May 5, 2023

Upgrading Pendleton's Infrastructure to Support Development at the Top of Its Water System

Presented by:
Taylor Spencer, Civil Engineer, Consor
Lael Alderman, Principal Engineer, Consor

Agenda

01 Water System Background

02 Airport Improvements Area Growth

03 Project Background

04 New Project Site

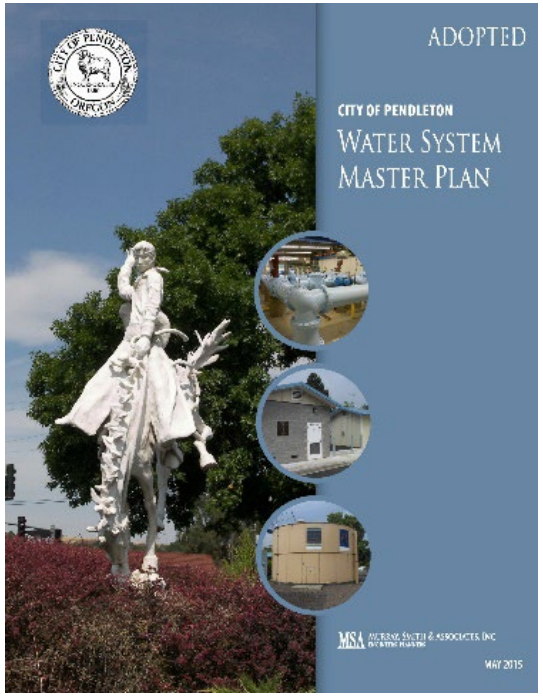
05 Construction

01

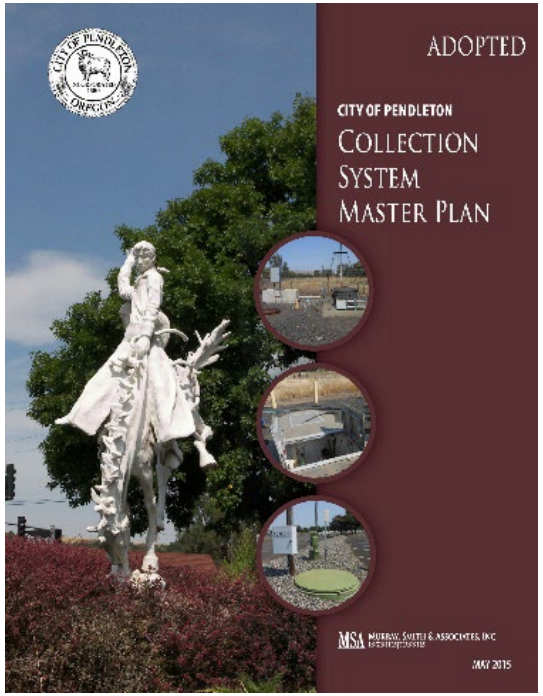
Water System Background

Systemwide Master Planning Effort

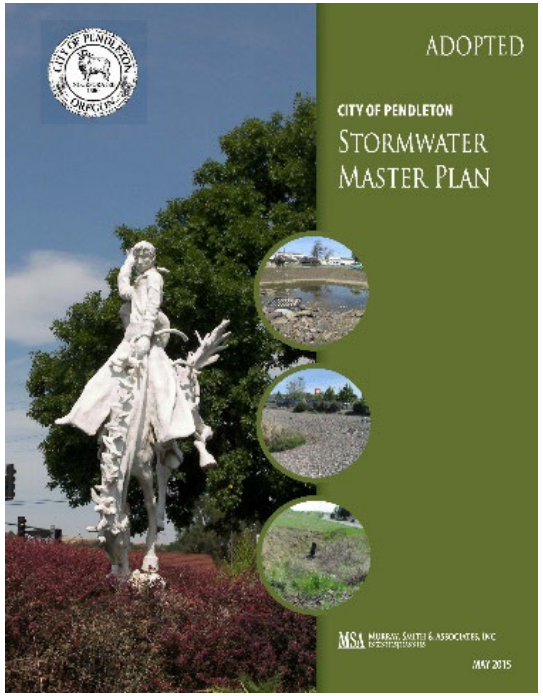
Water System Background



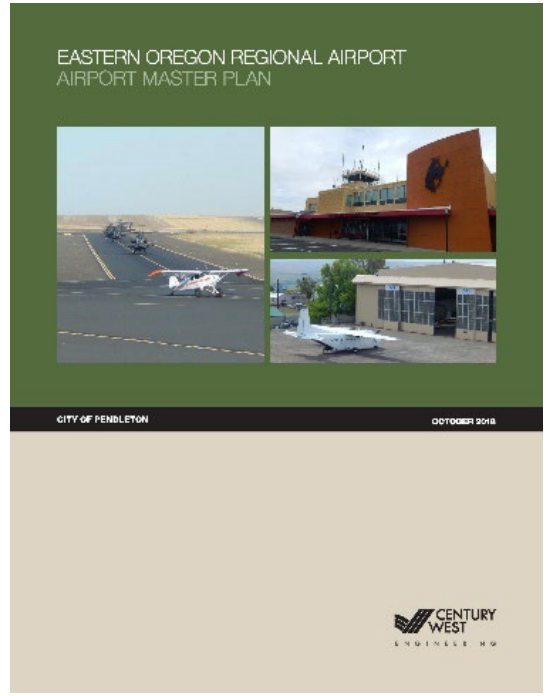
Water System
adopted 2015



Collection System
adopted 2015



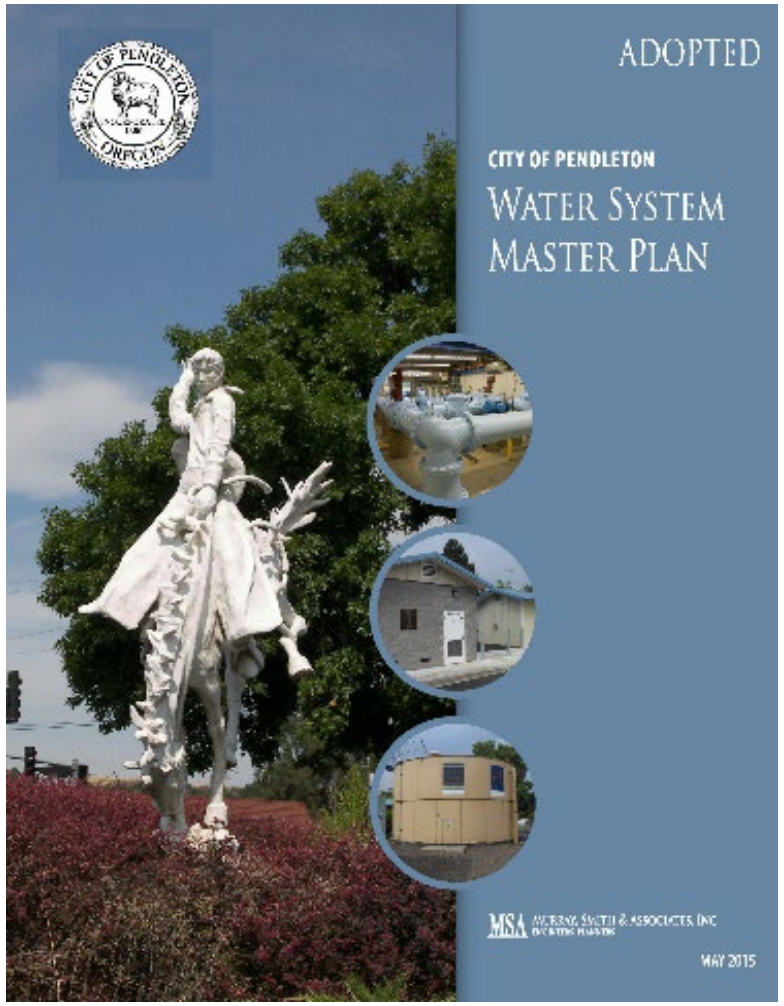
Stormwater
adopted 2015



Airport
Adopted 2018
Incorporated AIA development not captured in other utility plans

System Improvements

Water System Background



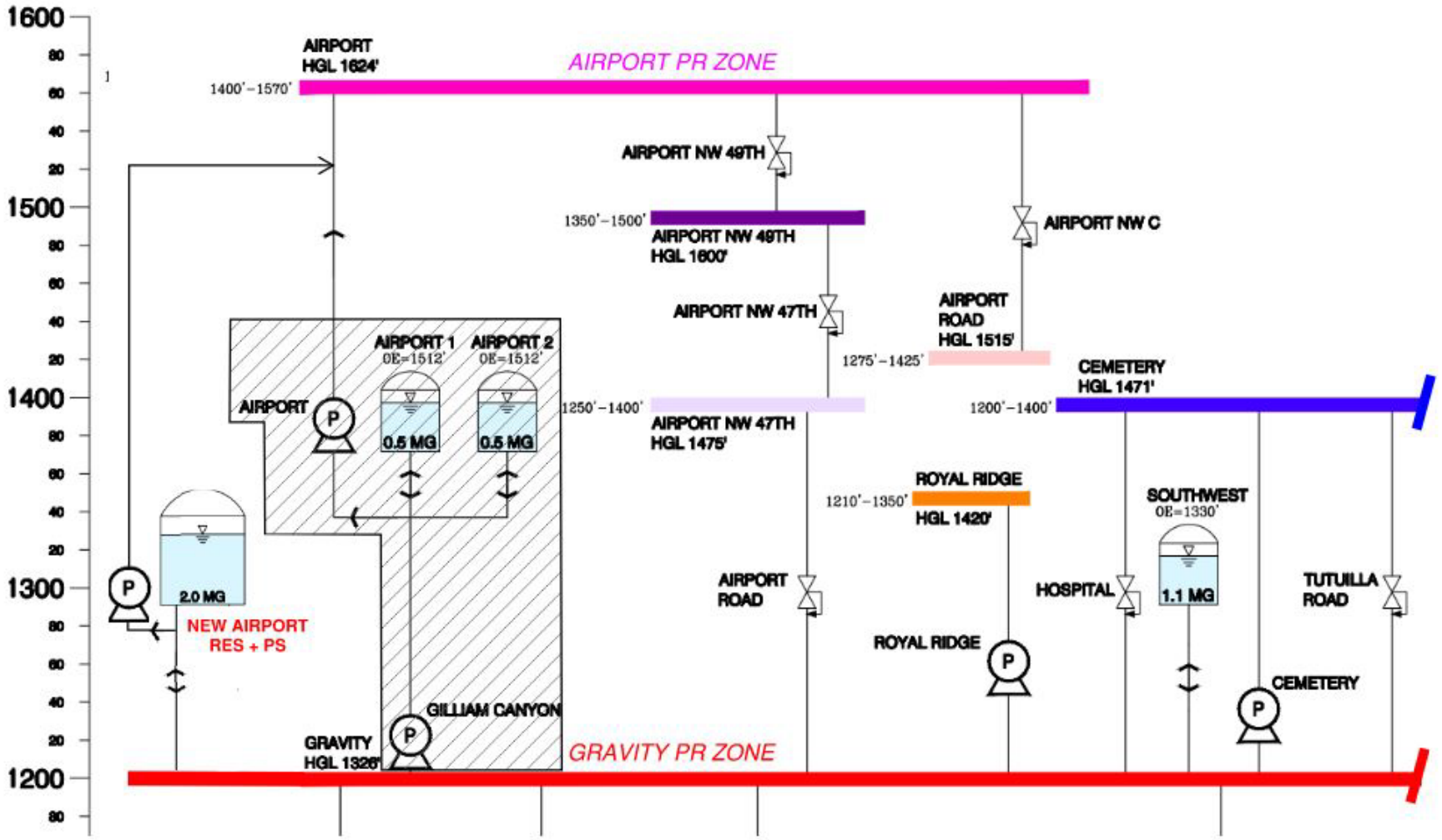
Storage deficit in the Airport Zone

+ anticipated industrial expansion

Replace Airport Reservoirs 1 & 2 and Airport PS

Hydraulic Schematic

Water System Background



Why We Are Here

Water System Background

Why We Are Here

Water System Background

Why We Are Here

Water System Background

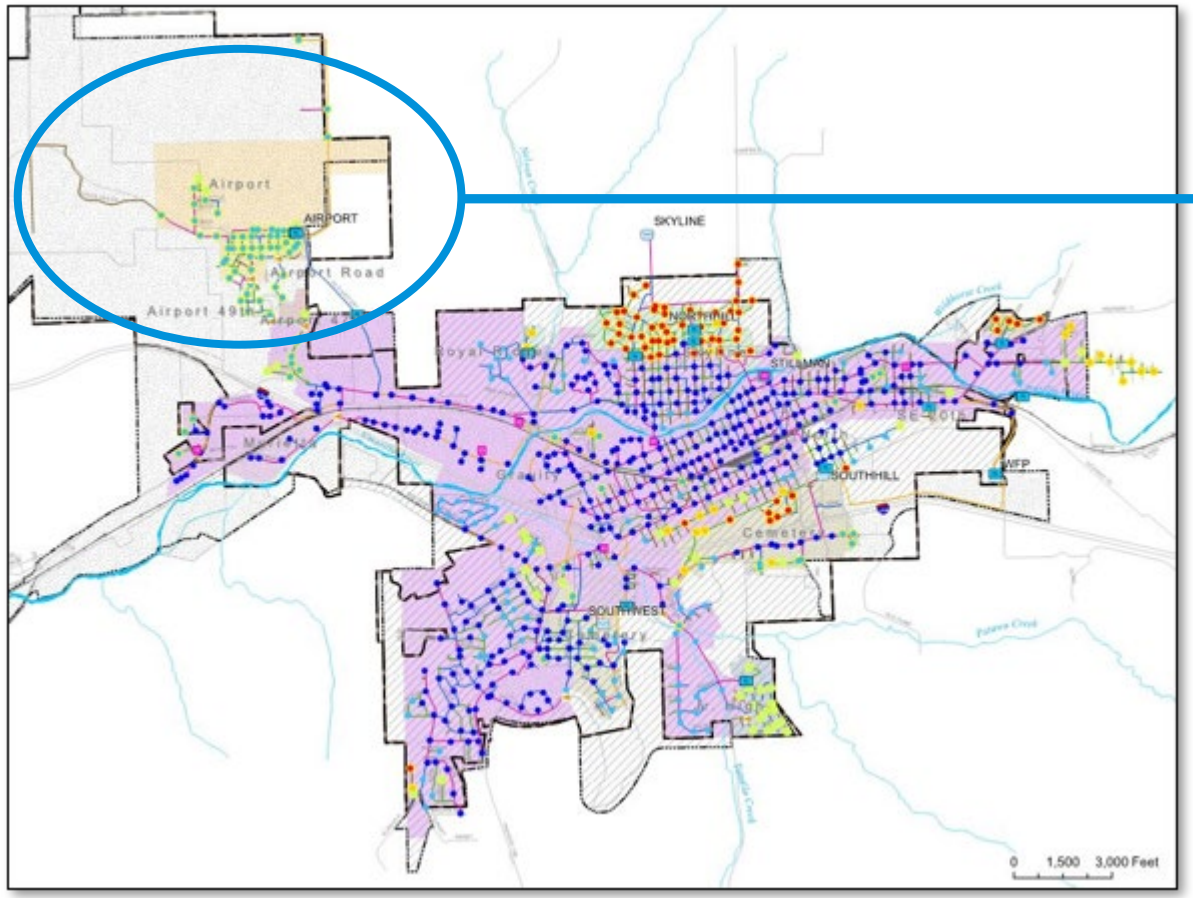
- The Pendleton UAS (Unmanned Aircraft System) Range continues to experience rapid growth
- City still needs more hangars
- City still needs more shovel-ready area for development

02

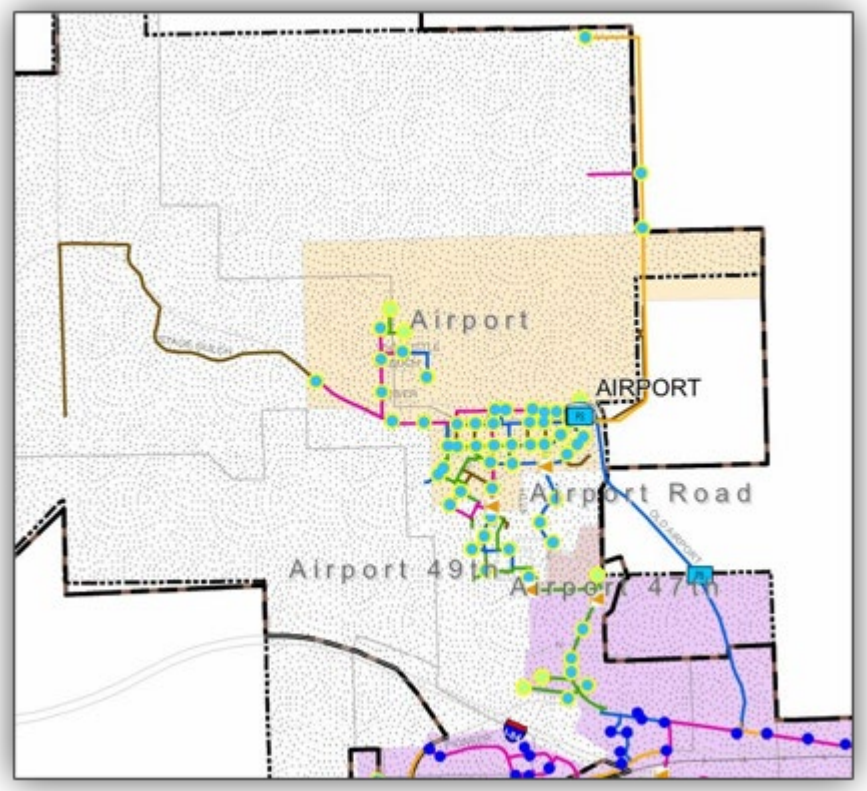
Airport Area Growth Improvements

Mapping

Airport Improvements Area Growth



City of Pendleton service area



Airport Improvement Area (AIA)

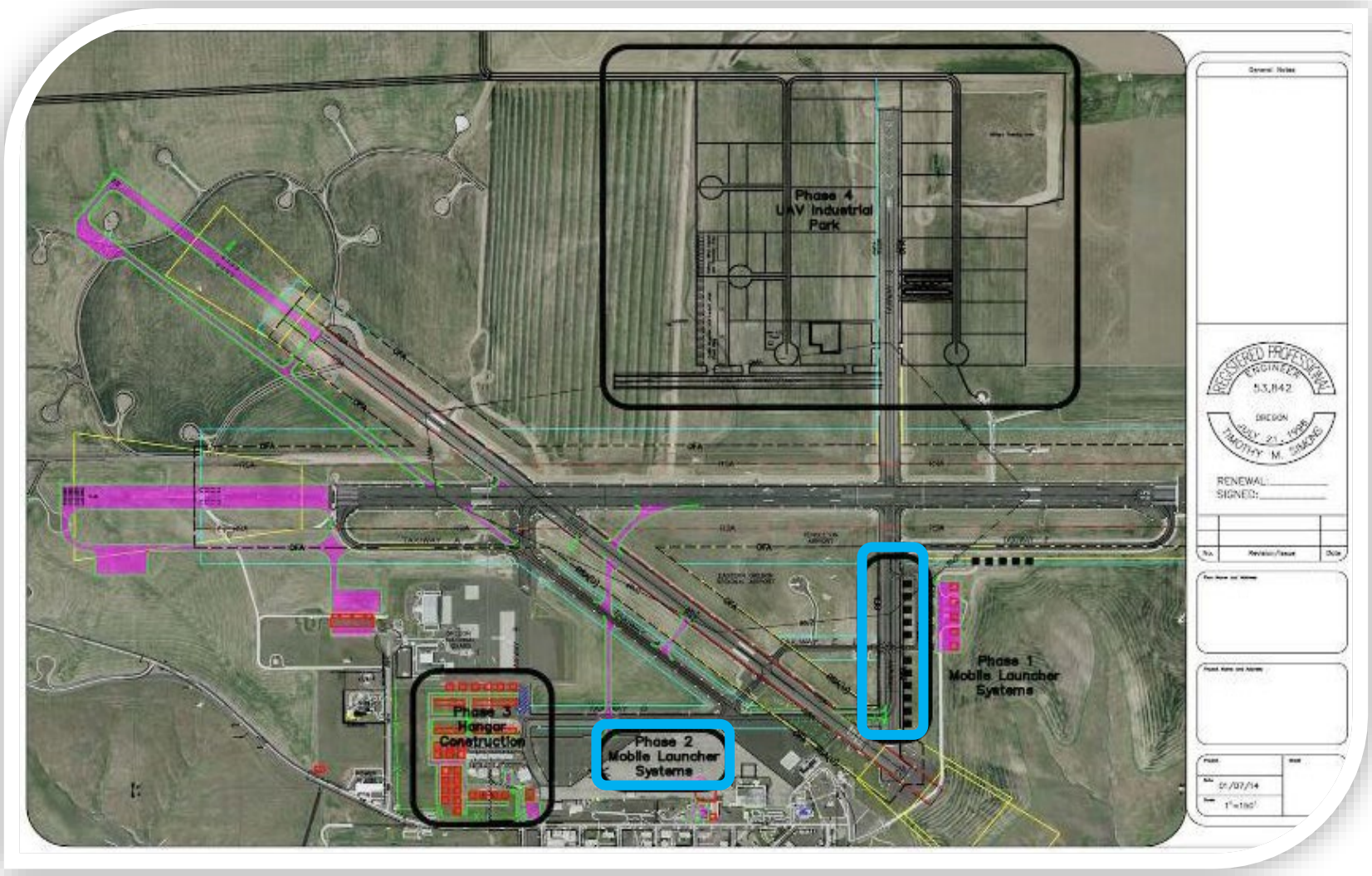
Mapping

Airport Improvements Area Growth

Pendleton Airport, 2015

Mapping

Airport Improvements Area Growth

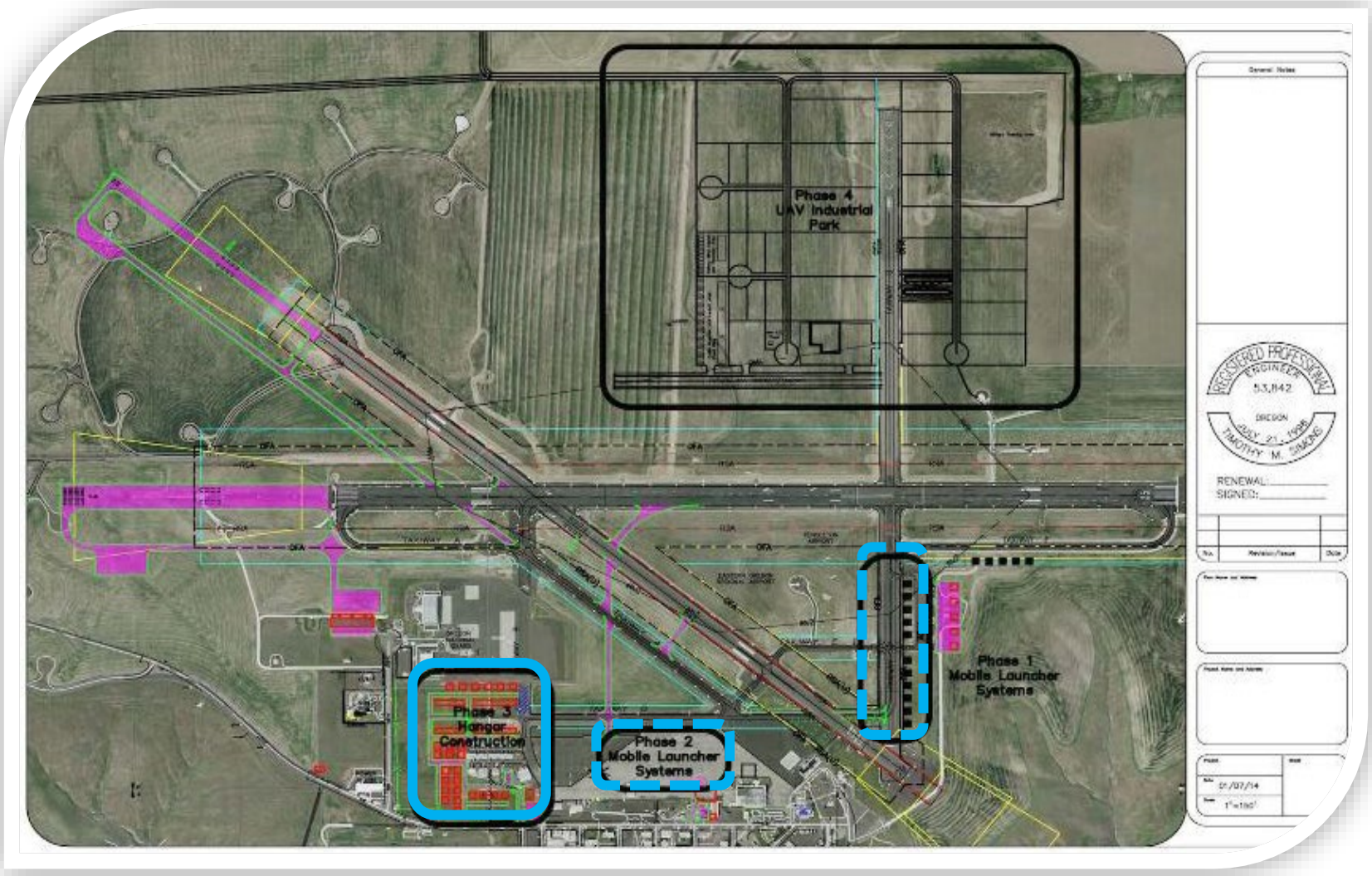


Ph I:
Mobile Launch Systems

Ph II:
Additional Mobile Launch Systems

Mapping

Airport Improvements Area Growth



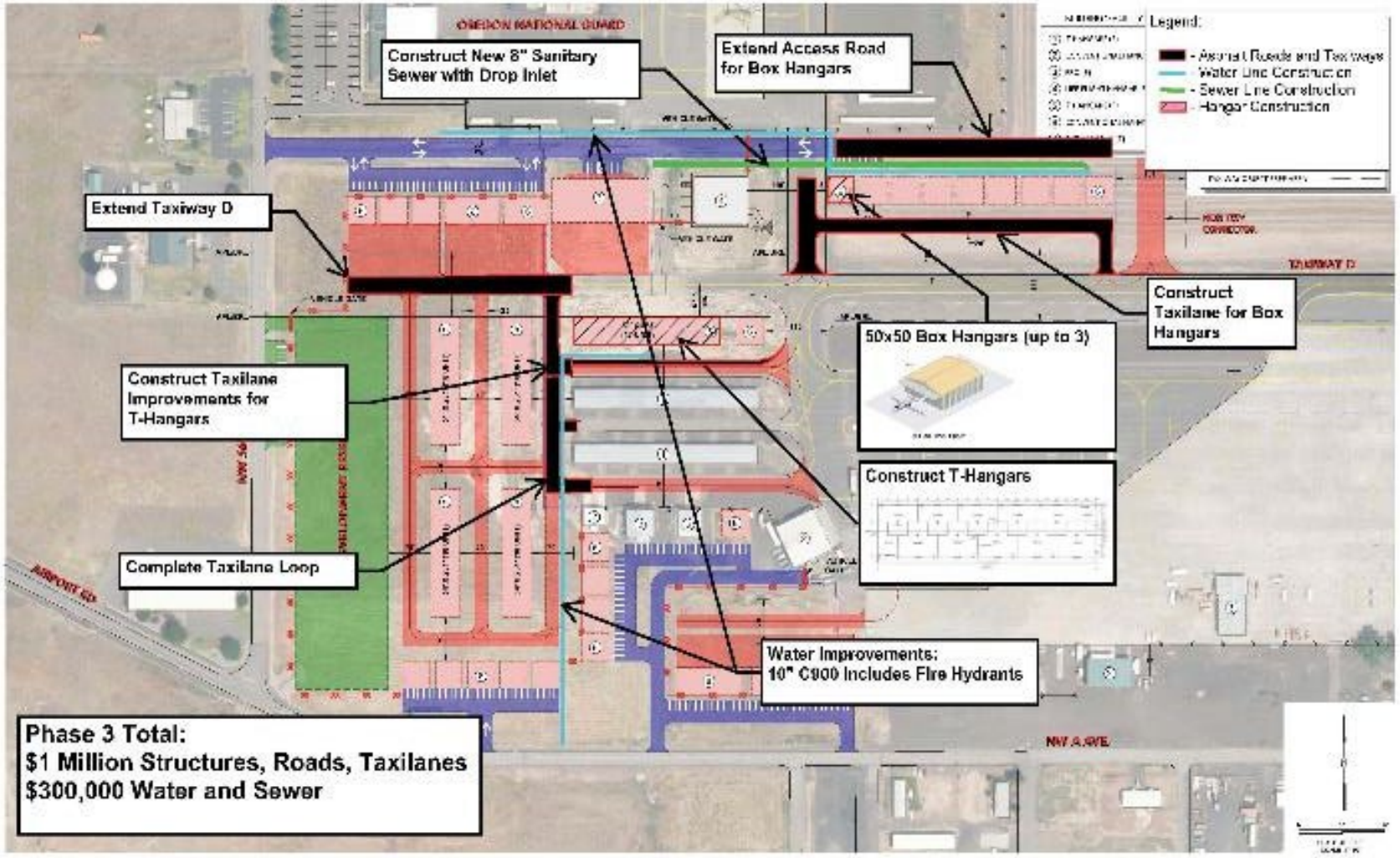
Ph I:
Mobile Launch Systems

Ph II:
Additional Mobile Launch Systems

Ph III:
Hangar Expansion

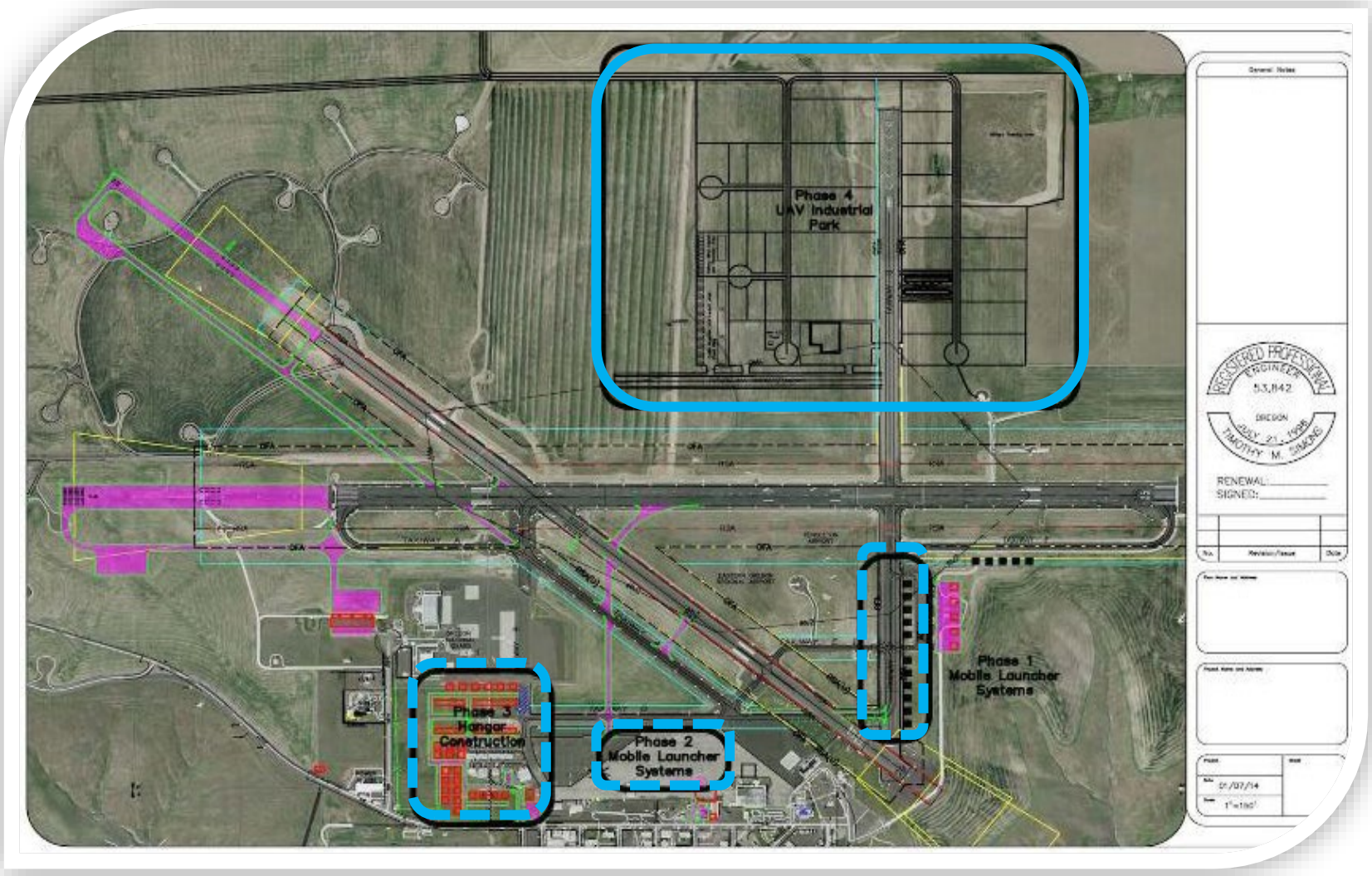
Phase III Development

Airport Improvements Area Growth



Mapping

Airport Improvements Area Growth



Ph I:
Mobile Launch Systems

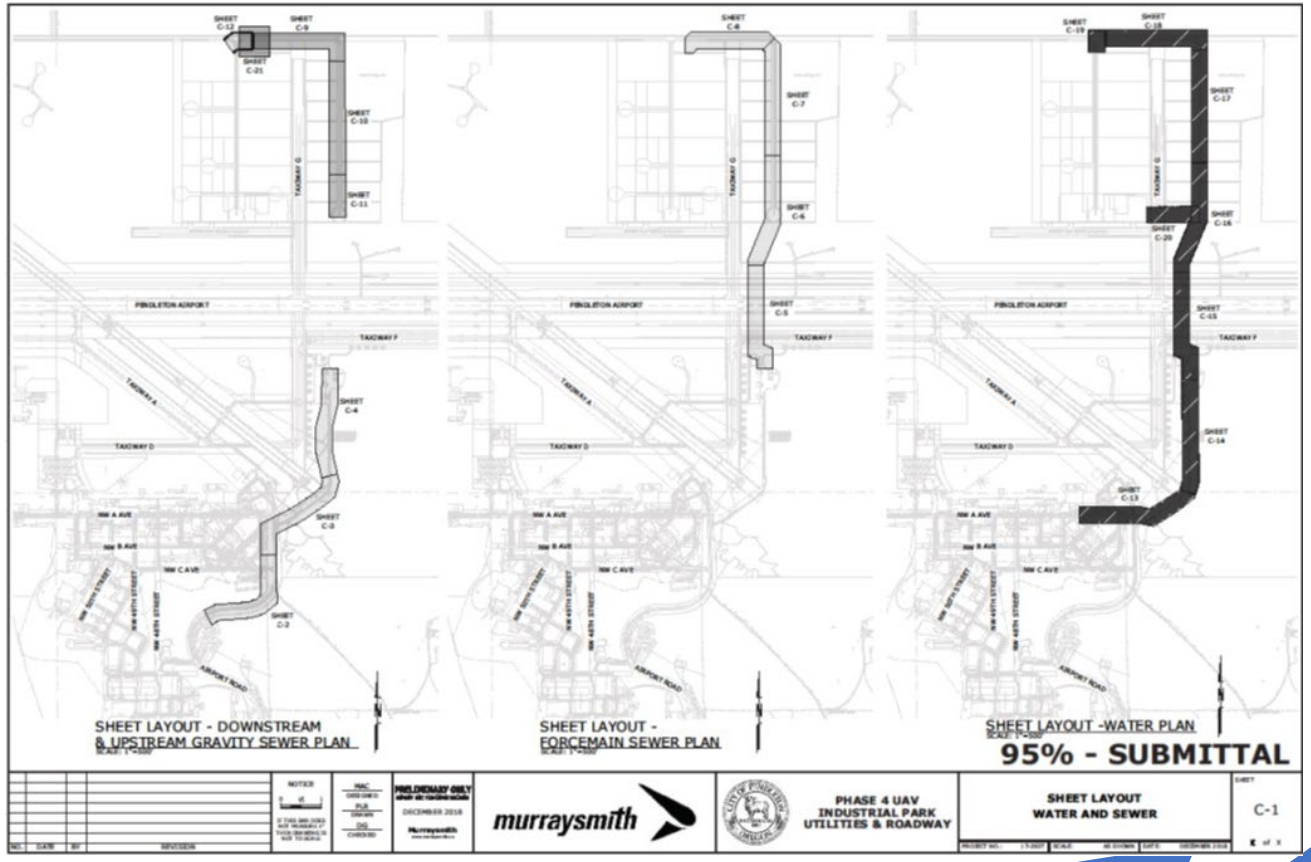
Ph II:
Additional Mobile Launch Systems

Ph III:
Hangar Expansion

Ph IV:
Industrial Park

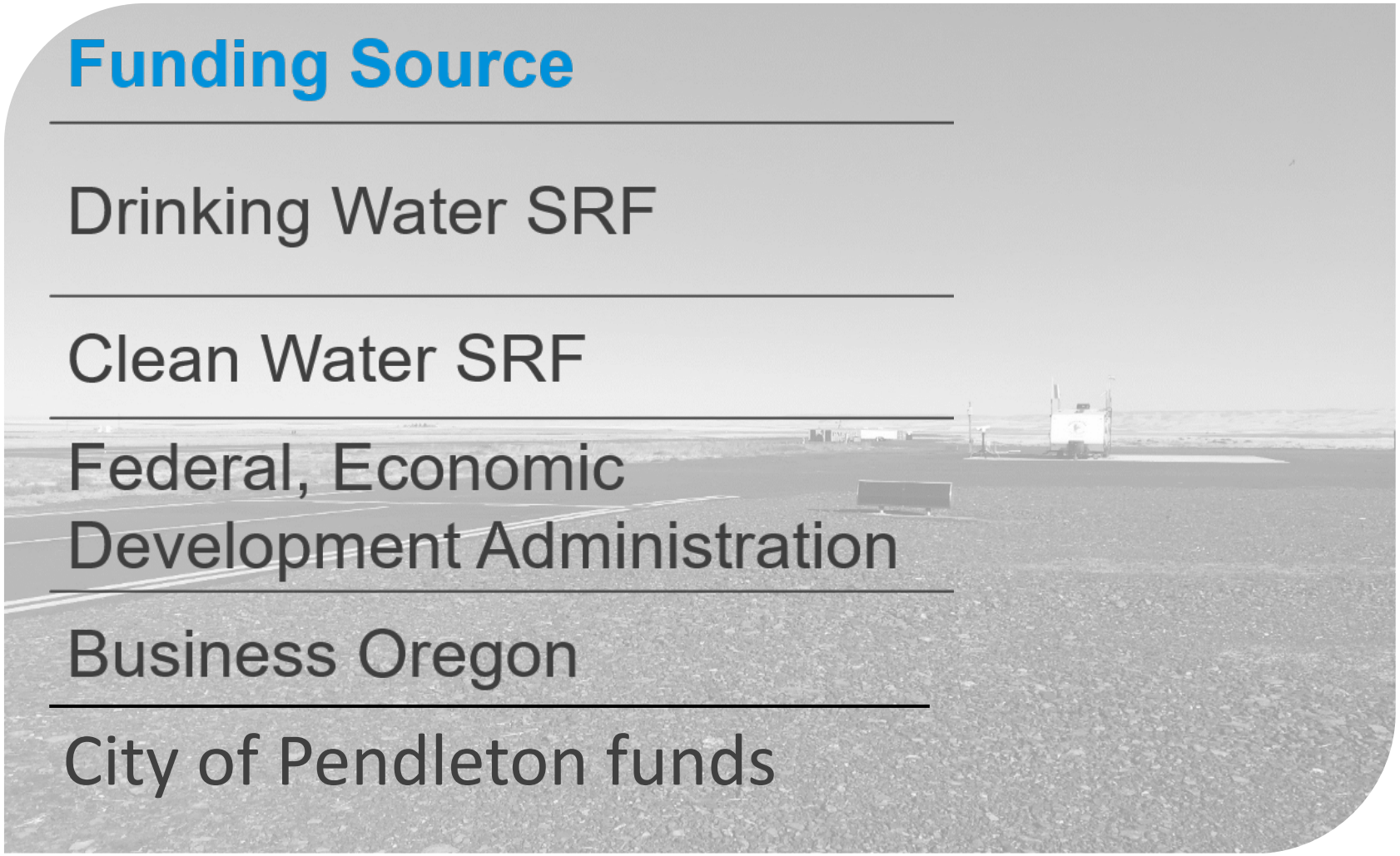
Phase IV Utility Expansion

- Water
  - 9,250 LF of 18-inch dia. waterline
- Sewer
  - 8,175 LF of 8-inch dia. gravity sewer
  - 4,400 LF of 6-inch dia. force main
  - 300 gpm lift station
- Road
  - 5,700 LF of asphalt road
- Stormwater control facilities
- Dry Utility
  - 5,275 LF of comm & power conduits



Project Funding

Water System Background



Funding Source
Drinking Water SRF
Clean Water SRF
Federal, Economic Development Administration
Business Oregon
City of Pendleton funds

03

Project Background

Project Elements

Project Background

City of Pendleton

New Airport Reservoir and Booster Station

2.0 MG welded steel reservoir
5,000 gpm booster pump station
1.5 miles transmission main piping

Project Purpose

Project Background

- Need to meet fire flow requirements for anticipated AIA development

  2,000 gpm fire flow event from public hydrants
  + 1,000 gpm sprinkler system demand
  = 3,000 gpm

- For a 3-hour duration = 540,000 gallons

Reservoir Purpose

Project Background

Reservoir Purpose

Project Background

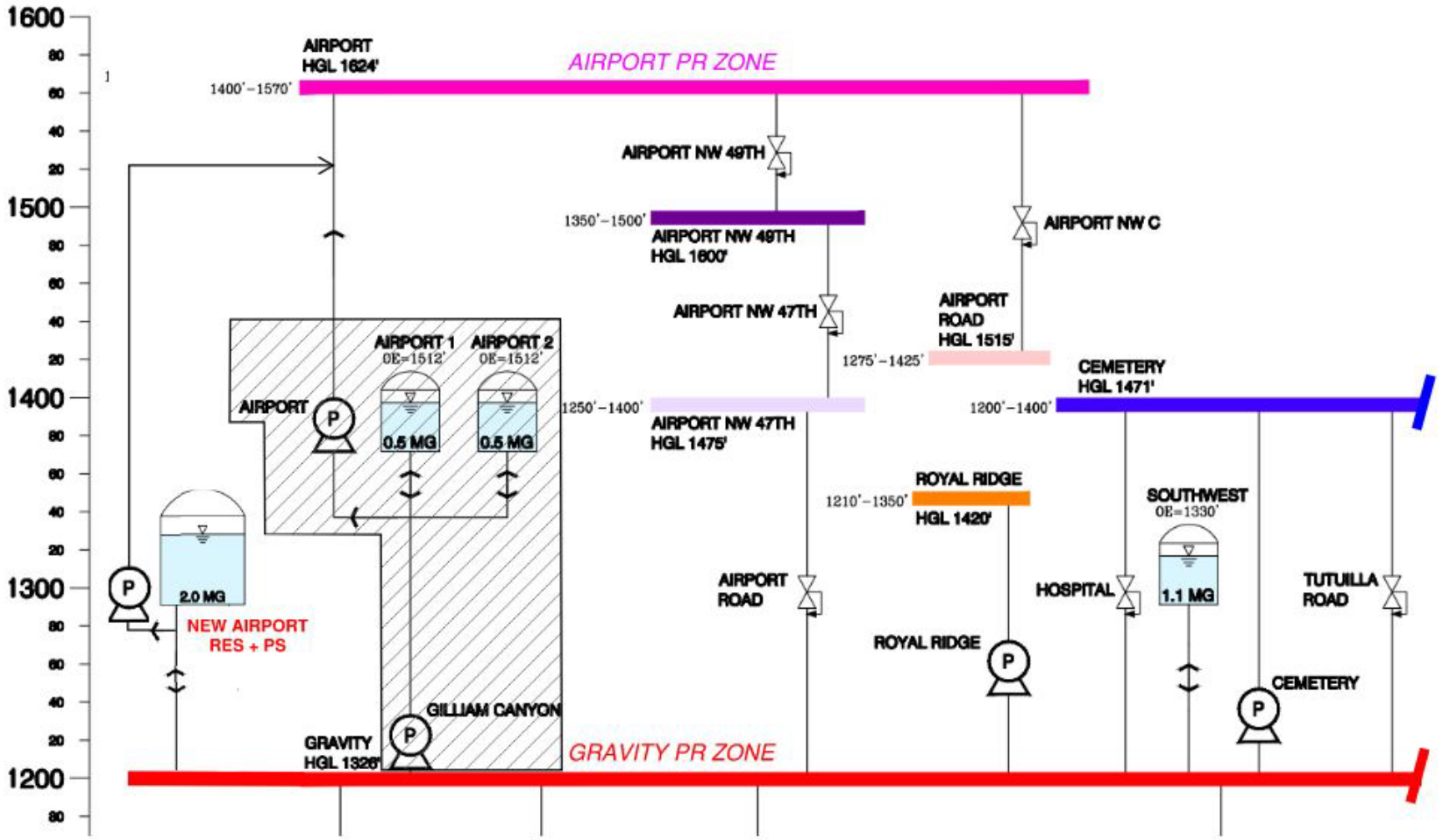
- Reservoir storage requirements

  Equalization = 170,000 gallons
  + Emergency = 800,000 gallons
  + Fire Flow = 540,000 gallons
  + Operational = 76,000 gallons
  = 1.6 million gallons

- Which leaves 400,000 gallons of supplemental storage for Gravity Zone

Reservoir Design

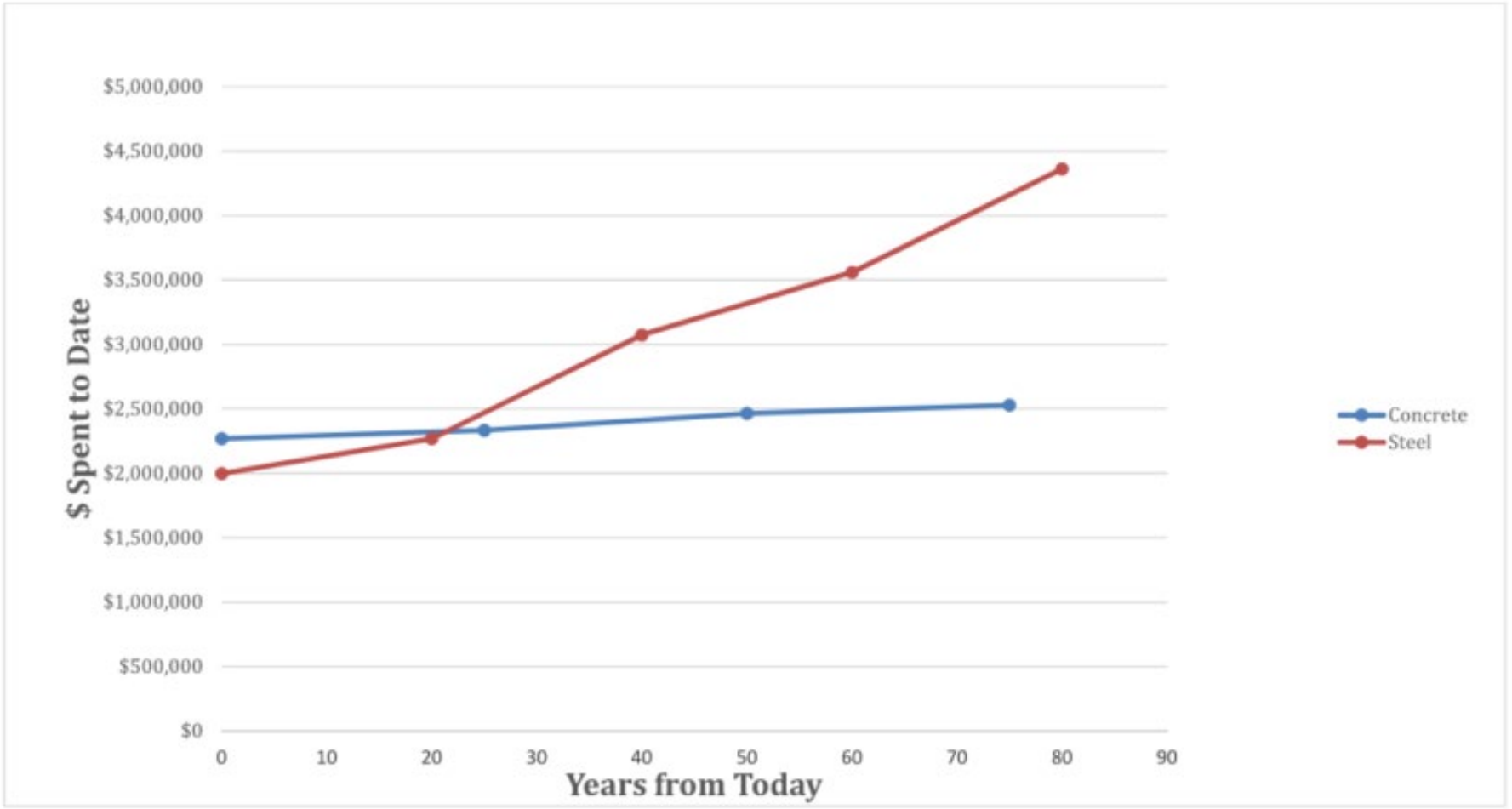
Project Background



Reservoir Design

Project Background

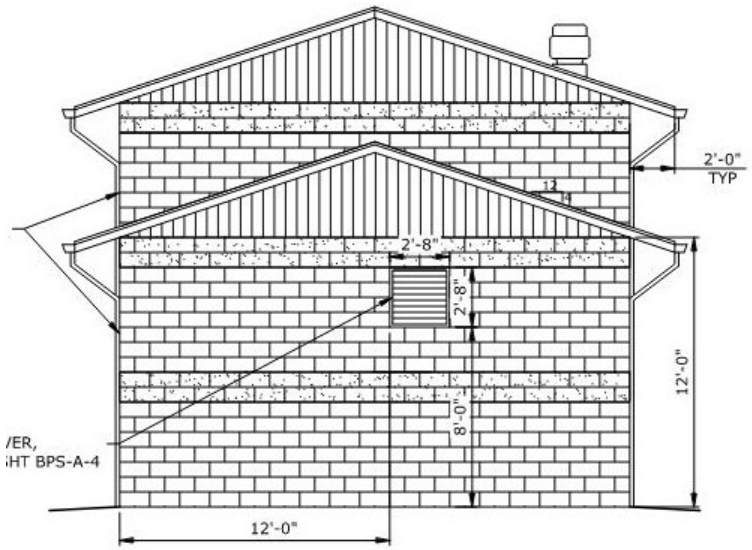
Annual Cost Estimates Associated with a
2.0 MG Welded Steel vs Prestressed Concrete Reservoir



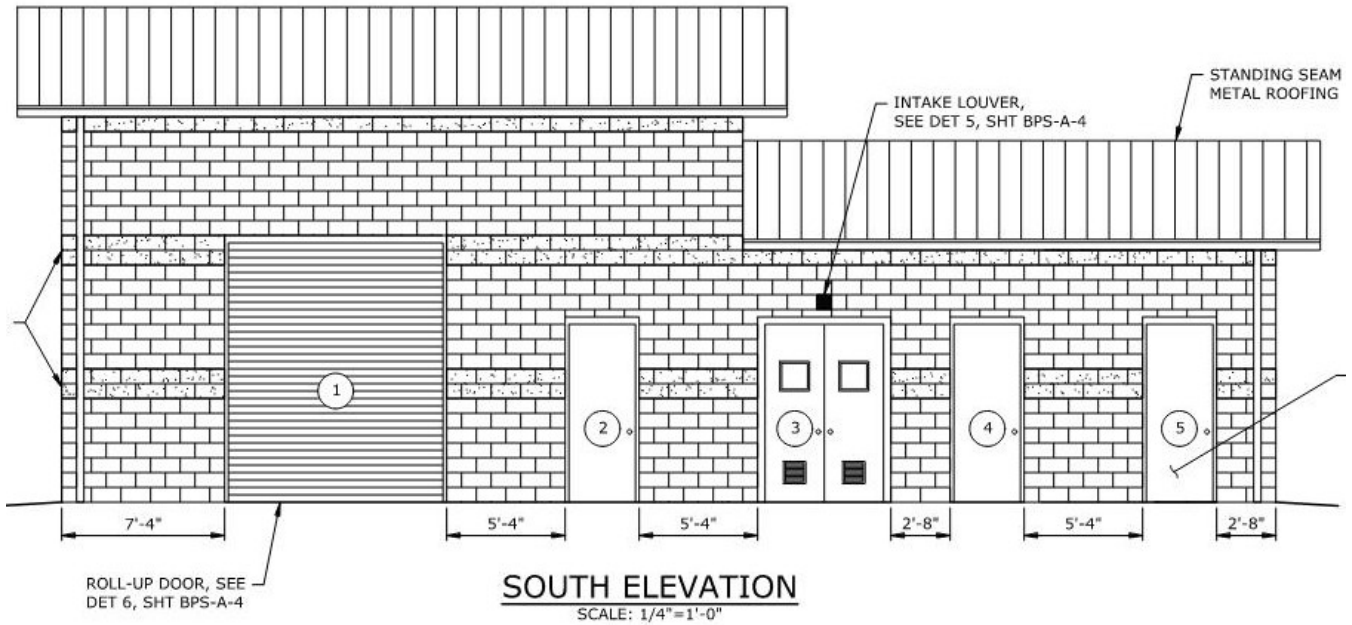
Consor, May 2018

BPS Purpose

Project Background



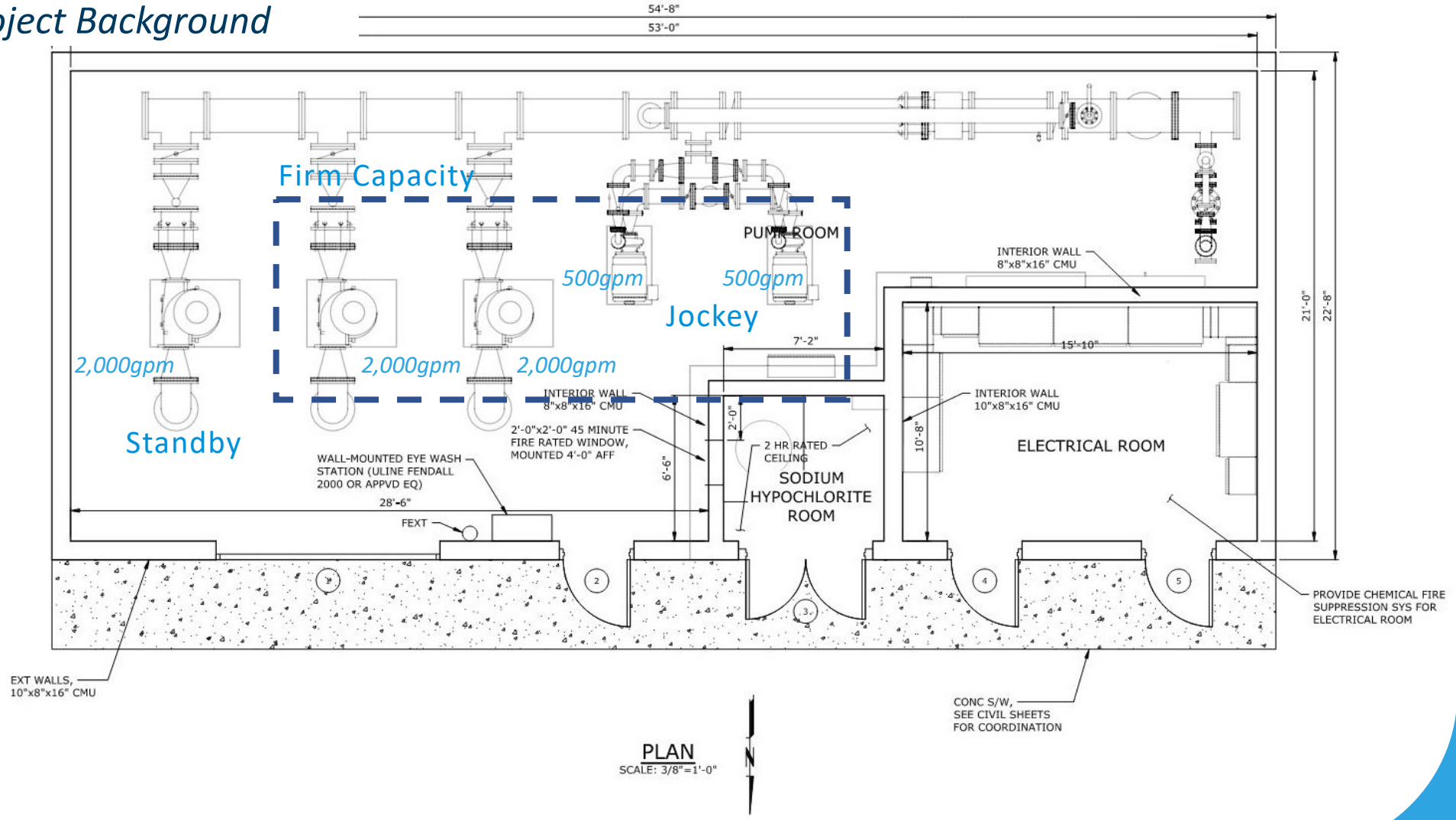
EAST ELEVATION
SCALE: 1/4"=1'-0"



SOUTH ELEVATION
SCALE: 1/4"=1'-0"

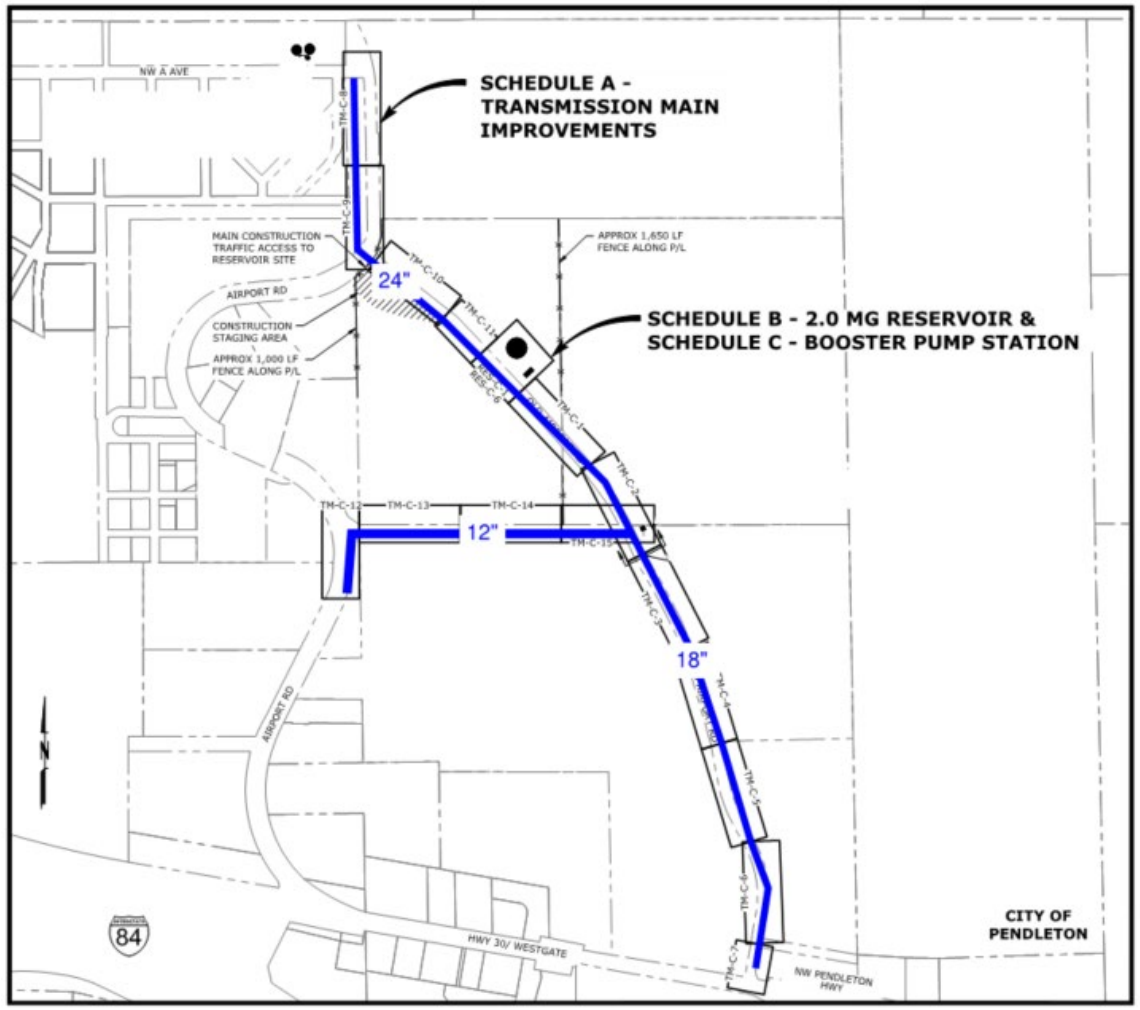
BPS Design

Project Background



Transmission Main Improvements

Project Background



1,800 LF of 12-inch diameter looped main

+

3,800 LF of 18-inch diameter gravity supply main

+

2,100 LF of 24-inch diameter pump station discharge main

=

7,700 LF of transmission main

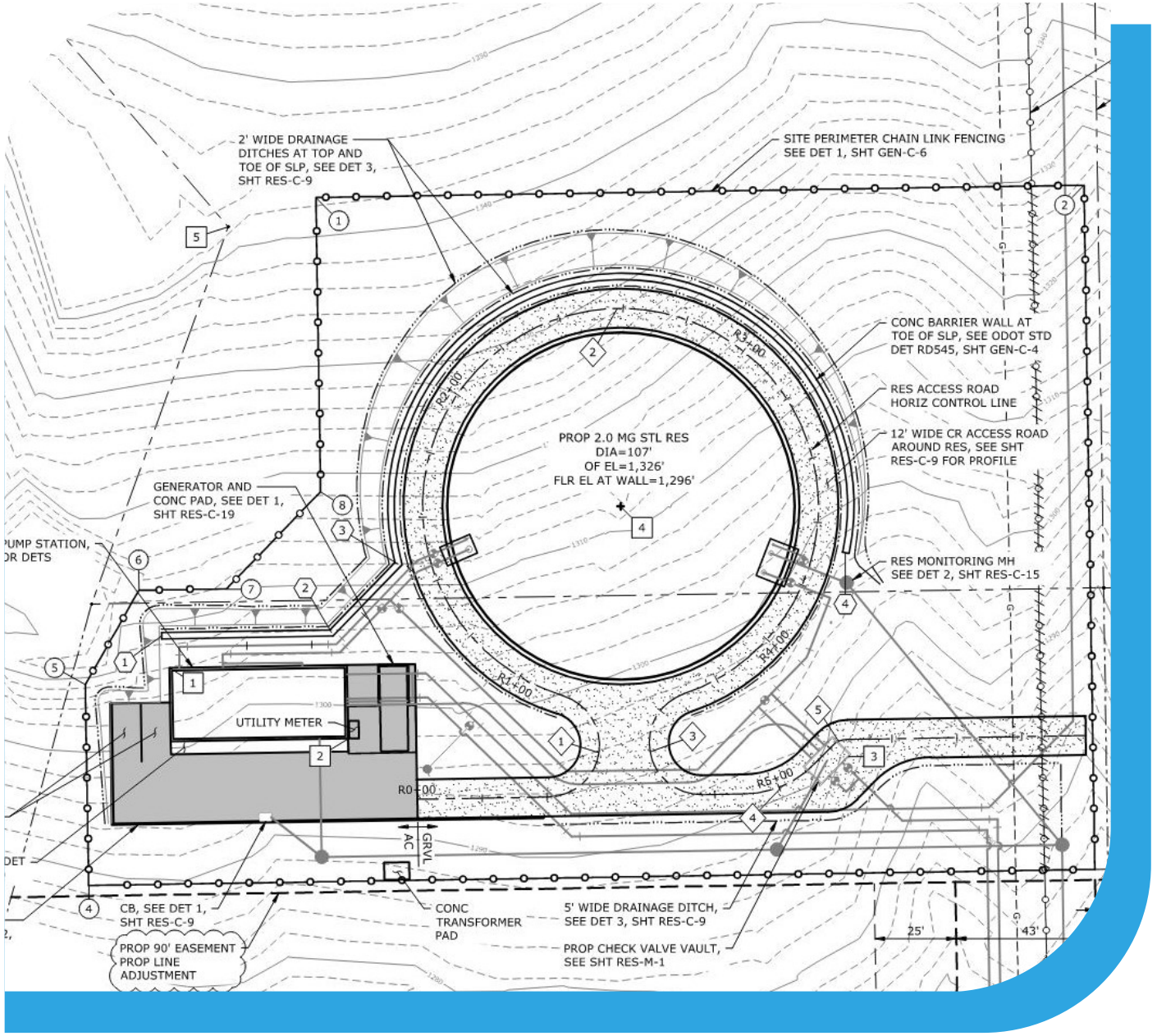
Project Benefits

Project Background

- Looped piping
  - Alignment ‘C’ connects area to Gravity Zone instead of Airport Zone
- Replacement of old infrastructure
  - Demolition of two reservoirs and two BPS
  - Replace with one reservoir and one BPS

Challenges

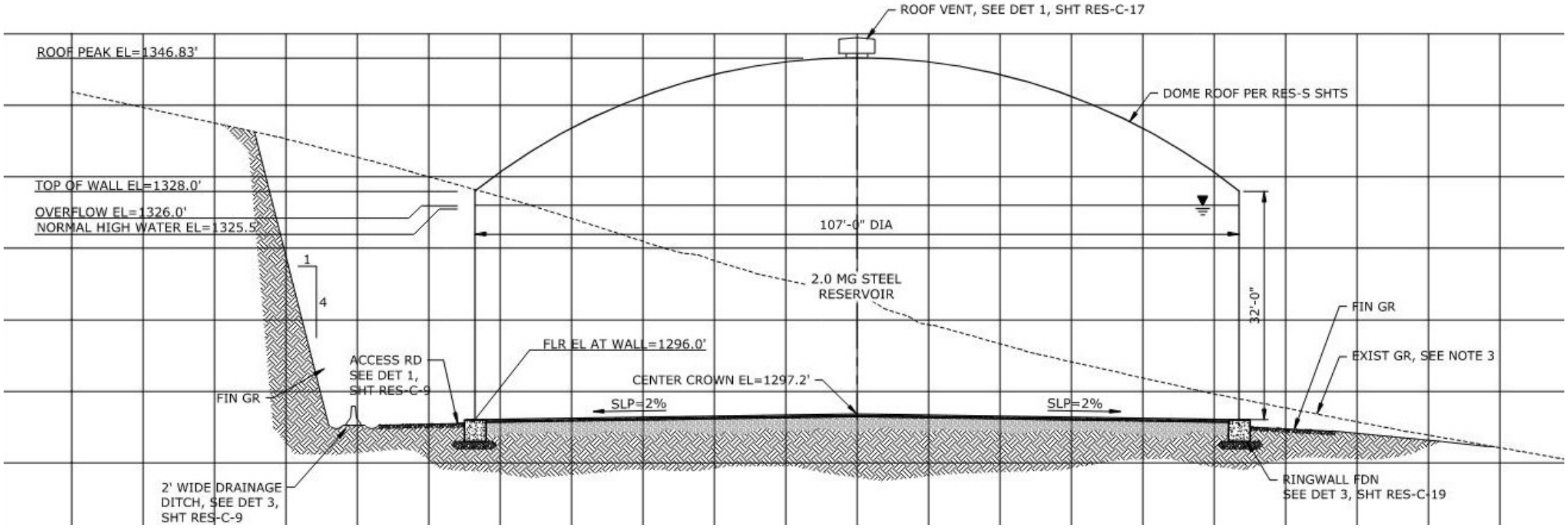
Project Background



- Site access
  - Steep
  - Old landfill
  - Easements
  - MSE wall

Challenges

Project Background



- Required cable net slope protection system on cut slope
- Significant blasting and excavation quantities
- Limited survey and geotechnical investigation

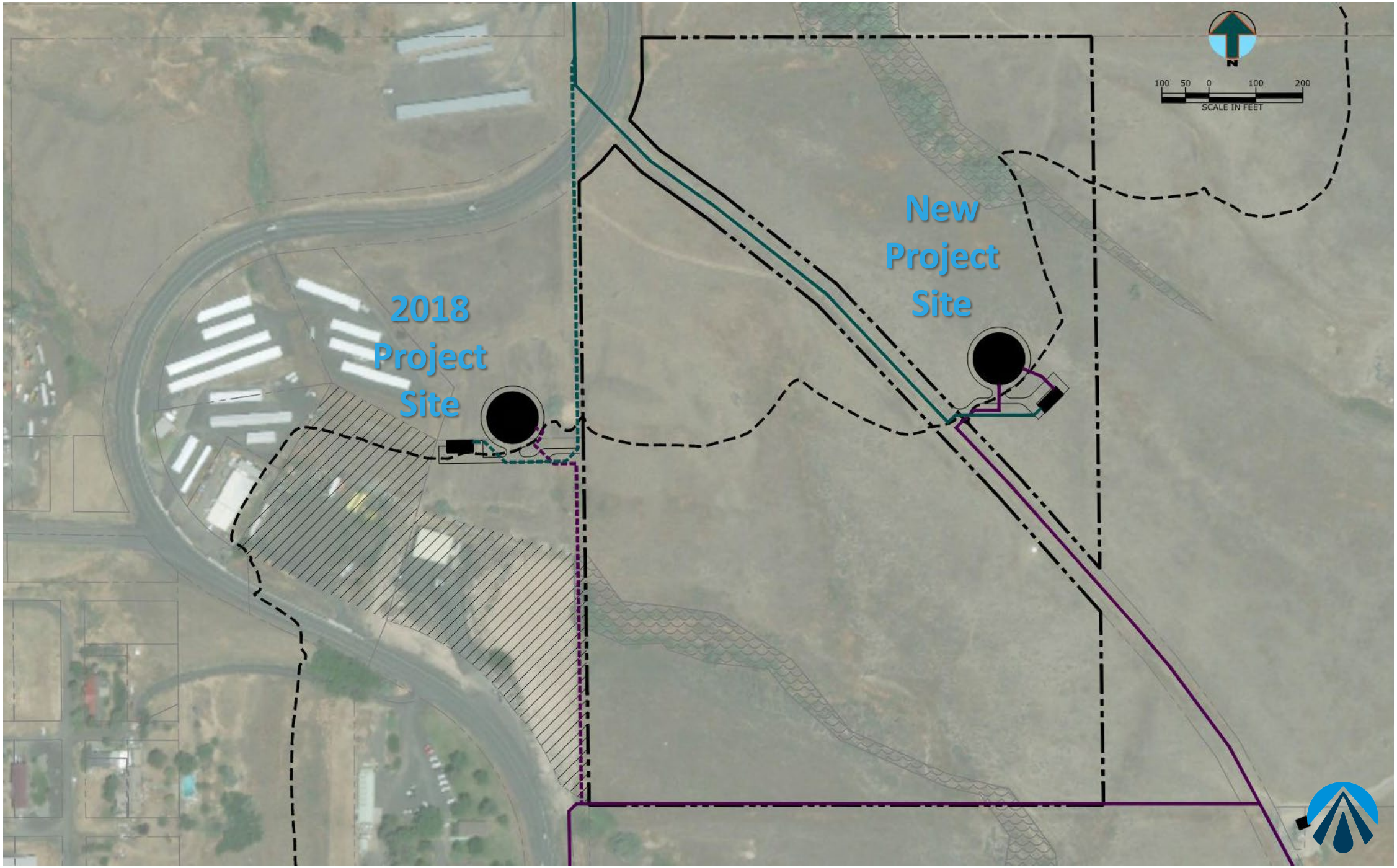
Project Shelved

Project Background

- Project shelved in January 2019
- Design brought to 95%
- Other concerns with site as previously mentioned
- Easement and property acquisition for site access
- Lack of funding and prioritization of other City projects

04

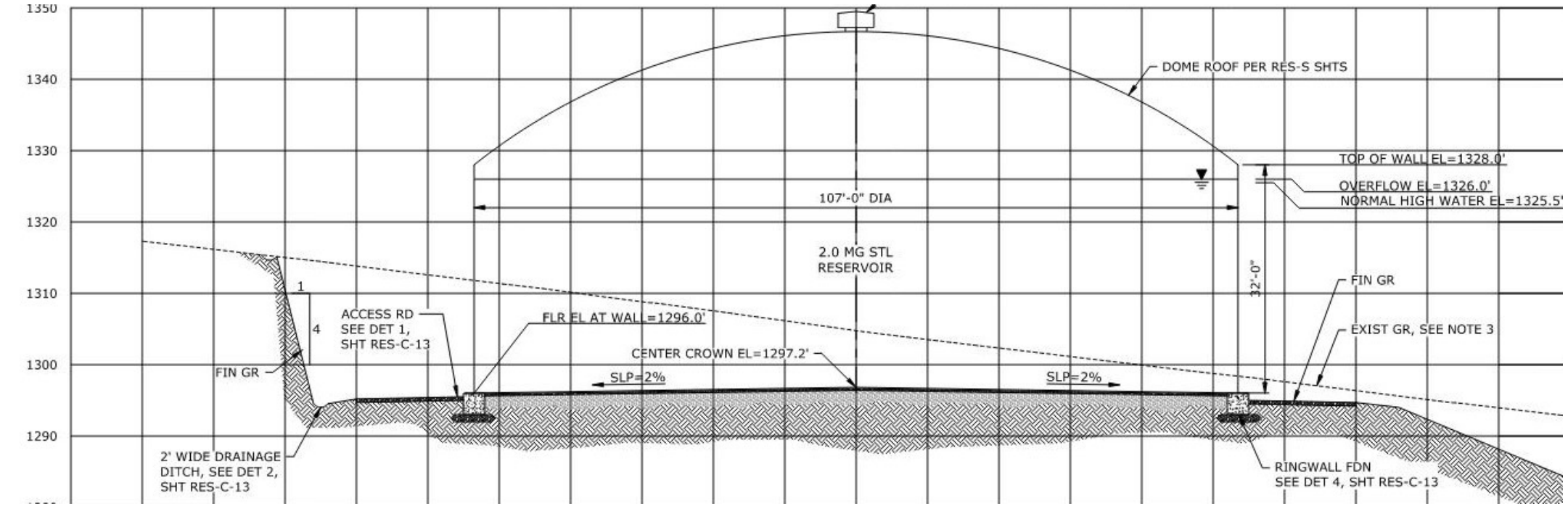
New Project Site

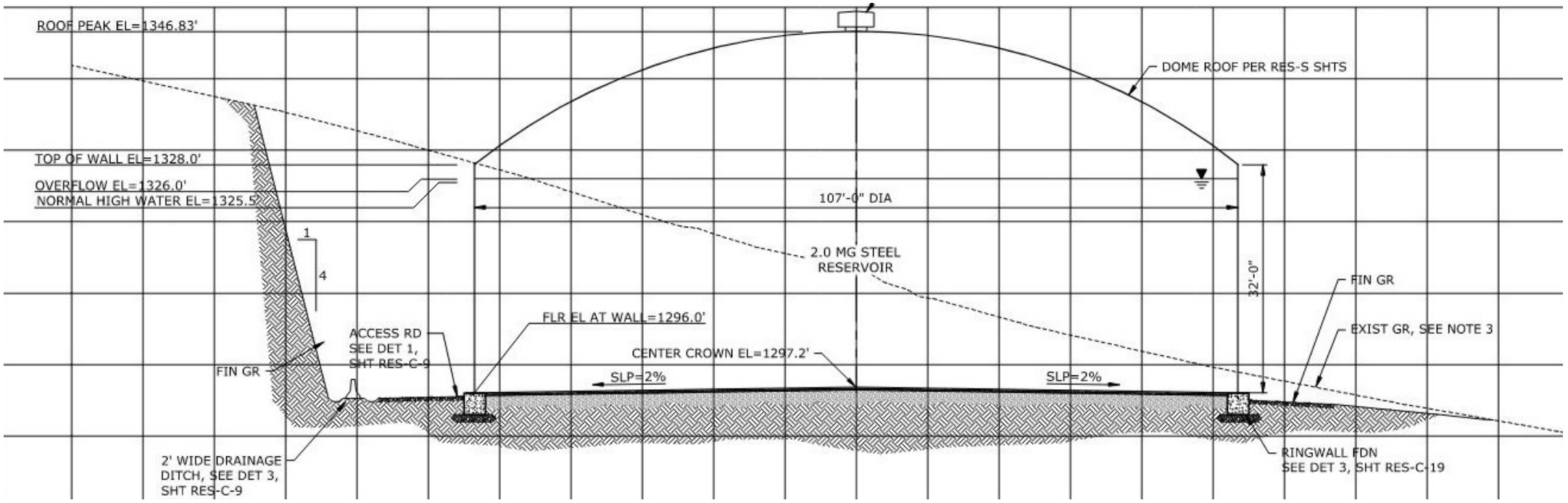

2018
Project
Site
New
Project
Site
N
100 50 0 100 200
SCALE IN FEET

Redesign Benefits

New Project Site

- Less steep site
  - Smaller blasting and excavation quantities
    - 2018 Site = 13,300 CY
    - New Site = 10,600 CY
  - Shorter cut slope
- No rock slope protection


1350
1340
1330
1320
1310
1300
1290
DOME ROOF PER RES-S SHTS
TOP OF WALL EL=1328.0'
OVERFLOW EL=1326.0'
NORMAL HIGH WATER EL=1325.5'
107'-0" DIA
2.0 MG STL
RESERVOIR
32'-0"
FIN GR
EXIST GR, SEE NOTE 3
1
4
ACCESS RD
SEE DET 1,
SHT RES-C-13
FLR EL AT WALL=1296.0'
CENTER CROWN EL=1297.2'
SLP=2%
SLP=2%
FIN GR
2' WIDE DRAINAGE
DITCH, SEE DET 2,
SHT RES-C-13
RINGWALL FDN
SEE DET 4, SHT RES-C-13


ROOF PEAK EL=1346.83'
DOME ROOF PER RES-S SHTS
TOP OF WALL EL=1328.0'
OVERFLOW EL=1326.0'
NORMAL HIGH WATER EL=1325.5'
107'-0" DIA
2.0 MG STEEL
RESERVOIR
32'-0"
FIN GR
EXIST GR, SEE NOTE 3
1
4
ACCESS RD
SEE DET 1,
SHT RES-C-9
FLR EL AT WALL=1296.0'
CENTER CROWN EL=1297.2'
SLP=2%
SLP=2%
FIN GR
2' WIDE DRAINAGE
DITCH, SEE DET 3,
SHT RES-C-9
RINGWALL FDN
SEE DET 3, SHT RES-C-19

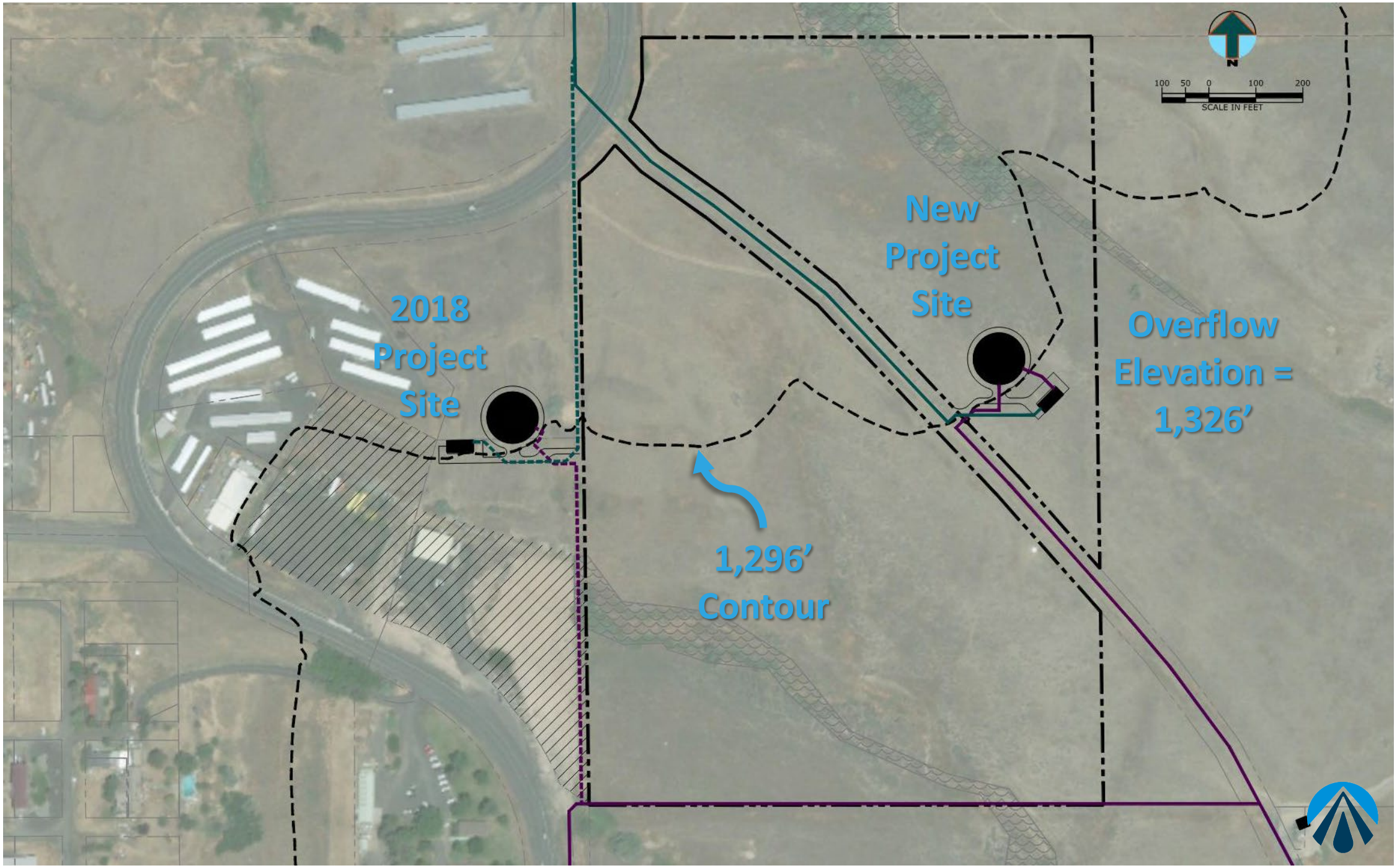
Redesign Benefits

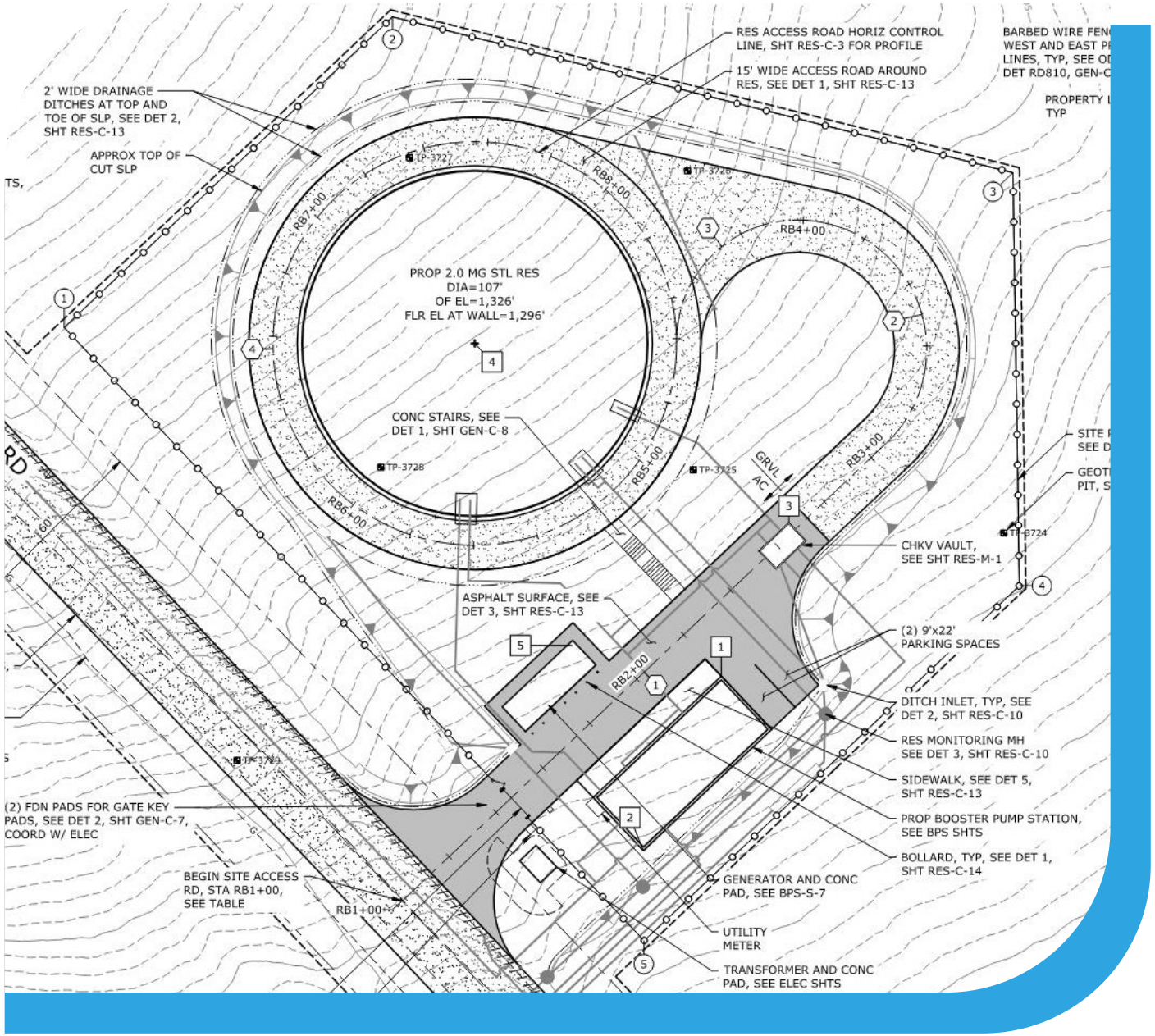
New Project Site

Redesign Benefits

New Project Site

- Site access
  - County road/ROW adjacent to site
  - Minimal roadway improvements
- Cost savings from optimized site available for redesign
- Opportunity to revise and refine our previous design


N
100 50 0 100 200
SCALE IN FEET
2018
Project
Site
New
Project
Site
Overflow
Elevation =
1,326’
1,296’
Contour



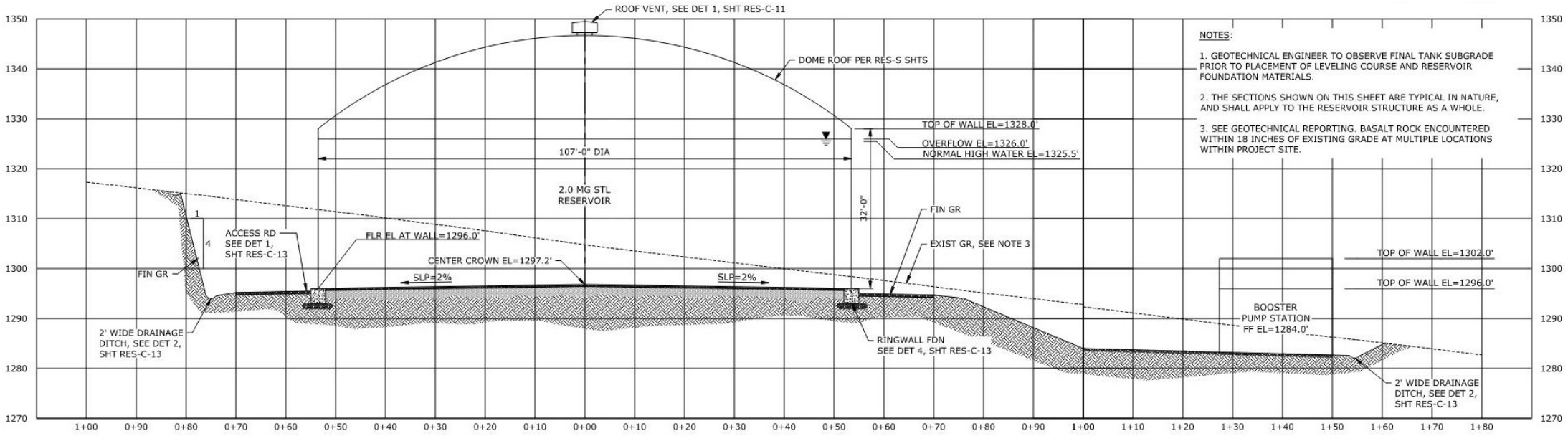
Challenges

New Project Site

- Reorienting reservoir and BPS
  - Maintain hydraulic requirements
  - Optimize impact to grading

Challenges

New Project Site



- Picked project back up while working fully remote
- Material cost escalation and supply chain interruptions

05

Construction

Prequalifications and Funding

Construction

- Specialty contractor prequalifications
  - Reservoir
  - Tank painting
  - Transmission main
  - Blasting
- State Drinking Water Revolving Fund (SDWRF)
  - Subject to EPA's American Iron and Steel (AIS) requirements

Upgrading Pendleton's Infrastructure to Support Development at the Top of Its Water System

Thank you!