Honolulu Rail Transit Project

AR00076082

Agenda

• Welcome / Introductions	- Harvey Berliner
• Rail Alignment	- Art Borst
• Corrosion Control	- Mike Berman
• Question / Individual Utility Company Meetings	- Harvey Berliner & Mike Berman
• Next Steps	- Harvey Berliner & Art Borst
• Other Issues	- Harvey Berliner

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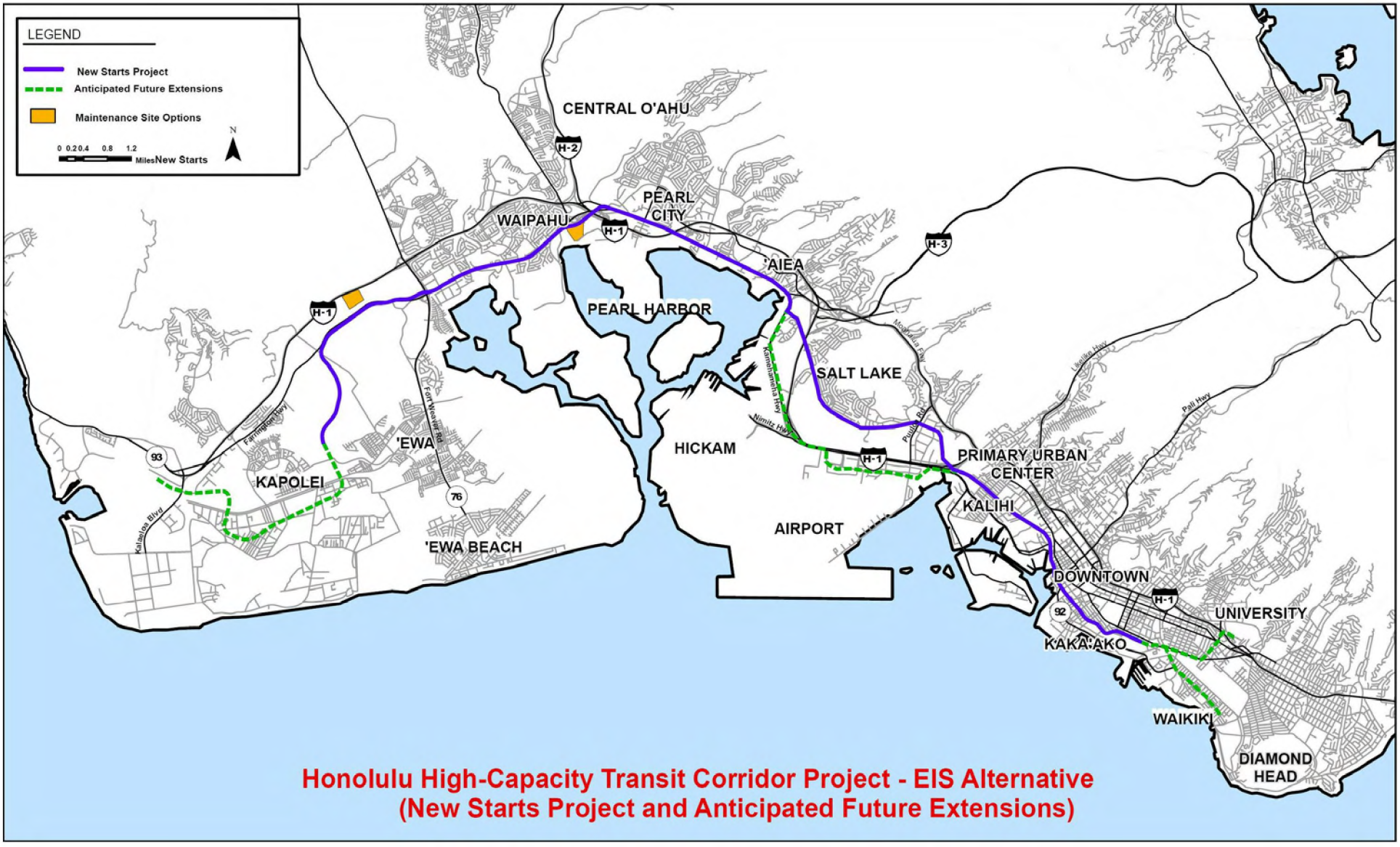
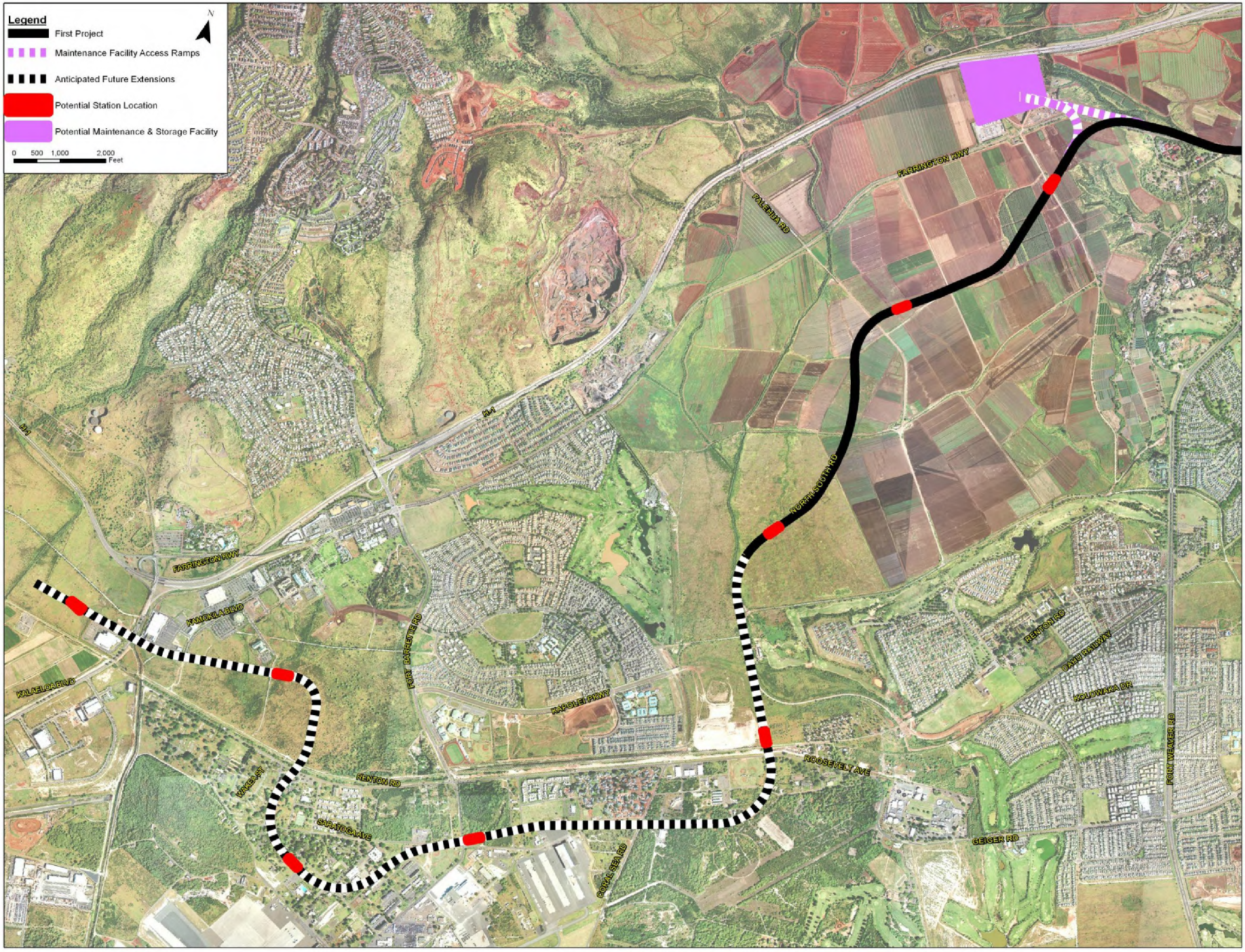
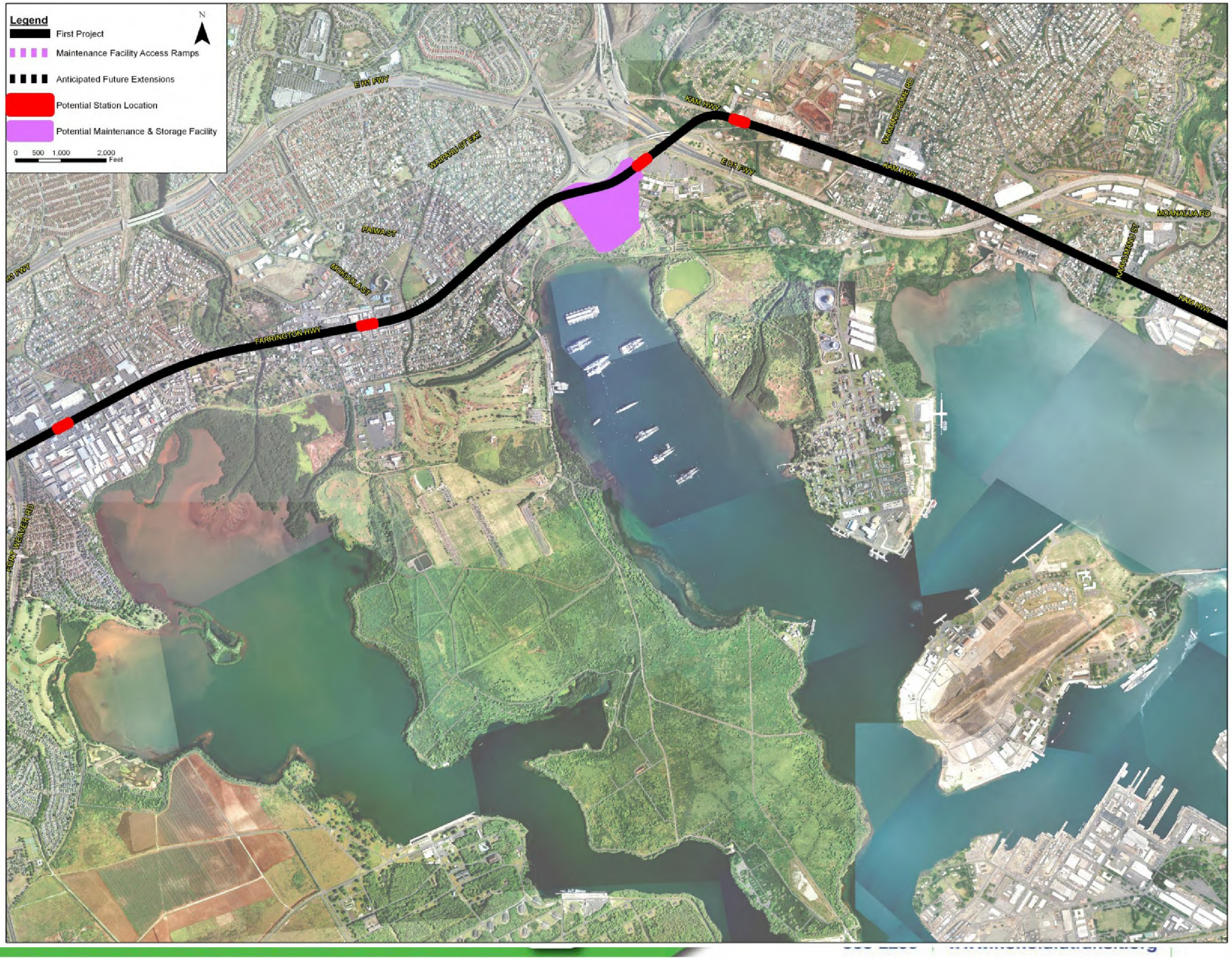
EIS Alternative




Legend
First Project
Maintenance Facility Access Ramps
Anticipated Future Extensions
Potential Station Location
Potential Maintenance & Storage Facility
0 500 1,000 2,000
Feet
N
FARRINGTON HWY
FALEHUA RD
NORTH-SOUTH RD
H-1
FARRINGTON HWY
KAMOKILA BLVD
KALAELOA BLVD
FORT BARRETTE RD
KAPOLEI PKWY
RENTON RD
SARATOGA AVE
CORAL SEA RD
ROOSEVELT AVE
RENTON RD
OAHU RAILWAY
KOLOWAKA DR
FORT WEAVER RD
GEIGER RD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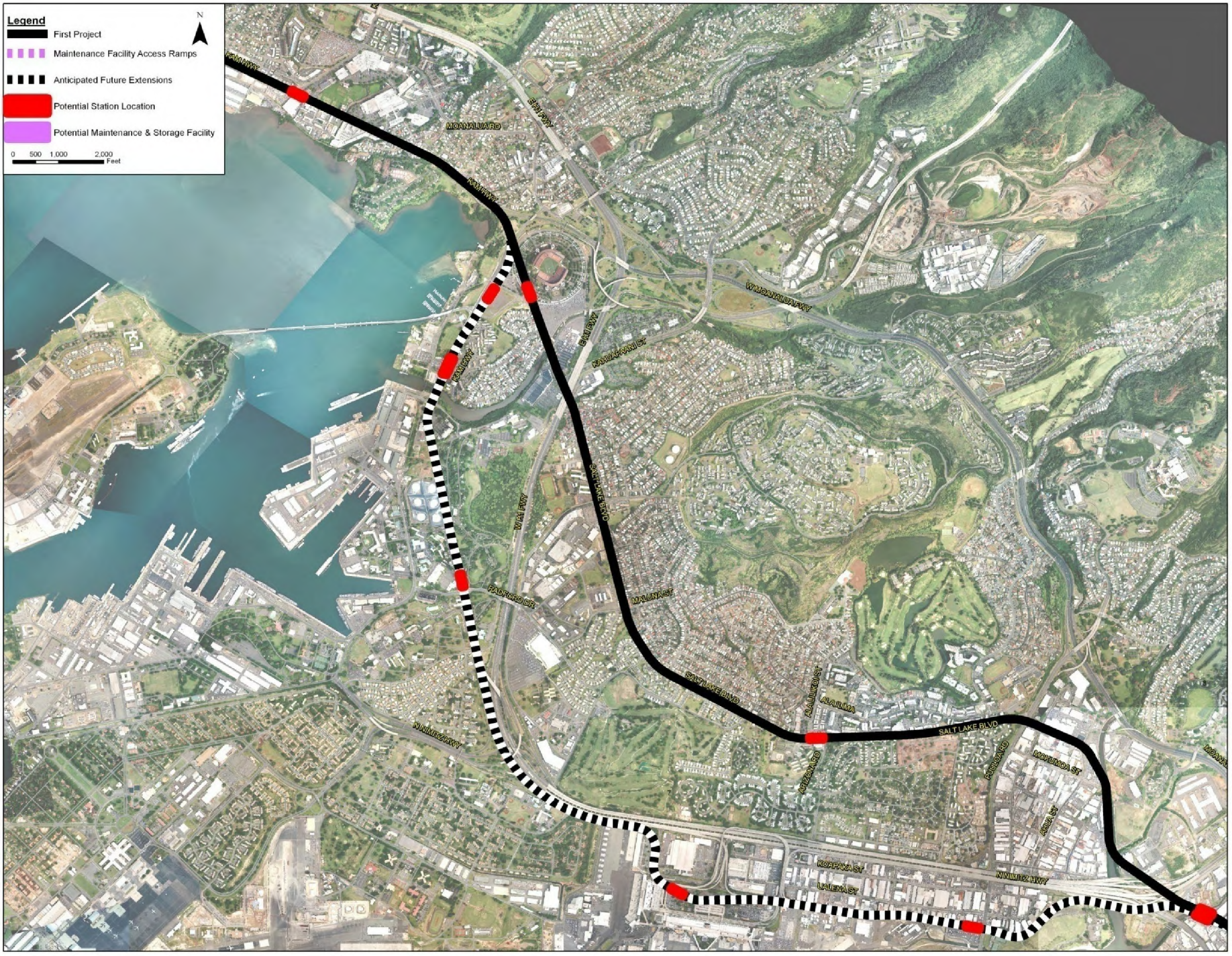
WAIPAHU ST EXT
KAM HWY
WAIMANO HOME RD
E H1 FWY
KAM HWY
MOANALUA RD
KAMEHAMEHA ST
KAM HWY
PAIWA ST
MPKUOLA ST
FARRINGTON HWY
FORT WEAVER RD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W MOANALUA FWY
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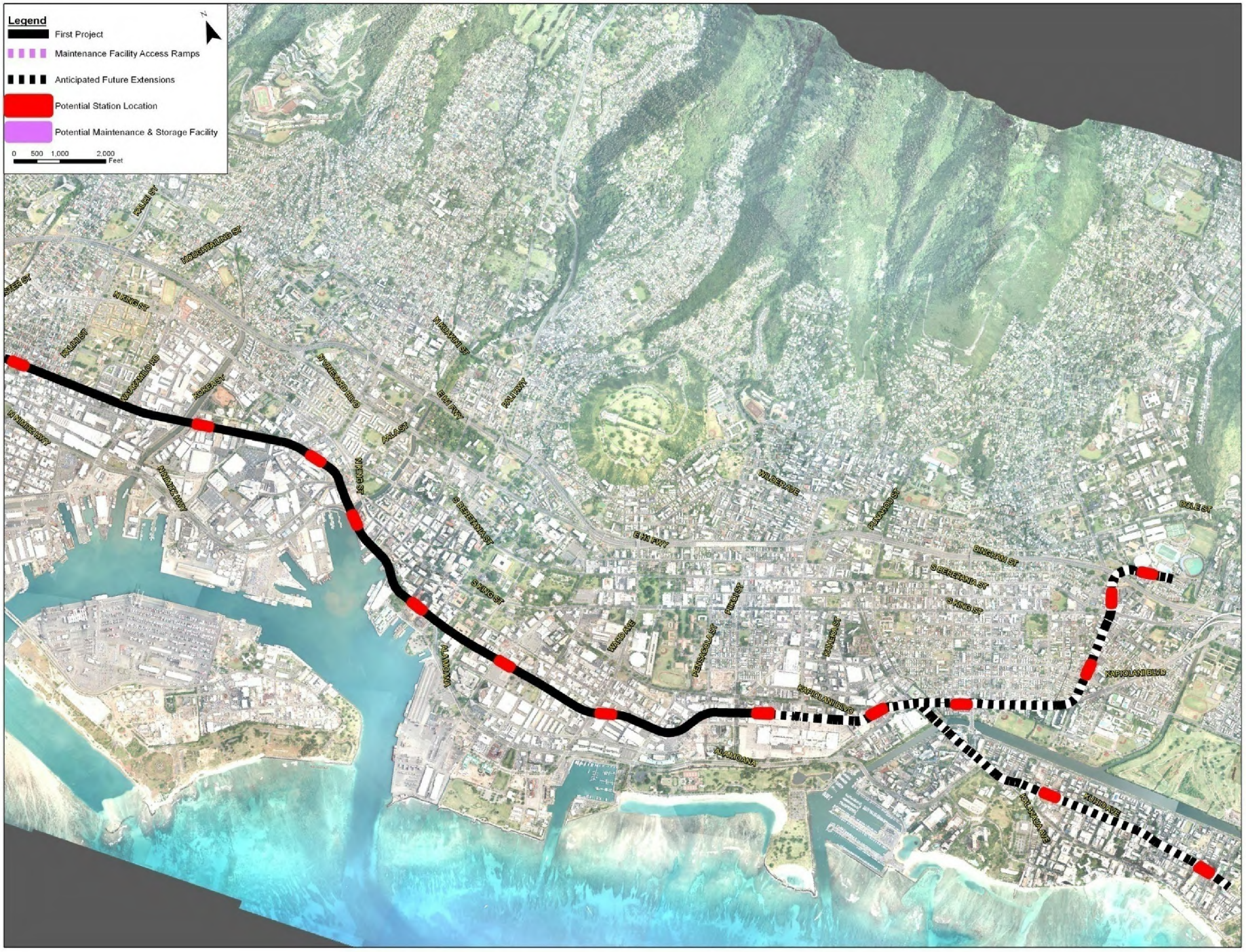
SALT LAKE BLVD
W H1 FWY
RADFORD DR
MALUNA ST
ALA ILIMA
N NIMITZ HWY
KOAPAKA ST
UALENA ST
MOKUMOA ST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0 500 1,000 2,000
Feet
N
KALIHI ST
HOUGHTAILING ST
N KING ST
KALIHI ST
N VINEYARD BLVD
KOKEA ST
N KUAKINI ST
E H1 FWY
PALI HWY
AALA ST
N NIMITZ HWY
N NIMITZ HWY
N KING ST
S BERETANIA ST
S KING ST
WILDER AVE
PUNAHOU ST
DOLE ST
E H1 FWY
BINGHAM ST
S BERETANIA ST
S KING ST
PIKOI ST
WARD AVE
PENSACOLA ST
KAPIOLANI BLVD
KAPIOLANI BLVD
ALAMOANA
ALAMOANA
KUHIO AVE
KALAKAUA AVE

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Stray Current

- Results From "Current Leakage" Into Ground
- Transit Projects Result in Dynamic Current
- Only DC Current is Problem

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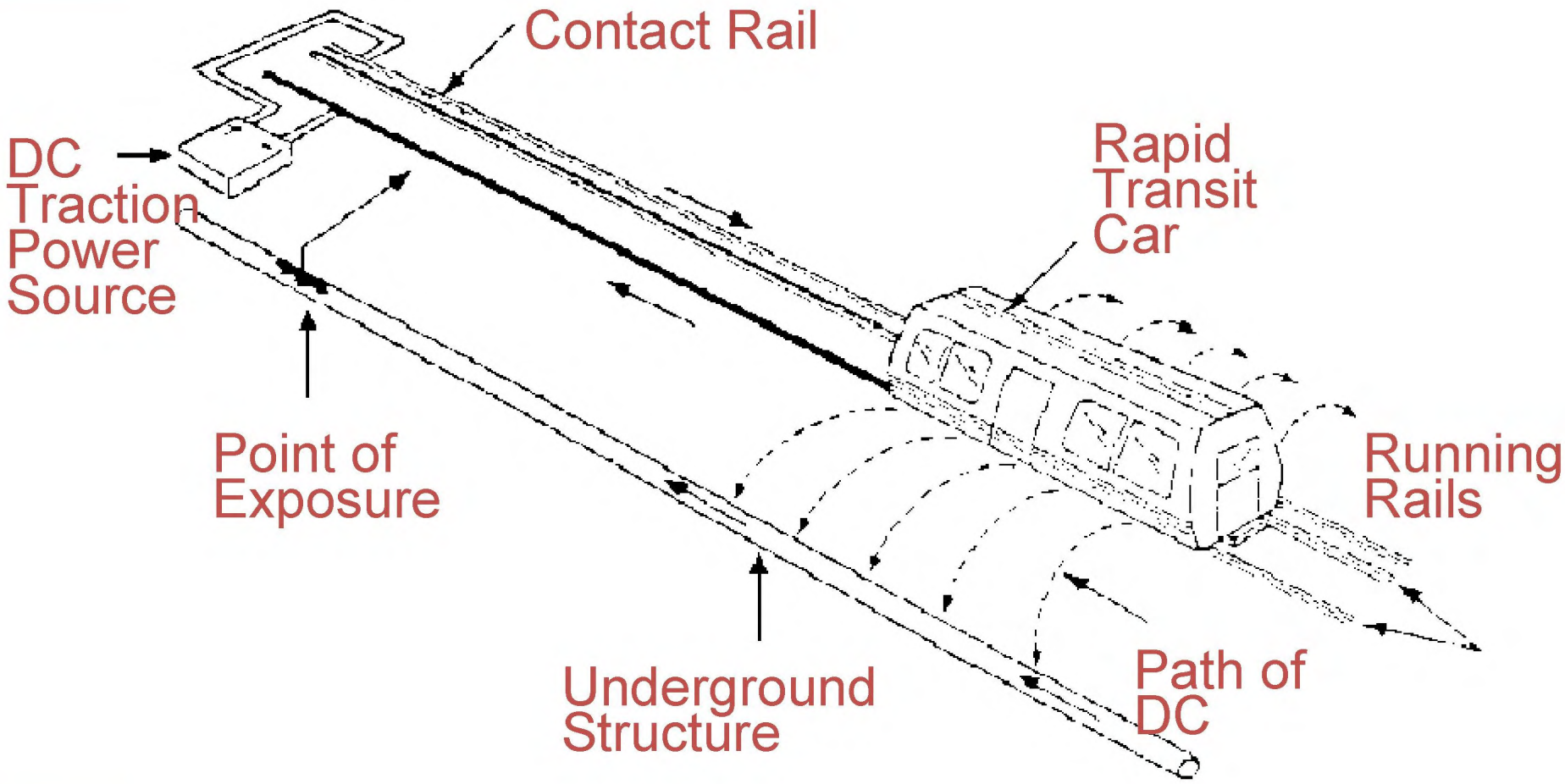
DC Leakage Currents



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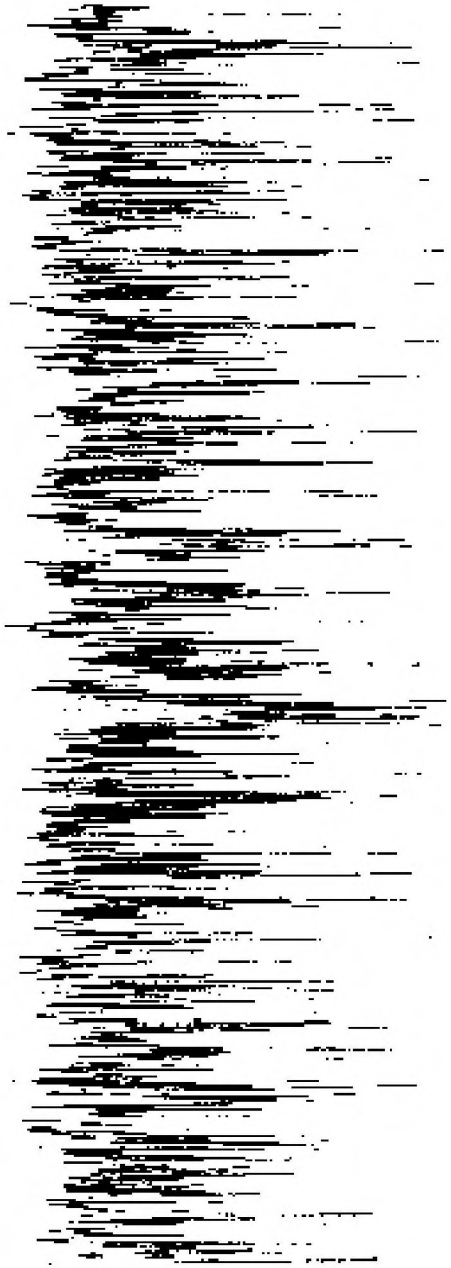
Stray Current Monitoring Chart



Honolulu On The Move

Control of Stray Current

- Control Leakage of Stray Current:
  - ➔ Rail Size
  - ➔ Rail Bonds
  - ➔ Cross Bonding
  - ➔ Parallel Conductors
  - ➔ Traction Power Substations
  - ➔ Drainage Bonds

  - ➔ Track – to – Earth Resistance
    (Direct Fixation Tracks)

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Corrosion Protection

- Coatings are Mandatory for Many Utility Structures
- Cathodic Protection is Optional
- Decide Based on Magnitude of Problem, Significance of Failure, and Cost of Rehabilitation
- Petroleum Pipelines are Mandated to Have Cathodic Protection

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Types of Coatings for Underground Pipes

- Many Types are Available
- Specification of Pipe Coatings Should be Considered
- Often Governed by Utility Company, Specifications or Codes
- Installation can Damage Coating - Integrity of Coating can be Checked After Installation

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Cathodic Protection

- Makes Metal to be Cathodic
- Widely Used for Metal Structures in Moist or Other Corrosive Environments
- Includes: Pipelines, Cables, Tanks, Foundation Pilings, Ship Hulls, and Chemical Process Equipment

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Galvanic Cathodic Protection

- Consists of Anodic Material Connected to the Metal to be Protected (Cathode)
- Anode Sacrifices Electrons to Cathode
- Induced Current Suppresses Local Corrosive Current
- Sacrificial Anode:

➔Usually Magnesium or Zinc, Aluminum Sometimes Used in Sea Water

➔Temporary/Hot Spot Protection

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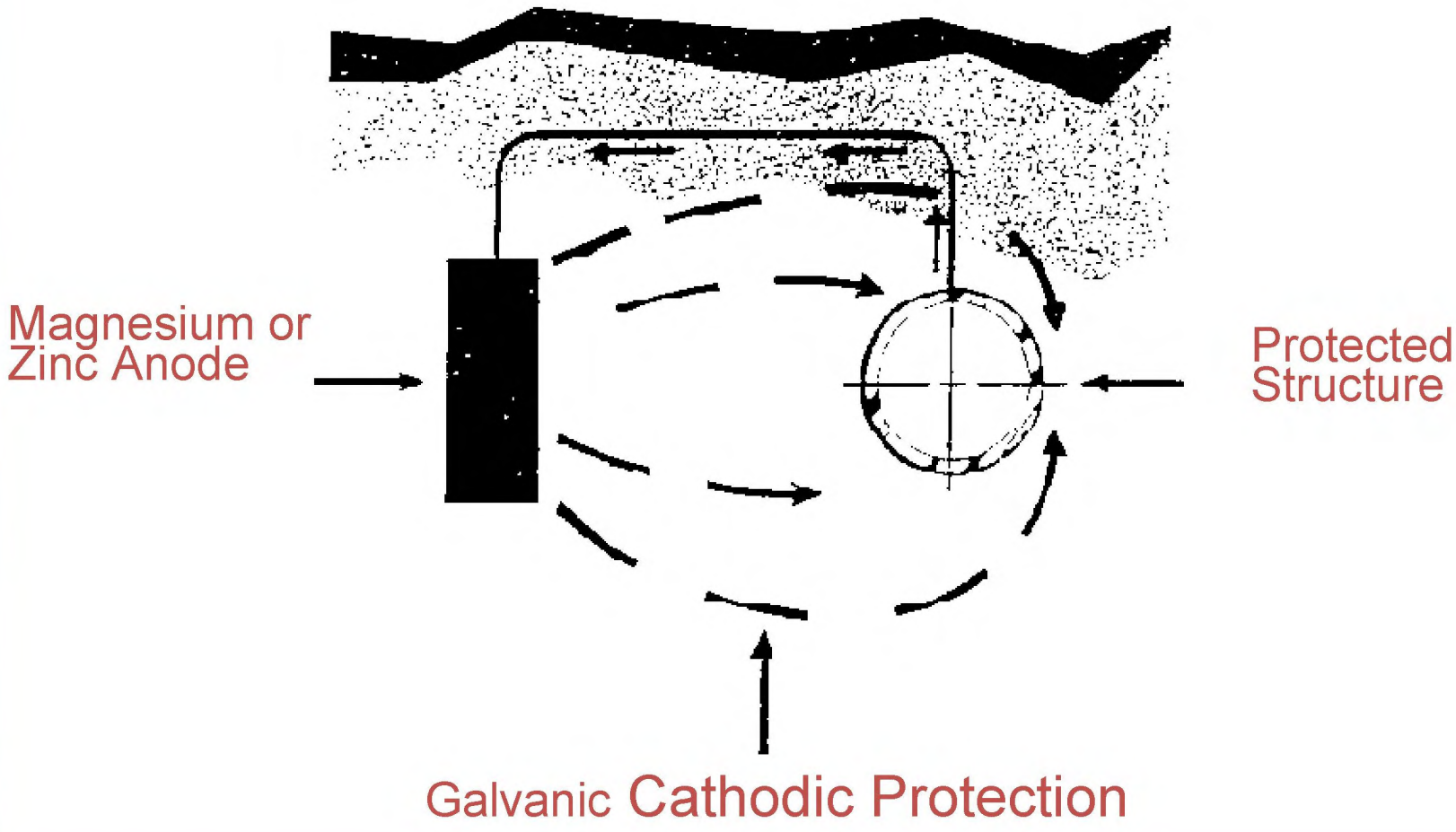
Galvanic Cathodic Protection



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Impressed Current Cathodic Protection

- Uses DC Power to Drive Current From Anode to Structure
- Used When Soil Resistivity or Other Factors will not Allow Galvanic Cathodic Protection to Create Enough Current to Suppress Local Activity
- Used to Protect Existing Structures
- Requires Rectifier to Convert AC to DC
- Requires Anodic Materials

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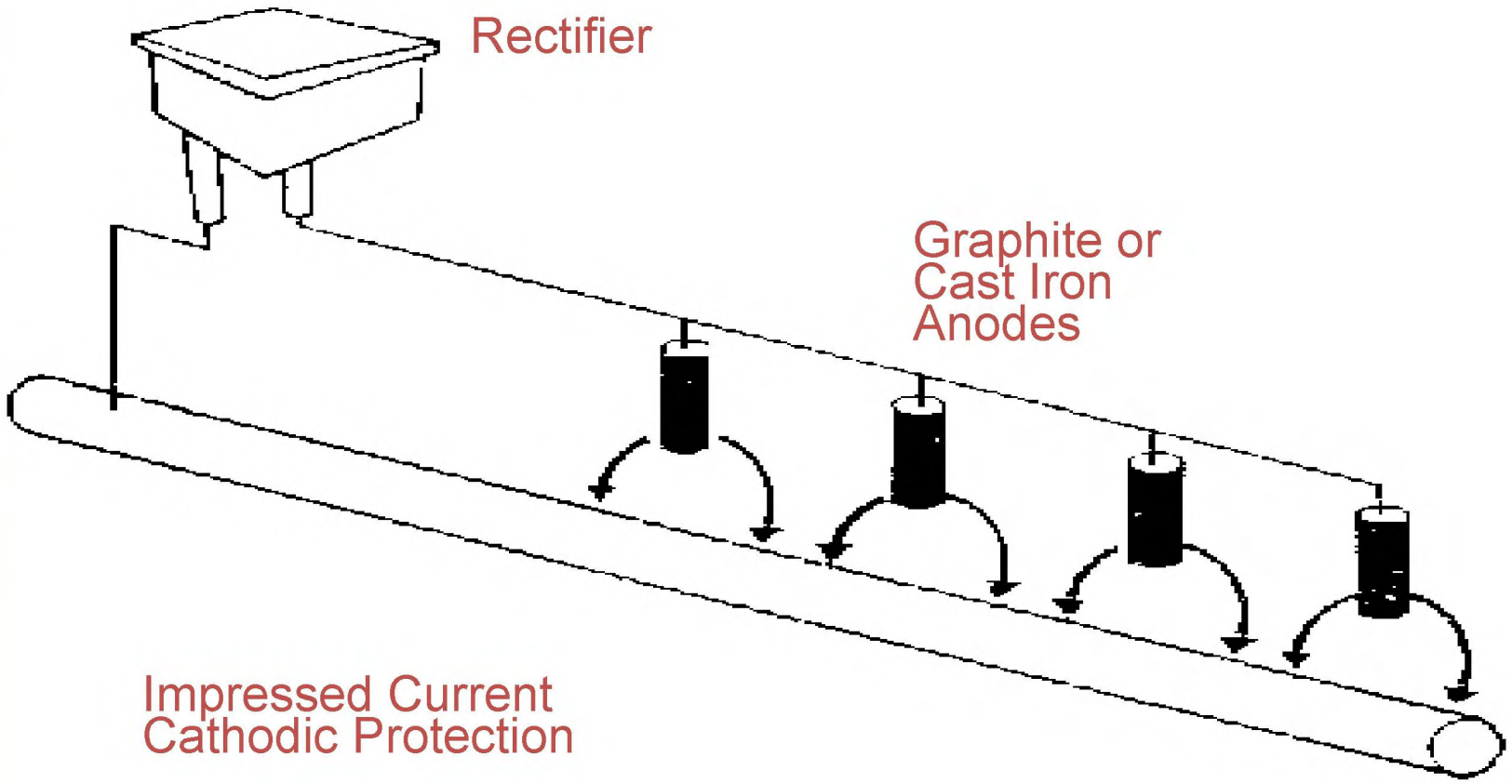
Impressed Current Protection



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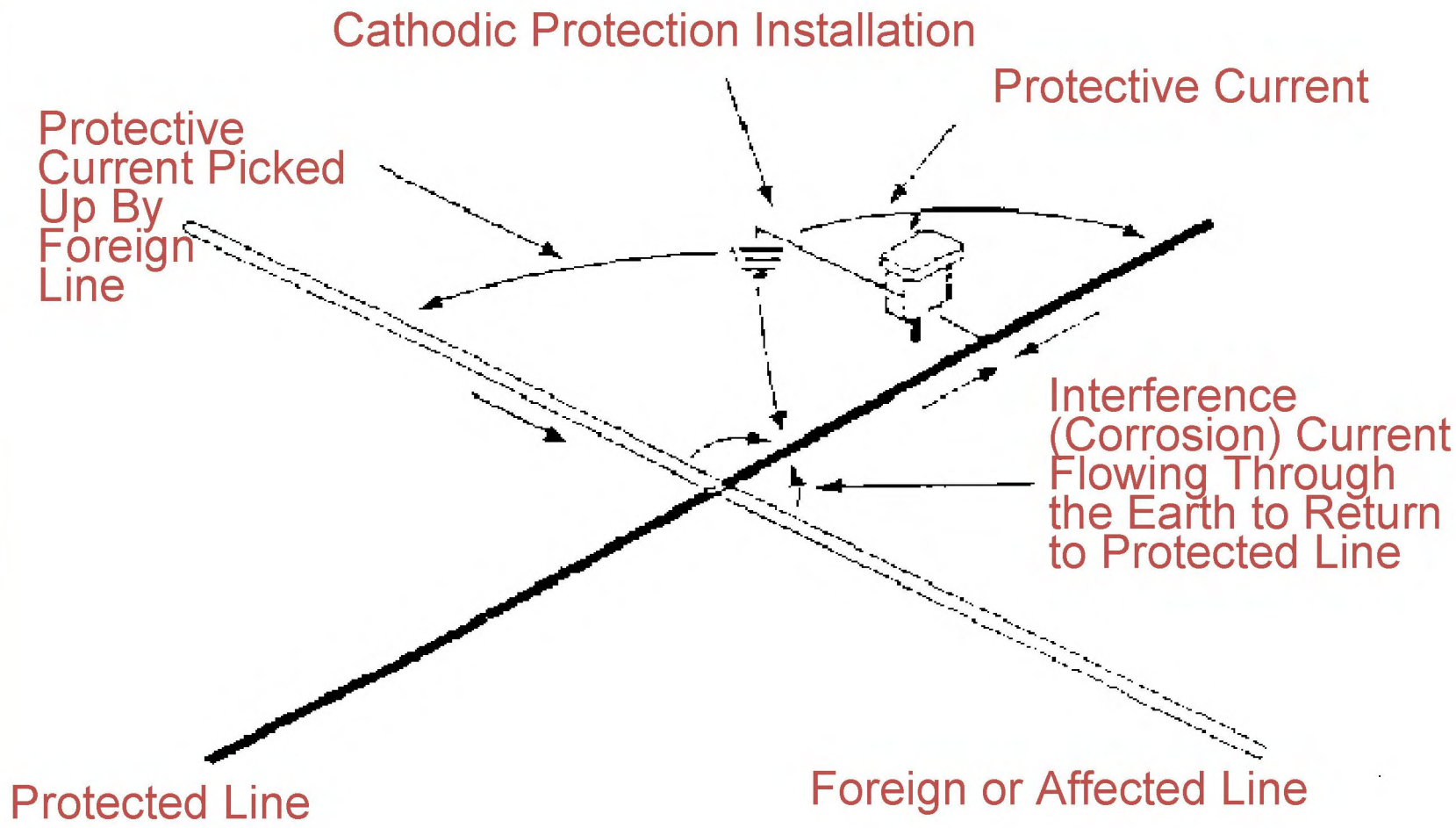
Static Stray Current



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Baseline Survey

- Existing Utility Structures Potentials (Water, Gas, Power)
- Soil Resistivity
- Soil Boring Tests (pH, Chloride Content, Sulfate Content, Soil Resistivity)

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Soil Resistivity Test

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Stray Current Testing on Gas

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Honolulu On The Move

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BRYANT

Mahalo!

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