

## **Unit Well 19 Treatment System Addition**

**MUNIS # 10448; Contract #9289**

**Project Engineer:** Pete Holmgren, P.E., Madison Water

**Alder:** Regina Vidaver, District 5

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### **Project Objective**

The objective of the Unit Well 19 (UW19) Treatment System Addition project is to add a filtration-based treatment system to an existing municipal drinking water well to remove iron, radium and manganese from the source water.

### **Project Location**

UW19 is located at 2526 Lake Mendota Drive, east of the Eagle Heights student housing complex and west of Picnic Point. The facility is located within the Lakeshore Nature Preserve on UW-Madison property on a 260' x 260' easement. See Figure 1.



Figure 1: Unit Well 19 Location

### **Existing Site and Facility**

The existing facility includes a wellhouse, a 3-million gallon buried reservoir and a MGE-owned emergency back-up generator. There is a narrow access drive with a small parking lot. The site is not open to the public but is visited daily by Water Utility staff in keeping with Wisconsin DNR

requirements. The site is steep, sloping down from Lake Mendota Drive to the wellhouse and reservoir at a 10% slope. The site is generally open with some scattered trees to the north and west. The building houses the deep well, three booster pumps, treatment equipment, process piping and electronic controls. Well 19 is the primary water supply point for the University, UW and VA hospital complexes, Village of Shorewood Hills, and serves much of the near west side of the City. UW19 produces 500 million gallons of water per year on average, approximately 5% of the Utility's total annual pumpage. See Figure 2.

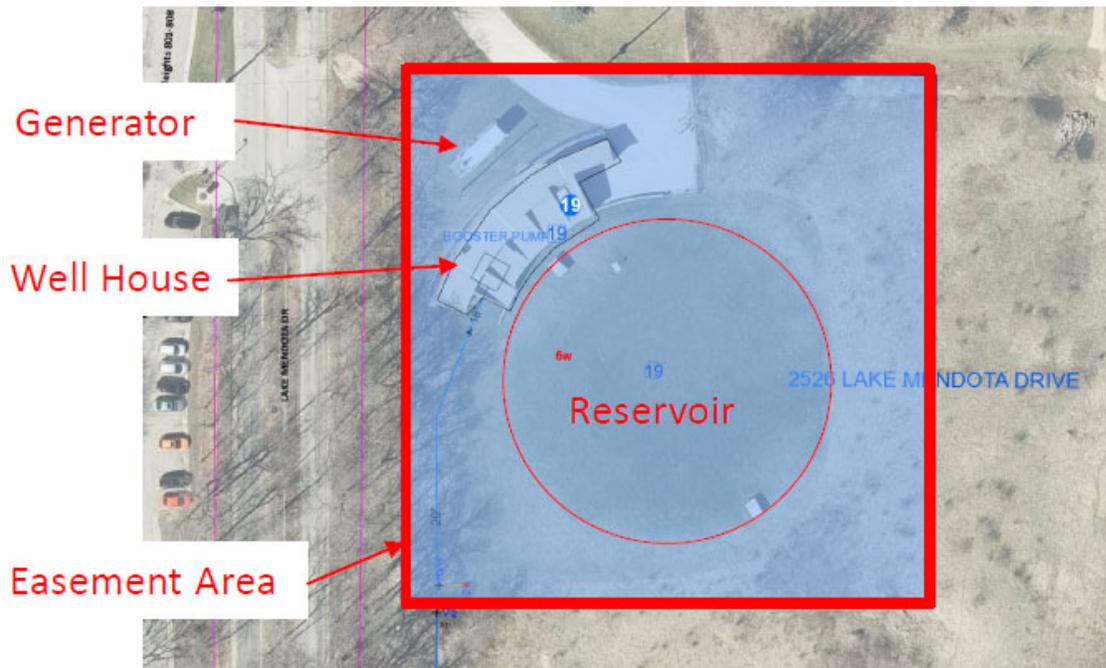


Figure 2: Existing Unit Well 19 Site

### Project Description

The main components of the project include the proposed filtration system, a building addition to house it, and installation of a backwash holding tank, site utilities and landscaping.

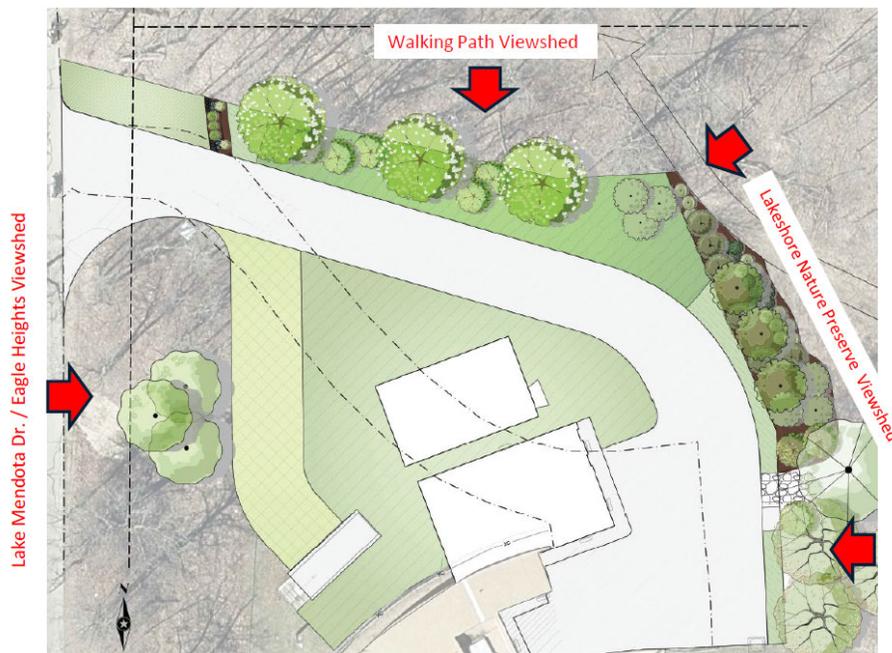
A 31' x 48' filtration building will be added to the northeast corner of the existing wellhouse. It will primarily house the 16-vessel filtration system and also include a restroom, chemical treatment room and a storage room that will be outfitted for additional treatment if required in the future. The 24' x 40' semi-buried backwash will be located just north of the addition. The filters remove the three contaminants from the raw water. The filtered water is pumped to the reservoir and ultimately into the distribution system. Every one to two days, the filters are backwashed to remove the accumulated contaminants. The backwash water is pumped to the backwash tank where the water settles before being recycled or wasted. See Figure 3.



**Figure 3: Filtration Addition and Backwash Tank**

Site utility work includes the relocation of a small sump and grinder pump and the installation of backwash water piping and structures. Grading changes will be minimal and focused on moving runoff around the new structures.

The landscaping plan has two objectives that were developed in coordination with UW-Madison and Lakeshore Nature Preserve staff: 1) Focus on Wisconsin native plantings already present in the Preserve, and 2) provide screening from viewsheds from the east (Preserve), west (Eagle Heights/Lake Mendota Drive) and north (walking path). The final landscaping plan was reviewed and vetted by UW-Madison staff who suggested several species swaps to better match recent Preserve restoration efforts. See Figure 4.



**Figure 4: Landscaping Plan and Viewshed Screening**

### **City of Madison and UW Madison Project Review**

The City of Madison Plan Commission approved the project at its December 12, 2022 meeting (LNDUSE-2022-00105; ID 74537). The project team presented the conceptual-level project the UW Design Review Board in January 2022, and design-development level in January 2023.

#### **Cost Breakdown:**

Assessments: \$ 0

Construction Cost: \$ 7,500,000

Consultant Fees: \$ 1,000,000

Internal Costs \$ 588,000

**Total Cost: \$ 9,088,000**

#### **Schedule:**

Advertise for bids: July 2023

Contract Award: October 2023

Contractor Purchasing and Submittals: Fall 2023

Construction Start: Spring 2024

Construction Completion: Fall 2025

# 60% REVIEW DRAWINGS FOR UNIT WELL 19 TREATMENT SYSTEM ADDITION MADISON, WISCONSIN



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

**NOT FOR CONSTRUCTION**

DATE: XXXXXXXX LICENSE NO.: REG. NO. \_\_\_\_\_  
Project Owner \_\_\_\_\_



PROJECT LOCATION MAP

BID OPENING:  
WATER UTILITY  
119 E. Olin  
Avenue, Madison,  
WI 53713-1431



CITY OF MADISON WATER UTILITY  
**UNIT WELL 19 TREATMENT SYSTEM ADDITION**

2526 LAKE MENDOTA DRIVE  
MADISON, WISCONSIN

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SEH Project	MADWU 167818
Checked By	XXX
Drawn By	LAP

Project Status	Issue Date
60%	2/14/2022

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE

TITLE SHEET

**G001**



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DATE:XXXXXXXXX LICENSE NO. REG. NO.

Project Owner

**SHEETS INCLUDED IN THIS ABBREVIATED PLAN SET:**

**GENERAL SHEETS**

G001	TITLE SHEET
G002	SHEET INDEX
S001	GENERAL STRUCTURAL ABBREVIATIONS, SYMBOLS AND TABLES
S002	GENERAL STRUCTURAL NOTES
S003	GENERAL STRUCTURAL NOTES
GP001	PROCESS FLOW DIAGRAM
GM1	MECHANICAL SYMBOLS AND ABBREVIATIONS
GM2	MECHANICAL SCHEDULES
GM3	MECHANICAL SCHEDULES
GE1	GENERAL ELECTRICAL NOTES

**CIVIL SHEETS**

G 201	EXISTING CONDITIONS
C 100	SITE PLAN
C 101	STAGING PLAN
C 102	GRADING PLAN
C 103	UTILITY PLAN
C 104	FIRE ACCESS PLAN

**LANDSCAPE SHEETS**

L101	LANDSCAPE PLAN
L201	LANDSCAPE DETAILS

**(01) WELLHOUSE 19 SHEETS**

01 S101	FOUNDATION FLOOR PLAN
01 S102	ROOF PLAN
01 S301	BUILDING SECTIONS
01 A001	GENERAL INFORMATION
01 A002	CODE PLAN
01 A100	DEMOLITION DRAWINGS
01 A101	FLOOR AND ROOF PLANS
01 A201	EXTERIOR ELEVATIONS
01 A301	BUILDING SECTIONS
01 A401	ENLARGED PLAN, SCHEDULES AND DETAILS
01 A501	WALL TYPES, EXTERIOR DETAILS
01 P101	PROCESS FLOOR PLAN
01 P301	PROCESS SECTIONS
01 M071	MECHANICAL DEMOLITION PLAN
01 M101	FIRST LEVEL HVAC PLAN
01 M102	ROOF MECHANICAL PLAN
01 M201	FIRST LEVEL DOMESTIC WATER AND GAS PLAN
01 M202	FIRST LEVEL SANITARY WASTE AND VENT PLAN

01 E070	OVERALL REMOVAL PLAN
01 E101	SITE PLAN - REMOVAL
01 E102	SITE PLAN
01 E201	LIGHTING PLAN
01 E301	POWER PLAN
01 E501	ONE-LINE DIAGRAM
01 E502	ONE-LINE DIAGRAM
01 E701	SCHEDULES

**(02) BACKWASH RECLAIM SHEETS**

02 S101	BACKWASH TANK PLANS
02 S301	BACKWASH TANK SECTIONS

02 P101	PROCESS FLOOR PLAN
02 P301	PROCESS SECTIONS

02 E201	LIGHTING PLAN
02 E301	POWER PLAN

**TYPICAL DETAILS**

S501	FOUNDATION DETAILS
S511	FRAMING DETAILS
DP 501	TYPICAL PROCESS DETAILS
DP 502	TYPICAL PROCESS DETAILS
DP 503	TYPICAL PROCESS DETAILS
DP 504	TYPICAL PROCESS DETAILS
DM1	MECHANICAL DETAILS
DM2	MECHANICAL DETAILS

CITY OF MADISON WATER UTILITY  
**UNIT WELL 19 TREATMENT SYSTEM ADDITION**  
 2526 LAKE MENDOTA DRIVE  
 MADISON, WISCONSIN

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Project Status 60% Issue Date 2/14/2022

REV. #	DESCRIPTION	DATE
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SHEET INDEX

**G002**





NOT FOR CONSTRUCTION

Pre-Construction		Post-Construction	
Driveway	6,134	Driveway	7,821
Building	2,887	Pr Building	1,473
Generator	262	Ex Building	2,887
		Generator	262
		Tank	960
		Total	13,403
Increase in Impervious Surface		4,382	SF

Land Use Summary Table	Area (SF)
Site Area	67,600
Expansion Building Inside	1,320
Expansion Building Footprint	1,473
Backwash Tank Footprint	960
Ex Building Inside	2,850
Ex Building Footprint	2,887
Lot Coverage	12,381
Dwelling Units	N/A
Usable Open Space	N/A
Landscape Area	3,865

- NOTES:
1. PARKING SUMMARY: NO FORMAL PARKING STALLS NEEDED FOR WELLHOUSE STAFF OR MAINTENANCE ACTIVITIES. NO PARKING STALLS PROVIDED.
  2. SEE PHOTOMETRIC PLANS FOR LIGHTING LOCATIONS.
  3. NO OUTDOOR REFUSE, LOADING, OR STORAGE AREAS PROVIDED.
  4. SEE LANDSCAPE PLAN FOR EXISTING TREE SPECIES AND SIZE INFORMATION.

Project Owner  
 CITY OF MADISON WATER UTILITY  
 119 E OLIN AVE  
 MADISON, WI 53713

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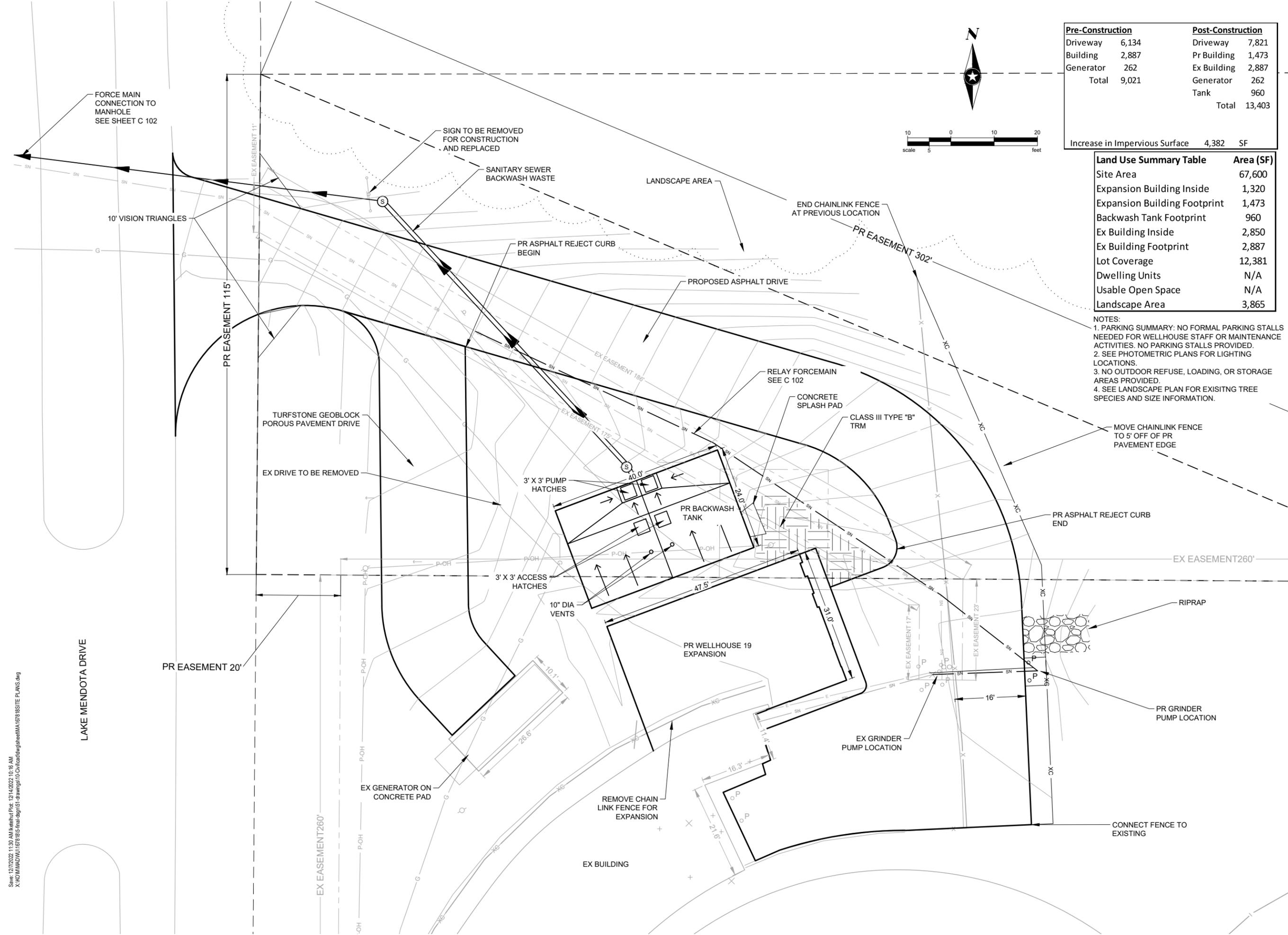
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 Drawn By

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 60% COMPLETE 12/14/2022

REVISION SCHEDULE

REV. #	DESCRIPTION	DATE

SITE PLAN

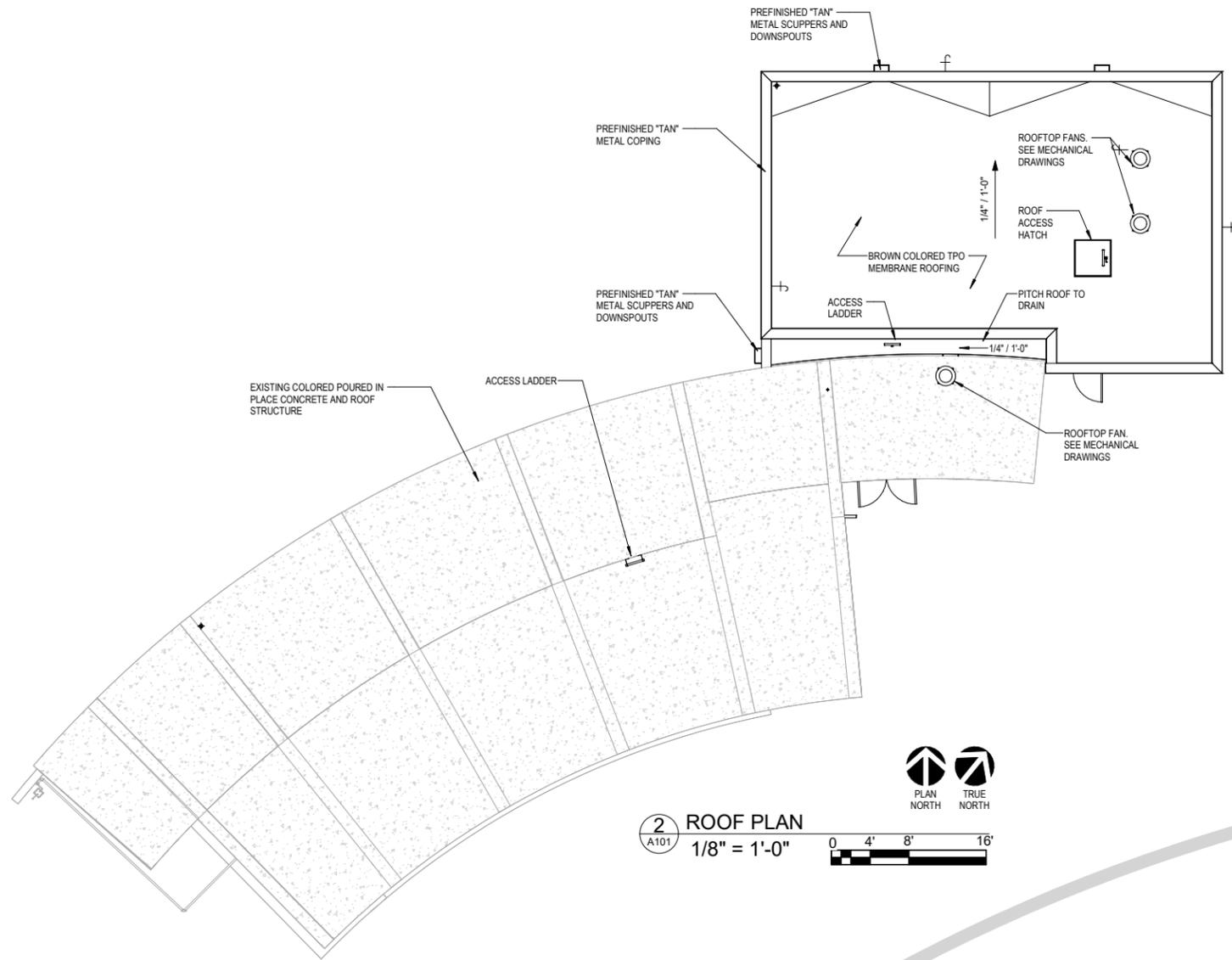


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 X:\NO\W\MADWU\167818\ma-dgn\151-drawings\10-Civil\cadd\dwg\sheet\MA167818SITE PLANS.dwg

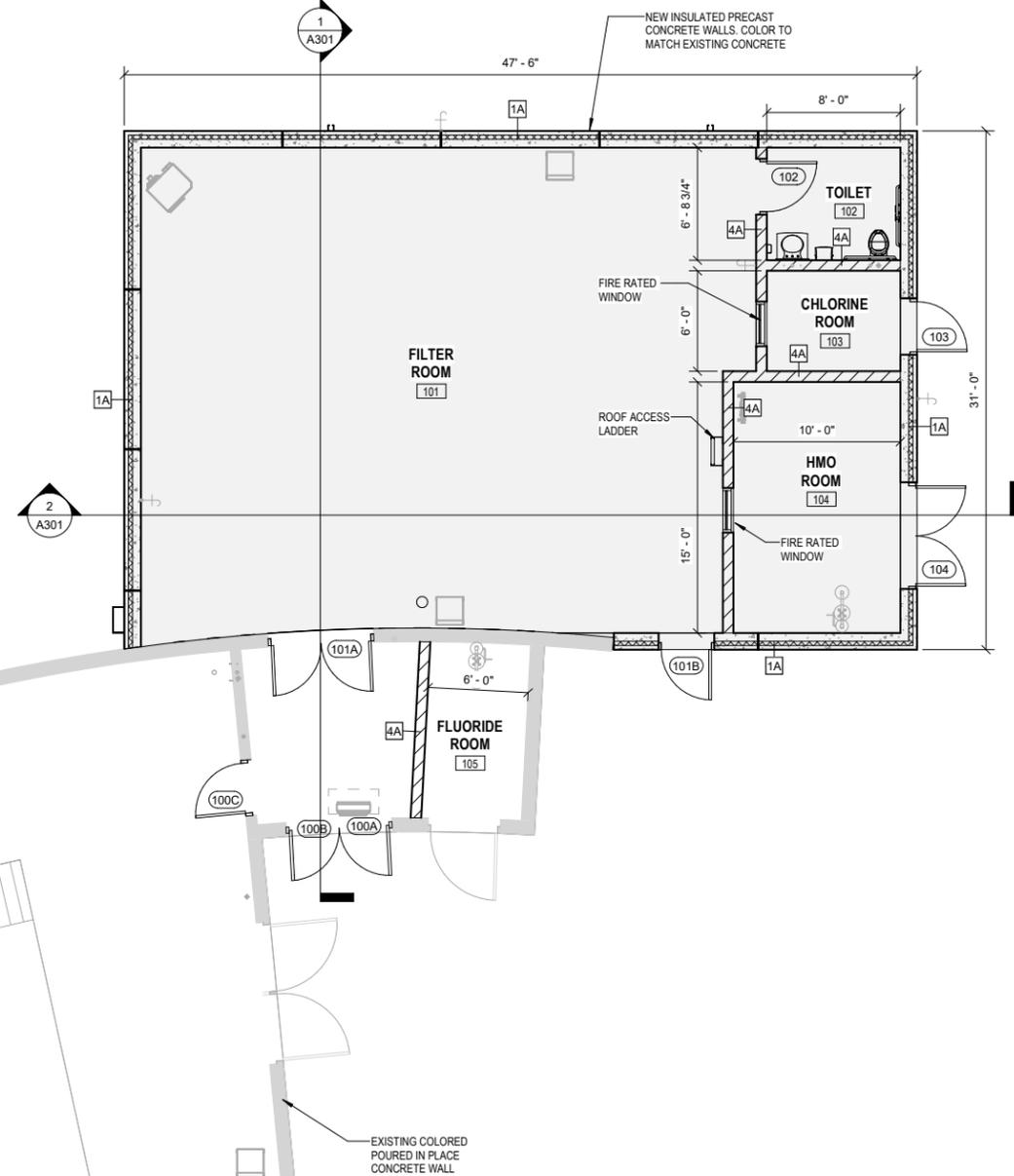








**2 ROOF PLAN**  
1/8" = 1'-0"  
0 4' 8' 16'

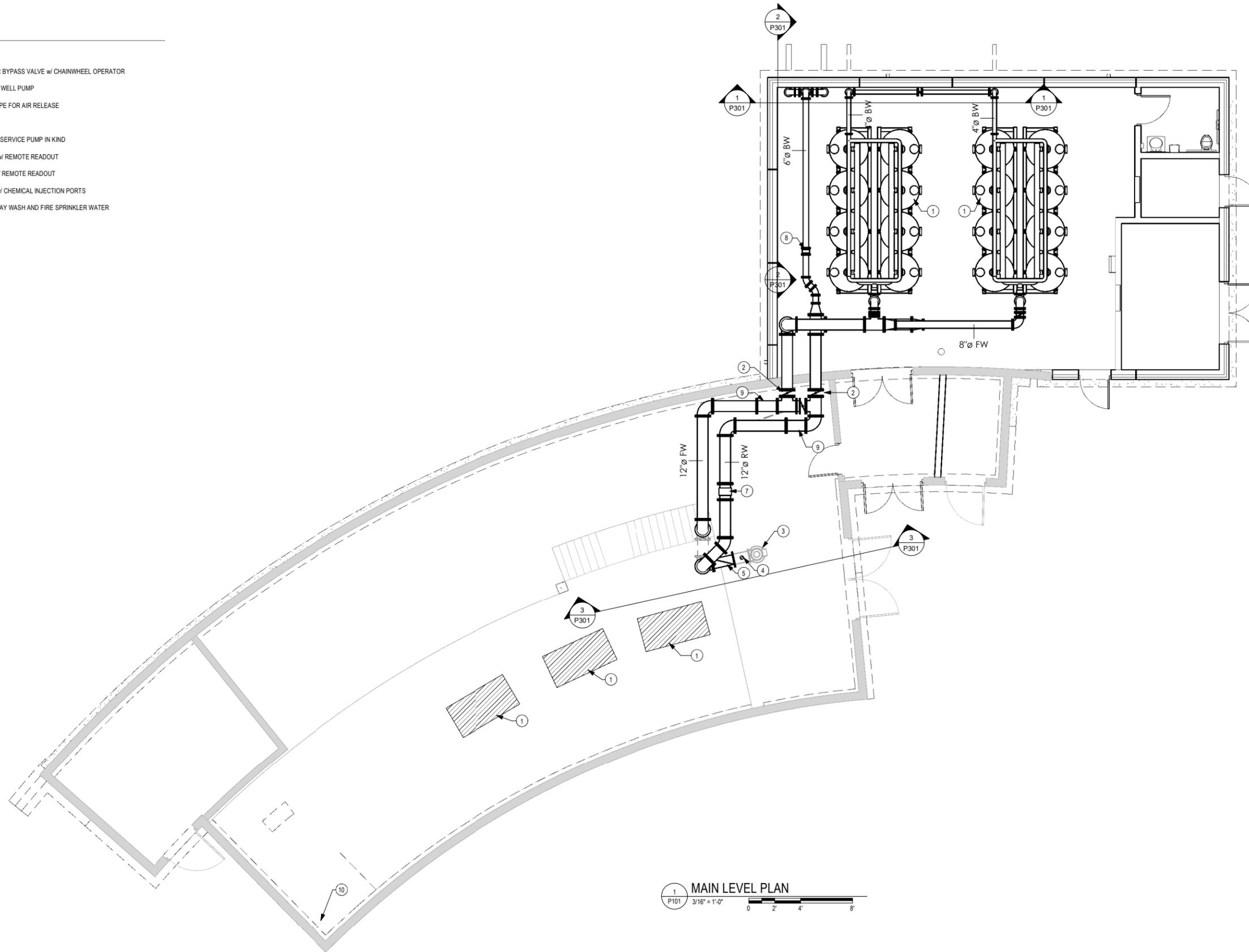


**1 GROUND LEVEL PLAN**  
3/16" = 1'-0"  
0 2' 4' 6'



**KEYNOTES**

- ① FILTER SKID
- ② 12" BUTTERFLY VALVE FILTER BYPASS VALVE w/ CHAINWHEEL OPERATOR
- ③ EXISTING VERTICAL TURBINE WELL PUMP
- ④ TAP PIPE FOR 4" VERTICAL PIPE FOR AIR RELEASE
- ⑤ INSTALL 12" CHECK VALVE
- ⑥ REMOVE AND REPLACE HIGH SERVICE PUMP IN KIND
- ⑦ 12" MAGNETIC FLOW METER w/ REMOTE READOUT
- ⑧ 6" MAGNETIC FLOW METER w/ REMOTE READOUT
- ⑨ 12" FLANGED STATIC MIXER w/ CHEMICAL INJECTION PORTS
- ⑩ SOURCE OF WATER FOR SPRAY WASH AND FIRE SPRINKLER WATER



**NOT FOR CONSTRUCTION**

Project Owner

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UNIT WELL 19 TREATMENT SYSTEM ADDITION**  
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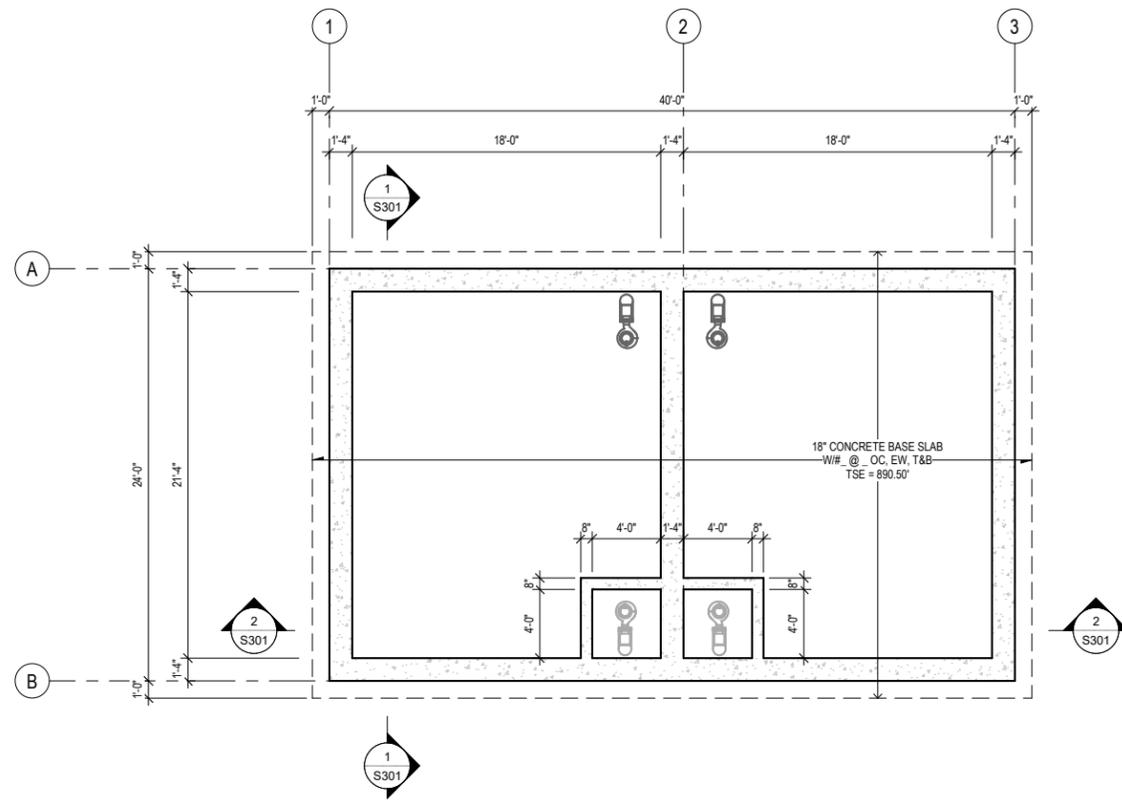
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PROCESS PLAN

**01  
P101**

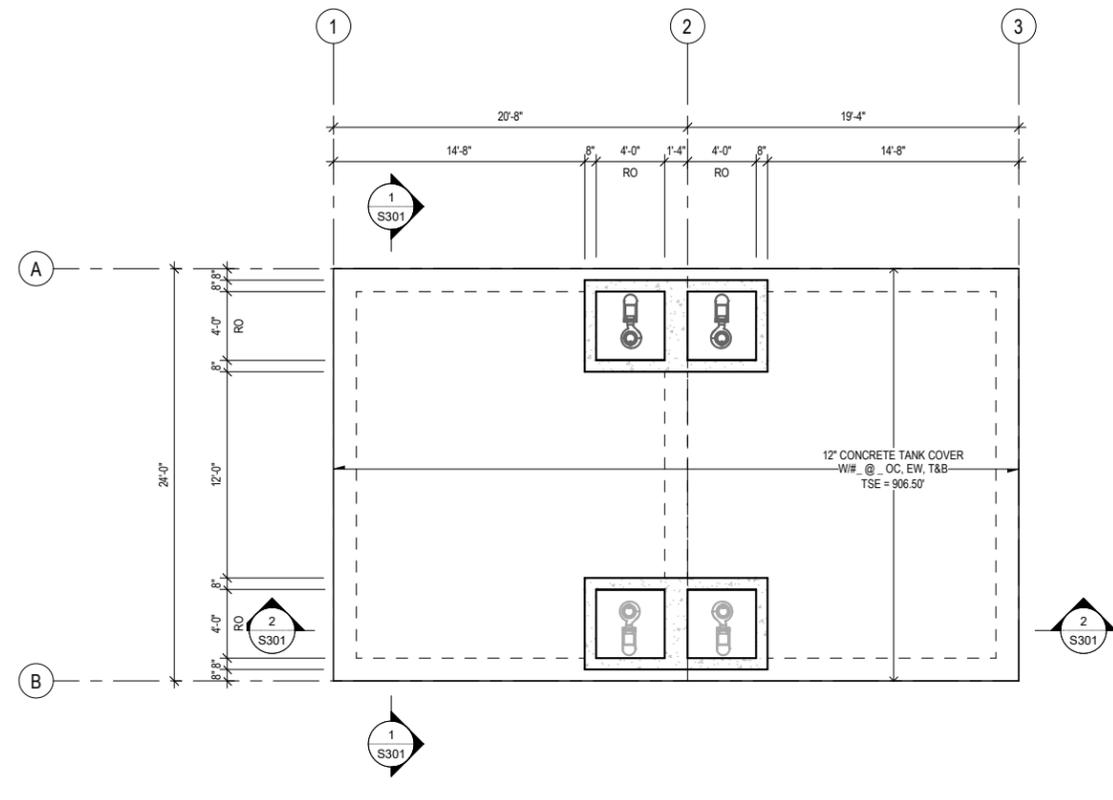


**1** BACKWASH TANK BASE SLAB  
S101 3/16" = 1'-0"  
0 4 8 12  
PROJECT NORTH

**BACKWASH TANK BASE SLAB - GENERAL NOTES:**

(TYPICAL UNLESS NOTED OTHERWISE)

1. VERIFY ALL SIZES, LOCATIONS, AND ELEVATIONS OF OPENINGS W/ MECHANICAL, ELECTRICAL, AND PROCESS DRAWINGS. REINFORCE AS NECESSARY PER TYPICAL DETAILS.
2. WALL CONSTRUCTION JOINTS ARE NOT INDICATED ON PLAN. REFER TO GENERAL STRUCTURAL NOTES FOR SPACING AND SUBMIT PROPOSED LOCATIONS FOR APPROVAL.



**2** BACKWASH TANK COVER  
S101 3/16" = 1'-0"  
0 4 8 12  
PROJECT NORTH

**BACKWASH TANK COVER - GENERAL NOTES:**

(TYPICAL UNLESS NOTED OTHERWISE)

1. XX
2. XX
3. XX