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Memorandum

1 Sundial Avenue
Suite 410
Manchester, NH 03103 USA
1.603.666.7181 Fax 1.603.666.7185

Date June 17, 2009

To Dave Chamberlain and John Englert

From Heath Marsden and Steve Berardo

Subject HHCTCP near HNL Runways 22L/22R

This memo is a review of the proposed Honolulu High Capacity Transit Corridor Project (HHCTCP) and the potential impacts to the FAA airspace surfaces that are in place to protect the approaches and departures to Runways 04L/22R and 04R/22L at Honolulu International Airport (HNL). This review was based in part on two drawings provided via email (dated June 11, 2009) titled HNL Runways with OFA, RSA and RPZ.pdf and HP029_Lagoon_R22R.pdf.

The information shown on the approved Ultimate Airport Layout Plan (ALP), which serves as the official plan of record for existing and future airport development should be obtained to confirm that the assumptions presented below are correct. A copy of the Ultimate ALP was not available at the time of our review of the attached plans. If any of the assumptions listed below are not correct, the airspace surfaces developed for this review will need to be recalculated and could change the conclusions presented below.

Conclusions

1. The HHCTCP would run through the Runway Protection Zone (RPZ) to both Runways 22R and 22L. The HHCTCP would create an additional non-conforming condition within both RPZs;

2. The northernmost corner of the Runway 22R Object Free Area (ROFA) would be penetrated by a portion of the HHCTCP;

3. The FAR Part 77 Approach surface for Runway 22R would not clear the HHCTCP by the required 23-foot clearance over a railway line (the approach surface would only clear the rail line by approximately 9 feet). The rail corridor would also penetrate the 7:1 transitional surfaces to the runway;

4. The departure surface described in FAA AC 150/5300-13, *Airport Design*, to Runways 04L and 04R would be penetrated by greater than 5 feet;

5. The One Engine Inoperative Surface (OEI) described in FAA AC 150/5300-13, *Airport Design*, to Runways 04L and 04R would be penetrated by more than 13 feet.

Criteria

Several FAA documents are applicable to the proposed development in the vicinity of the approach ends of Runways 22L and 22R:

1. FAA Advisory Circular 150/5300-13, *Airport Design*, through Change 14
2. FAR Part 77 (14CFR Part 77), *Objects Affecting Navigable Airspace*
3. FAA Order 8260.3B, *United States Standard for Terminal Instrument Procedures (TERPs)*
4. FAR Part 139 (14CFR Part 139), *Certification of Airports*

Assumptions

A number of assumptions were made in the review of the HHCTCP drawings:

1. Runway 04L/22R has an Airport Reference Code (ARC) of C-III and Runway 04R/22L is ARC D-V. The ARCs, which represent the most demanding aircraft that use either runway, were assumed based on the runway dimensions and type of aircraft that currently use HNL. The Ultimate ALP designates the actual ARC for each runway and it should be reviewed to confirm whether the ARCs used in this memo are correct.

2. Runway 22R end elev. – 7.7 feet MSL; Runway 22L end elev. = 8.6 feet MSL

3. Both Runway 22L and 22R have circle-to-land procedures. However, they are still considered to be visual runways (other than utility) with regard to FAR Part 77 imaginary surfaces.

4. Because of its length, it is assumed that Runway 04R/22L accommodates air carrier operations. Therefore, the criteria in FAA AC 150/5300-13, Table A2-1, Row 12 apply. Runway 04L/22R accommodates primarily general aviation (corporate) and regional aircraft.

5. Instrument departures are conducted on both Runway 04L and Runway 04R (based on the published Keola Two, Molokai Four, and Opihi Two instrument procedures).

6. The FAA Flight Procedures Development website was searched to determine if any future instrument approach procedures were scheduled for development to Runways 22L and 22R and none were indicated.

Airspace Surfaces Analyzed

The table below depicts the FAA airspace surfaces and associated dimensions applicable to aircraft operations on Runways 04L/22R and 04R/22L at HNL. These surfaces, which must be clear of penetrations, were applied based on the assumptions presented above. If the stated assumptions are

not correct based on information presented on the approved Ultimate ALP, or other date from the airport sponsor or the FAA, then these surfaces and dimensions must be revised accordingly.

FAA Criteria	Imaginary Surface	Width	Length	Slope
AC 5300-13	Runway Safety Area (RSA)	500'	1,000'	-
	Runway Object Free Area (ROFA)	800'	1,000'	-
	Runway Free Zone (ROFZ)	800'	200'	-
	Runway Protection Zone (RPZ) (1)	Inner – 500' Outer – 1,010'	1,700'	-
	Table A2-1 Row 4 – Approach end of runways expected to support instrument night circling (1)	Inner – 400' Outer – 3,400'	10,000'	20:1
	Table A2-1 Row 11 – Departure runway ends for all instrument operations	Inner – 1,000' Outer – 6,466'	10,200'	40:1
	Table A2-1 Row 12 (2) – Departure runway ends supporting Air Carrier operations	Inner – 600' Outer – 12,000'	50,000'	62.5:1
FAR Part 77	Approach Surface	Inner – 500' Outer – 1,500'	5,000'	20:1
TERPS	Visual Portion of Final Approach Segment (3)	Inner – 400' Outer – 3,400'	10,000'	20:1

(1) Surface begins 200 feet from runway end.
(2) Applies only to Runway 04R departures; penetrations to this surface are provided for information only.
(3) Surface begins 200 feet from runway threshold.

With regard to the drawings that were attached in an email sent on June 11, 2009, the Runway Protection Zones (RPZs) depicted on the drawing for Runways 04R/22L and 04L/22R do not appear to be shown correctly. Assuming that Runway 04L/22R is ARC C-III and Runway 04R/22L is ARC D-V, the RPZ, starting 200 feet from the runway end, should extend out 1,700 feet, have an inner width of 500 feet and an outer width of 1,010 feet.

We have redrawn the RPZs to the standards contained in FAA Ac 5300-13, *Airport Design,* for runways with a visual approach only with not lower than one mile visibility. With these dimensions, the RPZ for both runways extends well into the proposed HHCTCP and would add to existing non-conforming conditions.

In addition to the potential impacts from the HHCTCP noted above, it was observed that there are also several existing non-conforming conditions that the FAA would require the airport sponsor to address. Those existing non-conforming conditions appear to be as follows:

1. 22R Runway Safety Area – This area is required to be graded and free and clear of obstructions. Presently, there appears to be a drainage ditch which runs along the northern edge of the RSA and then crosses diagonally to the east through the top third of the RSA.

2. 22R Runway Object Free Area (ROFA) – This area requires the clearing of above ground objects protruding above the RSA edge elevation. There are several buildings located within the ROFA for Runway 22R.

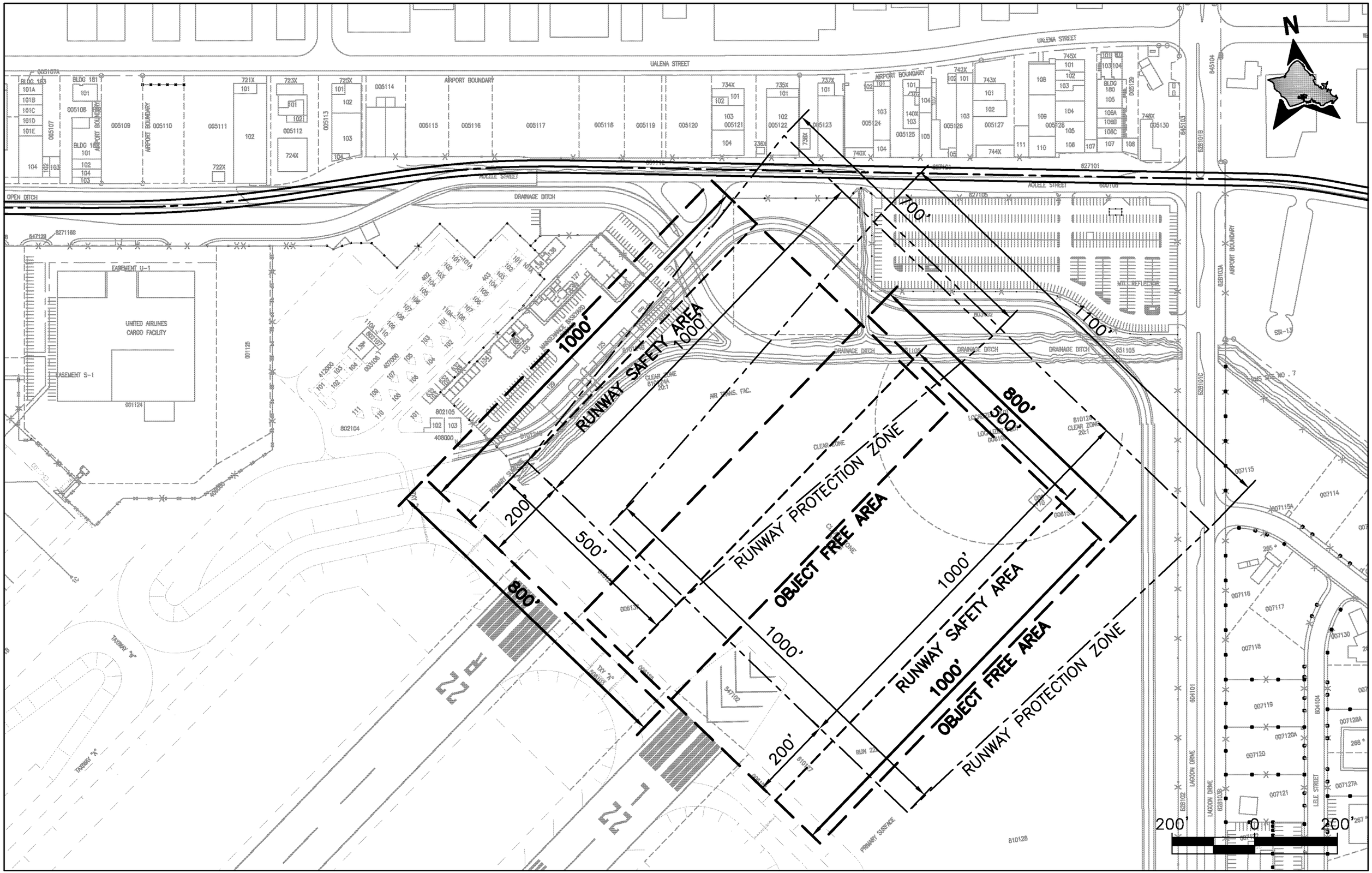
3. 22R and 22L Runway Protection Zone (RPZ) – These currently overlay land uses that are not in conformance with FAA criteria.

These existing non-conforming conditions may have either, a) already been approved by the FAA through waivers and/or modifications to standards, or b) the airport sponsor must have an action plan to bring these items into compliance with FAA criteria. Either option should be shown on the Ultimate ALP.

In general, the FAA has made clear to airport sponsors, particularly certified commercial service airports like HNL, that compliance with runway safety area standards is one of the Administration's top priorities.

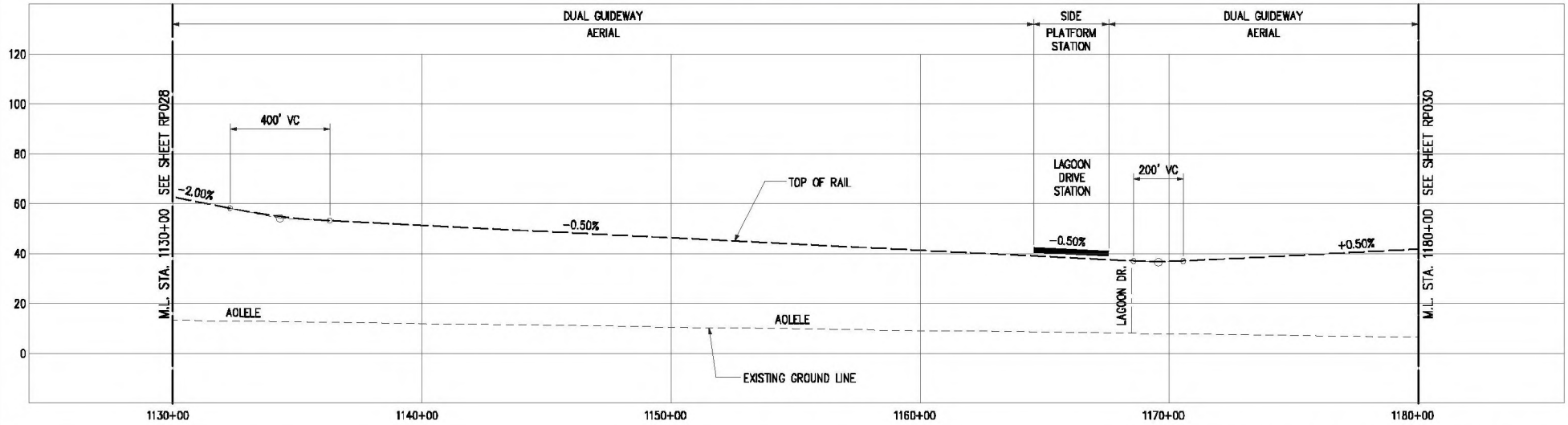
If a change in runway length or the location or height of either runway threshold is shown on the Ultimate ALP and is programmed to occur, then the airspace surfaces reviewed and conclusions presented in this memo would need to be revised accordingly to determine the impact on the proposed HHCTCP.

Attached are several graphics prepared by Jacobs depicting the airspace surfaces which would be impacted by the HHCTCP. The RPZ is shown in yellow, the One Engine Inoperative surface is shown in cyan, the Departure Surface is shown in dark red, the ROFA is shown in magenta, the RSA is in blue and the FAR Part 77 Approach Surface is shown in red. One drawing in plan view and one drawing in 3D has been included for each runway end. The surfaces were overlaid onto the latest Google Earth imagery.


N
UALENA STREET
AIRPORT BOUNDARY
AOLELE STREET
DRAINAGE DITCH
OPEN DITCH
EASEMENT U-1
UNITED AIRLINES CARGO FACILITY
EASEMENT S-1
MAINTENANCE BASEYARD
RUNWAY SAFETY AREA
1000'
200'
500'
800'
RUNWAY PROTECTION ZONE
OBJECT FREE AREA
1000'
200'
RUNWAY SAFETY AREA
1000'
OBJECT FREE AREA
RUNWAY PROTECTION ZONE
700'
1100'
800'
500'
200'
0
200'
LAGOON DRIVE
LELE STREET
TAXIWAY "A"
TAXIWAY "W"
PRIMARY SURFACE
AIR TRANS. FAC.
CLEAR ZONE
MIL. REFLECTOR
RUN 22
22
L
22
R

AR00112898

NOTE: PLANS ARE CONCEPTUAL AND SUBJECT TO CHANGE



CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES
RAPID TRANSIT DIVISION

HONOLULU HIGH-CAPACITY TRANSIT CORRIDOR PROJECT

Scale:
HORIZ. 0 200' 400'
VERT. 0 20' 40'

CONCEPTUAL ALIGNMENT PLANS AND PROFILES

PLAN AND PROFILE
STA 1130+00 TO STA 1180+00

SHEET 31 OF 32

Page No. 37 of 38
Drawing No: **RP029**
Date: 09/22/08

2008-09-25 11:17 AM K:\EIS Drawings_FINAL_PLANS AND PROFILES\HHCT-EIS-RP029.dwg

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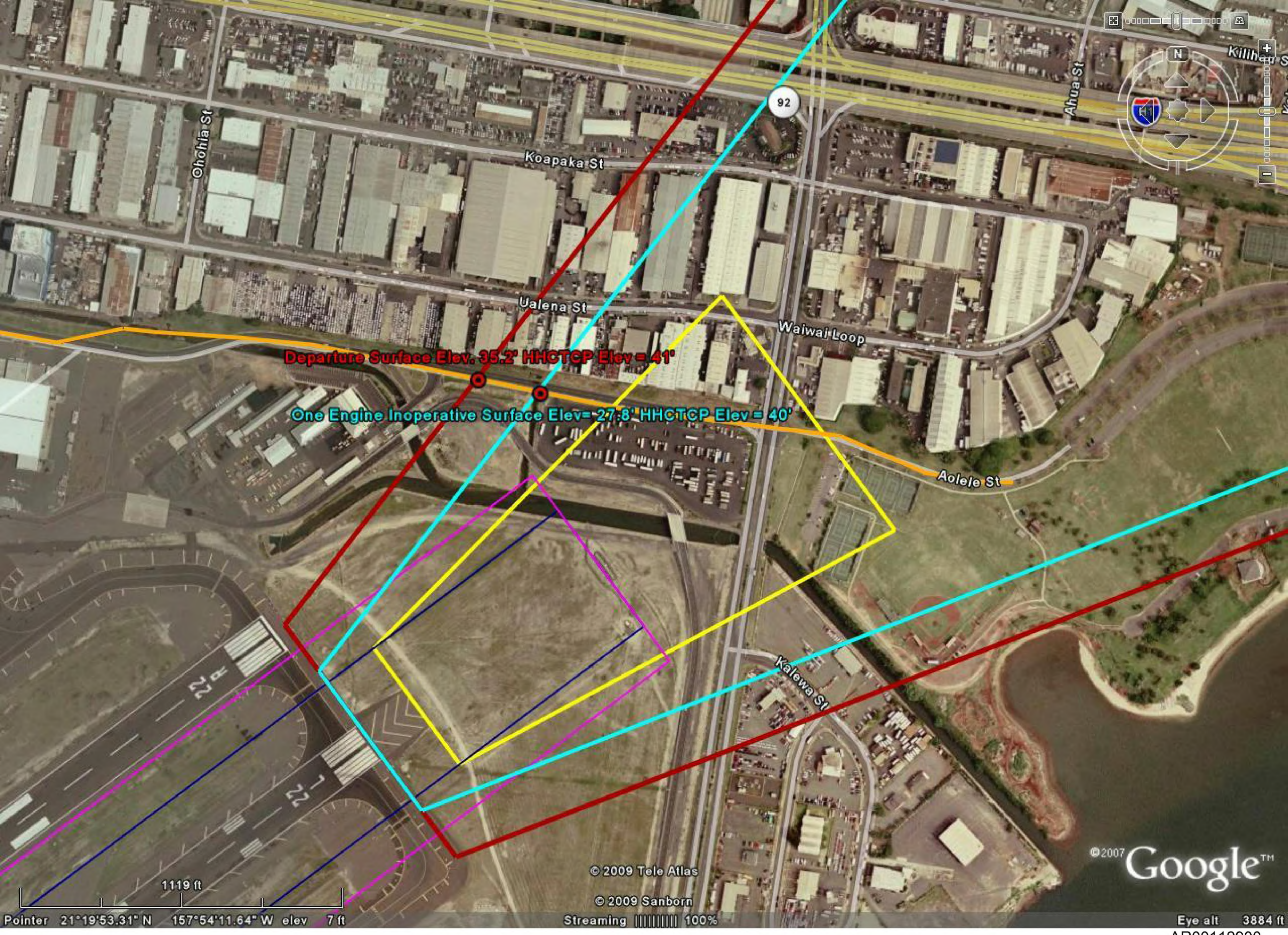
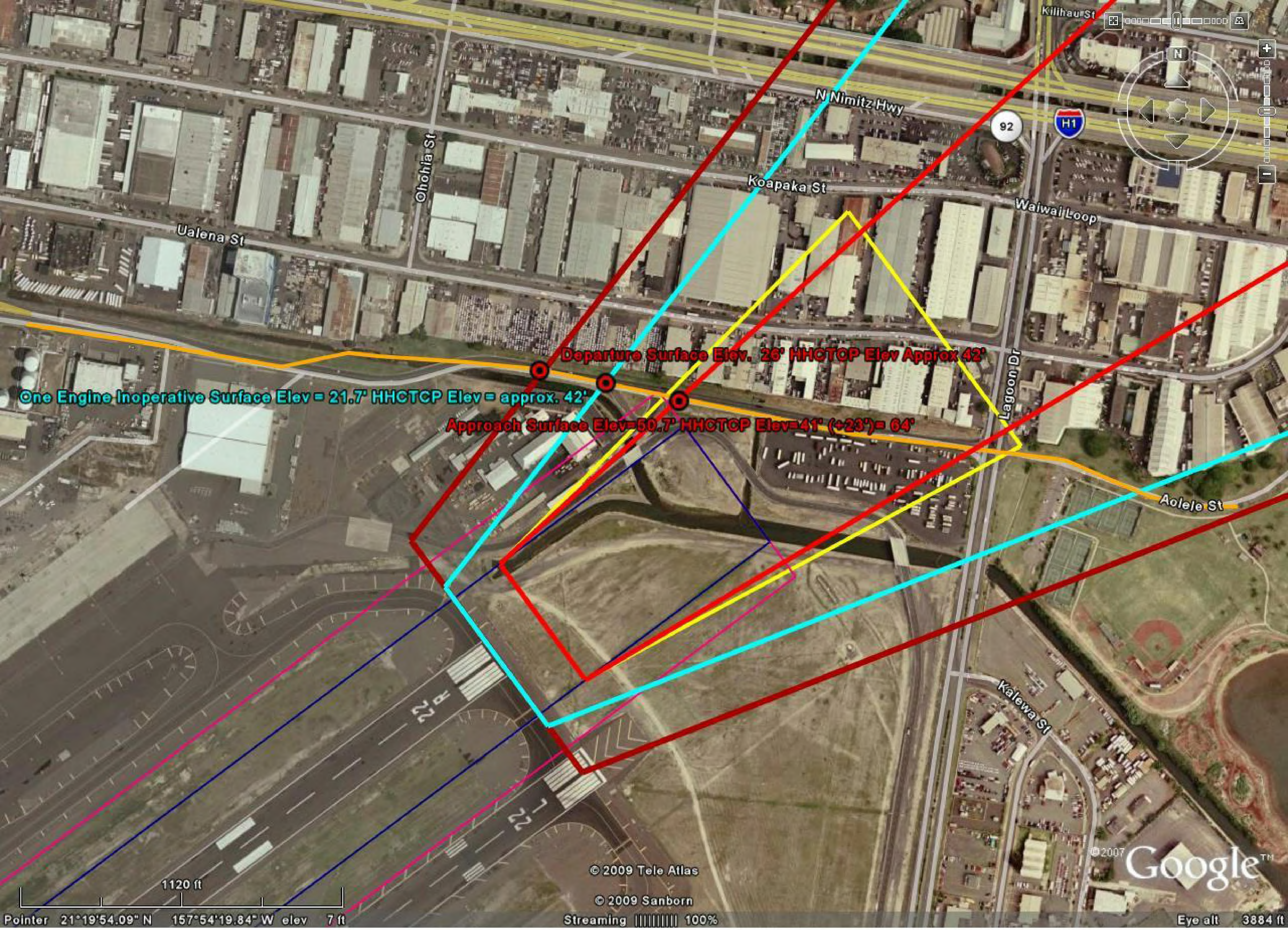

Ohohia St
Koapaka St
Ualena St
Waiwai Loop
Ahua St
Aolele St
Kalewa St
92
Departure Surface Elev. 35.2' HHCTCP Elev = 41'
One Engine Inoperative Surface Elev= 27.8' HHCTCP Elev = 40'
22
1119 ft
© 2009 Tele Atlas
© 2009 Sanborn
©2007 Google™
Pointer 21°19'53.31" N 157°54'11.64" W elev 7 ft
Streaming 100%
Eye alt 3884 ft

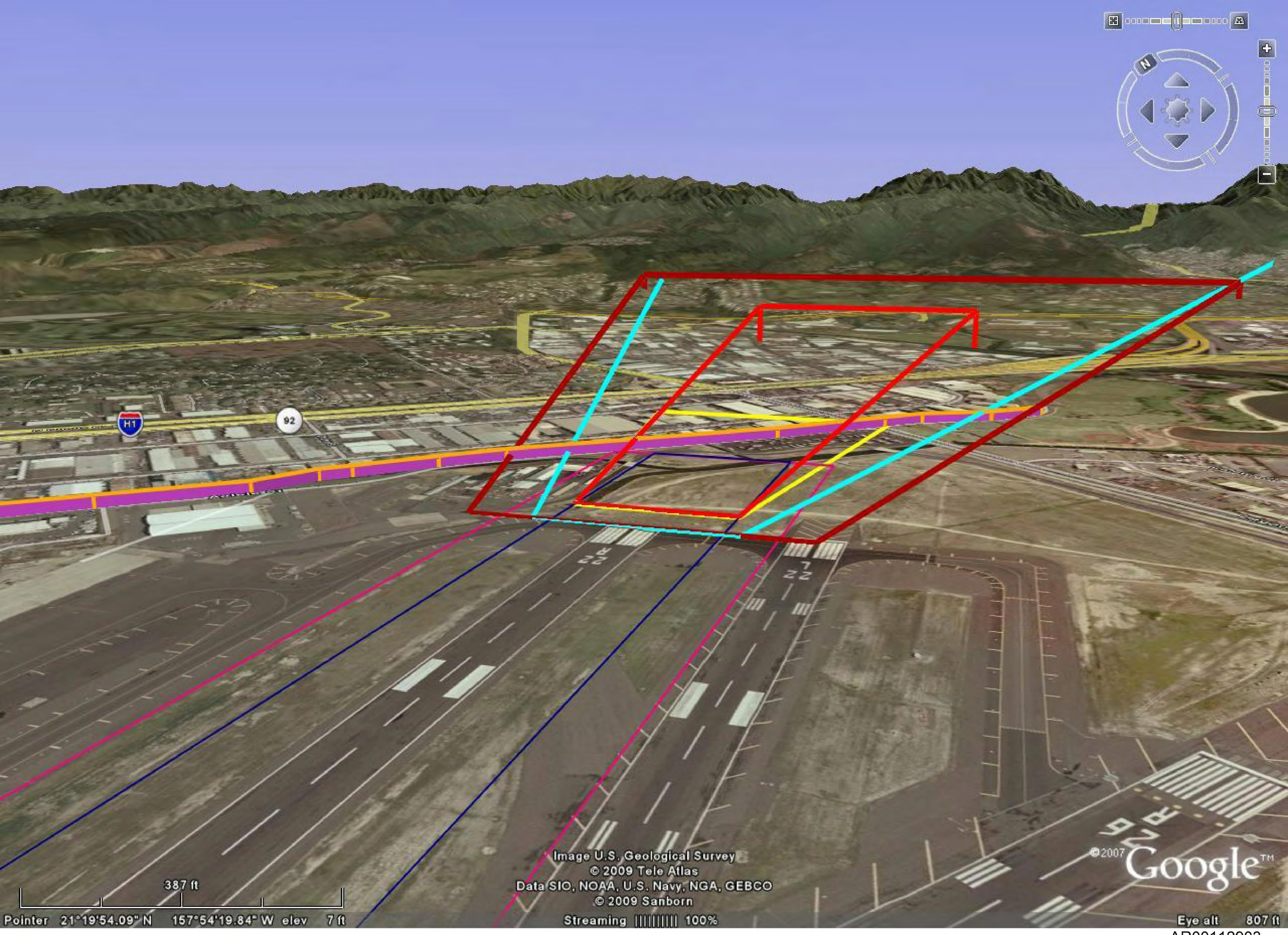
AR00112900

N
92
H1
387 ft
Pointer 21°19'55.16" N 157°54'12.61" W elev 7 ft
Image U.S. Geological Survey
© 2009 Tele Atlas
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Sanborn
Streaming 100%
©2007 Google™
Eye alt 807 ft

AR00112901


Kilihau St
N Nimitz Hwy
92
H1
Ohohia St
Koapaka St
Waiwai Loop
Ualena St
Lagoon Dr
Aolele St
Kalewa St
Departure Surface Elev. 26' HHCTCP Elev Approx 42'
One Engine Inoperative Surface Elev = 21.7' HHCTCP Elev = approx. 42'
Approach Surface Elev=50.7' HHCTCP Elev=41' (+23')= 64'
22
22
1120 ft
© 2009 Tele Atlas
© 2009 Sanborn
© 2007 Google
Pointer 21°19'54.09" N 157°54'19.84" W elev 7 ft
Streaming 100%
Eye alt 3884 ft

AR00112902


H1
92
387 ft
Pointer 21°19'54.09" N 157°54'19.84" W elev 7 ft
Image U.S. Geological Survey
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Streaming 100%
Eye alt 807 ft
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