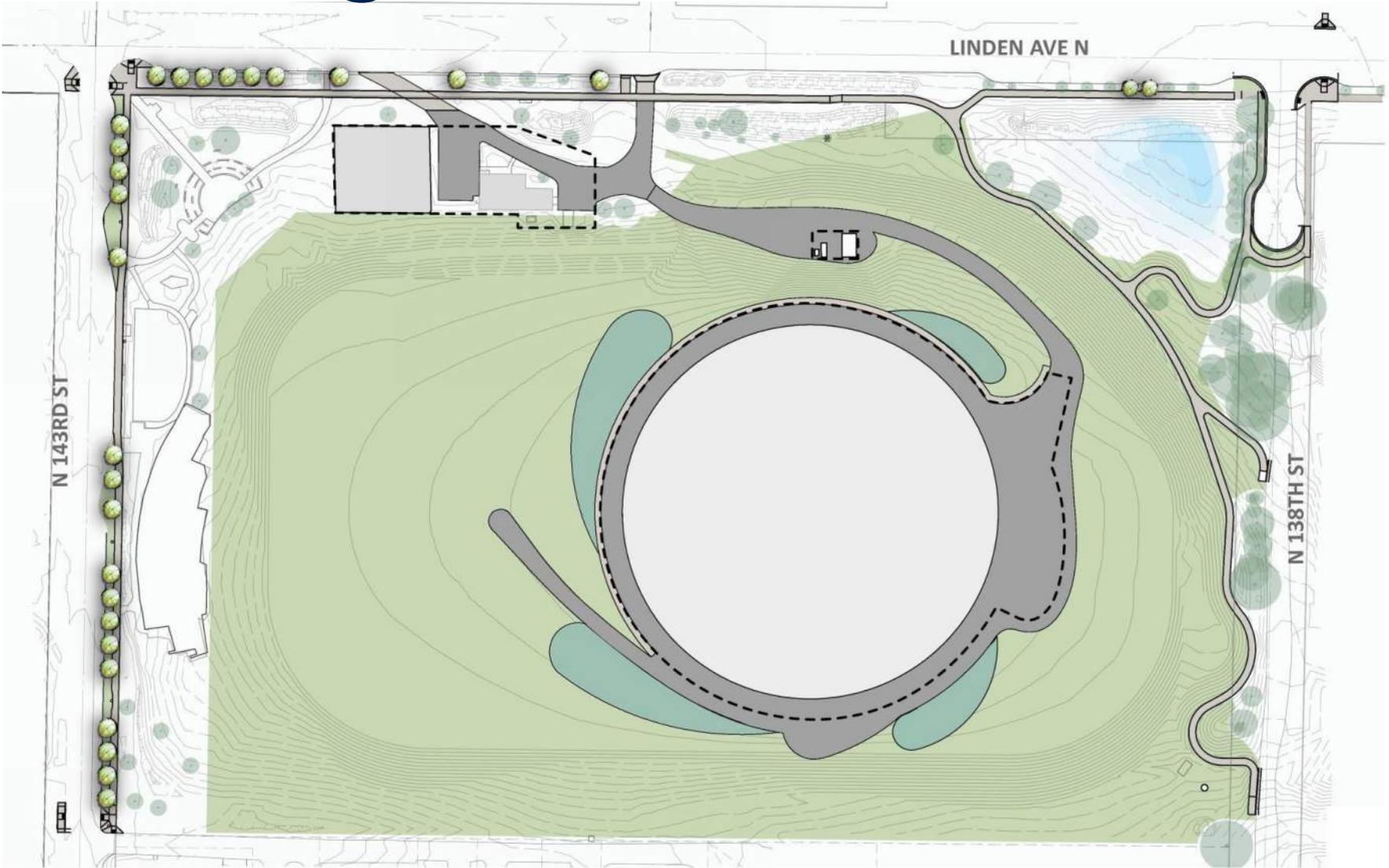
2018



2023

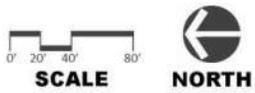
6 MG Reservoir, Clackamas River Water, Oregon (Conсор)

Fencing

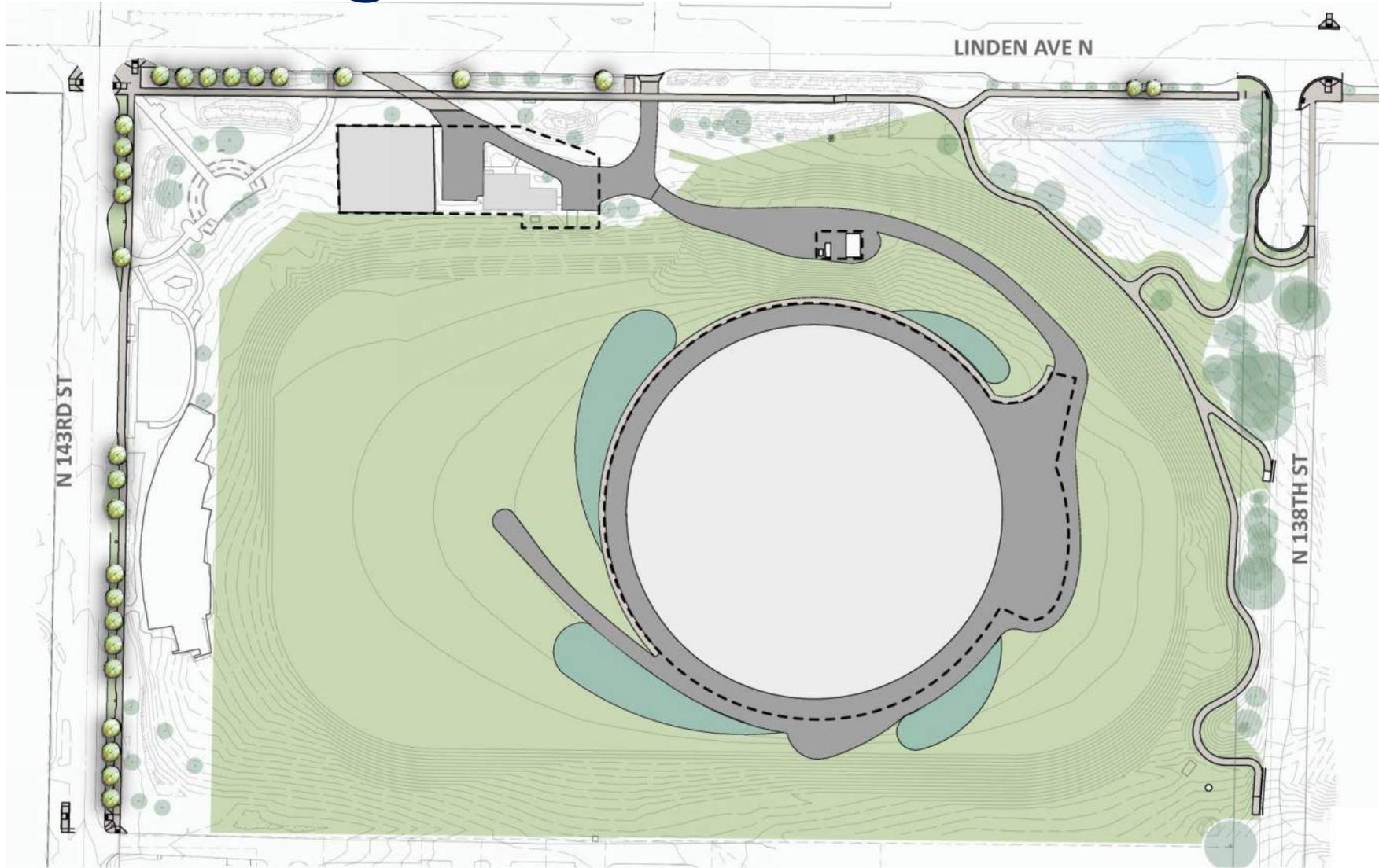


LEGEND

--- Security fence, lighting & security cameras

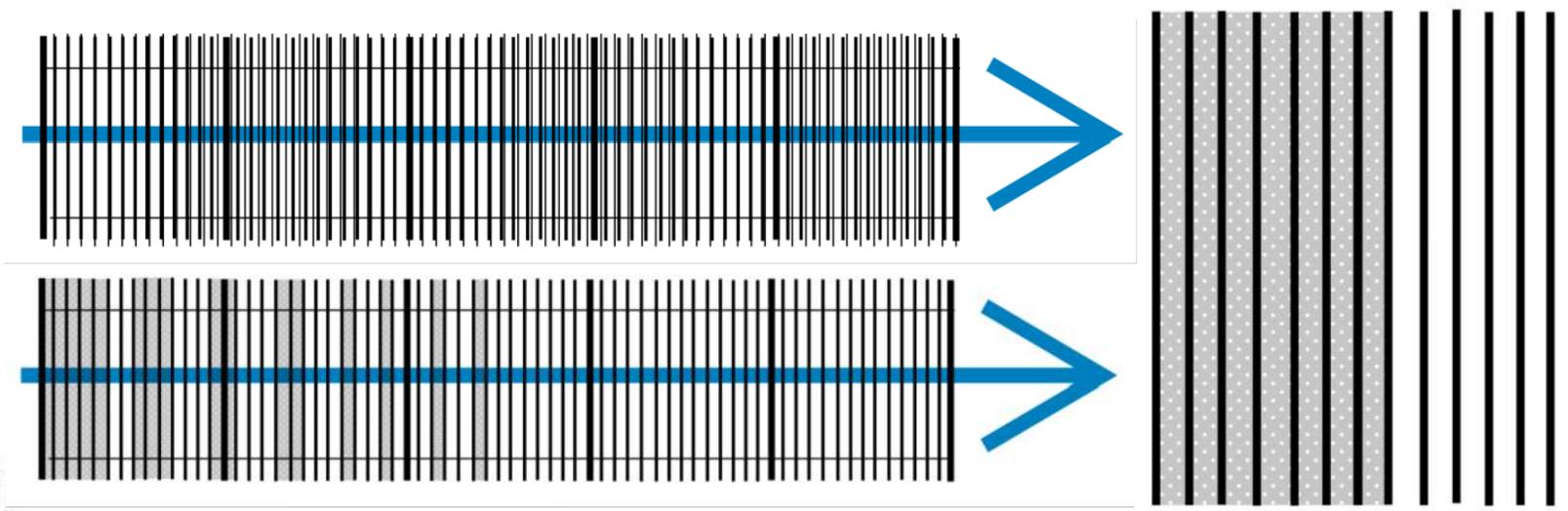
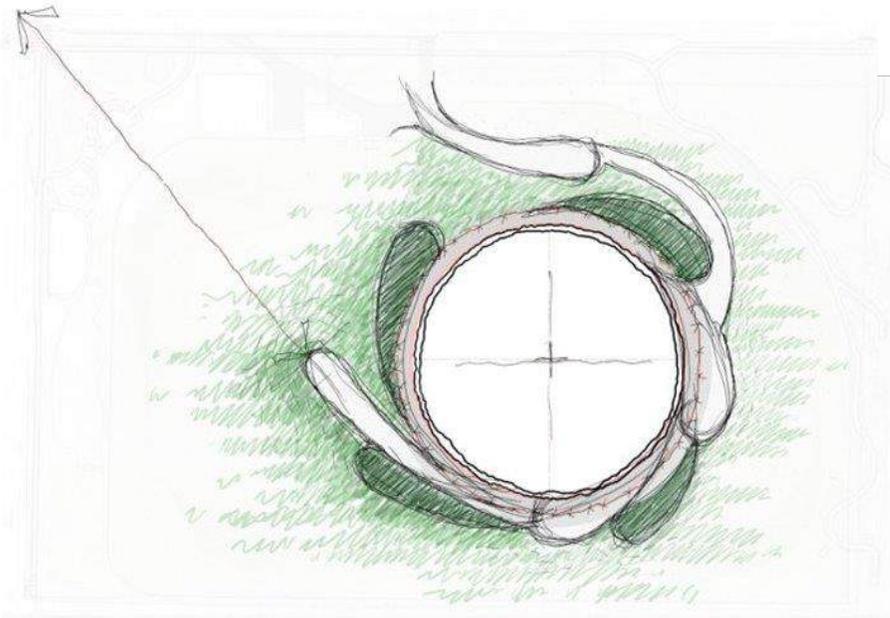
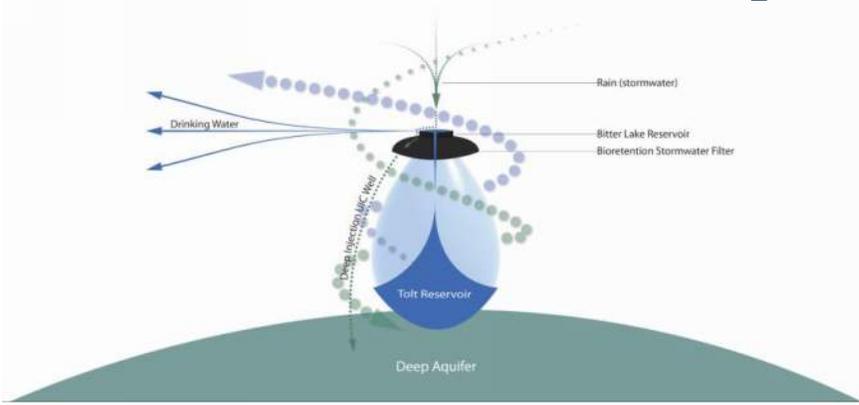


Fencing



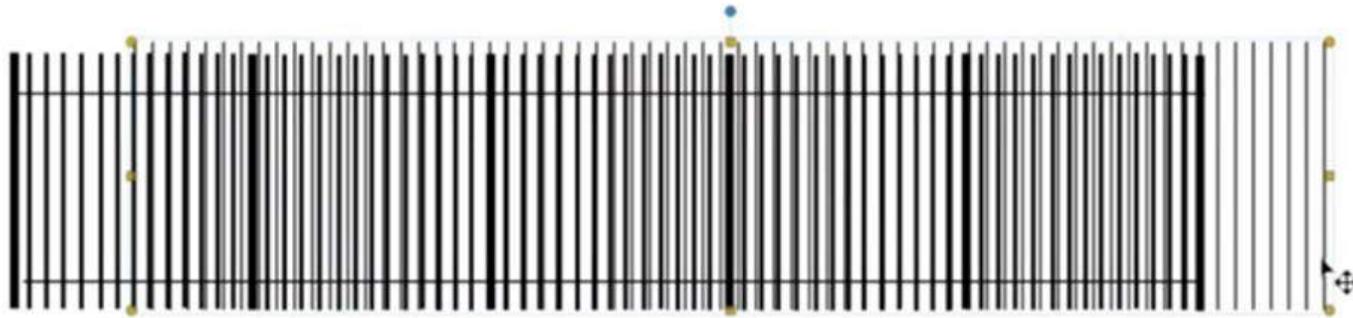
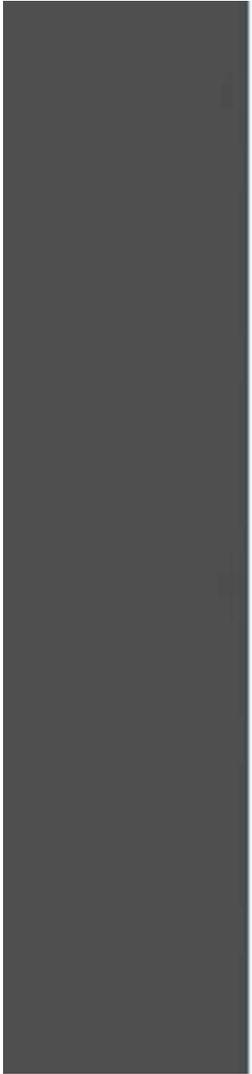
- Minimum 8' high
- Vertical pickets (non-climbable)
- SPU Standard estate style security fencing with possibilities of enhancing

Fence Concepts

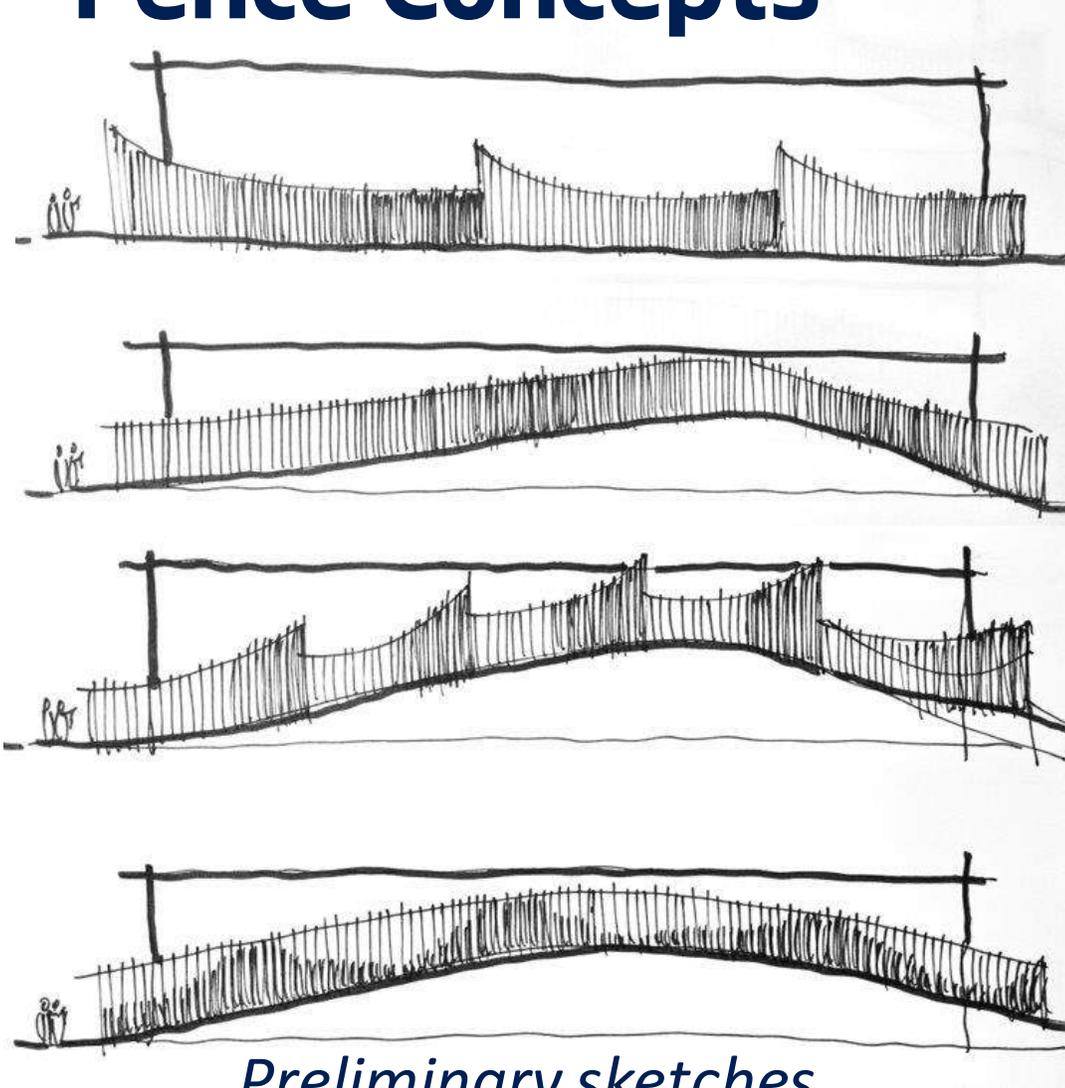


- Fence to emphasize movement and water whirl concept
- Various scales of perception
- Provide a dynamic base to the reservoir as a community landmark
- Collaborate with planning artist, public artists and community engagement

Fence Concepts

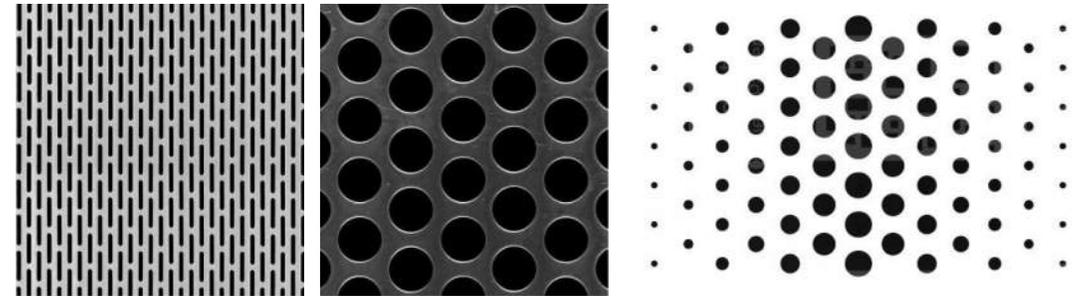


Fence Concepts



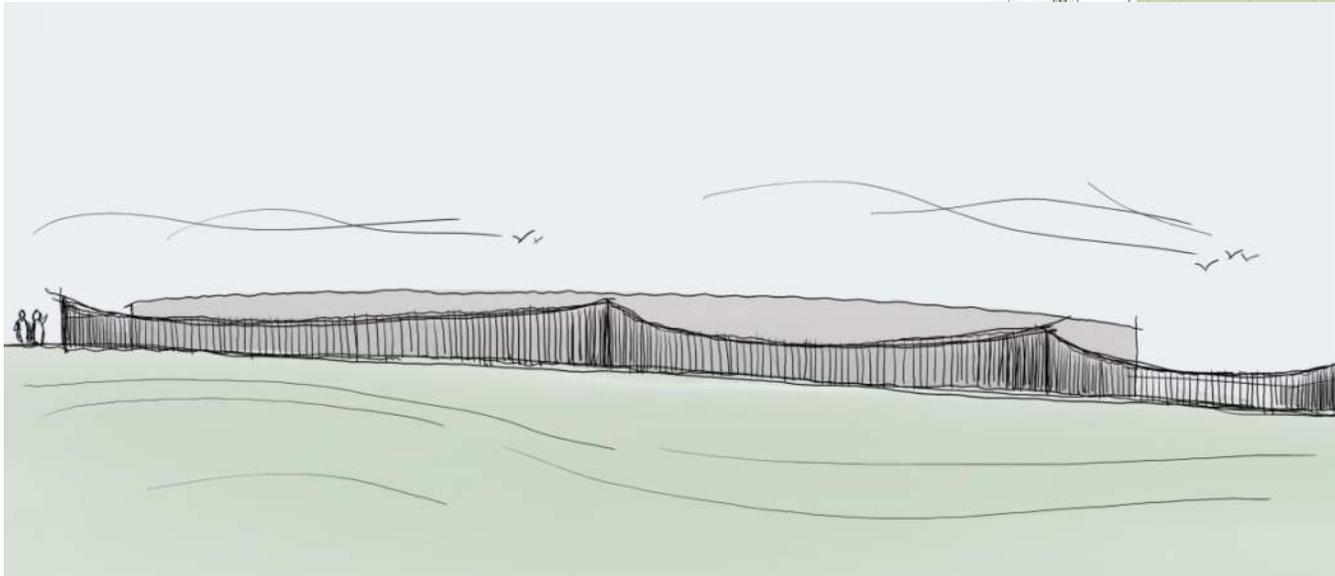
Preliminary sketches

- Opportunities:
 - Reflect site concept in movement of water in clockwise motion
 - Vary height above 8' in select areas
 - Vary height of topography
 - Add additional vertical pickets to create denser areas.
 - Apply patterned screens to pickets to create visual interest:



Examples of potential patterns

Fence Concepts



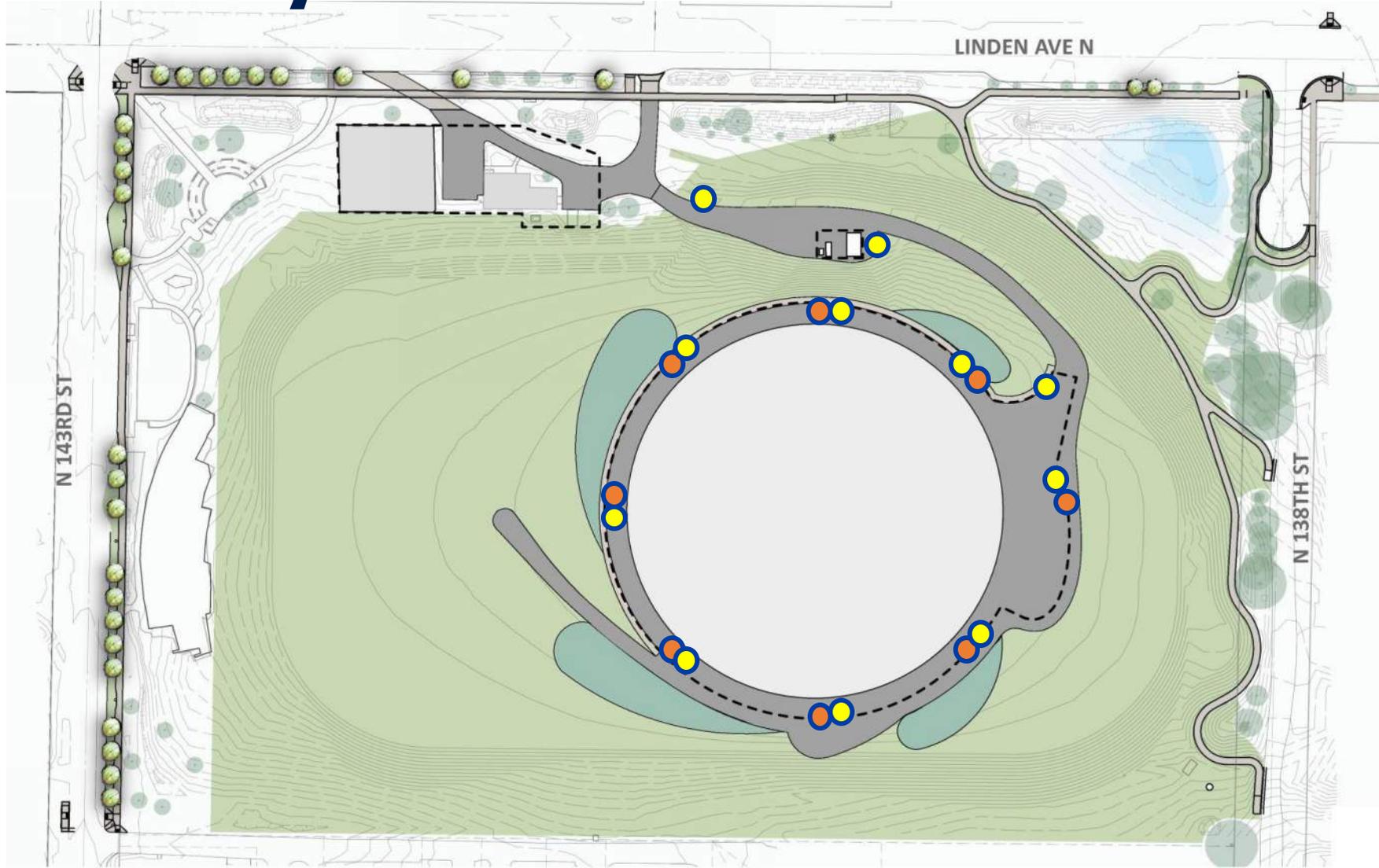
View from west looking east

- Option to create peaks in asymmetrical pattern to emphasize movement around reservoir
- Collaboration with planning artist

Concept Design Comments

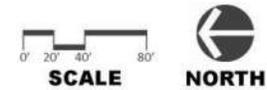
1. Site & Topography
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6. Sustainability
- 7. Safety**

Safety

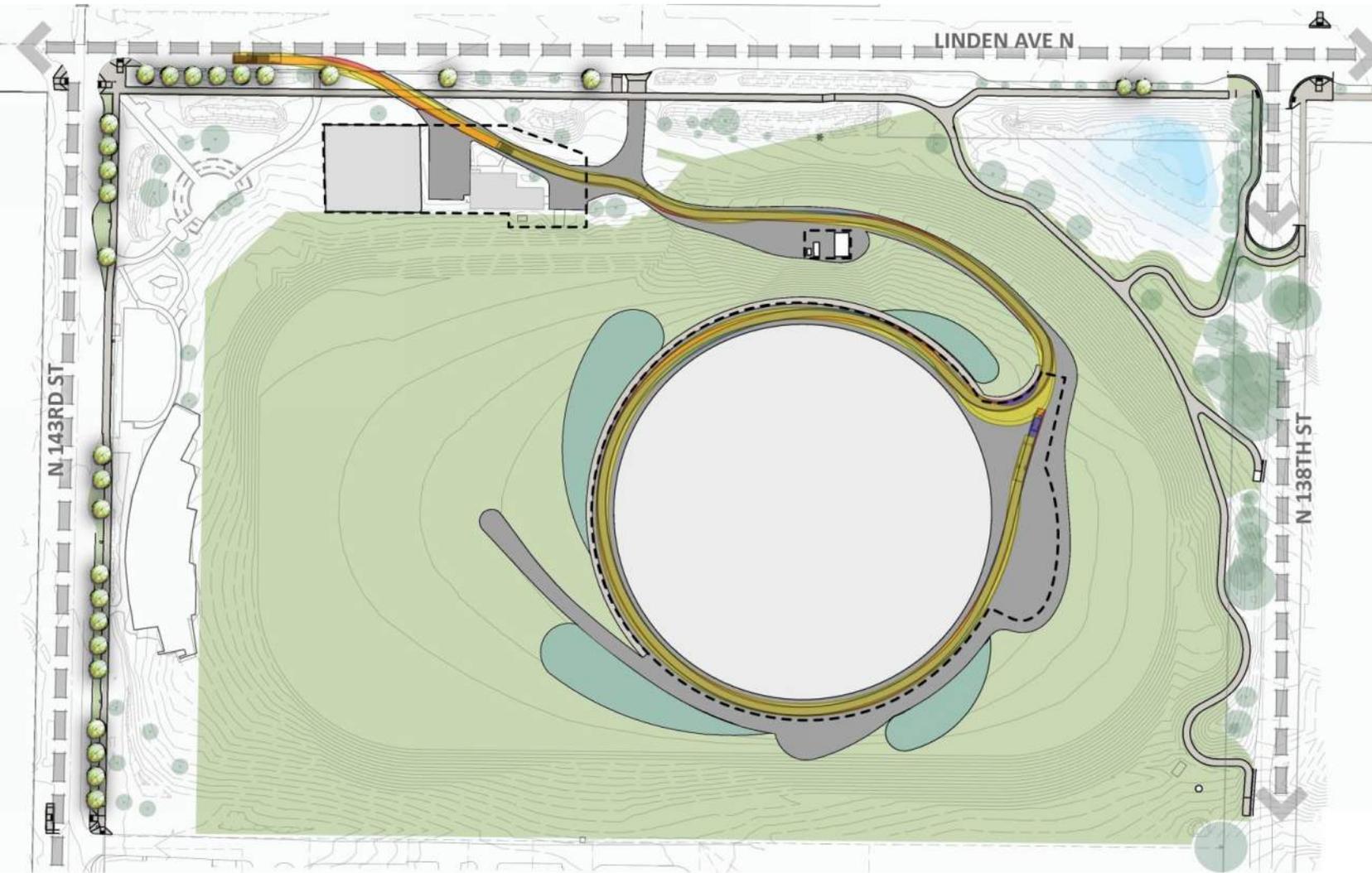


LEGEND

- Security fence, lighting & security cameras
- Cameras 
- Lights 
- Sight Lines
- Site access
- Natural surveillance
- CPTED principles
- Planned site visit with SPU security & Seattle Police
- SPR/SPU survey will inquired on "what makes you feel safe"
- Collaboration with SPR



Vehicular Circulation



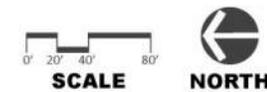
- Boom truck (with space for outriggers)
- Vac-truck
- Scissor lift
- Ford F-350 pickup truck

Pedestrian Circulation

LEGEND

-  Pedestrian path (ex & prop)
-  Ex bicycle path
-  Ex road
-  Ex parking
-  Ex bus stop
-  Proposed Parking

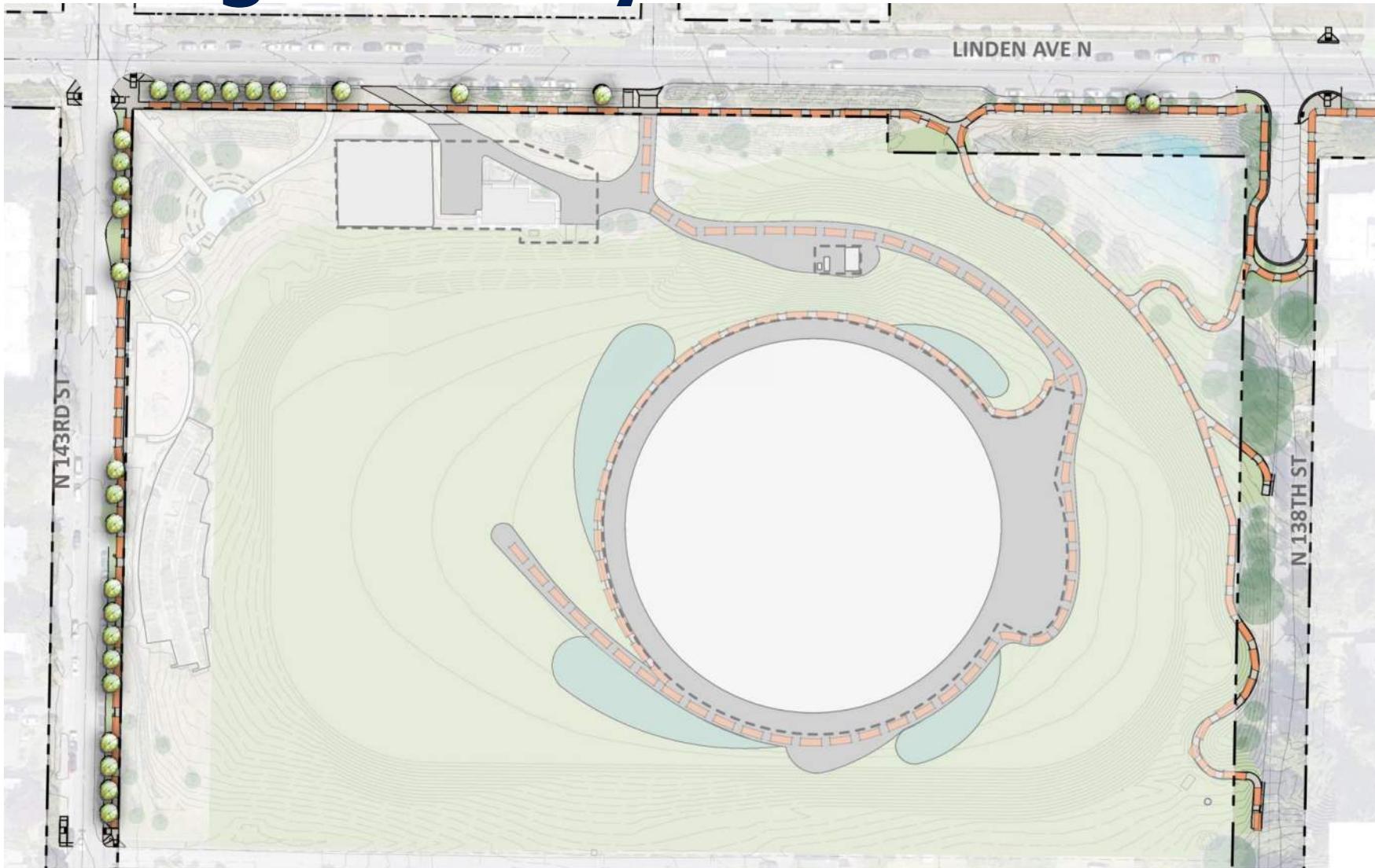
- **Additional** circulation for Park to be developed



Concept Design Comments

1. Site & Topography
2. Architecture, materials, and massing
3. Engagement
4. Art Opportunities
- 5. Right-of-Way**
6. Sustainability
7. Safety

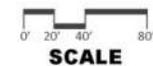
Right-of-Way



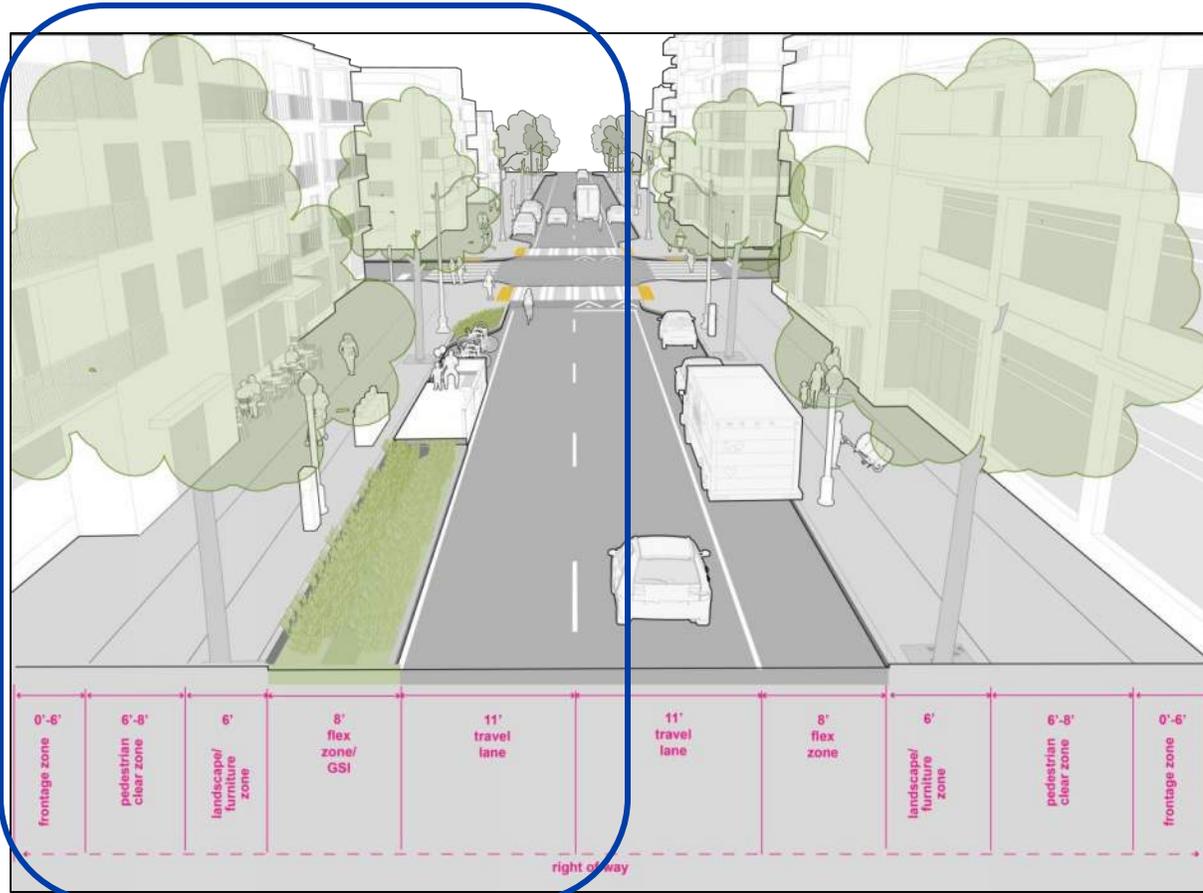
LEGEND

-  Proposed trees
-  Concrete sidewalk
-  ADA curb ramp
-  ROW line

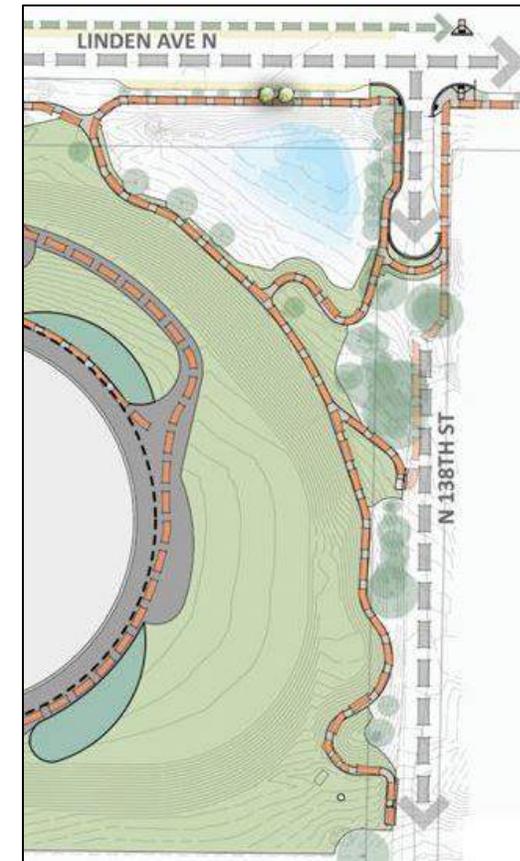
- Coordinated with SDOT
- New and widened sidewalks
- Street trees
- ADA curb ramp upgrades



Right-of-Way



N 143rd St, Urban Village
Neighborhood Access



N 138th St, Connectivity
Improvements

Concept Design Comments

1. Site & Topography
2. Architecture, materials, and massing
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7. Safety

Strategies for Sustainability

Project Goals	Opportunities
Ensuring long-term safe drinking water	Prestressed concrete with 100+ year service life Proven seismic resiliency
Minimize soil hauling	Maximize soil reuse onsite Reduce fuel consumption Optimize construction start for workability of soil
Reduction of Urban Heat Island effect	Additional Open Space available for planting trees
Increase City's electric vehicle charging infrastructure	Install electric vehicle charging stations
Provide stormwater treatment	Manage and treat stormwater on site Injecting high-quality water into the shallow aquifer

SPU is currently looking at the feasibility of PV panels on top of the reservoir.

Stormwater



LEGEND

- Existing trees
- Asphalt paving
- Seeded lawn
- Bioretention planting
- Ex stormwater detention pond
- Proposed trees
- Proposed grading

Challenges:

- Local downstream system at capacity
- Shallow infiltration not available
- Deep infiltration requires near-drinking water quality

Opportunities

- Onsite treatment and injection by UIC well to aquifer

 Celebrate stormwater water on site in collection, conveyance, treatment and UIC well



Stormwater



- Low growing water adaptable planting
- Emphasize movement of water through plant masses around reservoir
- Celebrate stormwater treatment
- Express conveyance through concrete runnels
- Celebrate UIC well location and technology

Concept Design Comments

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Community Engagement

- Background

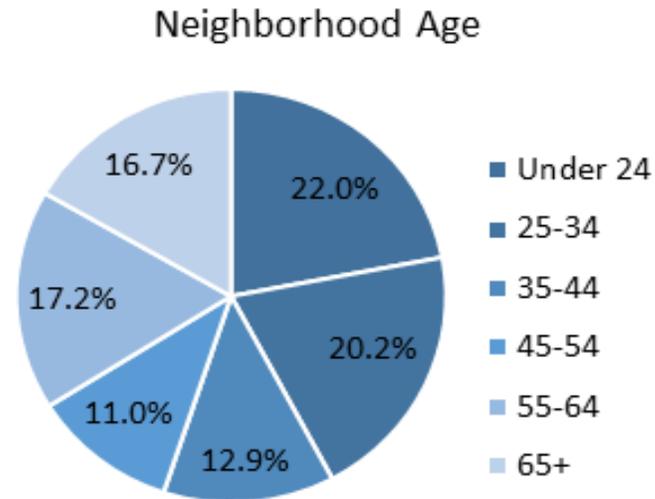
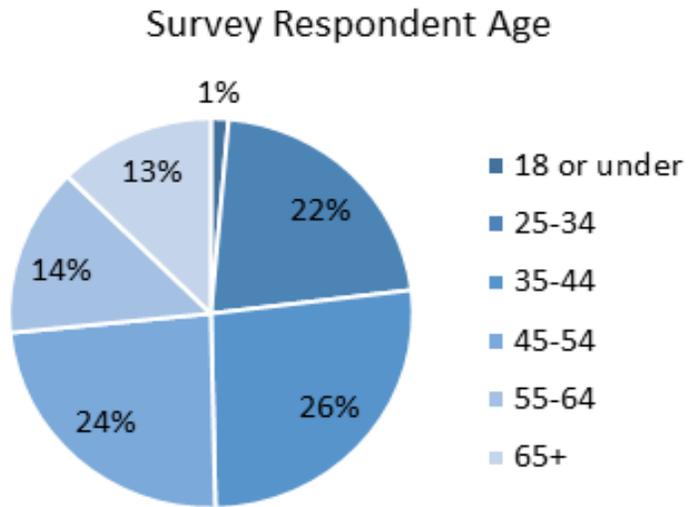
- Project analyzed using SPU Racial Equity Toolkit.
 - Stakeholder Analysis
 - Development of Inclusive Engagement Plan
- Finding: Racial and Social Equity Index for census tract project is in is the highest level for Disadvantage and Priority.
- Develop engagement program using SPU Communications Group and outside member of Consultant team

Community Engagement, Outreach Efforts



Engagement Efforts, May – Sept 2023	Participation
Project information website	<i>Ongoing</i>
Social media advertisements	--
Online Open House	347 unique users
Five in-person events: Open House, Broadview Public Library Staffed in-person information tables	86 people attended
Preliminary Design feedback survey	216 people responded
Update to feedback survey, RE: personal safety question	145 people responded

Community Engagement (SPU)



Age:

Successful engagement with most age groups

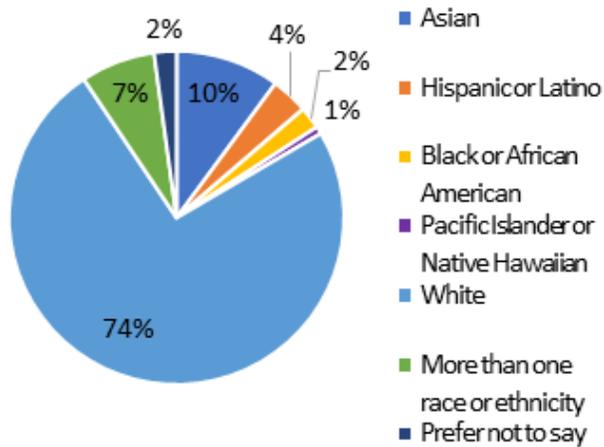
- However, our survey results do not reflect the opinions of Bitter Lake's youth community.
- Future engagement will prioritize this.

Census Tract 4.04, King County, Washington. Source: 2017 – 2021 American Community Survey 5-Year Narrative Profile

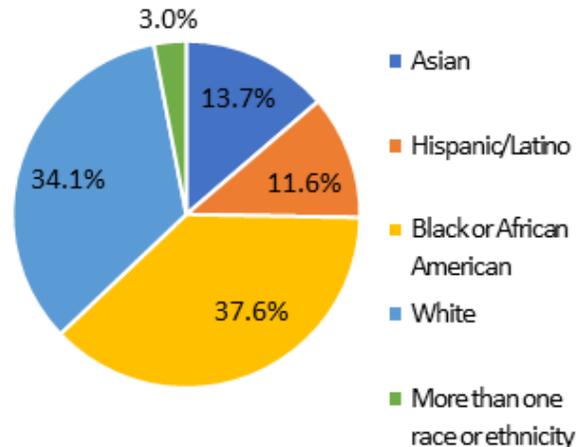
Note: Total population within the census block is 3,859.

Community Engagement (SPU)

Survey Respondent Race and Ethnicity



Neighborhood Race and Ethnicity



Race & Ethnicity:

Provided all materials in English, Spanish, Amharic, & Simplified Chinese

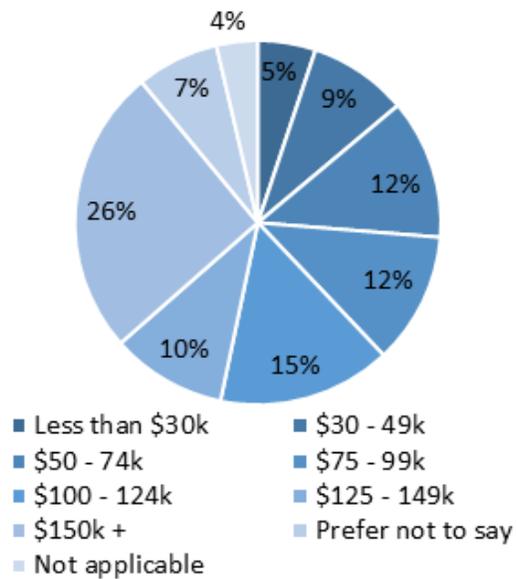
- Missing good information for people who identify as Black or African American & Hispanic or Latino
- Need for coordination with community liaisons

Census Tract 4.04, King County, Washington. Source: 2017 – 2021 American Community Survey 5-Year Narrative Profile

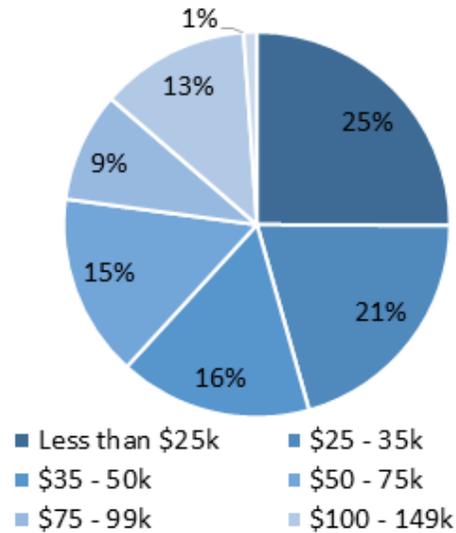
Note: Total population within the census block is 3,859.

Community Engagement (SPU)

Survey Respondent Household Income



Neighborhood Household income



Household income:

Successful engagement through social media advertisements.

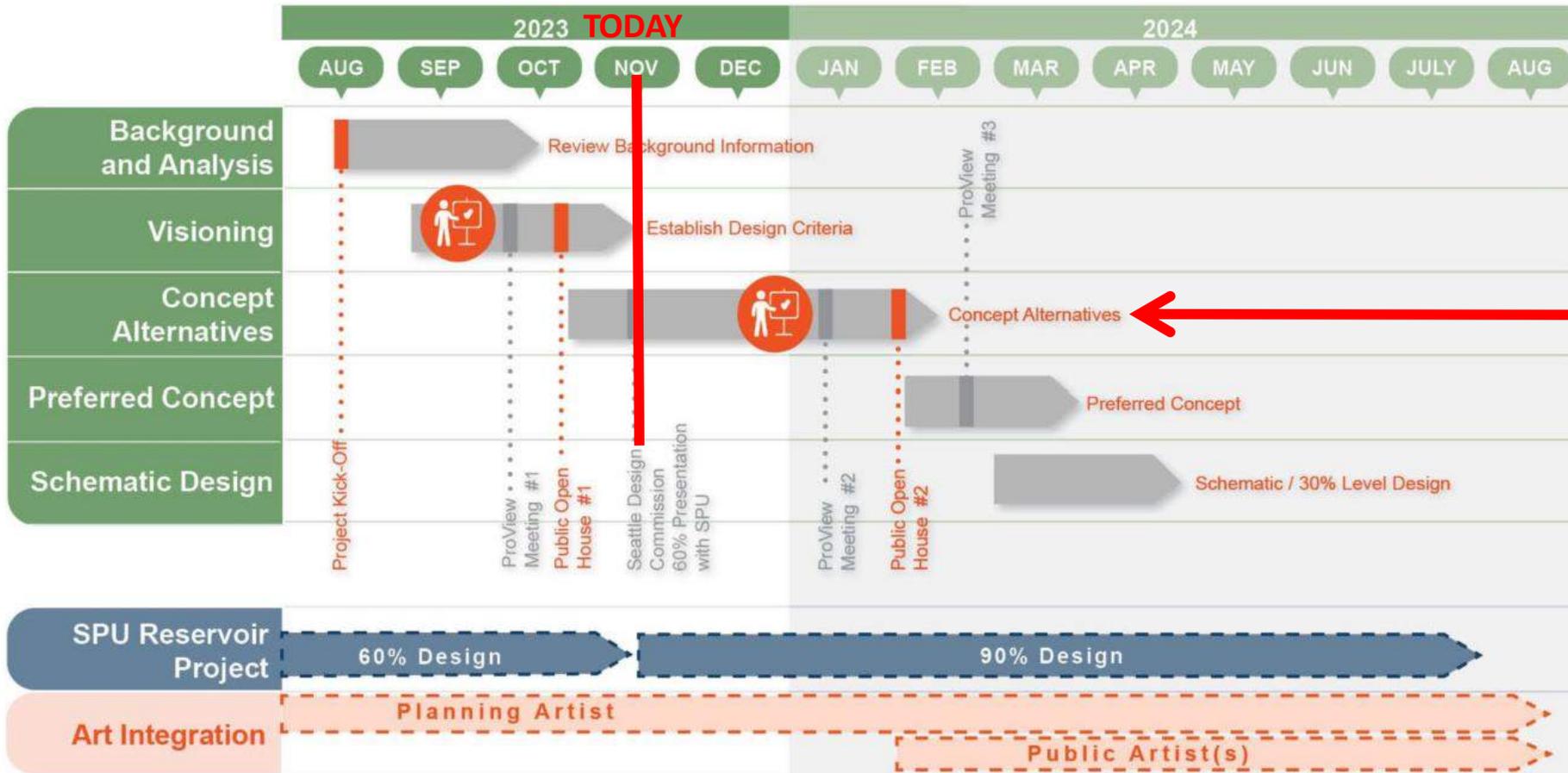
Census Tract 4.04, King County, Washington. Source: 2017 – 2021 American Community Survey 5-Year Narrative Profile

Note: Total population within the census block is 3,859.

Community Engagement Feedback (SPU)

- Illicit activities occurring at property.
- Removal of site perimeter fencing may lead to an increase in present illicit activities.
- Improve safety / Create a family-friendly environment
 - Increased lighting
 - Cleanliness: More trash and recycling bins
 - Not creating isolated or hidden areas
- Maintain / improve community P-patch garden
- ROW improvements (parking, sidewalks)
- Improve accessibility, some grading is acceptable.
- Low priority: Picnic shelter, fitness equipment, bike racks, multi-use sport court
- Future outreach: Direct mail + social media + information tables in Park (AM, weekends)

Community Engagement Progress (SPR)



What's next:
2nd Focus Group
& Public Open
house planned to
evaluate 3
alternative park
concepts in
collaboration
with SPU and
ARTS.

Community Engagement Progress (SPR)

BITTER LAKE RESERVOIR OPEN SPACE PUBLIC OPEN HOUSE

You're invited to join us at an Open House to learn about the Bitter Lake Reservoir Open Space Project and share your ideas about its design!

Seattle Public Utilities (SPU) is replacing the existing reservoir with a concrete tank that makes space for Seattle Parks and Recreation (SPR) to create an expanded park for the community. SPR is leading the park and open space design in coordination with SPU, the Office of Arts and Culture, and the Department of Neighborhoods. This project will incorporate elements of the existing park together with new recreation amenities, public art and a potential P-Patch expansion for the Bitter Lake neighborhood. We look forward to hearing your ideas!

THURSDAY, OCTOBER 26, 2023, 6 – 8 P.M.

BITTER LAKE COMMUNITY CENTER, 13035 LINDEN AVE N, SEATTLE, WA 98133

SAVE THIS CARD!

FOR MORE INFORMATION AND TO TAKE THE SURVEY BETWEEN OCTOBER 26 AND NOVEMBER 10 VISIT:

www.seattle.gov/parks/about-us/projects/bitter-lake-reservoir-park



繁體中文



Español



አማርኛ

For translation
of this postcard
please scan:

FOR MORE INFORMATION, PLEASE CONTACT
Kevin Bergsrud at Kevin.Bergsrud@seattle.gov or 206-684-5831.



- Project website:
www.seattle.gov/parks/about-us/projects/bitter-lake-reservoir-park
- Mailers
- Social media posts
- Project sign on site
- Focus Group
- Online survey in multiple languages

Community Engagement Feedback (SPR)



- What we've heard:
 - Expand P-Patch and playground
 - Large community gathering space
 - Variety of accessible paths throughout the park
 - Focus on passive recreation more than active
 - Good visibility of spaces for safety
 - Mix of trees and open lawn spaces

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Public Art (SPU & SPR)

Project includes 1% for Art

- Planning Artist commissioned \$56K
 - ARTS Community Engagement Roster
 - Collaborate in design meetings
 - Community outreach
 - Scope public art opportunities
- Public Artist for permanent artworks
 - Artist Selection early 2024

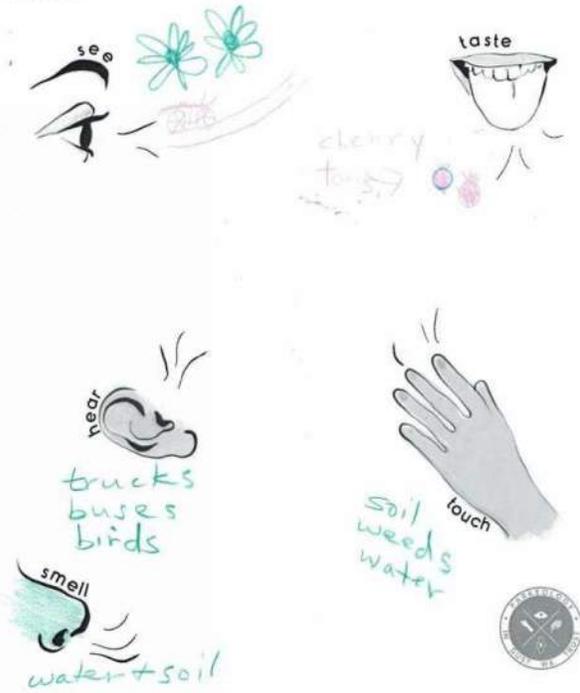


SPU, Central Area Water Main –
We Are Water (Melvin Freeman, 2020)



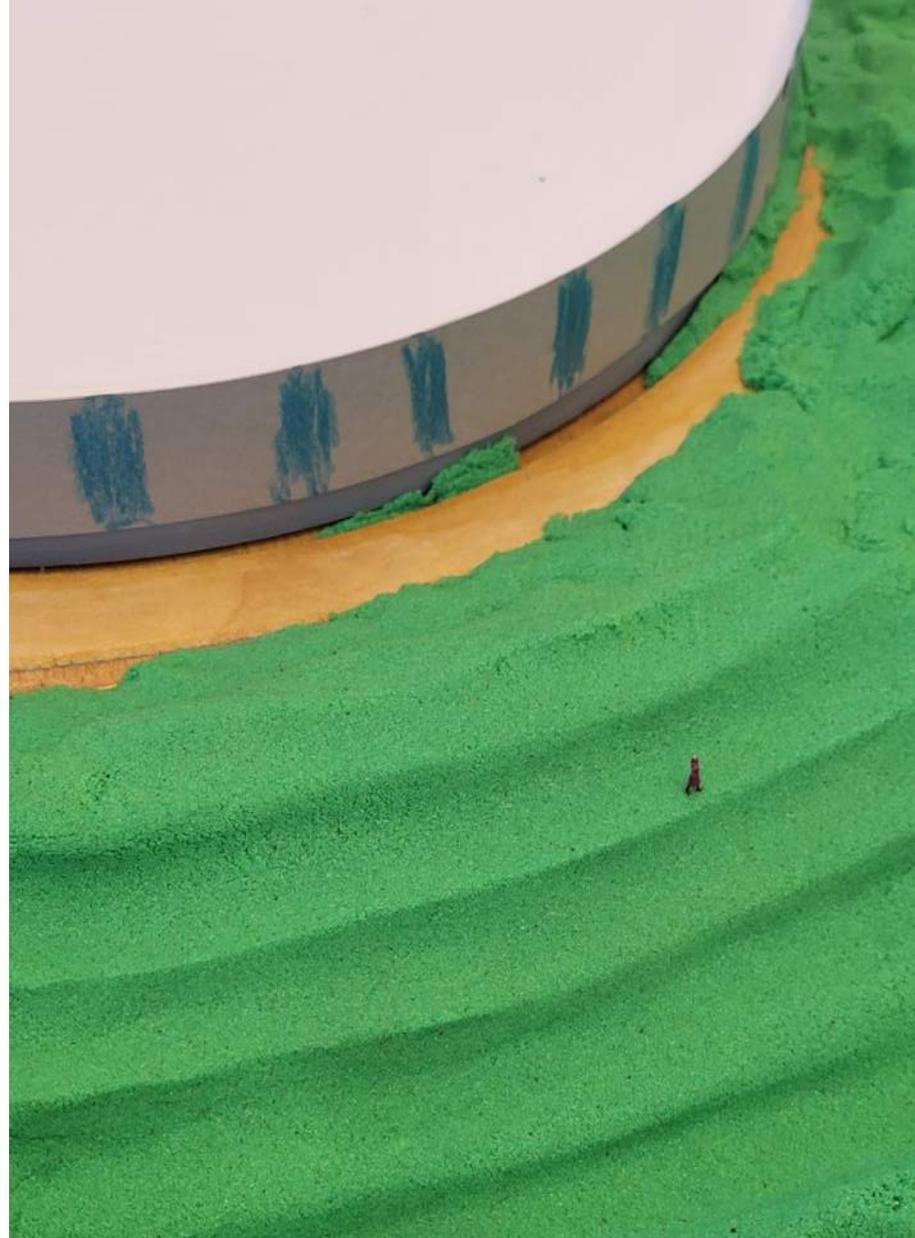
What are the senses that connect me to my neighborhood? Draw or Write

Name:



Planning Artist – Outreach Groups & Workshops

- North Star Permanent Supportive Housing (facilitated by the Downtown Emergency Service Center)
- SHAG Interurban Senior Living Apartments
- Ingraham High School Art Club
- Bitter Lake P-Patch Gardeners
- Eritrean residents of Bitter Lake
- SPU & Parks Outreach events



Collaboration Opportunities with Public Artist

- Reservoir color treatment
- Fencing
- Earthwork
- 2D/ low relief additions to roof line or ground plane



Pigmented shotcrete & concrete examples



Maya Lin, Wave Forms



Christian Moeller, Readers



Garth Edwards, Pedestrian Gateway

Thank you, questions?

Contact:

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Program Manager
City of Seattle, Seattle Public Utilities
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andrew.karch@seattle.gov