



# Certificate of Appropriateness For a Building Permit Administrative Review

On August 7, 2024, the Tennessee Technology Corridor Development Authority, hereinafter referred to as the Authority, did grant to Ellen Reeves Oak Ridge National Laboratory,, hereinafter referred to as the Applicant, on its application filed on August 6, 2024 with Application No. 9-A-24-TOA, this Certificate of Appropriateness for the following described property, 2360 Cherahala Blvd. / Parcel ID 103 E A 01602. This Certificate of Appropriateness is granted to the Applicant for the purpose of a Building Permit. The Applicant agrees that it will comply with all base zoning requirements, all Technology Overlay Zone requirements, the Design Guidelines and the Comprehensive Development Plan in its use of this property, unless specifically varied or altered by the Authority.

This Certificate of Appropriateness will automatically expire three years from the date of the affirmative vote of this Certificate, unless an extension of the Certificate is granted by the Authority upon the request of the Applicant, if construction of the structure or structures on the property has not reached fifty percent (50%) of completion at the end of that three year period.

The Applicant does hereby agree that staff and/or members of the Knox County governmental entities, or the Authority, shall have access to the property at reasonable times to inspect the same for compliance with the requirements of state and local laws and this Certificate of Appropriateness.

The structure or structures to be erected on this property will be erected according to the approved and accepted plans and specifications attached to this Certificate as Attachment No. One, and any changes thereto approved and accepted by the Applicant and the Authority.

**APPLICATION APPROVED August 7, 2024, pursuant to Article VIII, Section 7 of the Administrative Rules and Procedures of the Tennessee Technology Corridor Development Authority (Staff Review and Approval of Minor Changes to Previously Approved Applications), for a Certificate of Appropriateness subject to the following conditions:**

- 1) Meeting all relevant requirements of the Knoxville Zoning Ordinance, as appropriate.**
- 2) Providing privacy fence slats to the existing chain link fence in accordance with the code requirement of the National Fire Protection Association (NFPA 2) related to Hydrogen Technologies, in a dark or subdued color.**

By its signature hereunto, the Applicant binds itself to all terms and conditions hereof, both for itself, its heirs, and its successors in interest.

TENNESSEE TECHNOLOGY CORRIDOR DEVELOPMENT AUTHORITY

BY:

Chair

N/A (administrative review)

Attested to by

*Michelle Foster*

Approval date: 8/7/2024

COA expiration date (3 years): 8/7/2027

# Final Design for the ORNL Hydrogen and Locomotive Engine Support Infrastructure for 2360HVC - NTRC

Dean Edwards, Scott Curran,  
Ellen Reeves, Austin Parkison  
Oak Ridge National Laboratory

June 2024

ORNL is managed by UT-Battelle LLC for the US Department of Energy

APPROVED BY  
TENNESSEE TECHNOLOGY CORRIDOR  
DEVELOPMENT AUTHORITY  
Meeting Date: 8/7/2024  
(administrative approval)

## Contents

- Overview of project and updates since last meetings to review the initial design
- Start and end dates and the plan to limit visibility/impact to campus appearance
- Site plan showing location of work/placement - with complete detail in final stamped drawings
- Pictures of the area where the unit would be placed
- Picture/size of the model of any equipment that will be placed
- Statement of Work Document – supplemental document provided
- Final Stamped Drawings – provided digitally and 6 hard copies

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## Overview: 2360 HVC (NTRC) Infrastructure for Hydrogen Locomotive Engine

- US Department of Energy focus on hydrogen research for transportation, buildings and industrial use
- Proposed hydrogen infrastructure additions behind ORNL's National Transportation Research Center (NTRC) related to new DOE project in collaboration with WABTEC (GE Locomotive) who is making big investment at ORNL
- **Updates**
  - Preliminary review of plans by Knoxville TDC in June 2022, with go-ahead to complete design + updated plans shared in Dec 2022
  - Full design for hydrogen system and infrastructure completed by leading engineering firm in May 2024 that includes all safety systems meeting Knox County, ORNL and national codes/standards for hydrogen
  - **The final design matches the proposed layout proposed and all safety design requirements have been incorporated**

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## Project Details

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- **Project timing**
  - Start construction process as soon as approval is received
  - Construction will be completed within 6-9 months
- **Summary of special considerations in design to limit visibility/impact to campus appearance**
  - The final design matches the proposed visual layout initially proposed
  - Took the feedback on the overhead hydrogen line - final design has supply line within a trench to limit all visible impacts and removes overhead hazards to traffic
  - Fencing with slats around the tube trailer enclosure that match style of the existing awning
  - The hydrogen tube trailer moved back into the hillside to further minimize visual impact and to maintain drive lane for fire apparatus access as well as to not impact current traffic patterns
  - Removing existing infrastructure to have equipment go in similar place to minimize visual changes – minimal effort to restore any changes back to original visual appearance
- **The following slides show the proposed layout and summary of the final design**



Current view from Cherahala Blvd



Proposed – draft rendering

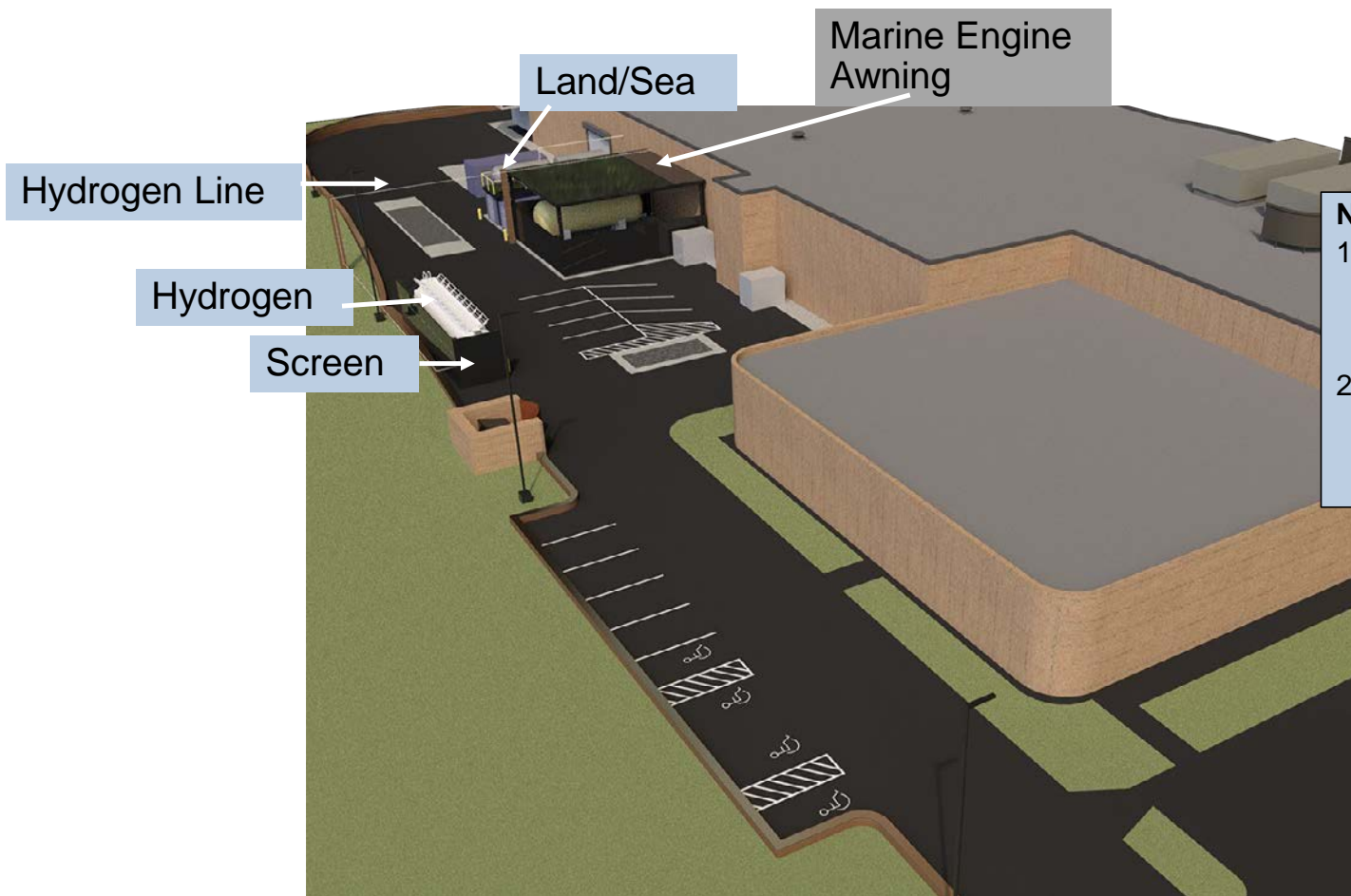
## Current Layout Behind NTRC Building

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**NTRC 2360HVC**

## Original Proposed Rendering of Site Plan with Layout

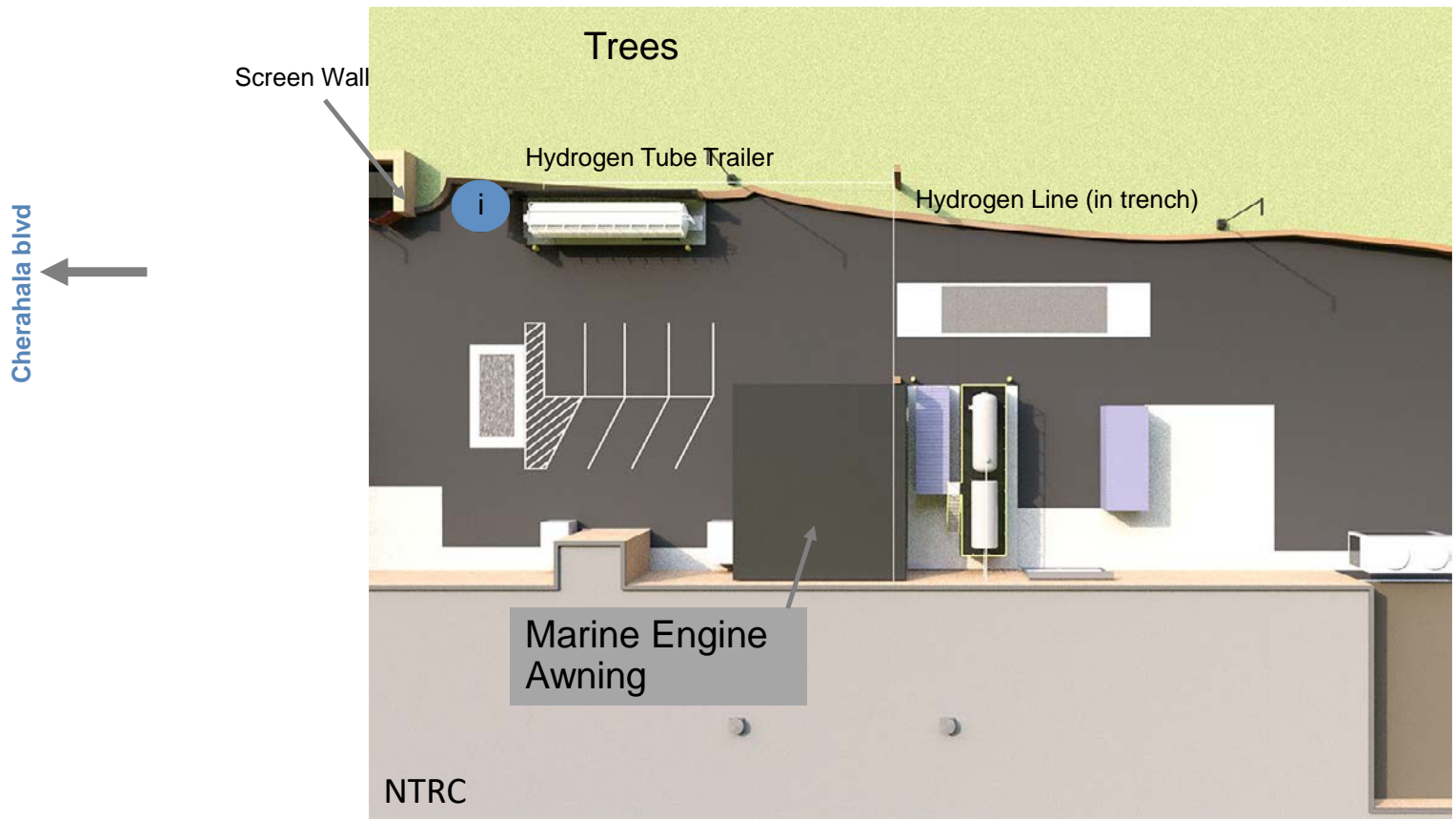


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### Notes

1. Screening material around hydrogen supply will match the bronze screening used for the awning
2. Concrete pad for supporting hydrogen tube trailer will match the visual of the other concrete pads in area

# Top View Rendering for the original proposed layout (2022)



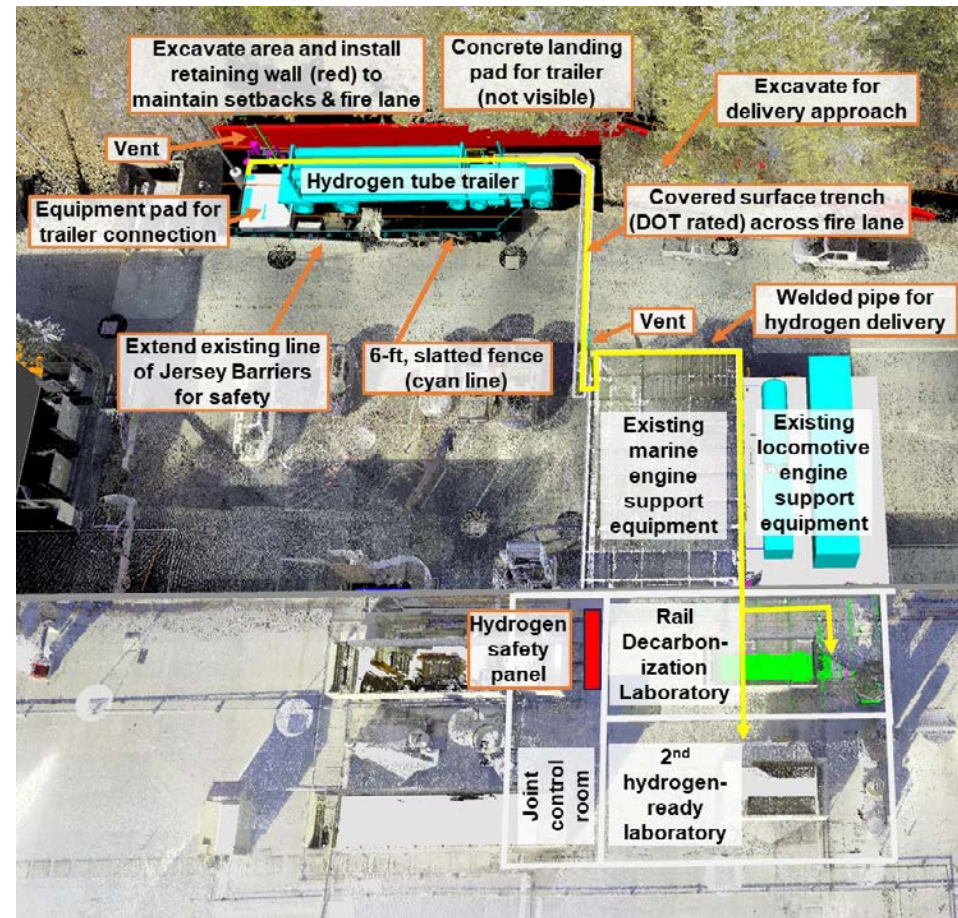
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# Hydrogen infrastructure installation at NTRC

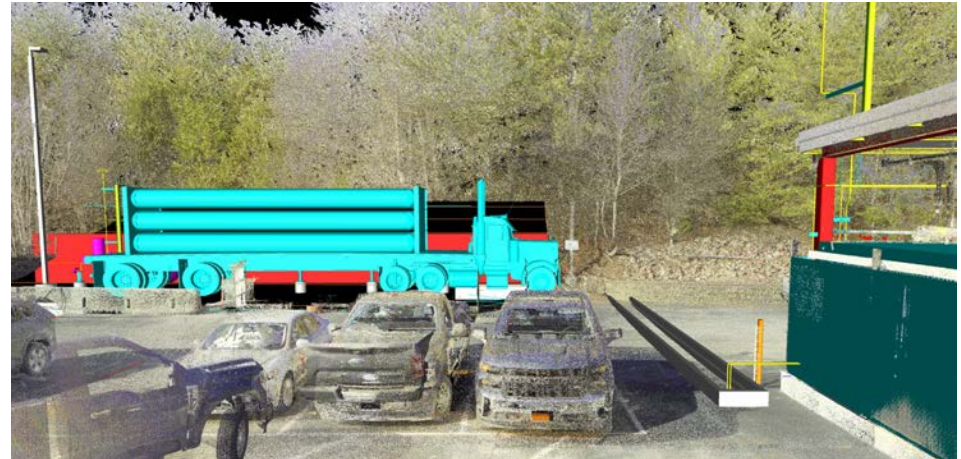
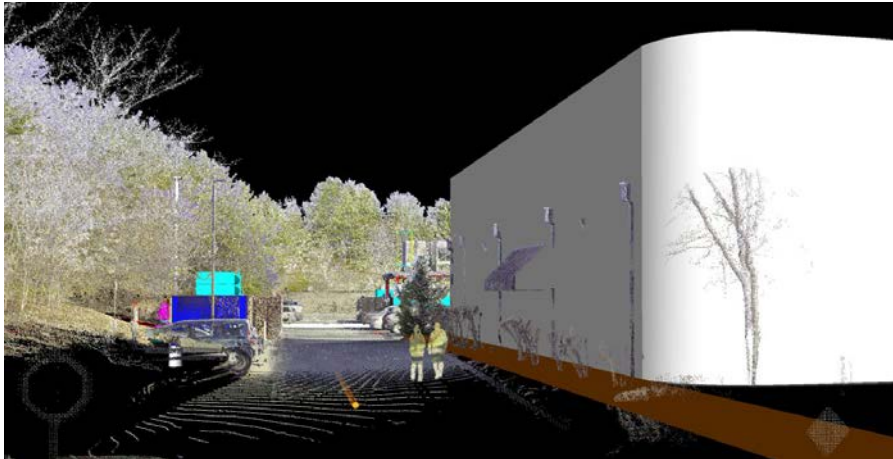
- **Tube trailers for hydrogen storage (vendor subcontract)**
  - Performed safety/code assessment to select trailer location
  - Tube trailer support pad replaces recently removed building to minimize visual impact
- **Hydrogen infrastructure installation tasks**
  - Install trailer storage location
    - Excavate area, install retaining wall
    - Install concrete landing pad and equipment pad
    - Additional Jersey Barriers and 6-ft fence
  - Install DOT-rated trench to route hydrogen piping and instrumentation across traffic areas (based on feedback from initial design review)
  - Install welded piping system to deliver hydrogen to laboratories
  - Install hydrogen safety and control systems
- **Details of installation in the statement of work provided (SOW)**

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CAD renderings of layout

## Additional views that overlay CAD designs from final drawings with laser scans of facility

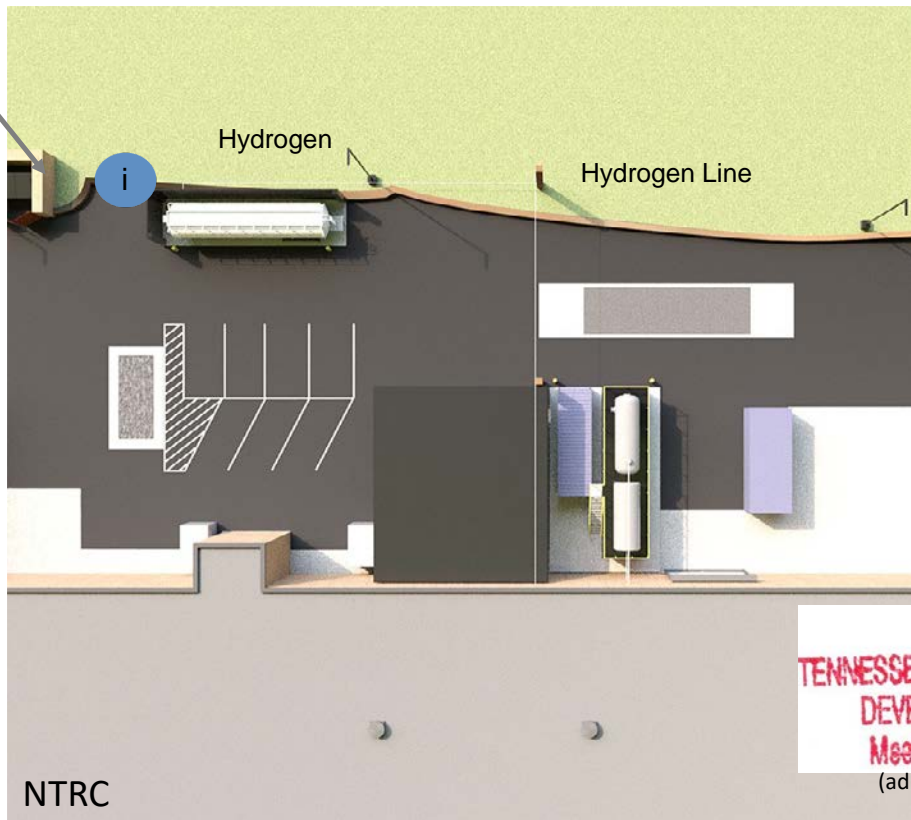


Note: The slatted fence around the trailer isn't shown in these renderings but will be installed for security and aesthetics

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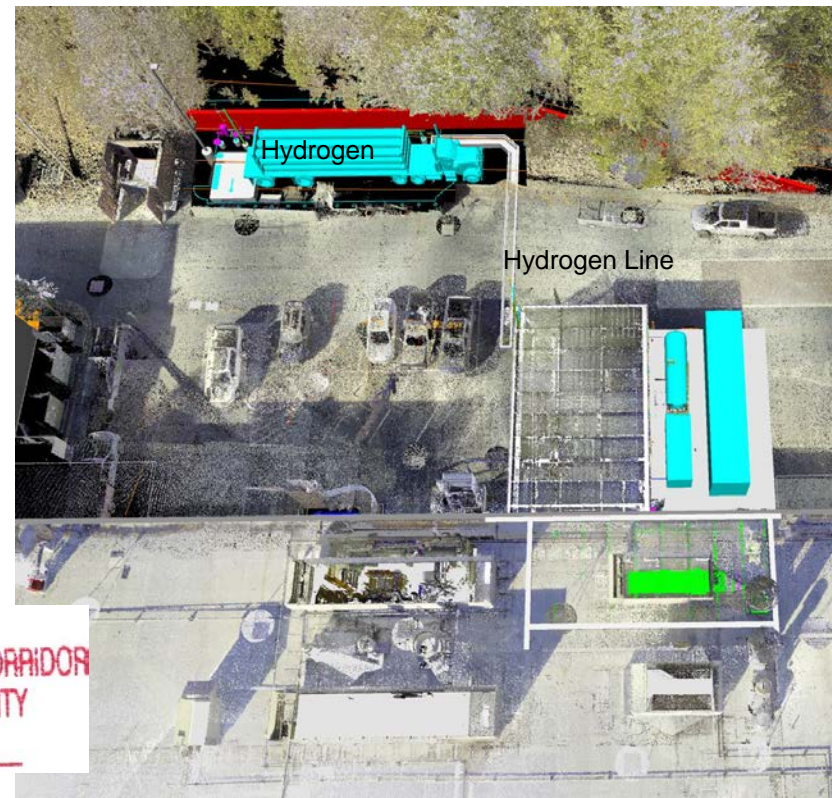
**Final design (right) matches what was proposed and reviewed in 2022**

Tube trailer pushed further back in final design to further minimize visual impact and to maintain drive lane for fire apparatus access as well as to not impact current traffic patterns



Preliminary design previously reviewed

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Final Design with hydrogen line buried in trench

## Items asked to be addressed by Knoxville TDC

1. Increasing the height of the elevated 1" steel pipe for hydrogen distribution;
2. Use of a highly visible color for the elevated pipe in order to alert drivers;
3. Inclusion of a support mechanism for the elevated pipe as it spans the distance of the paved area behind the building;
4. Investigate details of noise pollution generated from the proposed new air compressors including STC ratings at multiple distance intervals; and
5. Property restoration plan for when the project is completed.

Addressed by using the trench solution

Noise Rating 72-78 dB in specially designed enclosure

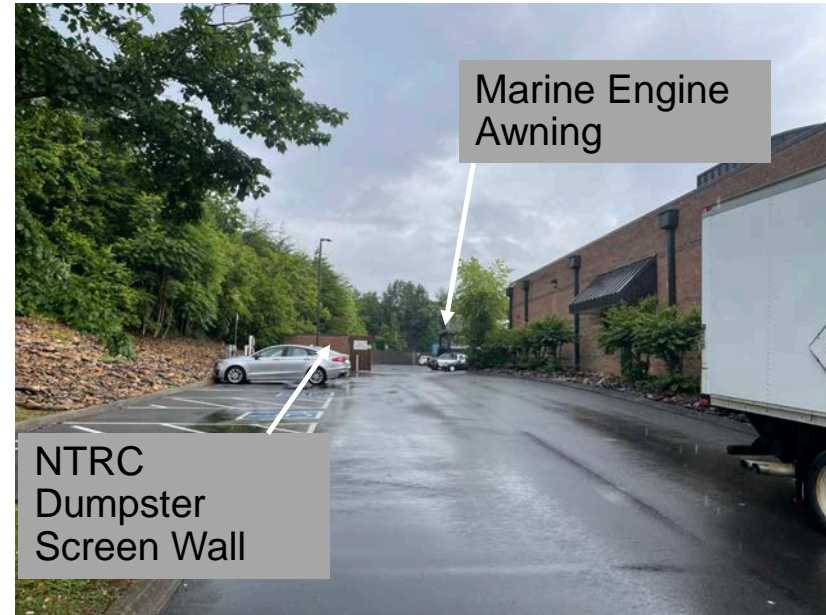
Design makes it very easy to remove equipment and have visual elements restored

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# Pictures of Site for Reference

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## Current view from Cherahala Blvd to “back” of NTRC (west side of 2360)



Closer view from behind NTRC

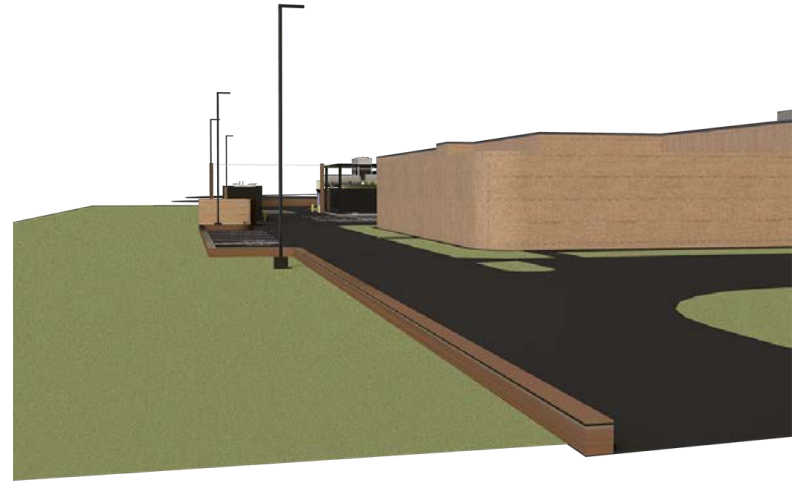
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## View from Cherahala Blvd

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Current view



Proposed – draft rendering

## Rendering with Tree Overlays

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Proposed rendering with current trees





- |  |  |  |
|--|--|--|
| <input type="checkbox"/> BUILDING PERMIT - NEW CONSTRUCTION        | <input type="checkbox"/> REZONING        | <input type="checkbox"/> ADMINISTRATIVE REVIEW |
| <input type="checkbox"/> BUILDING PERMIT - EXPANSION OR RENOVATION | <input type="checkbox"/> SIGNAGE         | <input type="checkbox"/> BOARD REVIEW          |
| <input type="checkbox"/> BUILDING PERMIT - GRADING PLAN            | <input type="checkbox"/> ZONING VARIANCE |  |

**PUBLISHED APPLICANT NAME** - *no individuals on behalf of -*

**9-A-24-TOA**

DATE FILED

MEETING DATE (IF APPLICABLE)

FILE NUMBER

## CORRESPONDENCE

*Correspondence related to this application will be directed to the contact listed below.*

- APPLICANT    OWNER    OPTION HOLDER    SURVEYOR    ENGINEER    ARCHITECT/LANDSCAPE ARCHITECT    ATTORNEY

NAME

COMPANY

ADDRESS

CITY

STATE

ZIP

PHONE

EMAIL

## CURRENT PROPERTY INFO

- MULTIPLE OWNERS / OPTION HOLDERS    PART OF PARCEL

**OWNER NAME** - *if different -*

**OWNER ADDRESS**

**OWNER PHONE/EMAIL**

**PROPERTY ADDRESS**

**PARCEL ID(S)**

**PART OF PARCEL? (Y/N)**

**TRACT SIZE**

## STAFF USE ONLY

<b>GENERAL LOCATION</b>		<input type="checkbox"/> CITY <input checked="" type="checkbox"/> COUNTY
Cherahala Blvd and Hardin Valley Rd		6
<b>ZONING</b>	<b>SECTOR PLAN LAND USE CLASSIFICATION</b>	<b>DISTRICT</b>
BP/TO	BP	
TP	Industrial	
<b>PLANNING SECTOR</b>	<b>EXISTING LAND USE</b>	

## REQUEST

### BUILDING PERMIT

- NEW CONSTRUCTION  
 EXPANSION OR RENOVATION  
 GRADING PLAN

- REZONING  
 SIGNAGE  
 ZONING VARIANCE

### PLAN MATERIALS:

- DEVELOPMENT PLAN  
 BUILDING ELEVATIONS  
 FLOOR PLAN  
 LANDSCAPE PLAN  
 SIGNAGE PLAN  
 OFF-STREET PARKING

OTHER:

WAIVERS OR VARIANCES REQUESTED?  YES  NO

ADMINISTRATIVE REVIEW:  LIGHTING  LANDSCAPING PLAN

## RENOVATION OR EXPANSION

SUMMARY OF WORK TO BE PERFORMED:

## ZONING VARIANCE

SUMMARY OF ZONING VARIANCE REQUEST:

## REZONING

REZONE FROM: \_\_\_\_\_

TO: \_\_\_\_\_

SECTOR PLAN AMENDMENT FROM: \_\_\_\_\_

TO: \_\_\_\_\_

## SIGNAGE

- YARD SIGN       BUILDING SIGN       OTHER SIGN  
 AREA: \_\_\_\_\_      AREA: \_\_\_\_\_      AREA: \_\_\_\_\_  
 HEIGHT: \_\_\_\_\_      HEIGHT: \_\_\_\_\_      HEIGHT: \_\_\_\_\_  
 FINISH: \_\_\_\_\_      FINISH: \_\_\_\_\_      TYPE: \_\_\_\_\_

## STAFF USE ONLY

<input type="checkbox"/> TTCDA Checklist <input type="checkbox"/> Property Owners/Option Holders	CODE	1106	CODE	TOTAL
	FEE	\$250	FEE	

## AUTHORIZATION

*By signing below*

*You certify that you are the property owner and/or authorized representative.*

*Theodore Kocak*

APPLICATION AUTHORIZED BY

AFFILIATION

DATE

PHONE NUMBER

EMAIL

*Whitney Warner*

STAFF SIGNATURE

PRINT NAME

DATE PAID