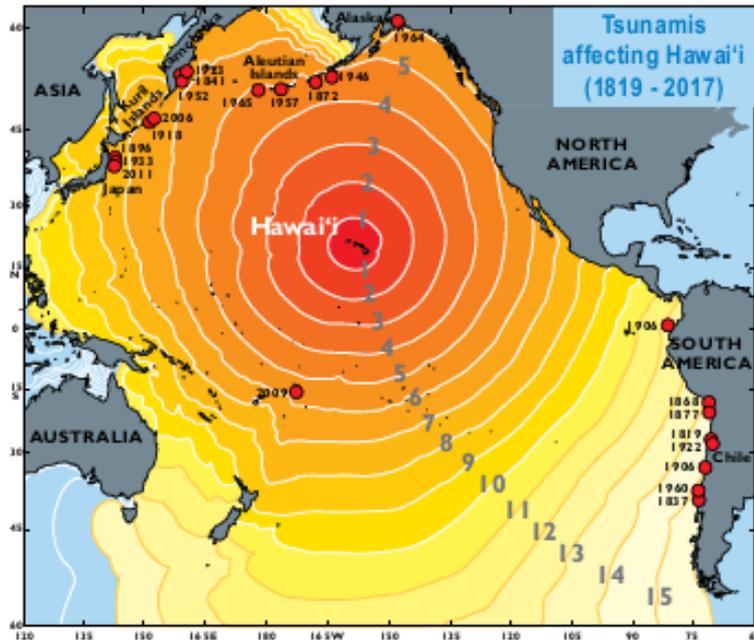


# Evacuation Planning for the City and County of Honolulu Department of Emergency Management

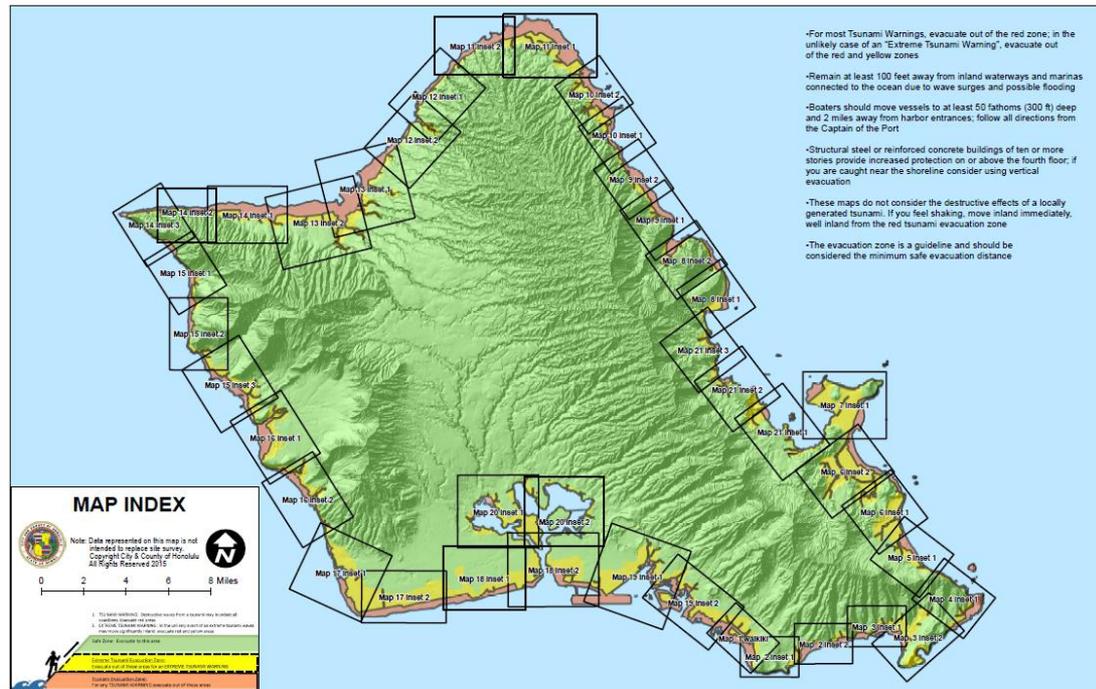


September 12, 2019



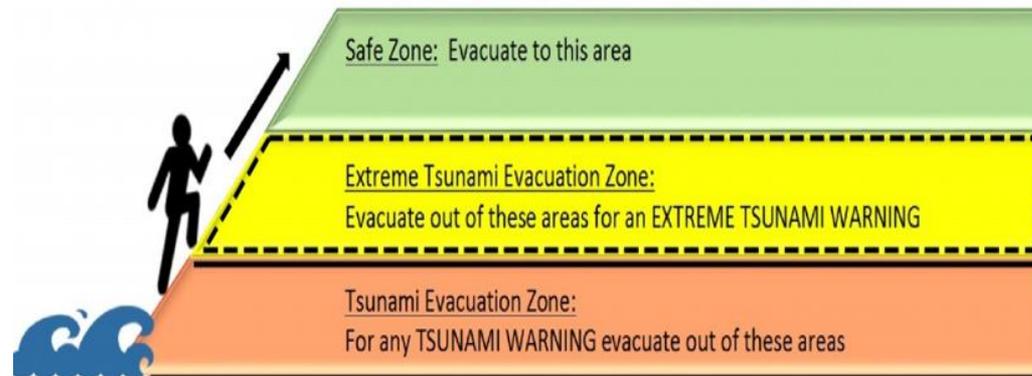
# Introductions & Objectives

- Welcome & Introductions
- Objectives
  - Project Overview
  - Public Input on Safe Sites
  - Next Steps



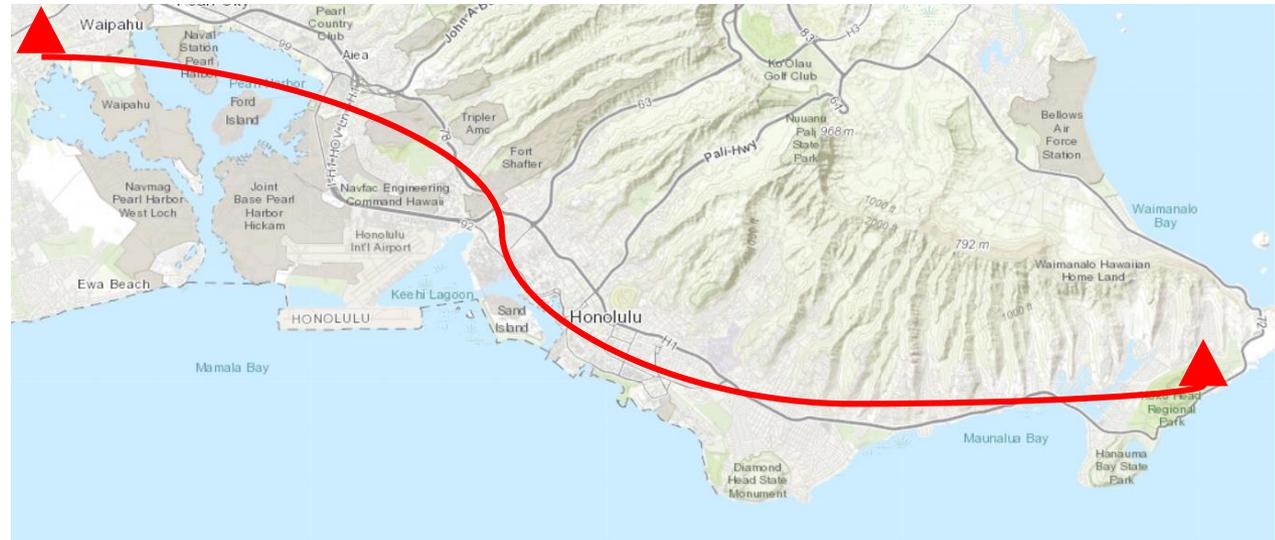
# Key Terms

- Tsunami Evacuation Zone (TEZ)
- Extreme Tsunami Evacuation Zone (XTEZ)
- Horizontal Evacuation
- Vertical Evacuation
- Evacuation Route
- Safe Site (aka Refuge Area – Phase I)



# Project Locations

- Hanauma Bay
- Hawaii Kai
- Wailupe
- Kahala
- Diamond Head
- Waikiki
- Downtown
- Ke'ehi Lagoon
- Pearl Harbor East/West (includes Waipahu, Pearl City, Aiea)
- Pearl Harbor Mouth (includes Honolulu Airport, Hickam)
- Waipahu



# Project Overview

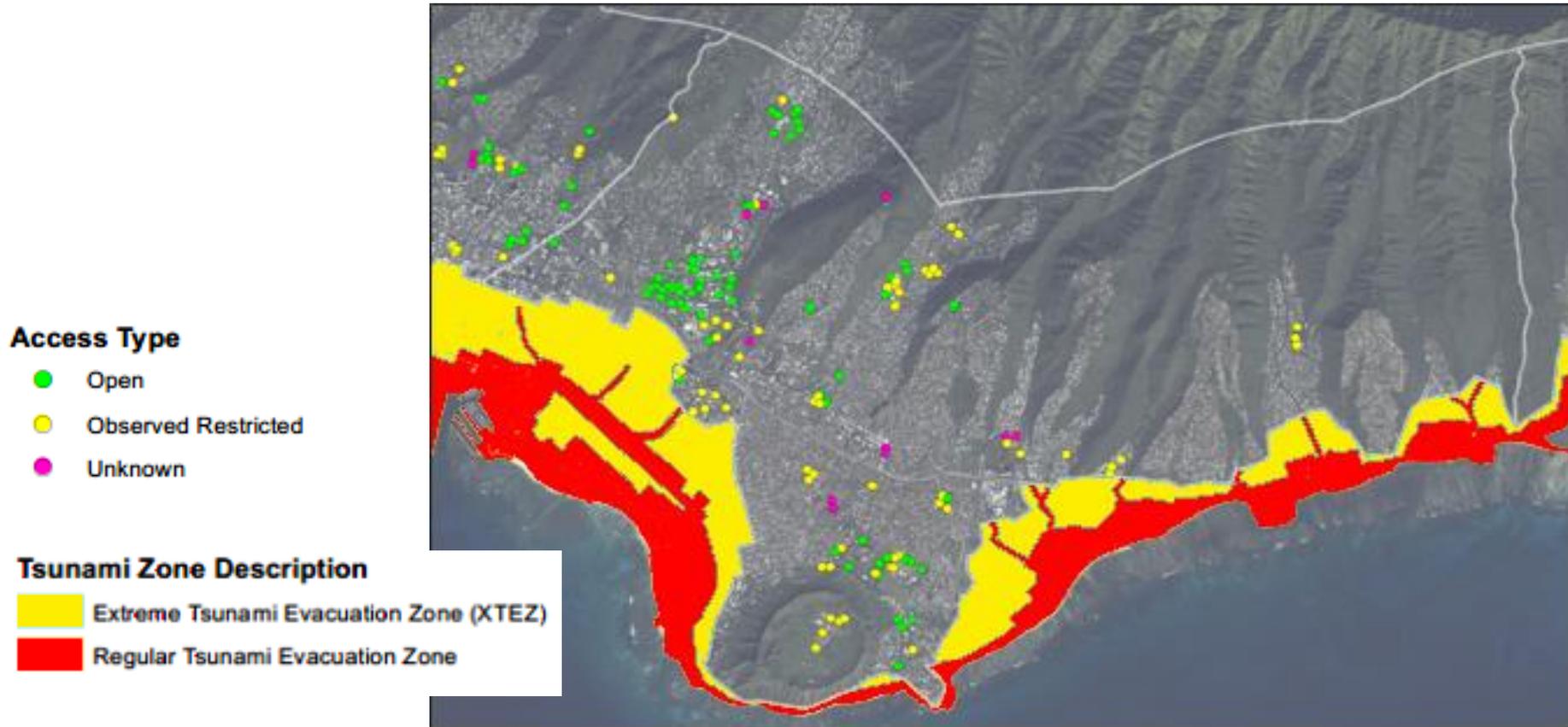
- Task 1. Gap Analysis
- Task 2. Field Work for Geographic Area Evacuation Route Plan
- Task 3. Plan Development for Geographic Area Evacuation Route Plan
- Task 4. GIS Mapping
- Task 5. Tsunami-Safe Vertical Evacuation Engineering Tool  
e.g. Tsunami-Ready Program
- Task 6. Public Outreach



# Task 1

## Gap Analysis and Preliminary Work

- Reviewed Inundation Zones and Developed Needs Assessment
- Identified Potential Safe Sites



# Needs Assessment Assumptions

- Assumed 100% Evacuation Rate
- Used 2016 Hawaii Data Book for Population and Transportation Assumptions
  - Added Tourist Populations
  - Distributed Over Hotel Data Layer
- Percentages of People Who Primarily Use Vehicles 70%
  - Assumed 80% Would Use Vehicles (10% buffer)
- Analyzed Combinations of Day/Night & Weekday/Weekend Scenarios
  - Night Scenario 3am When People Are Usually Home
  - Day Scenario around 3pm When People At School and Work
- Assumed Walking Speed of <2 mph
  - Clearance times no longer than 30-45 minutes for all Evac Areas



# Task 2

## Preliminary Safe Site Assumptions

- Government Locations
  - Parks – Community Parks, Beach Parks, District Parks, Neighborhood Parks and Regional Parks
  - Public Schools
  - Government Land Ownership
- Addresses were Attached/Associated to each location



# Community Input

- Alternate Site Options
- Incorporation of other locations
  - Businesses/Private Sector
- Vertical Evacuation Options
- Tsunami Ready Adoption and Integration Strategies
- Public Awareness Suggestions
  - Employee Awareness
  - Tourist/Visitor Awareness



# Ideal Safe Site Criteria

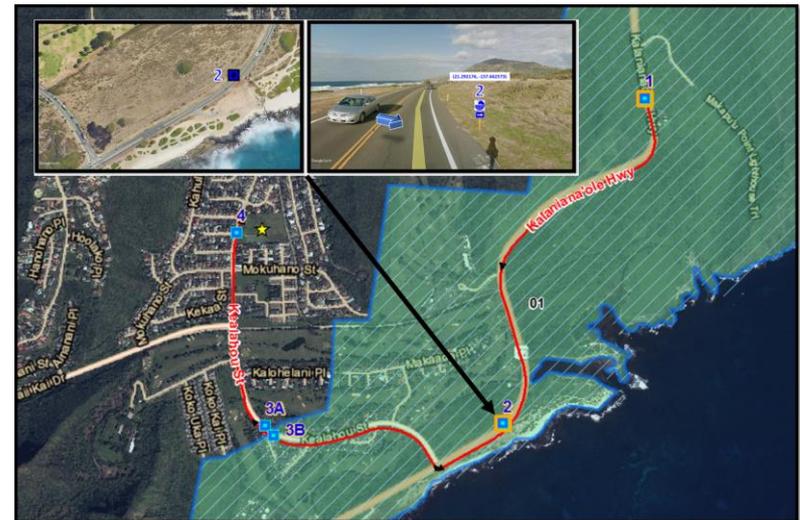
- Large Capacity
  - Space to Park More Than 100 Vehicles on Grass or Pavement
  - Paved Space – 350 sf / Field Space – 1,000 sf
- Easy Ingress and Egress
  - No Barriers to Entry
  - No Complicated Security Measures
  - ADA Compatible
- Close to Evacuation Zones
  - Easily Walkable
- Willingness to be Identified and Marked as a Tsunami Safe Site
  - Publicly-owned Areas
  - Private and Non-governmental



# Task 3

## Evacuation Routing

- Collected Community Input Through Public Outreach and Meetings
- Identified Preferred Safe Site Locations
- Determined Best Available Evacuation Routes
- Confirmed and Finalized Safe Sites and Evacuation Routing
- Identified Signage Placement
- Developed Installation Guide





# Sign Installation Guide



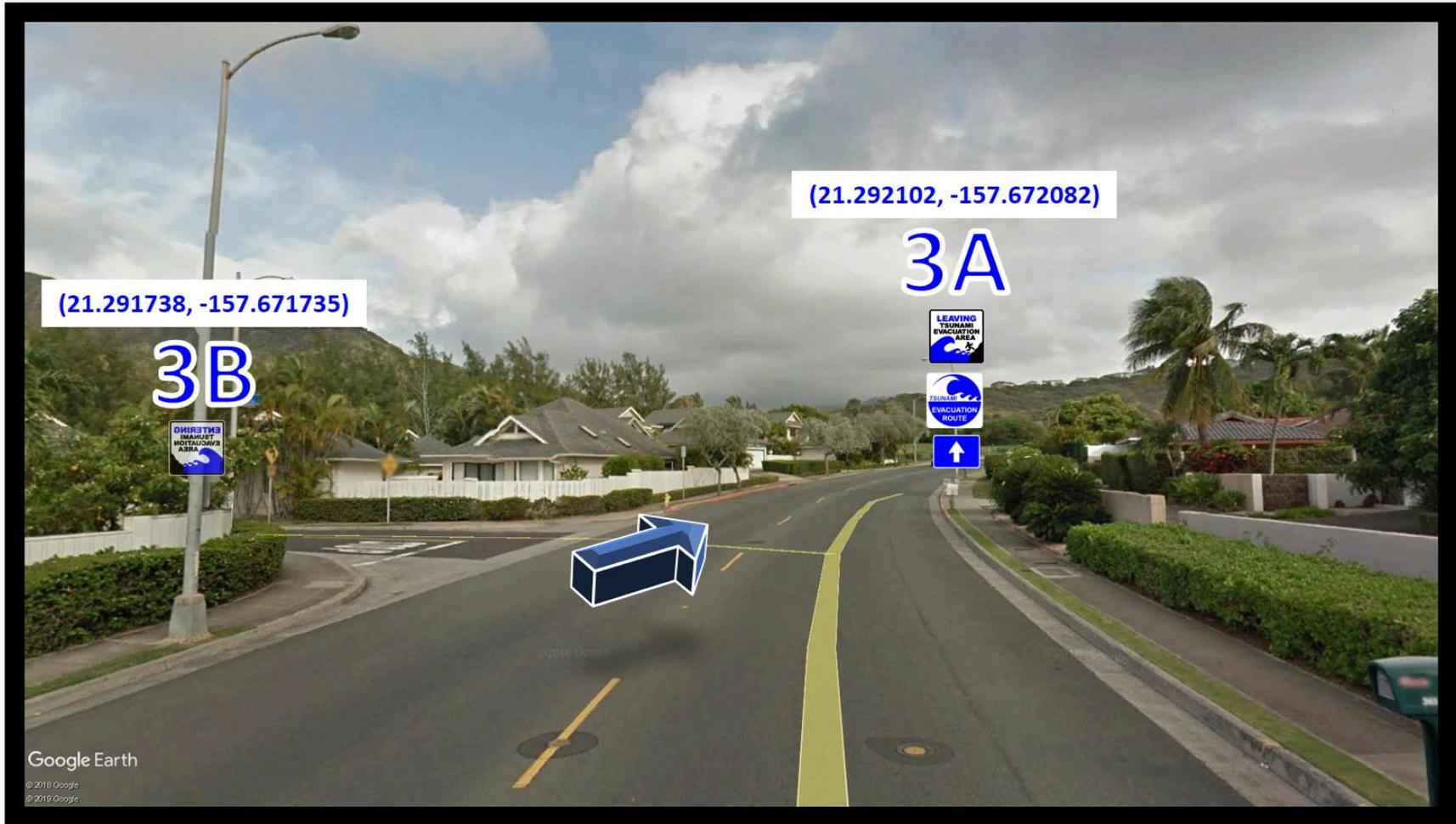
Kalanianaʻole Hwy

# Sign Installation Guide



Intersection of Kalanianaʻole Hwy and Kealahou St

# Sign Installation Guide



Intersection of Kealahou St. and Holokai Pl.

# Sign Installation Guide



Potential Safe Site: Kalama Valley Community Park



# Task 5

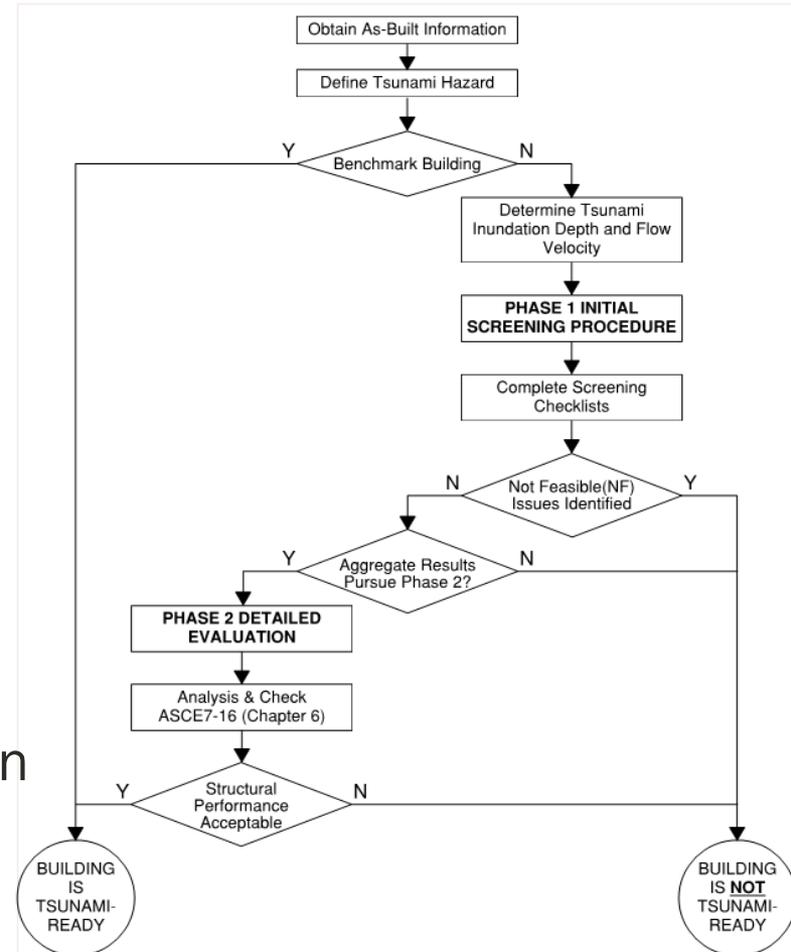
## Vertical Evacuation Engineering Tool

- Tsunami Engineering Specialists: Degenkolb Engineering
- Based Upon Newly Released Tsunami Engineering Standards
- Multi-Phased Engineering Tool to Assess Potential Tsunami Safety and Vertical Evacuation Suitability
- Close Integration with Technical Experts on the HETAC
- Refined Tool utilizing Beta-Tests on four Large Structures within the Tsunami Inundation Zone
- HETAC Engaged for Final Comments and Revisions



# TsunamiReady program: two-step process

- Maximum Considered Tsunami Hazard Level
- Benchmark building – ASCE7-16
- Phase 1 – Moderate calculation effort required
  - Results:
    - Favorable,
    - Unfavorable, or
    - Not TsunamiReady
- Phase 2 – Considerable calculation & analysis required



# Task 6

## Public Outreach (Currently in final production)

- Outreach materials to include presentation and handout flyer information sheet
- ADA and LEP Title II and Title VI Compliant

- 13 language

1. Chuukese-Foosun Chuuk
2. Hawaiian
3. Ilocano
4. Japanese
5. Korean
6. Pohnpeian-Lokaihn Pohnpei
7. Samoan
8. Tagalog
9. Thai
10. Tongan
11. Traditional Chinese
12. Vietnamese





## DEPARTMENT OF EMERGENCY MANAGEMENT



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