HAWAIIAN HOME LANDS

HAWAIIAN HOMES COMMISSION · DEPARTMENT OF HAWAIIAN HOME LANDS

Papakōlea-Kalāwahine Community Meeting

January 16, 2024

Stevenson Middle School

6pm – 7pm

Agenda

- Pule and Welcome
- Team Introductions
- Phase 1 Completed Individual Property Assessments (2022 – 2023)
  - Geotechnical Conditions
  - Structural Observations
  - Findings
- Phase 2 Geotechnical & Structural Monitoring & Continued Assessment
  - Monitoring Plan
    - -Surveys
    - -Crack Gauges
    - -Groundwater monitoring
- Next Steps

Team Introductions

- **DHHL** (Department of Hawaiian Homelands)
  - Kehaulani Quartero – Project Manager, Land Development Division
  - Stewart Matsunaga – Administrator, Land Development Division
  - Stacelynn Eli – Information and Community Relations Officer
- **G70** (Project Management & Community Outreach Consultant)
  - Ryan Char – Principal Engineer
  - Kahea Winchester – Project Manager
  - Kai Akiona-Ferriman – Project Engineer
- **HALEY & ALDRICH** (Geotechnical Consultant)
  - Dave Buscheck – Geotechnical Engineer
  - Daniel Shinsato – Geotechnical Engineer
- **WSP** (Structural Consultant)
  - Kimberly Hall – Structural Engineer

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Phase 1

Individual Property Assessments Completed

Individual Property Assessments

- **87 total homes** were each contacted via DHHL letters, phone calls and door-to-door solicitation to schedule an appointment for a visual inspection
- **59 homes** each elected to participate in an individual property assessment
- **Attended various community meeting presentations (2022)**
- A **Walk-Through Survey** conducted between **May-Oct. 2022** visually assessed the following on each property:
  - Site: topography, drainage and pavement conditions
  - Structural: foundations and building's interior and exterior envelope
  - Geotechnical: soils at foundations (where visible), and interior and exterior ground conditions

Individual Property Assessments

- **Findings** for the 59 homes include the following (some homes may be in multiple categories):
  - No homes were identified to have immediate life-safety issues at the time
  - A few homes were identified for further evaluation due to signs of potential structural compromise (signs of more significant building movement and larger foundation cracks/spalls)
  - A few homes had visible wet areas within soils under the home or under the road fronting the home; identified for further geotechnical investigation via borings (groundwater and soils)
  - Some homes identified for further, quarterly monitoring due to minor movements/cracking
  - Some homes did not have any indication of significant movement or water issues and have no recommendations for further investigation / monitoring.
- G70 presented the findings to DHHL at the end of 2022 and continued to scope the next phase of assessments in 2023.
- In the interim, BWS elected not to proceed with the water tank work.

Geotechnical Conditions

- Kalāwahine Streamside foundation systems consist of shallow foundations bearing on the underlying soil or rock
  - Type 1 House – perimeter strip footings with concrete slab
  - Type 2 House – predominantly column footings
  - Type 3 House – combination of column and strip footings
- Soil conditions
  - Fill soils – Placed during construction
  - Clays and Silts – Tantalus Silty Clay or Kaena Stony Clay
  - Weathered Volcanic Rock (Saprolite) – Thin layer
  - Tuff or Basalt Bedrock - Hard bearing materials
- Groundwater Conditions
  - Very deep aquifers
  - Localized perched stormwater on bedrock

Site Conditions

- Surface Water (regional)
  - Historical maps represented possible surface water flow paths
  - Community members have stated that there were springs in the area
  - There are no documented streams or water bodies in the area besides Kanahā stream
- Surface Water (properties)
  - Water was observed seeping out of the ground in the road and under a home.
  - Moisture was observed under a few homes
  - Roof drainage should be directed away from the homes
- Erosion Hazards
  - Some homes have foundations on a slope that is steeper than 1 horizontal to 1 vertical; can cause movement in building foundations.
  - Water flowing under homes can contribute to an eroding slope

Structural Observations

- No visible signs of structural distress, <u>no immediate life safety concerns.</u>
- Minor cracking in concrete retaining walls and slabs-on-grade. Cracks of interest were identified for further monitoring (cracks wider than approximately 1/16”) .
- CMU pier spalling and cracking, weathered shell.
- Drywall cracks, gaps and cracks in siding and molding, stuck window and doors may be indication of building movement.
- Review of original structural drawings indicates standard residential framing, detailing, and foundations.

Individual Property Assessments Findings

Regionally, all properties will undergo an aerial survey to set baseline ground elevation.

Around 7 homes will receive borings (4) to assess subsurface conditions (groundwater/soils).

30 homes will require ongoing monitoring including crack gauges / level surveys for movement monitoring.

2 homes will require exploratory investigation.

Some homes were already identified for recommended repairs that will be further confirmed in this phase.

Report recommended to share results of **visual assessment** with lessees.

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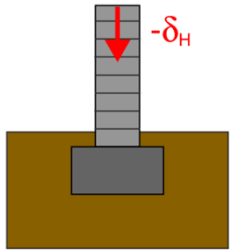
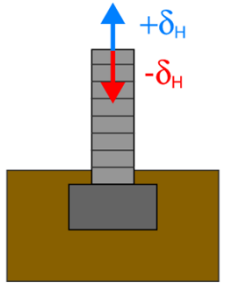
Continued Structural & Geotechnical Monitoring and Investigations

What can cause a house to move…

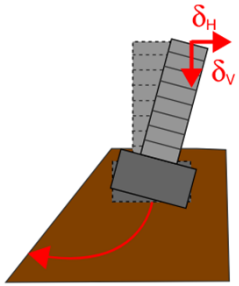
- **Settlement** – downwards vertical deformation of the foundation, may be caused by:
  - Loading of compressible materials (long-term)
  - Loading of poorly compacted fill soil (rapid)
  - Increases in loads

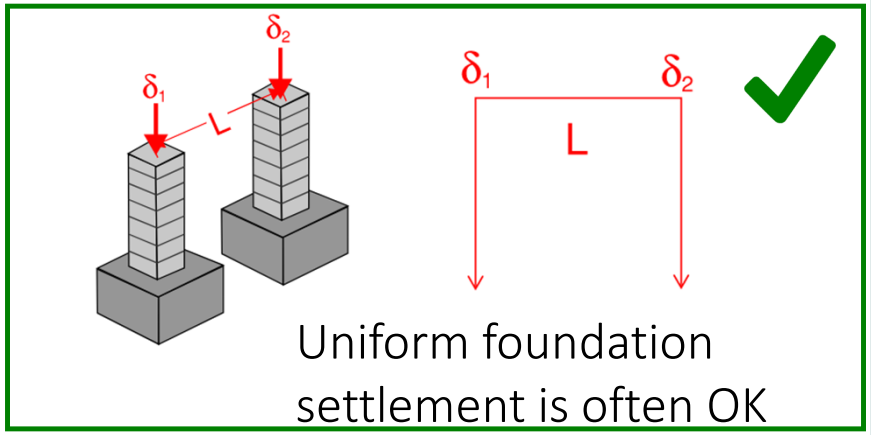


- **Shrink/Swell of soil** – seasonal cyclical vertical deformation (heave + and settlement -) of the foundation
  - Caused by susceptible soils exposed to water during rainy periods and shrinkage during dry periods
  - Could be poor fill

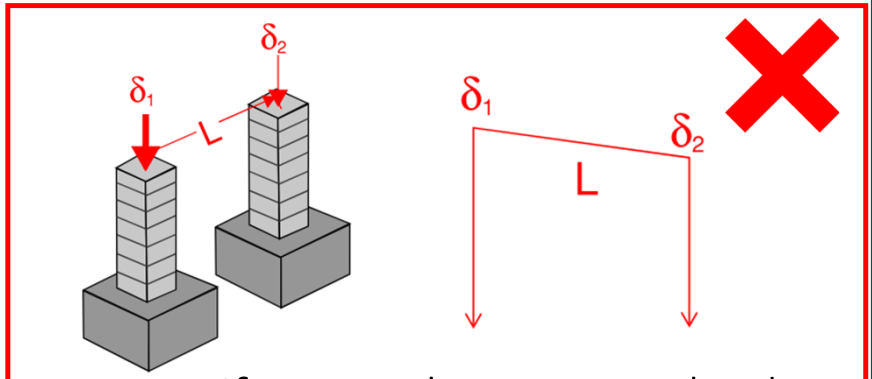


- **Erosion/Inadequate Embedment** – Slope adjacent foundations deform due to loss of soil restraint.
  - Caused by loss of soil due to erosion.
  - Erosion caused by lack of vegetative cover or stormwater runoff directed to slope.





Uniform foundation settlement is often OK



Non-uniform settlement may lead to structural or functional distress

Monitoring Plan

HOW TO MONITOR FOR MOVEMENT?

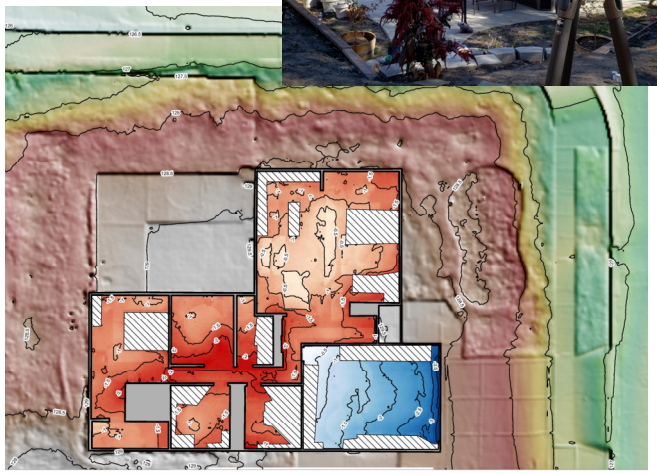
- **Aerial and Floor Level Surveys** –
  - establish a baseline survey with current elevation conditions (interior and exterior)
  - monitor for any future ground deformations with subsequent survey

- **Crack Gauge Monitoring** –
  - establish baseline measurements of opening/closure of existing cracks in foundations
  - monitor for any future foundation deformations with subsequent crack measurements

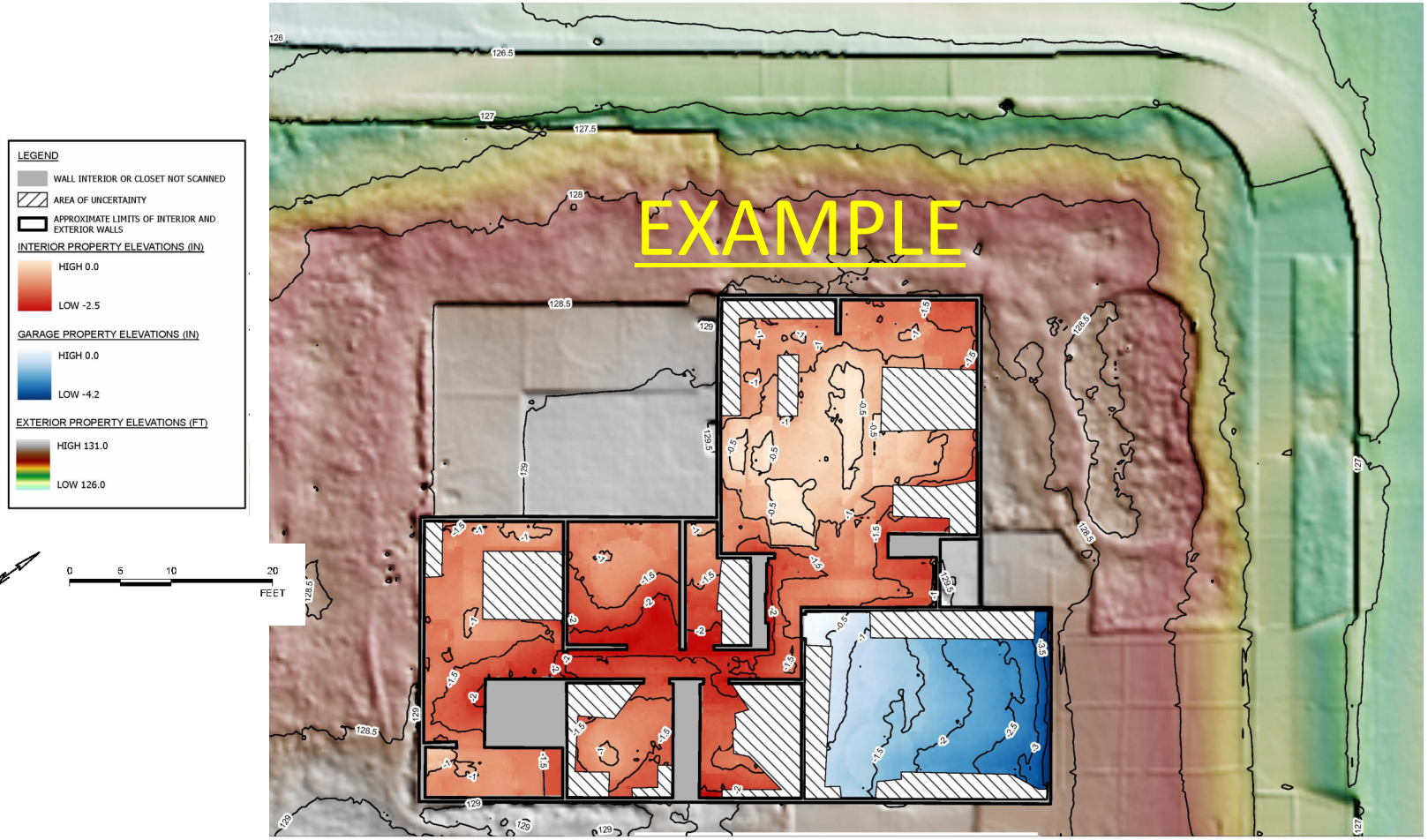
- **Groundwater Monitoring and Soil Sampling** –
  - preform borings for soil sampling and geologic evaluation
  - install and monitor groundwater observation wells

Monitoring Plan - Surveys

- Aerial Survey of Area of Interest
  - Drone-mounted LiDAR scan of Kapahu Street, Kamalehua Place, Ha‘alelea Place and adjacent properties
  - Establish baseline for monitoring potential future ground deformations
- Aerial Exterior Survey
  - Drone-mounted LiDAR scan of the exterior façade at select properties
  - Establish baseline for monitoring potential future deformation of the home exteriors
- Floor Level Survey
  - Tripod-mounted LiDAR scan of the lowest floor levels at select properties (closest to the foundation level)
  - Create a snapshot plan of current conditions
  - Establish baseline for monitoring potential future deformation of the home interiors



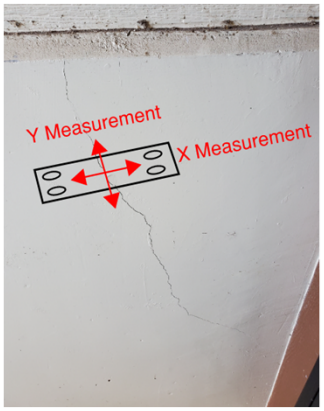
Monitoring Plan - Surveys

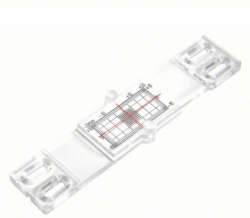


Monitoring Plan- Crack Gauges

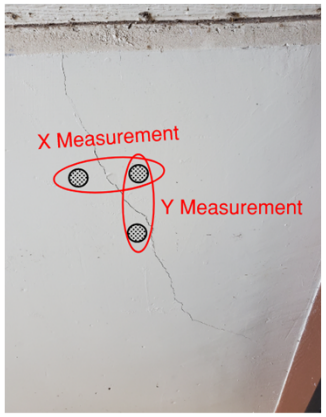
- Measure opening/closure of existing cracks in foundations
  - Measures in two directions (X-Y or Y-Z)
- Mounted with screws and epoxy
- In visible areas caliper points can be substituted upon request
- A crackmeter ruler will be used in instances where installation of crack gauges could further damage the structure or installation is infeasible and/or undesirable.
- Gauges will be removed upon completion of monitoring

X-Y Crack Gauge





X-Y Caliper Points



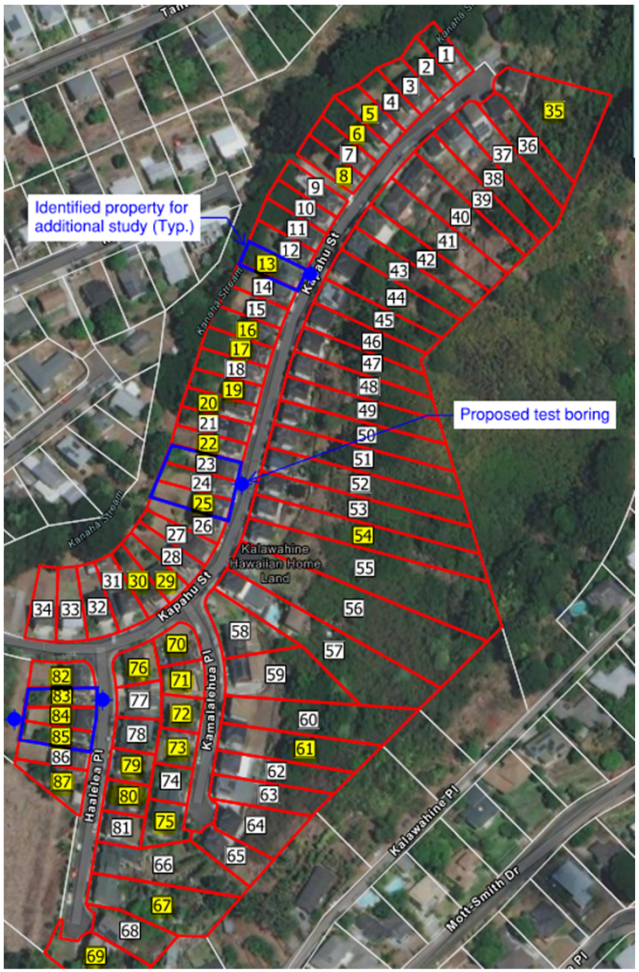
Y-Z Crack Gauge

Crackmeter Ruler

Monitoring Plan – Groundwater Study

- Groundwater monitoring & soil sampling plan
  - 4 test borings near 7 properties planned
    - Soil sampling and geologic evaluation (blue outline)
  - 2 observation wells planned
    - Equipment allows for automated hourly measurments over a 1-year period
    - Comparison of groundwater fluctuations to precipitation data
    - Data gathered in-person, quarterly
  - Geotechnical Laboratory Program
    - Submit soil samples from boring locations to assess physical characteristics of soil that may affect expansion/compression properties of material under load.

- Water intrusion can also cause potential damage to structural support elements (spalling).



Geotechnical Borings And Observation Wells

Install 4 test explorations and install 2 groundwater observation wells at select locations.

Geotechnical Borings And Observation Wells

Monitoring Plan by Property

Property Address	Floor Level Survey	Crack Gauges	Targeted for Geotechnical Drilling and Groundwater Monitoring
2031 Haalelea Place	X		
2034 Haalelea Place	X		X
2252 Kapahu Street	X		
2001 Haalelea Place			
2002 Kamalalehua Place		X	
2009 Haalelea Place	X		
2014 Kamalalehua Place	X		
2019 Kamalalehua Place	X	X	
2022 Kamalalehua Place		X	
2025 Haalealea Place		X	
2026 Haalelea Place		X	
2028 Kamalalehua Place		X	
2038 Haalelea Place	X		X
2038 Kamalalehua Place			
2042 Haalelea Place	X	X	X
2048 Haalelea Place	X		
2049 Haalelea Place	X	X	
2212 Kapahu Street		X	
2218 Kapahu Street		X	
2234 Kapahu Street	X		X
2237 Kapahu Street	X		
2246 Kapahu Street		X	
2256 Kapahu Street	X		
2262 Kapahu Street		X	
2264 Kapahu Street	X		
2274 Kapahu Street		X	X
2292 Kapahu Street		X	
2298 Kapahu Street		X	
2302 Kapahu Street	X	X	
2319 Kapahu Street		X	
2238 Kapahu Street			X
2242 Kapahu Street			X
Total	15	17	7

Individual notices will go out to each lessee

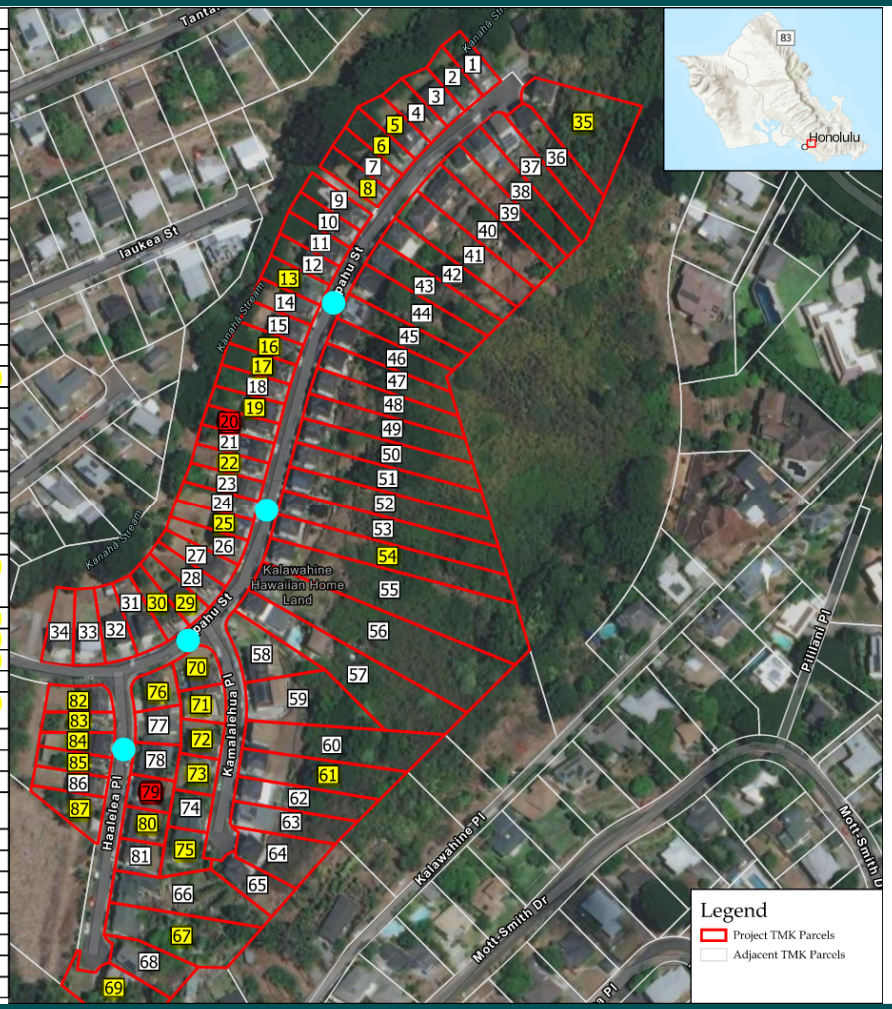
Site Map

LEGEND

- Boring
- Exploratory Investigation
- Crack Gauge/Manometer/ Settlement monitoring survey

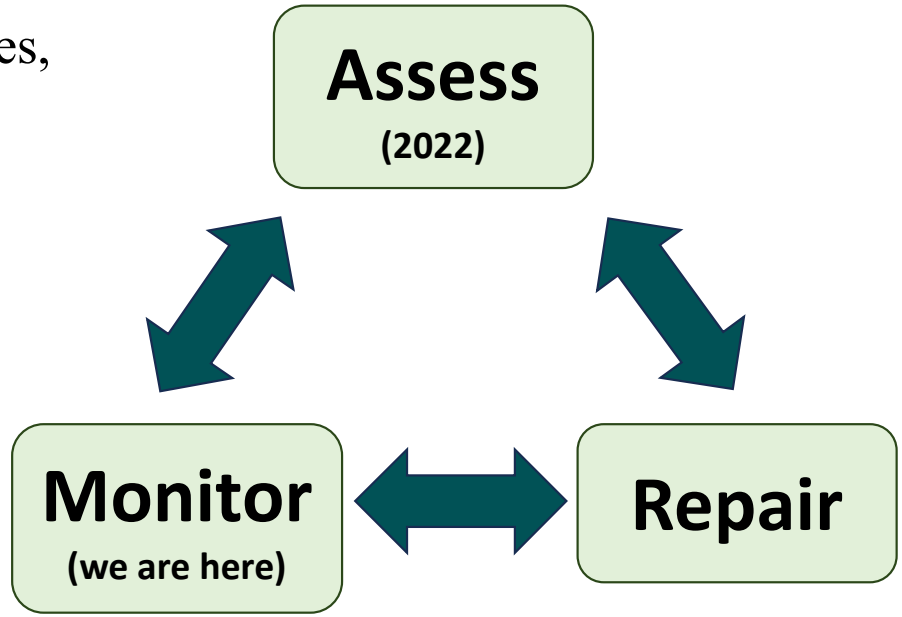
Individual notices will go out to each lessee

#	Address	#	Address
1	2316 Kapahu St	45	2273 Kapahu St
2	2312 Kapahu St	46	2269 Kapahu St
3	2308 Kapahu St	47	2265 Kapahu St
4	2306 Kapahu St	48	2261 Kapahu St
5	2302 Kapahu St	49	2257 Kapahu St
6	2298 Kapahu St	50	2253 Kapahu St
7	2296 Kapahu St	51	2249 Kapahu St
8	2292 Kapahu St	52	2245 Kapahu St
9	2288 Kapahu St	53	2241 Kapahu St
10	2284 Kapahu St	54	2237 Kapahu St
11	2282 Kapahu St	55	2233 Kapahu St
12	2278 Kapahu St	56	2227 Kapahu St
13	2274 Kapahu St	57	2223 Kapahu St
14	2272 Kapahu St	58	2037 Kamalalehua Pl
15	2268 Kapahu St	59	2029 Kamalalehua Pl
16	2264 Kapahu St	60	2023 Kamalalehua Pl
17	2262 Kapahu St	61	2019 Kamalalehua Pl
18	2258 Kapahu St	62	2013 Kamalalehua Pl
19	2256 Kapahu St	63	2009 Kamalalehua
20	2252 Kapahu St	64	2005 Kamalalehua Pl
21	2248 Kapahu St	65	2001 Kamalalehua Pl
22	2246 Kapahu St	66	2015 Haalelea Pl
23	2242 Kapahu St	67	2009 Haalelea Pl
24	2238 Kapahu St	68	2005 Haalelea Pl
25	2234 Kapahu St	69	2001 Haalelea Pl
26	2230 Kapahu St	70	2038 Kamalalehua Pl
27	2226 Kapahu St	71	2028 Kamalalehua Pl
28	2222 Kapahu St	72	2022 Kamalalehua Pl
29	2218 Kapahu St	73	2014 Kamalalehua Pl
30	2212 Kapahu St	74	2008 Kamalalehua Pl
31	2206 Kapahu St	75	2002 Kamalalehua Pl
32	2198 Kapahu St	76	2049 Haalelea Pl
33	2194 Kapahu St	77	2041 Haalelea Pl
34	2188 Kapahu St	78	2035 Haalelea Pl
35	2319 Kapahu St	79	2031 Haalelea Pl
36	2317 Kapahu St	80	2025 Haalelea Pl
37	2313 Kapahu St	81	2021 Haalelea Pl
38	2307 Kapahu St	82	2048 Haalelea Pl
39	2303 Kapahu St	83	2042 Haalelea Pl
40	2299 Kapahu St	84	2038 Haalelea Pl
41	2293 Kapahu St	85	2034 Haalelea Pl
42	2289 Kapahu St	86	2030 Haalelea Pl
43	2283 Kapahu St	87	2026 Haalelea Pl
44	2279 Kapahu St		



Monitoring Next Steps

- Individual notice to lessees for aerial/floor level surveys, crack gauges, and geotechnical borings
- Conduct aerial & floor survey, install crack gauges, install monitoring wells in DHHL-owned streets.
- Upon completion of initial assessments, monitor movement / groundwater concerns quarterly (crack gauges / groundwater monitoring)
- Identify properties where future surveys and/or exploratory investigation may be recommended
- Confirm / identify repairs that may be proposed
  - Some previously identified in visual assessments
  - Some will be identified during this phase.
  - Address either structure/ground/water issues.
- Determine with DHHL the scope of future phases.



Near-Term Next Steps

Dates (subject to change)	Milestone
January 2024	Individual notices to lessees for aerial/floor level surveys, crack gauges, and geotechnical borings
February 2024	Coordinate and schedule with individual lessees
March - April 2024	Conduct aerial survey over Kalāwahine-Papakōlea project area. Perform exploratory investigation. Install crack gauges and/or observation wells at homes recommended for continued monitoring.
May - June 2024	Conduct first quarterly monitoring of crack gauges and observation wells
June 2024 – June 2025	Continued quarterly monitoring of crack gauges and observation wells (with notice)

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Thank You – Q & A