



STAFF REPORT

DATE: 2/04/2025

Regular

TO: CITY COUNCIL
AGENDA ITEM: Approve Access Agreement with Bay West to conduct PFAS Destruction Research on city owned property
FROM: Nicole Miller, City Administrator
REVIEWED BY: Marty Powers, Public Works Director

BACKGROUND:

The City of Lake Elmo supports research focused removing and destroying per- and polyfluoroalkyl substances (PFAS) to provide safe drinking water to our community and the entire East Metro.

The City has been a proud partner with MPCA mobilizing a (surface activated foam fractionation) SAFF system at Tablyn Park. The system captures PFAS as foam that is then separated from the water. The foam is then removed and the water is returned to the environment.

Bay West in partnership with General Atomics and the US Army Engineer Research and Development Center (ERDC), have proposed conducting testing and research to destroy PFAS substances such as the foam concentrate that was removed from the water using the SAFF system within city limits. Bay West has identified city owned land adjacent to our Public Works department located at 3445 Ideal Avenue as their preferred site.

PROPOSAL DETAILS/ANALYSIS:

This access agreement will allow Bay West to enter city owned property to mobilize the temporary testing facilities for a timeline of approximately 4-5 weeks beginning mid April 2025. Below are some key considerations regarding this agreement:

Access to Public Works facility:

Public Works access road will remain open and accessible to employees and visitors.

Site improvements that are made will be restored to their original condition with the exception of the gravel pad that will remain in place after Bay West vacates the site.

Hours of Operation:

The hours for testing will be conducted during the hours of 8 AM to 6 PM that is consistent with the city code. Our city code allows for construction activities exceeding ambient noise levels to be operated between the hours of 7:00 a.m. to 7:00 p.m. on weekdays and on Saturdays from 8:00 a.m. to 6:00 p.m

Noise:

The noise decibel level from the research equipment as well as on site generators are within the guidelines of the city code and are not expected to disturb residents. There are no structures located within the 40 decibel noise perimeter. For comparison, our city code allows for heavy equipment usage as long as the sound level from the operation exceeds doesn't exceed 100 decibels measured along any property line.

Public Tours and Education

Bay West will work with staff to communicate the research and testing being conducted as well as informing the public when tours are available.

Permits:

Bay West is working with staff to identify and apply for all necessary permits.

The access agreement has been reviewed by our City Attorney.

ISSUE BEFORE COUNCIL:

Should the City Council approve access agreement with Bay West to allow them to conduct PFAS destruction research at the Public Works location 3445 Ideal Avenue?

FISCAL IMPACT:

No fiscal impact.

RECOMMENDATION:

“Motion to approve the Access Agreement with Bay West to conduct PFAS Destruction Research at city owned land located at 3445 Ideal Avenue.”

ATTACHMENTS:

- Access Agreement
- Bay West PFAS Destruction Research Presentation

Temporary Easement and Access Agreement

This Temporary Easement and Access Agreement (“**Agreement**”) dated as of _____, 2025 (the “**Effective Date**”), is entered into by and between the City of Lake Elmo (“**Property Owner**”); and Bay West, LLC (together with its successors and assigns, “**Bay West**”).

RECITALS

A. Property Owner owns the real property situated within Washington County, State of Minnesota more particularly known as 3445 Ideal Ave, Lake Elmo, MN 55042 (the “**Property**”).

B. Bay West wishes to perform per- and polyfluoroalkyl substances (PFAS) destruction tests as part of a federally funded research project (the “**Project**”) on the Property. Bay West intends to install certain temporary improvements, including but not limited to reinforcement of an existing access road, installation of testing equipment, including , but not limited to an air compressor and the mobile research unit, piping and conduit to provide temporary electrical and water services to the Property and secondary containment for liquid-holding totes and tanks (collectively and as more particularly described below and as generally depicted in the attached Exhibit A (the “**Site Plan**”), attached hereto and made a part hereof, the “**Testing Facilities**”) in connection with the Project.

C. Bay West desires to obtain a temporary construction and access easement on the Property to be used during the construction, maintenance, repair, replacement, relocation, use and removal of the Testing Facilities from the Effective Date until 11:59 P.m. on October 1, 2025 (the “**Term**”).

D. Property Owner is willing to grant Bay West certain rights pursuant to the terms and conditions set forth in this Agreement.

AGREEMENT

1. **Parties.** The Parties to this Agreement are:

A. Bay West located at 5 Empire Drive, St Paul MN 55103: and

B. City of Lake Elmo located at 3880 Laverne Ave North, Lake Elmo, MN 55042.

2. **Access.** The Property Owner hereby consents and provides authorization and a temporary easement to Bay West, its employees, agents, contractors, members of the public on tours of the Project, and state and federal entities overseeing the Project to enter the Property for the following purposes:

- Documentation of the work associated with the Project via note taking, surveying, photography, and painting of utility locations
 - Evaluation of the Property to prepare for the Testing Facilities;
 - Grading and ground preparation along the Property Owner's existing gravel road on the Property to the Testing Facilities and the area on which the Testing Facilities will be placed, conducted in accordance with reasonably agreed-upon procedures and materials such as Class V road base to reinforce the gravel driveway and the Testing Facilities work area.
 - Staging of materials, supplies, and the Testing Facilities
 - Daily access during the duration of staged onsite equipment, testing, and site restoration activities during the Term of this Agreement.
 - Access during the Term of this Agreement for tours as described in Section 4 herein. Visitor parking is noted on the site plan in Appendix A.
 - The Property Owner's Public Works Department will have access for public works operations at all times.
3. **Bay West obligations.** Prior to the initial start of the work on the Property, Bay West will notify the Property Owner at least two business days prior to starting such initial work actions. Work will be conducted during the hours of 8:00 a.m. to 6:00 p.m. unless Bay West receives permission to conduct work during different hours. Bay West is responsible for overseeing, coordinating, and completing site activities from start of ground preparation to completion of agreed-upon site restoration activities.
4. **Bay West support of public outreach.** Bay West will prepare and provide agreed-upon draft materials to the Property Owner for the purpose of public outreach. It is anticipated that such materials will be discussed and agreed upon 1) prior to start of any onsite work, 2) after completion of site activities, and 3) upon completion of the work associated with the research contract and grant. Bay West and its subcontractor General Atomics will arrange public tours, anticipated to take place after installation of the Testing Facilities and system checks and once a week during testing.
5. **Bay West and Property Owner precautions regarding work.**
- A. Bay West will conduct its activities so as to avoid unreasonable interference with the use of the Property by Property Owner, provided Property Owner understands and agrees the work contemplated and authorized by this Agreement in the locations generally depicted on the attached Site Plan shall not constitute unreasonable interference with the Property Owner's use of the Property. If a portion of the Property, significantly outside of the area to be used for the Project, as depicted in the Site Plan, must be disturbed as a result of Bay West's activities, Bay West will discuss the proposed disturbance with the Property Owner and agree upon actions and restoration. Bay West will restore the Property as close to its original condition

as is reasonably possible under the circumstances, provided Bay West shall not be required to remove or otherwise restore the access road and gravel pad as installed by Bay West, as part of its work authorized under this Agreement. Bay West will work with the Property Owner to install reasonable security measures and a work site security fence and gate that allows large vehicular access for Bay West and its agents, contractors, and subcontractors. The gate and fence will be removed as part of site restoration activities. Property Owner may request access to the fenced area upon two business days' notice, provided it must be escorted by Bay West when accessing areas secured by fencing.

- B. The Property Owner will take reasonable precautions to ensure that the equipment of Bay West and its contractors on the property is not damaged, and that the work being conducted by Bay West, its employees, agents, and contractors is not disrupted.
- C. Bay West and its subcontractors will conduct onsite activities in accordance with the Bay West Health & Safety Plan ("**H&S Plan**") and Accident Prevention Plan ("**APP**"), to be presented to Property Owner at least two weeks in advance of onsite activities. Copies of the H&S Plan and APP will be kept in the Project control shed throughout onsite activities and made available to Bay West and Property Owner personnel upon request.

6. **Permits.** Bay West will obtain all necessary permits for the work performed at the site. The following permits are the only permits Bay West is required to secure from the Property Owner, in its role as regulatory authority over the Property:

- Aboveground Tank Installation Permit (if applicable)
- Temporary Heating Permit (if applicable)
- Building Permit (if applicable)
- Zoning Permit (if applicable)
- Electrical Permit
- Fence Permit
- Sign Permit
- Grading Permit (if applicable)
- Structure Moving Permit (if applicable)
- Temporary Construction Permit (if applicable)
- List of Hazardous Materials
- Plumbing Permit/Connection Permit/Water Application
- Special Event Permit (if applicable)

As applicable, should permits be required by the Valley Branch Water District (VBWD) regarding erosion control and stormwater management, Bay West will obtain and share with the City.

7. Work to be conducted at the Property.

- A. Site Layout. The Site Plan has been developed and agreed upon by the Property Owner and Bay West.
- B. Site Preparation. Bay West and its subcontractors will prepare the ground on the gravel access road and at the work site to allow heavy vehicle deliveries. Grading of the site may be required to meet vehicle access and equipment staging requirements. The materials to be used will be discussed and agreed upon with the Property Owner, whose consent shall not be unreasonably withheld conditioned or delayed. Ground preparation is anticipated to meet requirements for installation of equipment and personnel access to conduct the Project.
- C. Utility connections. Water piping will have backflow prevention installed to code. Power connections and usage meters will be made by the local power utilities company and inspected as required. To the extent practicable, utilities serving the Project will be separately metered to allow Bay West to pay such invoices directly.
- D. Security fence and signage. A security fence, anticipated to be chain link with steel posts, to a height of feet above level ground, will be installed along with a lockable gate of a width allowing truck access. Signage about the research Project will be discussed and agreed upon with the Property Owner, whose consent shall not be unreasonably withheld conditioned or delayed, and the sign will be placed adjacent to the gate at a reasonable height for reading from the access road. The fence and gate will be removed during Site Restoration activities.
- E. Vehicles and parking. Expected vehicular traffic are semi-truckers with trailers to transport air compressor and PFAS destruction mobile unit to and from the site; crane for approximately one day to lift these two items of heavy equipment onto the site and approximately one day to remove; forklift for moving tanks and totes; work trucks and cars. During research work activities, Bay West requests that occasional overflow of vehicles such as official inspection vehicles or general public, be allowed to temporarily park along the building access road. Excepting the onsite forklift, Bay West and their subcontractors' vehicles will be removed daily unless otherwise agreed with the City Public Works Department.
- F. Research Preparation activities. Major equipment to be staged at the site in general accordance with the Site Plan include air compressor, PFAS destruction mobile unit, temporary cover for the mobile unit that will at least 20 feet in height, a project controls shed, liquid frac tanks and 275-gallon totes with steel frames, and secondary containment.
- G. Temporary fuel tank installations. Diesel fuel and propane tanks are necessary to run the mobile research unit and air compressor. The tanks will be installed,

inspected, maintained, and removed after completion of the research Project in accordance with their associated permits.

- H. Chemical materials. To run the testing mobile unit, chemical materials to be brought onsite and temporarily stored for research use. Chemicals will be stored in containers specific to each chemical compound's Safety Data Sheet (SDS). The SDS will be kept onsite in the project controls shed during the duration of the project and available for inspection. The chemicals are sodium hydroxide and PFAS-specific feed materials for research purposes.
 - I. Management and disposal of effluent liquids. Liquids remaining after the destruction tests will be piped directly to storage in appropriate frac tanks with sampling ports and secondary containment. The effluent will be analytically tested and the results will be used to determine the method of disposal.
8. **Notification.** Unless otherwise specified, written requests or other documents sent to the Property Owner shall be addressed to:

City of Lake Elmo
3880 Laverne Ave North
Attn: Nicole Miller, City Administrator
Email: NMiller@lakeelmo.gov
Phone: 651-747-3905

All reports or other documents sent to Bay West shall be addressed to:

Bay West LLC
5 Empire Drive
St. Paul, MN 55103
ATTN: Patricia Corcoran
Email: tcorcoran@baywest.com
Phone: 651-291-3482

9. Restoration. During the onsite research work, Bay West will oversee weekly removal of trash and debris. Supplies and materials will be contained and managed for site access throughout the onsite activities. At the conclusion of research testing using the mobile unit, Bay West will oversee packing, shipping, and off-site transport of research-related equipment and supplies. Totes containing the treated effluent will remain on secondary containment and covered, until analytical tests are completed for determination of disposition. After removal of the totes and secondary containment, Bay West will conduct a site

walk with the Property Owner to note any remaining removal or cleaning actions per the agreed-upon activities to complete site restoration.

10. Bay West Liability.

Bay West shall assume all liability for the actions and operations of its employees, contractors, consultants, agents, and invitees while performing work on the Property and conducting public visits and tours. Bay West shall indemnify, defend, and hold the City and its officials, employees, agents, and contractors harmless from and against any and all loss, damage, injury, or liability resulting from Bay West's performance under this Agreement, including allowing the public to access the Property and from any negligent acts of Bay West's employees, agents, and contractors and their employees and agents. Notwithstanding any provision to the contrary, Bay West shall not be required to indemnify the City, its officials, employees, agents or contractors for any loss, damage, injury or liability was caused by the negligence or willful misconduct of the City, its officials, employees, agents or contractors and Notwithstanding the foregoing, Bay West shall not be liable or otherwise responsible for any existing contamination on the Property that was not removed by Bay West during its testing on the Property.

11. This Agreement binds and benefits the parties and their successors and assigns and may only be modified by written agreement of the parties. This Agreement may not be assigned, transferred, or conveyed by either party without the express written consent of the other, which consent may be granted in such other party's sole and absolute discretion.
12. The laws of the State of Minnesota shall govern this Agreement.
13. All work on the Property completed by Bay West, its employees, contractors or agents and associated with the Project shall be at Bay West's sole cost and expense.
14. Bay West and its contractors, subcontractors, and agents must carry insurance during the term of this Agreement in accordance with the following requirements:
 - A. Workers' compensation insurance with limits as provided by statute, with all necessary statutory elections to provide coverage for actions brought by claims made by any person doing work on the Property pursuant to this Agreement.
 - B. Comprehensive auto liability insurance with minimum combined single limits of \$1,500,000 per occurrence.
 - C. Comprehensive general liability insurance with minimum combined single limits of \$1,500,00 per occurrence.
 - D. The Party(ies) supplying the Testing Facilities and/or any vehicles, materials, or equipment ("Facilities & Equipment") stored on the Property, shall carry the necessary insurance to cover said Facilities & Equipment.
 - E. The comprehensive general liability insurance policy must include the City as an additional insured.

15. Bay West agrees that throughout the term of this Agreement it shall not use the Property for the storage, handling, transportation, or disposal of any Hazardous Substances not specifically involved in the project. "Hazardous Substances" for purposes of this Agreement shall be interpreted broadly to include, but not be limited to, any material or substance that is defined, regulated or classified under any Environmental Law of other applicable federal, state or local laws and the regulations promulgated thereunder as: (i) a "hazardous substance" pursuant to Section 101 of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9601(14), the Federal Water Pollution Control Act, 33 U.S.C. §1321(14), as now or hereafter amended; (ii) a "hazardous waste" pursuant to Section 1004 or Section 3001 of the Resource Conservation and Recovery Act, 42 U.S.C. §§6903(5) , 6921, as now or hereafter amended; (iii) toxic pollutant under section 307(a)(1) of the Federal Water Pollution Control Act, 33 U.S.C. §1317(a)(1) as now or hereafter amended; (iv) a "hazardous air pollutant" under Section 112 of the Clean Air Act, 42 U.S.C. §7412(a)(6), as now or hereafter amended; (v) a "hazardous material" under the Hazardous Materials Transportation Uniform Safety Act of 1990, 49 U.S.C. §5102(2), as now or hereafter amended; (vi) toxic or hazardous pursuant to regulations promulgated now or hereafter under the aforementioned laws or any state or local counterpart to any of the aforementioned laws; or (vii) presenting a risk to human health or the environment under other applicable federal, state or local laws, ordinances or regulations, as now or as may be passed or promulgated in the future. "Hazardous Substances" shall also mean any substance that after release into the environment or upon exposure, ingestion, inhalation, or assimilation, either directly from the environment or directly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavior abnormalities, cancer, or genetic abnormalities and specifically includes, but is not limited to, asbestos, polychlorinated biphenyls ("PCBs"), radioactive materials, including radon and naturally occurring radio nuclides, natural gas, natural gas liquids, liquefied natural gas, synthetic gas, oil, petroleum and petroleum-based derivatives and urea formaldehyde. "Hazardous Substances" does not include diesel, propane, diesel exhaust fluid (DEF) to reduce NOx emissions from diesel engines, sodium hydroxide and PFAs-specific feed materials for research purposes that are to be used by Bay West for running the testing mobile unit on the Property.

Bay West will be solely liable for and will defend, indemnify, and hold City, its officials, employees, contractors, and agents harmless from and against any and all claims, costs and liabilities, including reasonable attorneys' fees and costs, arising out of or in connection with Bay West's use, storage, handling, transportation, or disposal of Hazardous Substances on, at or under the Property, including cleanup or restoration of the Property. Notwithstanding the foregoing, Bay West shall not be liable for or required to defend or indemnify the City, its officials, employees, contractors, and agents for any costs or liabilities caused by the negligence, willful act or omission of the City, its officials, employees, contractors, and agents.

The obligations of this Section shall survive the expiration or other termination of this Agreement.

16. Effective Date. This Agreement shall be effective upon the date it is signed by Bay West. ***By their signatures below, the undersigned represent that they have authority to bind the parties they represent, their agents, successors, and assigns.***

AGREED BY:**BAY WEST LLC**

By: _____
Name: _____
Title: _____
Date: _____

PROPERTY OWNER

By: _____
Name: _____
Title: **Mayor**
Date: _____

By: _____
Name: _____
Title: **City Clerk**
Date: _____

Exhibit A
Site Drawings and Technical Specifications

Exhibit A "Site Plan" is presented as a DRAFT, conceptual site layout with auxiliary drawings and technical specifications subject to changes as agreed upon between Bay West and the Property Owner.



MOBILE INDUSTRIAL SUPER CRITICAL WATER OXIDATION (ISCWO) SYSTEM LAYOUT DRAWINGS JANUARY 2025

DRAWING INDEX	
COVER	VICINITY MAP AND DRAWING INDEX
G-01	SPECIFICATIONS, LEGEND, AND ABBREVIATIONS
C-01	SITE LAYOUT
C-02	ISCWO UTILITY SOURCES
C-03A	SITE IMPROVEMENTS
C-03B	SITE IMPROVEMENTS
C-03C	EROSION CONTROL
C-04A	EQUIPMENT CROSS SECTIONS
C-04B	EQUIPMENT CROSS SECTIONS
C-05	SECONDARY CONTAINMENT
C-06	NOISE MAP
C-07	EQUIPMENT LOADING/UNLOADING AREAS
C-08	DELIVERY LOADING/UNLOADING AREAS
C-09	VISITOR PARKING OPTIONS
C-10	SITE RESTORATION

LAKE ELMO, MINNESOTA VICINITY MAP



**ERDC PFAS DESTRUCTION
RESEARCH PHASE II SITE**
3445 IDEAL AVENUE NORTH
LAKE ELMO, MN 55042

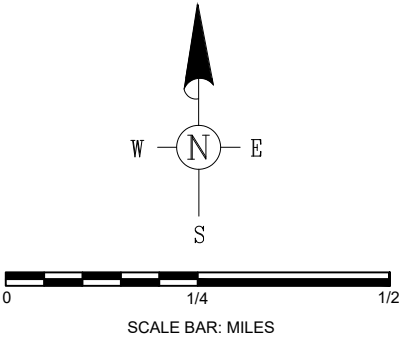


IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



ERDC PFAS DESTRUCTION RESEARCH
PHASE II SITE
LAKE ELMO, MN

VICINITY MAP AND
DRAWING INDEX

DESIGN	JRC	DATE	SHEET	COVER
DRAWN BY	JRC	1/28/25	DWG NO.	ERDC COVER
CHECKED BY	ERW	1/28/25	DATE	1/28/2025
APPROVED BY	ATJ	1/28/25	PROJ. NO.	J230044

SPECIFICATIONS:

GENERAL:

1.

THE TEMPORARY ISCWO SYSTEM WILL BE LOCATED ON THE PARCEL (PARCEL ID: 1602921240002) IMMEDIATELY NORTH OF THE LAKE ELMO PUBLIC WORKS BUILDING LOCATED AT 3445 IDEAL AVENUE NORTH, LAKE ELMO, MN 55042.
2.

BAY WEST SHALL COORDINATE ACCESS DURING CONSTRUCTION, SETUP, TESTING, AND SITE RESTORATION WITH THE CITY OF LAKE ELMO. THE TEMPORARY ISCWO SYSTEM WILL BE INSTALLED ON LAND OWNED BY THE CITY OF LAKE ELMO. BAY WEST SHALL BE RESPONSIBLE FOR MAINTAINING CONSTANT COORDINATION BETWEEN ANY SUBCONTRACTORS AND LAKE ELMO. ALL CONSTRUCTION ACTIVITIES PLANNED BY BAY WEST SHALL BE REVIEWED AND APPROVED BY THE OWNER.
3.

THE LOCATIONS OF UTILITIES SHOWN HAVE BEEN DETERMINED FROM AVAILABLE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF BAY WEST TO LOCATE ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE DRAWINGS, AND TO PROTECT THEM FROM DAMAGE. WHERE A UTILITY IS ABANDONED OR REQUIRES TO BE PROTECTED, BAY WEST SHALL PROVIDE PROTECTION OF THE UTILITY. BAY WEST SHALL BEAR ALL EXPENSE OF REPAIR, REPLACEMENT, OR ANY OTHER CHARGES RELATED TO EXISTING UTILITIES IN CONJUNCTION WITH THE EXECUTION OF THIS WORK.
4.

UNKNOWN SITUATIONS OR CONDITIONS NOT COVERED IN THE CONTRACT DOCUMENTS MAY ARISE DURING CONSTRUCTION. BAY WEST SHALL NOTIFY LAKE ELMO IF SUCH A CONDITION IS IDENTIFIED.
5.

ALL MATERIALS WILL BE IN STRICT COMPLIANCE WITH MINNESOTA STANDARD SPECIFICATIONS, LATEST EDITION. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SITE IMPROVEMENTS:

1.

BAY WEST SHALL CONSTRUCT AN 8-INCH THICK GRAVEL PAD AT THE JOB SITE. THE GRAVEL PAD WILL BE COMPOSED OF RECYCLED MATERIAL CLASS V GRAVEL WITH QUALITY REQUIREMENTS ACCORDING TO MNDOT SPECIFICATIONS.
2.

BAY WEST WILL GRADE THE JOB SITE BEFORE GRAVEL PLACEMENT. AS DIRECTED BY LAKE ELMO, BAY WEST WILL STOCKPILE EXCAVATED NATIVE SOIL FOR FUTURE USE AT THE SITE BY THE CITY OF LAKE ELMO.
3.

BAY WEST WILL COMPACT THE GRAVEL PAD TO 95% OF MAXIMUM DRY DENSITY IN TWO 4-INCH LIFTS. THE CLASS V GRAVEL WILL BE COMPACTED BY A MECHANICAL OR VIBRATING COMPACTOR.
4.

THE GRAVEL PAD WILL BE LEVEL WITH THE EXISTING GRAVEL ROAD (WEST TO EAST) & GROUND GRADE (SOUTH TO NORTH).

TEMPORARY ELECTRICAL SETUP:

1.

A GENERATOR WILL SUPPLY POWER FOR THE JOB SITE. THE GENERATOR SHALL SUPPLY 480/277 VOLTS AND 1,000 KILOWATTS. THE GENERATOR CONSUMES DIESEL AND DIESEL EXHAUST FLUID (DEF) TO GENERATE POWER. THE GENERATOR WILL BE HOUSED IN A TRAILER.
2.

IF NEEDED, XCEL ENERGY MAY INSTALL A LOW VOLTAGE, TEMPORARY POWER DROP TO SUPPLY POWER TO EQUIPMENT (E.G. SECURITY CAMERAS, HEATING DEVICES, ETC) WHICH WILL RUN DURING OFF WORK HOURS
3.

IF NEEDED, BAY WEST MAY USE A SMALLER GENERATOR TO POWER EQUIPMENT DURING OFF WORK HOURS
4.

ALL ELECTRICAL HOOK-UP AND INSTALLATION WILL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NATIONAL ELECTRIC CODE (NEC) AND ALL GOVERNING STATE AND LOCAL REGULATIONS.
5.

CONTROL PANELS WILL BE NEMA 4 AND ALL CONTROL PANEL COMPONENTS WILL BE UNDERWRITER LABORATORY (UL) LISTED.

WATER SUPPLY:

1.

BAY WEST WILL DRAW APPROXIMATELY 10 GPM FROM A LAKE ELMO FIRE HYDRANT. BAY WEST WILL GO THROUGH THE LAKE ELMO FIRE DEPARTMENT TO CONNECT THE ISCWO SYSTEM TO THE FIRE HYDRANT. BAY WEST WILL INSTALL A CERTIFIED BACKFLOW PREVENTER AND WATER USAGE METER ON THE FIRE HYDRANT CONNECTION.
2.

BAY WEST WILL DISCONNECT FROM THE FIRE HYDRANT AT THE END OF EACH WORKING DAY IN THE EVENT OF AN EMERGENCY AFTER NORMAL WORK HOURS. DURING NORMAL WORK HOURS, BAY WEST WILL ALWAYS HAVE SOMEONE ONSITE TO QUICKLY SHUT DOWN THE SYSTEM AND DISCONNECT FROM THE FIRE HYDRANT, IF NEEDED.

EQUIPMENT:

1.

THE ISCWO SKID WILL BE HOUSED UNDERNEATH A ISCWO SHELTER, WHICH WILL CONSIST OF STRUCTURE WITH ONLY A ROOF (SIMILAR TO A CARPORT). THE ISCWO STRUCTURE WILL BE CERTIFIED TO WITHSTAND 115 MPH WIND SPEEDS. THE ISCWO SHELTER MAY HAVE AN UNDERGROUND CONCRETE FOUNDATION (SIZE TBD)

SECONDARY CONTAINMENT:

1.

EQUIPMENT AND STORAGE AREAS WHICH CONTAIN CERTAIN MATERIALS WILL HAVE SECONDARY CONTAINMENT AS OUTLINED IN THESE DRAWINGS.
2.





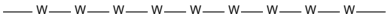














SOME SECONDARY CONTAINMENT OPTIONS ARE CONTAINMENT BERMS, WHICH COLLECT RAINWATER DURING STORM EVENTS. BAY WEST WILL REMOVE WATER FROM CONTAINMENT BERMS DAILY AND PUMP THAT ACCUMULATED WATER INTO THE EFFLUENT FRAC TANK.

SAFETY:

1.

BAY WEST AND ITS SUBCONTRACTORS WILL CONDUCT ONSITE ACTIVITIES IN ACCORDNACE WITH BAY WEST HEALTH AND SAFETY PLAN (H&S PLAN) AND ACCIDENT PREVENTION PLAN (APP), TO BE PRESENTED TO PROPERTY OWNER AT LEAST TWO WEEKS IN ADVANCE OF ONSITE ACTIVITIES. COPIES OF H&S PLAN AND APP WILL BE KEPT IN THE PROJECT CONTROL SHED THROUGHOUT ONSITE ACTIVITIES AND MADE AVAILABLE TO BAY WEST AND PROPERTY OWNER PRESONNEL UPON REQUEST.

GENERAL SYMBOLS KEY:

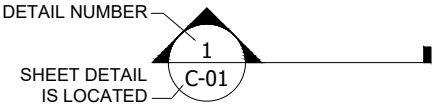
	CONCRETE
	CLASS V GRAVEL
	NATIVE SOIL
	TEMPORARY FENCE
	TEMPORARY WATER FEED LINE (ABOVE GRADE)
	HIGH PRESSURE AIR FEED LINE
	DIESEL FEED LINE (WITH SECONDARY CONTAINMENT)
	PFAS FEED LINE (WITH SECONDARY CONTAINMENT)
	PROPANE LINE
	LAKE ELMO WATER MAIN (12" DIA, DIP)
	15' OFFSET FROM LAKE ELMO WATER MAIN
	ISCWO LIQUID EFFLUENT LINE (WITH SECONDARY CONTAINMENT)
	SECONDARY CONTAINMENT
	SITE LIMITS (SEE GENERAL NOTES)
	EXISTING OVERHEAD ELECTRIC LINE
	PROPOSED TEMPORARY OVERHEAD ELECTRIC LINE
	EXISTING POWER POLE
	PROPOSED TEMPORARY POWER POLE
	SURVEY LOCATION (WITH DESCRIPTION) COLLECTED BY BAY WEST

DESCRIPTION

ABBREVIATIONS:

"	IN, INCH
'	FT, FOOT, FEET
A	AMPS
AST	ABOVE GROUND STORAGE TANK
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
dBA	DECIBELS
DEG. F/°F	DEGREES FAHRENHEIT
DIA./Ø	DIAMETER
DIP	DUCTILE IRON PIPE
E	EAST / EASTING
EFF.	EFFECTIVE
ELEV.	ELEVATION
FT	FOOT, FEET
GAL	GALLON
HP	HORSE POWER
HPAC	HIGH PRESSURE AIR COMPRESSOR
IN	INCH
ISCWO	INDUSTRIAL SUPER CRITICAL WATER OXIDATION
KW	KILOWATTS
LF	LINEAR FEET
MAX.	MAXIMUM
MIN.	MINIMUM
MNDOT	MINNESOTA DEPARTMENT OF TRANSPORTATION
MPH	MILES PER HOUR
N	NORTH / NORTHING
NEC	NATIONAL ELECTRIC CODE
NO.	NUMBER
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
PPM	PARTS PER MILLION
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
RPM	REVOLUTIONS PER MINUTE
SCH	SCHEDULE
SDR	STANDARD DIMENSION RATIO
SS	STAINLESS STEEL
TBD	TO BE DETERMINED
TYP.	TYPICAL
V	VOLTS
VAC	VOLTS ALTERNATING CURRENT
VDC	VOLTS DIRECT CURRENT

DETAIL & CROSS SECTION DESIGNATION:



SPECIFICATIONS CONTINUED:

NOISE:

1.

OPERATIONAL HOURS DEPENDANT UPON RESULTS OF CONTINUED NOISE LEVEL MEASUREMENTS OF THE ISCWO SYSTEM, HIGH PRESSURE AIR COMPRESSOR, AND GENERATOR TO BE COMPLETED IN JANUARY 2025 & DURING SYSTEM START UP WHILE THE EQUIPMENT IS AT THE LAKE ELMO SITE.
2.

BAY WEST DOES NOT EXPECT THE ISCWO EQUIPMENT TO EXCEED THE LAKE ELMO SOUND ORDINANCE (LAKE ELMO CITY CODE 13.00.080) OF AN INCREASE IN SOUND GREATER THAN SIX DECIBELS ABOVE THE AMBIENT NOISE AT THE PROPERTY LINE (DRAWING C-06). BAY WEST ASSUMED THE PROPERTY LINE AS THE WEST SIDE OF IDEAL AVENUE NORTH DUE TO REGULAR TRAFFIC NOISE DURING NORMAL WORKING HOURS. ACCORDING TO THE USDOT NATIONAL TRANSPORTATION NOISE MAP APPLICATION, IDEAL AVENUE NORTH GENERATES APPROXIMATELY 50 TO 54.9 dBA ON AVERAGE OVER A 24-HOUR PERIOD. PREVIOUS NOISE TESTS OF THE ISCWO SYSTEM SUGGEST THAT THE GENERATED NOISE LEVEL AT THE PROPERTY LINE WILL BE LESS THAN 40 dBA. THE ADDITION OF THE ISCWO SYSTEM NOISE TO THE IDEAL AVENUE NORTH NOISE DOES NOT RESULT IN AN INCREASE GREATER THAN SIX DECIBELS ABOVE THE AMBIENT NOISE AT THE PROPERTY LINE PER THE LAKE ELMO SOUND ORDINANCE.

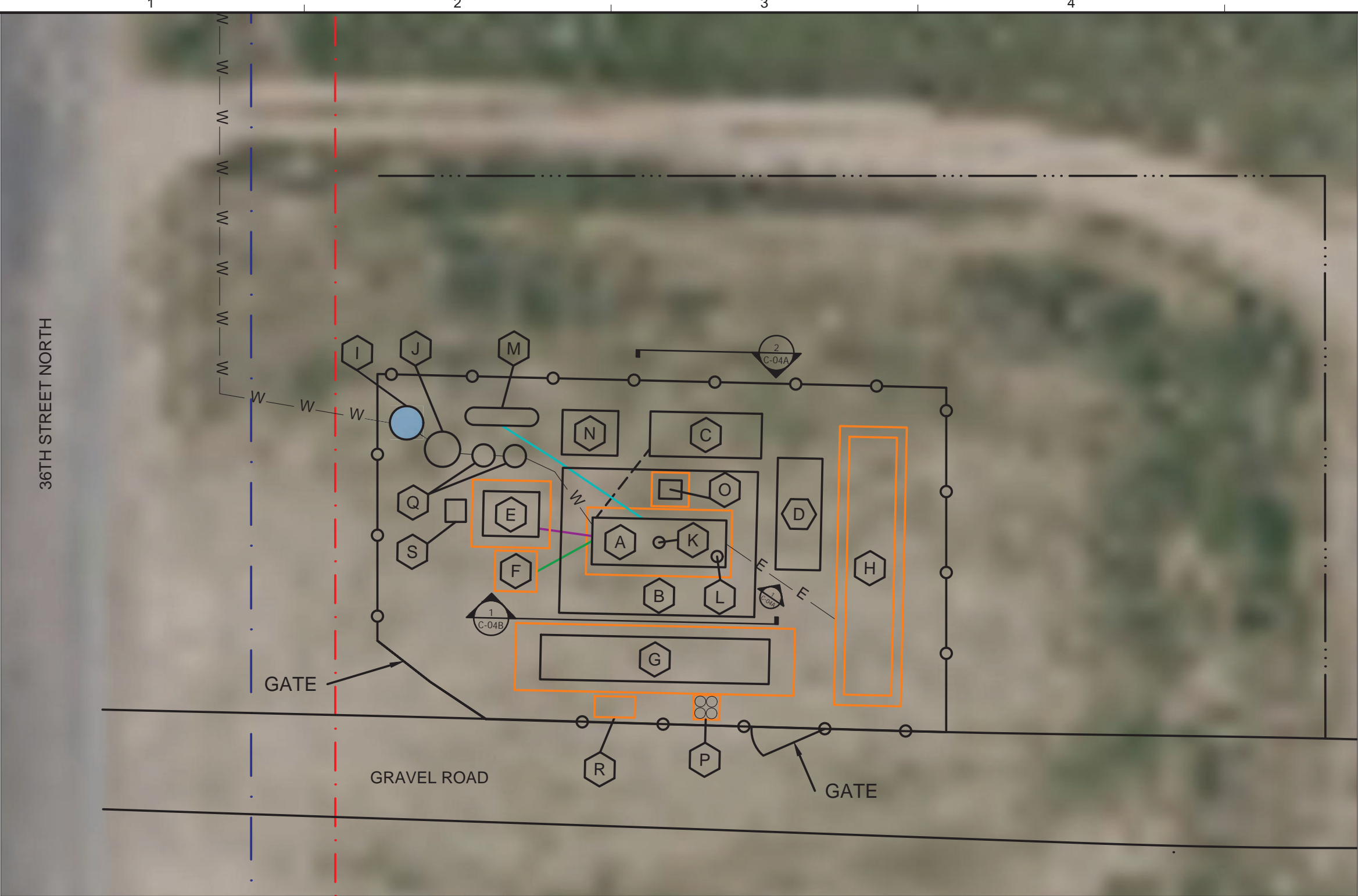
SITE SECURITY:

1.

JOB SITE WILL BE SURROUNDED BY TEMPORARY FENCING WHICH CONSISTS OF 12' LONG X 6" TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS. THE TEMPORARY FENCE LINE WILL INCLUDE TWO GATES WHICH WILL BE LOCKED DURING NON-OPERATIONAL HOURS.
2.

THE JOB SITE WILL ALSO INCLUDE SECURITY CAMERAS LOCATED ON EACH OF THE SIDES OF THE FENCE LINE.

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP		ERDC PFAS DESTRUCTION RESEARCH PHASE II SITE LAKE ELMO, MN	SPECIFICATIONS, LEGEND AND ABBREVIATIONS	DESIGN	JRC	DATE	SHEET	G-01
									DRAWN BY	JRC	1/28/25	DWG NO.	ERDC G-01
									CHECKED BY	ERW	1/28/25	DATE	1/28/2025
									APPROVED BY	ATJ	1/28/25	PROJ. NO.	J230044



ID	DESCRIPTION
A	ISCWO SKID
B	ISCWO SHELTER (W/CONCRETE FOUNDATION)
C	HIGH PRESSURE AIR COMPRESSOR (HPAC)
D	OFFICE/CONTROL ROOM (SHIPPING CONTAINER)
E	FEED MATERIAL STORAGE (8' X 10' SHIPPING CONTAINER)
F	DOUBLE WALLED DIESEL AST (1,000-GAL)
G	DIESEL GENERATOR
H	DOUBLE WALLED EFFLUENT FRAC TANK (18,430-GAL)
I	INFLUENT WATER TANK (1,000-GAL)
J	WATER SOFTENER VESSEL
K	PRE-HEATER EXHAUST STACK (12" DIA)
L	ISCWO EXHAUST STACK (12" DIA)
M	PROPANE TANK (500-GAL)
N	8' X 10' SHIPPING CONTAINER (WORK BENCH/TOOL STORAGE)
O	10% NAOH (275-GAL TOTE)
P	DIESEL EXHAUST FLUID (55-GAL DRUMS)
Q	ACTIVATED CARBON OR RESIN VESSELS FOR PRE-TREATMENT (IF NEEDED)
R	DOUBLE WALLED DIESEL AST (500-GAL)
S	PORT-A-POTTY

LEGEND

- LAKE ELMO WATER MAIN (12" DIA, DIP)
- 15' OFFSET FROM LAKE ELMO WATER MAIN
- TEMPORARY FENCE LINE
- W WATER FEED LINE (ABOVE GRADE)
- HIGH PRESSURE AIR FEED LINE
- DIESEL FEED LINE (WITH SECONDARY CONTAINMENT - DRAWING C-04A)
- PFAS FEED LINE (WITH SECONDARY CONTAINMENT - DRAWING C-04A)
- E ISCWO LIQUID EFFLUENT LINE (WITH SECONDARY CONTAINMENT DRAWING C-04A)
- SECONDARY CONTAINMENT
- SITE LIMITS
- PROPANE LINE

- GENERAL NOTES:
- GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
 - LAKE ELMO WATER MAIN LOCATION OBTAINED FROM A DRAWING PROVIDED BY THE CITY OF LAKE ELMO PUBLIC WORKS DEPARTMENT
 - SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
 - TEMPORARY FENCE LINE CONSISTS OF 12' LONG BY 6' TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS
 - 6,000 LB, DIESEL FORKLIFT WITH PNEUMATIC TIRES TO MOVE EQUIPMENT AND LOAD/UNLOAD CHEMICAL DELIVERIES
 - THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO.
 - ACTIVATED CARBON VESSELS WOULD REMOVE PFAS FROM LAKE ELMO CITY WATER BEFORE ISCWO PROCESS, IF NEEDED
 - THE DIESEL AST (R) BY THE GENERATOR WILL BE A CONTINGENCY IF FUEL SERVICE CAN'T DELIVER DAILY
- IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



ERDC PFAS DESTRUCTION RESEARCH
PHASE II
3445 IDEAL AVE N, LAKE ELMO, MN

SITE LAYOUT

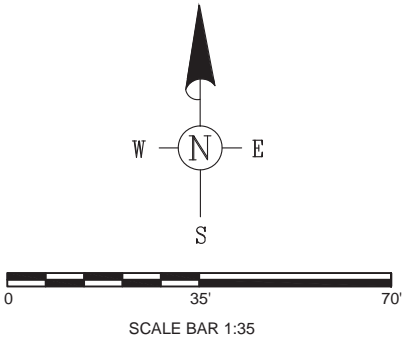
DESIGN	JRC	DATE	SHEET	C-01
DRAWN BY	JRC	1/13/25	DWG NO.	ERDC C-01
CHECKED BY	ERW	1/13/25	DATE	1/13/2025
APPROVED BY	PBD	1/13/25	PROJ. NO.	J230044



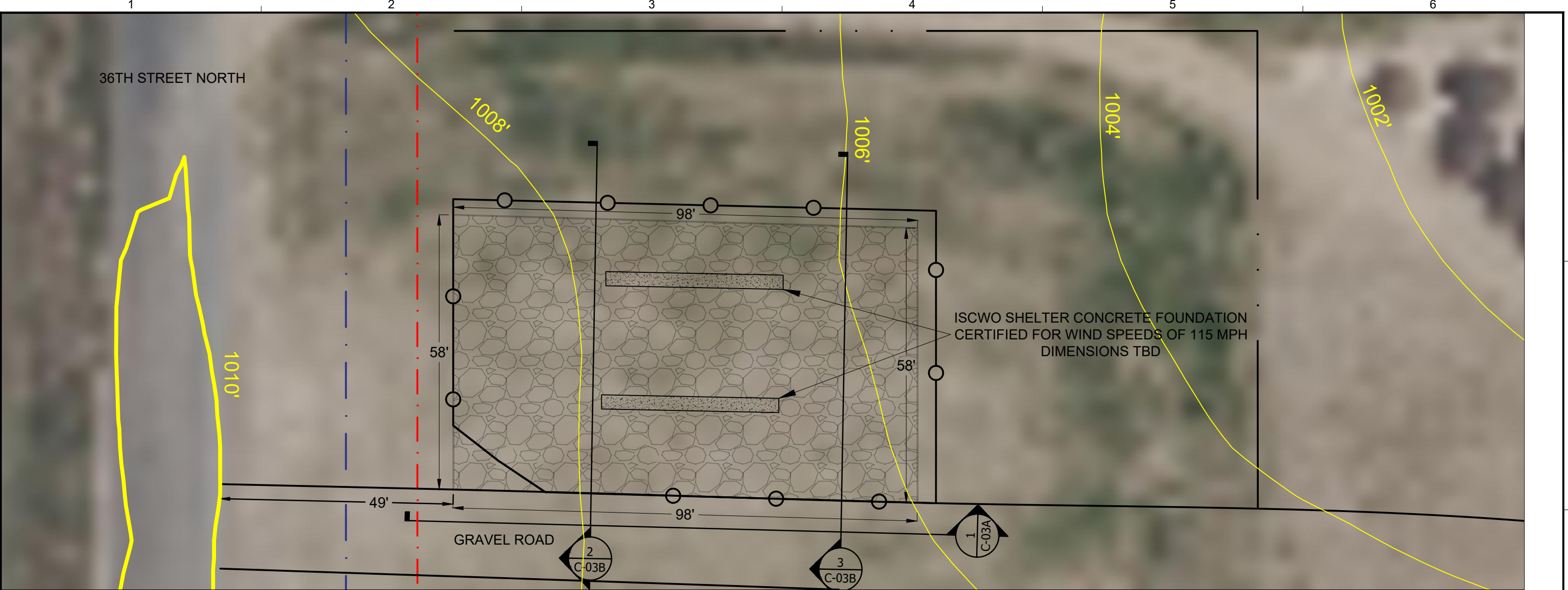
LEGEND

- LAKE ELMO WATER MAIN (12" DIA, DIP)
- 15' OFFSET FROM LAKE ELMO WATER MAIN
- TEMPORARY FENCE LINE
- SECONDARY CONTAINMENT
- SITE LIMITS
- W WATER FEED LINE (ABOVE GRADE)
- OH EXISTING OVERHEAD ELECTRIC LINE
- OH PROPOSED TEMPORARY OVERHEAD ELECTRIC LINE (IF NEEDED)
- EXISTING POWER POLE
- PROPOSED TEMPORARY POWER POLE (IF NEEDED)
- INFLUENT WATER TANK

- GENERAL NOTES:
- GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
 - LAKE ELMO WATER MAIN LOCATION OBTAINED FROM A DRAWING PROVIDED BY THE CITY OF LAKE ELMO PUBLIC WORKS DEPARTMENT
 - SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
 - TEMPORARY FENCE LINE CONSISTS OF 12' LONG BY 6' TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS
 - THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO
 - CONNECTION AT FIRE HYDRANT WILL INCLUDE WATER METER TO TRACK WATER USAGE AND A CERTIFIED BACKFLOW PREVENTER
 - BAY WEST WILL DISCONNECT FROM THE FIRE HYDRANT AT THE END OF EACH WORKING DAY IN THE EVENT OF AN EMERGENCY AFTER NORMAL WORK HOURS.
 - DURING NORMAL WORK HOURS, BAY WEST WILL ALWAYS HAVE SOMEONE ONSITE TO QUICKLY SHUT DOWN THE SYSTEM AND DISCONNECT FROM THE FIRE HYDRANT, IF NEEDED
 - A TEMPORARY, LOW VOLTAGE POWER DROP MAY BE NEEDED TO OPERATE SECURITY CAMERAS AND HEATING DEVICES OVERNIGHT WITHOUT THE NEED FOR A GENERATOR
- IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS



REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	<div><div>ERDC PFAS DESTRUCTION RESEARCH PHASE II 3445 IDEAL AVE N, LAKE ELMO, MN</div></div>	ISCWO UTILITY SOURCES	DESIGN	JRC	DATE	SHEET	C-02
								DRAWN BY	JRC	1/13/25	DWG NO.	ERDC C-02
								CHECKED BY	ERW	1/13/25	DATE	1/13/2025
								APPROVED BY	ATJ	1/13/25	PROJ. NO.	J230044



LAKE ELMO WATER MAIN (12" DIA, DIP)

15' OFFSET FROM LAKE ELMO WATER MAIN

TEMPORARY FENCE LINE

SITE LIMITS

SITE PAD (COMPOSED OF RECYCLED CLASS V)

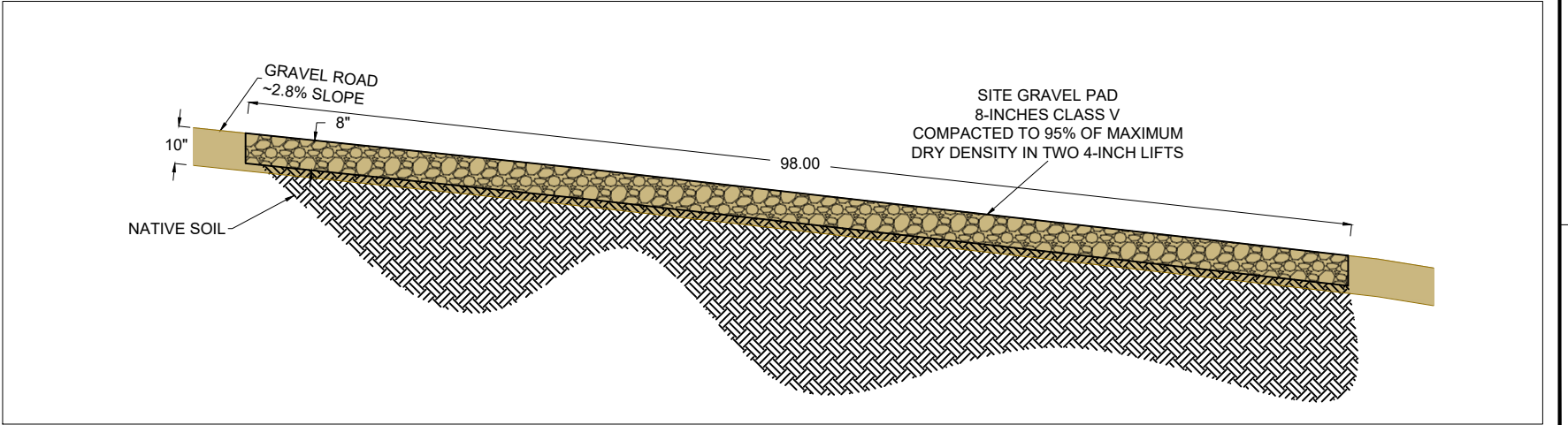
NATIVE SOIL

CONCRETE

TOPOGRAPHIC LINES

GRAVEL ROAD

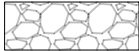



- GENERAL NOTES:
- SITE PAD WILL FOLLOW THE SAME GRADE AS THE GRAVEL ROAD. BAY WEST MAY LEVEL SPECIFIC PIECES OF EQUIPMENT WITH EXTRA GRAVEL OR RAILROAD TIES.
 - GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS & RELATIVE ELEVATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT

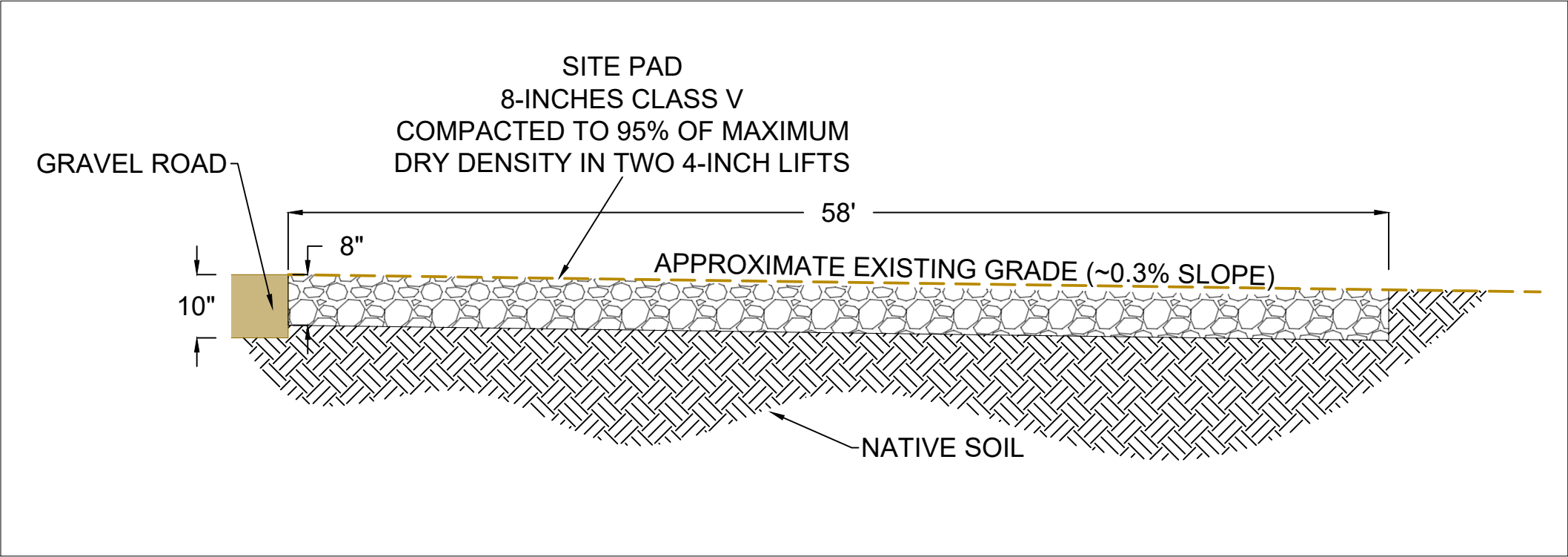


1 GRADING CROSS SECTION
HORIZONTAL 1:15 & VERTICAL: 4:15

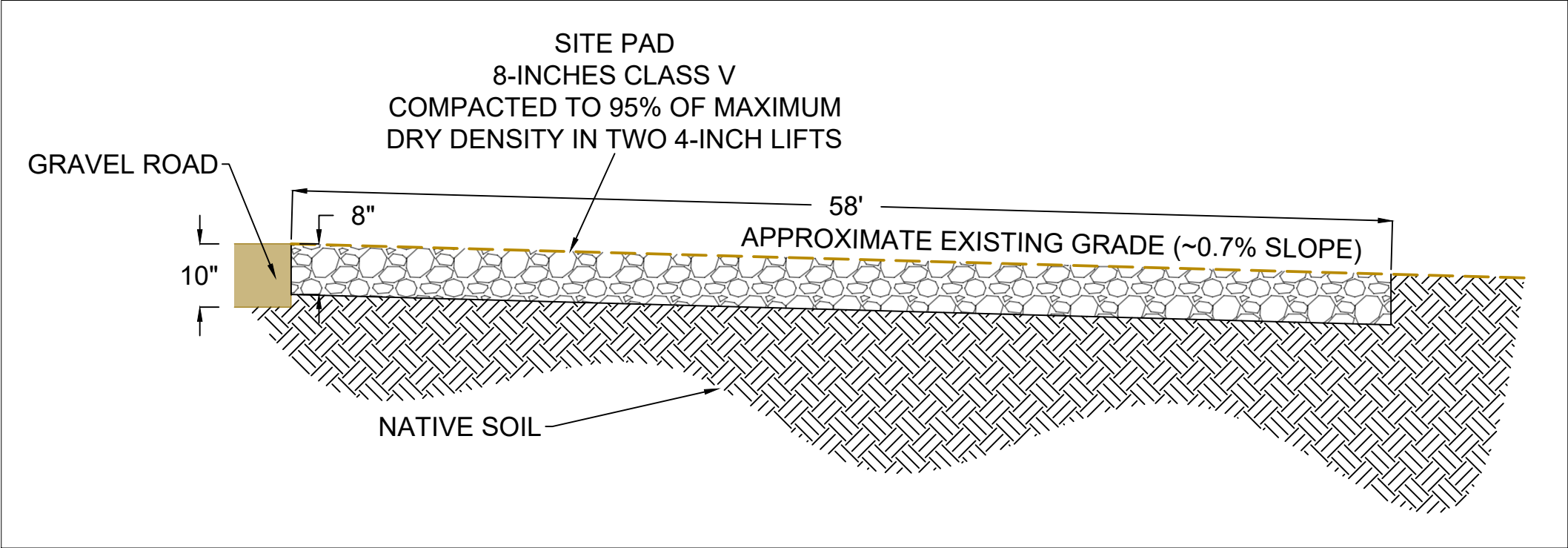
REV	DATE	REVISION DESCRIPTION	BY	CHK	APP				ERDC PFAS DESTRUCTION RESEARCH PHASE II 3445 IDEAL AVE N, LAKE ELMO, MN		SITE IMPROVEMENTS		DESIGN	JRC	DATE	SHEET	C-03A
													DRAWN BY	JRC	1/28/25	DWG NO.	ERDC C-03A
													CHECKED BY	ERW	1/28/25	DATE	1/28/2025
													APPROVED BY	PBD	1/28/25	PROJ. NO.	J230044

LEGEND

-  SITE PAD (COMPOSED OF RECYCLED CLASS V)
-  NATIVE SOIL
-  GRAVEL ROAD
-  APPROXIMATE EXISTING GRADE



2 WEST GRADING CROSS SECTION
HORIZONTAL 1:7.5 & VERTICAL: 4:7.5



3 EAST GRADING CROSS SECTION
HORIZONTAL 1:7.5 & VERTICAL: 4:7.5

GENERAL NOTES:

- SITE PAD WILL FOLLOW THE SAME GRADE AS THE CURRENT GRADE. BAY WEST MAY LEVEL SPECIFIC PIECES OF EQUIPMENT WITH EXTRA GRAVEL OR RAILROAD TIES.
 - GRAVEL ROAD LOCATIONS & RELATIVE ELEVATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
 - SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
 - TEMPORARY FENCE LINE CONSISTS OF 12' LONG BY 6" TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS
 - NATIVE SOIL WILL BE EXCAVATED TO PREPARE FOR THE SITE PAD AS SHOWN IN CROSS SECTION 1. EXCAVATED SOIL WILL BE MOVED TO CONTAINMENT BERMS TO BE USED BY LAKE ELMO AT A LATER DATE (DRAWING C-03C)
 - SOIL SHALL BE COMPACTED BY MEANS OF A MECHANICAL OR VIBRATING COMPACTOR
 - BAY WEST USED CONTOURS GENERATED IN 2011 FROM THE MINNESOTA GEOSPATIAL COMMONS FOR WASHINGTON COUNTY, MINNESOTA. THE CONTOURS RESEMBLE RELATIVE ELEVATION MEASUREMENTS AS DESCRIBED ABOVE. BAY WEST USED THE 2011 CONTOURS AS A "WORST CASE SCENARIO" SINCE THOSE CONTOURS HAD A LARGER SLOPE COMPARED TO SITE MEASUREMENTS.
 - MATERIAL FOR SITE PAD TO CONSIST OF RECYCLED CLASS V MATERIAL PER MNDOT SPECIFICATIONS
- IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

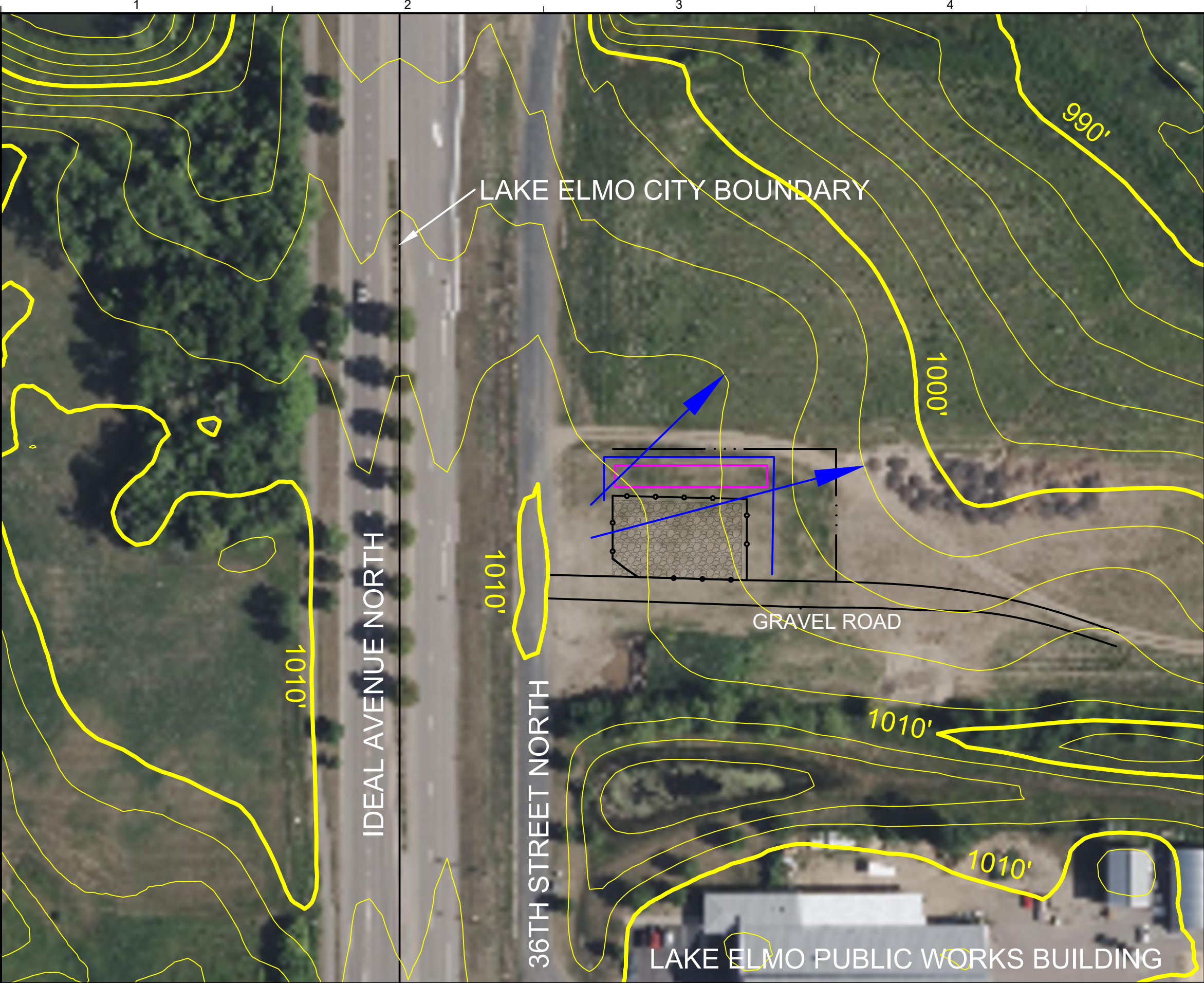
REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



ERDC PFAS DESTRUCTION RESEARCH
PHASE II
3445 IDEAL AVE N, LAKE ELMO, MN

SITE IMPROVEMENTS

DESIGN	JRC	DATE	SHEET	C-03B
DRAWN BY	JRC	1/28/25	DWG NO.	ERDC C-03B
CHECKED BY	ERW	1/28/25	DATE	1/28/2025
APPROVED BY	PBD	1/28/25	PROJ. NO.	J230044



LEGEND

- TEMPORARY FENCE LINE
- SITE LIMITS
- EXCAVATED SOIL STOCKPILE AREA
- SILT FENCE
- TOPOGRAPHIC LINES
- SITE PAD
- SURFACE WATER FLOW DIRECTION

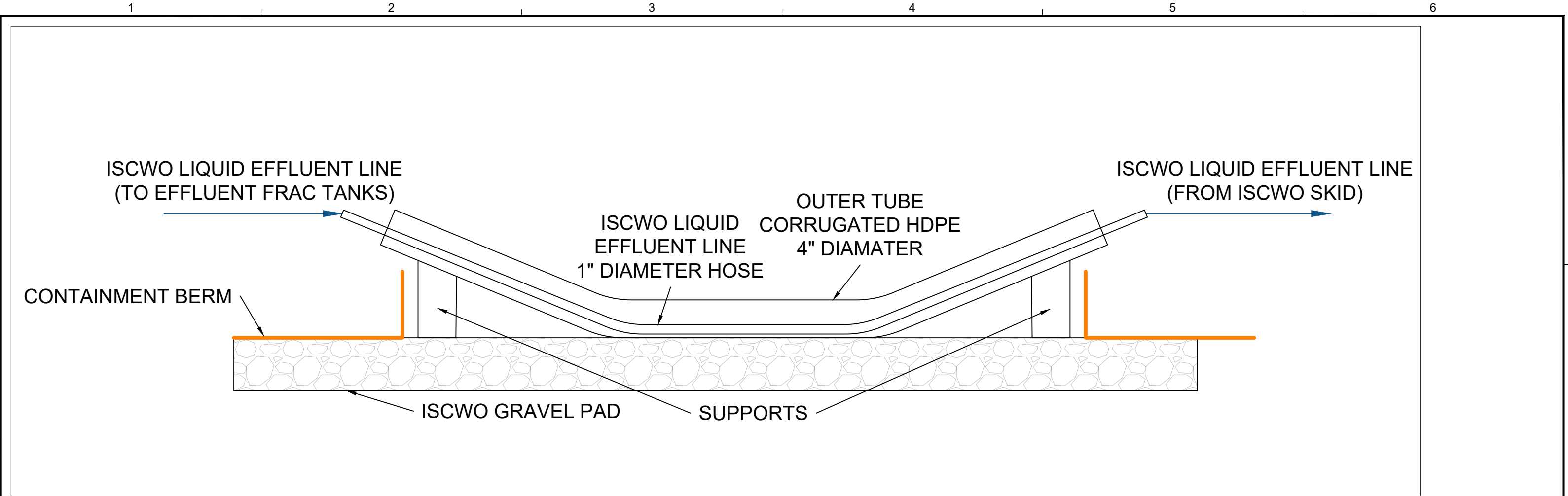
GENERAL NOTES:

- GRAVEL ROAD AND SITE LIMIT LOCATIONS & RELATIVE ELEVATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
- SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
- TEMPORARY FENCE LINE CONSISTS OF 12' LONG BY 6' TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS
- NATIVE SOIL WILL BE EXCAVATED TO PREPARE FOR THE SITE PAD. EXCAVATED SOIL WILL BE STOCKPILED AS DIRECTED BY LAKE ELMO TO BE USED BY LAKE ELMO AT A LATER DATE
- BAY WEST USED CONTOURS GENERATED IN 2011 FROM THE MINNESOTA GEOSPATIAL COMMONS FOR WASHINGTON COUNTY, MINNESOTA. THE CONTOURS RESEMBLE RELATIVE ELEVATION MEASUREMENTS AS DESCRIBED ABOVE. BAY WEST USED THE 2011 CONTOURS AS A "WORST CASE SCENARIO" SINCE THOSE CONTOURS HAD A LARGER SLOPE COMPARED TO SITE MEASUREMENTS.
- SURFACE WATER FLOW DIRECTION BASED ON THE 2011 CONTOURS
- MATERIAL FOR SITE PAD TO CONSIST OF RECYCLED CLASS V MATERIAL PER MNDOT SPECIFICATIONS

IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

SCALE BAR 1:75

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP			ERDC PFAS DESTRUCTION RESEARCH PHASE II 3445 IDEAL AVE N, LAKE ELMO, MN		EROSION CONTROL		DESIGN	JRC	DATE	SHEET	C-03C
												DRAWN BY	JRC	1/28/25	DWG NO.	ERDC C-03C
												CHECKED BY	ERW	1/28/25	DATE	1/28/2025
												APPROVED BY	PBD	1/28/25	PROJ. NO.	J230044



1

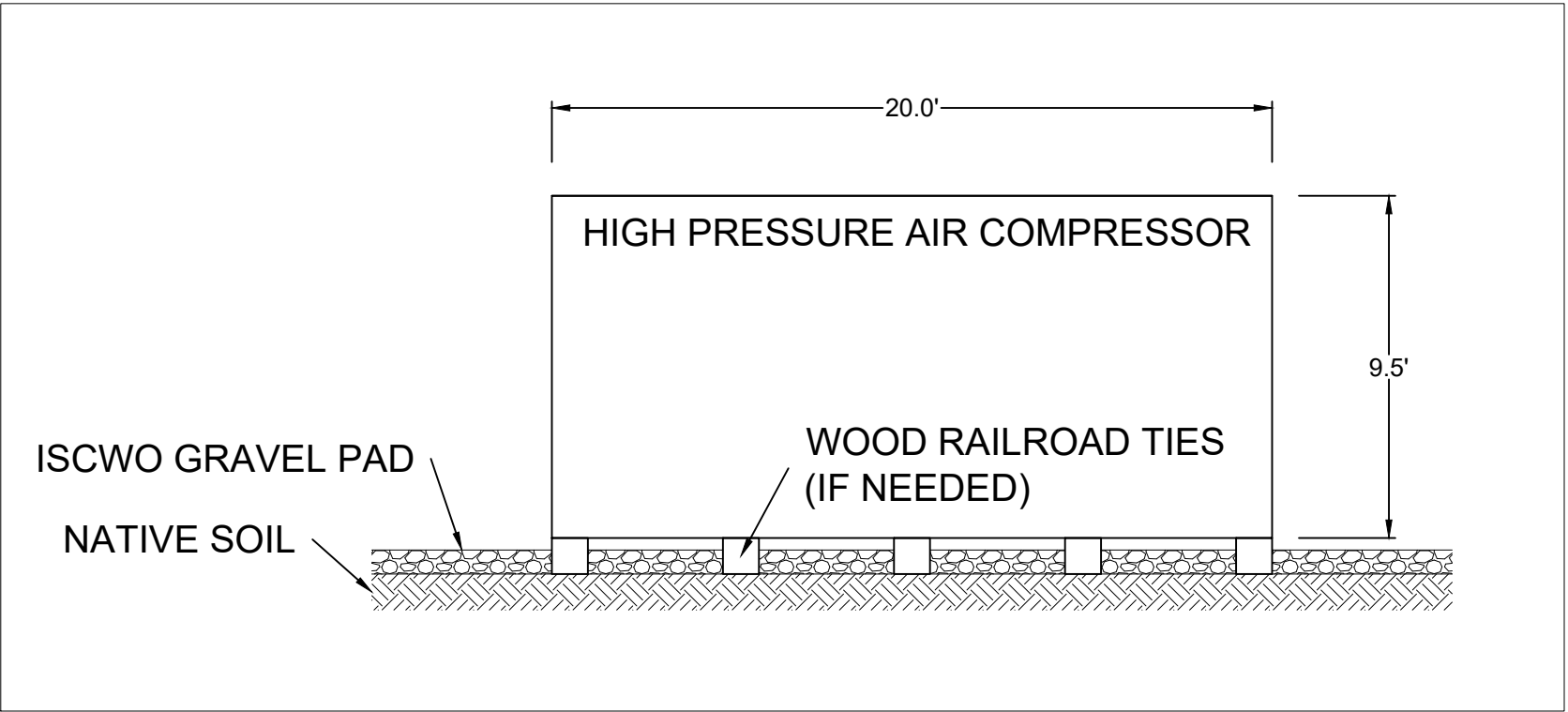
PIPING SECONDARY CONTAINMENT

NOT TO SCALE

- GENERAL NOTES:
- 1. BAY WEST WILL INSTALL DUAL TUBE PIPING SECONDARY CONTAINMENT ON THE LIQUID EFFLUENT LINE (SHOWN ABOVE), THE PFAS FEED LINE, AND THE DIESEL FEED LINE
 - 2. DUAL TUBE PIPING SECONDARY CONTAINMENT WILL CONSIST OF CORRUGATED, HDPE, 4-INCH TUBING
 - 3. BAY WEST MAY NEED TO DISCONNECT FEED AND EFFLUENT LINES FROM THE ISCWO SYSTEM TO FACILITATE FORKLIFT ACCESS AROUND THE ISCWO SYSTEM. BAY WEST WILL DRAIN LINES AND DUAL TUBE PIPING WITHIN A CONTAINMENT BERM BEFORE DISCONNECTION.

LEGEND

- SECONDARY CONTAINMENT
- SITE GRAVEL PAD
- NATIVE SOIL



2

HIGH PRESSURE AIR COMPRESSOR

1:5 SCALE

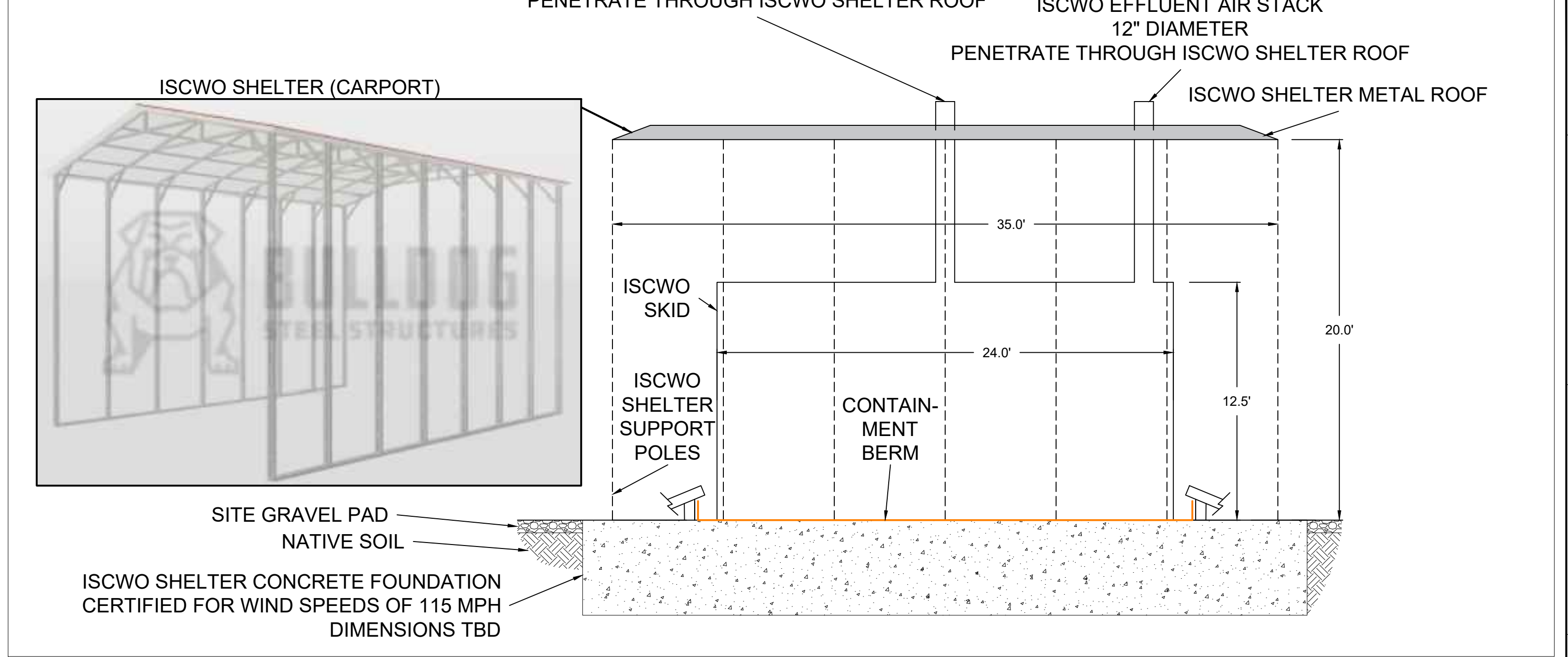
REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



ERDC PFAS DESTRUCTION RESEARCH
PHASE II
3445 IDEAL AVE N, LAKE ELMO, MN

EQUIPMENT CROSS-SECTIONS

DESIGN	JRC	DATE	SHEET	C-04A
DRAWN BY	JRC	1/13/25	DWG NO.	ERDC C-04A
CHECKED BY	ERW	1/13/25	DATE	1/13/2025
APPROVED BY	PBD	1/13/25	PROJ. NO.	J230044



0510

SCALE BAR 1:5

3

ISCWO SHELTER & SKID

SCALE 1:5

LEGEND

SECONDARY CONTAINMENT

PIPING SECONDARY CONTAINMENT
(SEE DRAWING C-04A)

GENERAL NOTES:

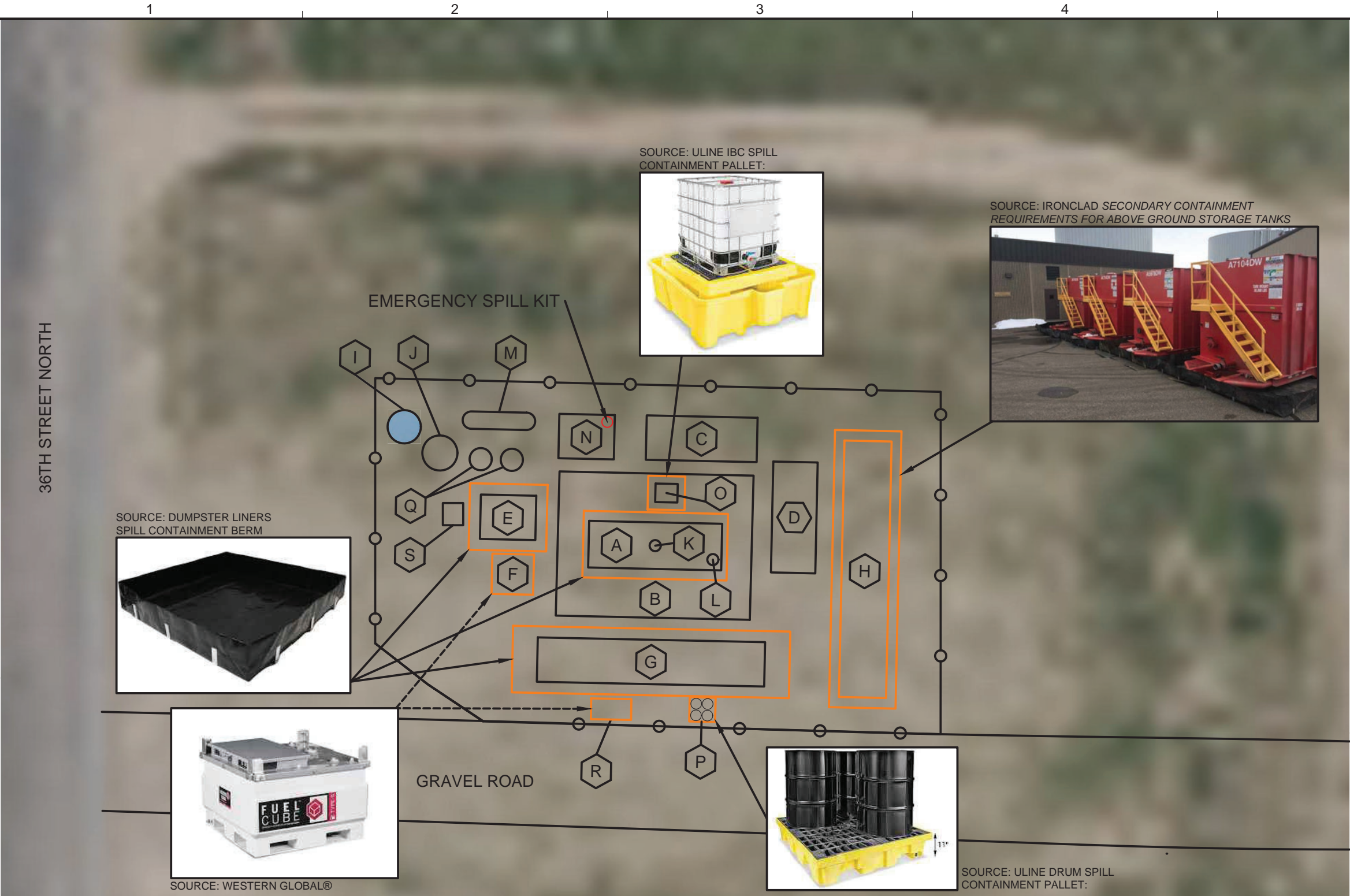
1. ISCWO SHELTER WILL BE CERTIFIED TO WITHSTAND WIND SPEEDS OF 115 MPH

2. ISCWO SHELTER WILL BE 35' LONG X 26' WIDE X 20' TALL (AT THE EDGES)

3. ISCWO SKID WILL BE 24' LONG X 8.4' WIDE X 12.5' TALL (EXCLUDING STACKS)

4. TOP OF ISCWO STACKS WILL CLEAR THE ISCWO SHELTER ROOF BY APPROXIMATELY 1 TO 2 FEET

IMAGE SOURCE: BULLDOG STEEL STRUCTURES



ID	DESCRIPTION
A	ISCWO SKID
B	ISCWO SHELTER (W/CONCRETE FOUNDATION)
C	HIGH PRESSURE AIR COMPRESSOR (HPAC)
D	OFFICE/CONTROL ROOM (SHIPPING CONTAINER)
E	FEED MATERIAL STORAGE (8' X 10' SHIPPING CONTAINER)
F	DOUBLE WALLED DIESEL AST (1,000-GAL)
G	DIESEL GENERATOR
H	DOUBLE WALLED EFFLUENT FRAC TANK (18,430-GAL)
I	INFLUENT WATER TANK (1,000-GAL)
J	WATER SOFTENER VESSEL
K	PRE-HEATER EXHAUST STACK (12" DIA)
L	ISCWO EXHAUST STACK (12" DIA)
M	PROPANE TANK (500-GAL)
N	8' X 10' SHIPPING CONTAINER (WORK BENCH/TOOL STORAGE)
O	10% NAOH (275-GAL TOTE)
P	DIESEL EXHAUST FLUID (55-GAL DRUMS)
Q	ACTIVATED CARBON OR RESIN VESSELS FOR PRE-TREATMENT (IF NEEDED)
R	DOUBLE WALLED DIESEL AST (500-GAL)
S	PORT-A-POTTY

LEGEND

- TEMPORARY FENCE LINE
- SECONDARY CONTAINMENT
- EMERGENCY SPILL KIT

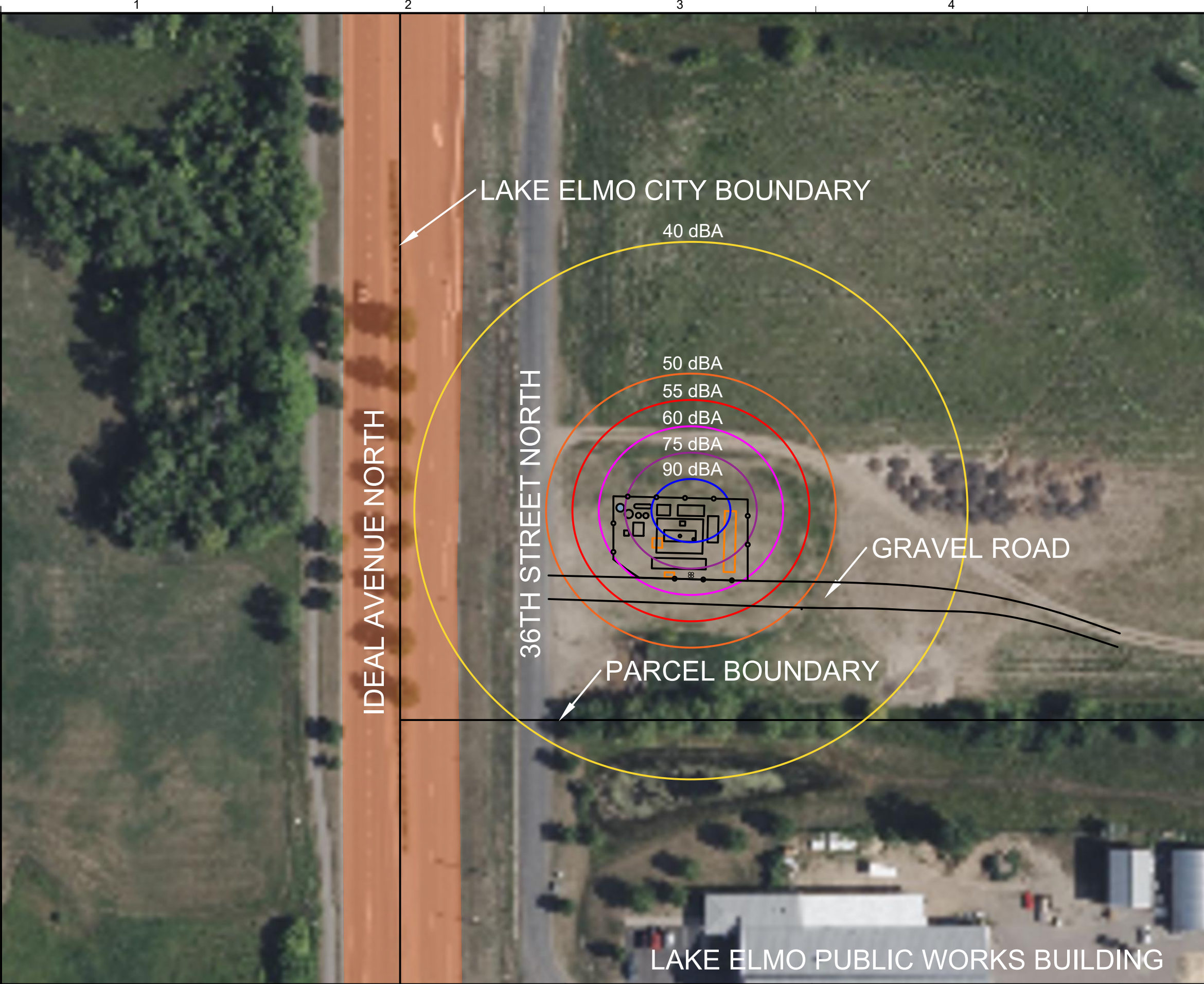
SCALE BAR 1:20

0 20' 40'

GENERAL NOTES:

- GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
- SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
- TEMPORARY FENCE LINE CONSISTS OF 12' LONG BY 6' TALL SEGMENTS SUPPORTED BY ABOVEGROUND STANDS
- 6,000 LB, DIESEL FORKLIFT WITH PNEUMATIC TIRES TO MOVE EQUIPMENT AND CHEMICAL DELIVERIES
- THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO.
- REFERENCE DRAWING C-04A FOR SECONDARY CONTAINMENT OF PIPING
- THE ISCWO SKID, FEED MATERIAL STORAGE, EFFLUENT FRAC TANK, AND GENERATOR WILL BE SURROUNDED BY CONTAINMENT BERMS
- THE WORK BENCH/TOOL STORAGE SHIPPING CONTAINER WILL CONTAIN A SPILL KIT FOR CONTAINING/RECOVERING RELEASES
- SOME SECONDARY CONTAINMENT OPTIONS ARE CONTAINMENT BERMS, WHICH COLLECT RAINWATER DURING STORM EVENTS. BAY WEST WILL REMOVE WATER FROM CONTAINMENT BERMS DAILY AND PUMP THAT ACCUMULATED WATER INTO THE EFFLUENT FRAC TANK.

IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS



LEGEND

40 dBA NOISE CONTOUR

50 dBA NOISE CONTOUR

55 dBA NOISE CONTOUR

60 dBA NOISE CONTOUR

75 dBA NOISE CONTOUR

> 90 dBA NOISE CONTOUR

50 TO 54.9 dBA NOISE AREA PER USDOT NATIONAL TRANSPORTATION NOISE MAP APPLICATION

GENERAL NOTES:

1. BAY WEST DOES NOT EXPECT THE ISCWO EQUIPMENT TO EXCEED THE LAKE ELMO SOUND ORDINANCE (LAKE ELMO CITY CODE 13.00.080) OF AN INCREASE IN SOUND GREATER THAN SIX DECIBELS ABOVE THE AMBIENT NOISE AT THE PROPERTY LINE (DRAWING C-06). BAY WEST ASSUMED THE PROPERTY LINE AS THE WEST SIDE OF IDEAL AVENUE NORTH DUE TO REGULAR TRAFFIC NOISE DURING NORMAL WORKING HOURS. ACCORDING TO THE USDOT NATIONAL TRANSPORTATION NOISE MAP APPLICATION, IDEAL AVENUE NORTH GENERATES APPROXIMATELY 50 TO 54.9 dBA ON AVERAGE OVER A 24-HOUR PERIOD. PREVIOUS NOISE TESTS OF THE ISCWO SYSTEM SUGGEST THAT THE GENERATED NOISE LEVEL AT THE PROPERTY LINE WILL BE LESS THAN 40 dBA. THE ADDITION OF THE ISCWO SYSTEM NOISE TO THE IDEAL AVENUE NORTH NOISE DOES NOT RESULT IN AN INCREASE GREATER THAN SIX DECIBELS ABOVE THE AMBIENT NOISE AT THE PROPERTY LINE PER THE LAKE ELMO SOUND ORDINANCE.

2. BAY WEST WILL ONLY OPERATE (INCLUDING THE GENERATOR, ISCWO SKID, AND HPAC) BETWEEN THE HOURS OF 7:00 AM TO 7:00 PM ON WEEKDAYS. THESE HOURS ARE SUBJECT TO CHANGE BASED ON NOISE MEASUREMENTS RESULTS BEFORE SYSTEM START UP

3. BAY WEST MIGHT USE A SMALLER GENERATOR TO POWER HEATING EQUIPMENT OVERNIGHT

4. NOISE CONTOURS CENTERED AROUND THE HIGH PRESSURE AIR COMPRESSOR (HPAC)

5. NOISE CONTOURS DO NOT TAKE INTO ACCOUNT LOCAL SITE FEATURES (E.G. TREES)

6. NOISE MEASUREMENTS AT THE HPAC ARE APPROXIMATELY 120 dBA

7. NOISE MEASUREMENTS 10 FT FROM THE HPAC ARE APPROXIMATELY 110 dBA

8. NOISE MEASUREMENTS COLLECTED AT GENERAL ATOMICS' SAN DIEGO FACILITY WITH THEIR DEMO AIR COMPRESSOR UNIT

9. THE USDOT NATIONAL TRANSPORTATION NOISE MAP APPLICATION NOISE USES A 24-HR EQUIVALENT, A-WEIGHTED SOUND LEVEL NOISE METRIC. THE METRIC REPRESENTS THE APPROXIMATE AVERAGE NOISE OVER A 24-HR PERIOD.

10. DURING SYSTEM OPERATIONS, HEARING PROTECTION WILL BE REQUIRED WHILE OUTSIDE THE MOBILE OFFICE.

11. PARCEL BOUNDARY OBTAINED FROM WASHINGTON COUNTY PROPERTY MAP

12. GRAVEL ROAD LOCATION DATA GATHERED WITH A EOS ARROW GOLD GPS UNIT

13. THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO

IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

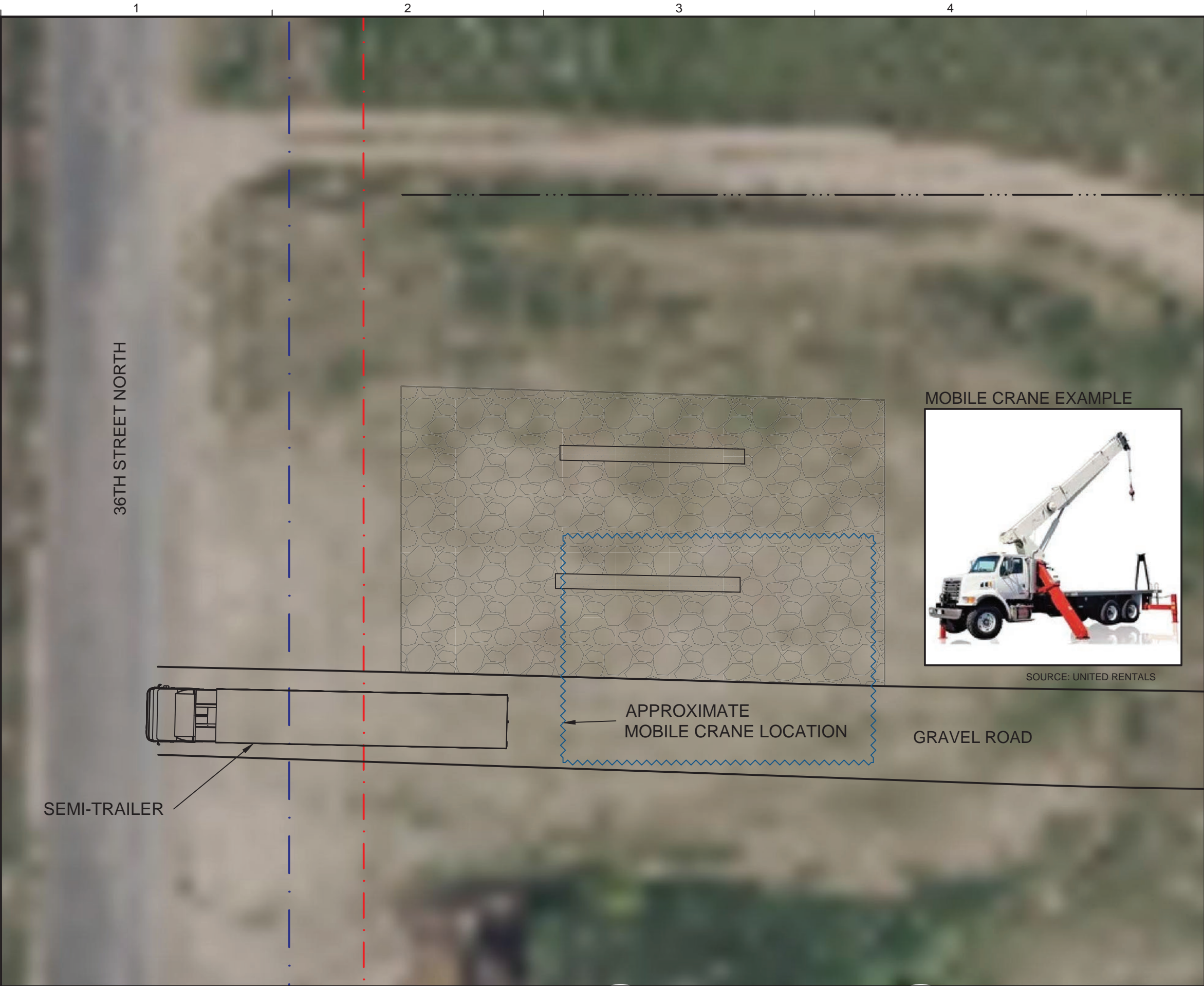
075'150'

SCALE BAR 1:75

W N E

S

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	<div><div></div><div>Bay West</div></div>	ERDC PFAS DESTRUCTION RESEARCH PHASE II 3445 IDEAL AVE N, LAKE ELMO, MN	NOISE MAP	DESIGN	JRC	DATE	SHEET	C-06
									DRAWN BY	JRC	1/28/25	DWG NO.	ERDC C-06
									CHECKED BY	ERW	1/28/25	DATE	1/28/2025
									APPROVED BY	ATJ	1/28/25	PROJ. NO.	J230044



LEGEND

LAKE ELMO WATER MAIN (12" DIA, DIP)

15' OFFSET FROM LAKE ELMO WATER MAIN

SITE LIMITS

SITE GRAVEL PAD

CONCRETE FOUNDATION FOR ISCWO SHELTER

GENERAL NOTES:

- EQUIPMENT STAGING WILL INCLUDE A MOBILE CRANE WHICH WILL UNLOAD THE ISCWO SKID AND HIGH PRESSURE AIR COMPRESSOR.
- BAY WEST WILL SETUP TEMPORARY FENCE AFTER EQUIPMENT STAGING
- GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
- LAKE ELMO WATER MAIN LOCATION OBTAINED FROM A DRAWING PROVIDED BY THE CITY OF LAKE ELMO PUBLIC WORKS DEPARTMENT
- SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
- THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO

IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

N

W

E

S

0

20'

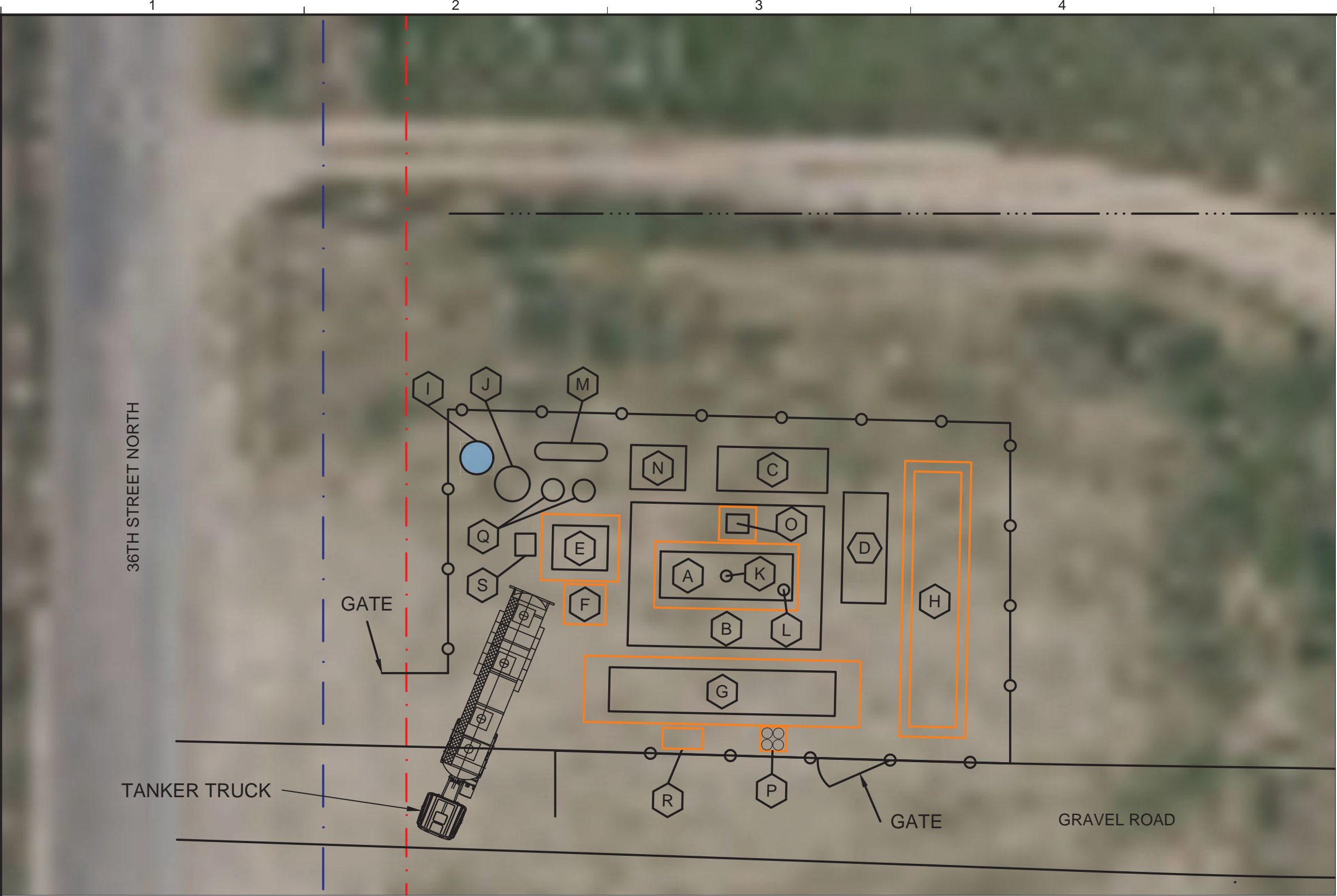
40'

SCALE BAR 1:20

MOBILE CRANE EXAMPLE

SOURCE: UNITED RENTALS

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	<div><div></div><div>Bay West</div></div>		ERDC PFAS DESTRUCTION RESEARCH PHASE II 3445 IDEAL AVE N, LAKE ELMO, MN		EQUIPMENT LOADING & UNLOADING AREAS		DESIGN	JRC	DATE	SHEET	C-07
												DRAWN BY	JRC	1/13/25	DWG NO.	ERDC C-07
												CHECKED BY	ERW	1/13/25	DATE	1/13/2025
												APPROVED BY	ATJ	1/13/25	PROJ. NO.	J230044



ID	DESCRIPTION
A	ISCWO SKID
B	ISCWO SHELTER (W/CONCRETE FOUNDATION)
C	HIGH PRESSURE AIR COMPRESSOR (HPAC)
D	OFFICE/CONTROL ROOM (SHIPPING CONTAINER)
E	FEED MATERIAL STORAGE (8' X 10' SHIPPING CONTAINER)
F	DOUBLE WALLED DIESEL AST (1,000-GAL)
G	DIESEL GENERATOR
H	DOUBLE WALLED EFFLUENT FRAC TANK (18,430-GAL)
I	INFLUENT WATER TANK (1,000-GAL)
J	WATER SOFTENER VESSEL
K	PRE-HEATER EXHAUST STACK (12" DIA)
L	ISCWO EXHAUST STACK (12" DIA)
M	PROPANE TANK (500-GAL)
N	8' X 10' SHIPPING CONTAINER (WORK BENCH/TOOL STORAGE)
O	10% NAOH (275-GAL TOTE)
P	DIESEL EXHAUST FLUID (55-GAL DRUMS)
Q	ACTIVATED CARBON OR RESIN VESSELS FOR PRE-TREATMENT (IF NEEDED)
R	DOUBLE WALLED DIESEL AST (500-GAL)
S	PORT-A-POTTY

LEGEND

- LAKE ELMO WATER MAIN (12" DIA, DIP)
- 15' OFFSET FROM LAKE ELMO WATER MAIN
- TEMPORARY FENCE LINE
- SITE LIMITS
- SECONDARY CONTAINMENT

- GENERAL NOTES:
- DELIVERIES INCLUDE: DIESEL FOR THE ISCWO SKID AND GENERATOR, ISCWO FEED MATERIAL, SODIUM HYDROXIDE, PROPANE, WATER SOFTENER TANK(S), ACTIVATED CARBON VESSEL TANKS (IF NEEDED), PORT-A-POTTY MAINTENANCE, AND DEF FOR THE GENERATOR
 - DELIVERIES WILL ALWAYS REQUIRE A SPOTTER FOR THE DELIVERY VEHICLES
 - HIGH VISIBILITY CONES WILL BE PLACED AROUND THE DIESEL AST
 - GRAVEL ROAD, FIRE HYDRANT, AND SITE LIMIT LOCATIONS GATHERED WITH A EOS ARROW GOLD GPS UNIT
 - LAKE ELMO WATER MAIN LOCATION OBTAINED FROM A DRAWING PROVIDED BY THE CITY OF LAKE ELMO PUBLIC WORKS DEPARTMENT
 - SITE LIMITS DEFINED BY A CORNFIELD TO THE NORTH AND A SOIL STORAGE AREA TO THE EAST
 - THE BASEMAP IMAGERY OF THE SITE DOES NOT INCLUDE A GRAVEL ROAD INSTALLED BY THE CITY OF LAKE ELMO
- IMAGE SOURCE: MICROSOFT BING, 2024 MICROSOFT CORPORATION, 2024 MAXAR, CNES (2024) DISTRIBUTION AIRBUS DS

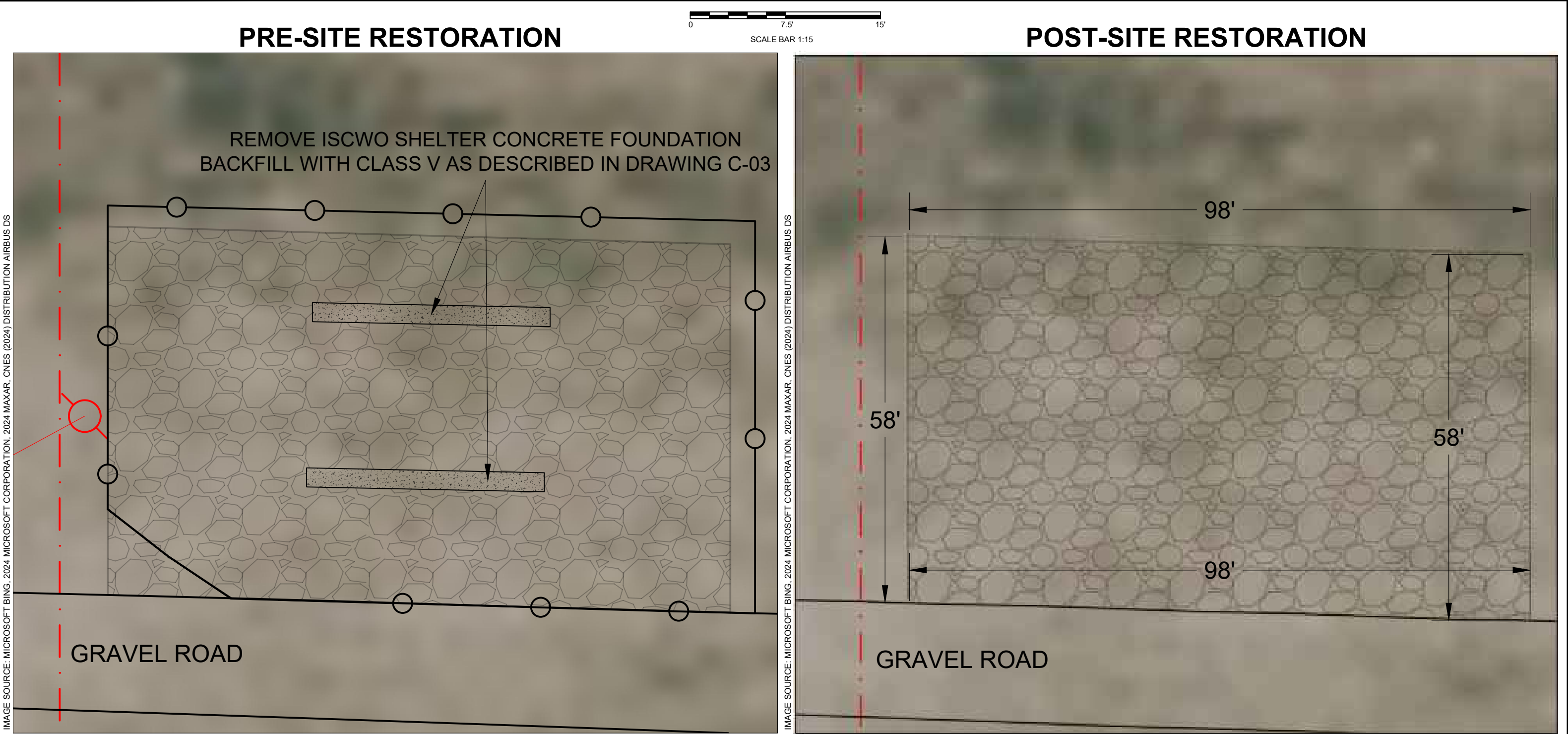
REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



ERDC PFAS DESTRUCTION RESEARCH
PHASE II
3445 IDEAL AVE N, LAKE ELMO, MN

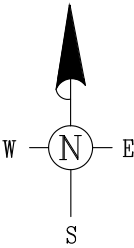
DELIVERY LOADING &
UNLOADING AREAS

DESIGN	JRC	DATE	SHEET	C-08
DRAWN BY	JRC	1/13/25	DWG NO.	ERDC C-08
CHECKED BY	ERW	1/13/25	DATE	1/13/2025
APPROVED BY	AJT	1/13/25	PROJ. NO.	J230044



ADDITIONAL SITE RESTORATION TASKS:

1. REMOVE EQUIPMENT & MATERIALS AS SHOWN IN DRAWING C-01
2. REMOVE LEFTOVER FEED MATERIAL, DIESEL, DEF, NAOH, AND ISCWO LIQUID EFFLUENT, FOR OFFSITE DISPOSAL
3. REMOVE TEMPORARY POWER INFRASTRUCTURE, IF NEEDED
4. REMOVE SILT FENCING, IF NEEDED
5. DISCONNECT FROM LAKE ELMO FIRE HYDRANT AND RESTORE TO ORIGINAL CONDITION
6. REMOVE TEMPORARY FENCE AND GATES
7. RESTORE GRASSY VISITOR PARKING AREAS ALONG 36TH STREET NORTH TO PRE-WORK CONDITIONS WITH HYDROSEED, IF NEEDED



LEGEND

- 15' OFFSET FROM LAKE ELMO WATER MAIN

W

WATER FEED LINE (ABOVE GRADE)

PROPOSED TEMPORARY OVERHEAD
ELECTRIC LINE (IF NEEDED)

PROPOSED TEMPORARY POWER POLE
(IF NEEDED)

SITE GRAVEL PAD

ISCWO SHELTER CONCRETE FOUNDATION
- | | | | | | | | | | | | | | |
|-----|------|----------------------|----|-----|-------------|---|---|------------------|--------|---------|-----------|-----------|------|
| REV | DATE | REVISION DESCRIPTION | BY | CHK | APP | <div><div></div><div>Bay West</div></div> | ERDC PFAS DESTRUCTION RESEARCH
PHASE II
3445 IDEAL AVE N, LAKE ELMO, MN | SITE RESTORATION | DESIGN | JRC | DATE | SHEET | C-10 |
| | | | | | DRAWN BY | | | | JRC | 1/28/25 | DWG NO. | ERDC C-10 | |
| | | | | | CHECKED BY | | | | ERW | 1/28/25 | DATE | 1/28/2025 | |
| | | | | | APPROVED BY | | | | PBD | 1/28/25 | PROJ. NO. | J230044 | |

City of Lake Elmo Site Access Request

3445 Ideal Avenue

Bay West
General Atomics
US Army ERDC



February 4, 2025

Our Request

Purpose: Field testing of PFAS materials destruction using iSCWO Technology

Why the 3445 Ideal Ave location?

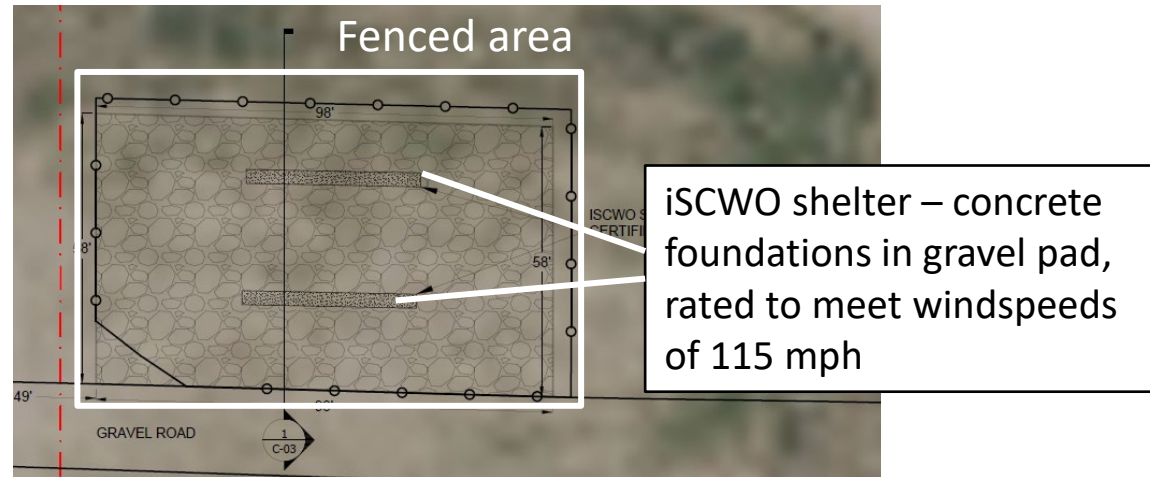
Community & State concerns with PFAS; testing to demonstrate system's destruction at field scale

Request Overview

- Temporary use of < 6000 sq ft area, located north of Public Works HQ
- Costs to City: None, the project is Gov't funded research
- Terms: Bay West and City "Temporary Easement & Access Agreement" defines Bay West and City roles & responsibilities

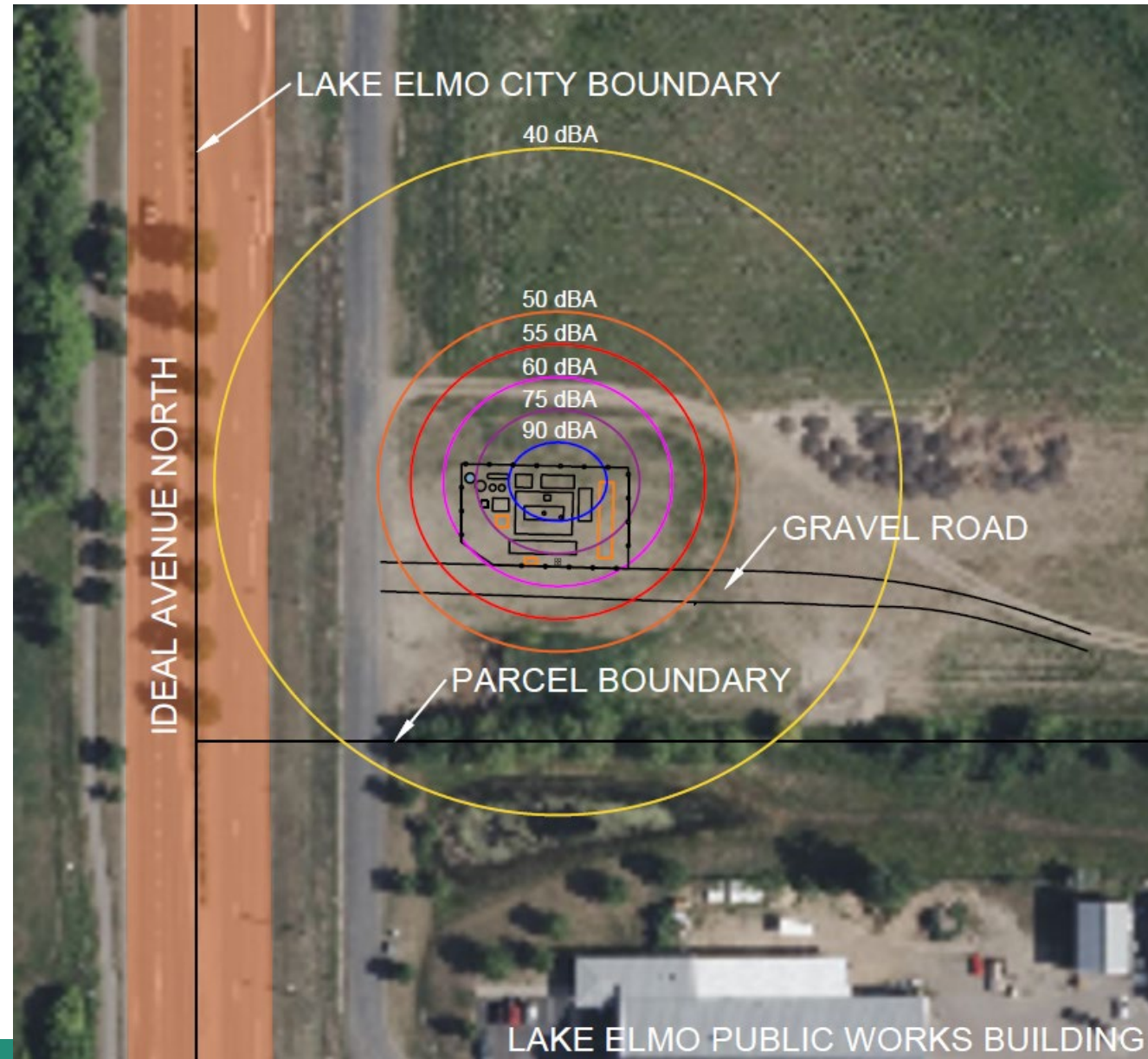
Safety

- Bay West manages all projects with H&S Plan, AHA reviews, and in-depth training of all employees
- General Atomics' system developed and sold for over 30 years that meets highest standards – excellent safety record
- **Onsite:** safety fence and signage, Bay West escort for all visitors
- **City access:** BW will coordinate with and ensure City's PWD access throughout testing



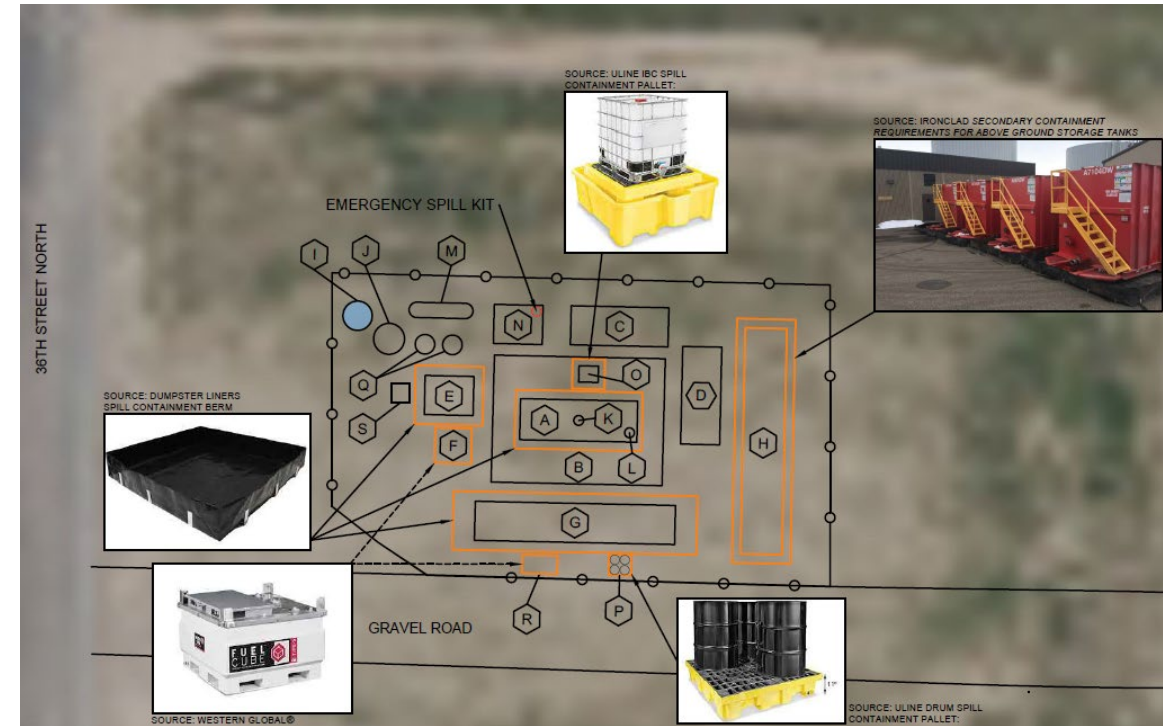
Noise

- Noise measurements by General Atomics
- All structures are outside 40 dBA perimeter.
- Hearing protection required during onsite operations
- Edge of closest neighborhood (road) is 1,000 feet to the west



Materials Storage & Removal

- All site activities coordinated and defined by test plans and procedures
- All materials are shipped and stored in material-specific, approved containers
- Secondary containment throughout
- Aboveground permit for temporary diesel fuel tank, other permits listed in “Temporary Easement & Access Agreement”



Prevention/Mitigation of Potential Spills— first, manage transport and temporary storage to avoid spills. In the case of a spill, Bay West is a Great Lakes Region recognized expert in spill containment and cleanup. Bay West is responsible for cleanup and site restoration to existing site conditions.

Site Restoration: by City request, leave gravel pad



Now: Google imagery 2025

After test completion: Remove equipment, containers, fence. Leave gravel pad in place.



More on Safety and Quality, Our Top Priorities

Safety

- ✓ GA iSCWO system has been extensively tested and approved by ASME pressure vessel codes
- ✓ HAZOP (Hazardous Operations) reviews met every review; safety studies; pressure calculations
- ✓ 40-hour OSHA HAZWOPER and GA system operations training
- ✓ PFAS sampling and waste handling follow Bay West Site Health & Safety Plan requirements and procedures
- ✓ Operations for over 30 years without incident

Examples of Quality Controls

- ✓ General Atomics' SCWO unit meets ISO-9001 requirements
- ✓ Analytical sample results reviewed and validated



Considerations

Technology? Materials are destroyed using supercritical water oxidation (SCWO) which breaks C-F bonds at high temp and pressure in water to produce CO₂, water, inorganic salts

Volume destroyed? about 300-500 gallons of PFAS materials

How long onsite? 4-5 weeks, including system check, equipment staging, testing, and site restoration

- Typical day: 1 hour warm up, 5-6 hrs testing, 1 hour shutdown

Considerations cont'd

How is water managed?

- Similar to the Tablyn Park SAFF® study
- Onsite, temporary storage using tanks in secondary containment
- Test, analysis and then determine best disposal options

Noise management? 40 dBA at the middle of Ideal Avenue ~ sound of refrigerator engine hum

Public outreach?

- Tours will be made available 1x/week to the public at a safe distance
- Possible visits by DoD, MPCA, industry, Congressional staff and other Government agencies
- Test results will be made public through conference presentations and research papers

City and State Benefits

- Proactive demonstration of PFAS destruction as an option now
- Tablyn Park, advance from removing PFAS from water to PFAS destruction. Removes potential future contamination.
- Field deployment of iSCWO aligns with regional PFAS remediation targets
- Supports City's leadership and outreach about PFAS programs
- Supports US test programs to identify best method to destroy PFAS waste

