

# TUA Decision Process

***Navy/DLA will propose the best available practicable technology for a Tank Upgrade Alternative (TUA)  
EPA/DOH will then evaluate and make a determination***

**MARCH - JULY**

**AUGUST - SEPTEMBER**

**OCTOBER**

Open House to  
inform Public /  
Public feedback

Public Meeting  
for formal  
comments

**Navy/DLA Proposes Decision**

**EPA/DOH  
Reviews Decision**

**EPA/DOH  
Approves Decision**

**Brief  
Congress  
and  
Execute**

TUA Report: 6  
TUAs/  
18 Attributes

EV Tech Memo, 13 MWs,  
Seismic Study, Alternate  
Site Study, All other  
interim data/testing

If EPA/DOH  
Disapproves Decision

*\*Repeat Process At least Every  
Five (5) Years*



# TANK UPGRADE ALTERNATIVE (TUA) AND ALTERNATIVE LOCATION STUDY SUMMARY

*The TUA Report evaluated six alternatives (three single wall/three double wall) and the preliminary alternative location study identified a suitable site on Oahu*

TUA	Description	ROM Cost Per Tank (\$M)	Number of Tanks (% capacity)	Project End Date
1A	Restoration of Existing Tank	\$10-25	18 (100%)	2031
1B	Restoration of Existing Tank plus Interior Coating	\$25-100	18 (100%)	2037
1D	Remove existing Liner, Install New Steel Liner with Interior Coating	\$100-250	18 (100%)	2038
2A	Composite Tank (Double Wall) Carbon Steel, with Interior Coating	\$25-100	20 (88%)	2040
2B	Composite Tank (Double Wall) Stainless Steel	\$100-250	20 (88%)	2037
3A	Tank within a Tank (Carbon Steel), full Interior and Exterior Coating	\$100-250	20 (80%)	2038
Alt	New Tanks (Cut and Cover)	\$100-250	<u>40</u> (100%)	<u>2051</u>

## TUA Report

### Rated 18 attributes:

- Constructible
- Testable
- Inspectable
- Repairable
- Practicable
- Corrosion damage mechanism
- Successful implementation elsewhere
- Reliability
- Impact on storage volume
- Secondary containment
- Dependency on existing liner
- Release detection integral to construction
- Testing & Commissioning Procedures
- Pre-TIRM requirements
- Post-TIRM requirements
- Impact on Operations/ Maintenance
- Cost
- Duration

## Alternative Location Study

### Screened 12 sites that could meet the following requirements:

- Support JBPHH (Oahu)
- Energy Independent
- Secure (Cyber, Missile)
- Capacity
- EV Regulations

Preliminary Results: *Kapūkaki*

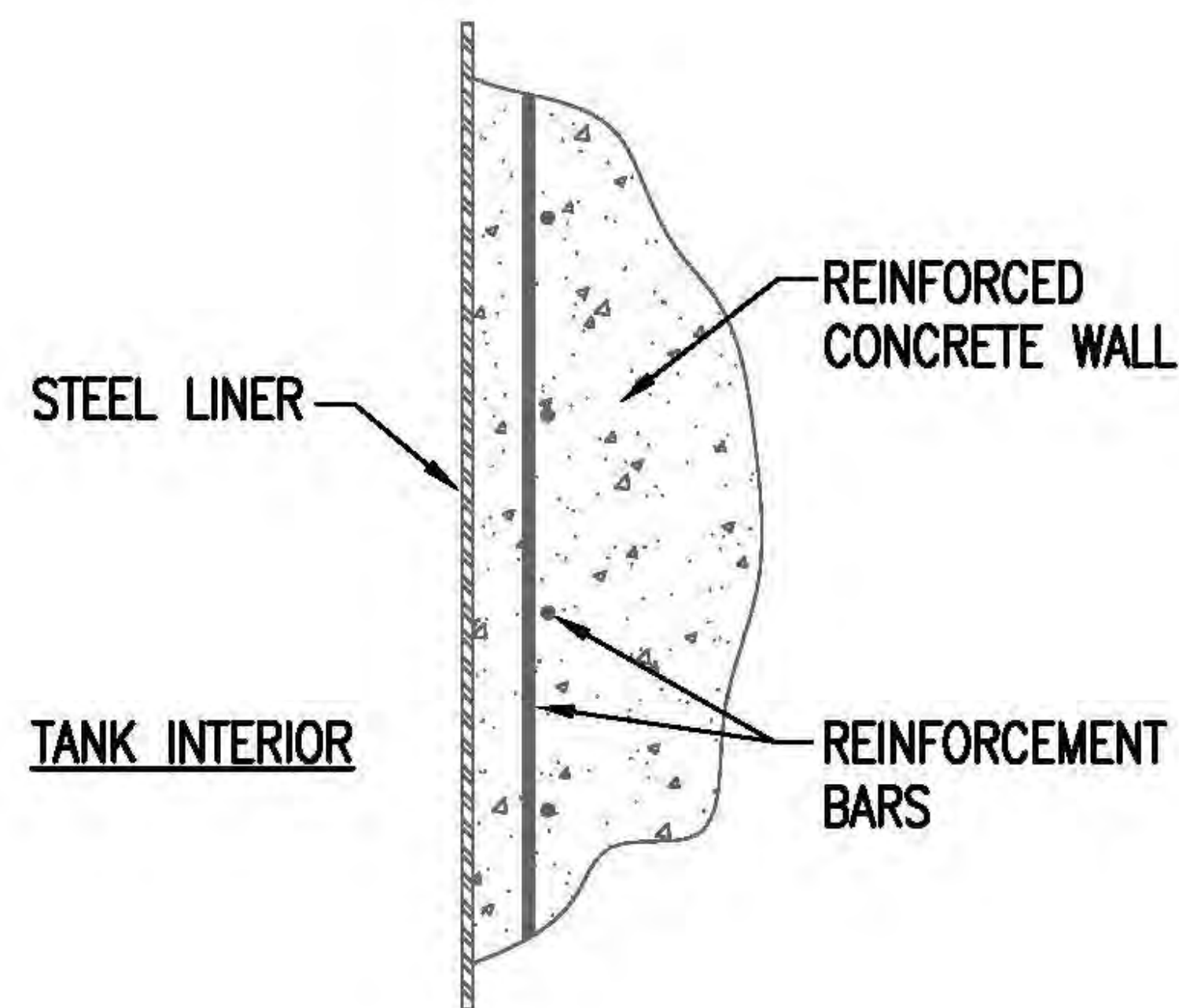
*Many factors have to be considered and weighted objectively when deciding on the best available practicable technology*



# Alternatives Construction Summary

*The TUA Report rated attributes for three single wall tank and three double wall tank upgrade variations.  
An Alternative Location Study is now complete for a double wall tank variant.*

## 1A – New TIRM



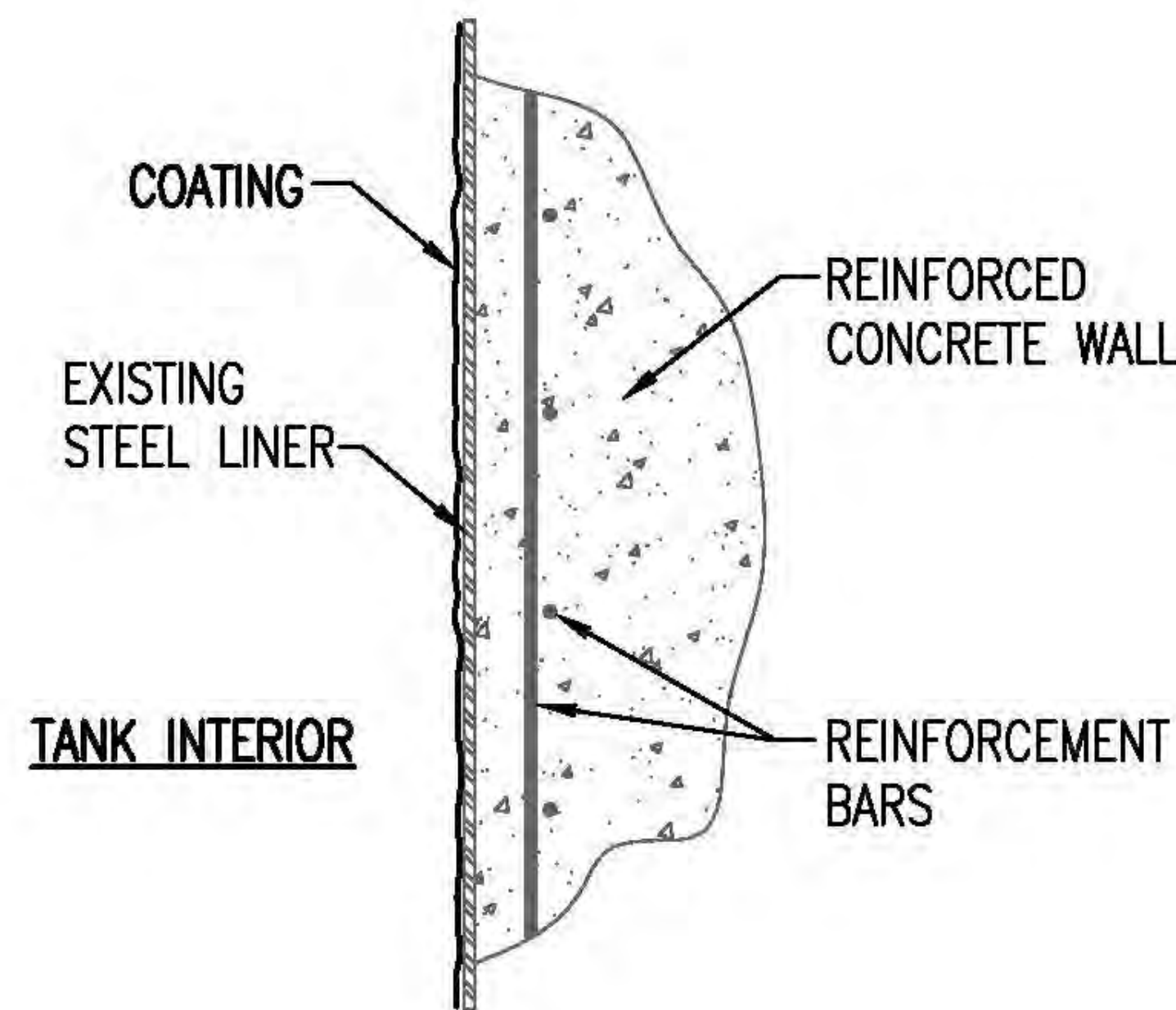
### Pros:

- Readily Inspectable
- Lowest Project Risk

### Cons:

- No secondary Containment

## 1B – 1A + Coating



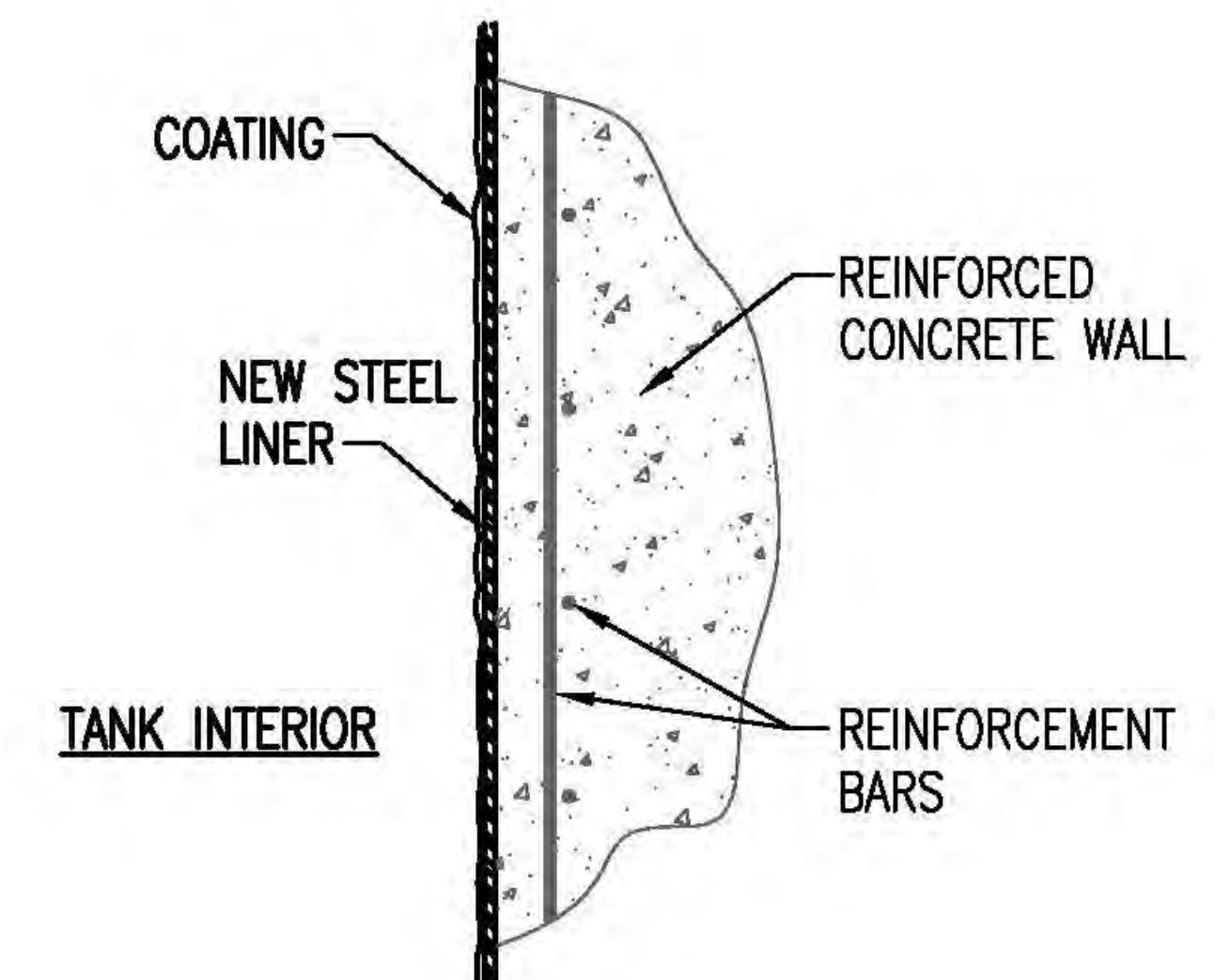
### Pros:

- Readily Inspectable
- Low Project Risk
- Additional barrier

### Cons:

- No secondary Containment

## 1D – New Liner



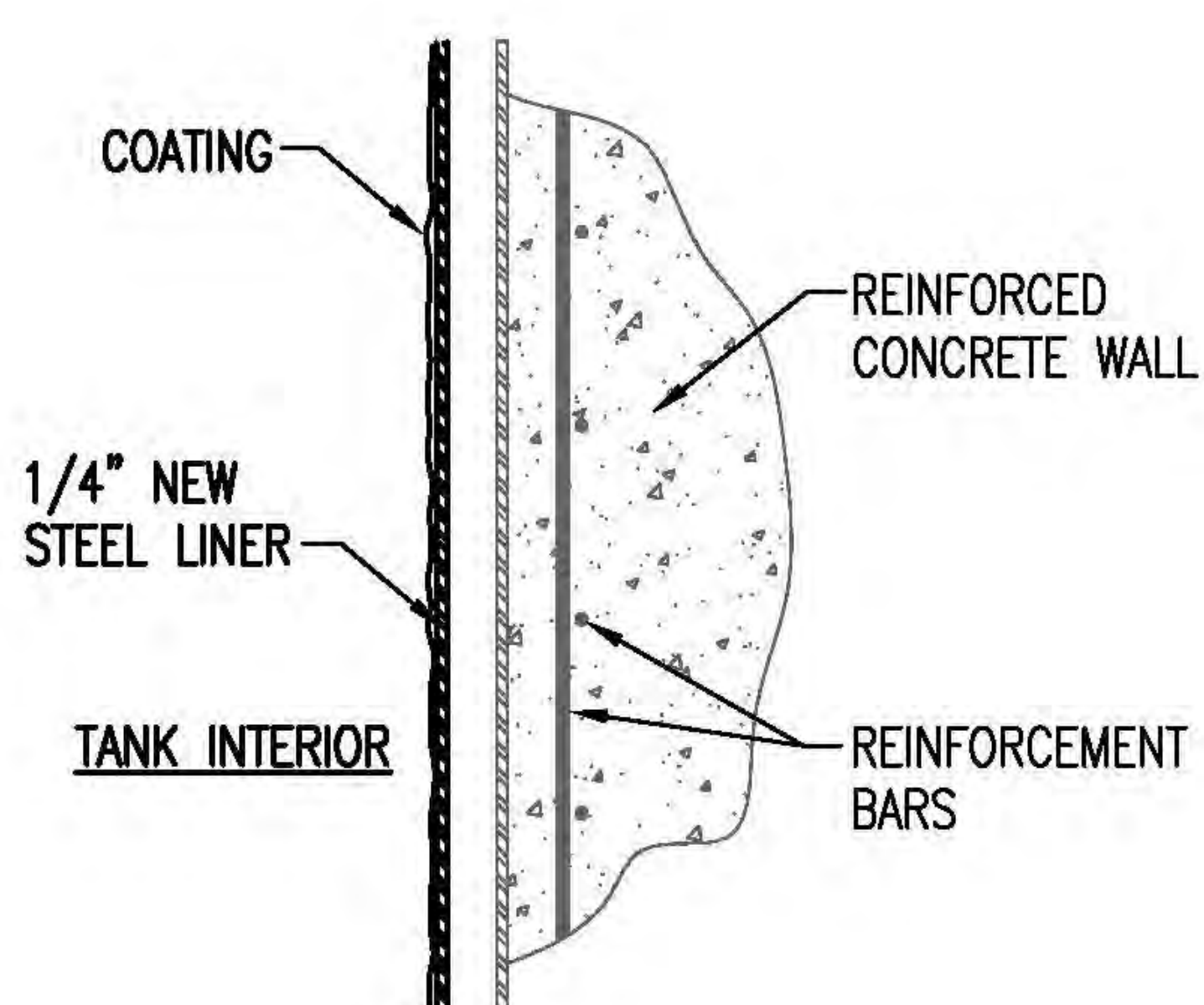
### Pros:

- Readily Inspectable
- Complete new liner

### Cons:

- No secondary Containment
- High Project Risk

## 2A – Composite Carbon Steel



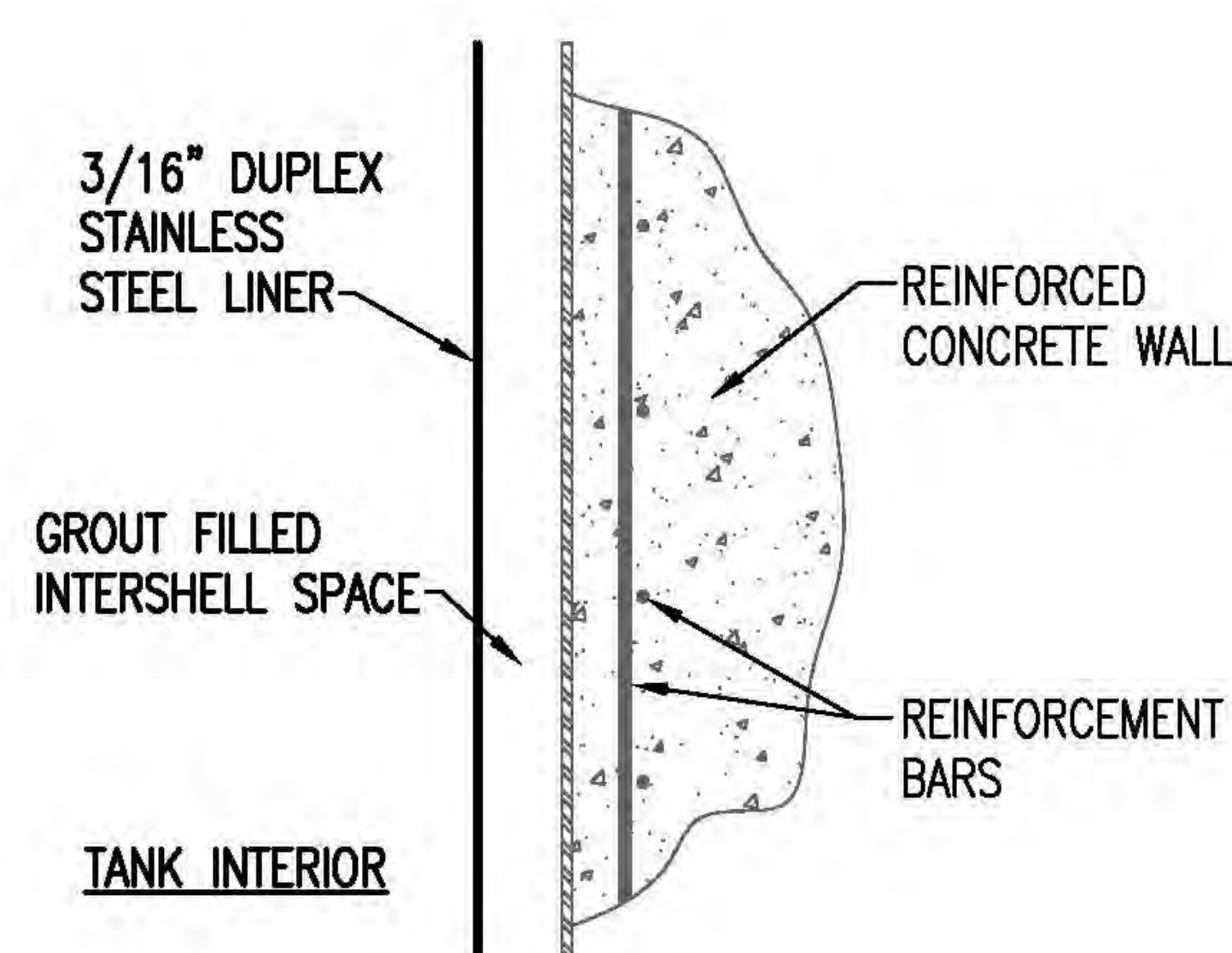
### Pros:

- Complete new inner liner
- Secondary Containment

### Cons:

- High Project Risk
- Not tried on this scale

## 2B – Composite Stainless Steel



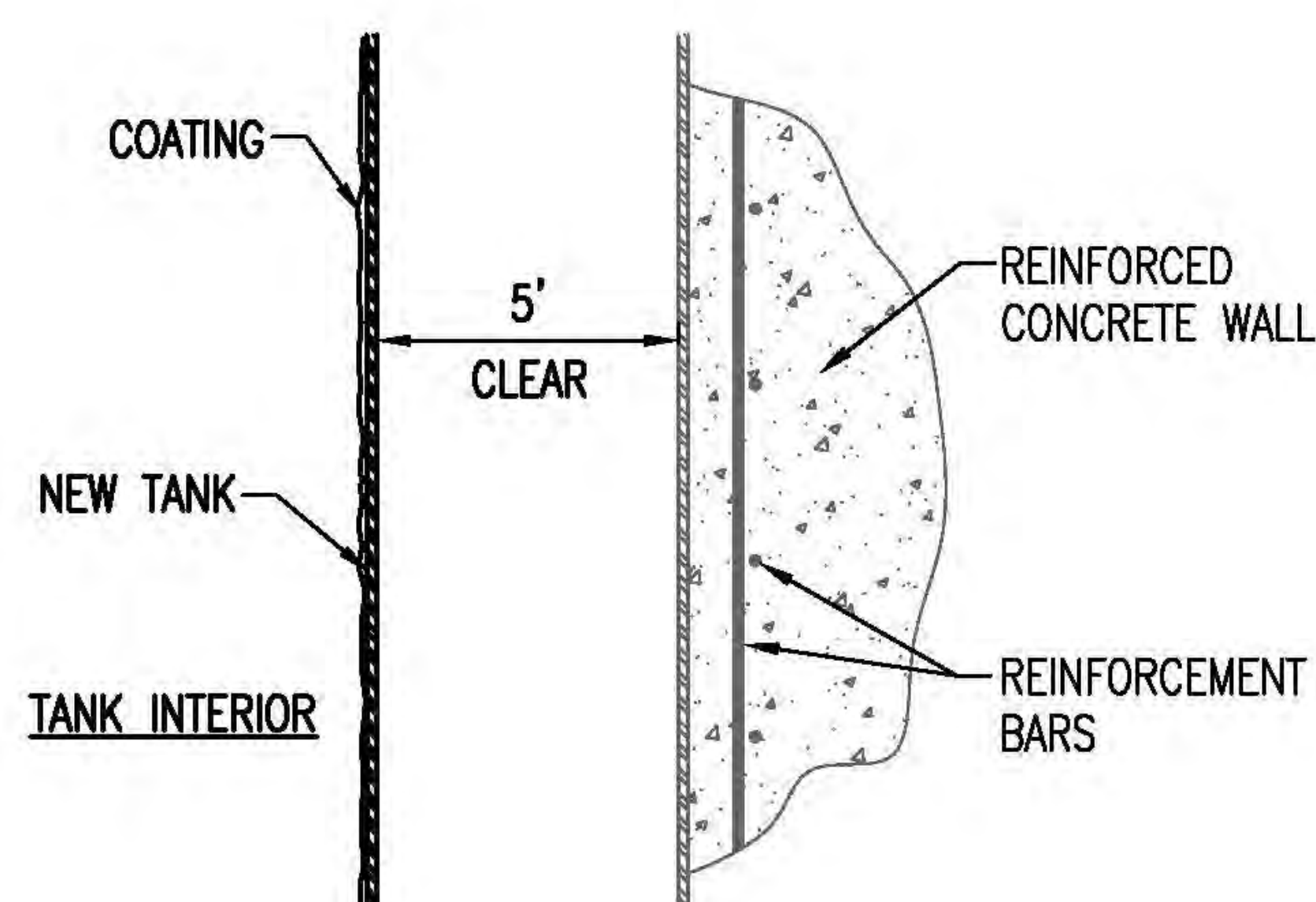
### Pros:

- Complete new SS inner liner
- Secondary Containment

### Cons:

- High Project Risk
- Not tried on this scale

## 3A – Tank in a Tank



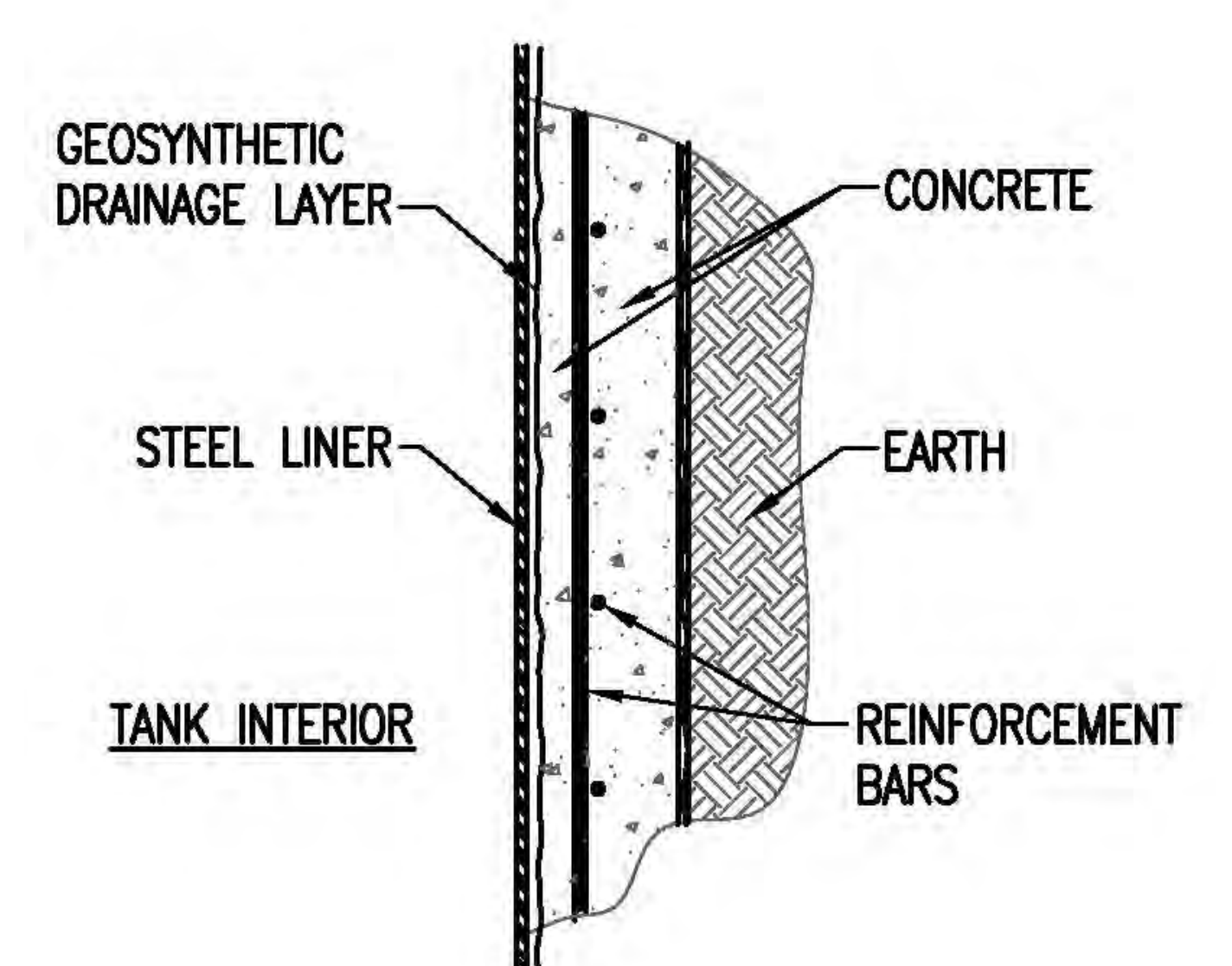
### Pros:

- Complete new inner liner
- Secondary Containment

### Cons:

- High Project Risk
- Not tried on this scale
- Seismic concerns

## Alt – Cut and Cover



### Pros:

- Readily Inspectable
- Complete new Tank
- Proven Design

### Cons:

- Longest time to construct
- Most Costly



# Alternative Site Study

**PURPOSE:** To determine to see what, if any, location is feasible to meet the constraints and requirements.

## IDENTIFICATION AND SELECTION OF SITES



### CONSTRAINTS

- Located on Oahu to Support JBPHH
- Meet all Environmental Regulations & Laws
- Equivalent Capability to Red Hill

### TWELVE SITES EVALUATED

- Two eastern Sites
- Six Lower Elevation Sites near JBPHH
- Four Upper Elevation Sites

### TANK REQUIREMENTS

- Field Constructed, Underground Storage Tank (Cut-and-Cover)
- Double-Wall with Continuous Interstitial Monitoring
- Quantity & Size: 40 Tanks, 150,000 bbl each, 150' wide X 52' tall

**Preliminary Alternate Candidate Site: KAPŪKAKI**

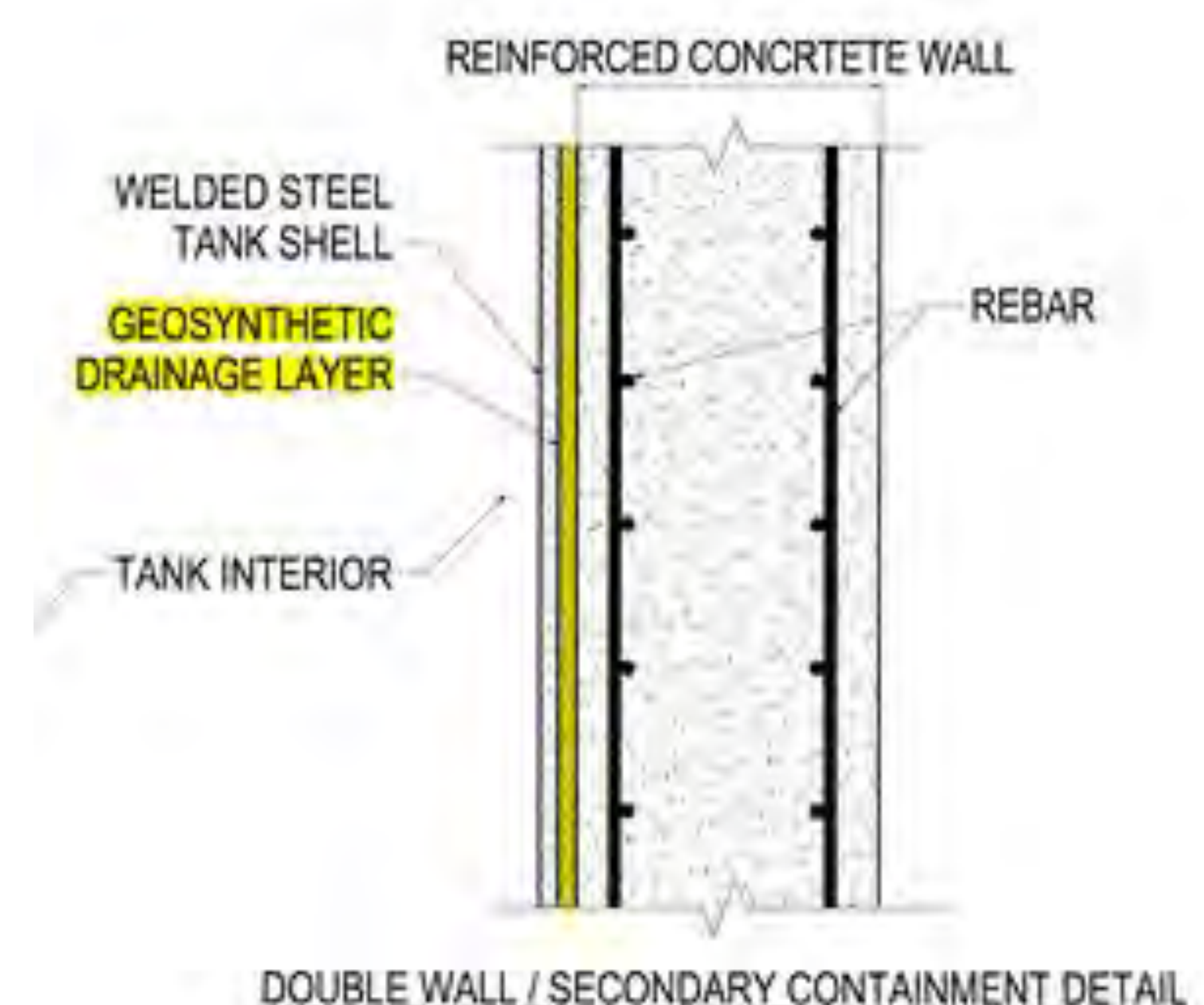
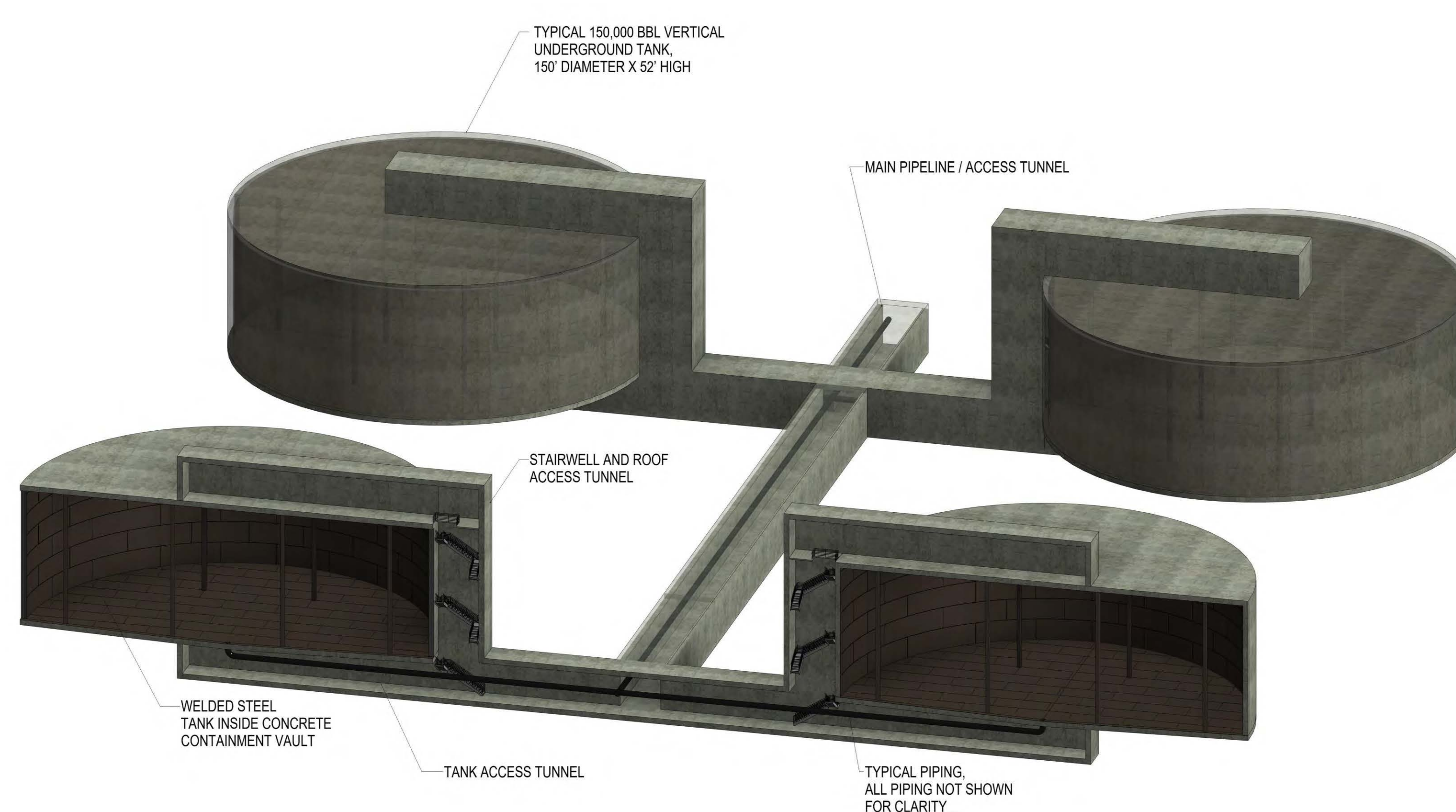
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# Alternative Site Study

## KAPŪKAKI

### ARTIST RENDERING OF CONCEPT



### TANK DESIGN/CONSTRUCTION REQUIREMENTS

- Complies With All Current Regulations:
  - UFC 3-460-01 - Design: Petroleum Fuel Facilities
  - DoD Standard Design AW 78-24-33 – Cut-and-Cover Tank
- Tank Type:
  - Field Constructed
  - Double-Wall with Continuous Interstitial Monitoring
  - Quantity & Size: 40 Tanks, 150,000 bbl each, 150' wide X 52' tall
- Estimated Completion Date - 2051

**CONCEPT ONLY**

14 March 2018

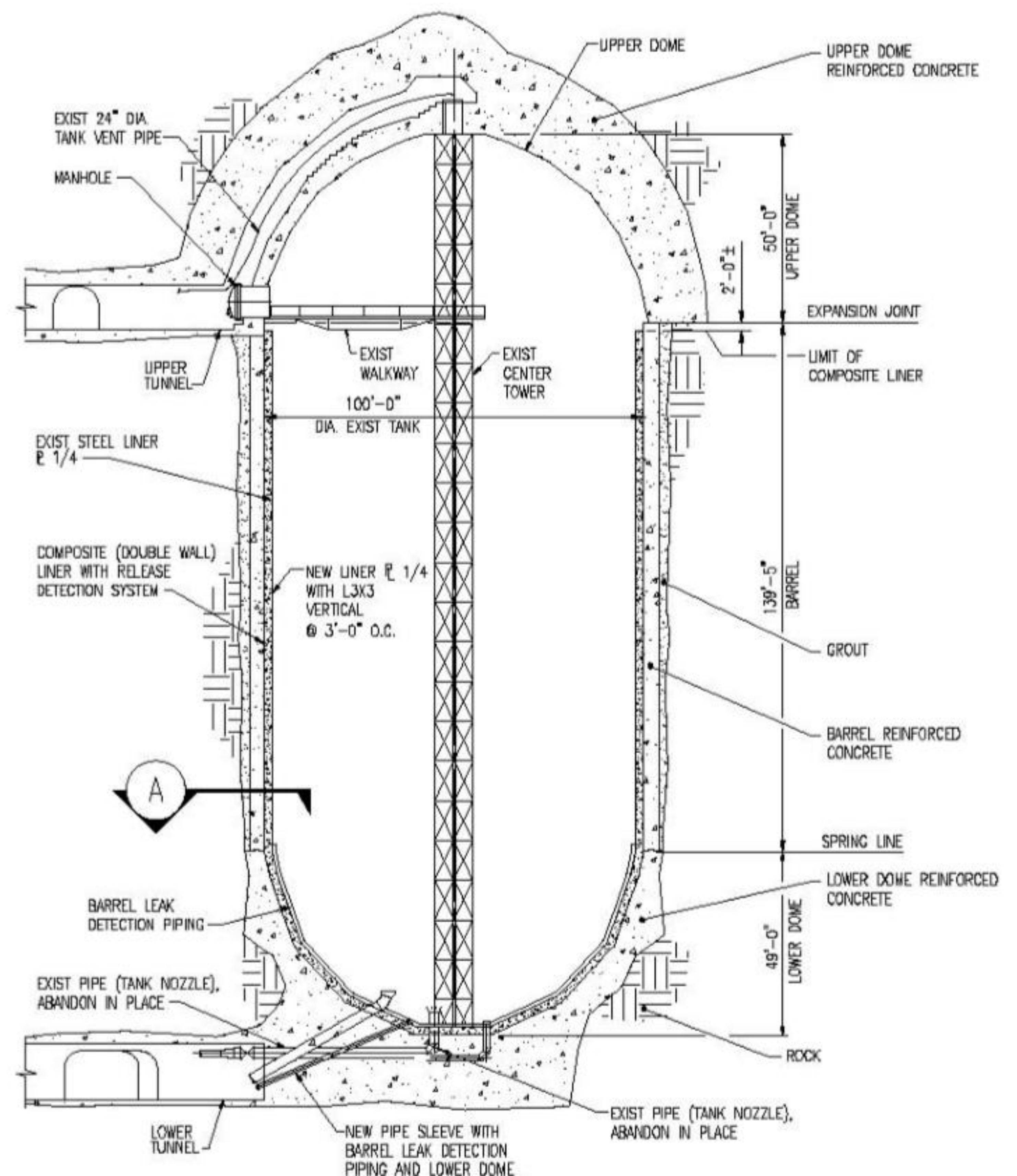


# RELEASE DETECTION

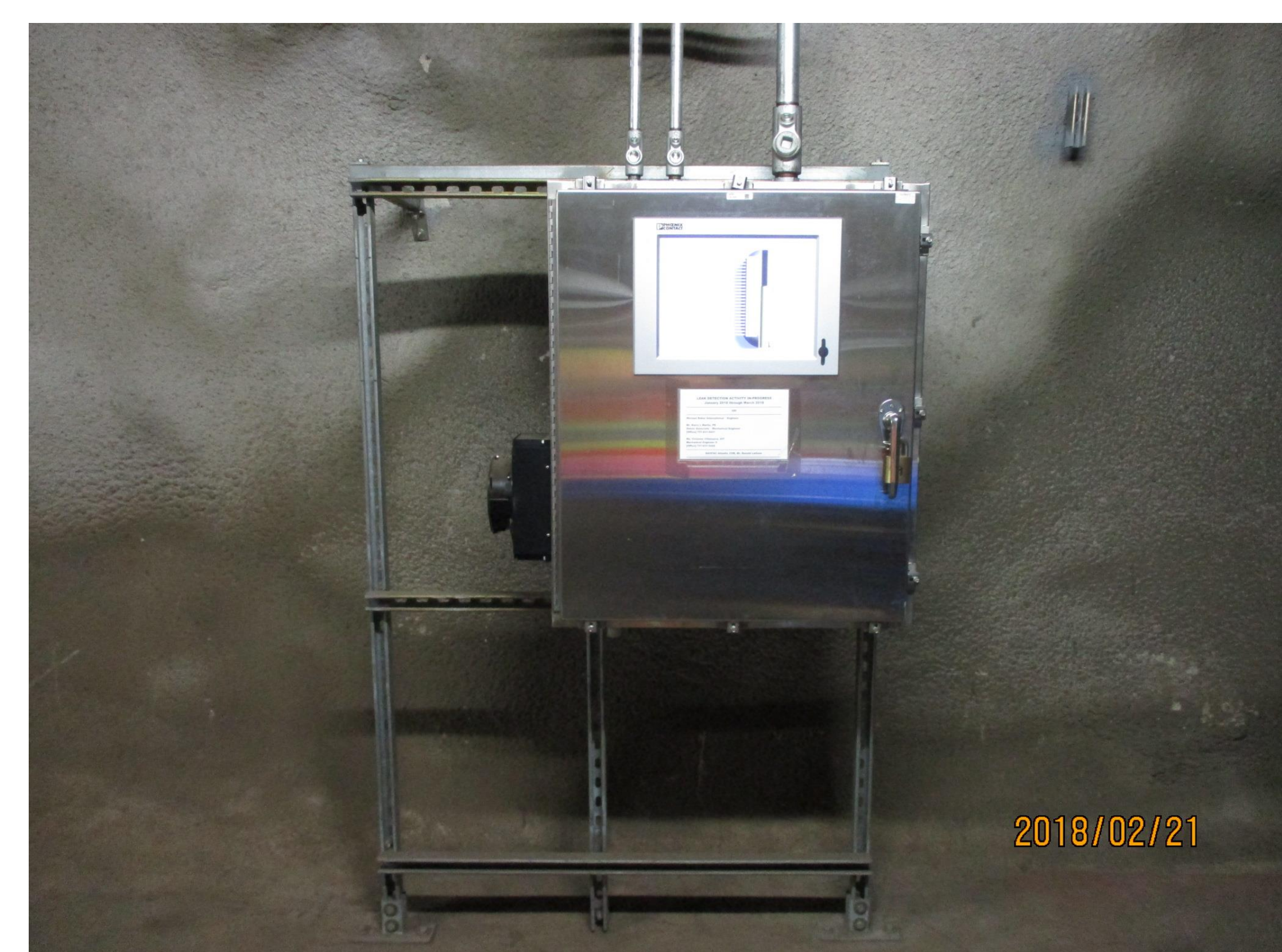
*The Navy is committed to installing the best release detection system available.*

## Custom Release Detection Systems

- \*Improves upon existing capability
- \*No off-the-shelf systems
- \*Three vendors have developed Red Hill specific systems
- \*All tanks that are in service have received a passing result since 2015



**On-site testing is in progress**



## Expectations

- Provides more continuous and precise monitoring Systems that meet or exceed regulatory requirements

*The combination of enhanced, permanent release detection along with other upgrades greatly reduces the risk for single walled tanks.*