Kahului Airport (OGG)
Resurface Runway 2-20
Safety Risk Assessment Panel Meeting
Safety Risk Management Document

State of Hawaii
Department of Transportation
Airports Division

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Prepared by: Base Management

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Change Control and Version Tracking

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HDOT-A SRA Panel Meeting	May 18, 2022	--
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Signature Page

Title: Kahului Airport (OGG) Resurface Runway 2-20, Safety Risk Management Panel Meeting, Safety Risk Management Document

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Risk Acceptance Signature:

Marvin Moniz – Manager, District Airport — Jul 19, 2022 — Date

Ross Higashi – HDOT-A Deputy Director — Jul 20, 2022 — Date

Proposal Rejection:

N/A

Signature, Name and Organization — Date

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Executive Summary

The State of Hawaii, Department of Transportation, Airports Division (HDOT-A) proposes to resurface Runway (RWY) 2-20 at Kahului Airport (OGG) to address the deteriorated conditions of the existing pavement. Once completed, airfield safety will be enhanced for all users.

The HDOT-A implemented the Safety Risk Assessment (SRA) process into the Construction Safety Phasing Plan (CSPP) review due to the proposed changes to the airfield had presumed significant impacts to the airfield operational status and the National Airspace System (NAS). All HDOT-A led SRA preliminary and panel meetings were conducted and facilitated in accordance with the FAA Airport (ARP) Safety Management System Order 5200.11A, FAA ARP Safety Management Systems (SMS) Desk Reference, Version 1.0, FAA AC 150/5200-37A Safety Management Systems for Airport Operators, and FAA Order 8040.4B Safety Risk Management Policy.

This Safety Risk Management Document (SRMD) documents the Safety Risk Management Panel (SRMP) evaluation of the proposed Construction Safety Phasing Plan (CSPP) to resurface RWY 2-20 at Kahului Airport.

HDOT-A conducted a single Preliminary SRA meeting with all Airport stakeholder groups to ensure that the panelists are sufficiently knowledgeable of the Federal Aviation Administration (FAA) Airports SMS process and also understand the proposed change to airfield system. This meeting was conducted on May 12, 2022, with the indicated stakeholder groups:

1. May 12, 2022, Preliminary invitations were sent out to all airport stakeholders. HDOT-A Maui AAS V, HDOT-A OGG AOC, HDOT-A GA Officer, HDOT-A AIR-EA, HDOT-A AIR-EP, RM Towill, Orion Engineers, AECOM, FAA OGG ATCT, FAA OGG Tech Ops, FAA HNL ADO, FAA HCF, FAA RSO, FAA WSA NPI, FAA WSC FP, American Airlines, Alaska Airlines, Delta Airlines, Hawaiian Airlines, United Airlines, Southwest Airlines, and UPS were able to attend virtually via Microsoft Teams Video conference call.

Minor comments to the CSPP were noted and agreed upon for revisions prior to the Panel meeting. Some of the concerns discussed were available runways due to overlapping statewide runway closures, HDOT-A will evaluate. Phase 5, there was a concern of back taxi and aircraft running past the temporary threshold when traffic picks up between 0600-0700. The project decided the work hours will be shortened to end at 0600, while TWY "G" will remain closed in order to accommodate the needs of airlines.

Following the Preliminary SRA meeting, the SRA Panel meeting was conducted on May 18, 2022, with all stakeholders.

SRMP Findings

The Hazards were identified, analyzed, and assessed in an organized group discussion, based on the thorough review of the Project Proposal Summary (PPS) and the CSPP. There were twenty-one (21) presumed hazards generated through the brainstorming session and documented in the Preliminary Hazard List (PHL). The Safety Risk Management Panel (SRMP) evaluated the twenty-one (21) presumed hazards from the PHL and categorized into sixteen (16) credible hazards for further evaluation in the Preliminary Hazard Analysis (PHA) worksheet.

During the PHA evaluation, the SRMP refined the hazard list to three (3) hazards, evaluating them for different effects. OGG-RESURFACE-3 was further broken down into analyzing and assessing multiple effects based on the concerns of the SRMP. This resulted in an increase from three (3) to five (5) hazards for analysis in the PHA. The remaining presumed hazards were determined as a Cause, Effect or covered in another hazards analysis and accepted for removal. See Table 1 below for summary.

The SRMP agreed that the following Hazards OGG-Resurface-1/2/3A and associated Effects which were rated with Low Initial Risk 4D, had existing controls in place to effectively manage these risks and no mitigation measures were needed.

It was discussed that Hazard OGG-Resurface-3B which was rated with a Medium Initial Risk3D, may have been misunderstood by SRMP members and under the impression the worst credible effect being voted on was a Surface Incident and not the documented Runway incursion. The SRMP concurred to revote on this hazard and assigned it another ID Hazard OGG-Resurface-3C. The revote resulted in the same risk rating with a Medium Initial Risk3D.

The SRMP continued discussions to further mitigate this hazard from a medium to a low risk. The SRMP members were not able to assign anyone with the responsibility to implement the mitigations, therefore, no predicted residual risk rating was voted on.

Table 1: Hazard Risk Assessment Results

(1) Hazard ID	(2) Hazard Description	(7) Effect	(12) Initial Risk	(15) Predicted Residual Risk
XYZ-1	Condition, real or potential; can cause injury, illness, etc. Pre-requisite for accident or incident	Potential outcome or harm of the hazard if it occurs in the defined system state (worst credible)	Conditions, characterized by qualities, in which a system can exist; worst credible	Risk status predicted to occur when recommended controls or requirements are verified
OGG-RESURFACE-1	**Pilot LOSA**	**Runway Incursion**	**4D – Low**	**N/A**
OGG-RESURFACE-2	**Controller LOSA**	**Runway Incursion**	**4D – Low**	**N/A**
OGG-RESURFACE-3A	**Vehicle/Pedestrian LOSA**	**Surface Incident**	**4D – Low**	**N/A**
OGG-RESURFACE-3B	**Vehicle/Pedestrian LOSA**	**Runway Incursion**	**3D – Medium**	**N/A**
OGG-RESURFACE-3C	**Vehicle/Pedestrian LOSA**	**Runway Incursion (Revote)**	**3D – Medium**	**N/A**

(1) Hazard ID	(2) Hazard Description	(7) Effect	(12) Initial Risk	(15) Predicted Residual Risk
OGG-RESURFACE-4	*During tower hours RI, SI, and RE when shortened*	*Removed based on SRMP determination captured in Effect*	*N/A*	*N/A*
OGG-RESURFACE-5	*After tower hours, RI, SI, and RE when runway shortened*	*Removed based on SRMP determination captured in Effect*	*N/A*	*N/A*
OGG-RESURFACE-6	*Increased ARFF response times*	*Removed due to ARFF response routes are made available, and barricades shown on phasing plan*	*N/A*	*N/A*
OGG-RESURFACE-7	*Multiple runway closures across State of Hawaii limiting available alternates*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-8	*Confusion regarding changed routes, Miscommunication*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-9	*Pilot or controller missing (not reading) current NOTAMs*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-10	*NOTAMs description of closures can get confusing*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-11	*Back-taxi operation*	*Removed based on SRMP determination captured in Cause/Effect*	*N/A*	*N/A*
OGG-RESURFACE-12	*Lack of good communication for go/no go between Airport and FAA*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-13	*Diversion if runways are closed*	*Removed based on SRMP determination captured in an alternate runway at HNL*	*N/A*	*N/A*
OGG-RESURFACE-14	*Missed communications regarding go/no go*	*Removed based on SRMP determination that it is the same as OGG-RESURFACE-12*	*N/A*	*N/A*

(1) Hazard ID	(2) Hazard Description	(7) Effect	(12) Initial Risk	(15) Predicted Residual Risk
OGG-RESURFACE-15	*Arrival spacing after tower hours during shortened runway phases*	*Removed based on SRMP determination captured in Cause*	*N/A*	*N/A*
OGG-RESURFACE-16	*Un-grooved runway portions for 30 days*	*Removed due to NOTAMs will be issued up to 7 days prior*	*N/A*	*N/A*

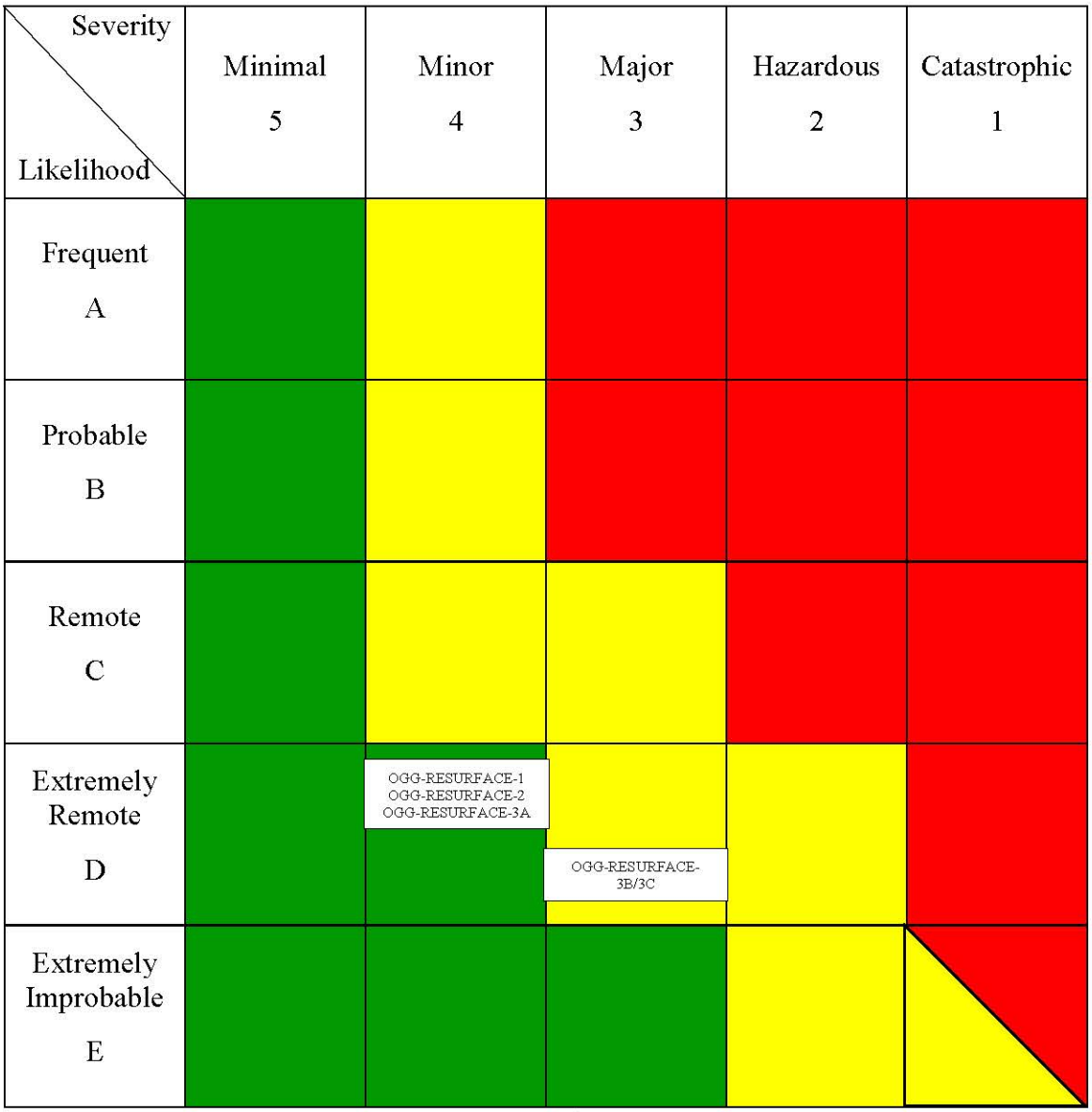

Figure 1: Risk matrix

High Risk – Unacceptable
Medium Risk – Acceptable with Mitigation
Low Risk – Acceptable

The SRMP applied the SRM process determining that the OGG Resurface RWY 2-20 can be introduced into the NAS with an acceptable level of risk (See Figure 1 above). Appendix F provides the SAS-1 Form 5200-8 Signature Page, Signifying SRMP member's concurrence of this Safety Risk Assessment for the Kahului Airport Resurface RWY 2-20 project. Please note, the Hazards in the Matrix are abbreviated and are the same hazards as identified in Table 1, Hazard ID.

Introduction and Background

Kahului Airport is located in Kahului, in the North Shore portion of the island of Maui, in Maui County, Hawaii. OGG is located about three miles East of Kahului and is the general airport for the island of Maui, serving the commercial and private aviation needs of the residents and visitors both with domestic overseas service, interisland service, air cargo, commuter, air taxi, general aviation, and helicopter operations.

Runway 2-20, which is constructed of asphaltic concrete, was originally constructed in the 1940's by the United States Navy. A structural pavement evaluation in 2010, which was based on historical pavement analysis reports, historical geotechnical investigations, and visual inspections, showed the need for significant reconstruction of RWY 2-20. Additionally, in 2011, a comprehensive geotechnical evaluation and pavement analysis was conducted on RWY 2-20. The last pavement management report for OGG was published in 2016, and the entirety of RWY 2-20 was stated to have fewer than 10 years of pavement life remaining. The Southern and Northern sections of the RWY were found to have fewer than five years of pavement life remaining, and the middle section was found to have between six to ten years of pavement life remaining. The RWY now requires resurfacing until a full depth reconstruction project can ensue to continue to serve the community's needs.

The HDOT-A utilized their SRA facilitator services consultant to conduct all SRA preliminary and panel meetings in accordance with the FAA Airports (ARP) Safety Management System (SMS) Order 5200.11, FAA Order 8040.4B Safety Risk Management Policy, and FAA ARP SMS Desk Reference, Version 1.0. A singular preliminary SRA meeting was conducted using a systematic approach to prepare for the final SRA panel meeting. The meeting was scheduled with stakeholder groups as they reviewed the CSPP Phasing and Barricade plan provided by the designer. The following outlines the meeting date and stakeholder groups that were invited. However, it is not an indicator of the actual attendance, please refer to Appendix E Sign-In Sheets.

Preliminary SRA Meeting Date	Stakeholder Group	Purpose
May 12, 2022	HDOT-A Maui AAS V, HDOT-A OGG AOC, HDOT-A GA Officer, HDOT-A AIR-EA, HDOT-A AIR-EP, RM Towill, Orion Engineers, AECOM, FAA OGG ATCT, FAA OGG Tech Ops, FAA HNL ADO, FAA HCF, FAA RSO, FAA WSA NPI, FAA WSC FP, American Airlines, Alaska Airlines, Delta Airlines, Hawaiian Airlines, United Airlines, Southwest Airlines, and UPS	To review the phasing for the field investigations with all FAA LOB's and develop to an acceptable level by all parties

As the preliminary meeting was conducted, an SRA briefing on the FAA ARP SMS process, roles and responsibilities, and ground rules were presented and posted in the room. The ground rules provided participants the opportunity to ask questions and have their concerns addressed prior to

conducting the final SRA Panel Meeting. Throughout this meeting, the participants were reminded of the ground rules. Specifically, "the absence of an answer is understood as agreement." This fostered open discussion with participants' concerns, being either addressed during the meeting or placed on the issues board for future discussion.

The following provides a brief overview of the preliminary SRA meeting discussion and concerns by the stakeholder group in narrative format.

The first Preliminary SRA meeting was conducted on May 12, 2022, with all affected stakeholders to ensure that the drawings were at the point to have a panel meeting discussion. It was decided that this project would be conducted in six (6) phases, with some phases including smaller subphases. Adjustments to the barricade placement, shortened RWY marking/lighting and request for schedules were the main topics of discussion. The following is a recap of the discussion that took place.

a. The overall phasing plan is at a 60% design review and will use Phases 1 through 3 for the grooving and marking. The Project Definition Report for the KOA RWY Rehab project was presented to have a guide to deconflict both runways under construction limitations at the same time. Other runway closures and available runways will be analyzed to see the impacts and overlays.
b. Phases 1A and 1B will have the nightly working hours of 2300-0700 and will have an estimated duration of 8 calendar days. Phase 1B will start 30 days after the completion of Phase 1A to allow for grooving and marking. The outer lane will be adjusted to TWY "C", all the way to TWY "E". Crack sealing will be done along the areas that will not be milled. Nightly runway closures will allow for 7 days a week of work, leading to the approximately 8 calendar day duration. Phase 1B will include the haul route and staging area. TWYs "C" and "D" will be closed, with all other taxiways and RWY 5-23 open. A review will be conducted to determine if crack routing can be done ahead of the work area to prep for the following night work. The routing crack is smaller than some of the existing cracks. The ADO recommended to follow the advisory circular and stay within regulations. No objections from the airlines.
c. Phases 2A and 2B will be moving down along the runway. These phases will have the same nightly closures and working hours of 1300-0700, with also the same NAVAID status. All taxiways will be closed except for TWYs "G" and "K", for any GA aircraft that will need to get over to the East ramp. The staging area will remain the same, but a different access point will be used. Flaggers will also be used to monitor the haul route. Distances for lighted X's will be added to all phases of the drawings to ensure wing tip clearance of crossing aircraft.
d. Phases 3A and 3B will have the contractor shifting operations to the route along TWY "K" to get to the work area and will be offset 250' from the centerline. It was confirmed the temporary half application of markings will have no glass beads.
e. Phase 4 will have a triangle piece within the runways while they area closed. RWY 2-20 will not be allowed to be closed in its entirety, so work will be done in two-night shifts to install the temporary threshold just Southeast of TWY "G". The inset shows temporary conditions and inboard temporary lighting. 4,600' will be available for landing and/or

takeoffs on RWY 2, with 10' outboard temporary threshold bar. All taxiways except for TWYs "G" and "K" will be closed, with an 800' RSA being used. The same staging area as the previous phases will be used and it will be ensured that ARFF has access to get to the terminal in the event of an emergency. The gap in the barricade will need to be shown on the East ramp to ensure ARFF vehicles can drive through for emergencies. No landings will be allowed on RWY 20 for the duration of this phase.

f. Phase 5 will be like Phase 4, aside from shifting the temporary threshold to allow for a greater distance. RWY 2 will be restricted to ADG-III, with the declared distances being a little over 5,000'. RWY 5-23 will be closed for the duration of this phase. Airport parking may go up to the edge of the taxi lane, so the barricade gaps should be shown on the drawings. The temporary threshold lighting will be all red, with no landings being allowed on RWY 20. No work during Kona winds. This phase will have a 2200-0700 closure time during working hours, with the runway going back to full-length during daytime hours. There was a concern of back taxi and aircraft running past the temporary threshold when traffic picks up between 0600-0700. The project decided the work hours will be shortened to end at 0600, while TWY "G" will remain closed in order to accommodate the needs of airlines.
g. Phase 6 will see the RWY 2-20 NAVAIDs be OTS for 3 calendar days. A portion of TWY "A" North of RWY 5-23 and TWY "C" will be closed. The working hours of this phase will be 2300-0700, with nightly closures being the same. This phase will also last for 3 calendar days. Crack routing and sealing, and no mill and fill will be done in this area. Portions of RWY 2 are open for taxi, however the covering of lights in the closed RWY portions are required. It was decided to close the entire RWY 2 and allow only a crossing taxiway at TWY "F". There are no restrictions for Kona winds during this phase.

At the conclusion of the preliminary SRA meeting with all stakeholders; the designer was able to refine the Phasing and Barricade Plan, and the CSPP for the SRA Panel review. The SRA Panel meeting was conducted on May 18, 2022.

Section 1 – Current System / Baseline

- OGG is a 1,540-acre public facility located approximately 3 miles east of the Kahului central business district. It is the primary commercial airport on the island of Maui. The airport is owned and operated by the HDOT-A as part of its state-wide airport system. The airport is designated as a Primary Airport in the FAA's National Plan for Integrated Airport Systems (NPIAS).
- The airport primarily serves scheduled international, domestic, and inter-island carriers. Kahului Airport is a vital link in Hawaii's economic and transportation system as well as a destination airport for the millions of visitors to the island of Maui.
- The airport has two active runways comprised of bituminous asphaltic concrete with a grooved surfacing. The primary runway, RWY 2-20, is 6,998 feet long by 150 feet wide. RWY 2-20 has a Runway Design Code of C-V-2400 serving large commercial aircraft and has a precision instrument approach at the Runway 2 end. This runway also has an associated full length parallel Taxiway A which is 75 feet wide and is classified as an Airplane Design Group (ADG) V.
- The secondary crosswind runway, RWY 5-23, is 4,978 feet long by 150 feet wide and is typically used by inter-island commuter airline service and smaller general aviation aircraft.

See Table 2 below for a summary of the runways at OGG including dimensions, lighting, visual and navigational aids, marking type, and Part 77 Approach categories.

Table 2: Runway Data Summary

Item	Runway		Runway	
	2	20	5	23
Width	150'		150'	
Length	6,995'		4,990'	
Marking Type	Precision		Precision	
Part 77 Approach	Precision	Non-Precision	Visual	Non-Precision
Navigational Aids	ILS, NDB, RNAV (GPS), RNAV (RNP)Z	VOR, RNAV (GPS), VOR/DME or TACAN		RNAV (GPS)
Visual Aids	4-Light PAPI, MALSR	4-Light PAPI	4-Light PAPI	None
Runway Lighting Type	HIRL	HIRL	MIRL	MIRL

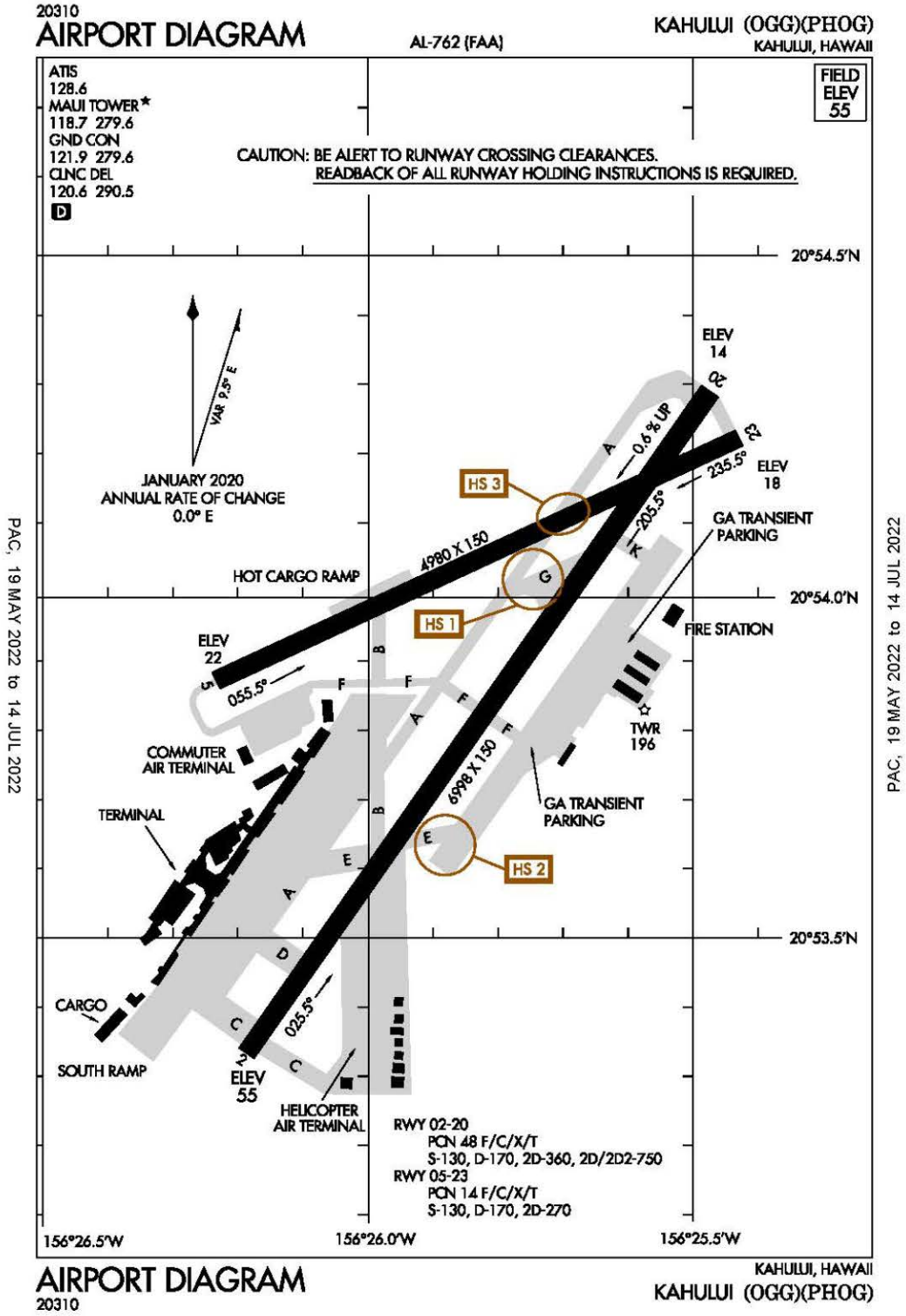

Figure 2: OGG Airport Diagram (Source: AirNav)

Section 2 – Proposed Change

The scope of work consists of resurfacing RWY 2-20 at Kahului Airport (OGG) to address the deteriorated conditions of the existing pavement.

This project will be constructed in six (6) phases (Phase 1 through Phase 6), with some phases having smaller subphases. An overview of the phasing and barricade plan is presented in Figure 3. The following stages are as proposed:

Phases 1A and 1B:

- Description of Work:
  - Phase 1A: Cold mill pavement/prepare surface, construct AC pavement, perform crack repairs, obliterate existing markings, and apply half application pavement markings.
  - Phase 1B: Pavement grooving and full application pavement markings.
- Work Hours:
  - 7 days a week.
  - 2300-0700.
- Duration:
  - Phase 1A: 8 calendar days.
  - Phase 1B: 4 calendar days.
- NOTAMs (Work Hours Only):
  - RWY 2-20 closed.
  - TWY "C" closed.
  - TWY "D" closed.
- Phasing Notes:
  - Phasing 1B shall not start until 30 calendar days following substantial completion of Phase 1A.
  - Additional low-profile barricades shall be added as directed by the airport operations.
  - Barricades shall be placed outside of all active runway safety areas across the hold short markings unless shown otherwise.
  - NAVAIDs will only be off during construction.
- Comments:
  - HA and ATCT thought 0600 was the construction end time and not 0700. At the 60% design meeting the airlines wanted 2200-0600 shift to 2300-0700. ATCT indicated they can accommodate either way.
  - ATCT wants to hear back from the users before making a decision.
  - The designer stated the project needs 8 hours minimum for contractor to do work; to include sawcut, mill, paving, cooling, install temp markings, check for FOD and reopen.
  - Shorter worker hours end up with more transverse joints, lessen lifespan and add days to project.

- As with the 60% design meeting, the SRA meetings have challenges with airline nonparticipation and
- In order to proceed with this SRA Panel meeting, the amount of past meetings, coordination, consensus up to this point, we will move forward with work hours of 2300-0700 with the exception of phase 5 which will be 2300-0600.
- Whether 0600 or 0700 will impact OGG ATCT hours, ATCT opens at 0600. Is it less of a safety concern, more of an operational issue that will be addressed.
- This issue was deferred for a sidebar meeting between the State and airlines to resolve the scheduling concerns.

Phases 2A and 2B:

- Description of work:
  - Phase 2A: Cold mill pavement/prepare surface, construct AC pavement, perform crack repairs, obliterate existing markings, and apply half application pavement markings.
  - Phase 2B: Pavement grooving and full application pavement markings.
- Work Hours:
  - 7 days a week.
  - 2300-0700.
- Duration:
  - Phase 2A: 8 calendar days.
  - Phase 2B: 4 calendar days.
- NOTAMs (Work Hours Only):
  - RWY 2-20 closed.
  - TWY "B" closed between TWY "A" and RWY 2-20.
  - TWY "C" closed.
  - TWY "D" closed.
  - TWY "E" closed.
  - TWY "F" closed between TWY "A" and East ramp.
- Phasing Notes:
  - Phase 2B shall not start until 30 calendar days following substantial completion of Phase 2A.
  - Additional low-profile barricades shall be added as directed by the airport operations.
  - Barricades shall be placed outside of all active runway safety areas across the hold short markings unless shown otherwise.
  - Haul route offset from East ramp is based on ADG III.
- Comments:
  - None.

Phases 3A and 3B:

- Description of Work:
  - Phase 3A: Cold mill pavement/prepare surface, construct AC pavement, perform crack repairs, obliterate existing markings, and apply half application pavement markings.
  - Phase 3B: Pavement grooving and full application pavement markings.
- Work Hours:
  - 7 days a week.
  - 2300-0700.
- Duration:
  - Phase 3A: 11 calendar days.
  - Phase 3B: 4 calendar days.
- NOTAMs (Work Hours Only):
  - RWY 2-20 closed.
  - TWY "C" closed.
  - TWY "D" closed.
  - TWY "F" closed between TWY "A" and East ramp.
  - TWY "G" closed.
  - TWY "K" closed.
- Phasing Notes:
  - Phase 6 may be concurrent with Phase 3.
  - Additional low-profile barricades shall be added as directed by the airport operations.
  - Barricades shall be placed outside of all active runway safety areas across the hold short markings unless shown otherwise.
- Comments:
  - As phasing is progressing down the runway, the portions of ungrooved pavement increases. A NOTAM will be issued to address incremental ungrooved pavement.

Phase 4:

- Description of work:
  - Perform crack repairs, obliterate existing markings, and apply full application pavement markings.
- Work Hours:
  - Sundays only.
  - 0030-0600.
- Duration
  - 2 Sunday shifts.
- NOTAMs (Work Hours Only):
  - RWY 2 restricted to ADG B-III.
  - RWY 2 TORA/TODA/ASDA/LDA = 4,633'.

  - RWY 20 closed.
  - Nonstandard RWY 2 lighting.
  - RWY 5-23 closed.
  - TWY "A" closed between TWY "F" and RWY 5-23.
  - TWY "B" closed between TWY "F" and RWY 5-23.
  - TWY "F" closed at RWY 5.
  - TWY "G" closed.
  - TWY "K" closed.
- Phasing Notes:
  - RWY 2-20 restricted to B-III and smaller aircraft.
  - During Kona wind conditions, contractor shall coordinate with ATC and HCF 2-hours prior to start of each work shift. Work shall be cancelled if Kona wind conditions are forecast during working hours. If weather conditions change, the contractor shall vacate the work area within 1-hour of notification.
  - Contractor shall install temporary threshold lights, cover RDR signs, and cover edge lights on the closed portion of the runway.
  - Place barricades across hold short markings unless shown otherwise.
  - Additional low-profile barricades shall be added as directed by the airport operations.
- Comments: None.

Phase 5:

- Description of Work:
  - Perform crack repairs, obliterate existing markings, and apply full application pavement markings.
- Work Hours:
  - 7 days a week.
  - 2300-0600.
- Duration
  - 5 calendar days.
- NOTAMs (Work Hours Only):
  - RWY 2 restricted to ADG B-III.
  - RWY 2 TORA/TODA/ASDA/LDA = 5,003'.
  - RWY 20 closed.
  - Nonstandard RWY 2 lighting.
  - RWY 5-23 closed.
  - TWY "A" closed between TWY "F" and RWY 5-23.
  - TWY "B" closed between TWY "F" and RWY 5-23.
  - TWY "F" closed at RWY 5.
  - TWY "G" closed.
  - TWY "K" closed.

- Phasing Notes:
  - RWY 2-20 restricted to B-III and smaller aircraft.
  - During Kona wind conditions, contractor shall coordinate with ATC and HCF 2-hours prior to start of each work shift. Work shall be cancelled if Kona wind conditions are forecast during working hours. If weather conditions change, the contractor shall vacate the work area within 1-hour of notification.
  - Contractor shall install temporary threshold lights, cover RDR signs, and cover edge lights on the closed portion of the runway.
  - Place barricades across hold short markings unless shown otherwise.
  - Additional low-profile barricades shall be added as directed by the airport operations.
- Comments: None.

Phase 6:

- Description of work:
  - Perform crack repairs, obliterate existing markings, and apply pavement marking.
- Work Hours:
  - 7 days a week.
  - 2300-0700.
- Duration:
  - 3 calendar days.
- NOTAMs (Work Hours Only):
  - RWY 2-20 closed.
  - TWY "A" closed East of RWY 5-23.
  - TWY "C" closed between TWY "A" and Helicopter Air Terminal area.
  - TWY "B" closed.
  - TWY "D" closed.
  - TWY "E" closed.
  - TWY "G" closed.
  - TWY "K" closed.
- Phasing Notes:
  - Place barricades across hold short markings unless shown otherwise.
  - Additional low-profile barricades shall be added as directed by airport operations.
- Comments:
  - Question was raised by ATCT for the allowing a medivac taxi route on a closed RWY 2 to get to their facility on East Ramp. It was discussed a change now will require changes to the CSPP and additional coordination. The meeting is not here to argue the change but to evaluate if this proposal results in any hazards and unacceptable risk.
  - This issue was deferred for a sidebar meeting between the State and the medical flights to resolve any access concerns.
  - It was confirmed on 5/26/22, coordination with Hawaii Life Flight and AMR/Reach. They are good with Phase 6 as is.

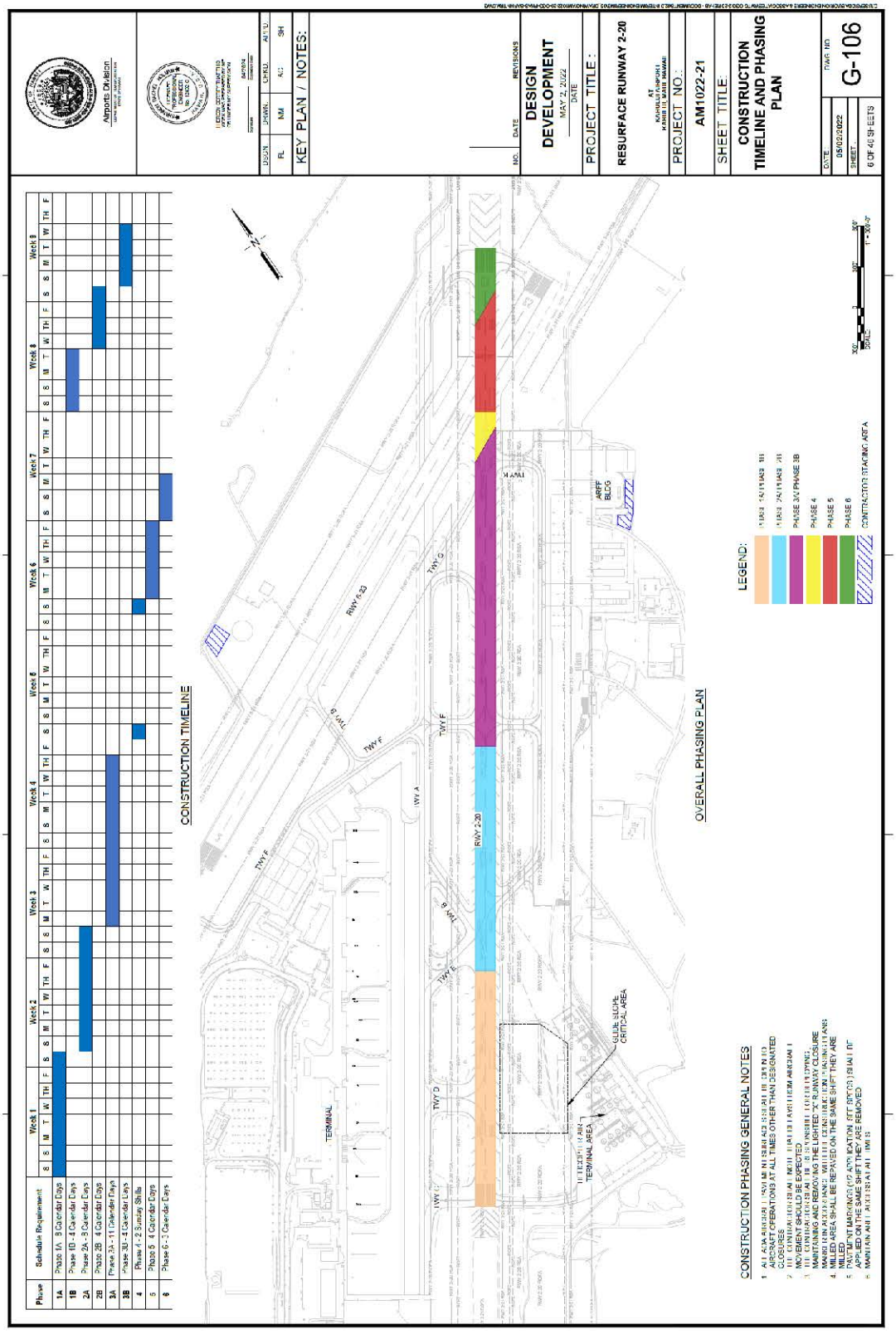

Figure 3: Overall Phasing Plan

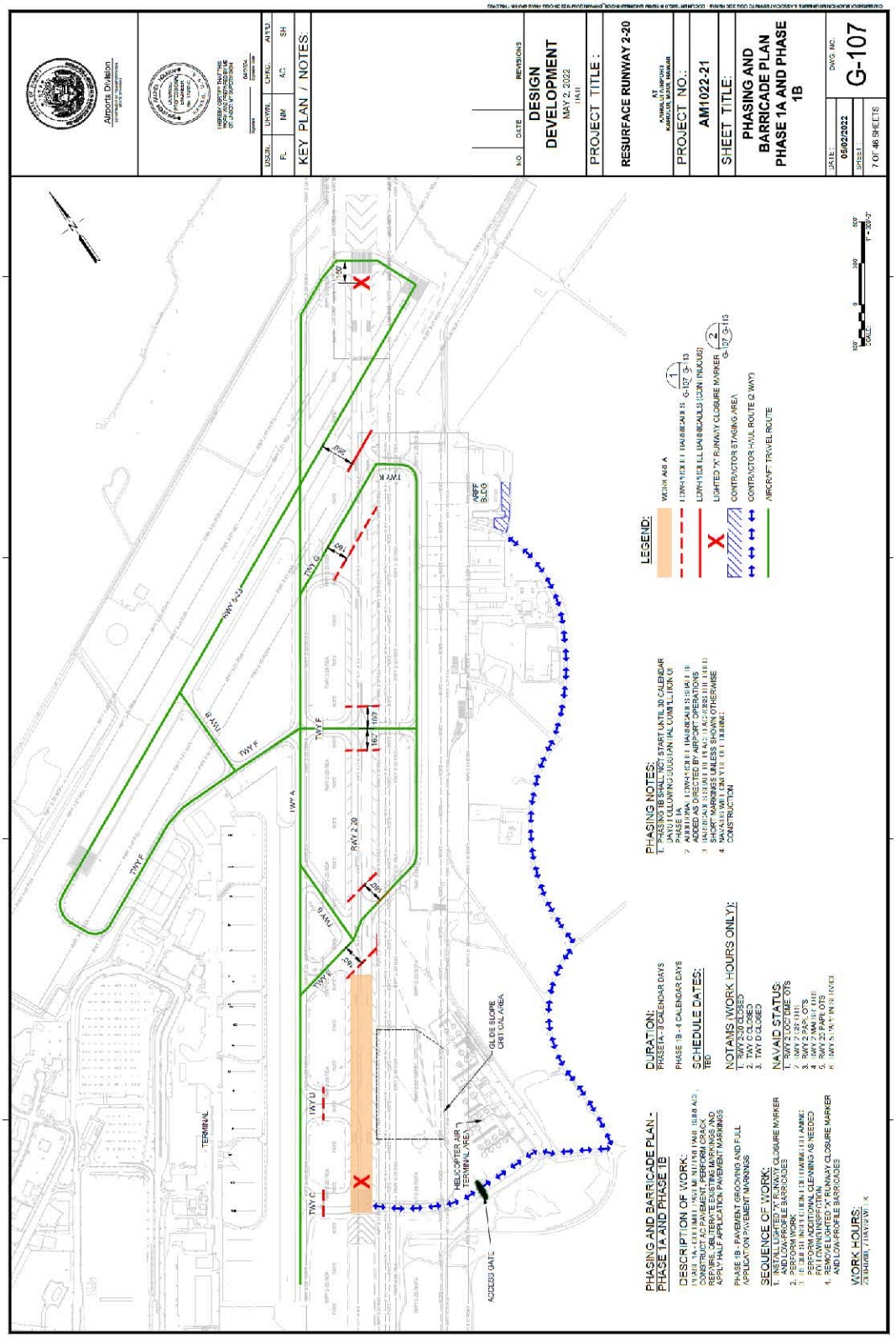

Figure 4: Phase 1A and Phase 1B

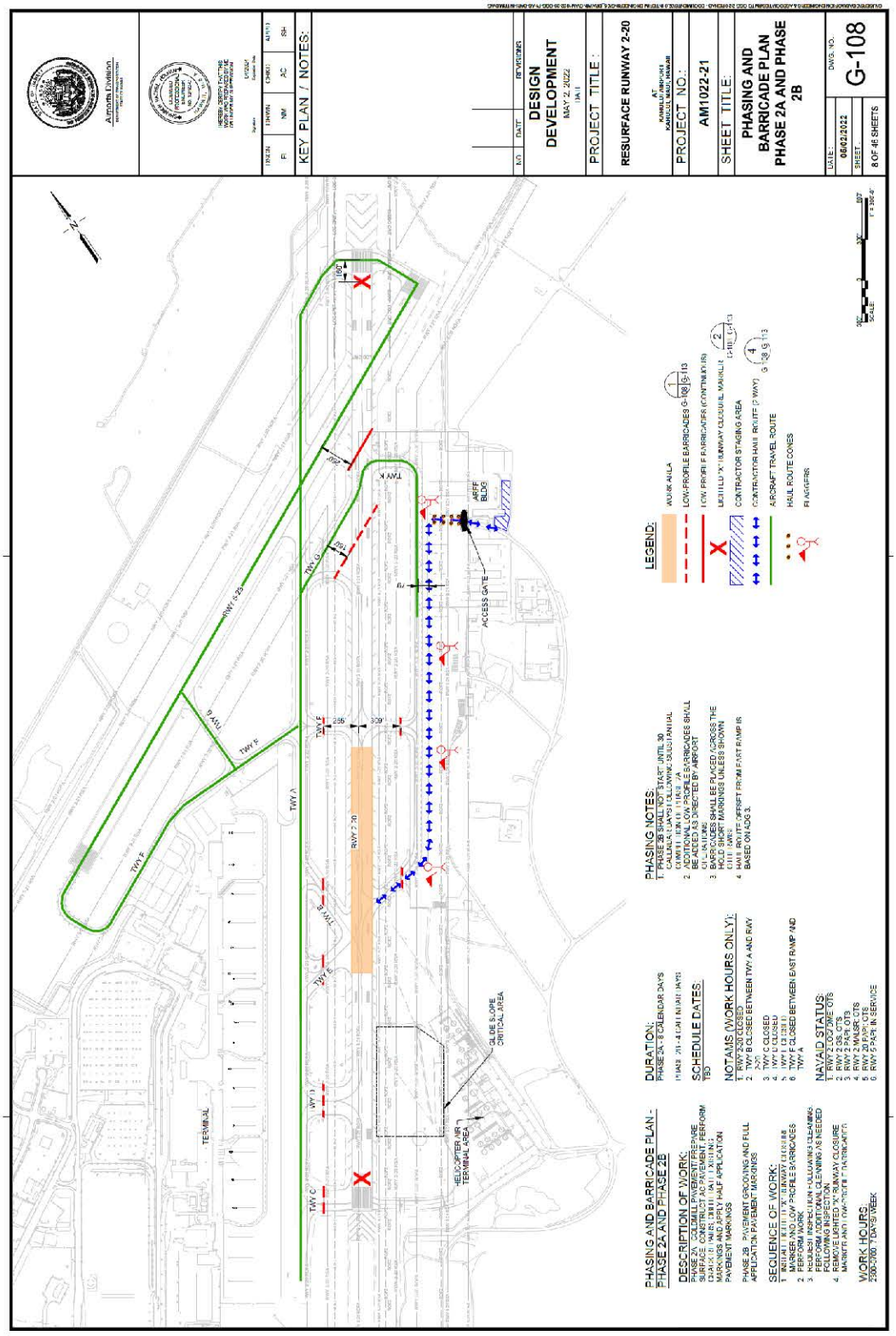

Figure 5: Phase 2A and Phase 2B

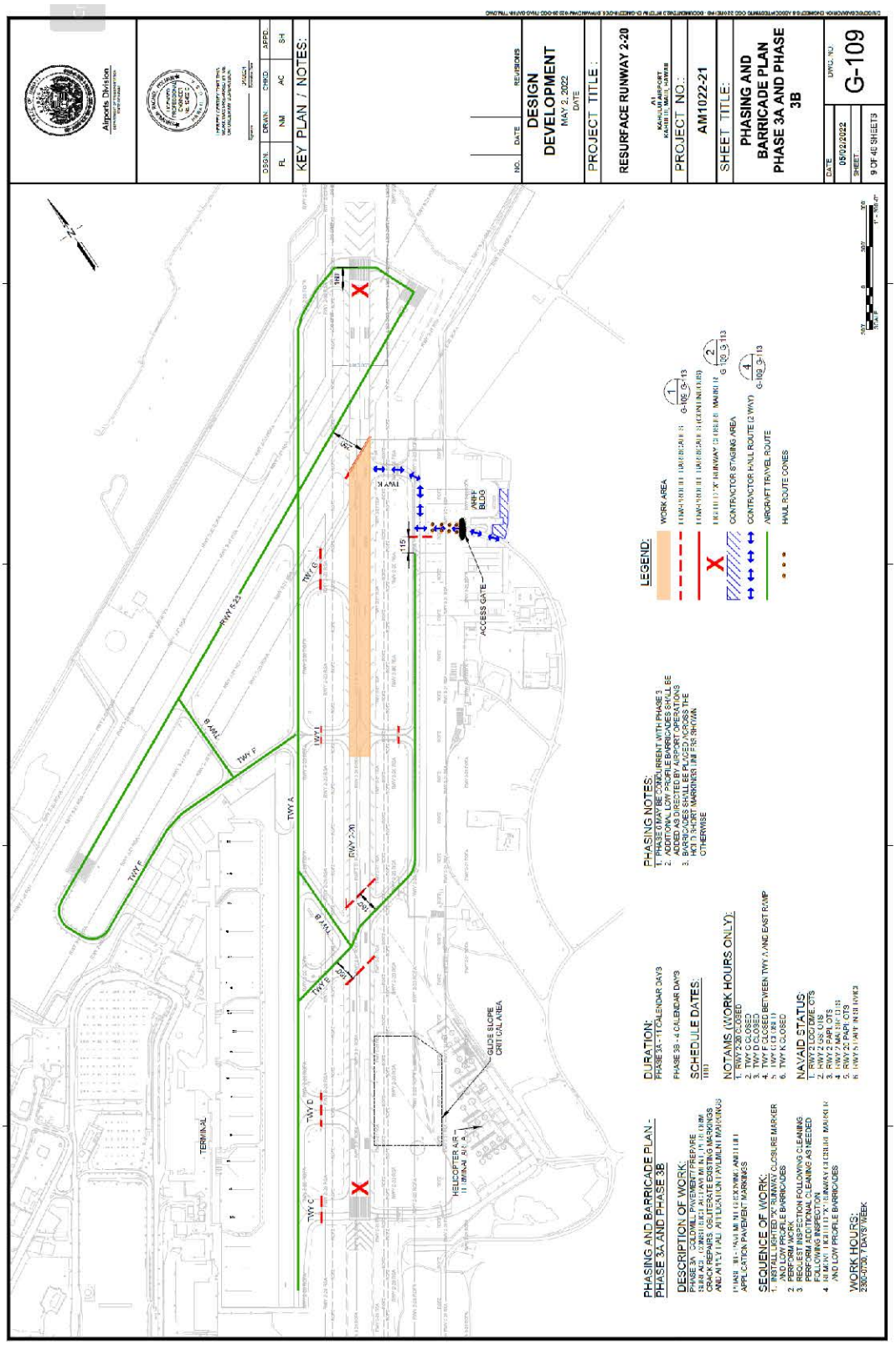

Figure 6: Phase 3A and 3B

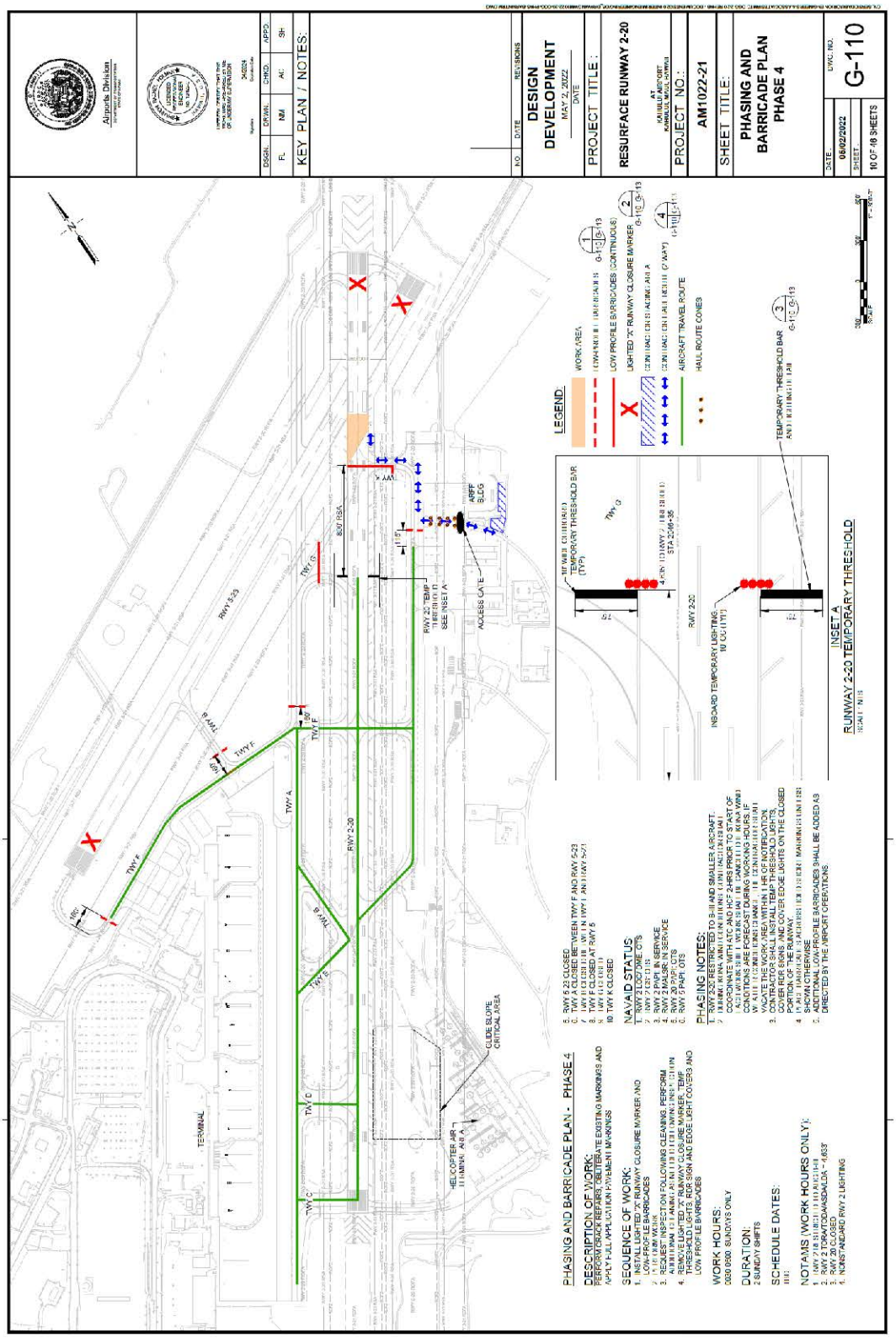

Figure 7: Phase 4

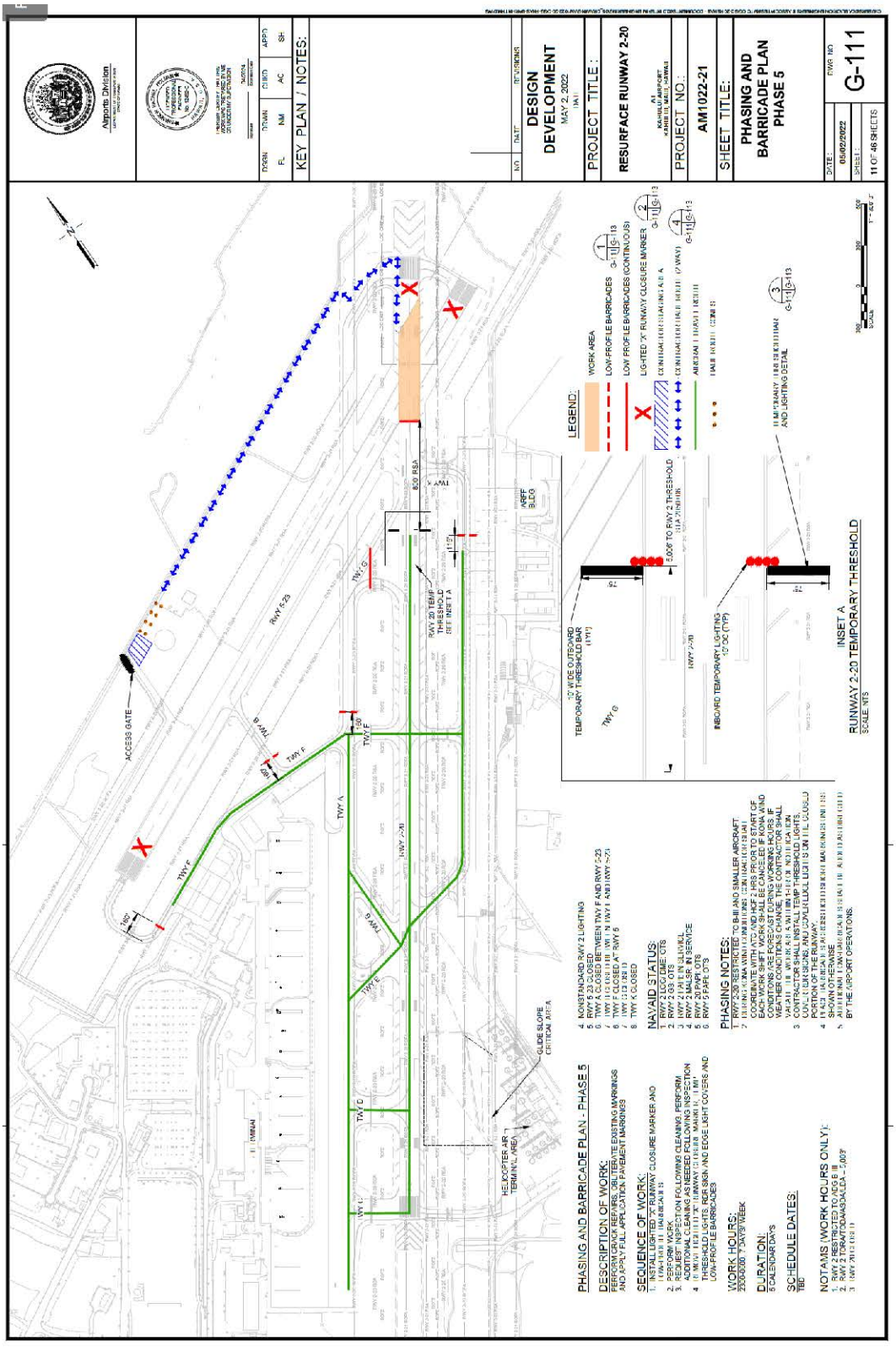

Figure 8: Phase 5

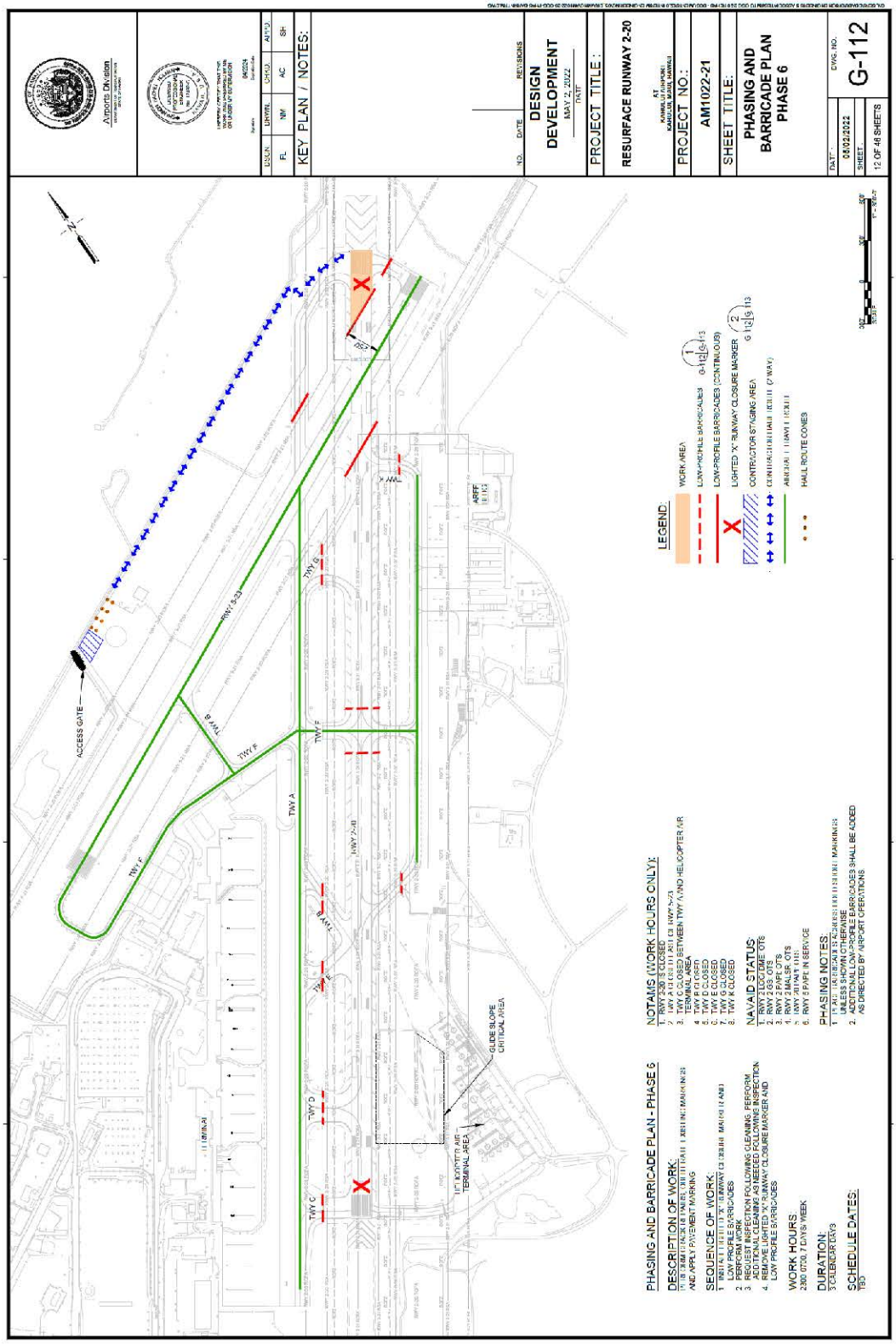

Figure 9: Phase 6

Section 3 – Safety Risk Management Planning and Impacted Organizations

The Safety Risk Management Panel met on May 18, 2022, to assess the proposed change to the NAS and associated hazards. The facilitator worked with the HNL ADO Program Manager to identify SRMP members, Subject Matter Experts (SMEs), and obtain concurrence prior to sending out calendar invitations. All FAA Lines of Business and OGG stakeholders were included in the invitation. See Table 3 below for the list of panel meeting participants for this panel meeting. The sign-in sheets can be found in Appendix E.

Table 3: SRM Panel Members, Subject Matter Experts, Meeting Attendees

Panel Member	Organization, Position/Title	E-mail
Phillip Daniells	HDOT-A OGG AOC	phillip.s.daniells.gov
Steven Csigi	FAA OGG ATCT	steven.csigi@faa.gov
Frank Flores	FAA OGG Tech Ops	frank.flores@faa.gov
Ronson Fox	FAA HNL ADO	fonson.fox@faa.gov
Neil Okuna	FAA HCF	neil.n.okuna@faa.gov
Joe Santoro	FAA RSO	joe.santoro@faa.gov
Perfecto Delmendo	AvAir Pros	p.delmendo@avairpros.com
Richard Silva	Hawaiian Airlines	richard.silva@hawaiianair.com
George Hodgson	Southwest	george.hodgson@wnco.com
Tim Sprowls	Mokulele Airlines	tim.sprowls@mokuleleairlines.com

SME	Organization, Position/Title	E-mail
Larry Miller	HDOT-A Maui District	robert.l.miller@hawaii.gov
Anna Metcalfe	HDOT-A GA Officer	anna.p.metcalfe@hawaii.gov
Greg Garcia	HDOT-A AIR-EA	greg.garcia@hawaii.gov
Herman Tuiolosega	HDOT-A AIR-EP	herman.tuiolosega@hawaii.gov
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Shannon Holman	Orion Engineers	shannon.holman@orionengineers.com
Daniel Dabu	Orion Engineers	daniel.dabu@orionengineers.com
Tony Raposo	Orion Engineers	tony.raposo@orionengineers.com
Alan Campbell	AECOM	alan.campbell@aecom.com
Sean Dunckel	AECOM	sean.dunckel@aecom.com
Colin Selch	AECOM	colin.selch@aecom.com
Scott Gilson	FAA OGG ATCT	scott.c.gilson@faa.gov
Max Lundgren	FAA OGG ATCT	maxlundgren11@outlook.com
Kandyce Watanabe	FAA HNL ADO	kandyce.watanabe@faa.gov
Matthew Robertson	FAA WSA NPI	matthew.d.robertson@faa.gov
David Clark	FAA WSC FP	david.m.clark@faa.gov
Jeff Tarpey	AvAir Pros	jeff.tarpey@united.com

SME	Organization, Position/Title	E-mail
Kevin Coon	United Airlines	kevin.coon@united.com
David Mendonsa	AMR	david.mendonsa@gmr.net

Facilitation Team	Organization, Position/Title	E-mail
Dawn Ward	Base Management, Facilitator	dawn@basesgrp.com
Steve Wong	Base Management, Co-Facilitator	steve@basesgrp.com
Dalyn DeMattos	Base Management, Tech Writer	dalyn@basesgrp.com
Sue Yamauchi	Base Management, Tech Writer	sue@basesgrp.com
Ken Rewick	Base Management, Facilitation Support	ken@basesgrp.com
Tanya Dela Cruz	Base Management, Tech Writer Support	tanya@basesgrp.com

Section 4 – Assumptions

1. All existing controls are in place.
2. Radio personnel will be onsite during construction.
3. Work will not be allowed on the airfield unless a Conditional Approval for the CSPP is received from OEAAA.
4. Geotechnical work will not be allowed until the equipment 7460-1 filings are approved.
5. Barricade phasing and schedules will be provided to affected parties including the airlines, ATCT, contractor, CM, and District via periodic construction meetings, informational meetings, and email.
6. Construction vehicle routes, flaggers and barricades will be reviewed as indicated in the CSPP prior to the start of each construction phase.
7. OGG information changes will be broadly disseminated to the airline community including airlines operations and trade groups (A4A, IATA, NBAA, AOPA, GACH) on the use of temporary markings (e.g., centerlines and lead-in lines) for each construction phase.
8. Construction areas will be clearly marked with lighted low-profile barricades that will be weighted down.
9. Controllers and vehicle operators will be briefed on runway and taxiway changes, closures, and procedures.
10. FOD checks will be completed by construction and airport personnel when movement areas are used in addition to routine airfield Part 139 inspections.
11. NOTAMs will be issued for each phase.
12. Ongoing construction meetings will address operations during upcoming phases to ensure attendee awareness of impending construction work and associated operational impacts, including runway and taxiway section closures.
13. Temporary airfield signage and marking will meet FAA standards.
14. Filing of a Airport Sponsor Strategic Event (SEC) 45 days prior to closing RWYs down for 2 or more consecutive days, FAA Form 6000-26. Contact matthew.d.robertson@faa.gov, Matt Robertson, NAS Planning.
15. System Impact statements to be filed by HCF Traffic Management Unit.
16. The "Go" / "No Go" call for work will be made two (2) hours prior to the scheduled closure time. Coordination between with the Contractor, OGG ACTC and HCF is done prior to the decision.
17. No work during Kona Winds when RWY 2 is shortened (Passes 4 and 5, no landings on RWY 20). Should conditions change during construction, contractor to be provided 1 hour notification per the CSPP notes.

Section 5 – Phase 1: System Description

The existing system conditions are described in Section 1, Current System / Baseline.

OGG Rwy 2-20 Resurfacing current project timeline:

- Estimated Bid Opening: September 2022
- Estimated Contract Award: October 2022
- Estimated Notice-to-Proceed: April 2023
- Estimated Construction Start Date: June 2023
- Estimated Construction Completion Date: August 2023

Shown below are the current and future projects anticipated to occur at OGG that were considered for potential cumulative impacts to airfield operations.

1. Holdroom and Apron expansion. Ongoing and estimated completion? No anticipated impacts with this resurfacing project.

2. FAA Projects: ATCT Project. ATCT will not be operational and will use back up procedures. Frank and Scott will provide dates when available. Changes in ATCT hours needs to be provided to RM Towill and Orion.

The SRMP determined that the projects listed above would not have any significant impacts to this OGG Resurface RWY 2-20 project.

Section 6 – Phase 2: Identified Hazards

Identification of hazards in this step, considers all reasonably possible sources of hazards. According to Order 5200.11, a hazard is any existing or potential condition that can lead to injury, illness, or death to people; damage or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite of an accident or incident.

During this hazard identification stage, the facilitator began by providing the panel members with some ground rules listed in Appendix G and reminded the group that, "the absence of an answer is understood as agreement." The SRM Panel Meeting is the venue to vet out all safety concerns related to this Kahului Airport Resurface RWY 2-20.

The SRMP listed twenty-one (21) presumed hazards generated through the brainstorming session and documented in the Preliminary Hazard List (PHL). The SRMP then reviewed each preliminary hazard from the PHL and categorized each entry as a Cause, Hazard or Effect (Appendix A). The PHL concluded sixteen (16) credible hazards for further evaluation in the Preliminary Hazard Analysis (PHA) worksheet. The Pilot/Controller confusion regarding changed routes and miscommunication were combined into one hazard because it was all in regard to confusion. Also, the Pilot or Controller missing and not reading NOTAMs were also combined into one hazard. There were three (3) presumed hazards that were categorized as a Cause and/or Effect.

The SRMP determined three (3) hazards were credible and fully evaluated as shown in Table 4 below and is also derived from the PHA in Appendix B. As part of the evaluation process, the SRMP determined multiple credible Effects attributable to the Hazard #3 Vehicle/Pedestrian LOSA. This hazard was further broken down into three sub-hazards based on their Effect.

During the Panel's discussion, the panel members decided to remove several hazards taken from the Preliminary Hazard List based on thorough discussion and determined that they were documented in other columns within the PHA as shown in the table below:

Table 4: List of Hazards and the Associated System State and Effects

(1) Hazard ID	(2) Hazard Description	(4) System State	(7) Effect
XYZ-1	Condition, real or potential; can cause injury, illness, etc. Pre-requisite for accident or incident	Potential outcome or harm of the hazard if it occurs in the defined system state (worst credible)	Potential outcome or harm of the hazard if it occurs in the defined system state (worst credible)
OGG-RESURFACE-1	**Pilot LOSA**	**All Phases of Construction**	**Runway Incursion**
OGG-RESURFACE-2	**Controller LOSA**	**All Phases of Construction**	**Runway Incursion**

(1) Hazard ID	(2) Hazard Description	(4) System State	(7) Effect
OGG-RESURFACE-3A	**Vehicle/Pedestrian LOSA**	**All Phases of Construction**	**Surface Incident**
OGG-RESURFACE-3B	**Vehicle/Pedestrian LOSA**	**All Phases of Construction**	**Runway Incursion**
OGG-RESURFACE-3C	**Vehicle/Pedestrian LOSA**	**All Phases of Construction**	**Runway Incursion (Revote)**
OGG-RESURFACE-4	*During tower hours RI, SI, and RE when shortened*	*N/A*	*Removed based on SRMP determination captured in Effect*
OGG-RESURFACE-5	*After tower hours, RI, SI, and RE when runway shortened*	*N/A*	*Removed based on SRMP determination captured in Effect*
OGG-RESURFACE-6	*Increased ARFF response times*	*N/A*	*Removed based on SRMP determination that ARFF response routes are made available, and barricades shown on phasing plan*
OGG-RESURFACE-7	*Multiple runway closures across State of Hawaii limiting available alternates*	*N/A*	*Removed based on SRMP determination captured in Cause*
OGG-RESURFACE-8	*Confusion regarding changed routes, Miscommunication*	*N/A*	*Removed based on SRMP determination captured in Cause*
OGG-RESURFACE-9	*Pilot or controller missing (not reading) current NOTAMs*	*N/A*	*Removed based on SRMP determination captured in Cause*
OGG-RESURFACE-10	*NOTAMs description of closures can get confusing*	*N/A*	*Removed based on SRMP determination captured in Cause*
OGG-RESURFACE-11	*Back-taxi operation*	*N/A*	*Removed based on SRMP determination captured in Cause/Effect*
OGG-RESURFACE-12	*Lack of good communication between go/no go between Airport and FAA*	*N/A*	*Removed based on SRMP determination captured in Cause*

(1) Hazard ID	(2) Hazard Description	(4) System State	(7) Effect
OGG-RESURFACE-13	*Diversion if runways are closed*	*N/A*	*Removed based on SRMP determination captured in an alternate runway at HNL*
OGG-RESURFACE-14	*Missed communications regarding go/no go*	*N/A*	*Removed based on SRMP determination that it is the same as OGG-RESURFACE-12*
OGG-RESURFACE-15	*Arrival spacing after tower hours during shortened runway phases*	*N/A*	*Removed based on SRMP determination captured in Cause*
OGG-RESURFACE-16	*Un-grooved runway portions for 30 days*	*N/A*	*Removed based on SRMP determination that NOTAMs will be issued up to 7 days prior*

This panel used the PHA tool/technique provided in the ARP Desk Reference for the airspace determinations for the proposed plan. The PHA provided the panel members with an initial overview of the hazards present in the overall flow of the operation in this proposed change.

Description of Hazards

This step focuses on the hazard identification, including further analysis of the hazards to assist Panel Members on analyzing the safety risks. The Facilitator cultivated discussions to endure the panel considered all credible sources of system failure, including equipment, human factors, operational procedures, maintenance procedures, and external services.

The Facilitator initiated the functional brainstorming technique as a tool to systematically identify hazards as the panel developed the Preliminary Hazard List. During the brainstorming session, the group developed a list of potential hazards associated with the project and provided the bases for the Preliminary Hazard Analysis (PHA).

During the hazard identification stage, the panel identified potential safety issues, their possible causes and corresponding effects. The Technical Writer documented these discussions in the PHA. Following each portion, the Facilitator obtained concurrence from the Panel Members to ensure all documentation was correct.

The sections below provide an overview of each identified hazard, cause, and effect, for the proposed project.

OGG-RESURFACE-1 Pilot Loss of Situational Awareness (LOSA)

(All Phases)

The SRMP determined that Pilot LOSA is a hazard which could be caused by changed routes, miscommunications, unclearly worded NOTAMs, NOTAMs description of closures getting confusing, back-taxi operation, pilot or controller missing (not reading) current NOTAMs, lack of good communication between go/no go between Airport and FAA, irregular operations (either late arrivals or late departures), multiple runway closures across the State of Hawaii, limiting available alternates, increased ARFF timed response, and arrival spacing after tower hours during shortened runway phases. This hazard exists in all stages of construction as the SRMP considered all existing controls that relate to the prevention or reduction of this hazard occurrence or to mitigate its effects.

Mitigations that exist to prevent or reduce this hazard occurrence or mitigate its effects were listed under existing controls in the PHA as follows: AC 150/5200-18 Airport Safety Self Inspection, AC 150/5210-20 Ground Vehicle Operations on Airports, AC 150/5210-24 Airport Foreign Object Debris Management, AC 150/5210-5 Painting, Markings, Lighting of Vehicles Used on Airport, AC 150/5300-13 Airport Design, AC 150/5340-18 Standards for Airport Sign Systems, AC 150/5345-46 Specifications for Runway and Taxiway Lighting Fixtures, AC 150/5345-53 Airport Lighting Equipment Certification Program, AC 150/5345-55 Specification for L-893, Lighted Visual Aid to indicate Temporary Runway Closure, AC 150/5370-2 Operational Safety on Airports During Construction, FAR Part 139, ARSR, ASR-9, ASR-11 Surveillance Radar, ATIS Automated Terminal Information System, Pilot Training, Airfield Driver Training, Access Control Training, Pilot Intervention, Controller Intervention, ATC Scanning, Airfield Operations Monitoring, Operational Supervision, Radio Frequency Monitoring, NOTAM Notice to Airmen, Charts Aeronautical, Jeppesen Charts, AIM Aeronautical Information Manual, CRM Crew Resource Management, Daily Briefings/Notes, and CSPP Construction Safety and Phasing Plan.

The SRMP identified ten (10) possible effects and had thorough discussion on potential outcomes or harm related to possible injury to people, damage to aircraft or a taxiway incursion. The SRMP decided that the worst credible potential outcome or harm of the hazard if it occurs in the defined system state was a runway incursion (or equivalent when tower is closed). This hazard was analyzed by the SRMP and the results are documented in Section 7.

OGG-RESURFACE-2 Controller Loss of Situational Awareness (LOSA)

(All Phases)

The SRMP determined that Controller LOSA is a hazard which could be caused by changed routes, miscommunications, unclearly worded NOTAMs, NOTAMs description of closures getting confusing, back-taxi operation, pilot or controller missing (not reading) current NOTAMs, lack of good communication between go/no go between Airport and FAA, irregular operations (either late arrivals or late departures), multiple runway closures across the State of Hawaii, limiting available alternates, increased ARFF timed response, and arrival spacing after tower hours during shortened

runway phases. This hazard exists in all stages of construction as the SRMP considered all existing controls that relate to the prevention or reduction of this hazard occurrence or to mitigate its effects.

Mitigations that exist to prevent or reduce this hazard occurrence or mitigate its effects were listed under existing controls in the PHA as follows: AC 150/5200-18 Airport Safety Self Inspection, AC 150/5210-20 Ground Vehicle Operations on Airports, AC 150/5210-24 Airport Foreign Object Debris Management, AC 150/5210-5 Painting, Markings, Lighting of Vehicles Used on Airport, AC 150/5300-13 Airport Design, AC 150/5340-18 Standards for Airport Sign Systems, AC 150/5345-46 Specifications for Runway and Taxiway Lighting Fixtures, AC 150/5345-53 Airport Lighting Equipment Certification Program, AC 150/5345-55 Specification for L-893, Lighted Visual Aid to indicate Temporary Runway Closure, AC 150/5370-2 Operational Safety on Airports During Construction, FAR Part 139, ACAC Checklist, JO 7110.65 Air Traffic Control, JO 7400.2 Handling Airspace Matters Procedures, JO 7210.3 Facility Operations and Administration, SOP Standard Operating Procedure, LOA Letter of Agreement, MEARTS/STARS Micro En-route Automated Radar Tracking System, ARSR, ASR-9, ASR-11 Surveillance Radar, ATIS Automated Terminal Information System, TCAS Traffic Alert & Collision Avoidance System, CA/MSAW Conflict Alert/Minimum Safe Altitude Warning, ASOS Automated Surface Observing System, Pilot Training, Controller Training, Pilot Intervention, Controller Intervention, ATC Scanning, Airfield Operations Monitoring, Operational Supervision, Radio Frequency Monitoring, NOTAM Notice to Airmen, AIM Aeronautical Information Manual, CRM Crew Resource Management, Daily Briefings/Notes, and CSPP Construction Safety and Phasing Plan.

The SRMP identified five (5) possible effects and decided that the worst credible potential outcome or harm of the hazard if it occurs in the defined system state was a runway incursion (or equivalent when tower is closed). This hazard was analyzed by the SRMP and the results are documented in Section 7.

OGG-RESURFACE-3A/3B/3C

Vehicle/Pedestrian Loss of Situational Awareness (LOSA)

(All Phases)

The SRMP determined that Vehicle/Pedestrian LOSA is a hazard which could be caused by changed routes, miscommunications, inadequate briefings, irregular operations (either late arrivals or late departures), time it takes to clear runway, and misplacement of barriers. This hazard exists in all stages of construction as the SRMP considered all existing controls that relate to the prevention or reduction of this hazard occurrence or to mitigate its effects.

Mitigations that exist to prevent or reduce this hazard occurrence or mitigate its effects were listed under existing controls in the PHA as follows: AC 150/5200-18 Airport Safety Self Inspection, AC 150/5200-18 Airport Safety Self Inspection, AC 150/5210-20 Ground Vehicle Operations on Airports, AC 150/5210-5 Painting, Markings, Lighting of Vehicles Used on Airport, AC 150/5300-13 Airport Design, AC 150/5340-18 Standards for Airport Sign Systems, AC 150/5345-

44 Specifications for Runway and Taxiway Signs, AC 150/5345-46 Specifications for Runway and Taxiway Lighting Fixtures, AC 150/5345-55 Specification for L-893, Lighted Visual Aid to indicate Temporary Runway Closure, AC 150/5370-2 Operational Safety on Airports During Construction, FAR Part 139, ACAC Checklist, JO 7110.65 Air Traffic Control, SOP Standard Operating Procedure, LOA Letter of Agreement, Airfield Driver Training, Access Control Training, Controller Intervention, ATC Scanning, Airfield Operations Monitoring, Operational Supervision, Radio Frequency Monitoring, NOTAM Notice to Airmen, and CSPP Construction Safety and Phasing Plan.

The SRMP identified five (5) possible effect and decided that the worst credible potential outcome or harm of the hazard if it occurs in the defined system state was a surface incident. This hazard was analyzed by the SRMP and the results are documented in Section 7.

Conclusion on Description of Hazards

The three (3) hazard descriptions documented above were identified by the SRMP members and hazard OGG-RESURFACE-3 was broken down into analyzing and assessing multiple effects based on the concerns of the SRMP. This resulted in an increase from three (3) to five (5) hazards for analysis in the PHA. These discussions are documented under Section 7 and 8 in the subsequent sections.

Section 7 – Phases 3 & 4: Hazard Analysis and Risks Assessed

To ensure a thorough examination of hazards, the SRMP's methodology for risk analysis was based on the Five-Step SRM process detailed in FAA Order 5200.11.

1. Describe the System
2. Identify Hazards
3. Analyze Risk
4. Assess Level of Risk
5. Mitigation Actions

Risk Analysis

The objective of this step is to determine the initial safety risk associated with the effects of each identified hazard. The safety risk associated with a hazard is the combination of predicted severity and the likelihood of the potential effect of a hazard in the worst credible system state. This is also accomplished in consideration of the existing controls which help to mitigate risks to an acceptable level.

The Effect is defined as the potential outcome or harm of the hazard if it occurs in the defined system state. The SRMP categorized a list of Effects due to each Hazard during the PHL process (Appendix A).

The Preliminary Hazard Assessment (PHA) worksheet was developed to record the hazards, causes, system states, existing controls, possible effects, severity and likelihood rationale, initial risk, mitigation, and predicted residual risk. The completed PHA is found in Appendix B.

Risk Assessment

The objective of this step is to determine the safety risk level acceptability. Risk Assessment is the process of combining the impacts of risk elements discovered in risk analysis and comparing them against some acceptability criteria. Risk Assessment can include consolidating risks into risk sets that can be jointly mitigated, combined, and then used in decision making. Order 5200.11 defines risk as the composite of predicted severity and likelihood of the potential effect of a hazard in the worst credible system state.

Each hazard was evaluated by two factors; first the severity was determined using Table 5, followed by a determination of likelihood using Table 6. The SRM Panel identified the severity and likelihood of each hazard, as described above. These documents were also provided as a complete SRMP Panel Packet, see Appendix C. The severity and likelihood ratings from each panel member can be found in Appendix D.

Severity is the potential consequence or impact of a hazard in terms of degree of loss or harm. It is a prediction of how bad the outcome of a hazard can be. There may be many outcomes associated with a given hazard, and the severity should be determined for each outcome.

Likelihood is the estimated probability or frequency, in quantitative or qualitative terms, of the outcome(s) associated with a hazard. It is an expression of how often an outcome of a hazard is predicted to occur in the future.

The SRMP plotted the severity and likelihood for each hazard's worst credible outcome on the FAA predictive risk matrix (Figure 10). The SRMP then observed where the hazards lie based on the three categories of risk (low, medium, high). This indicates the "initial" risk level for each hazard.

An initial Low Risk (green) is acceptable without restriction and requires the FAA Local Airport Division signature. Low Risk hazards do not need to be actively managed but must be recorded in the SRM documentation.

An initial Medium Risk (yellow) is acceptable within the ARP SMS and requires FAA Regional signatures. With a Medium Risk the proposal may be carried out as long as the risk is tracked and managed.

If the initial risk for any analyzed hazards falls in the high risk (red) region, this is unacceptable within the ARP SMS and the proposal cannot be carried out unless the hazard is further mitigated to a reduced medium or low level and the ARP Safety Review Board Recommends that ARP-1 approve the mitigations. An initial high risk with mitigations requires FAA Headquarter signature. Additionally, the ARP SMS requires tracking and management of initial high-risk hazards and controls.

The Risk matrix provides a visual depiction of the safety risk and enables prioritization in the control of the hazards. The Risk Matrix shown in Figure 10 is referenced from FAA Order 8040.4B Safety Risk Management Policy.

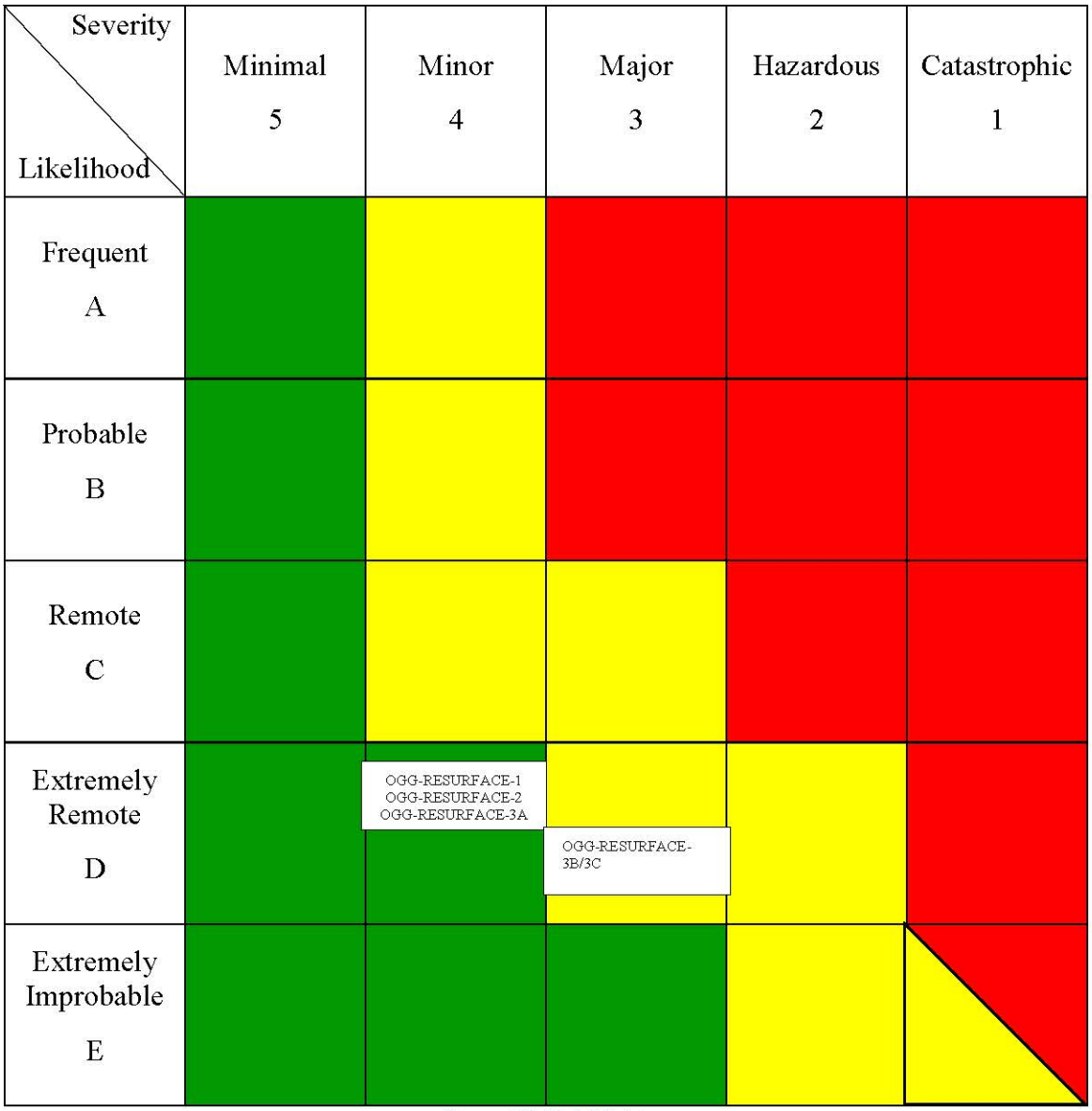

Figure 10: Risk Matrix

High Risk – Unacceptable
Medium Risk – Acceptable with Mitigation
Low Risk – Acceptable

Table 4 above, as well as the following paragraph sections provide the SRMP's analysis of each hazard, including the worst credible effect for analysis.

OGG-RESURFACE-1 Pilot Loss of Situational Awareness (LOSA)

Effect: Runway Incursion (or equivalent when tower is closed)

The SRMP analyzed and assessed this hazard by discussing the identified Causes that contribute to potential outcomes if this hazard occurs in the defined system state. The SRMP continued their assessment based on the worst credible effect, which was identified as a runway incursion (or equivalent when tower is closed). The SRMP determined that in this case it is possible that minimal damage to aircraft and/or minor injury to passengers/workers, minimal unplanned disruption to airport operations, or minor incident involving the use of airport emergency procedures could take place. The SRMP concluded on a risk rating on severity of 4-Minor and the likelihood as D-Extremely Remote as it is expected to occur once every 10-100 years or 25 million departures, whichever occurs sooner. The SRMP evaluation resulted with an initial risk rating of 4-Minor in severity and D-Extremely Remote for its likelihood. This hazard resultant matrix determination is a 4D – Low (Green) and considered as an acceptable level of risk without further mitigation.

OGG-RESURFACE-2 Controller Loss of Situational Awareness (LOSA)

Effect: Runway Incursion (or equivalent when tower is closed)

The SRMP analyzed and assessed this hazard by discussing the identified Causes that contribute to potential outcomes if this hazard occurs in the defined system state. The SRMP continued their assessment based on the worst credible effect, which was identified as a runway incursion (or equivalent when tower is closed). The SRMP determined that in this case it is possible that minimal damage to aircraft and/or minor injury to passengers/workers, minimal unplanned disruption to airport operations, or minor incident involving the use of airport emergency procedures could take place. The SRMP concluded on a risk rating on severity of 4-Minor and the likelihood as D-Extremely Remote as it is expected to occur once every 10-100 years or 25 million departures, whichever occurs sooner. The SRMP evaluation resulted with an initial risk rating of 4-Minor in severity and D-Extremely Remote for its likelihood. This hazard resultant matrix determination is a 4D – Low (Green) and considered as an acceptable level of risk without further mitigation.

OGG-RESURFACE-3 Vehicle Loss of Situational Awareness (LOSA)

As the SRMP members started analyzing and assessing this hazard, there were many concerns raised on the several potential outcomes or harm if this hazard occurred during construction and the members decided to move forward with analyzing and assessing two (2) effect. The two (2) effects were, Surface Incident and Runway Incursion which are further discussed below.

OGG-RESURFACE-3A Vehicle Loss of Situational Awareness (LOSA)

Effect: Surface Incident

The SRMP analyzed and assessed this hazard by discussing the identified Causes that contribute to potential outcomes if this hazard occurs in the defined system state. The SRMP continued their assessment based on the worst credible effect, which was identified as a surface incident. The SRMP determined that in this case it is possible that minimal damage to aircraft and/or minor injury to passengers/workers, minimal unplanned disruption to airport operations, or minor incident involving the use of airport emergency procedures could take place. The SRMP concluded on a risk rating on severity of 4-Minor and the likelihood as D-Extremely Remote as it is expected to occur once every 10-100 years or 25 million departures, whichever occurs sooner. The SRMP evaluation resulted with an initial risk rating of 4-Minor in severity and D-Extremely Remote for its likelihood. This hazard resultant matrix determination is a 4D – Low (Green) and considered as an acceptable level of risk without further mitigation.

OGG-RESURFACE-3B Vehicle Loss of Situational Awareness (LOSA)

Effect: Runway Incursion

The SRMP analyzed and assessed this hazard by discussing the identified Causes that contribute to potential outcomes if this hazard occurs in the defined system state. The SRMP continued their assessment based on the worst credible effect, which was identified as a runway incursion. The SRMP determined that in this case it is possible that major damage to aircraft and/or major injury to passengers/workers, major unplanned disruption to airport operations, serious incident, or deduction on the airport's ability to deal with adverse conditions could occur. The SRMP concluded on a risk rating on severity of 3-Major and the likelihood as D-Extremely Remote as it is expected to occur once every 10-100 years or 25 million departures, whichever occurs sooner. The SRMP evaluation resulted with an initial risk rating of 3-Major in severity and D-Extremely Remote for its likelihood. This hazard resultant matrix determination is a 3D – Medium (Yellow).

As the discussions continued, some SRMP members were under the impression that the worst credible effect was a Surface Incident, which was already assessed. Further discussion and input was provided by the OGG AOC's to clarify the discussion on two (2) sets of vehicle drivers, daily driver operators who have greater understanding and experience driving in the movement areas compared to contractors that are normally confined to the work area.

Based on the misunderstanding with the SRMP members, the Facilitators brought to light the additional confusion as some SRMP members were using the Microsoft Teams Chat feature while others were using their audio without the ability to view the Chat feature. Due to the Panel Members being 100% on-line and some individuals without the ability to view that Chat and only hear the audio, this brought its own challenges and the SRMP members were asked to consider a

re-vote based on their documented, worst credible effect of a Runway Incursion. Therefore, the SRMP members agreed to move forward with a revote on the same Hazard with the Runway Incursion as the worst credible effect, which resulted in the Same matrix determination, 3D – Medium (Yellow), documented again below as OGG-RESURFACE-3C.

The SRMP members were offered the opportunity to provide additional mitigation measures to effectively reduce the risk to an acceptable level. The SRMP continued discussions to incorporate additional controls that could mitigate, prevent or reduce the hazard occurrence or to mitigate its effects.

OGG-RESURFACE-3C Vehicle Loss of Situational Awareness (LOSA) (Re-Vote)

Effect: Runway Incursion

The SRMP continued their assessment based on the understanding of the worst credible effect, which was identified as a runway incursion as a revote. As the SRMP analyzed and assessed this hazard again, they continued discussing the identified Causes that contribute to potential outcomes if this hazard occurs in the defined system state and determined that the Causes, Effects, Existing Controls and Justifications/Supporting Data remained unchanged from OGG-RESURFACE-3B.

The discussion continued on the two (2) types of drivers that have the potential to lose situational awareness. The panel conversed in great detail that all vehicle drivers are required to go through the OGG Movement Area Driver Training class provided by the OGG AOC's and their respective company must also provide additional training to ensure the driver's familiarity with the airport layout and CSPP. At the conclusion of this discussion, the hazard resulting matrix determination remained unchanged as a 3D-Medium (Yellow) and the SRMP continued discussions to incorporate additional controls that could mitigate, prevent or reduce the hazard occurrence or to mitigate its effects.

Hazard OGG-RESURFACE-3B and 3C remained unchanged as a 3D-Medium Risk and is only broken out into separate hazards for the purpose of documenting the SRMP member discussions.

OGG-RESURFACE-4 During tower hours RI, SI, RE when Runway Shortened

The SRMP initially determined that During tower hours RI, SI, RE when Runway Shortened was a hazard, however, through discussion, the SRMP decided that this hazard was documented as effects of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-5 After tower hours RI, SI, RE when Runway Shortened

The SRMP initially determined that After tower hours RI, SI, RE when Runway Shortened was a hazard, however, through discussion, the SRMP decided that this hazard was documented as effects of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-6 Increased ARFF Response Times

The SRMP initially determined that Increased ARFF Response Times was a hazard, however, through discussion, the SRMP decided that the ARFF response routes are made available and barricades shown on phasing plan. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-7 Multiple runway closures across State of Hawaii limiting available alternates

The SRMP initially determined that Multiple runway closures across State of Hawaii limiting available alternates was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-8 Confusion Regarding Changed Routes, Miscommunication

The SRMP initially determined that Confusion Regarding Changed Routes, Miscommunication was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-9 Pilot or controller missing (not reading) current NOTAMs

The SRMP initially determined that Pilot or controller missing (not reading) current NOTAMs was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-10 NOTAMs description of closures can get confusing

The SRMP initially determined that "NOTAM description's of closures can get confusing" was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-11 Back-Taxi Operation

The SRMP initially determined that Back-Taxi Operations was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause/effect of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-12 Lack of good communication between go/no-go between Airport and FAA

The SRMP initially determined that the Lack of good communication between go/no-go between Airport was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-13 Diversion if runways are closed

The SRMP initially determined that Diversion if runways are closed was a hazard, however, through discussion, the SRMP decided that this hazard was covered by existing alternate runway at HNL. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-14 Missed communication regarding go/no-go

The SRMP initially determined that Missed communication regarding go/no-go was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-15 Arrival spacing after tower hours during shortened runway phases

The SRMP initially determined that Arrival spacing after two hours during shortened runway phases was a hazard, however, through discussion, the SRMP decided that this hazard was documented as a cause of other hazards listed. This hazard was removed, and no further analysis was conducted.

OGG-RESURFACE-16 Un-grooved runway portions for 30 days

The SRMP initially determined that Un-grooved runway portions for 30 days was a hazard, however, through discussion, the SRMP decided that this condition will have NOTAMs issued up to 7 days prior and documented in existing controls along with standard airport practices. This hazard was removed, and no further analysis was conducted.

Table 5: Severity Definitions

Hazard Severity Classification

Effect On:	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Airports	No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or worker(s)	-Minimal damage to aircraft, or -Minor injury to passengers, or -Minimal unplanned airport operations limitations (i.e. taxiway closure), or -Minor incident involving the use of airport emergency procedures	-Major damage to aircraft and/or minor injury to passenger(s)/worker(s), or -Major unplanned disruption to airport operations, or -Serious incident, or -Deduction on the airport's ability to deal with adverse conditions	-Severe damage to aircraft and/or serious injury to passenger(s)/worker(s); or -Complete unplanned airport closure, or -Major unplanned operations limitations (i.e., runway closure), or -Major airport damage to equipment and facilities	-Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/worker(s); or -Complete unplanned airport closure and destruction of critical facilities; or -Airport facilities and equipment destroyed
ATC Services	A minimal reduction in ATC services CAT D runway incursion[1] Proximity Event, Operational Deviation, or measure of compliance greater than or equal to 66 percent[2]	Low Risk Analysis Event severity,[3] two or fewer indicators fail CAT C runway incursion	Medium Risk Analysis Event severity, three indicators fail CAT B runway incursion	High Risk Analysis Event severity, four indicators fail CAT A runway incursion	Ground collision[4] Mid-air collision Controlled flight into terrain or obstacles
Flying Public	Minimal injury or discomfort to persons on board	Physical discomfort to passenger(s) (e.g., extreme braking action, clear air turbulence causing unexpected movement of aircraft resulting in injuries to one or two passengers out of their seats) Minor injury to less than or equal to 10 percent of person on board[6]	Physical distress to passengers (e.g., abrupt evasive action, severe turbulence causing unexpected aircraft movements) Minor injury to greater than 10 percent of persons on board	Serious injury to persons onboard[7]	Fatal injuries to persons onboard[8]
Flight Crew	Pilot is aware of traffic (identified by Traffic Collision Avoidance System traffic alert, issued by ATC, or observed by flight crew) in close enough proximity to require focused attention, but no action is required Pilot deviation[9] where loss of airborne separation falls within the same parameters of a Proximity Event or measure of compliance	Pilot deviation where loss of airborne separation falls within the same parameters of a low Risk Analysis Event severity Reduction of functional capability of aircraft, but overall safety not affected (e.g., normal procedures as per Airplane Flight Manuals) Circumstances requiring a flight crew to abort takeoff (rejected takeoff); however, the	Pilot deviation where loss of airborne separation falls within the same parameters of a medium Risk Analysis Event severity Reduction in safety margin or functional capability of the aircraft, requiring crew to follow abnormal procedures as per Airplane Flight Manuals Circumstances requiring a flight crew to reject landing (i.e., balked	Pilot deviation where loss of airborne separation falls within the same parameters of a high Risk Analysis Event severity Reduction in safety margin and functional capability of the aircraft requiring crew to follow emergency procedures as per Airplane Flight Manuals Near mid-air collision encounters with	Ground collision Mid-air collision Controlled flight into terrain or obstacles Hull loss to manned aircraft Failure conditions that would prevent continued safe flight and landing
	greater than or equal to 66 percent Circumstances requiring a flight crew to initiate a go-around	act of aborting takeoff does not degrade the aircraft performance capability Near mid-air collision encounters with separation greater than 500 feet[10]	landing) at or near the runway threshold Circumstances requiring a flight crew to abort takeoff (i.e., rejected takeoff); the act of aborting takeoff degrades the aircraft performance capability Near mid-air collision encounters with separation less than 500 feet[10]	separation less than 100 feet[10]	

Effect On:	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Unmanned Aircraft Systems	Discomfort to those on the ground Loss of separation leading to a measure of compliance greater than or equal to 66 percent	Low Risk Analysis Event severity, two or fewer indicators fail Non-serious injury to three or fewer people on the ground	Medium Risk Analysis Event severity, three indicators fail Non-serious injury to more than three people on the ground A reduced ability of the crew to cope with adverse operating conditions to the extent that there would be a significant reduction in safety margins Manned aircraft making an evasive maneuver, but proximity from unmanned aircraft remains greater than 500 feet	High Risk Analysis Event severity, four indicators fail Incapacitation to unmanned aircraft system crew Proximity of less than 500 feet to a manned aircraft Serious injury to persons other than the unmanned aircraft System crew	A collision with a manned aircraft Fatality or fatal injury to persons other than the unmanned aircraft system crew

Table 6: Likelihood Definitions

	Airport Specific	Quantitative (ATC/Flight Procedures/Systems Engineering)	Domain-wide: NAS-wide, Terminal, or En route
A Frequent	Expected to occur more than once per week or every 2500 departures, whichever occurs sooner	(Probability) ≥ 1 per 1000	Equal to or more than once per week
B Probable	Expected to occur about once every month or 250,000 departures, whichever occurs sooner	1 per 1000 > (Probability) ≥ 1 per 100,000	Less than once per week and equal to more than once per three months
C Remote	Expected to occur about once every year or 2.5 million departures, whichever occurs sooner	1 per 100,000 > (Probability) ≥ 1 per 10,000,000	Less than once per three months and equal to more than once per three years
D Extremely Remote	Expected to occur once every 10-100 years or 25 million departures, whichever occurs sooner	1 per 10,000,000 > (Probability) ≥ 1 per 1,000,000,000	Less than once per three years and equal to or more than once per 30 years.
E Extremely Improbable	Expected to occur less than every 100 years	1 per 1,000,000,000 > (Probability) ≥ 1 per 10^{14}	Less than once per 30 years

Note: A cutoff point of 10^{-14} was established to define the boundaries of credible events for the purpose of calculating likelihood.

Section 8 – Phase 5: Treatment of Risk / Mitigation of Hazards

The SRMP agreed that the following Hazards and associated Effects which were rated with Low Initial Risk 4D, had existing controls in place to effectively manage these risks and no mitigation measures were needed.

- OGG-RESURFACE-1, Pilot LOSA.
- OGG-RESURFACE-2, Controller LOSA.
- OGG-RESURFACE-3A, Vehicle/Pedestrian LOSA.

However, the SRMP decided to continue discussions to further mitigate the following Hazard and associated Effect which was rated with Medium Initial Risk 3D.

- OGG-RESURFACE-3B, Vehicle/Pedestrian LOSA, Runway Incursion
- OGG-RESURFACE-3C, Vehicle/Pedestrian LOSA, Runway Incursion (Re-Vote)

Hazard OGG-RESURFACE-3B, Vehicle/Pedestrian LOSA was evaluated and assessed by the SRMP members, however, as mentioned in Section 7, some of the SRMP members were under the impression that the worst credible effect being voted on was a Surface Incident and not the documented Runway incursion. Due to this misunderstanding, the Facilitators suggested a re-vote to ensure that all SRMP members are voting based on the worst credible effect documented as a Runway Incursion. The risk rating remained as a Medium Initial Risk, 3D, which the SRMP members decided to further mitigate in hopes of reducing the Risks likelihood.

The SRMP members discussed previous runway incursion incidents by Vehicle/Pedestrian LOSA caused by miscommunications, changes in routes and irregular operations. They determined that adding the following proposed mitigations would reduce the likelihood of a Runway Incursion, which were identified as follows:

1. Training
2. Daily safety briefings before start of work
3. Airport diagrams in vehicle, with capability to mark up

These three (3) mitigations were discussed in great length, unfortunately, these mitigations could not be assigned to anyone to ensure these mitigations could be implemented. According to the FAA ARP Desk Reference, anytime there is a stated proposed mitigation for a hazard, there must be a documented mitigation responsibility, who has the responsibility to implement the mitigation plan.

The SRMP members were not able to assign anyone with the responsibility to implement these mitigations, therefore, no predicted residual risk rating was voted on.

During the SRMP PHA, there were instances that SRMP members were outside of the majority vote for either severity and likelihood while assessing for initial risks, which were recorded and shown below in Tables 7 and 8 and Appendix D – Dissenting Opinions. Those SRMP members with the indicated yellow highlights under each Hazard ID, were afforded an opportunity to provide their dissenting opinions in writing as required by FAA Office of airports Safety Management System (SMS) Implementation Guidance and Desk Reference, Section 5.3.e.2,

SRMD documentation; however, there were no dissenting opinions provided by any of the Panel Members.

Table 7: Initial Risk Dissenting Opinion Summary (1 of 2)

	OGG-RESURFACE-1 Pilot LOSA		OGG-RESURFACE-2 Controller LOSA		OGG-RESURFACE-3A Vehicle/Pedestrian LOSA	
Panel Member	Severity	Likelihood	Severity	Likelihood	Severity	Likelihood
Phillip Daniells	4	D	4	D	4	D
Steven Csigi	4	D	4	D	4	D
Ronson Fox	4	D	4	D	4	D
Neil Okuna	4	D	4	D	4	D
Joe Santoro	4	C	4	C	4	D
Frank Flores	4	D	4	D	4	C
Perfecto Delmendo	4	D	4	D	4	D
Richard Silva	4	D	3	D	3	D
George Hodgson	4	D	4	D	4	D
Tim Sprowls	3	D	3	D	4	D
Majority Rating	**4**	**D**	**4**	**D**	**4**	**D**
	4D – Low		**4D – Low**		**4D – Low**	

Table 8: Initial Risk Dissenting Opinion Summary (2 of 2)

	OGG-RESURFACE-3B Vehicle/Pedestrian LOSA		OGG-RESURFACE-3C Vehicle/Pedestrian LOSA	
Panel Member	Severity	Likelihood	Severity	Likelihood
Phillip Daniells	3	D	3	E
Steven Csigi	3	D	3	D
Ronson Fox	3	E	4	E
Neil Okuna	3	D	4	D
Joe Santoro	3	C	4	D
Frank Flores	3	C	4	D
Perfecto Delmendo	3	D	4	E
Richard Silva	3	D	3	D
George Hodgson	3	D	3	D
Tim Sprowls	3	D	3	E
Majority Rating	**3**	**D**	**3**	**D**
	3D – Medium		**3D – Medium**	

Section 9 – Tracking and Monitoring Hazards

Referencing the SRMP SMS Desk Reference, low risk hazards (green) do not need to be actively managed but must be recorded in the SRMD. Medium risk is acceptable within the ARP SMS. A medium risk is the minimum acceptable safety objective. With medium risk, the proposal may be carried out as long as the risk is tracked and managed.

These hazards will be monitored by HDOT-A as they move through the design and construction SRA phases and addressed as needed.

The SRMP incorporated safety performance targets for triggering a reconvened panel, including, but not limited to, the definitions as described below. The panel will consider reconvening to look at additional mitigation if there is one incident falling within the category of 4-Minor for the duration of the Kahului Airport Resurface RWY 2-20 project.

- ATC Services
  - Conditions resulting in a slight reduction in ATC services
  - A loss of separation resulting in a Category C, RI, or Operation Error (OE)

- Flight Crew
  - Potential for PD due to TCAS Preventative Resolution Advisory (PRA) advising crew not to deviate from present vertical profile
  - PD where loss of airborne separation falls within the same parameters of a Category C, OE
  - A reduction of functional capability of aircraft but does not impact overall safety (e.g., normal procedures per ARM)

- Flying Public
  - Physical discomfort to passenger(s) (e.g., extreme braking action, clear air turbulence causing unexpected movement of aircraft causing injuries to one or two passengers out of their seats)
  - Minor injury to greater than zero or less than equal to 10% of passengers

- Airport
  - Minimal damage to aircraft
  - Minor injury to passengers
  - Minimal unplanned airport operations limitations (e.g., taxiway closure)
  - Minor incident involving the use of airport emergency procedures

This would effectively cover all incidents associated with all stakeholder groups.