

# Bitter Lake Reservoir Improvements

***DRAFT, 2/8/2023***

Seattle Design Commission,  
Presentation of Concept Design

February 16, 2023



# Introduction to Project

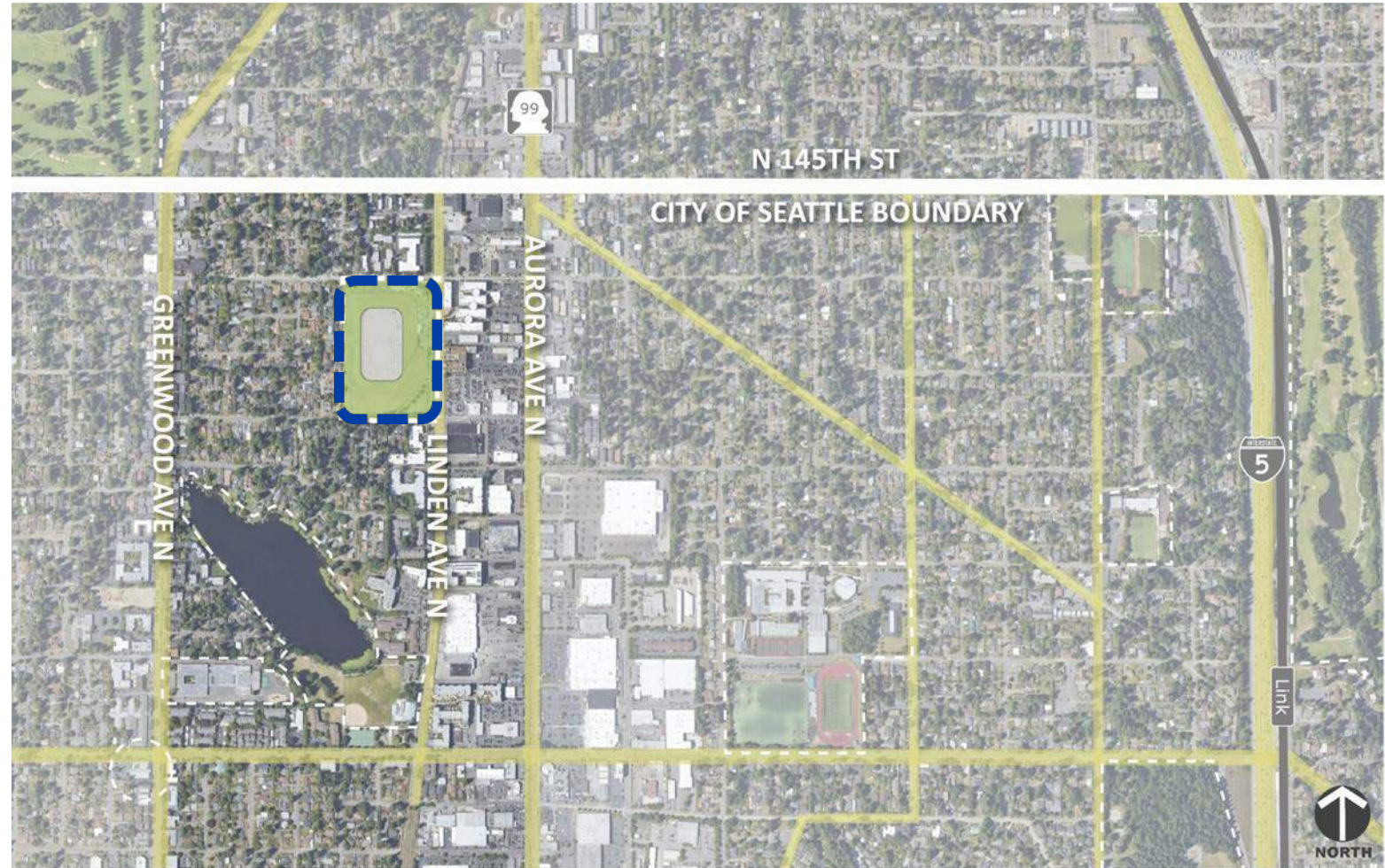
- Project address / location:  
14141 Linden Ave N
- SDCI project number:  
004462-22PA
- SDOT SIP reference number:  
Pending review of conceptual designs
- SEPA Checklist:  
Pending initiation of 60% Design



## LEGEND

- Bitter lake neighborhood
- Seattle city limits

# Vicinity Map



# 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)

# 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.

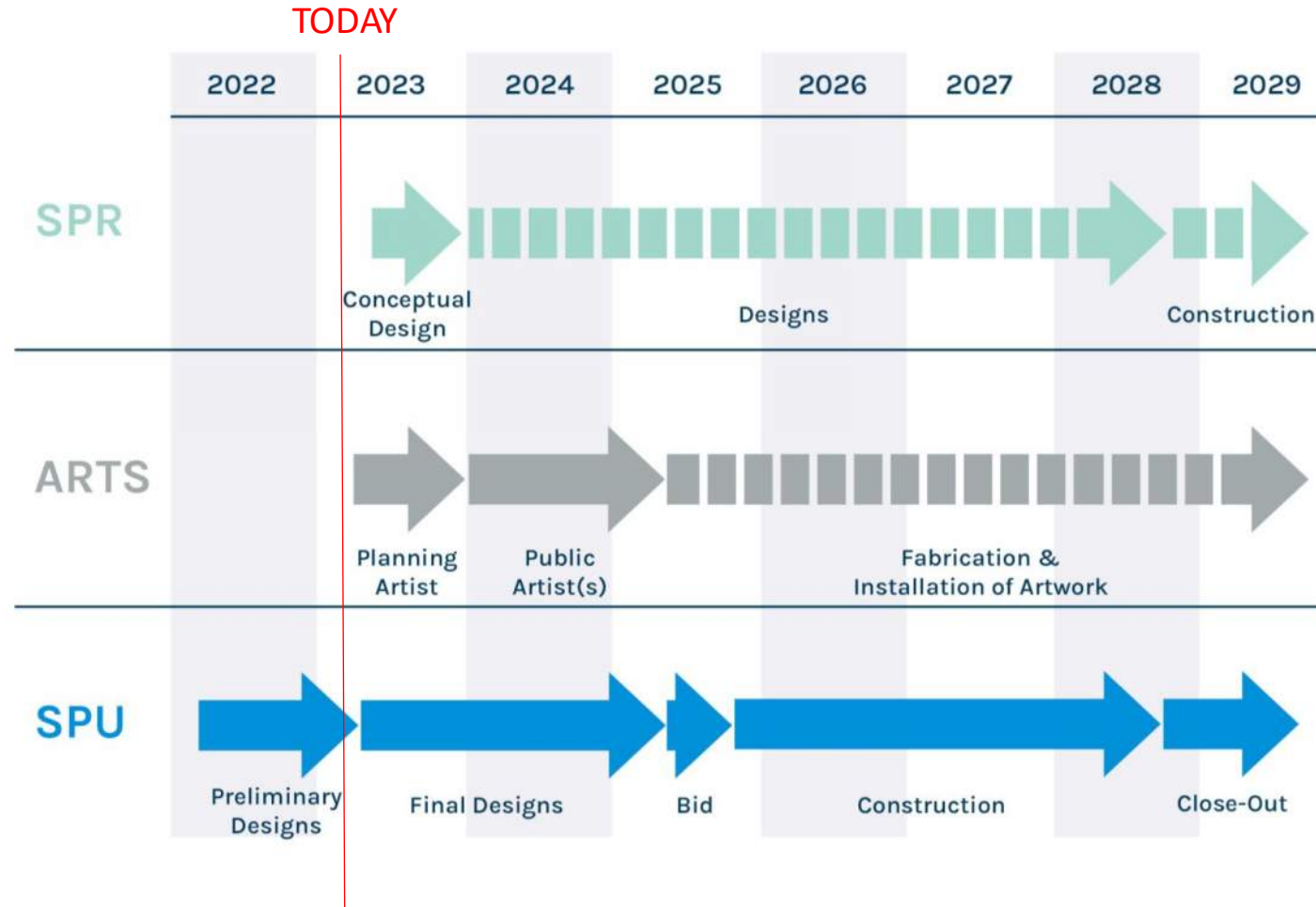


# Project Scope & Budget

- 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: *In development*
- Seattle Parks & Recreation
  - Scope: Planning, Design, and Development of additional Open Space created by construction of Bitter Lake Reservoir Covering Improvements.
  - Budget: *TBD*

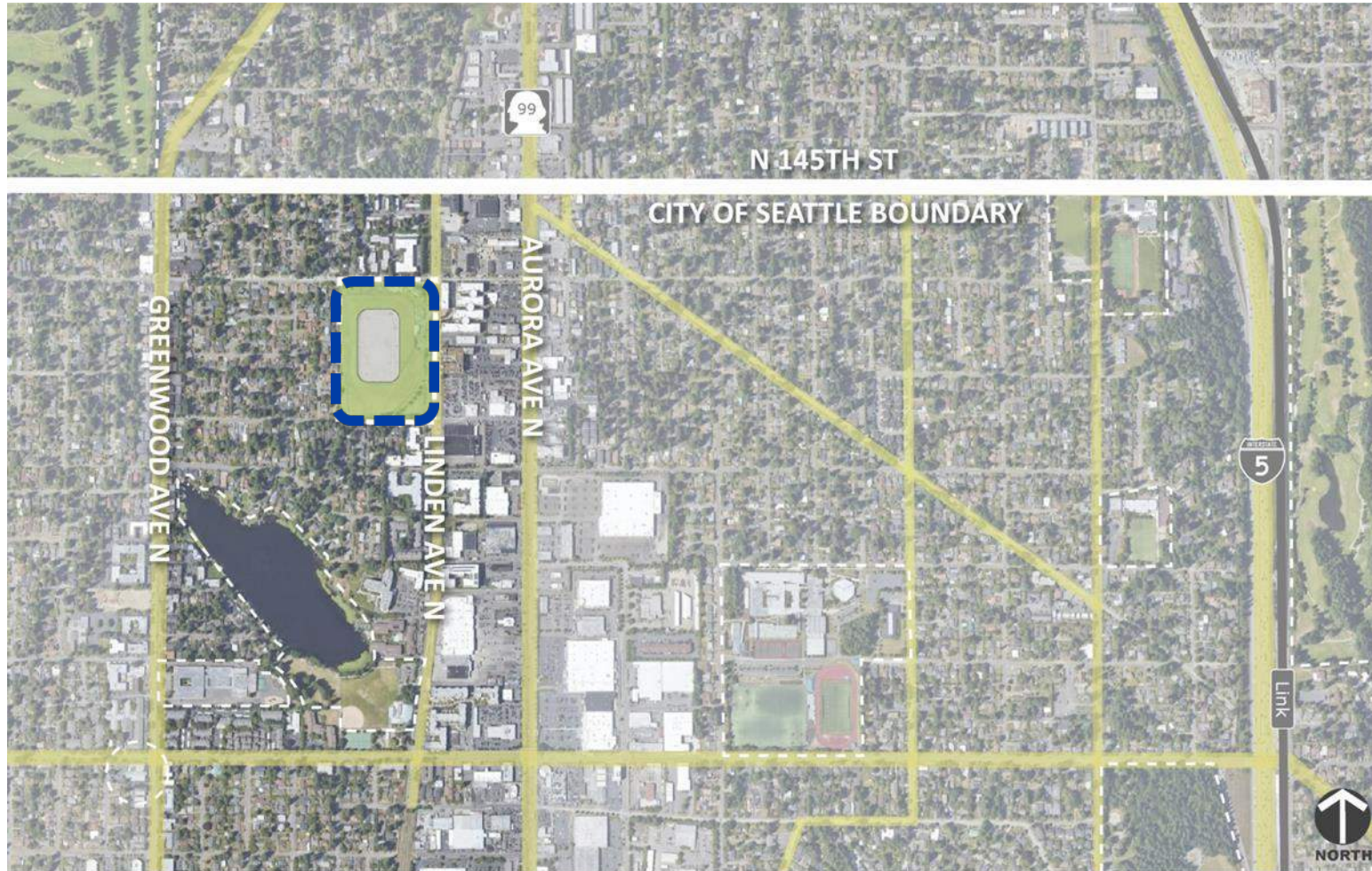


# Coordinated Schedules



# CONTEXT

# Vicinity Map



## KEY MAP

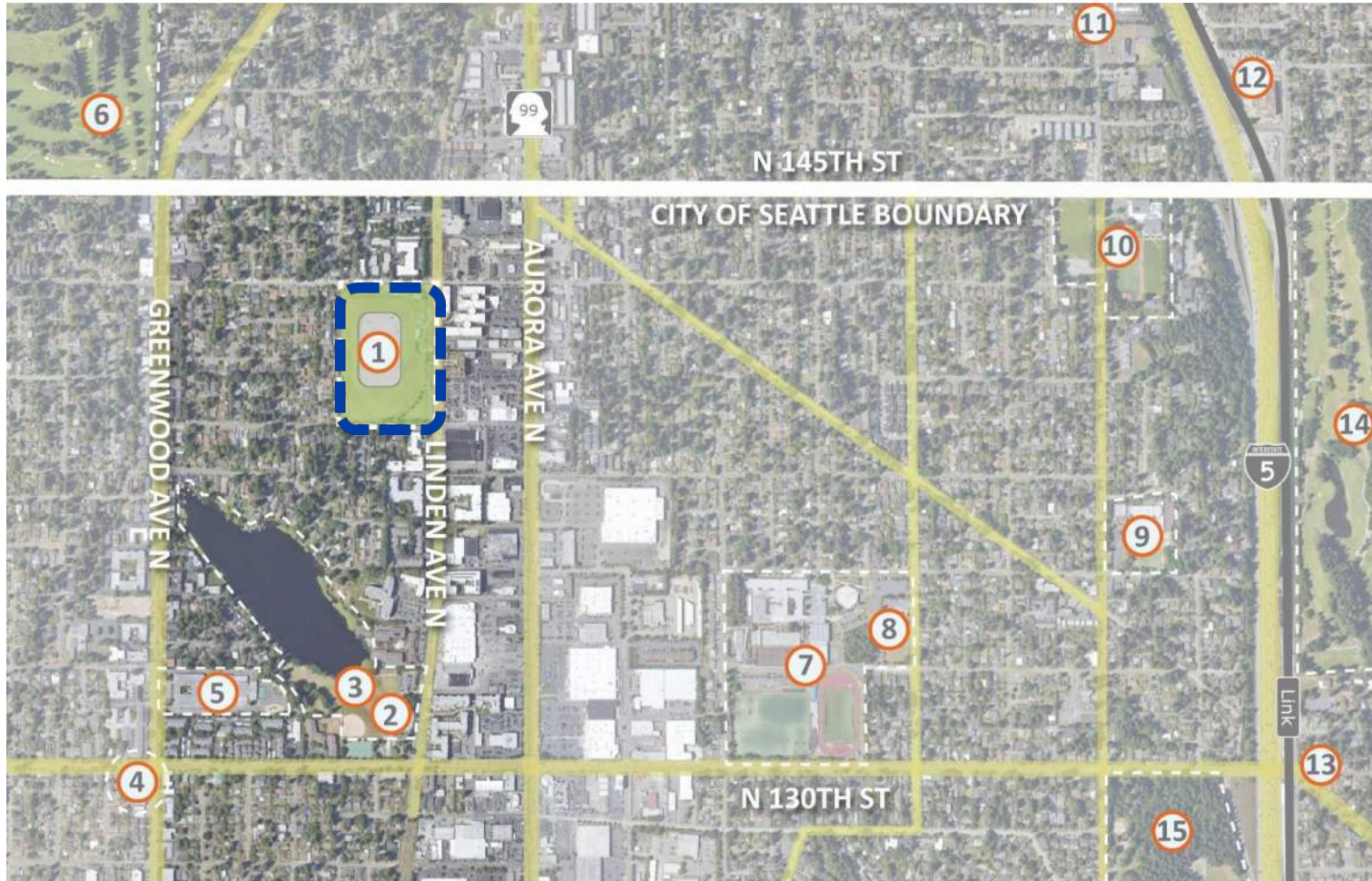


### LEGEND

- Bitter lake neighborhood
- Seattle city limits

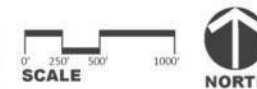


# Site Context



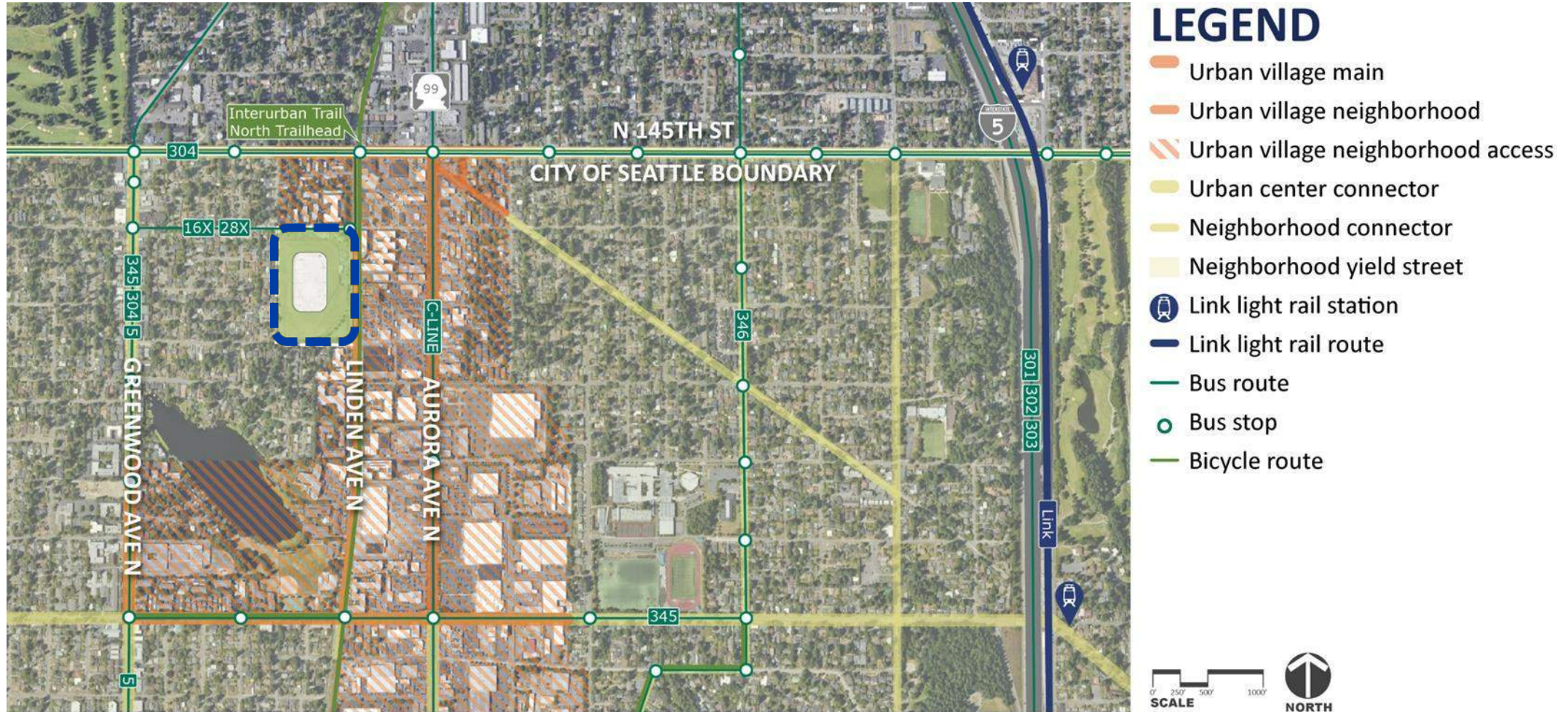
## KEY

- 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
- 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)



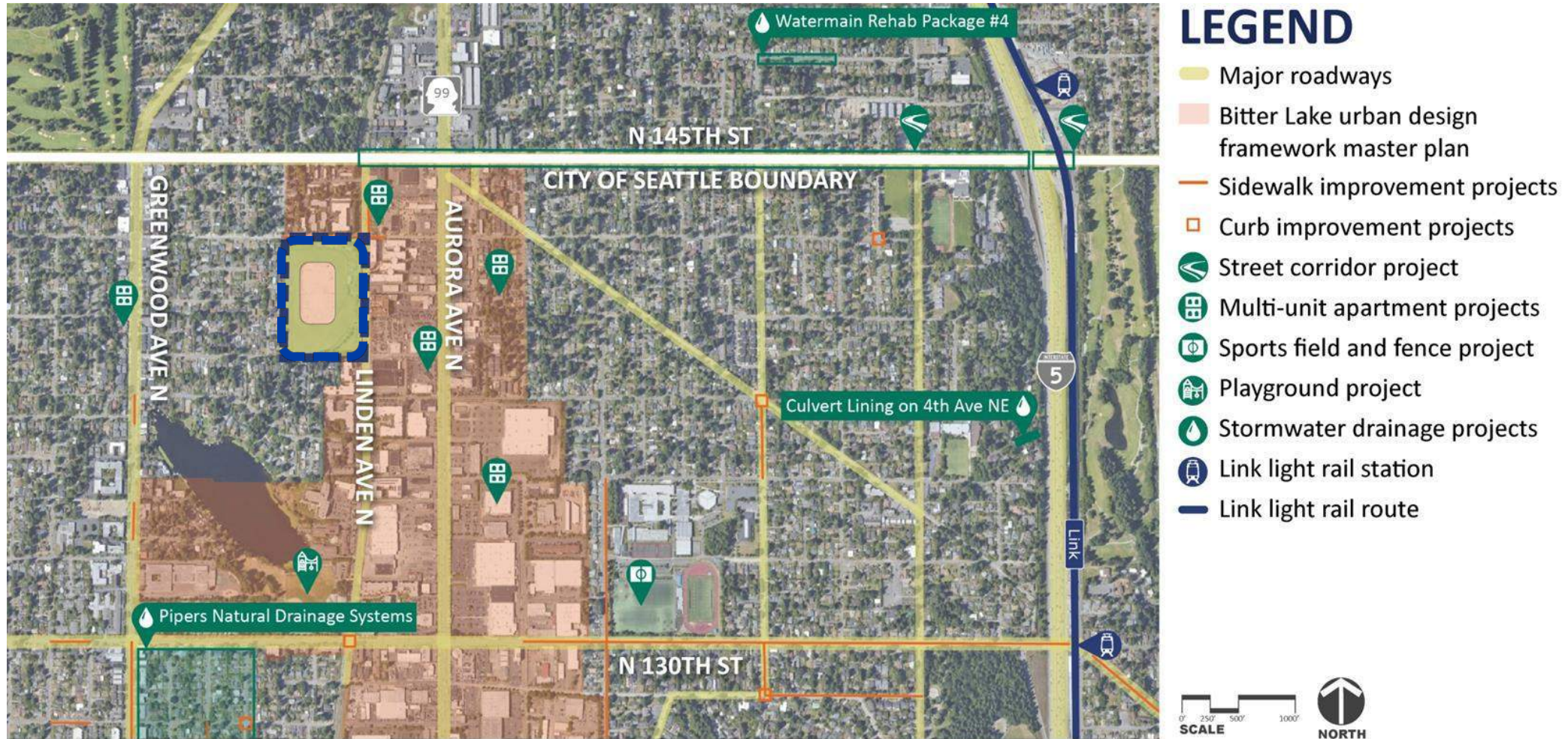


# Site Context





# 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

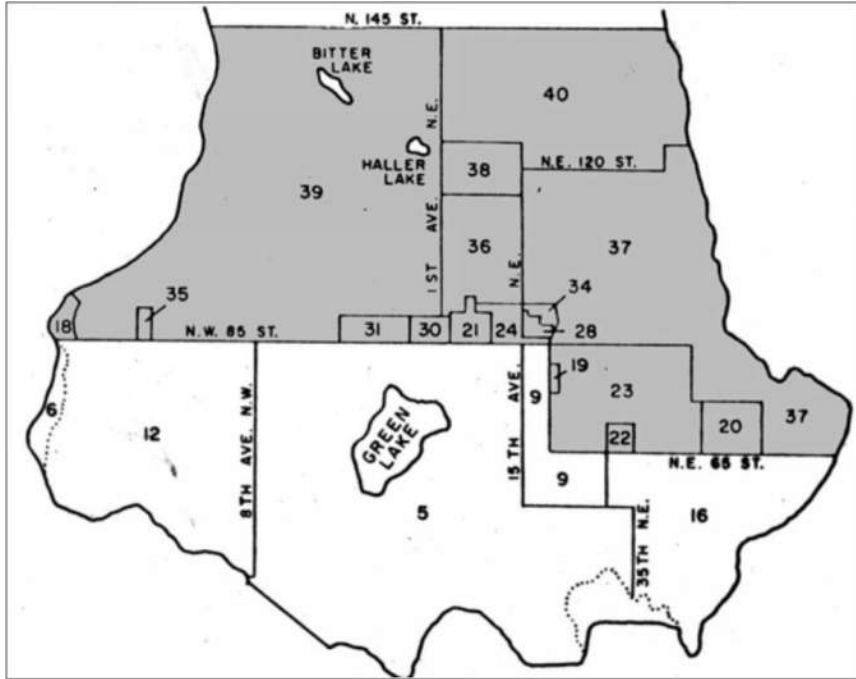
- 86% renter occupied
- 14% owner occupied

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

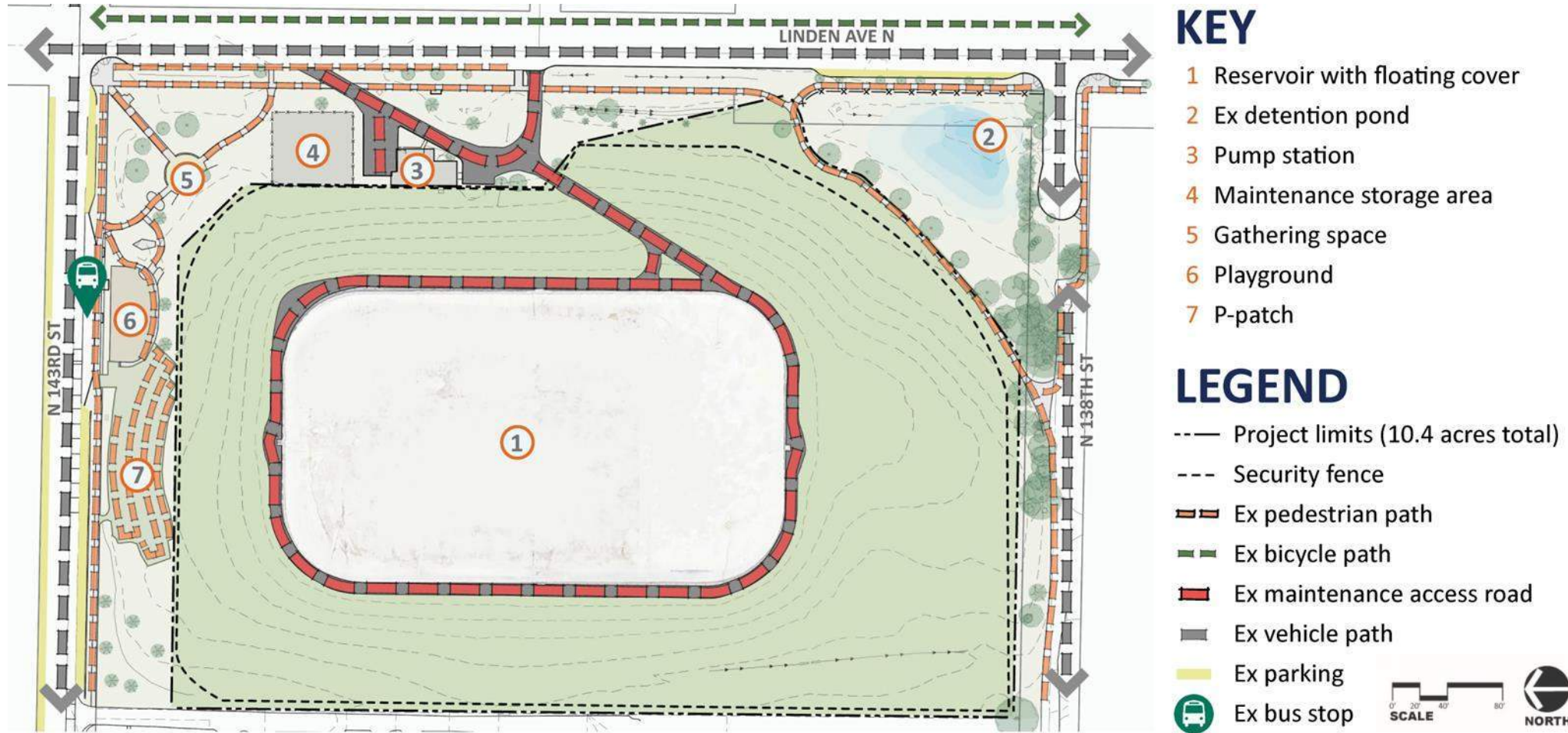


1999 Aerial (without covering)



2002 Aerial (with covering)

# Existing Bitter Lake Reservoir Property





# Existing Bitter Lake Reservoir Property



Northeast perspective. Source: Google Earth.



# Site Zoning & Ownership

## Agreements

- MOA - Dept. of Neighborhoods
- MOA - Dept. Parks and Rec.

## LEGEND


--- Project limits (10.4 acres total)


--- Security fence


— Easement boundary

— Parcel boundary

### Property ownership


 Commercial properties

 Apartment properties


 Residential properties


 Municipal properties

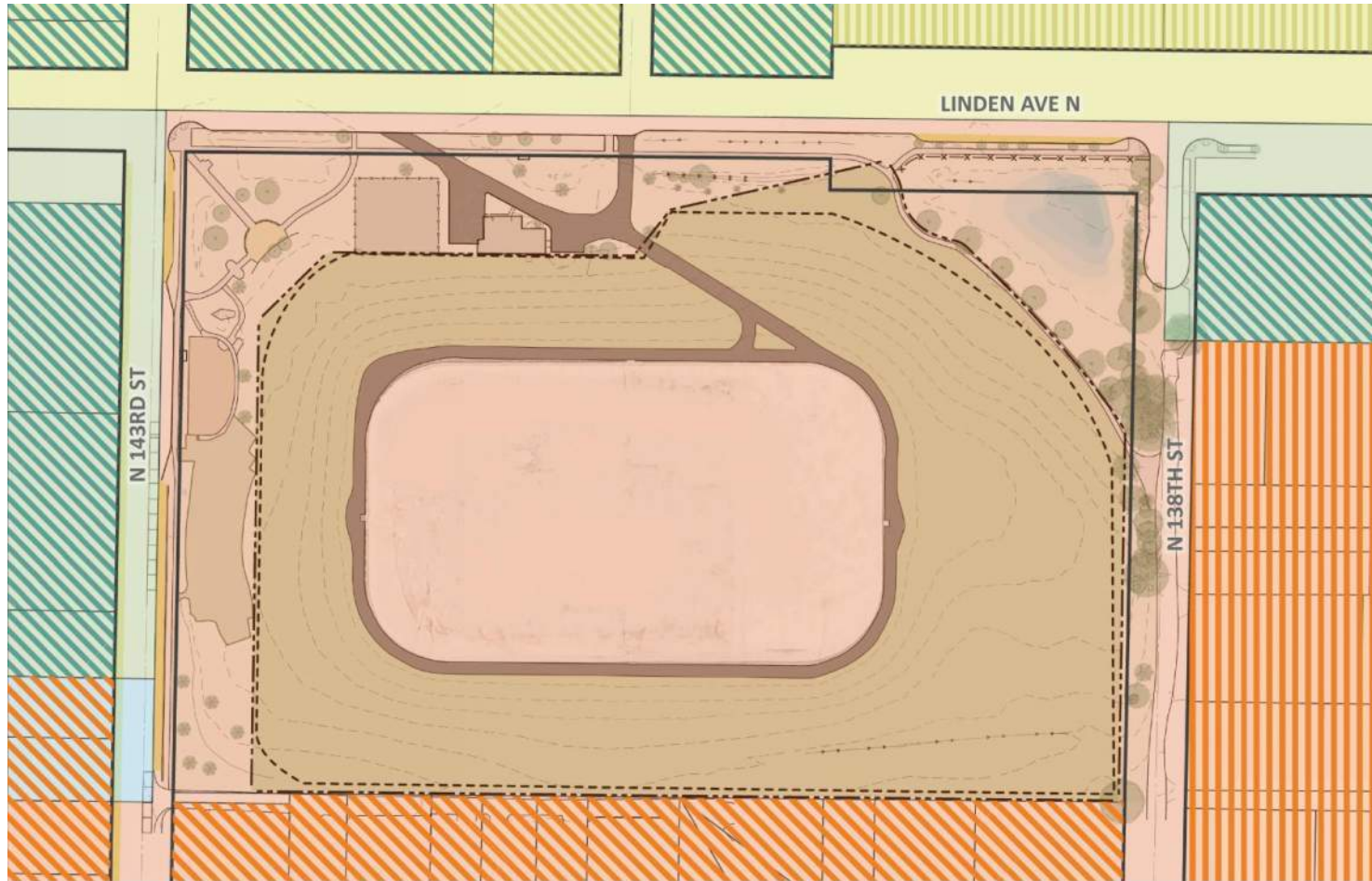
### Zoning

 C1-75(M) - commercial 1

 LR3 (M) - lowrise 3

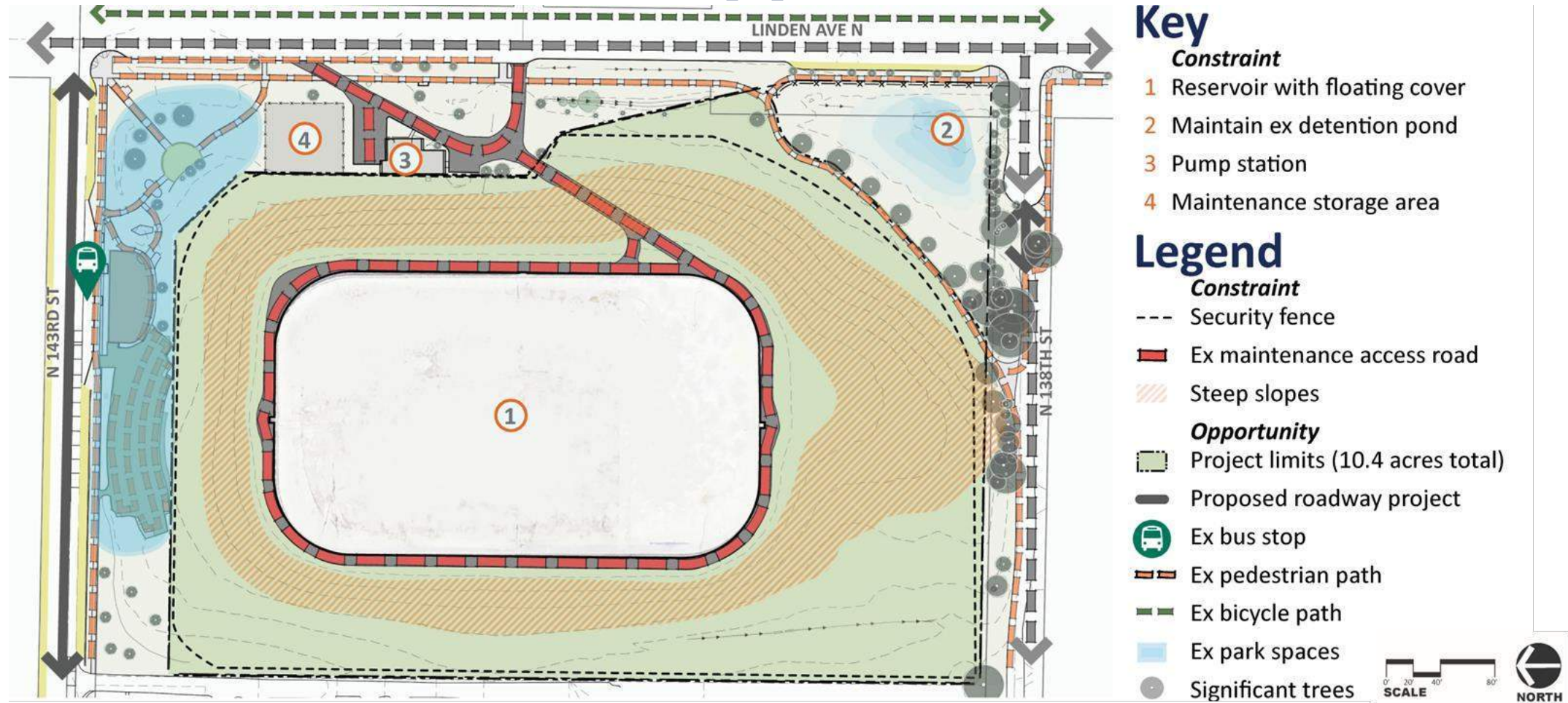
 NR2 - neighborhood residential 3

 RSL (M) - neighborhood residential small lot

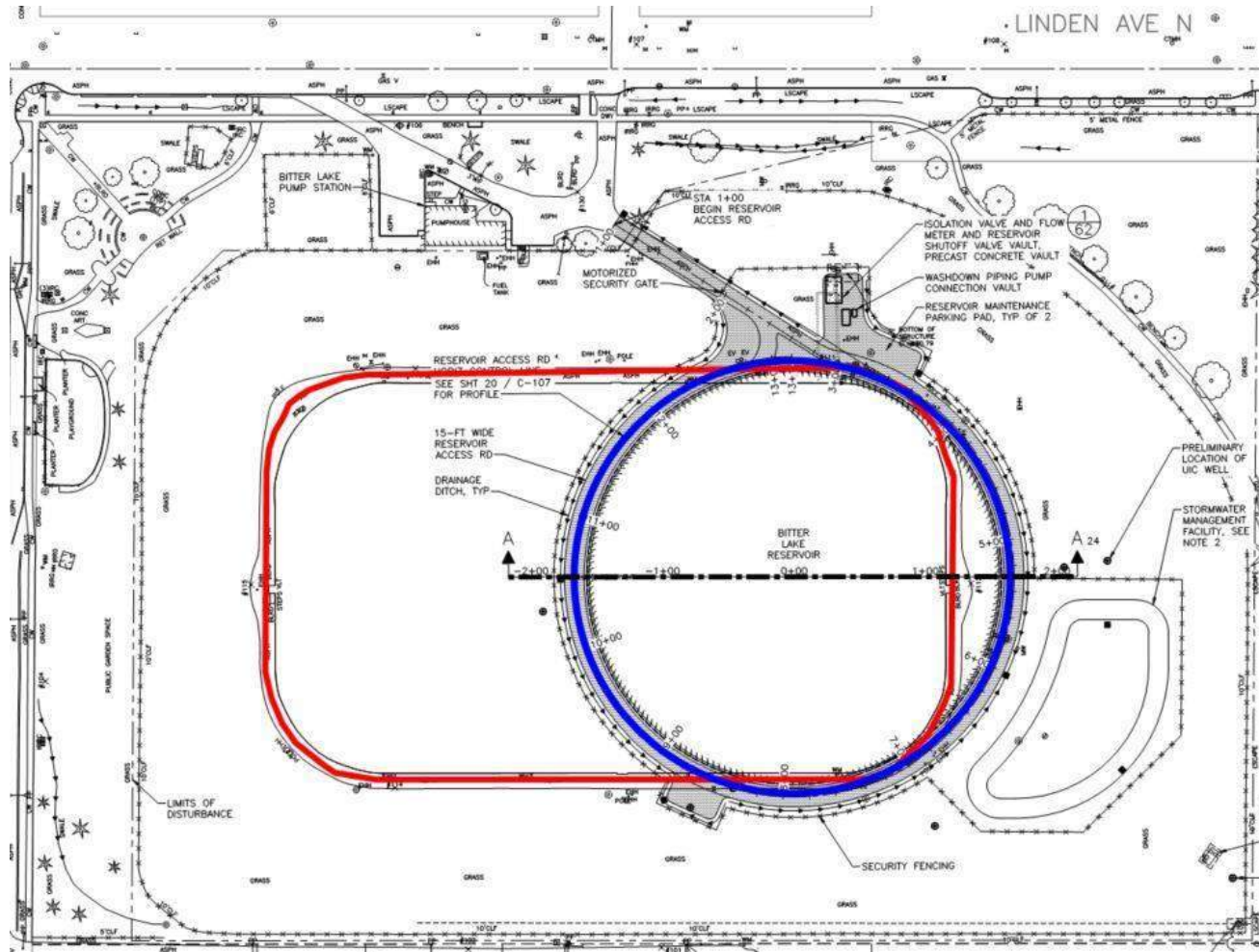




# Site Constraints & Opportunities



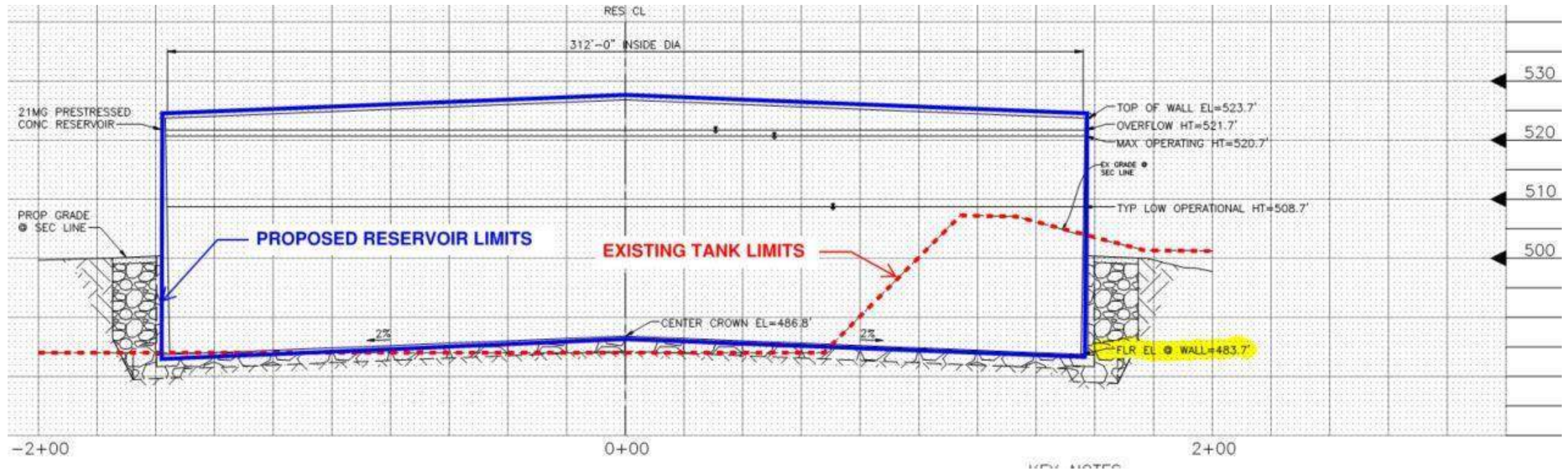
# Site Constraints, Engineering Considerations



- Reservoir Location
- Minimize soil hauling, keep soils on site
- Stormwater Management
  - Shallow Infiltration Restricted
- Site Security
- Facilities Access



# Site Constraints, Engineering Considerations



- Reservoir configuration to store 21 MG
- Hydraulic Elevations
  - Bottom elev. needs to remain the same

# Site Opportunities

- 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 Constraints & Opportunities (SPR)

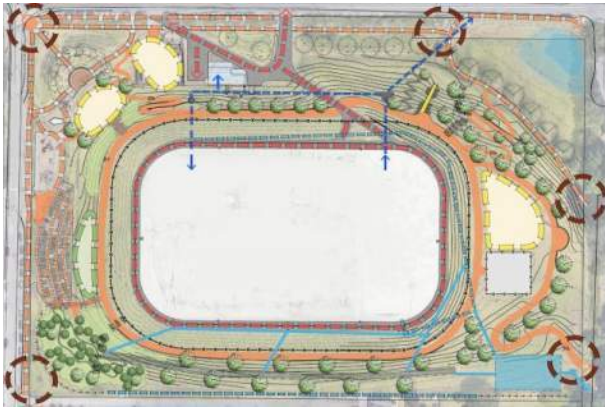
- Additional Open Space (currently ~25% of site, future ~75% of site)
  - Approximately 6 acres
- Blending existing park spaces into new
- Accessibility improvements
- Balancing desired park amenities with adjacent single family residential properties

# **SITE AND BUILDING PLANS**



# Preliminary Conceptual Site Plans

Option 1, Floating Cover



Option 2, Aluminum Roof



Option 3, Prestressed Conc Reservoir



Option 4, Fully Buried Reservoir

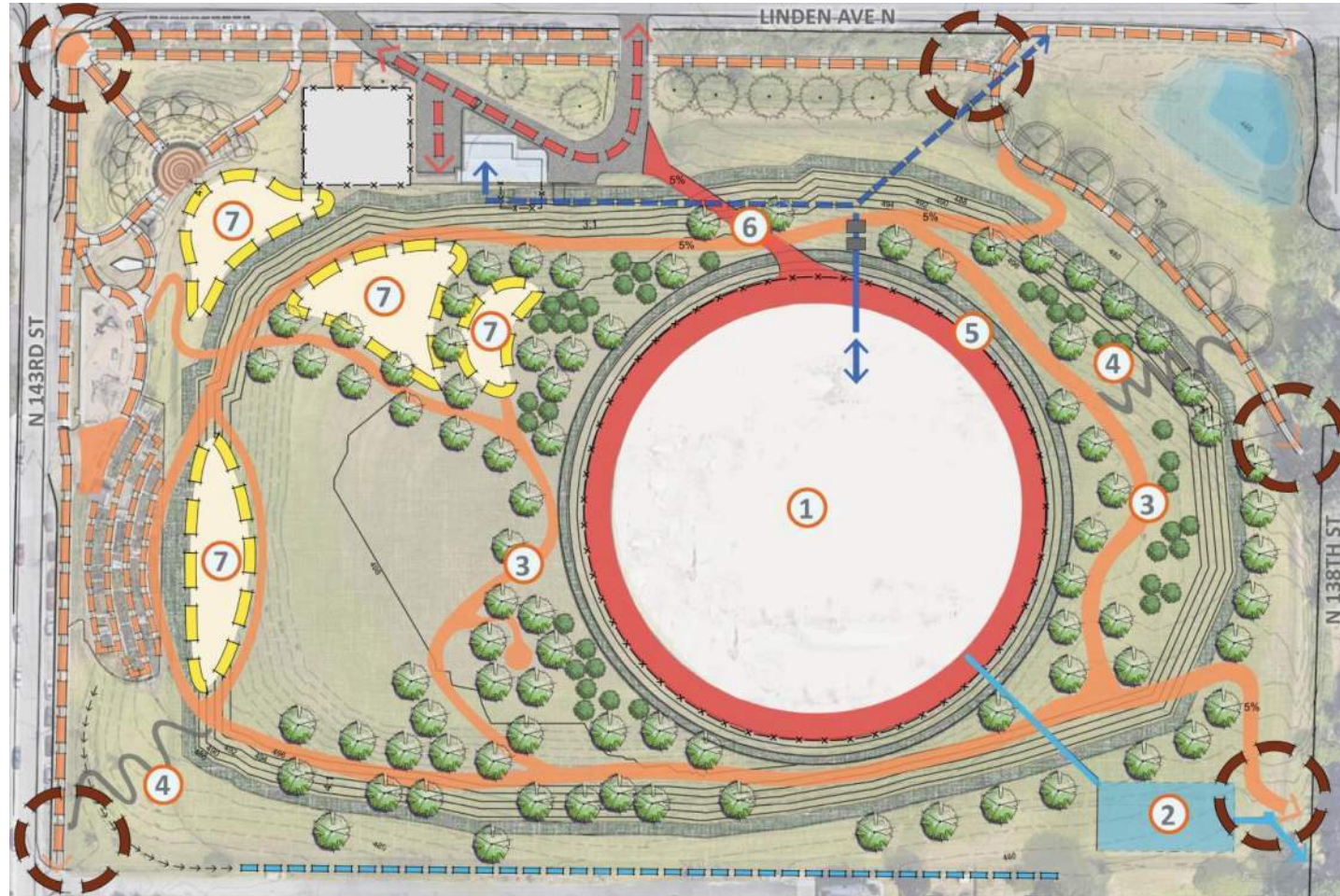


## LEGEND

- 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



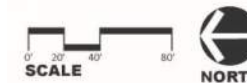
## KEY

- 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

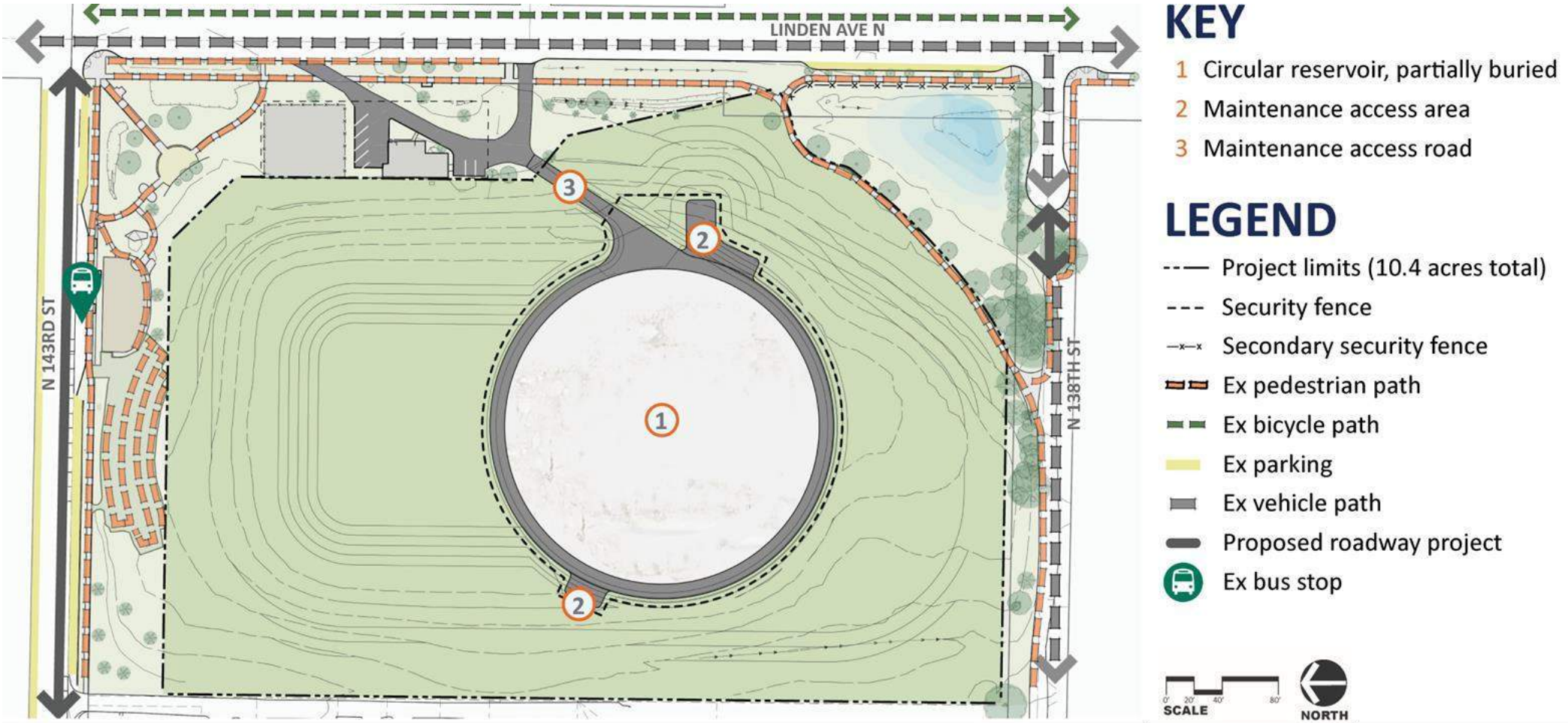
- x-x Security fence
- - - Ex pedestrian path
- - - Ex water input/output
- - - Ex maintenance access road
- - - Programmable space
- - - Ex entrance
- - - Proposed pedestrian path
- - - Proposed secondary pedestrian path
- - - Maintenance access road
- - - Onsite detention output

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

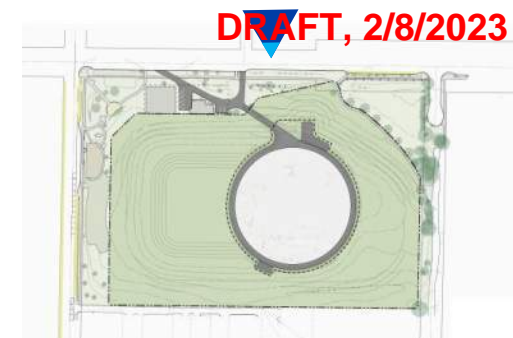
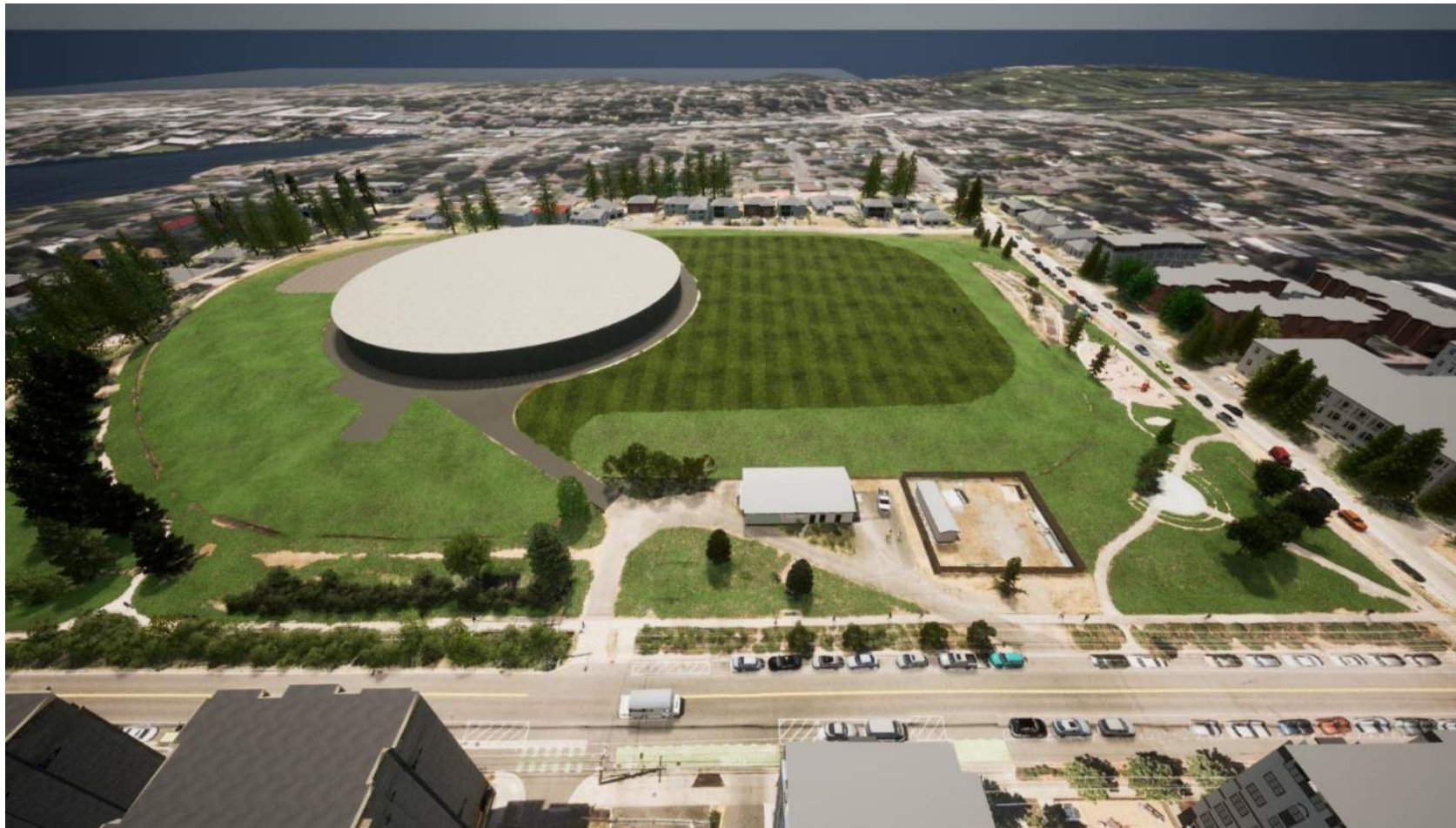




# Current Concept Site Plan (SPU)



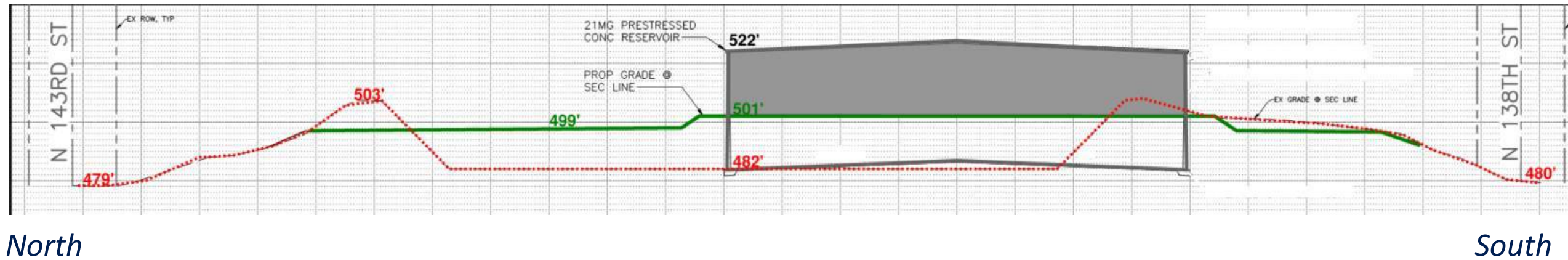
# Visualizations



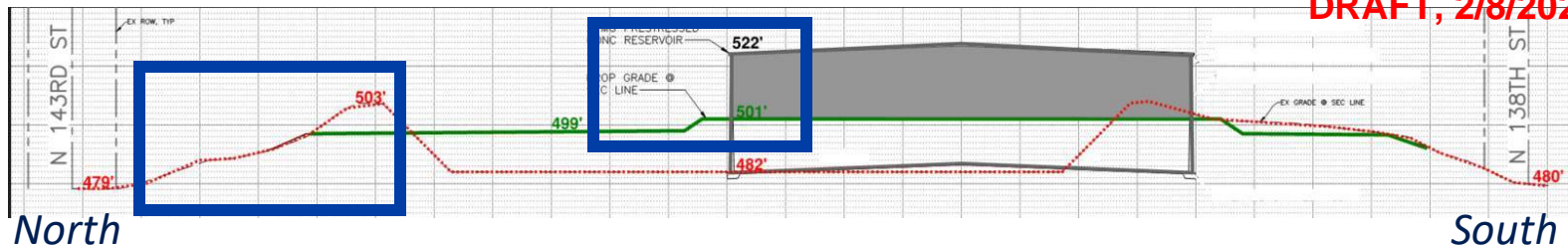


# Visualizations

*Site section view, north to south*

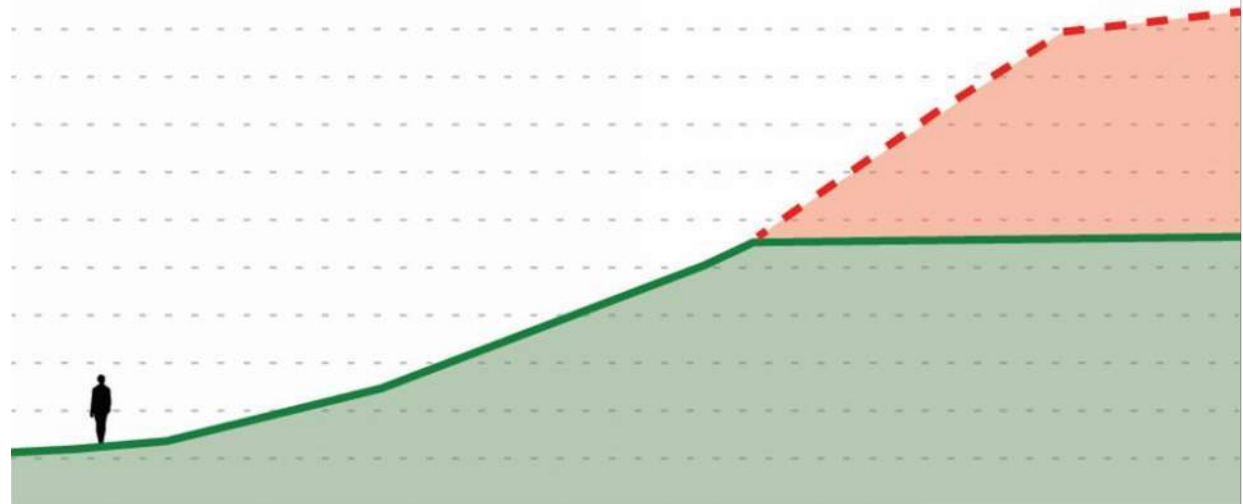


# Visualizations

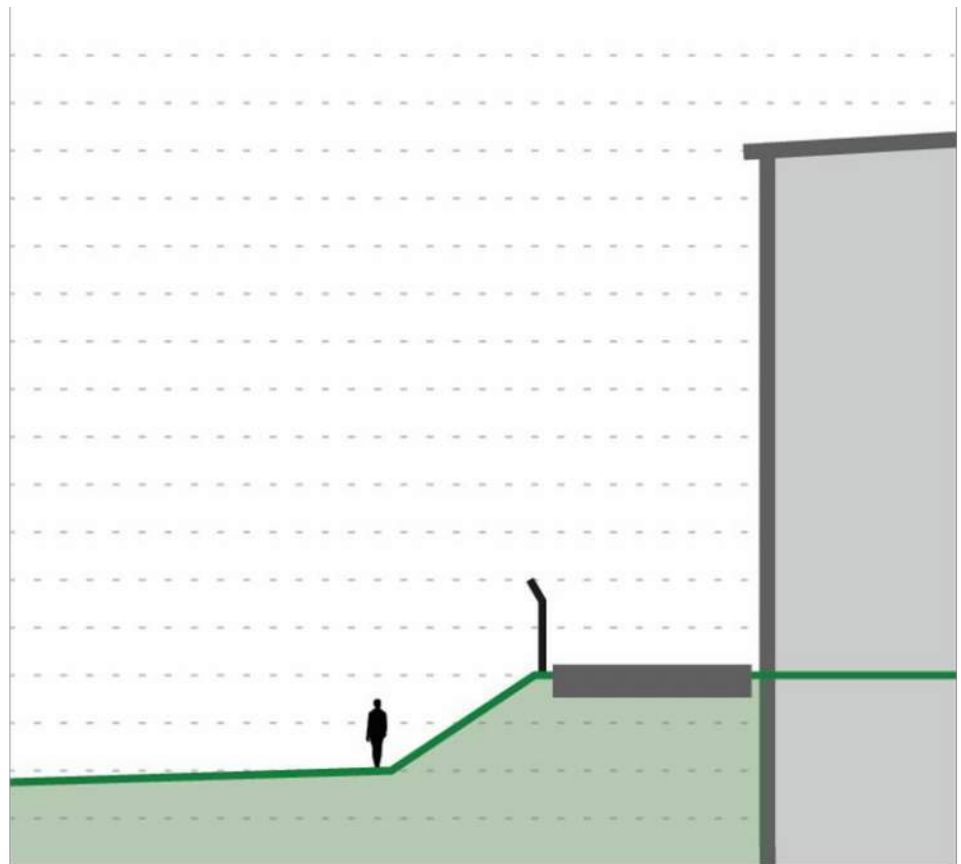


## LEGEND

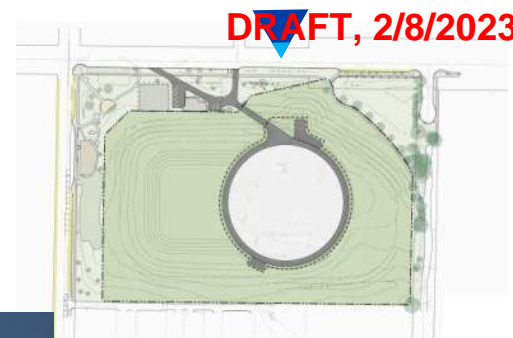
- █ Proposed grade at section line
- - - Ex grade at section line
- Concrete reservoir
- | 8' Fence



Section at berm



Section at reservoir

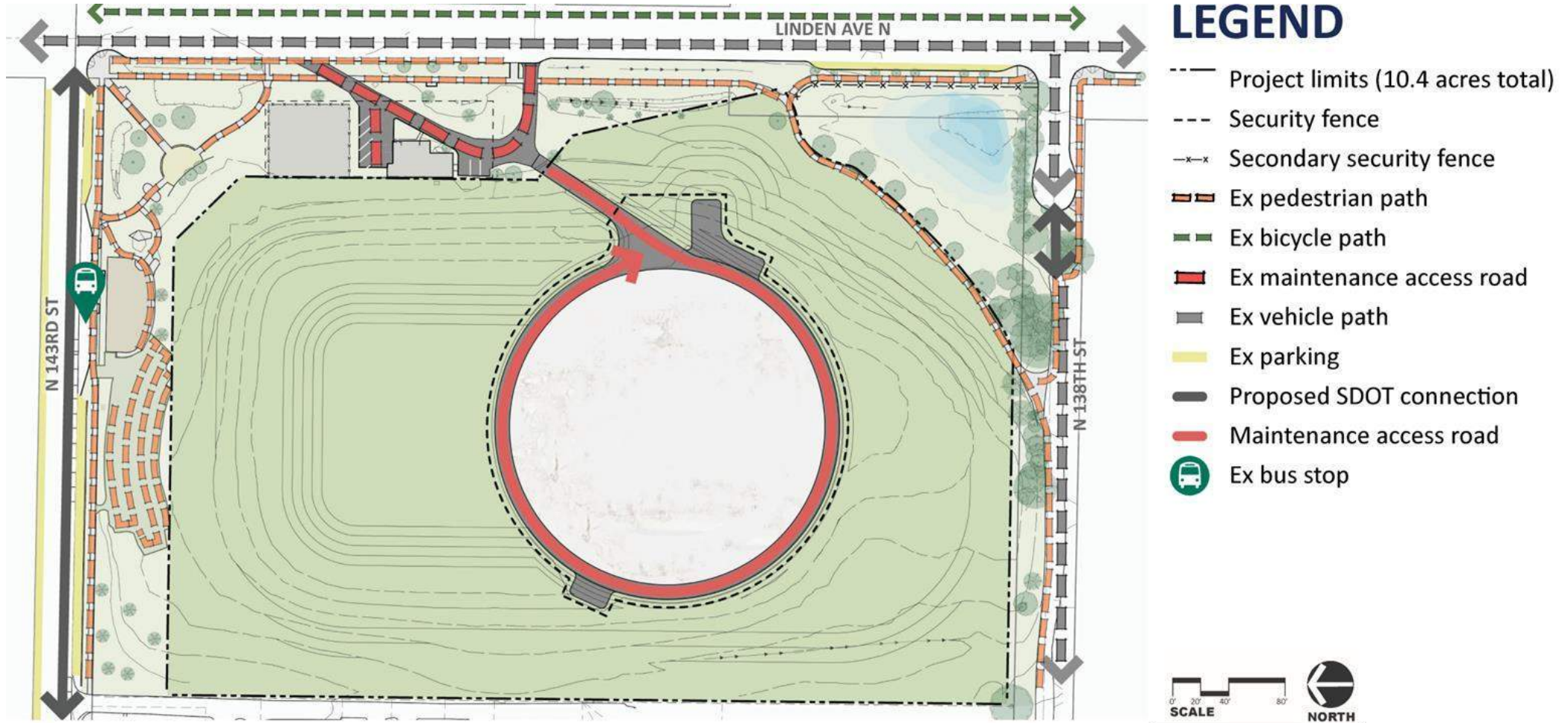


# Visualizations

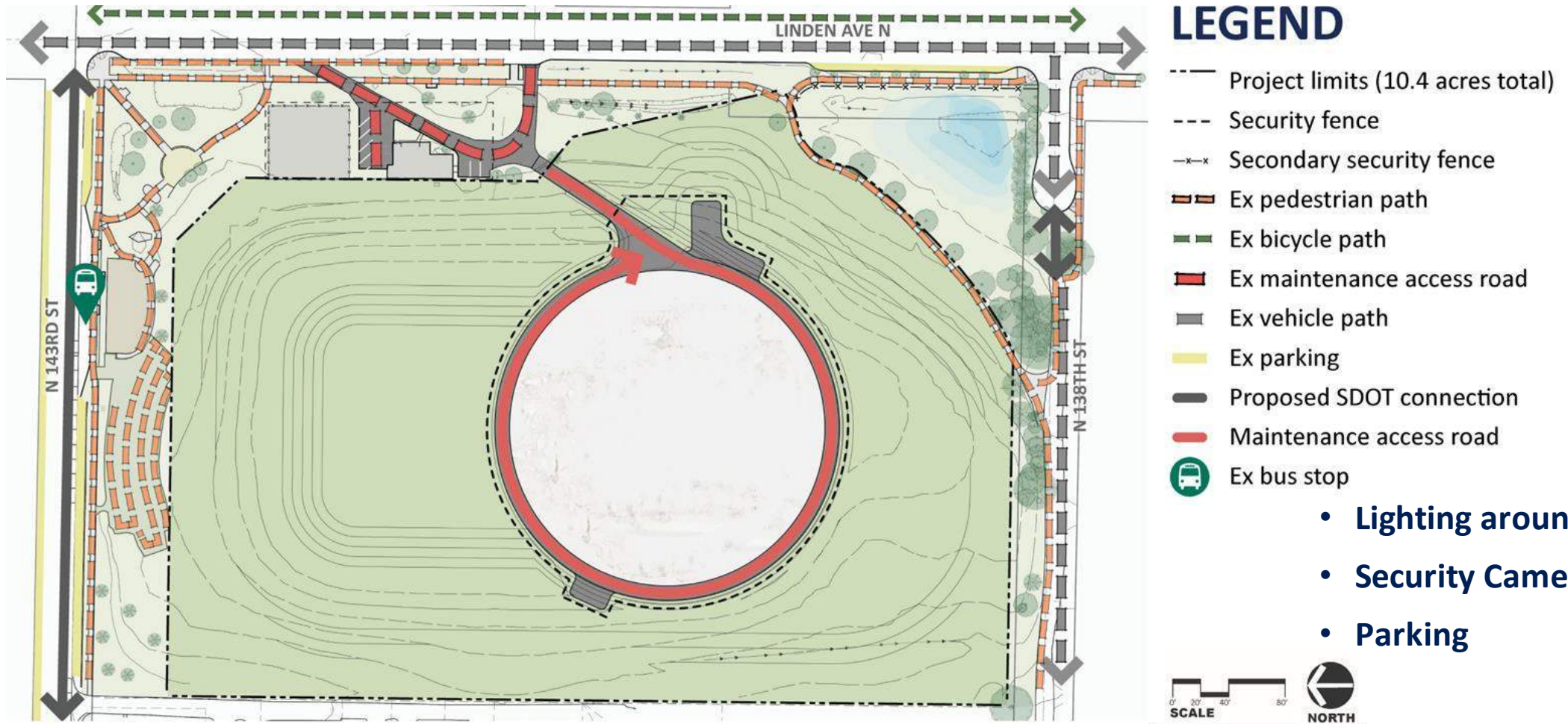




# Site Circulation

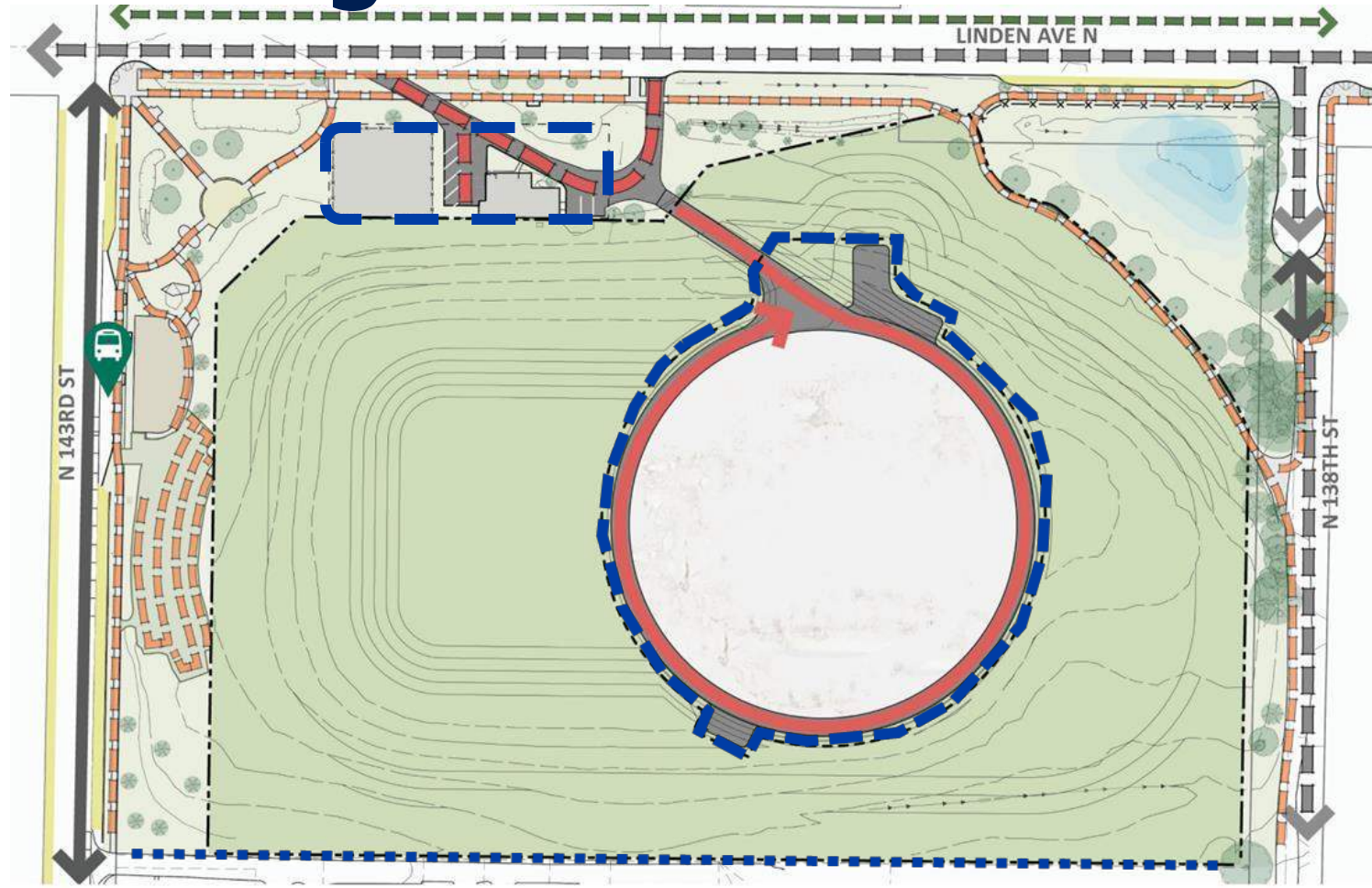


# Site Access & Security

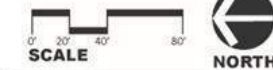




# Fencing



*8' tall metal decorative picket fence & gates*





# Fencing Examples



Elevated Tank - Maple  
Leaf Reservoir Park



Pump Station - Myrtle  
Reservoir Park

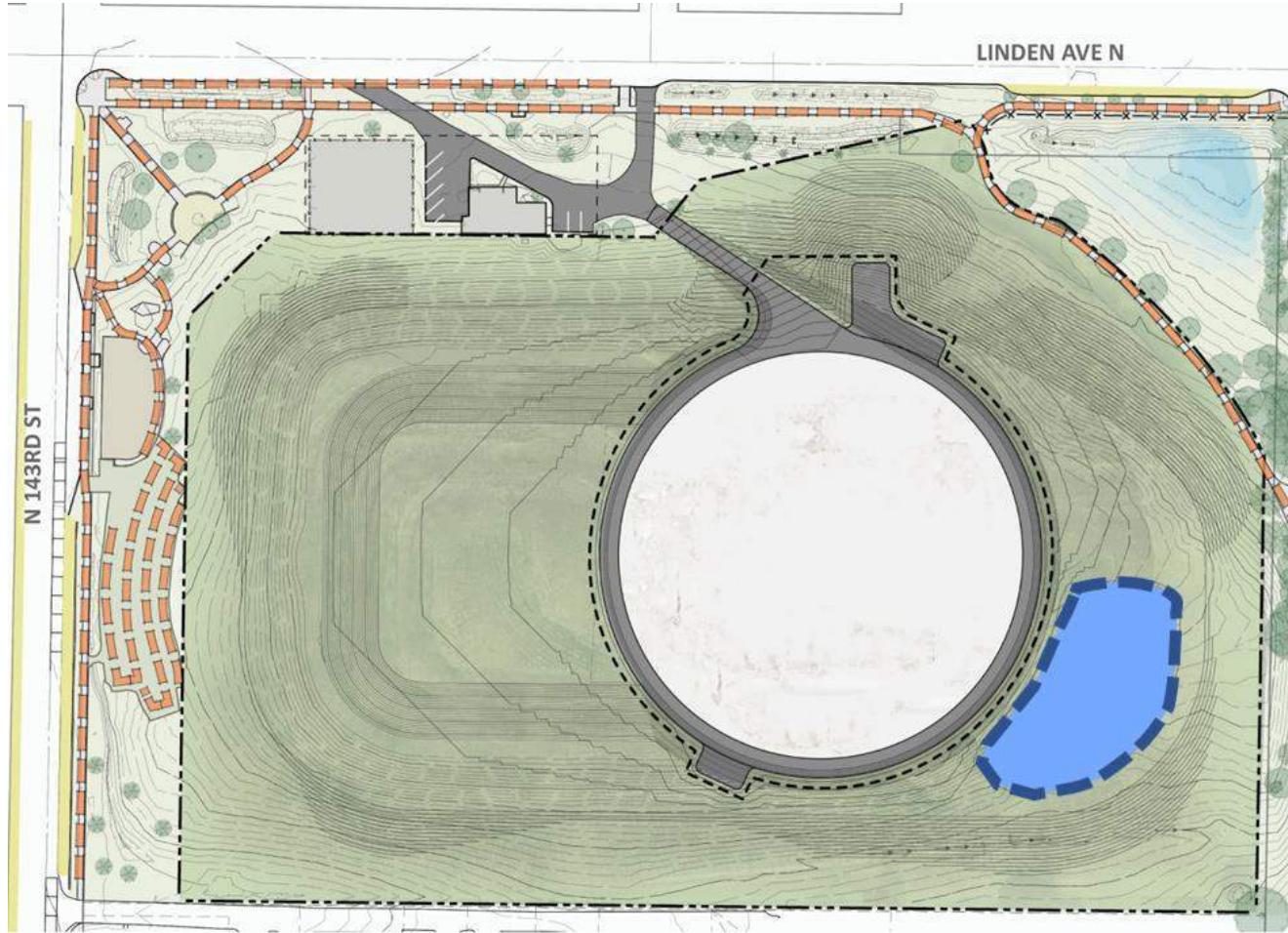


Reservoir Access – Westcrest Park



Gate House – Maple  
Leaf Reservoir Park

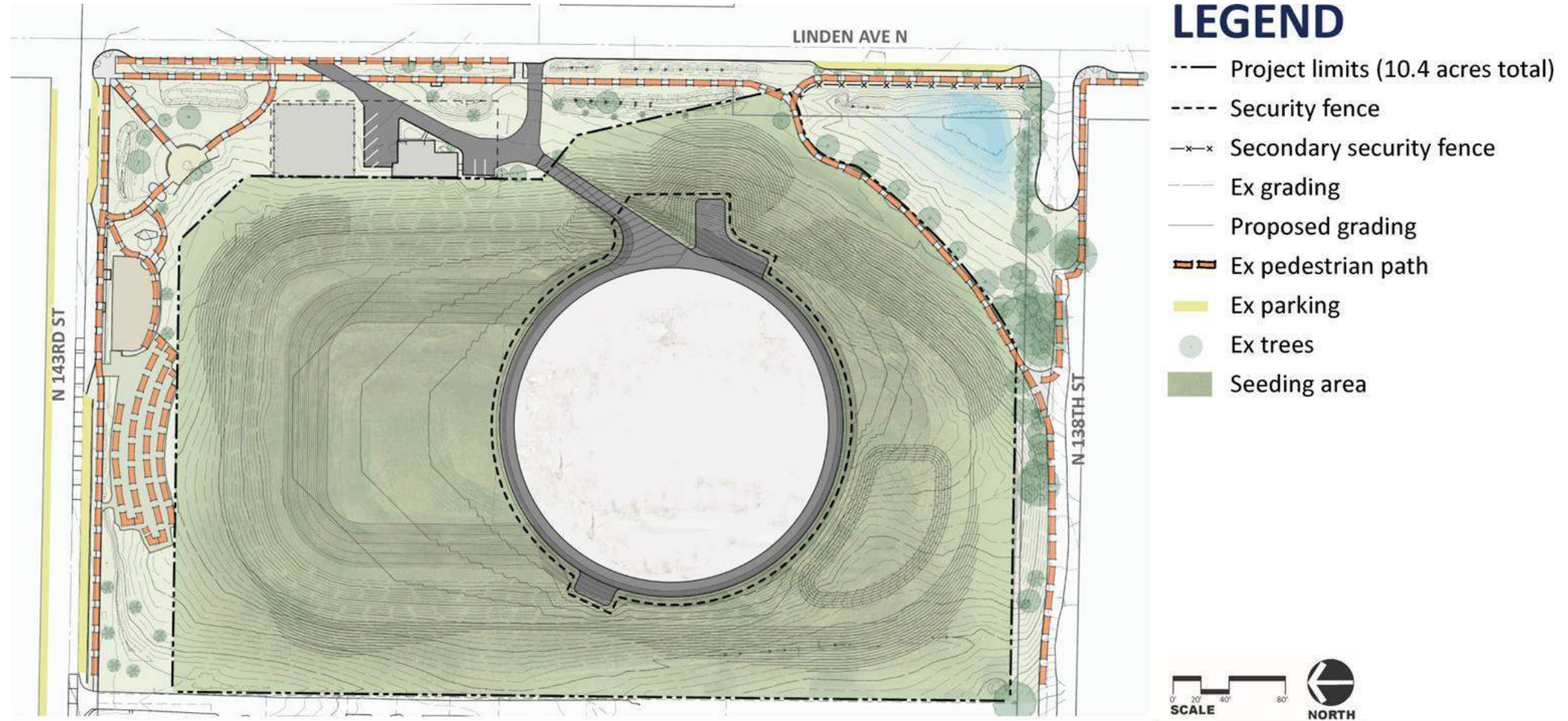
# Stormwater Management



- Challenges:
  - Local downstream system at capacity
  - Shallow infiltration not available
  - Deep infiltration requires near-drinking water quality
- Options:
  - Onsite detention (secured)
  - Onsite management, UIC well

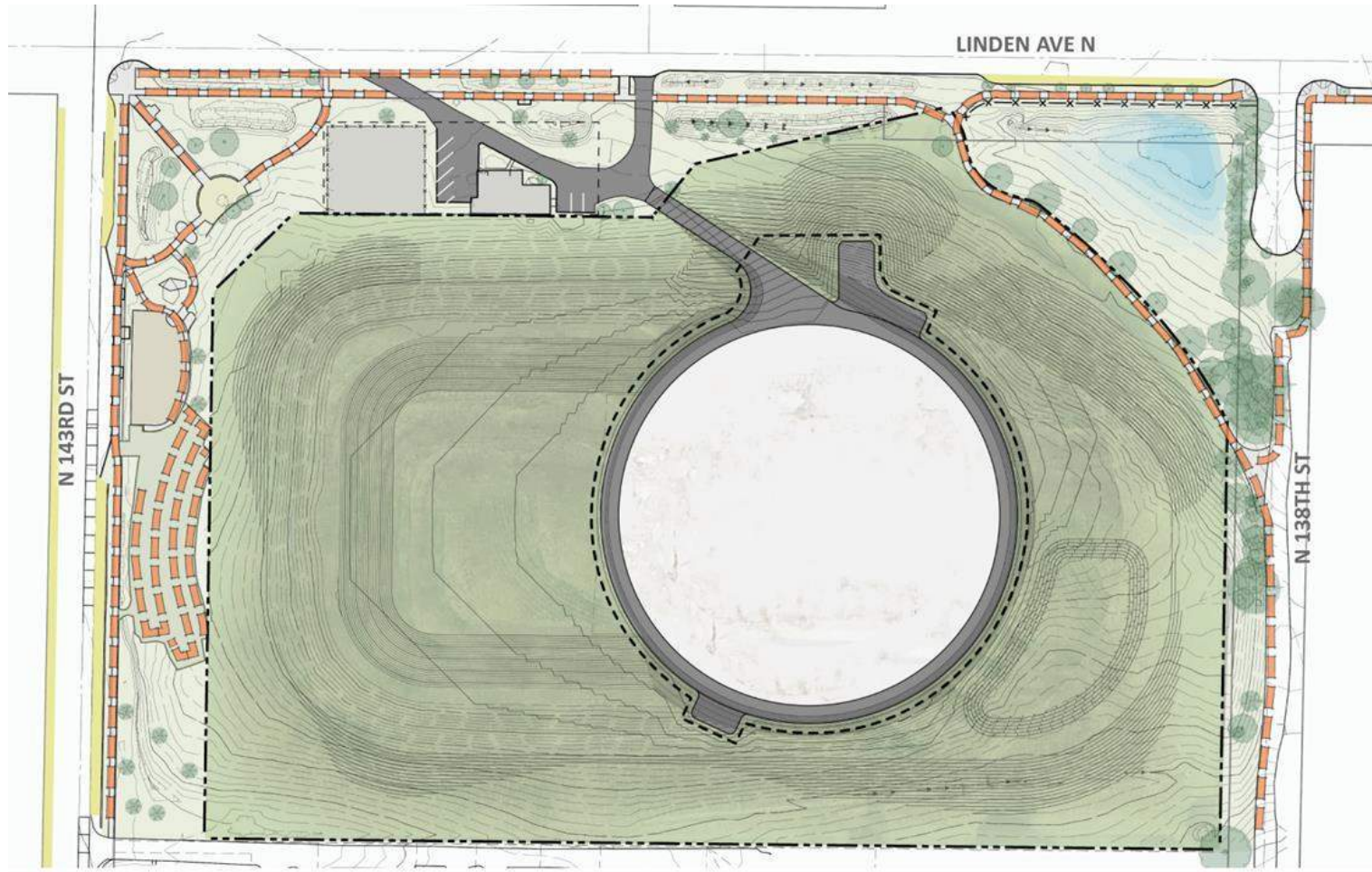


# Concept Landscape Plan





# Points of Collaboration SPU & SPR



- Clear understanding of available public areas
- Schedules for design and construction
- Temporary seeding
- Community engagement
- Possible grading

# Architectural / Structural Materials

## *Reservoir*





# Architectural / Structural Materials

## *Reservoir*





# 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

# 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.
  - Development engagement program using SPU Communications Group and outside member of Consultant team

# Community Engagement Feedback

- Concerns
  - Illicit activities occurring at property.
  - Removal of site perimeter fencing may lead to an increase in present illicit activities.
- Desired Improvements
  - Safety
    - Adequate lighting
    - Cameras
    - Not creating isolated or hidden areas
  - Maintain / improve community P-patch garden
  - Accessibility improvements
  - Exercise spaces (e.g., basketball courts)



# Community Engagement Progress

- What we have done to date
  - Stakeholder interviews
  - Community online survey
  - Project information website
    - <https://www.seattle.gov/utilities/neighborhood-projects/bitter-lake-reservoir-improvement-project>
  - Draft, Public Involvement Plan
- What we plan on doing
  - Community Open Houses
  - Project website updates

# Public Art

## Project includes 1% for Art

- Planning Artist commissioned
  - ARTS Community Engagement Roster
  - Budget up to \$56,000
  - Join design team Q1 2023
- Public Artist(s) for permanent artworks
  - Opportunities developed in 2023
  - Selection process Q1 2024



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



# Planning Artist – Scope of Work

## Community Engagement & identifying Public Art opportunities

- Develop a workplan to create meaningful community engagement
  - Outline a timeline and milestones to engage the community
  - Identify a strategy to gather input from the community (culture, values, priorities, site use, etc.)
  - Identify ways to engage community in a fun and meaningful way (on-going touchpoints)

## Coordination with design team

- Participate in capital project design meetings with SPU and Parks
- Participate in capital project public engagement
- Create materials for public engagement
- Collaborate w/ design team to identify public art opportunities (themes, budgets, perm/temp, etc.)
- Develop materials for Call for Artist opportunities (language and renderings)
- Participate in public artist selection process
- Coordinate with selected artists during the design process

# Thank you, questions?

## Contact:

**Andrew Karch, PE, PMP**  
**Program Manager**  
**City of Seattle, Seattle Public Utilities**  
**206-684-4643**  
**[andrew.karch@seattle.gov](mailto:andrew.karch@seattle.gov)**