sustainable**DOT-A**

sustainable**HNL**

2009 Waste Assessment

MADE IN HAWAIʻI · 2009

Honolulu International Airport
Waste Assessment Report

INTRODUCTION

WHY RECYCLE?

An Important Step for Sustainability

For over a thousand years, the people of Hawaii have heavily relied on natural resources to maintain life both in the physical and spiritual sense. Advancement of modern technology and the evolution of society have inherently increased the degeneration of Hawaii's isolated ecosystem. To combat the decreasing quality and availability of pristine natural resources of the islands, the state has implemented a number of recycling efforts in which residents and visitors alike participate. This movement toward an environmentally responsible economy not only benefits the environment and quality of life, but saves money, creates industry and promotes jobs. Thus, it behooves large facilities to integrate recycling as a component of their solid waste disposal systems. As Hawaii looks to its rich cultural past while moving forward in the pursuit of a sustainable future, responsible waste management is a fundamental first step.

Mounting Trash Problems in Hawaii

Oahu produces nearly 1,000,000 tons of solid waste per year[1]. In Hawaii where land is not only scarce but also regarded as culturally sacred, conventional modes of waste disposal such as land filling garbage can be considered sacrilege to both economists and Native Hawaiians alike. However, much of the waste generated on Oahu is disposed of in this manner at Oahu's only landfill for commercial and residential waste located in Waimanalo Gulch. The landfill was set to close in May of 2008 after reaching full capacity, but instead has since expanded by over 90 acres. In order to relieve pressure on the landfill, garbage is also sent to the H-Power Waste-to-Energy (WTE) plant located in Campbell Industrial Park. While H-Power processes up to 600,000 tons of solid waste per year, it also faces limited capacity as it periodically shuts down for maintenance. Consequently, about 20% of all waste destined for H-Power is ultimately land filled due to plant closures throughout the year, while another 10% continuously ends up in the landfill in the form of ash residue from the trash combustion process.[1] Oahu's building code restricts all structures to a height of no more than 400 feet; however the landfill is an exception to this rule. With trash piling to over 430 feet high, the landfill is Oahu's tallest manmade structure.[2]

Community Engagement

In light of Hawaii's rich cultural values and limited capacity for garbage disposal, recycling is a strategically important first step towards the greening of Honolulu International Airport (HNL). When recycling bins and the associated signage are in place, recycling is one of the more highly visible aspects of addressing the sustainability agenda. From the initial point of program inception (i.e. the waste assessment report) to the

Figure 1. Municipal Landfill in Waimanalo Gulch.

[1] "2006 Waste Characterization Study." Data retrieved from: http://www.opala.org/pdfs/solid_waste/2006%20Final%20Waste%20Characterization%20Report.pdf

[2] "Big pile-up at big gulch: Landfill will be Oahu's tallest manmade structure" Data retrieved from: http://www.bizjournals.com/pacific/stories/2002/09/16/daily20.html

establishment of a formal recycling program and participation over time, recycling is an opportunity to educate and engage all stakeholders in the community. Everyone from the janitorial and administrative staff to the visiting public receives a clear message that HNL is committed to the process of institutionalizing sustainability.

WHAT IS RECYCLING?

To recycle waste, by definition is to pass again through a series of changes or treatments as to process material into new products to prevent excessive waste, utilize existing materials, reduce the amount of waste being sent to the landfill, and lower greenhouse gas emissions when compared to production using virgin materials. For example, recycling paper instead of using new wood material generates 74% less air pollution, uses 50% less water, and requires about 30% less energy. Recycling aluminum saves 95% of the energy needed to produce new aluminum from raw materials. Therefore:

- Recycling one aluminum can saves enough energy to run a 100-watt bulb for 20 hours, a computer for 3 hours, or a TV for 2 hours.
- With the same amount of energy it takes to make one aluminum can out of new material, 20 can be made out of recycled material.
- When one aluminum can is tossed out, as much energy is wasted as if someone filled the same can half-full of gasoline and poured it into the ground.
- Energy saved from recycling one ton of aluminum is equal to the amount of electricity the average home uses over 10 years.[5]

As more people become aware of recycling it is important to know that all recycling is not the same. William McDonough, author of *Cradle to Cradle: Remaking the Way We Make Things*[6], defines recycling by the process of upcycling, true recycling and downcycling. Upcycling is defined as taking something that is disposable and transforming it into something of greater use and value. True recycling is turning material into the exact same product. Downcycling is turning a product into a product of lesser quality that ultimately becomes waste. All reduce the amount of material going to landfill, however upcycling and true recycling are much more environmentally responsible than downcycling.

Recycling Facts[3]

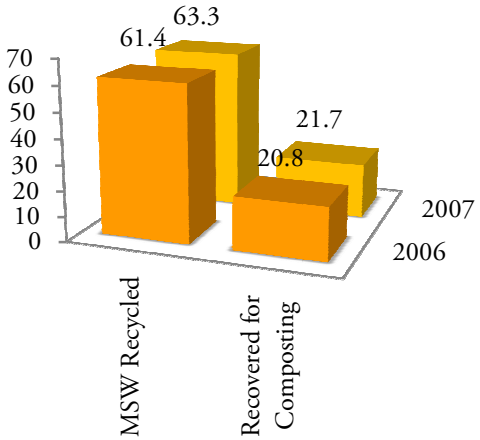
Every three months, Americans landfill enough aluminum to rebuild the entire commercial fleet in the U.S. every three months.

There is enough office paper thrown away each year to build a 12' high wall of paper from NY to Seattle.

Making glass from recycled material cuts related water pollution by 50%.

5 PET bottles yield enough fiber fill to fill one ski jacket.

U.S. Recycling Rate (tons)[4]



[3] "Know Your Trash Facts retrieved."
Data retrieved from: http://environmentalistseveryday.com/solid waste-management/garbage-trash-waste-facts.php
[4] "Municipal Solid Waste in the United States: 2007 Facts and Figures." Data retrieved from: http://epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf
[5] "Recycling Facts." Data retrieved from: http://www.oberlin.edu/recycle/facts.html
[6] McDonough, William, and Michael Braungart. Cradle to Cradle Remaking the Way We Make Things. New York: North Point, 2002.

MUNICIPAL SOLID WASTE (MSW)

To understand the rate at which the United States recycles, it must first be understood what constitutes trash or municipal solid waste (MSW). MSW refers to the common household items that are collected through community sanitation services. Accounting for the largest share of MSW is paper and yard waste, both of which can be directly recycled or composted. Items that are deemed hazardous, industrial, and construction waste are generally excluded when recycling statistics are computed by the United States Environmental Protection Agency (EPA). Relatively new technology has allowed a diversion of waste once destined to the landfill, to be diverted to waste-to-energy facilities where the waste is combusted and used as an electricity generator in the form of a steam turned turbine.

According to the 2007 EPA MSW report executive summary[7]: The United States generated 254 million tons of MSW in 2007. Excluding composting, the amount of MSW recycled increased 1.9 million tons from 2006 for a total of 63.3 million tons. MSW generation in 2007 decreased 0.6% from 2006 to 2007 to 4.62 pounds per person per day. The recycling rate in 2007 was 1.54 pounds per person per day. Discards sent to landfills after recycling and combustion with energy recovery declined to 2.50 pounds per person per day in 2007. This is a decrease of 2.7% from 2006 to 2007.

RECYCLING BACKGROUND

Government involvement at the national level is lead by the EPA which oversees a variety of waste issues, while the city or state further defines the specific recycling legislation. State policies fall in two major categories: landfill bans and recycling goals. While California and Illinois focus on recycling goals, states including Wisconsin, Minnesota, Michigan and North Carolina focus on landfill bans. Landfill ban focused state regulations make it illegal to dispose of items such as yard waste, oil, and recyclables that are easily collected in curbside recycling programs. To encourage the recycling of specific drink containers, states pass a bottle bill. In all, eleven states including California, Hawaii, Oregon, Connecticut, Delaware, Maine, Vermont, Massachusetts, Iowa, Michigan and New York have established laws that implement a beverage container deposit system to promote reuse and recycling.

Recycling centers are typically independently operated businesses that are certified by state departments to accept empty beverage containers and pay the state's designated refund value to consumers. The first recycling center in the United States opened in New York City in 1896. Since then, hundreds of thousands of recycling centers and an estimated 8,500 recycling programs have been established throughout the U.S., and have vastly improved the country's recycling rate. There are currently 107 recycling centers in the State of Hawaii, 63 in Oahu, 13 in Maui, 3 in Molokai, 1 in Lanai, 19 in Big Island and 8 in Kauai. Appendix C portrays the closest recycling redemption centers to HNL.

NATIONAL/INTERNATIONAL INITIATIVES, STANDARDS & GUIDELINES

At the national level, various organizations have established a number of programs and policies designed to educate the general population of processes that prevent pollution by saving energy, encouraging environmentally preferable acts and providing technical assistance to state agencies and businesses. These include, but are not limited to:

- **Federal Executive Order 13101 (EO 13101)** - Recognizing the need for a healthier way of living pertaining to sustainability and the government, the United States Federal government adopted Federal Executive Orders (FEO) to set an example for the people through acts of the government's purchasing power. Adopted in September 1998, EO 13101 encourages executive agencies to purchase environmentally preferable products and services in hopes of expanding markets for recovered materials through the efforts of the Federal Government. The EPA issued the Comprehensive Procurement Guidelines (CPG), which

[7] "Municipal Solid Waste in the United State: 2007 Facts and Figures." Data retrieved from: http://epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf

designates products that must contain recycled content when purchased by federal agencies, or by government contractors using appropriated federal funds.

- **The Pollution Prevention Act (1990)** - The Pollution Prevention Act developed by the (EPA) is a national policy in which pollution should be prevented or reduced at the source whenever feasible. Pollution prevention reduces or eliminates waste at the source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques and re-using materials rather than putting them into the waste stream. Preventing pollution offers important economic benefits, as pollution never created avoids the need for expensive investments in waste management or cleanup.

LOCAL INITIATIVES, STANDARDS & GUIDELINES

Issues of Hawaii landfills quickly reaching capacity have increased an awareness of recycling with the help of media coverage and various public service announcements fostering sustainable behavior. With a diversion rate on par with the national average, Hawaii still manages to send more waste to landfills per capita than other states because of the shear rate at which waste is generated. Acknowledgment that waste reduction is the first step toward achieving a sustainable future is key, while recycling should remain as a secondary solution. Many local initiatives were created to enhance awareness. These include, but are not limited to:

- **Hawaii Pollution Prevention and Waste Minimization Program** – The State of Hawaii established the Hawaii Pollution Prevention and Waste Minimization Program in 1991 with a goal to reduce hazardous waste generation and promote environmental protection while helping businesses to reduce costs. The program provides businesses with methods and resources to reduce their generation of wastes and conserve their use of resources.

- **Green Business Program -** Working together, the Departments of Health (DOH); Business, Economic Development, and Tourism (DBEDT); and the Chamber of Commerce of Hawaii established the Green Business Program in 2003. The program specific to office, retail, resort and hotel establishments recognize those that have applied environmentally responsible measures in their establishments. The program offers a variety of services to businesses interested in reducing their generation of waste and conserving the use of resources through workshops and presentations, technical bulletins, providing on-site assist visits, as well as public recognition as a green business. Objectives of all involved remain to reduce energy and water consumption, promote recycling, prevent pollution, reduce emissions and to educate employees and customers about environmental practices.

- **State of Hawaii Department of Environmental Services (ENV)** - The State of Hawaii Department of Environmental Services is perhaps the most well known form of waste management in the State of Hawaii. Included in the department is a Refuse Division in which the City and County Recycling branch is housed and chartered with the duty to provide an island wide waste management system that protects the environment and operates efficiently to minimize costs to residents and businesses. Services include bulky item collection, curbside recycling, community recycling bins, and condo recycling. The department includes WTE technology, recycling and composting, as well as evaluating emerging technologies that could reduce a reliance on landfills. The department began curbside recycling in October 2007. In addition to the typical grey bins for trash which the majority of residents possess, the city provides residents with a complimentary green bin for green waste (grass, tree and hedge trimmings) and blue bin for mixed recyclables (newspaper, corrugated cardboard, glass bottles and jars, aluminum cans, and plastic bottles coded No.1 and No.2).

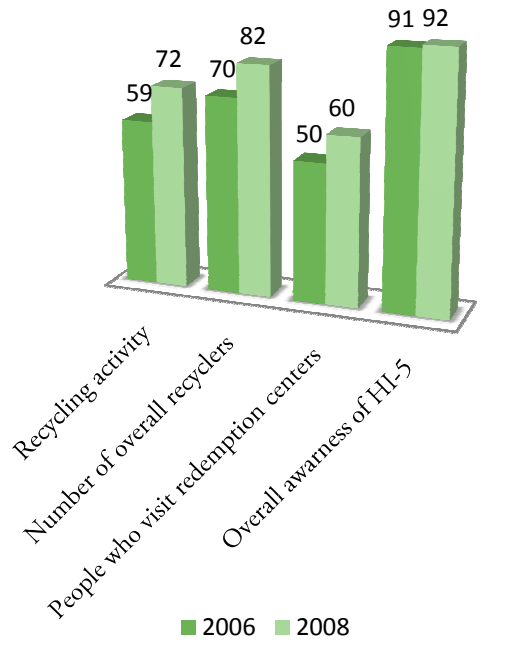
- **Integrated Solid Waste Management Plan (ISWMP)** - Waste management in Hawaii has greatly improved since the establishment of the first ISWMP and waste management laws of 1991. Updated in 2000, the ISWMP continues to propose recommended actions toward waste management challenges for the City & County of Honolulu. Yet another draft update was initiated in 2006 followed by the establishment of the Solid Waste Advisory Committee (SWAC) in 2007 by Mayor Mufi Hannemann. The SWAC committee consists of individuals from within the recycling industry, military and government agencies, as well as

private businesses and students. The purpose of the SWAC is to review solid waste data, learn about past and current practices, and explore future directions for incorporation into the updated plan. As of April 2008, ENV continues to work on a revised version of the ISWMP for the next five years.

- **Tour de Trash** - Since 1999, the annual Tour de Trash program has offered a free monthly behind the scenes look at recycling and waste processing technology set at various locations throughout Oahu. The tour has since grown in popularity each year evolving from a primarily business sector audience to a broad general public group. Coordinated by the City & County and supported by local businesses, the program has increased public awareness which is critical to move forward new initiatives and achieve higher diversion rates. Upon implementation of an exemplary airport recycling program, HNL can potentially be a destination included on the Tour de Trash to provide public outreach, education, and promotion of the Department of Transportation Airports Division's (DOT-A) sustainability success.

- **HI-5 Program** - Implemented in 2005, Hawaii became the 11th state to adopt a beverage container deposit program. The HI-5 program places a value on glass, aluminum and plastic beverage containers (beer, mixed spirits, mixed wine, coffee and teas, carbonated soft drinks and water). Although the general public is not required to recycle beverage containers, all city agencies and restaurants and bars serving alcoholic beverages are required to recycle aluminum, glass and plastic. The program requires all Hawaii beverage distributors to register with the DOH and participate in the HI-5 program. Distributors are defined as businesses that manufacture or import beverages into the state, traditional beverage distributors and wholesalers, retailers that import beverages directly as well as military entities. Not included are airlines and shipping companies that merely transport the beverages into the state. Distributors are responsible for paying the department container fee of 1¢ on all eligible containers that are manufactured or imported into the state. At the point of sale, the consumer is charged a 6¢ deposit. The deposit gives the consumer an incentive to recycle containers as they will receive their deposit of 5¢ back when they return their containers for recycling at redemption centers. The remaining 1¢ non-refundable container fee is then deposited in a special fund that is only used to support the costs of recycling and program administration in Hawaii. With the help of the financial incentive to encourage recycling, the program has successfully diverted millions of containers from the waste stream or as litter in our community. For the 2008 fiscal year, Hawaii achieved a redemption rate of 72% (682 of 948 million tons) with an overall goal of 80% redemption. The program endeavors for continued success.

2006/2008 HI-5 Survey Results (%)[8]



- **City and County Commercial Recycling Ordinances** – The City and County of Honolulu has various recycling requirements and landfill bans in place; commercial and government trucks are limited to a maximum of 10% green waste per H-POWER disposal load, and a maximum of 10% cardboard per disposal load at both the landfill and H-Power; green waste, tires, auto batteries, white goods, and scrap metals have been banned from all City disposal sites since 1994; bars and restaurants serving alcoholic beverages are required to recycle glass containers. Office buildings with 20,000 square feet or more of office space are required to recycle office paper, newspaper and cardboard, and city agencies are required to recycle

[8] 2009 Report to the Legislature. Data retrieved from: http://hawaii.gov/health/environmental/waste/sw/sw/hi5/support/2009ReportToLeg.pdf

newspaper, cardboard, office paper, aluminum, glass, and plastics through a government mandatory recycling program established in 1990 for all City agencies. Additionally, the City is required to purchase recycled paper products such as toilet tissue, paper towels, copier and computer paper to support the recycled paper market. Hotels, restaurants, grocery stores, food courts, food manufacturers/ processors and hospitals meeting specific size criteria are required to recycle food waste and used cooking oil.

CONCERNS WITH RECYCLING IN HAWAII

Because Hawaii lacks the economy of scale to warrant local remanufacturing, recycled materials in Hawaii are sorted and shipped to remanufacturing communities around the world. Newspapers are sent to mills mostly in Asia to be recycled into more newspaper, wrapping paper and molded packaging. Corrugated cardboard is also sent to Asia and processed into more cardboard and brown paper bags. Aluminum cans are sent to the U.S. mainland and are melted into new aluminum cans and other products. However, glass bottles generally stay on the island and are downcycled for use in construction as gravel, trench bedding, backfill and glasphalt in road-based applications. The remainder of glass is shipped to the West Coast and melted into new glass products. Plastics are shipped to the mainland or Asia and processed into carpeting, plastic lumber, toys, fiberfill and detergent bottles. Green waste is the only recyclable material processed locally, providing compost for purchase as well as complimentary mulch at various locations throughout Oahu.

Comprehensive and efficient recycling programs statewide are essential to relieving pressure on Hawaii's landfills. In an effort to improve landfill diversion rates, the State identified some issues and concerns associated with the expansion of island recycling. These issues include a lack of education, too few recycling drop-off centers, and slow implementation of curb-side recycling. In response to these concerns, the state set forth a series of the following recycling initiatives to be executed during 2008 and 2009:

- Expansion of community recycling bins
    - Add 40 new locations to the existing 80
- Increasing recycling support for schools
    - Providing the tools and resources necessary to increase recycling efforts and raise funds
- Developing comprehensive curbside recycling
    - Evaluate pilot programs and begin island wide expansion by May 2009
- Increasing recycling assistance for condos
    - Provide financial support for recycling program start-up costs
- Pursuing alternative technologies
    - Expand and engage H-POWER waste-to-energy capacity

As the state Refuse Division and the City and County Recycling Department continues to improve recycling initiatives from the residential, educational and technical support end, it is critical for private and other governmental organizations to mirror these goals. Opportunities abound for individual institutions like the DOT-A and Honolulu International Airport to raise the bar of expectation for responsible waste management.

AIRPORT RECYCLING

AIRPORT WASTE BACKGROUND

Airport Waste

Included in the category of MSW is waste generated from the day-to-day operations of airports. As large institutional facilities open to the public nearly 24 hours per day, solid waste disposal for airports is an important management issue with unique challenges and opportunities. Airport waste is generated from a myriad of sources each with their own distinct waste streams including airport offices, shops, restaurants, restrooms, flight kitchens, cargo operations, maintenance areas, and hangars. According to the 2006 report compiled by the National Resources Defense Council (NRDC) based on a year-long study of waste management practices at 30 airports, the net impact of airport solid waste generation is striking; the U.S. airline industry discarded 9,000 tons of plastic and enough newspaper to fill a football field to a depth of more than 230 feet. Even for materials like aluminum with high resale scrap value, the U.S. airline industry discards enough aluminum cans each year to build 58 Boeing 747 airplanes.

According the NRDC, Airport waste can be broken down according to three basic categories:

1. Terminal Public Areas Waste (includes the DOT-A's administrative office waste)
2. Terminal Tenant Waste (includes terminal retail and restaurant or concession tenant waste)
3. Airline Waste (includes airline offices and airplane waste)

Terminal public area waste generally includes food and drink containers, food scraps, newspapers, magazines, plastic wrappers, restroom trash, and any other miscellaneous waste discarded from public areas of the passenger terminals and DOT-A offices. Terminal tenant waste generally includes retail and restaurant waste like cardboard boxes, paper and plastic packaging, food scraps and food wrappers disposed of in shops, airport kitchens, and restaurant dining areas. Airline waste is generated from passenger airplanes, ticketing counters and gate areas and generally includes food and drink containers, uneaten food, newspapers, magazines, computer printouts, and other paper generated at ticketing counters. Airline waste accounts for about 50% of total airport waste production while the combination of airline and terminal tenant waste constitutes nearly 90% of a typical airport waste stream.

Airport Recycling Facts[9]

If airports and airlines recycled as much as the average U.S. recycling rate of 31%, enough energy would be saved to power 20,000 U.S households, and enough carbon emissions would be reduced to remove 80,000 cars from the road each year.

Recycling 70 % of the aluminum cans discarded at airports instead of sending them to landfills would save the amount of energy used by 5,000 U.S. households in a year and reduce carbon emissions equal to removing 9,000 cars from the road annually.

Recycling 70 % of the paper products discarded at airports would save the amount of energy used by 13,500 U.S. households in a year and reduce carbon emissions by an amount equal to removing 68,000 cars from the road annually.

Within the NRDC airline waste management report, 10 airports provided data revealing how much passenger-related waste they disposed of in 2004. Airports with waste generation estimates for all three categories reported an average of 1.28 pounds of waste per passenger while airports with waste generation estimates for terminal public areas waste, terminal, but not airline waste, reported an average of 0.68 pounds per passenger. When extrapolated across the U.S. airport industry, these figures amount to a total of about 425,000 tons of waste generated annually.

[9] "Trash Landings: How Airlines and Airports Can Clean Up Their Recycling Programs" Data retrieved from: http://www.nrdc.org/cities/recycling/airline/airline.pdf.

Airport Waste Management Systems
Airport waste management systems are either centralized, decentralized, or a combination of both:

Centralized Systems
Centralized systems generally have one waste management contract for all terminal and airplane waste, with the common exception of flight kitchens. In this scenario, the airport authority provides refuse and recycling receptacles for use by all airport tenants and airlines. When waste management systems are centralized, the cost of waste disposal can be factored into the lease and landing fees or billed as a utility service. Centralized waste management systems require more oversight on the part of the airport authority; however they also offer the following advantages:

- Centralized waste management systems allow for larger contracts and the realization of favorable economies of scale, enabling negotiation for lower per ton trash disposal prices and higher per ton shares of revenue from the sale of recyclable materials.
- Aggregating waste and recyclables can lead to optimum handling efficiency through avoiding unnecessary trips to the loading dock and minimization of truck traffic and fuel use from hauling services.
- Airport authority control over the type, placement, and maintenance of dumpsters or compactors may save space and eliminate the need for each airline to have their own containers.
- Airlines and tenants with small amounts of waste can recycle with fewer overhead costs.
- The airport authority can develop incentives for waste reduction and recycling by directly billing tenants and airlines for waste management services.

Decentralized Systems
In decentralized systems, the airport authority and terminal tenants each manage their own waste management contracts separately. In this scenario, there can be numerous waste management contracts as each company operating within the airport has control over its own waste disposal. This set-up minimizes the airport authority's responsibility to coordinate among the various entities within the airport; however there can be several drawbacks to this type of system:

- Because waste management is not coordinated, these systems may be less efficient when more dumpsters than necessary are used.
- Multiple waste disposal contracts may lead to more waste disposal trucks and trips than necessary, posing potential hazards to airside operations and unnecessary CO2 emissions.
- Improper dumping in tenant and DOT-A dumpsters may occur.
- Quantification, tracking, and waste reduction incentive schemes are more difficult to achieve than with centrally organized systems.
- Little control over airport waste management practices may lead to poor maintenance, and subsequent loose papers or attraction of birds.

PURPOSE OF THE HNL WASTE ASSESSMENT

Sustainability at Honolulu International Airport
The State of Hawaii Department of Transportation – Airports Division recognizes the significance and importance of sustainability as it embarks on future development programs at the Honolulu International Airport. It is the responsibility for all involved to understand and respond to the issues of sustainability as an integral part of the goals moving forward. The DOT-A also recognizes all of the sustainability efforts being made by both governmental and non-governmental organization in both the Hawaii and aviation community and endeavors to support those efforts as much as possible, one of them being solid waste reduction and recycling.

Honolulu International Airport Sustainability Committee
Established in 2008, the DOT-A HNL Sustainability Committee (HNL SC) is leading the effort in compiling a waste assessment for the Honolulu Airport. The unique culture of an airport makes it different from any other edifice in the world. The airport is a 24 hour living complex that must constantly change and adapt to transportation industry needs. An airport's life cycle considerations are much greater than that of a typical structure and it is critical an airport be fully functional on a continuous basis. The HNL SC was created to make executive decisions to sustain

this goal. The committee is comprised of individuals that stem from the ACI-NA's EONS model (Economic Viability, Operational Efficiency, Natural Resource Conservation and Social Responsibility).
The role of the HNL SC is to:

- **Develop and Foster a Sustainable Culture –** The HNL SC members are committed to developing a sustainable culture within Hawaii's airports that are unique to the local environment of the islands. The committee's goal is to foster high performance strategies and tactics that will help guide the airport to continually increase their efficiency in planning, development, operations and maintenance and capitalize on maximum benefits through efficient use of available funds.
- **Lead Sustainable Initiatives –** It is the belief of the HNL Sustainability Committee that it is their duty to ignite sustainable thinking through example of their actions and developments. Encouragement of forward thinking drives the committee to lead Hawaii's airports to be forefront leaders in sustainable high performance practice.
- **Educate Others of Sustainable Practices –** Sustainable education is a key element in making high performance practices a success. It is the committee's hopes that by leading and developing sustainable high performance initiatives, these efforts will directly influence visitors to the airport, airport employees, concessionaires, in-house staff, and other federal and state agencies.
- **Monitor Progress of Sustainable Developments –** The HNL SC is dedicated to ensuring sustainable initiatives are carried through successfully. Measuring success and making sure projected goals are achieved and proportionately adjusted are critical to continually strive forward.

Listed below are the current members of the HNL Sustainability Committee:

Guy M. Ichinotsubo, P.E., LEED AP, *Design Engineer, Committee Chair*
Sandra J. Kam, P.E., LEED AP, *Programs Management Engineer*
Jimmy Koshino, *Assistant Airport Superintendent*
Diana M. Lee, P.E., LEED AP, *Project Manager*
James W. Pratt, LEED AP, *Airside Operations Manager*
Ross Smith, *Property Management Supervisor*
Gary Yokoyama, LEED AP, *Project Manager*

Current HNL Policy and Practices

HNL does not currently have an airport wide recycling program, but has a mix of varying efforts in different departments. Some of these efforts include, but are not limited to:

- Compliance with the State of Hawaii HI-5 program in all public access areas throughout HNL, including airport concourses, lobby shops and walkways. The HNL custodial staff currently manages this recycling effort.
- The DOT-A created an office paper recycling program for selected administration areas. Each section has paper and cardboard recycle bins that are managed by airfield and ground maintenance staff and are collected by a third party recycling company at the Maintenance Baseyard facility.
- Various airlines recycle deplaned waste (but not all).
- Various airside recycling efforts such as gas and oil filters, scrap metal, batteries, tires, wood pallets, etc. (but not done by all tenants or on a regular basis).
- Various landside recycling efforts such as electrical wiring, electronic waste, wood pallets, etc. (but not done by all tenants or on a regular basis).

Goals

The ultimate goal of HNL's recycling program is to make HNL a more sustainable airport by creating a comprehensive and efficient recycling program, minimize generation of solid waste and reduce HNL's carbon footprint.

HNL WASTE ESTIMATES AND ANYALYSIS

HNL Waste Estimates

The more people passing through an airport, the more waste is generated. At HNL, an estimated 10,000 people can be found in the airport complex as passengers, employees and/or visitors at any given hour of the day. HNL is ranked one of the busiest airports in the world as it hosts over 21 million total passengers annually[10]. In 2007, HNL hosted 10,237,234 enplaned passengers, meaning that roughly half of these 21 million annual passengers represent departures only[11]. According to the calculation method provided by the NRDC of an average 1.28 pounds of waste per passenger departure, HNL produced about 6,552 tons of waste in 2007.

The current waste disposal contract managed by the DOT-A requires a total of 1005 cubic yards of container space for refuse and recycling disposal at a minimum service rate of once per week. (See Appendix A) Over the course of one year, that amounts to approximately 52,000 cubic yards per year. If one had to carry this amount of trash in a 3'x 3' truck, the trailer would need to be over 3 miles long to transport it to the landfill in one trip.

According to the EPA's standard conversion factor, one cubic yard of non-compacted commercial/industrial municipal solid waste weighs between 300-600 lbs.[12] Thus, it can be deduced that the amount of waste managed for disposal exclusively by the DOT-A contract is expected to be in the area of 150-300 tons per week, or 7,800-15,600 tons per year depending on the actual weight of the garbage. The calculation results from both the NRDC's average waste per passenger departure method and the EPA's standard MSW conversion method make it reasonable to assume that HNL generates waste in the order of 7,000 tons annually. In Hawaii, waste estimates measured by weight are especially important because tipping fees for trash disposal are based on tonnage. With Oahu's typical landfill and H-Power tipping fees of about $90/ton, 7,000 tons translates to an expenditure of at least $600,000 for waste disposal per year.

Because HNL does not have a centralized waste management system, the DOT-A manages a waste disposal contract that does not provide for all waste generated within the airport complex. While some airport tenants do rely on DOT-A provided bins for disposal, other larger tenants require their own waste disposal contracts and associated bins. Therefore the garbage containers specified in the DOT-A Waste Disposal Contract only represent a portion of the total rubbish generated on HNL grounds.

Further investigation of HNL's waste management system is essential to formulating a more accurate total waste generation baseline that can be used to benchmark later improvement. Interviewing HNL personnel, interviewing contracted waste haulers, conducting a facility walk-through, examining waste records, and performing a series of detailed waste sorts to assess composition are all vital components to setting an accurate baseline. It is important to check the accuracy of the estimated 7,000 tons per year waste generation provided in this report. The estimated 7,000 tons/year of waste generation at HNL serves the purpose for analysis of potential waste reduction benefits.

In comparison, waste generation statistics for other U.S. airports presented in the NRDC report are listed in the table below:

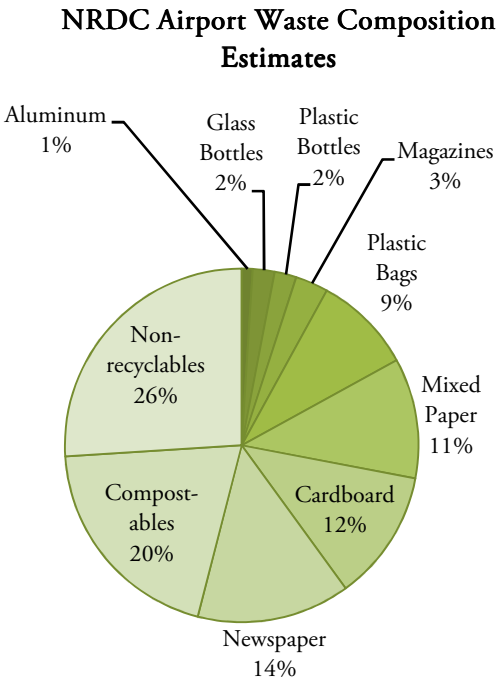
Airport	**Portland International Airport**	**Fort Lauderdale International Airport**	**Seattle Tacoma International Airport**	**Los Angeles International Airport**	***Honolulu International Airport***
Passenger Departures	6.5 million	10 million	14 million	29 million	***10.2 million***
Annual Waste Estimate	2,800 tons.	3,312 tons	5,000 tons	19,000 tons	***7, 000 tons***

[10] Data Retrieved from: http://hawaii.gov/hnl/airport-information
[11] Data Retrieved from: http://hawaii.gov/dbedt/info/economic/databook/db2008/section18.pdf
[12] "Standard Volume-to-Weight Conversion Factors." Data retrieved from: http://www.epa.gov/waste/conserve/tools/recmeas/docs/guide_b.pdf.

HNL has a comparable amount of annual passenger departures to Fort Lauderdale International Airport, however Fort Lauderdale generates about half as much waste. This may be due to the fact that Fort Lauderdale International Airport was one of the first airports to establish a comprehensive airport-wide recycling program fully equipped with an onsite material recovery facility (MRF) in 1989, which is a facility that receives, separates and prepares recyclable materialst.[13]

Waste Composition Estimates Provided by the NRDC*[14]*

As stated by the NRDC's airport waste composition estimates, 1% of airport waste is aluminum, 2% are glass bottles, 2% are plastic bottles, 3% are magazines, 9% are plastics (packaging, bags, etc.), 11% is mixed paper, 12% is cardboard, 14% is newspaper, 20% are compostables, and 26% are non-recyclables.



Waste Composition Extrapolation for HNL

The table below contains data extrapolated from the DOT-A's disposal contract requirements of 52,000 cubic yards per year ("DOT-A (cu/yd)"), the estimated total annual solid waste generation for HNL of 7,000 ('System-Wide (Tons)"), and waste composition percentage estimates provided by the NRDC as noted above ("Materials"). The values in the "Disposal" column illustrate the cost of traditional disposal based on the standard $90/ton H-Power and landfill tipping fees, as well the potential savings that could be realized from diverting these materials out of the waste stream through source reduction and recycling. The "Potential Revenues" column reflects the potential revenues that could be generated from the sale of recyclable materials on top of any disposal cost savings and are extrapolated from sources listed in Appendix D.

Materials	DOT-A (cu yd/yr)	System-Wide (Tons)	Disposal	Potential Revenues
Aluminum	520	70	$6,300	$42,000
Glass Bottles	1,040	140	$12,600	----
Plastic Bottles	1,040	140	$12,600	----
Magazines	1,560	210	$18, 900	$3,990
Plastics	4,680	630	$56,700	----
Mixed Paper	5,720	770	$69,300	$25,410
Cardboard	6,240	840	$75, 600	$100,800
Newspaper	7,280	980	$88,200	$83,790
Compostable	10,400	1,400	$126,000	----
Non-Recyclable	13,520	1,820	$163,800	----
Total:	52,000	7,000	$630,000	$255,990

[13] "Airport Recycling Specialists" Data Retrieve from: http://www.airportrecycling.com/history.html.
[14] "Trash Landings: How Airlines and Airports Can Clean Up Their Recycling Programs" Data retrieved from: http://www.nrdc.org/cities/recycling/airline/airline.pdf.

HNL WASTE ASSESSMENT PROCESS

The HNL Waste Assessment Report is the first step in developing HNL's recycling program. To begin the development process, a Waste Stream Assessment Questionnaire (Appendix B) was distributed to a wide variety of HNL occupants, including airline carriers, maintenance facilities, concessionaires, cargo facilities, in-flight catering, ground handling and administration in order to obtain a well-rounded perspective. The questionnaires were distributed to 48 entities and a total of 29 were returned and completed. Follow up interviews and site visits were conducted to complete the report. The range that this report will cover:

- 21 Airlines, consisting of:
  - 13 Airline Carriers
  - 5 Maintenance Facilities
  - 2 Cargo Facilities
  - 1 In-flight Catering Facility
- 4 Ground Handling Facilities
- 2 Concessionaires
- 2 Administration - Federal Agencies

The Waste Stream Assessment Questionnaire addresses the following areas:

- Facilities Background
- Current Trash Services
- Waste Reduction/Recycling Efforts
- Receptacles and Staging
- Waste Generation
- Airplane Waste Management

The Questionnaire Summary will discuss the overall feedback from the Waste Stream Assessment Questionnaires and begin to evaluate existing conditions, identify current practices and recognize critical areas of improvement.

QUESTIONNAIRE SUMMARY

FACILITIES BACKGROUND

One of the key factors in a successful recycling program is efficient infrastructure. The HNL waste assessment began by first evaluating existing facilities around the airport and investigating what occupants were dealing with. The participants were asked to provide the following information:

- Number of employees
- Number of buildings
- Number of floors
- Occupied square footage
- Number of freight elevators available (if any)
- Describe if their facility had a loading dock
- Describe special needs that may affect recycling

Much of this information was to help contextualize their questionnaire responses. The respondents ranged from one-man offices to companies with multi-building facilities.

The number one necessity that the respondents expressed they would need for recycling is space for staging waste materials. Many have limited space available to sort recyclables in their existing facilities, therefore limiting the types of materials they collect and their recycling efforts. Space limitations are especially an issue for operations such as Maintenance and Ground Handling as they already deal with the collection of larger materials, such as rubber tires and scrap metal. Appendix A shows the maps of all current HNL refuse collection and disposal locations.

CURRENT TRASH CAPACITY

Current trash services were analyzed for the different facilities. The survey asked for the following information:

- Number and size of dumpsters and receptacles for trash, compactors and shredders

This information was used to identify the capacity of existing trash conditions. It was also used to identify existing organizations that are already implementing waste volume reduction equipment, such as trash compactors and paper shredders.

Only 6 out of 29 respondents reported that they make use of trash compactors. Compactors would help with waste collection capacity and address space limitations as seen in Figures 6 and 7. Some trash compactors can reduce waste volume to 15% of its original volume, which can ultimately reduce hauling expenses. Strategic placement of common use compactors could be investigated at HNL in future development. Almost all participants own and utilize shredding machines, primarily in administration spaces. Utilizing paper shredders is reported to reduce bulk solid waste capacity by up to 80%. This aids in recycling and helps protect processing equipment. Examples of equipment can be seen in Figures 8 and 9.

Figure 2. Typical trash bins located throughout ramp areas for use by State custodial staff, air carriers and ground handling companies.

Figure 6. AOA trash bins filled beyond capacity.

Figure 7. AOA trash bins filled beyond capacity.

Figure 8. Example of a concession owned trash compactor on the ramp/apron level which helps manage waste capacity efficiently.

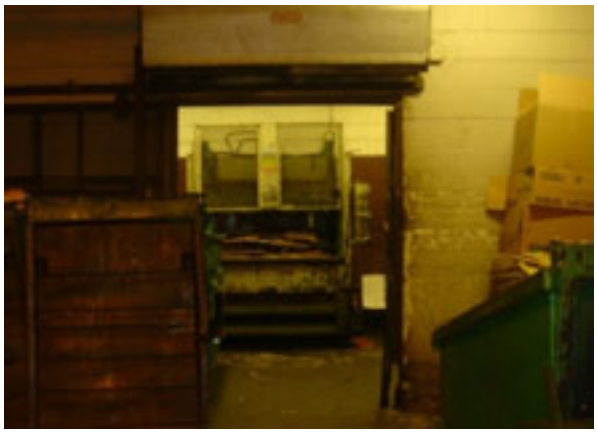


Figure 9. Example of a concession owned cardboard baler which typically compact 20 lbs. of cardboard per cubic foot of baled material.

RECYCLING PROGRAM

There have been many individual recycling efforts throughout HNL. The survey asked:

- Do you have a recycling program? Please describe.
- Has the program been successful? Why?
- What materials do you wish to recycle that you currently are not?

It was important to learn and understand the programs that current occupants of HNL were implementing; determine what is working and what are lessons learned.

Within the different areas of the airport, recycling efforts seem to be split. Approximately 50% of the participants surveyed state they have recycling programs that are proving to be successful. However, there is a diverse range of activities each organization's recycling program entails.

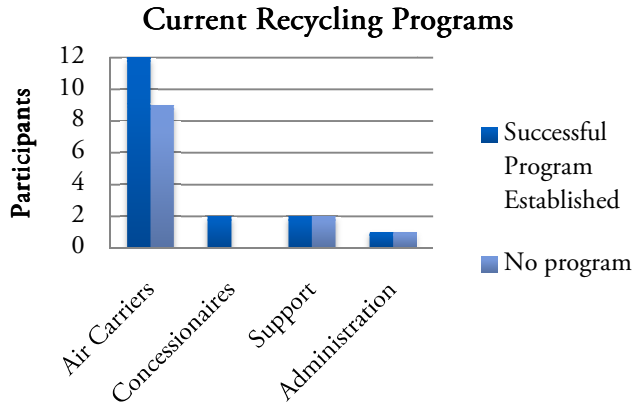
Majority of self-initiated efforts include recycling of HI-5 items such as plastic bottles and aluminum cans, as well as recycling paper. HI-5 redemption values seem to drive these particular efforts; however there is a mixed use of how

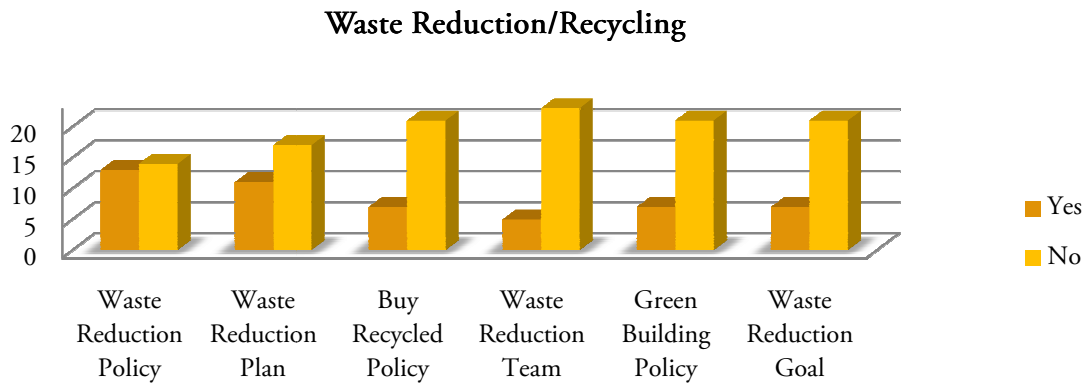
the profits are utilized. Some departments use it for donations to charities, others use it to provide rewards to their employees, and others let the individual employee who transports the materials keep the profits. In current practices, in order for individual departments to keep redemption profits, they need to transport the materials themselves versus utilizing State supplied bins. Currently profits from the State supplied HI-5 recycling bins are typically going to the custodians who collect the waste.

Two items that most organizations seem to be inquiring for recycling infrastructure support are paper and cardboard. There are a couple organizations that contract a third party shredding and recycling company to handle all paper. However, these are typically bigger organizations that produce significant loads of material, whereas the smaller companies have a bigger challenge finding feasible ways to recycle their paper.

Programs for bulky materials such as scrap metal and rubber tires are individually established by departments and have so far been successful in waste reduction, but seem to be increasingly cost prohibitive.

Implemented programs seem to be at various stages of infancy, between one and five years. There are only a handful of programs that have been running for a significant duration of time. Four companies have had recycling programs for over 8 years. All programs that have been implemented thus far are noted by participants as being successful and forecast to continue into the future.





Participants were asked if they had in place any of the plans/policies listed above. Half of them responded that they have both a Waste Reduction Policy and a Waste Reduction Plan; however, some policies and plans are more mature than others.

EMPLOYEE PARTICIPATION

Participants were asked the following questions regarding employee participation:

- Do employees participate in the formulation of waste reduction policies? If yes, are they rewarded?
- Are employees educated about recycling and waste reduction programs? If yes, how so?

Employee participation and understanding is a crucial component of creating a successful waste management program. Engaging employees early help give them a sense of ownership of their actions and they will become the program's most valuable asset. Clear, positive, and continuous communication is essential. Companies should motivate their employees to participate to achieve waste reduction goals.

Approximately half of the respondents said that employees participate in the formulation of waste reduction policies, but of those there was only a small handful that rewarded their employees for doing so.

62% of participants said they educate their employees about recycling and the benefits of waste reduction. These efforts are being made through company events, followed by announcements in newsletters, posters and other paraphernalia. One participant updates employees through paycheck inserts.

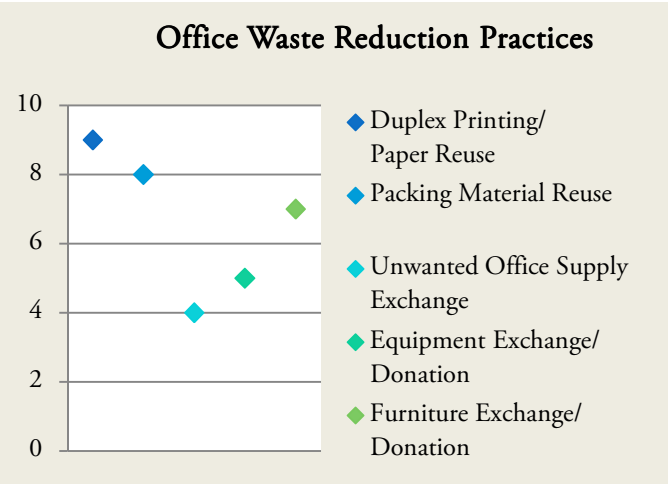
RECYCLING REGULATION

Many times companies use "recycling champions" which identify employees that are enthusiastic about waste reduction. Champions help sell the program to other employees and track results.

The survey inquired if participants with recycling programs had someone who monitors or regulates the collection process. The findings are as follows:

- 3 out of 13 airline carriers
- 0 cargo facilities
- 2 out of 5 maintenance facilities
- 1 out of 1 catering facility
- 1 out of 4 ground handling services
- 1 out of 2 federal agencies
- 1 out of 2 concessionaires

Approximately 31% of participants have a monitoring system in place. Those companies seem to be the ones with stronger waste reduction efforts and more extensive programs. They also seem to be the ones with a higher success rate.



WASTE REDUCTION PRACTICES

It is important to understand what companies are trying to achieve when creating waste reduction programs and practices. The HNL participants were asked the following:

- What is your waste reduction goal?
- Describe any waste reduction practices in which your office participates.
- Are company purchased products made with recycled content?

The majority of respondents have more than one waste reduction goal, but most favored the purpose of "being environmentally responsible", followed by "reducing waste" and "reducing cost" holding equal weight.

The survey found that many companies have in-house waste reduction initiatives being practiced. 66% of all participants say that they have some type of waste reduction practice happening within their offices. Initiatives include duplex printing, reuse of packing materials and exchange/donation of office supplies, equipment and furniture.

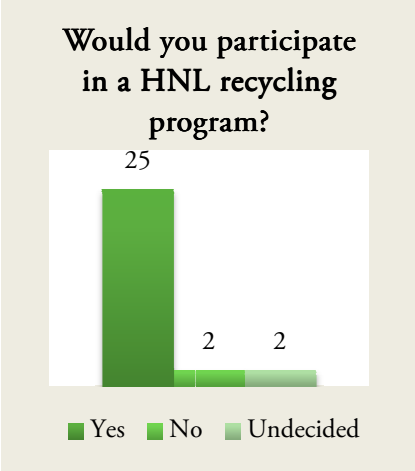
Occupants of HNL should be encouraged to purchase recycled-content products to help support EPA's efforts to ensure that materials collected in recycling programs will be recycled into new products. 52% of survey participants claim to make a conscious effort to purchase products and supplies consisting of recycling content, such as copier paper, envelopes, binders, packaging material, paper for in-flight menus and shopping bags.

FUTURE PARTICIPATION AND INCENTIVES

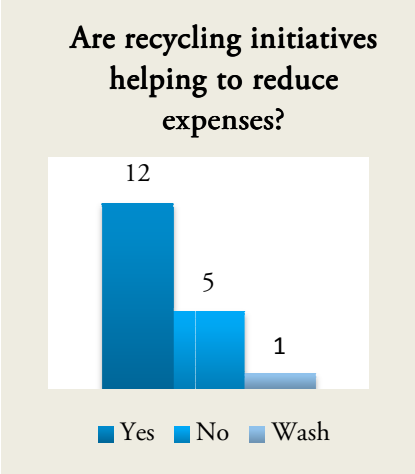
Moving forward the DOT-A would like to do their part in being sustainable. The DOT-A wanted a consensus of how they can support the HNL occupants. In the survey, the following questions were asked:

- If the DOT-A started a recycling program, would you participate? Why or why not?
- Is recycling adding additional cost? Or saving cost?

86% of respondents said that they would participate in an HNL recycling program if established. Two respondents said that they would decline participation because they already have corporate/nationwide recycling programs in place. Two participants said that they would want to review the proposed program before deciding to participate.



When asked if recycling programs were affecting the cost of operations, 11 participants responded positively that recycling has helped reduce expenses by reducing trash hauling fees and purchasing of office supplies. Five participants responded that it was adding cost due to either transporting recycling goods to redemption centers or contracting with a third party recycling company to haul materials. One respondent said that recycling costs are a wash, meaning they are spending money on hauling recyclables but saving money on hauling trash and therefore see no monetary gain.

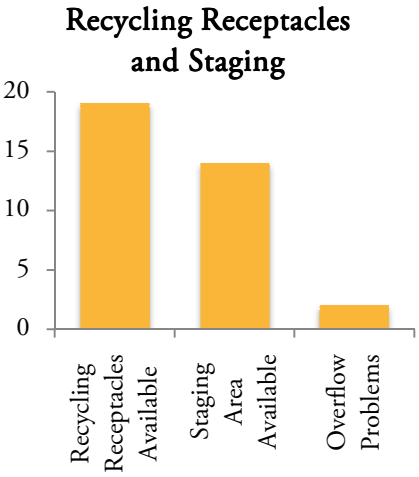


CURRENT RECYCLING CAPACITY

A facility's infrastructure is a key factor in a successful waste reduction program. Analyzing participants' current recycling capacities help establish steps moving forward. The following questions were asked:

- Do you currently have receptacles to collect recyclables? If yes, how are they designated?
- Is there a general staging area for recyclables?
- Are there overflow problems for recycling receptacles?
- Indicate any specific disposal restrictions affecting your facility?

Those participants who have established recycling programs all have clearly marked bins to separate materials, some more extensive than others. Many claim they have a lack of staging areas for their recyclables which prohibits the amount of materials they collect. There were only a couple participants that claim they have waste overflow problems, however the quantity of overflow problems by all occupants is questionable based on observations in certain HNL areas. It is noted that the State does not have any DOT-A provided recycling collection bins for Airport Operations areas and tenants, there is only HI-5 collection for public areas. Currently occupants must find their own means of recycling.



Disposal restrictions listed by participants include typical responses regarding abiding regulations for hazardous waste and international waste. The main obstacle for participants who use State dumpsters and do not want to take their materials to redemption centers themselves, is the lack of State recycling bins. However, the majority of participants who recycle claim not to have this problem, being they are taking their own waste to redemption centers to capitalize on the redemption value. It is important to note that the generalization may not be accurate due to the fact that the responses received are an uneven distribution of occupant types.

CURRENT WASTE GENERATION

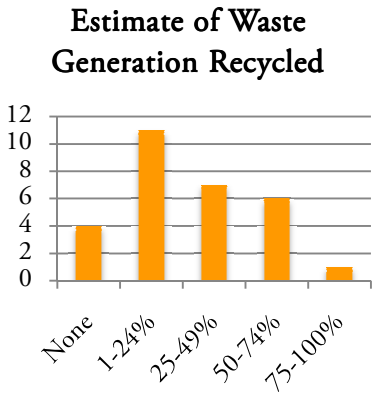
The participants were given a list of materials and were asked to indicate the type of waste they generate, the destination of wastes (whether it is going to trash or being recycled) and the frequency of pick-up. The Waste Generation Summary Table on the following page lists the results of the questionnaire. In addition, the following questions were asked:

- Estimate what percentage of your waste is being recycled.
- Are there seasonal fluctuations in waste generation?

The materials with the highest recycling rate per what is being used are scrap metal and rubber tires, all totaling 100% participation. Materials with the lowest recycling rate are food waste, light bulbs and electrical wiring, all below 40% participation.

The majority average waste generation being recycled by HNL occupants is between 1-24%. Only six participants claim they recycle up to 50-74% and one participant claims 75-100%. Quantifiable data would need to be assessed, but seems there is a great deal of room for improvement. Currently the greatest numbers of participants are making initiatives to recycle paper, followed by aluminum and plastic.

Participants observe minimal seasonal fluctuations. The elimination of this aspect is one less obstacle to overcome when developing the future HNL recycling program and establishing staging areas.



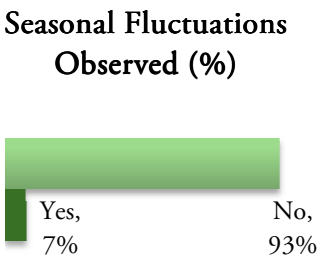


Figure 10. Protocol breached with trash bin lids ajar and trash not allowed to be left on the gate operations areas.

WASTE GENERATION SUMMARY TABLE

LOCATION	Newspaper	Paper	Cardboard	Glass	Aluminum	Scrap Metal	General Plastic	Food Waste	Electronic Waste	Gas/Oil Filters	Motor Oil/Anti-Freeze	Batteries	Light Bulbs	Tires	Wood Pallets	Electrical Wiring	Hazardous Materials and Spent Solvents	Other
AIRLINE CARRIERS																		
Airline Carrier 1																		
Airline Carrier 2																		
Airline Carrier 3																		
Airline Carrier 4																		
Airline Carrier 5																		
Airline Carrier 6																		
Airline Carrier 7																		
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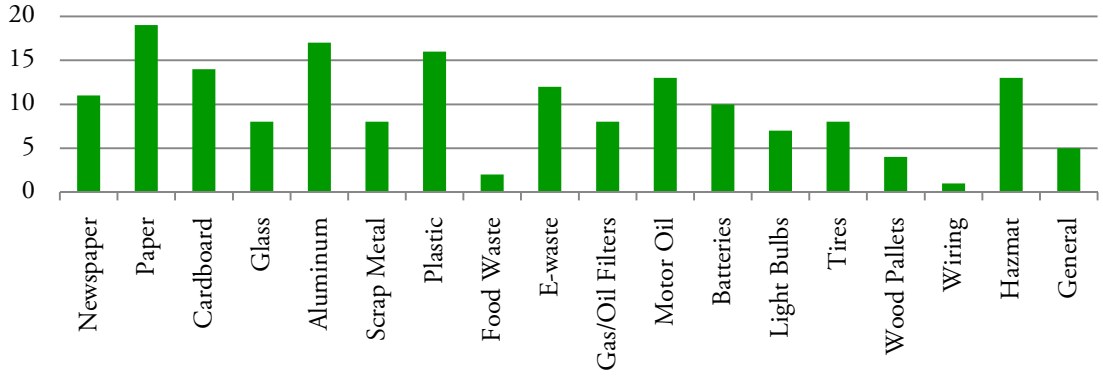
Airline Carrier 12																		
Airline Carrier 13																		
Cargo 1																		
Cargo 2																		
Maintenance 1																		
Maintenance 2																		
Maintenance 3																		
Maintenance 4																		
Maintenance 5																		
Catering 1																		
CONCESSIONAIRES																		
Concessionaire 1																		
Concessionaire 2																		
ADMINISTRATION																		
Federal Agency 1																		
Federal Agency 2																		
GROUND HANDLING																		
Ground Handling 1																		
Ground Handling 2																		
Ground Handling 3																		
Ground Handling 4																		
Ground Handling 5																		
TOTAL																		
Sent to Landfill:	8	10	8	1	3	0	5	13	2	2	1	2	11	0	5	4	0	24
Diverted from Landfill:	11	19	14	8	17	8	16	2	12	8	13	10	7	8	4	1	13	5
Total % Diverted:	**58%**	**66%**	**64%**	**89%**	**85%**	**100%**	**76%**	**13%**	**86%**	**80%**	**93%**	**83%**	**39%**	**100%**	**44%**	**20%**	**100%**	**17%**

NOT APPLICABLE

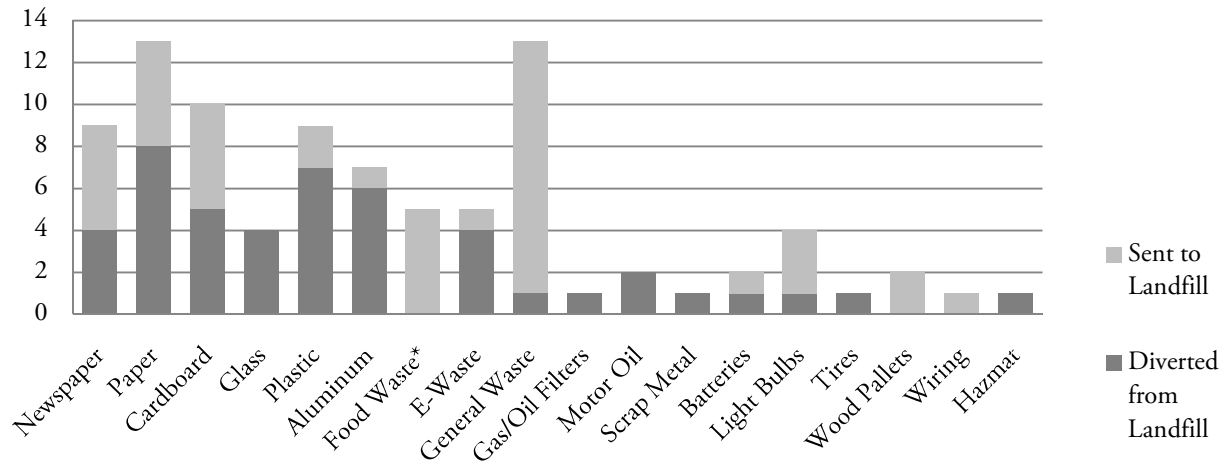
Participants in recycling effort:



AIRLINE ANALYSIS – AIRLINE CARRIER

WASTE TYPE GENERATION

For the purposes of this report, thirteen air carriers were interviewed and analyzed. Air carriers have a wide array of waste type generation, including:

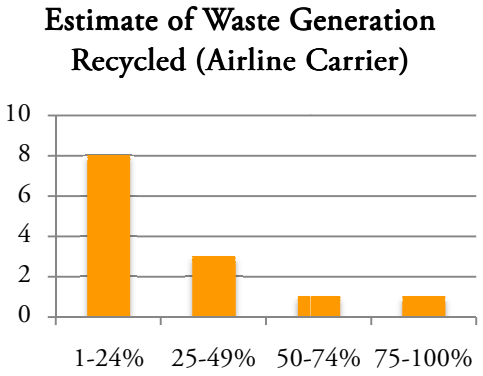


* "Food Waste" does not include international flights. Federal regulations require food waste from in-bound planes to be incinerated.

CURRENT RECYCLING EFFORTS

Airline Carrier Administration Spaces

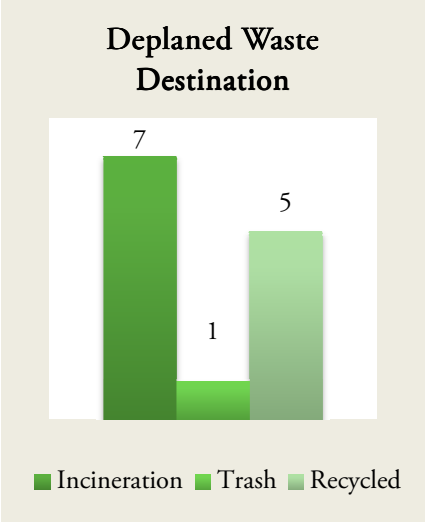
Half of the Air Carriers surveyed are already making an effort to recycle. Two of these companies have recycling programs in place for over eight years, whereas all others are less than five years old. Items that seem to take precedence in their recycling efforts are paper, aluminum and plastic. Approximately 50% of the Air Carriers have had great success in employee participation, all of which state that they have a formal waste reduction policy and plan in place. This success is most likely attributed to company waste reduction policies and education programs. There were only a handful of Air Carriers that stated they have additional efforts in place such as a waste reduction team, green building policy, buy recycled policy and have waste reduction goals. 35% of the Air Carriers surveyed agree that their main waste reduction goal is to be environmentally responsible, followed by a reduction in waste and a reduction in cost.



The majority of the Air Carriers do not have a designated person that monitors their recycling efforts. However, the companies that do have a waste reduction leader or a waste reduction team seem to have greater successes in their waste reduction efforts. There is one airline that has an Environmental Management System in place and monitors their program through a waste generation report.

Air Carriers do not appear to be active in purchasing products with recycled content. Only four of the thirteen Air Carriers responded positively, however the effort seems to be limited to office supplies such as paper and packaging material.

77% of Air Carriers execute some type of waste reduction practice in their daily office routine. These include duplex printing, minimizing amount of hard copy printing, reuse of packing materials, and exchange of unwanted supplies, equipment and furniture. Other practices mentioned are recycling magazines, newspapers and returning used ink cartridges to manufacturers.



46% of Air Carrier respondents say that recycling efforts provide a cost savings, while 23% say that recycling efforts add cost to their operation. 31% did not respond. Savings are seen through a reduction of supply purchasing and trash disposal. Additional costs are resulting from collecting and transporting recycled waste to redemption centers.

In-flight Waste Efforts:

Recycling of deplaned waste depends on whether the flight is domestic or international. International flights must operate in accordance with FDA regulations which require them to incinerate all deplaned waste. On domestic flights, waste is either segregated in flight, sorted on ground or a combination there of. Remaining waste is sent to dumpsters for landfill. In many cases the deplaned waste is handled by the airlines' catering vendors at their facilities. Airline Carriers are assuming recycling efforts are being conducted at the catering facilities. This report is unable to make conclusive observations of these facilities due to the lack of participation and information.

CHALLENGES

The main challenge mentioned by the Air Carriers is finding adequate space for staging areas to store and sort recyclables. Another challenge lies with federal regulations for international flights where the waste materials from the inbound planes are not allowed to be removed for recycling; all waste must be incinerated. Several international carriers have expressed that they would want to participate in more recycling initiatives if it were not for these regulations. The Airline Carriers surveyed claim they do not have any seasonal fluctuations.

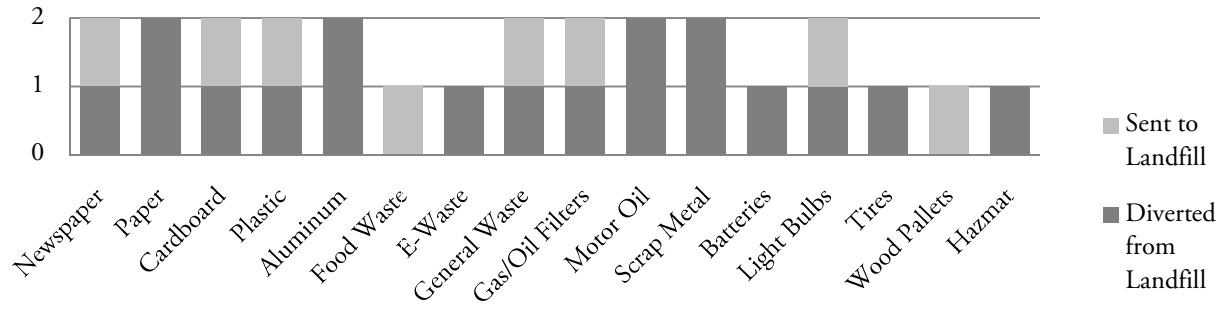
FUTURE DEVELOPMENT

Air Carriers seem to have a lack of recycling support from the State for their administrative areas, especially ones of smaller operations. Many would wish they were able to recycle paper and cardboard boxes through the provision of on-site collection bins, some not even interested in the monetary refund value; they simply want to do the right thing for the environment. Many administrative offices are doing small various efforts and it would be exponential if there were a forum that they could share information, tips and lessons learned with other offices to keep the momentum moving forward. Almost all Air Carriers (11 out of 13) responded that they would be in favor of participating in a future HNL recycling program. As for the future development of deplaned waste, international flights will not likely need help recycling due to federal regulations, where as domestic flights will require more investigation with flight kitchens.

AIRLINE ANALYSIS – CARGO FACILITIES

WASTE TYPE GENERATION

For the purposes of this report, two cargo facilities were interviewed and analyzed. Cargo Facility waste type generation, includes:



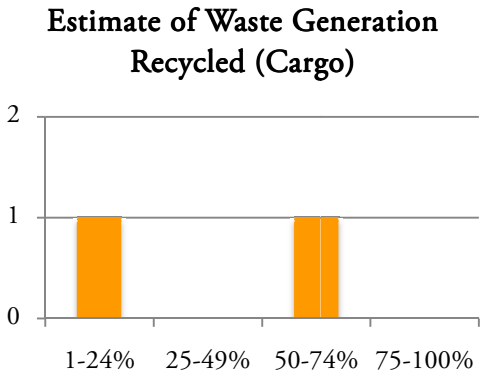
CURRENT RECYCLING EFFORTS

Recycling programs amongst the cargo facilities are a relatively new venture with one program running for about a year and the other with no company backed recycling program in place. Although the existence of a recycling program varies, both facilities find common ground with the implementation of a waste reduction policy. Other efforts that vary between the facilities include a buy recycled policy, waste reduction plan, green building policy and a waste reduction goal.

Both Cargo Facilities state that their main focus is to reduce waste and be environmentally responsible. Currently both companies are successful in recycling paper, aluminum, motor oil and scrap metal. Efforts are varied with all other materials.

The combination of company purchased products made with recycled content and employee education on company recycling/waste reduction programs have contributed to the overall success of waste reduction/recycling with one cargo facility resulting in a recycled rate of 50-74%.

Although the approach to waste reduction/recycling varies amongst the cargo facilities, they have both seen cost savings as a result of their efforts.



In both facilities, Administrative areas use good waste reduction practices such as dual-side printing, ordering recycled ink cartridges for printers and redistributing unused furniture between stations.

Deplaned waste is discarded to ground-level dumpsters in accordance with all corporate, USDA and applicable federal policies. Deplaned waste is minimal for cargo flights being there are no passengers to transport, with the exception of the Captain and First Officer.

CHALLENGES

Based on the survey, cargo facilities do not have waste streams of special concern or disposal restrictions making the continued operation or implementation of reduction/recycling programs easy to establish and/or maintain. However, one cargo facility claims to have seasonal fluctuations which may affect proper sizing of potential recycling staging areas. Space limitation for storage of collected recycled materials is also a major concern for one of the cargo facilities. The remedy of this situation will need to be a high priority if there is a desire for the expansion and success of a future recycling program.

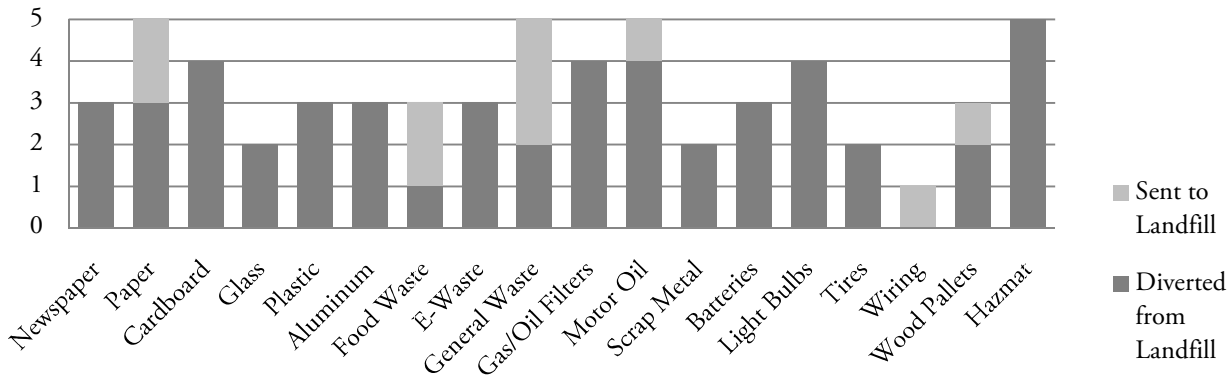
FUTURE DEVELOPMENT

The positive result of cost savings amongst the airline cargo facilities from the waste reduction and recycling efforts have opened the door for possible expansion and implementation of additional programs. Both Cargo Facilities say that they would participate in an HNL recycling program if established.

AIRLINE ANALYSIS – MAINTENANCE FACILITIES

WASTE TYPE GENERATION

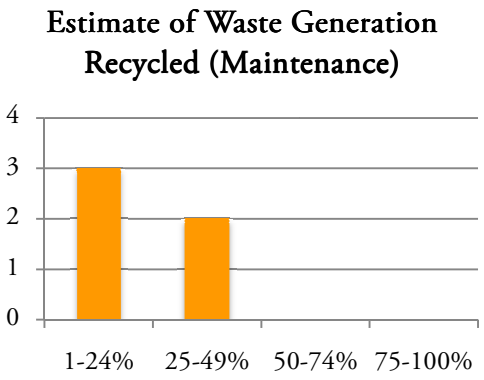
For the purposes of this report, five maintenance companies were interviewed and analyzed. Maintenance companies have a wide array of waste type generation, including:



CURRENT RECYCLING EFFORTS

Maintenance facilities at HNL are perhaps the most consistent in their recycling efforts with regard to the different waste materials, however the quantity of general waste seems to overpower the total output. Three of five of the maintenance facilities implemented a recycling program. Two of those facilities have attributed a success of cost savings to the education and participation of employees. The rewards of a successful program have gone beyond a personal benefit to employees; one company donating their redemption fees to various community charities per employees request. Two of the three recycling programs have a designated group to manage waste reduction practices, which helped to construct the programs.

Common plans of action for waste reduction for the three maintenance facilities include a waste reduction goal. Other techniques include the development of a waste reduction policy and plan, waste reduction team, green building policy, and a buy recycled policy. Amongst the group, 60% are using waste reduction practices including duplex printing, re-use of packing materials, exchange of unwanted supplies, equipment and furniture and the recycling of aircraft parts including oxygen masks and various switches. 80% of maintenance facilities are also making a conscious effort to purchase paper, envelopes and binders made with recycled content.



CHALLENGES

The duration of which the three waste reduction programs have been in place vary from two to five to ten years. Challenges associated with maintaining a properly functioning recycling program include space limitations and accessibility. For example, only two out of five maintenance facilities says they have a dedicated staging area for recyclables. With such a vast amount of waste it is in the best interest of the maintenance companies to implement reduction practices. All maintenance facilities claim to not have any seasonal fluctuations but a few have materials of special concern, in example refrigerators, AC units and hazardous materials.

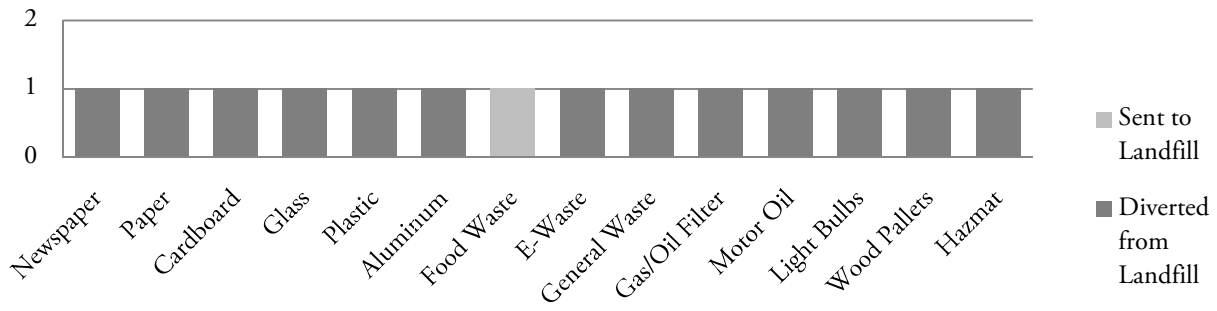
FUTURE DEVELOPMENT

Four of five maintenance facilities state that they will participate in a future HNL recycling program. One company stated that they would decline participation due to already having a corporate nationwide recycling program that they are committed to.

AIRLINE ANALYSIS – CATERING FACILITIES

WASTE TYPE GENERATION

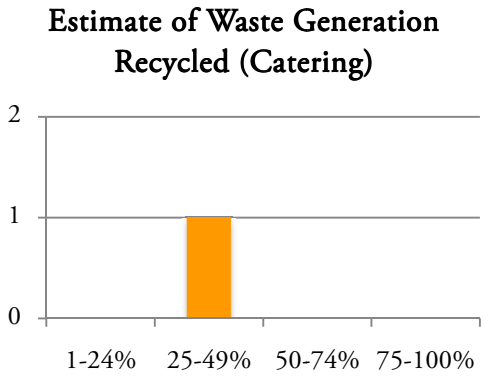
Due to limited participation, only one catering facility was interviewed and analyzed. The catering facility's waste type generation, included:

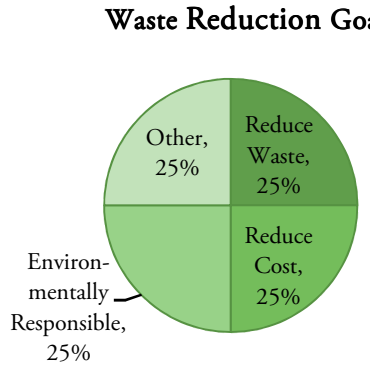


CURRENT RECYCLING EFFORTS

This catering facility has implemented a long-term recycling program for over 10 years. Their comprehensive approach involves collecting and sorting various recyclable material including aluminum, plastics, newspapers and magazines in individual clearly-labeled receptacles. Management has made every effort to educate and encourage employee participation in their waste reduction programs which encompass a waste reduction policy, waste reduction plan, green building policy and waste reduction goal. However, they do not implement a buy recycled policy or have a waste reduction team in place.

The recycling program covers deplaned waste, office areas, kitchen processing and maintenance and the catering has a contracted recycling service provider. Waste reduction practices include duplex printing, recycling ink ribbons, and utilizing recycled paper. Company purchased products with recycled content include on-board menus that are printed with recycled paper. The catering facility also takes advantage of a compactor and several shredders. Recycling efforts at the facility translate to a cost savings as trash hauling frequency is decreased.





Deplaned waste is managed in accordance with all corporate, USDA and applicable Federal policies. The handling process of recycled waste for domestic flights includes an in-flight crew segregation of newspaper, magazines &

aluminum, followed by transportation to the kitchen and placement of the items into designated recyclable receptacles.

CHALLENGES

Challenges in maintaining an efficient recycling program for the catering facility lie in space limitation issues: Storage of all collected and segregated recycled materials and provision of a proper staging area apart from the truck yard is something that will need to be addressed and resolved. There are no seasonal fluctuations of waste generation or waste streams of special concerns.

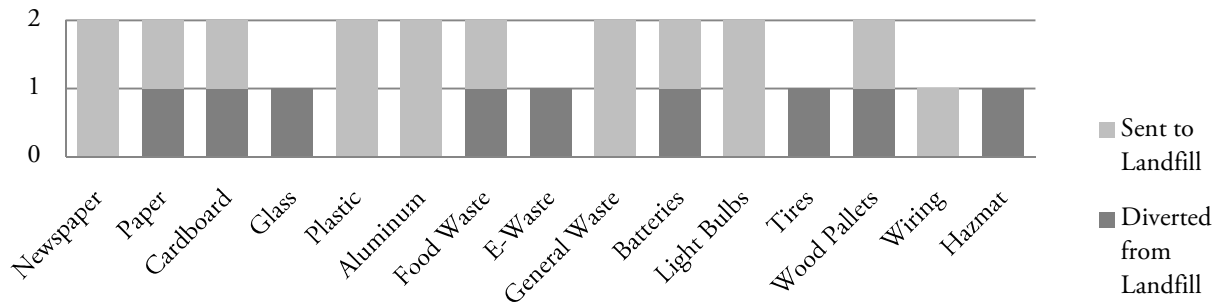
FUTURE DEVELOPMENT

The catering facility exhibits a high success rate in the implementation of waste reduction programs. They state that they would participate in a future HNL recycling program. More investigation of other catering facilities would be needed to make an appropriate assessment. However, the particular respondent has set great examples for other catering facilities to follow.

CONCESSIONAIRE ANALYSIS

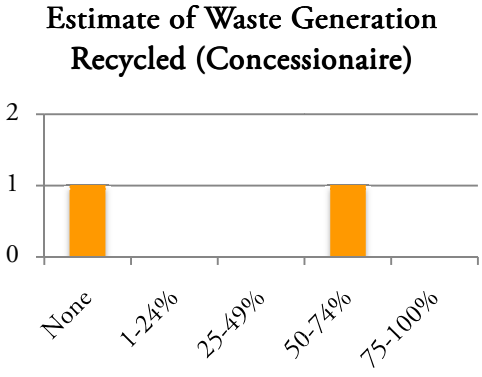
WASTE TYPE GENERATION

For the purposes of this report, two concessionaires were interviewed and analyzed. Concessionaires have a wide array of waste type generation, including:



CURRENT RECYCLING EFFORTS

Many concessions are already making an effort to recycle. The two concessionaires that were surveyed both have recycling programs implemented, although all efforts are not being carried through to fruition due to the lack of infrastructure support at HNL. The two concessionaires are facing very different challenges. One concessionaire, a larger entity, focuses on recycling glass and cardboard and has done so for the last nine years. This particular concessionaire is making use of their on-site cardboard baler, trash compactors and has access to an off-site staging area. However, they mention because of their limited space on-site, they are unable to collect a larger variety of waste types such as plastic bottles, aluminum and newspapers. They also contract a paper shredding and recycling company to dispose of the paper waste. The other concessionaire's circumstance is drastically different. The smaller entity makes the conscious effort to sort paper, cardboard, plastic bottles, aluminum cans and general waste. This concessionaire takes the initiative to recycle aluminum and plastic at local redemption centers. However, the other materials do not have such a positive fate. The materials are taken to the State provided dumpsters where they are all typically recombined with regular rubbish, being there are no receptacles provided.



Only one concessionaire claims they have had great success in participation and effort by employees in a waste reduction policy and plan, a waste reduction team and a waste reduction goal.

Concessionaires' reasons for their waste reduction goal seem to be evenly split between wanting to reduce waste, reduce cost and simply be environmentally friendly. Both concessionaires seem to be active in purchasing products with recycled content where possible, in example purchasing eco-friendly shopping bags in place of the previously purchased PVC type. Office practices include duplex printing, reuse of paper and packaging, and exchange of unwanted supplies, equipment and furniture.

The larger concessionaire that is currently recycling is seeing waste reduction costs as a wash. They are spending additional fees for labor to collect, stage and deliver the recycled materials, but have less general waste in trash receptacles which saves them disposal fees. The smaller concessionaire is unable to assess cost impact due to the challenges within their program.

CHALLENGES

As aforementioned, the two common challenges among concessionaires are space limitations and lack of HNL infrastructure. Space limitations impede recycling staging areas and limit the growth of recycling initiatives. Lack of infrastructure at HNL prevents initiatives to be carried through and does not show an overall support of sustainable practices by the State as the overall guiding body.

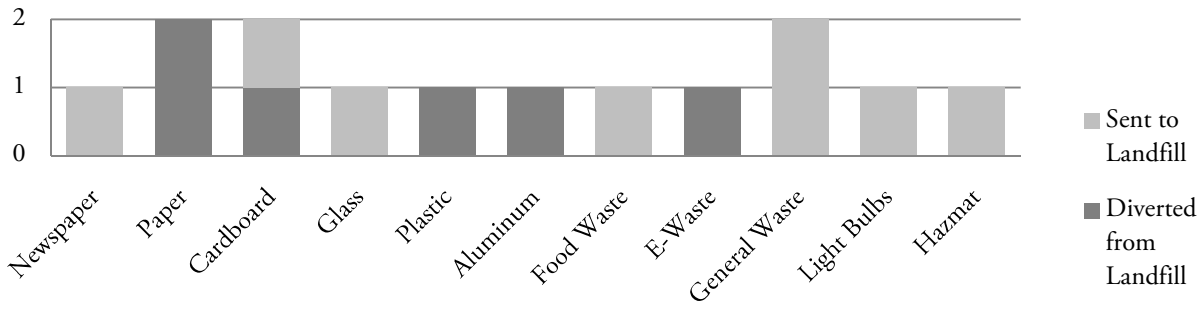
FUTURE DEVELOPMENT

Due to the lack of participation in this survey, it is unknown what many of the other concessionaires are practicing, in example retail concessionaires. Proper investigation will need to be done to investigate all concessionaire types moving forward. However, the two concessionaire respondents seem to be doing their part in waste reduction practices. If HNL can meet them half way in helping to strategize staging areas and provide proper infrastructure of recycled waste collection, their programs can see a greater success rate. Both concessions seem very willing and anxious to participate in a HNL recycling program.

ADMINISTRATION ANALYSIS

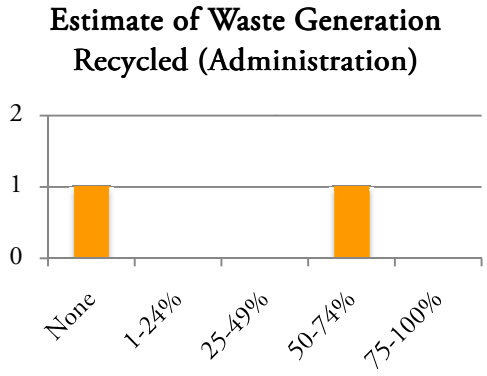
WASTE TYPE GENERATION

For the purposes of this report, two federal agencies were interviewed and analyzed. Federal Agencies' waste type generation includes:



CURRENT RECYCLING EFFORTS

There are different views and efforts among federal agencies within HNL in regards to recycling. Among the two agencies surveyed, one agency has no waste reduction program, while the other has had a very successful program in place for approximately seven years. The proactive agency currently focuses on aluminum cans, plastic water bottles, telephone books and paper, and would eventually like to include cardboard in their waste collection. They currently utilize proceeds from recycling aluminum cans and plastic water bottles towards employee rewards such as stocking soft drinks. Collection of bottles and cans are located in break areas. These efforts are coordinated and guided by an in-house committee. However, the agency claims they have no formal waste reduction policy or plan. Their main goal for waste reduction seems to focus mainly on being environmentally friendly rather than a reduction of waste or cost. The other federal agency has not yet set a goal.



Both Federal Agencies have a "Buy Recycled Policy" in place (compliance with EO 13101) and purchase copy paper with recycled content.

Office practices include offering surplus computer and office furniture to other federal agencies, schools and organizations and returning used ink cartridges to the manufacturers. One federal agency also contracts out shredding and recycling of office paper, and has designated bins around the office for all paper to be collected.

The federal agency that has a recycling program says that they are incurring costs to transport the aluminum cans and plastic water bottles to recycling redemption centers as well as contracting with a shredding/recycling company

for the paper. They do not mention how this compares to a reduction of hauling fees for general trash, if any. However, the real benefit is seen by employees who are rewarded for their efforts, which regardless of cost or waste reduction is environmentally responsible and beneficial.

CHALLENGES

Challenges for federal agencies include space limitations for staging areas and accessibility due to federal regulations. The agencies do not see seasonal fluctuations or have materials of special concern.

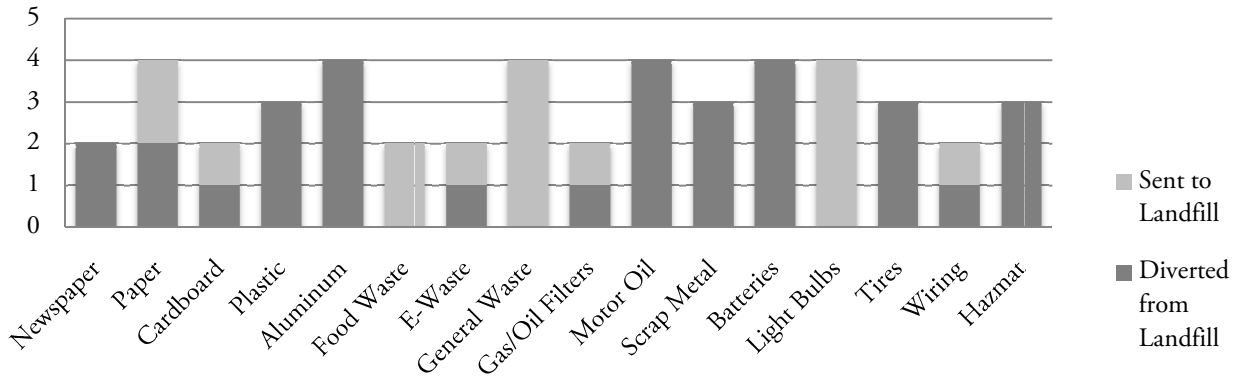
FUTURE DEVELOPMENT

Both federal agencies responded that they would want to participate in an HNL recycling program; however one agency stated they will still want to collect their own cans and bottles to claim the HI5 redemption value. This may be a concern for several tenants who are practicing similar techniques. These efforts should be respected and acknowledged in the future HNL recycling program.

GROUND HANDLING ANALYSIS

WASTE TYPE GENERATION

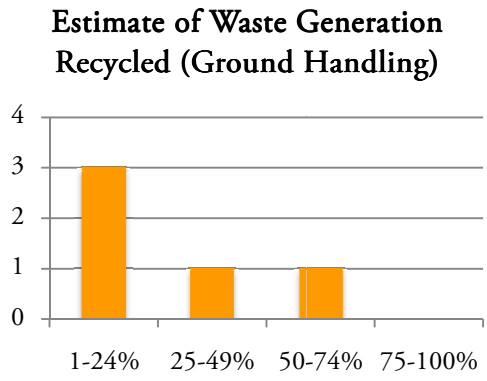
For the purposes of this report, five ground handling companies were interviewed and analyzed. Ground handling waste type generation comprises of:

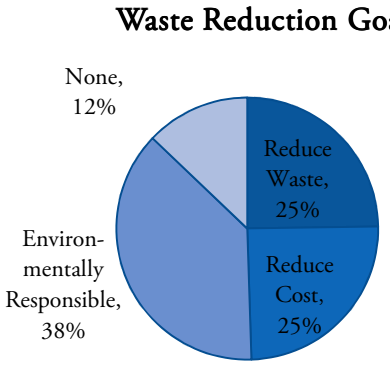


CURRENT RECYCLING EFFORTS

Three out of five ground handling companies that were analyzed in this survey have recycling programs. The recycling programs are fairly new (within the past three years) and seem successful thus far. However, one company has been initiating recycling certain maintenance items for the past 10 years. Ground handling companies seem to have the most ease recycling aluminum, motor oil, batteries and tires. All three companies with programs recycle scrap metal using a local metal recycling business. Space limitations occasionally become an issue for staging scrap metal due to the size of the materials. All companies seem to be making small efforts where possible and feasible. Most ground handling companies participate in the collection of HI-5 items. Some companies additionally engage in bi-monthly programs to discard solvents and oils. Although there are many waste reduction efforts happening among the companies, majority of them do not have formal waste reduction plans and policies. The main waste reduction goal of ground handling companies is to be environmentally friendly, followed by a reduction of waste disposal and waste disposal cost.

Two companies have designated person/persons who help regulate and monitor the waste collection process and recycling program.





The majority of ground handling companies use various techniques to educate their employees about company recycling/waste reduction programs: two companies commonly use newsletters, while others utilize company events and paycheck inserts.

Companies are making some efforts to reduce waste in their administrative areas, although more can always be done. One company practices duplex printing, reuses packing material, printing cartridges are sent back to the manufacturers, donates unwanted supplies and purchases paper with recycled content.

Some of the smaller initiatives such as paper, aluminum cans and plastic bottle recycling by ground handling companies are showing successful reduction of cost. However most of the larger recycling efforts, such as rubber tires, waste oils and solvents, are adding to expenses.

CHALLENGES

The common challenge seems to be the limitation of space for staging areas. This has caused some ground handling companies to limit what they can recycle, even though many wish they could do more. Additionally, one ground company claims they struggle with pest control in staging areas.

Some ground handling companies would like to recycle more but due to Hawaii's lack of infrastructure, cost starts to become an obstacle. In example, Oahu only has one vendor who will take used rubber tires and charge a high fee for their services.

FUTURE DEVELOPMENT

Ground handling companies seem to be progressive in disposing and recycling non-traditional materials. However, in moving forward, opportunities to coordinate maintenance recycling efforts should be investigated to seek potential strategies to overcome the lack of infrastructure at HNL and within the State of Hawaii. A coordinated staging area is also something that should be investigated as the HNL recycling program moves forward. All ground handling companies that were surveyed are willing to participate in a future HNL recycling program.

CONCLUSION

Enhanced recycling is a fundamental first step towards the greening of HNL. Planning for improved recycling engages the community and brings airport stakeholders together around the common goal of sustainability. Because recycling programs are highly visible, they showcase a commitment to environmental stewardship while providing an excellent opportunity for employee and public education. With the aviation industry push to adopt sustainability goals, airports will increasingly improve recordkeeping of baseline information in order to benchmark future success. This report marks the beginning of the benchmarking process to improve solid waste management at HNL. The report outlines the basic anatomy of the airport's waste management system, provides valuable qualitative information regarding the nature of waste generation at HNL, identifies potential areas for future waste diversion and estimates that HNL produces about 7,000 tons of municipal solid waste annually.

While this assessment provides some insight into the volume of annual waste generation at HNL, the actual tonnage is still uncertain. The 7,000-ton airport-wide estimate is based on two assumptions; that the DOT-A's waste disposal contract reflects the majority of HNL's total waste production and that each departing passenger produces an average of 1.28 pounds of waste. However, HNL's real waste production rate per passenger departure may differ from the NRDC's 1.28 national survey average. Moreover, because HNL does not have a fully centralized waste management system, the DOT-A waste disposal contract does not account for all waste generated within the airport complex. Some airport tenants rely on DOT-A provided bins, while other larger tenants require their own contracts. This initial assessment serves the purpose of analysis for potential waste reduction benefits, but it is important to check the accuracy of the 7,000-ton estimate in order to establish a more precise baseline.

Though more detailed investigation of HNL's waste management system is essential, it is clear that a formal, coordinated program can improve current recycling rates. One half of survey respondents indicated that they have successful recycling programs. However, definitions of recycling success may vary and consistent recycling procedures throughout the airport complex would undoubtedly increase solid waste stream diversion. In addition, those respondents that currently are recycling represent only one third of airport. In other words, there is a great deal of room for improvement because 60% of the airport is likely not recycling. The report also indicates that wood pallets, food waste, light bulbs, and electrical wiring have low recycling rates, illustrating a need to coordinate airport-wide recycling infrastructure for these materials.

Moving forward, each tenant and facility type has special needs to consider. For example, they all share a common concern for the lack of staging and sorting areas for recyclables. Nevertheless, the airlines, concessionaires, administration and ground handling facilities all welcome the support of an HNL recycling program and infrastructure, especially to make recycling easier in small administrative areas. In fact, 86% of survey respondents indicated that they are eager to participate in an airport-wide recycling program if established. These survey respondents represent 11/13 airlines, 4/5 maintenance facilities, all cargo, catering, concessionaires, administration, and ground handling facilities.

While many airport tenants are enthusiastic about participating in a coordinated HNL recycling program, special considerations for each facility must be considered in the design of such a program. In particular, considerations for the airlines include proper handling of deplaned waste from international flights with regard to federal regulations, monitoring of recycling programs, and shared recycling tactics within their respective administrative areas. Considerations for cargo facilities include seasonal fluctuations of waste generation and the proper sizing of potential staging areas. Maintenance facilities must consider proper handling of hazardous materials, while catering facilities must consider food waste disposal from domestic flights. Ground handling facilities cited the need for assistance in finding avenues of recycling of non-typical materials, as well as special considerations for pest control. And finally, the airlines, maintenance facilities, and administrative offices all mentioned a desire to retain the ability for employees to recoup the benefits of HI-5 redemption for beverage containers.

The next step for improving HNL's waste management system is to continue evaluation of the existing conditions via the following activities:

- Airport facility walk-throughs
- Interviews with airport facility managers and other personnel
- Interviews with contracted waste-haulers
- Examination of waste hauling records
- Examination of paper purchasing records
- Performance of detailed waste audits

Each of the steps mentioned above are necessary to identify any opportunities for waste reduction and collection efficiency. Interviews, facility tours, and records examination are all vital components to establishing an accurate annual waste generation baseline. For example, San Francisco International Airport verified by their waste generation baseline via an extensive facility walk-through in which they by surveyed their waste management system compactor-by-compactor. In addition to confirming the total waste generation, it is also essential to confirm actual waste stream composition.

Evaluation of waste stream composition reveals the anticipated volume of waste reduction and diversion opportunities. In example, understanding the amount of food waste or paper in a particular waste stream informs later recycling program design decisions such as the size, quantity, placement, and type of collection bins. Waste stream evaluation is typically achieved through performing a series of detailed waste audits via hand-sorting of rubbish samples into specific categories such as recyclables, paper, food waste, etc. Denver International Airport (DIA) and Portland International Airport (PDX) are two examples of airports that have conducted a series of waste audits in this manner. In particular, PDX solicited the support of university students to help perform their audit and analysis. Through this partnership, PDX transformed the waste audit experience into a platform for education and workforce development, thereby enriching the connection between airport and community.

Once baseline information such as total airport-wide waste generation, waste stream composition, and current recycling rates are captured, the information must be incorporated into a solid waste-reporting scheme. For example, EPA's WasteWise program is a voluntary waste reduction reporting program that is utilized by Portland International Airport and Los Angeles International Airport. Program participants submit baseline information upon registration and report yearly on progress. WasteWise Partners are given access to free resources and can use the program as a platform to share information among other Partners and recognize success[15]. Whether done internally or published externally, it is important to establish a system of metrics for recordkeeping, benchmarking progress, and sharing results.

Next steps such as confirming a waste generation baseline, assessing waste stream composition, developing a reporting scheme, and using this information to analyze enhanced waste reduction and recycling activities should ultimately be supported by a formal policy, goals, and an HNL Waste Management Team. Establishing a formal waste management policy and declaring goals will provide formal context for the aforementioned activities, while an HNL Waste Management Team can guide the development process and empower recommendations. Members of an HNL Waste Management Team could consist of representatives from across the airport that already actively participate in various recycling operations.

As the aviation industry is embracing sustainability, recycling and waste management programs are emerging as a top priority. A goal of the Airport's Council International North America (ACI-NA) is that all member airports should strive to have a basic recycling program in place by 2011 and that half of airports will have more extensive recycling programs by 2014. This waste assessment report indicates that some recycling activities are currently taking place in HNL, however these efforts are far from the well-coordinated programs that the visiting public and kama'aina community are increasingly expecting to see. As a member of the ACI-NA, a pronounced public facility, and the international gateway of the Pacific, it is the responsibility of the DOT-A to investigate, develop and advance a robust recycling program at the Honolulu International Airport.

[15] Please see http://www.epa.gov/waste/partnerships/wastewise/index.htm for more information on the EPA's Waste Wise Program.

DEFINITIONS

Aluminum is a non-ferrous metal that is not magnetic. This category includes any food or beverage container made of aluminum such as soda or beer cans, aluminum window siding, aluminum window frames, and aluminum foil.

Batteries are any type of battery including both dry cell and lead acid. Examples include car, flashlight, small appliance, and watch and hearing aid batteries.

Cardboard usually has three layers. The center wavy layer is sandwiched between the two outer layers. It does not have any wax coating on the inside or outside. Examples include entire cardboard containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces of boxes and cartons. This type does not include chipboard boxes such as cereal and tissue boxes.

Electrical Wiring refers to insulated conductors used to carry electricity, and associated devices.

E-Waste refers to electronics that are computer-related or portable non-computer related with large circuitry. Examples include processors, mice, keyboards, laptops, disk drives, printers, modems, fax machines, personal digital assistants (PDA), cell phones, phone systems, phone answering machines, electronic toys, portable CD players, camcorders, digital cameras, televisions, computer monitors, and other items containing a cathode ray tube (CRT).

Food Waste is any food material resulting from the processing, storage, preparation, cooking, handling, or consumption of food. This type includes material from industrial, commercial, or residential sources. Examples include discarded meat scraps, dairy products, egg shells, fruit or vegetable peels, and other food items.

Gas/Oil Filters are used in motor vehicles and other engines, which contain a residue of used gas/oil.

Glass includes glass bottles and containers whole or broken with or without Hawaii Redemption Value (HI-5) label. Examples include soda/beer/wine bottles, mayonnaise/peanut butter jars. Also included in this definition is glass that is clear or tinted and flat. Examples include window panes, doors and table tops, safety glass, etc.

Hazardous Materials and Spent Solvents are hazardous material that cannot be put in any other type. This type also includes hazardous material that is mixed. Examples include hazardous waste which if improperly put in the solid waste stream may present handling problems or other hazards, such as pesticides, caustic cleaners.

Light bulbs are composed mostly of glass combined with other materials. Examples include incandescent, light-emitting diodes (LEDs), etc.

Motor Oil/Anti-Freeze refers to containers with fluids used in vehicles or engines. Examples include spent lubricating oil such as crankcase and transmission oil, gear oil, hydraulic oil and anti-freeze.

Other includes items that cannot be categorized by any other type.

Plastic are clear or colored plastic items including containers and plastic items that are made to last for more than one use. These items may bear the numbers 1 through 7 in the triangular recycling symbol. Examples include mop buckets, dishes, cups, cutlery, housings for electronics such as computers, televisions and stereos, fan blades, impact-resistant cases such as tool boxes and first aid boxes, plastic pipes and fittings, soft drink and water bottles/jugs, some liquor bottles, cooking oil containers, aspirin bottles, and clamshell-shaped fast food containers.

Newspaper refers to the paper used in newspapers. Examples include all items made from newsprint, such as free advertising guides, and tax instruction booklets.

Paper refers to bond, rag, or stationery paper that may be brown (unbleached), white (bleached), or colored and used for computer printouts or stationery. Examples include computer paper, colored photocopy and letter paper, paper grocery bags, fast food bags, and department store bags.

Scrap Metal refers to the leftover metal from every manner of product consumption that has a monetary value. Examples include copper, steel, etc.

Tires refer to vehicle tires. Examples include tires from trucks, automobiles, motorcycles, heavy equipment, and bicycles.

Wood pallets are lumber processed wood for packaging

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"United States Recycling Statistics." Data retrieved from: http://greenliving.lovetoknow.com/United_States_Recycling_Statistics

APPENDIX A

HNL REFUSE COLLECTION AND DISPOSAL

HNL Refuse Collection and Disposal

Building/ Area Gate	Location	Bin #	Map Reference
302*	Lei stands/Ewa end	1	A
302*	Lei stands/Diamond Head end	2	A
304*	Commuter Terminal/Mauka end	3	A
310*	Inter-Island Terminal Building/Mauka Transportation Park	4	A
310	Inter-Island Terminal/Gate 56/Baggage breakdown area/Makai end	5	A
314	Inter-Island Terminal/Makai Pier/inside/between Gates 53 & 54	6	A
341	Diamond Head Extension/Basement/Mauka wall/center (NW)	7	B
341	Diamond Head Extension/Basement/Mauka-Ewa corner (CO)	8	B
341	Diamond Head Extension/Basement/Makai chute	9	B
341*	Diamond Head Extension/Ground level/Loading dock	10	C
341	Diamond Head Extension/Ground level/Baggage makeup G1	11	C
341	Diamond Head Extension/Ground level/Baggage makeup H1	12	C
341	Diamond Head Extension/Ramp/Gate 14 elevator	28	C
342	Main Terminal/Ground level/Baggage Makeup “F” Diamond head Wall Mauka	13	D
342	Main Terminal/Ground level/Baggage Makeup “E”	14	D
342	Main Terminal/Ground level/Baggage Makeup “F”	15	C
342	Main Terminal/Ground level/Employee Cafeteria	16	C
342	Main Terminal/Ground level/Facility Maintenance	17	C
342	Main Terminal/Ground level/Tower Administration Bldg./Separate recycle collection bin (orange top) for office generated paper products only.	18	C
344	Ewa Extension/Group level/Baggage Makeup “D”/Mauka Diamond Head wall	19	D
344	Ewa Extension/Group level/Baggage Makeup “D”/Ewa-Makai wall	20	D
344	Ewa Extension/Under Gate 24	21	D
344	Ewa Extension/International Arrivals Building/basement/Diamond Head wall	23	B
344	Ewa Extension/International Arrivals Building/basement/Makai chute	24	B
346	Ewa Extension/International Arrivals Building/basement/Central chute	25	B
346	Ewa Extension/International Arrivals Building/basement/Ewa chute	26	B

Building/ Area Gate	Location	Bin #	Map Reference
346	Ewa Extension/International Arrivals Building/basement/Mauka-Ewa chute	27	B
350	Central Concourse/Gate 14/ramp	29	E
350	Central Concourse/Gate 16/ramp	30	E
350	Central Concourse/Gate 18/ramp	31	E
350	Central Concourse/Gate 22/wall	32	E
352*	IAB/Ground level/Between Customs and Ewa Service Court Road	33	F
355*	Overseas Parking Structure/Ground level/center	34	G
360	Ewa Concourse/Gate 26/ramp	35	H
360*	Ewa Concourse/Gate 26/Room 101 chute	36	F
360	Ewa Concourse/Gate 27/ramp	37	H
360*	Ewa Concourse/Gate 27/Room 109 chute	38	F
360	Ewa Concourse/Gate 29/ramp	39	H
360	Ewa Concourse/Gate 29/Room 118 chute	40	F
360	Ewa Concourse/Gate 31/Restroom Holding room chute	41	F
360	Ewa Concourse/Gate 34/ramp	57	F
360	Ewa Concourse/Gate 33/ramp	60	H
360	Ewa Concourse/2nd level/Vehicle Turn Around	61	H
363	Diamond Extension/Gate 12/ramp	22	C
373	Diamond Concourse/Gate 6/Triturator	59	J
373	Diamond Concourse/Gate 7/ramp	44	I
373	Diamond Concourse/Gate 9/ramp	45	I
373	Diamond Concourse/Gate 10/ramp	46	I
373	Diamond Concourse/Gate 10/Room 145 chute	47	J
373	Diamond Concourse/Gate 11/ramp	48	I
373	Diamond Concourse/2nd level/Vehicle Turn Around	42	I
Elliott Street*	Park Lot N	49	K
South Ramp	T-Hangers/East end of Bldg. #420	50	L

Building/ Area Gate	Location	Bin #	Map Reference
South Ramp	T-Hangers/East end of Bldg. #421	51	L
South Ramp	T-Hangers/East end of Bldg. #422	52	L
South Ramp	T-Hangers/Makai of tie-down 423-187A	53	L
500	Airport Base Yard	54	M
Wash Rack	Ewa of Taxiway Lima/Makai of the Aloha Cargo Ramp	55	N
ARFF #1	Crash-Fire Station/Ewa of Taxiway Lima/Behind Mauka-end of station	56	N
ARFF #2	Crash-Fire Station/Ewa of Taxiway Lima/Behind Mauka-end of station	58	L
ARFF #2	Crash-Fire Station/Reef Runway/Makai side	43	L

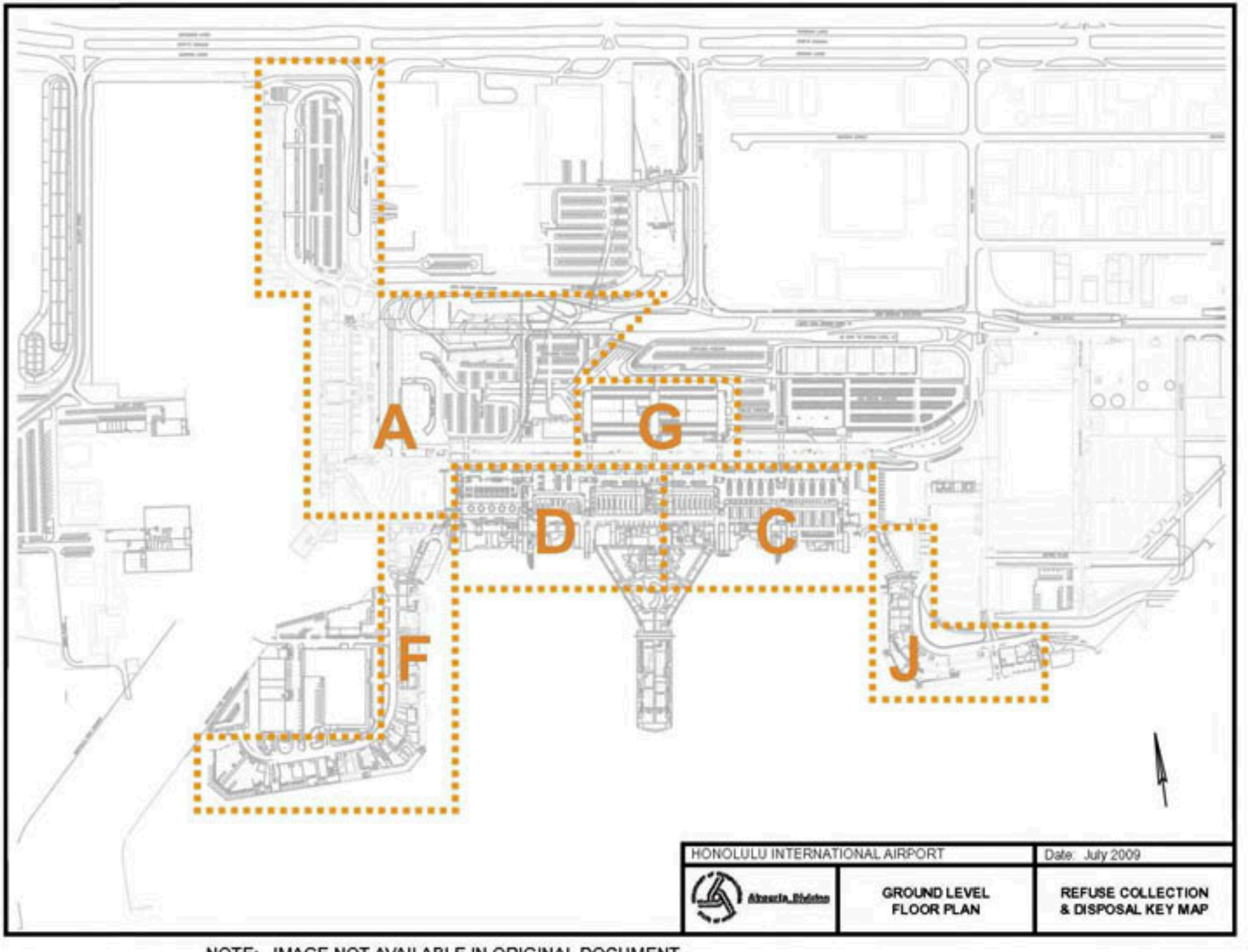
*denotes “non-AOA” access

Additional Large Refuse/Waste

1. Airport Maintenance Baseyard – Aolele Street
2. South Ramp Cargo

HONOLULU INTERNATIONAL AIRPORT		Date: July 2009
Airports Division	SITE PLAN	REFUSE COLLECTION & DISPOSAL KEY MAP

NOTE: IMAGE NOT AVAILABLE IN ORIGINAL DOCUMENT



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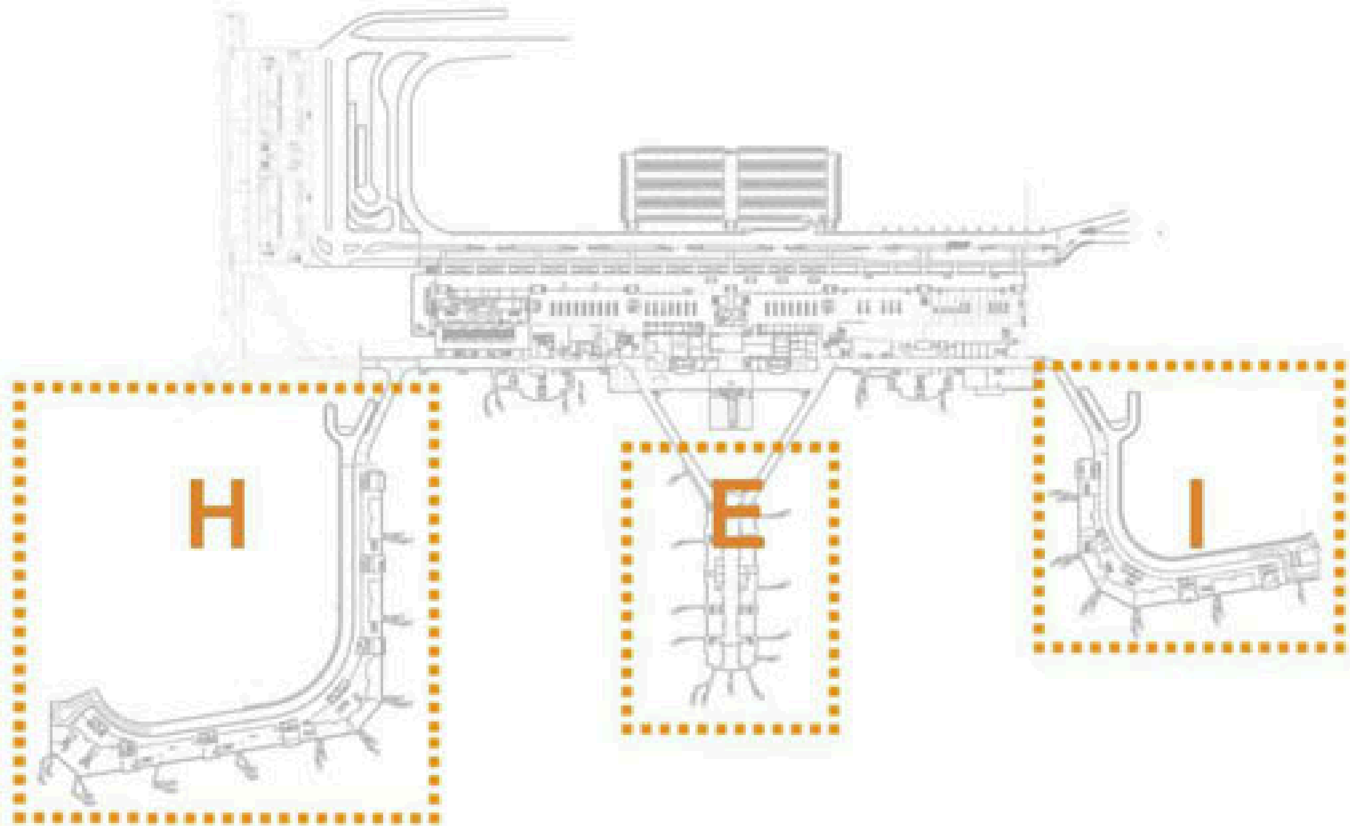
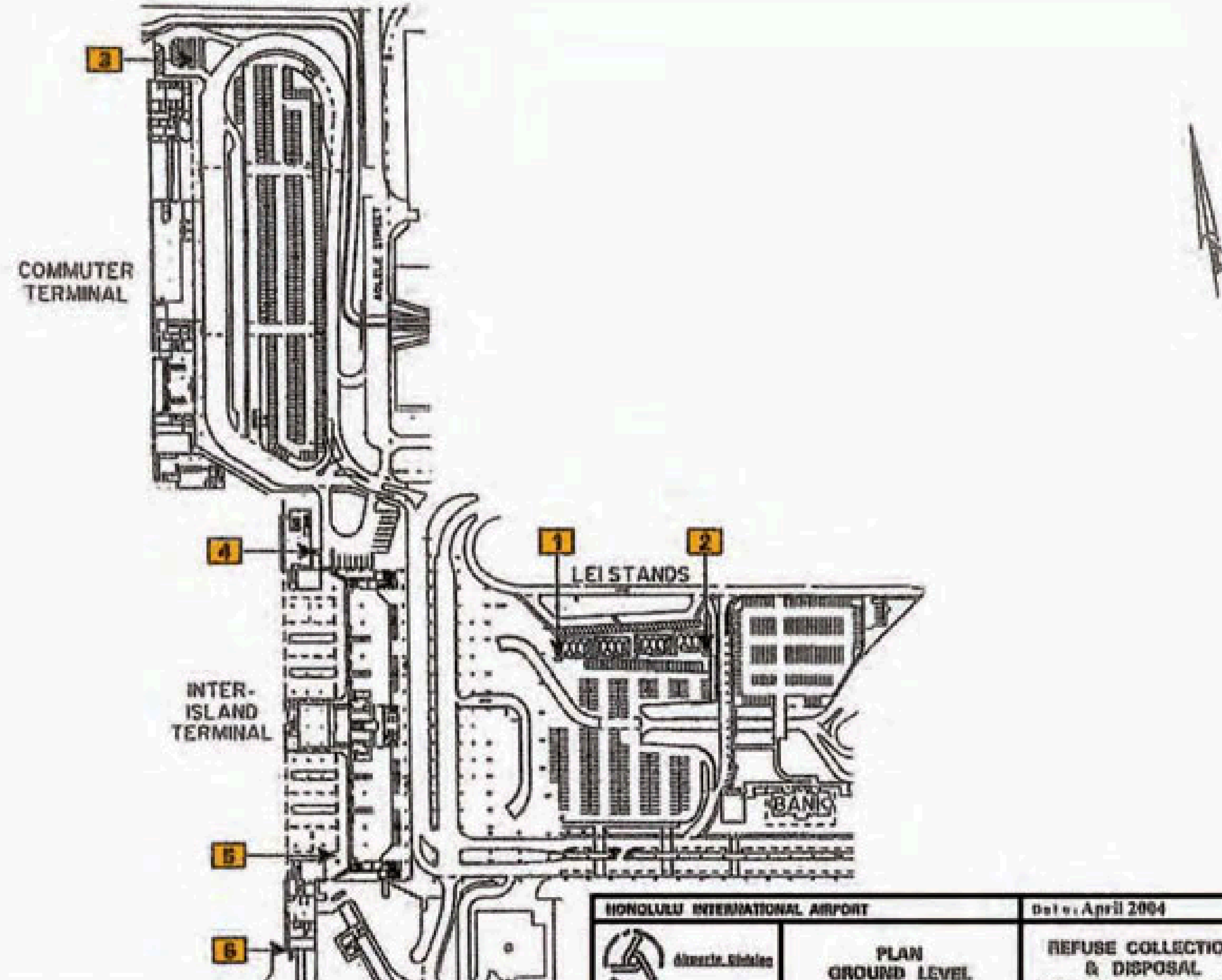


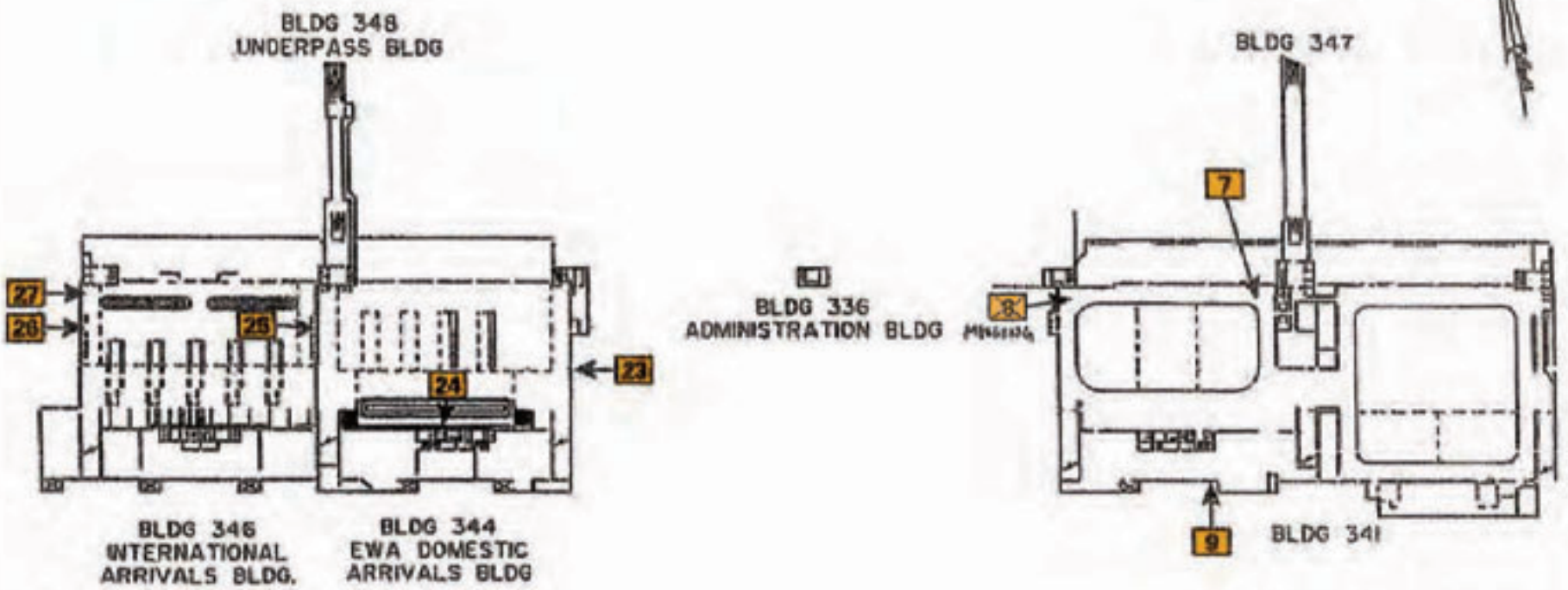
HONOLULU INTERNATIONAL AIRPORT		Date: July 2009
Airports Division	SECOND LEVEL FLOOR PLAN	REFUSE COLLECTION & DISPOSAL KEY MAP

NOTE: IMAGE NOT AVAILABLE IN ORIGINAL DOCUMENT



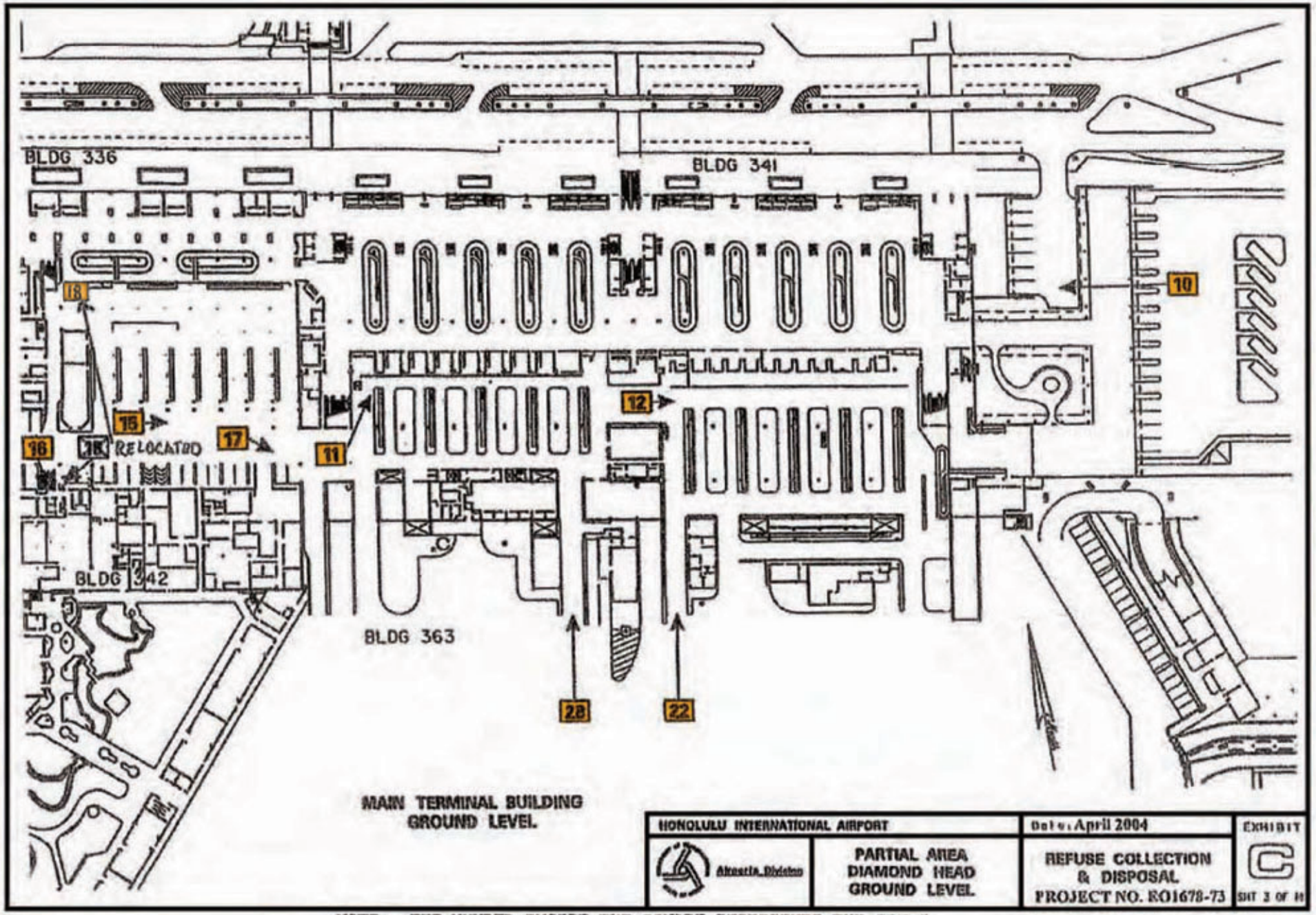
HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
Airports Division	PLAN GROUND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	A

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
	PLAN MAIN TERMINAL BASEMENT	REFUSE COLLECTION & DISPOSAL PROJECT NO. RO1678-73	B SHT 2 OF 11

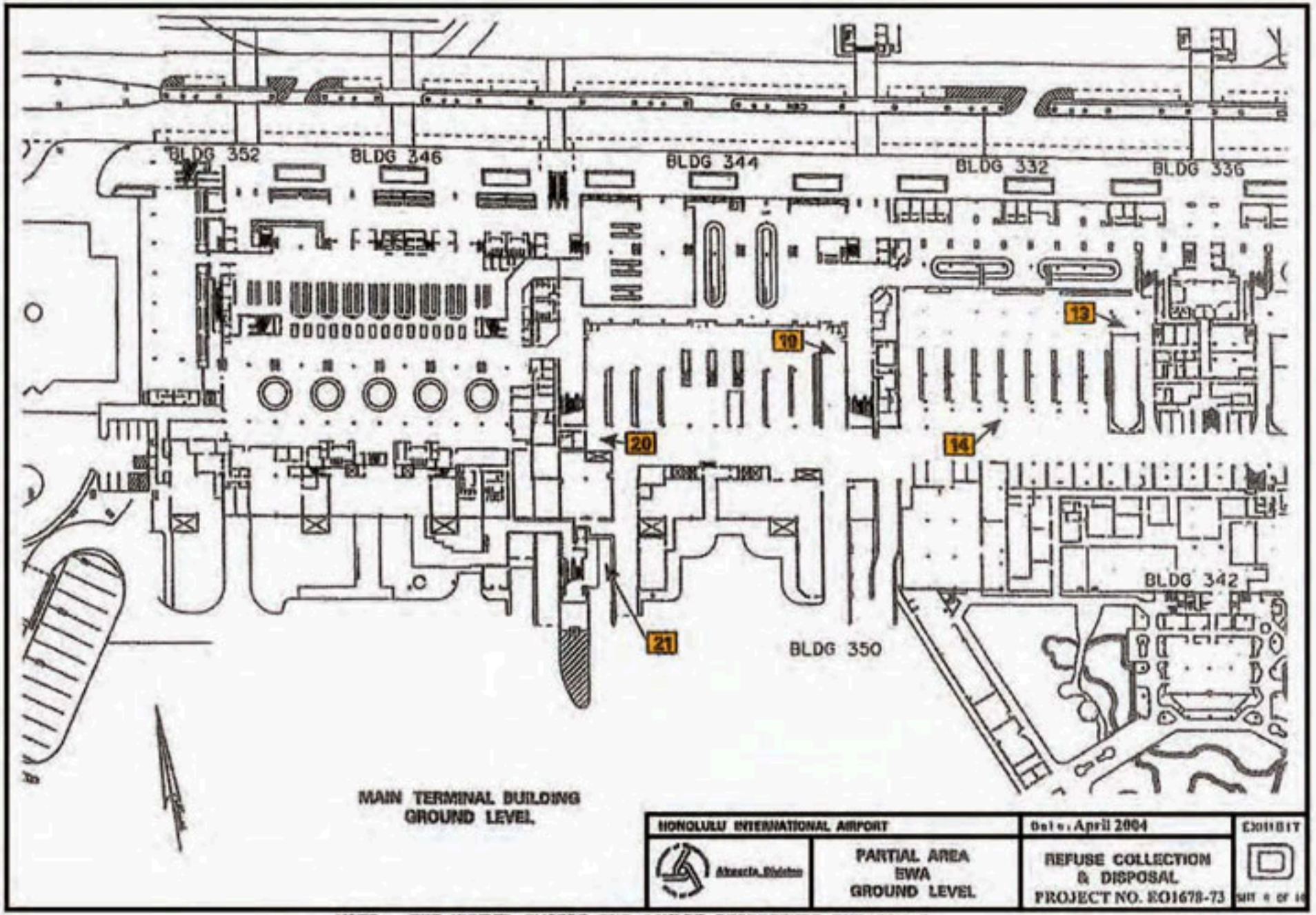
NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



MAIN TERMINAL BUILDING
GROUND LEVEL

HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT C
Aloastia Division	PARTIAL AREA DIAMOND HEAD GROUND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. RO1678-73	SHT 3 OF 11

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



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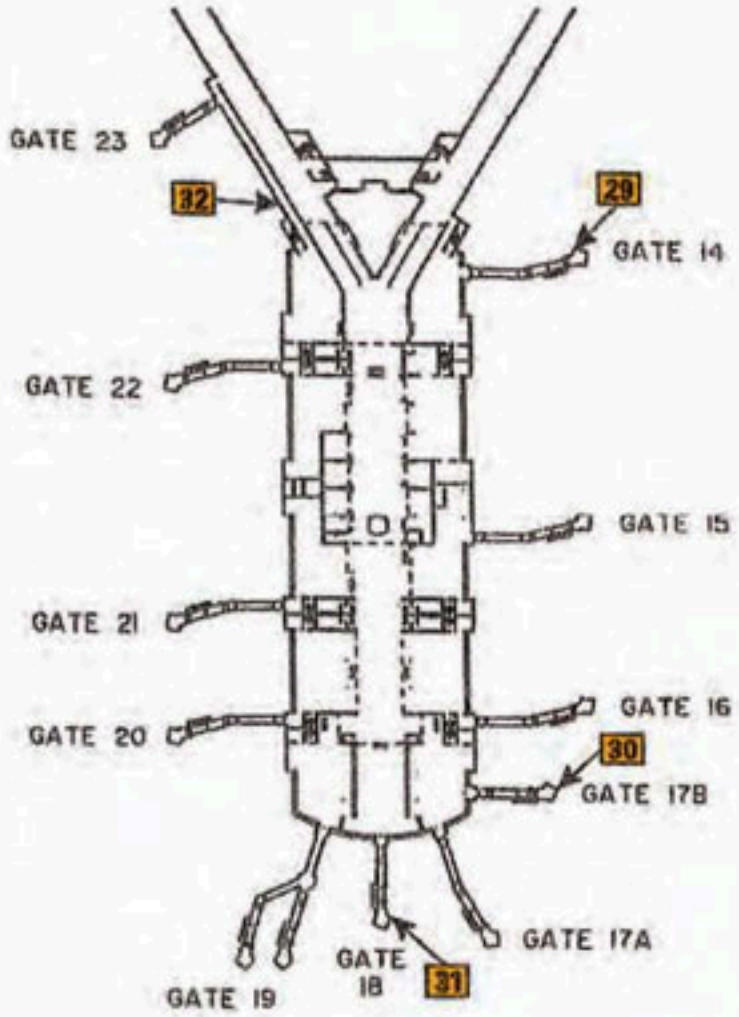
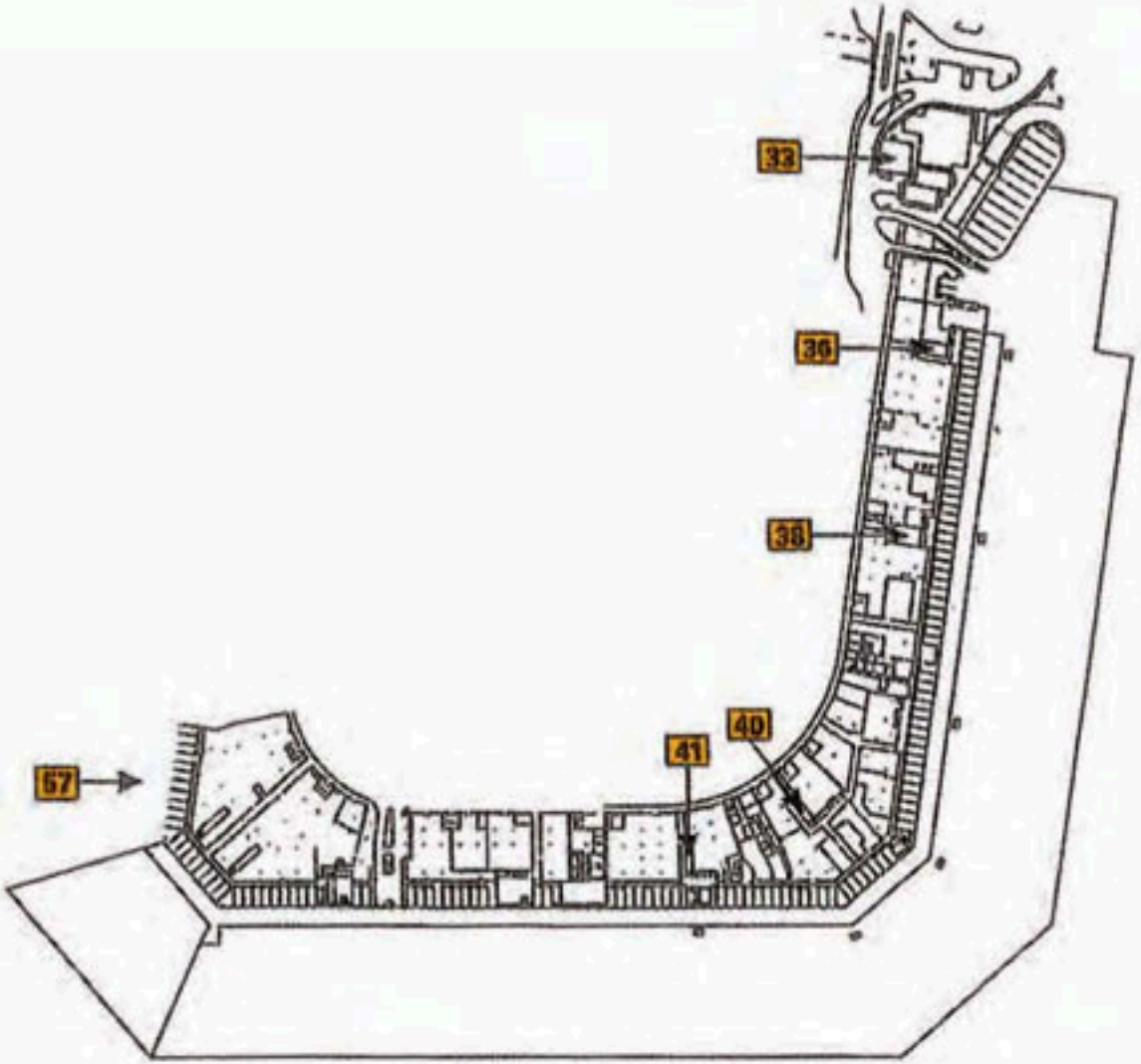


BLDG 350
CENTRAL CONCOURSE

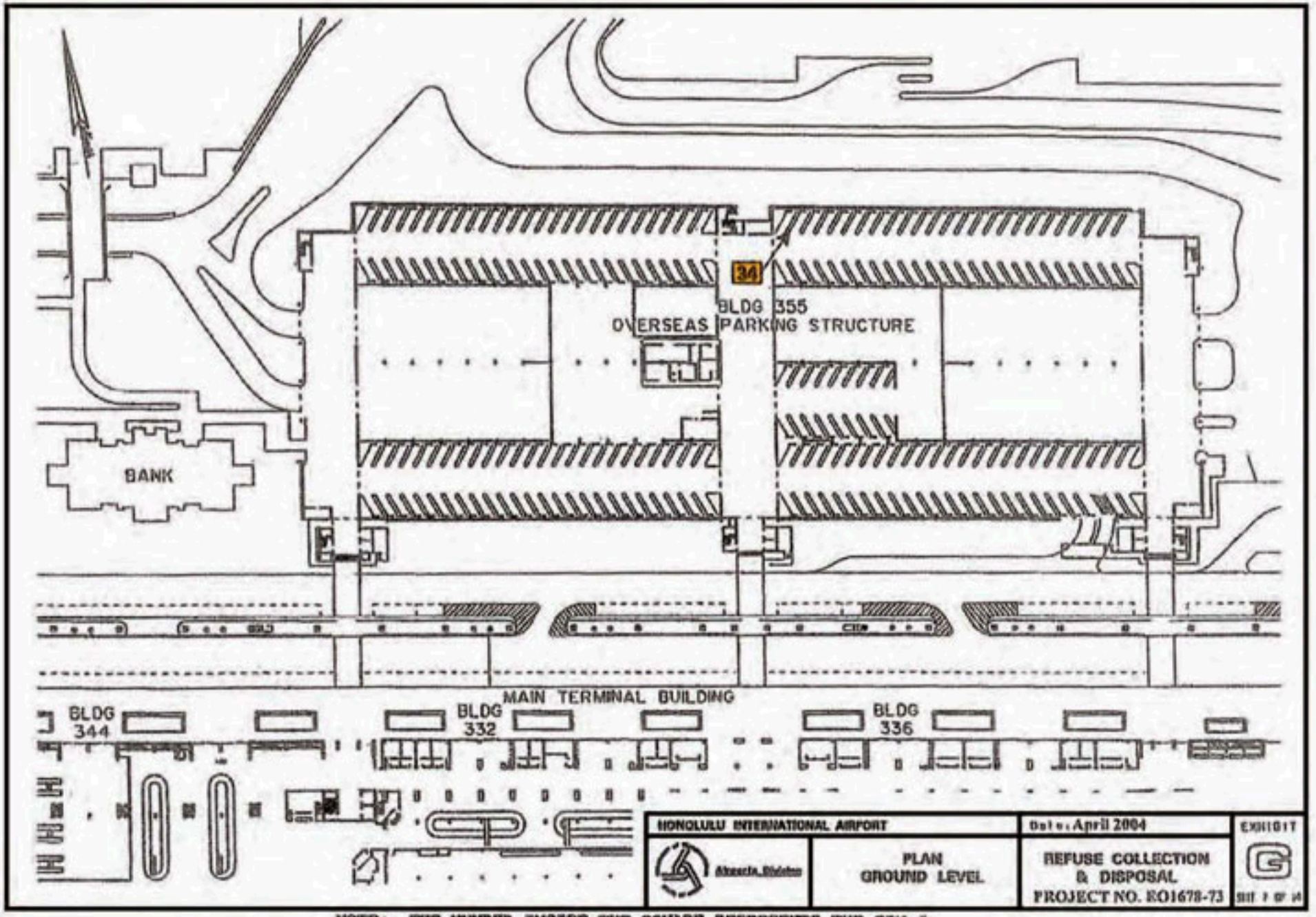
HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
Aloecia Division	PLAN CENTRAL CONCOURSE SECOND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	E SHT 3 OF 14

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.

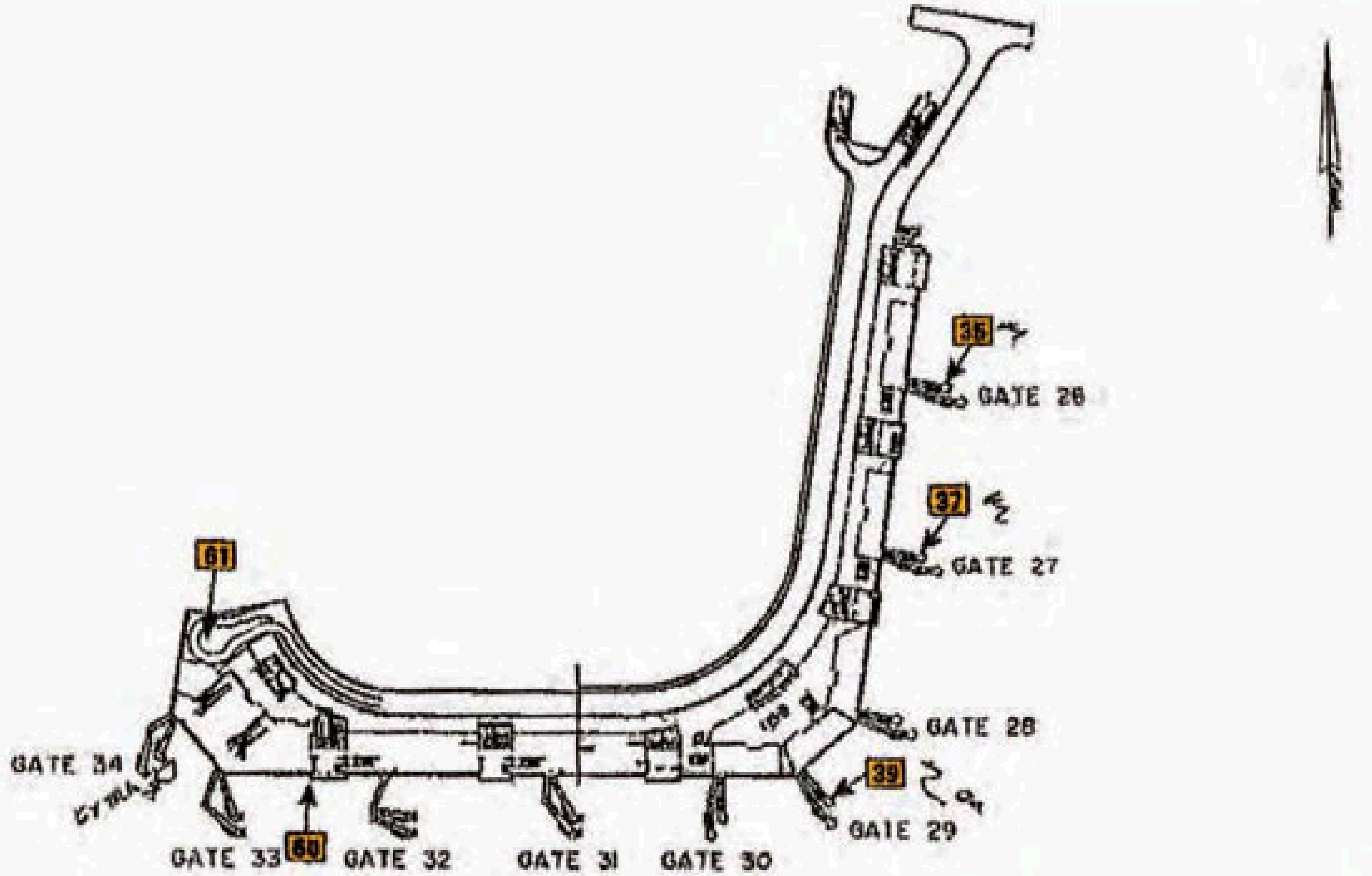


HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT F
Airports Division	PLAN EWA CONCOURSE GROUND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	SHT. 6 OF 11

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



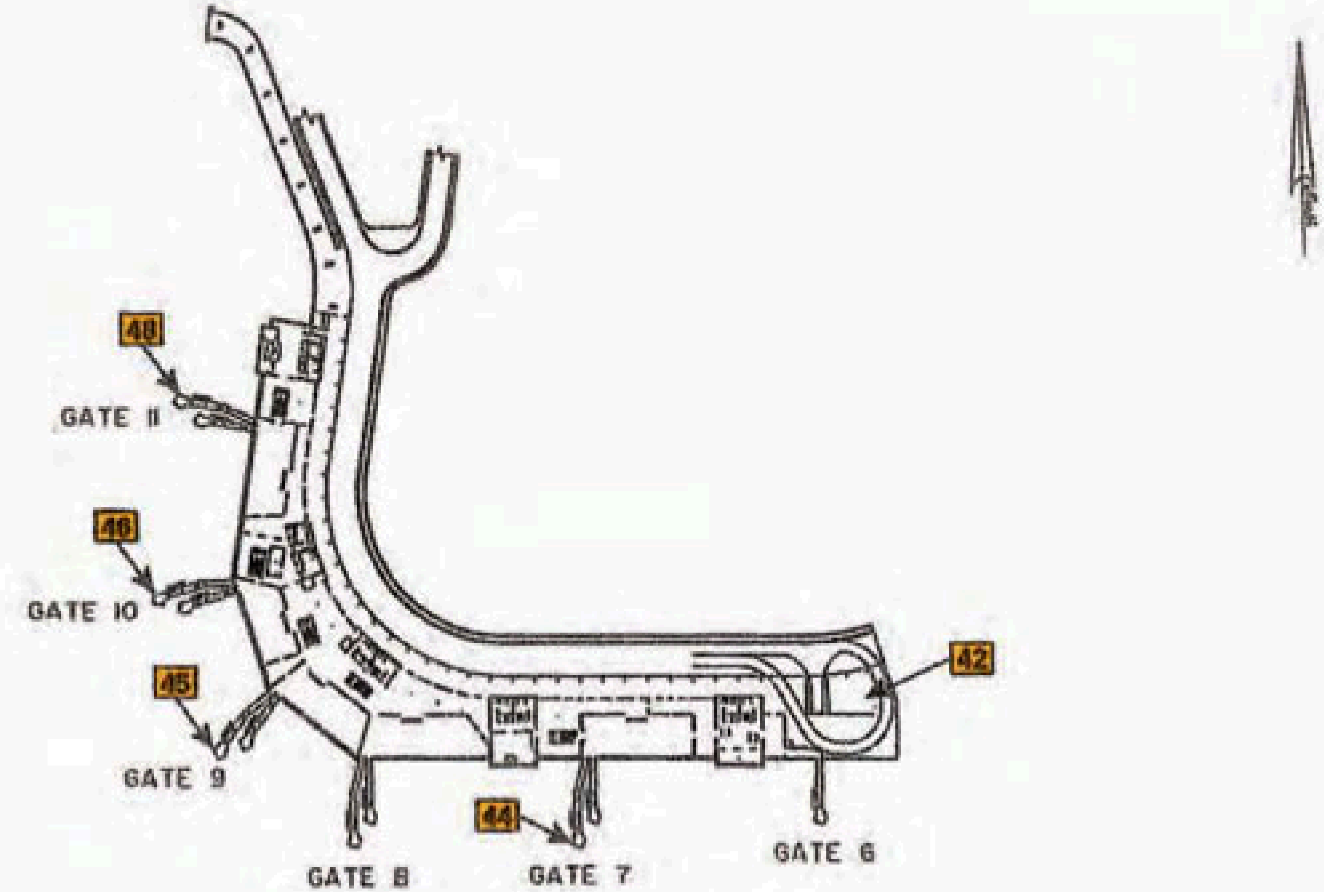
NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



BLDG 380
EWA CONCOURSE

HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
	PLAN EWA CONCOURSE SECOND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	H

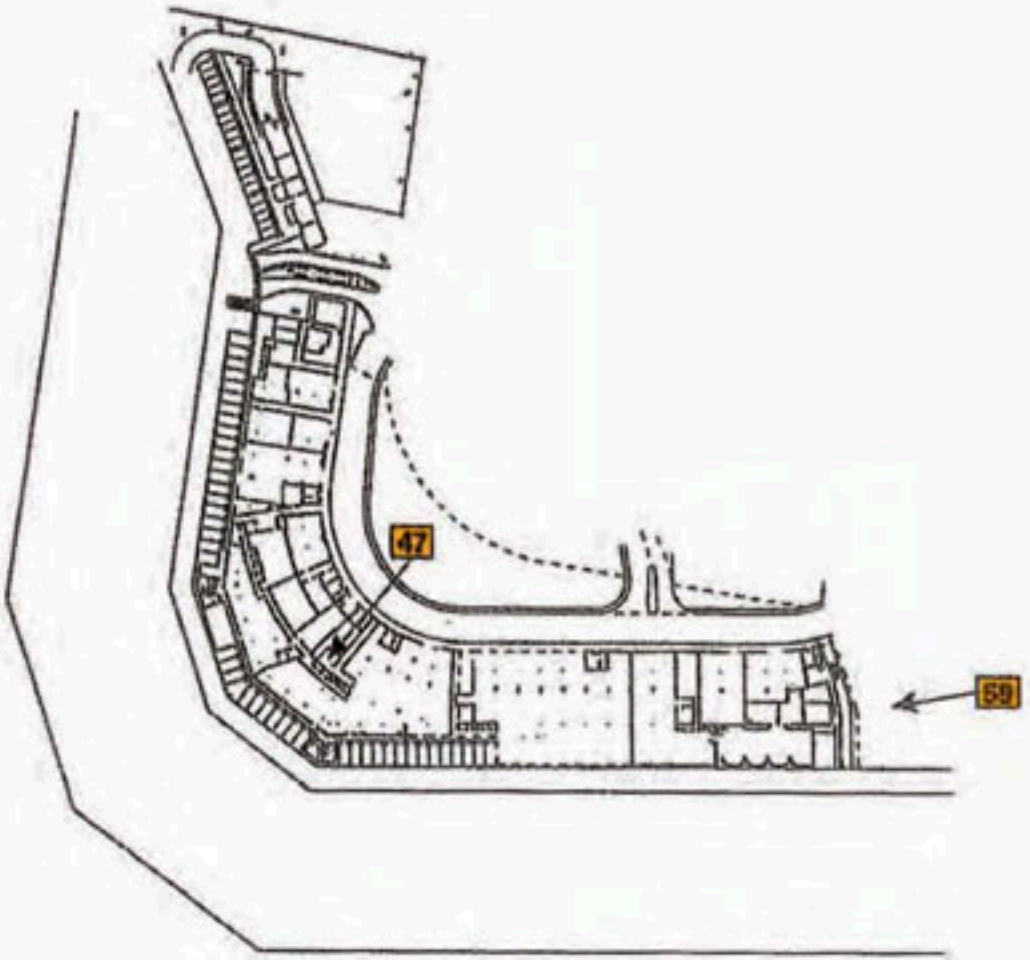
NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



BLDG 373
DIAMOND HEAD CONCOURSE

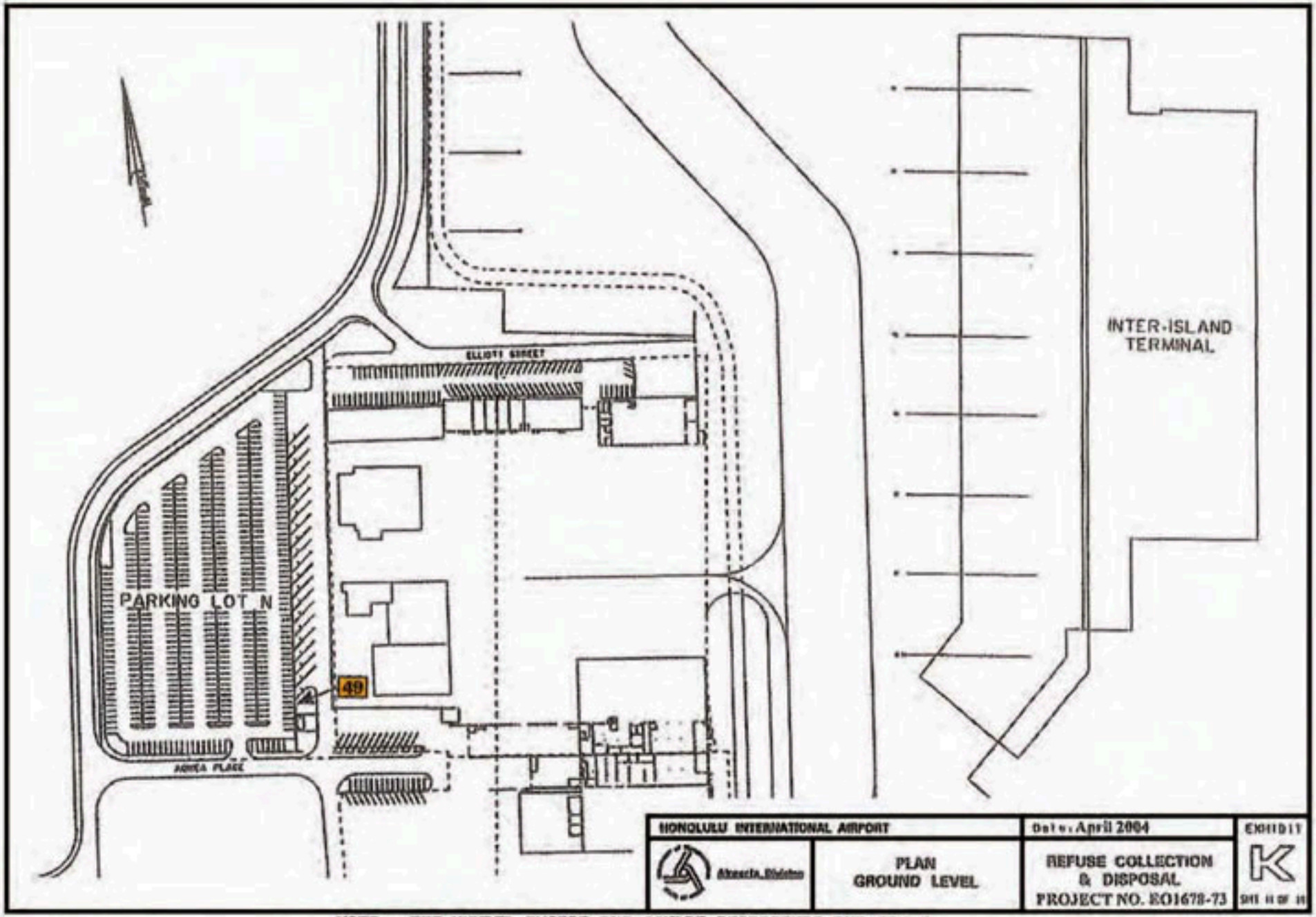
HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
	PLAN DIAMOND HEAD CONCOURSE SECOND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	SHT 9 OF 16

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
Hawaiian Dividers	PLAN DIAMOND HEAD CONCOURSE GROUND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	J SHT # OF #

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



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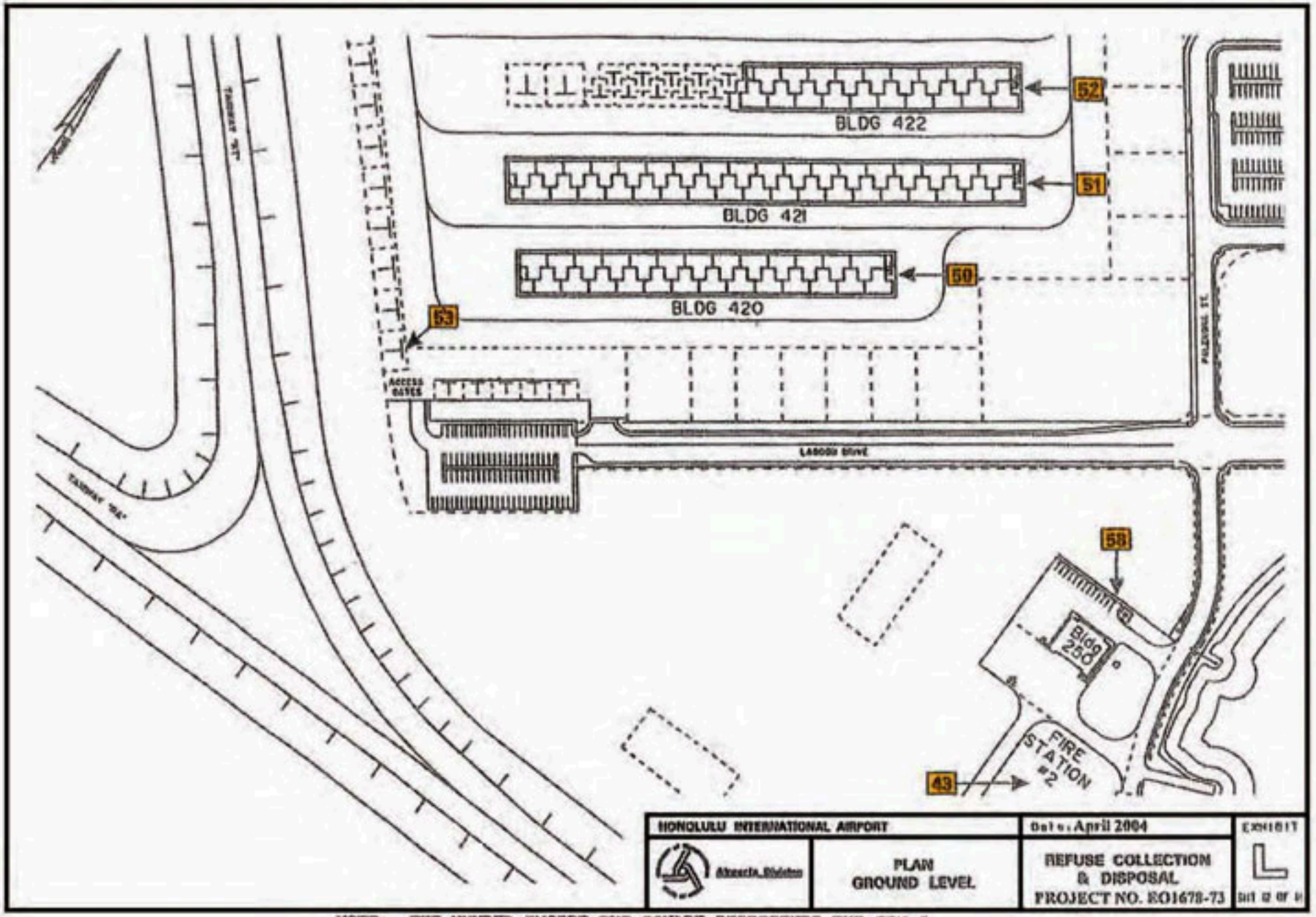

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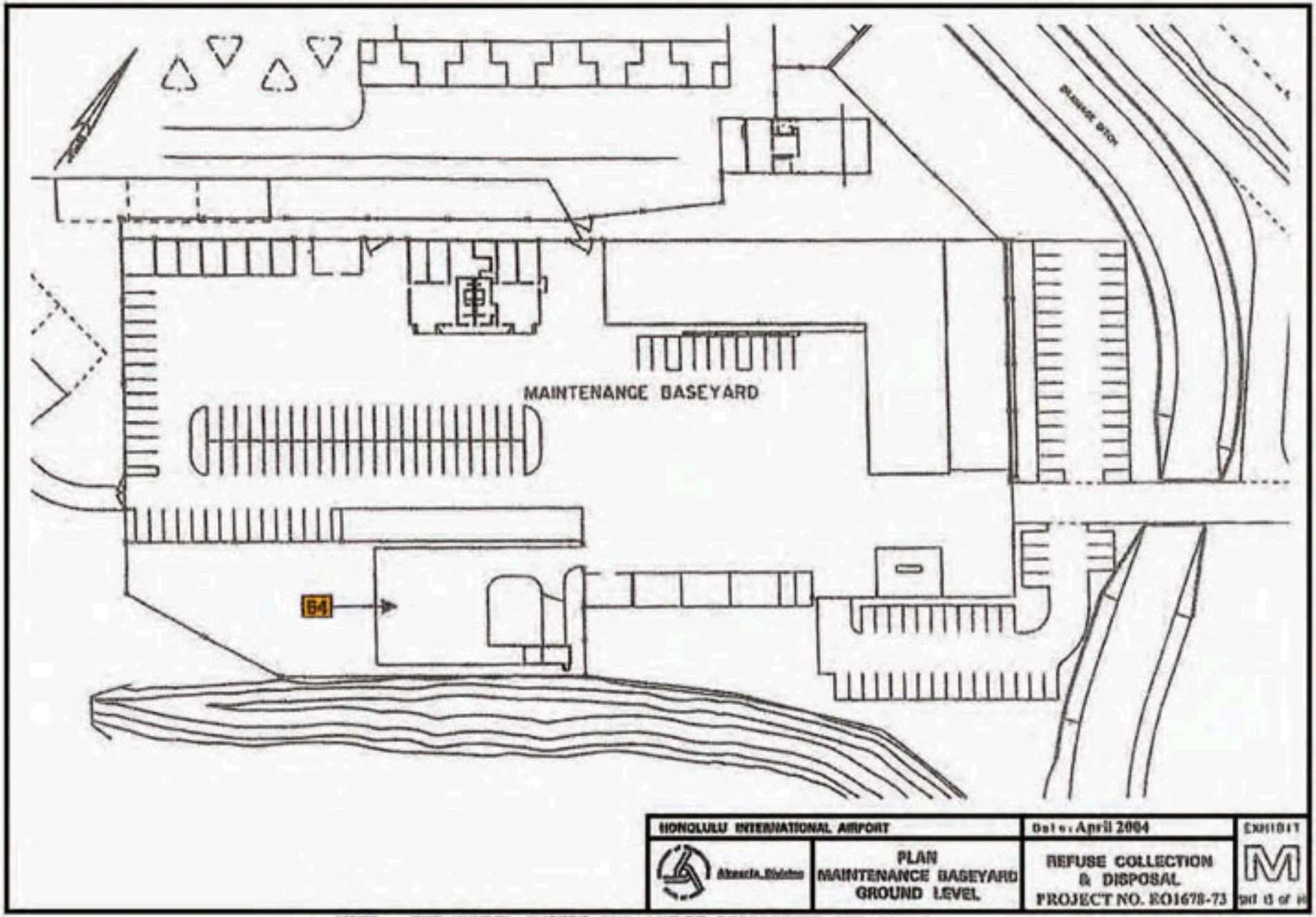
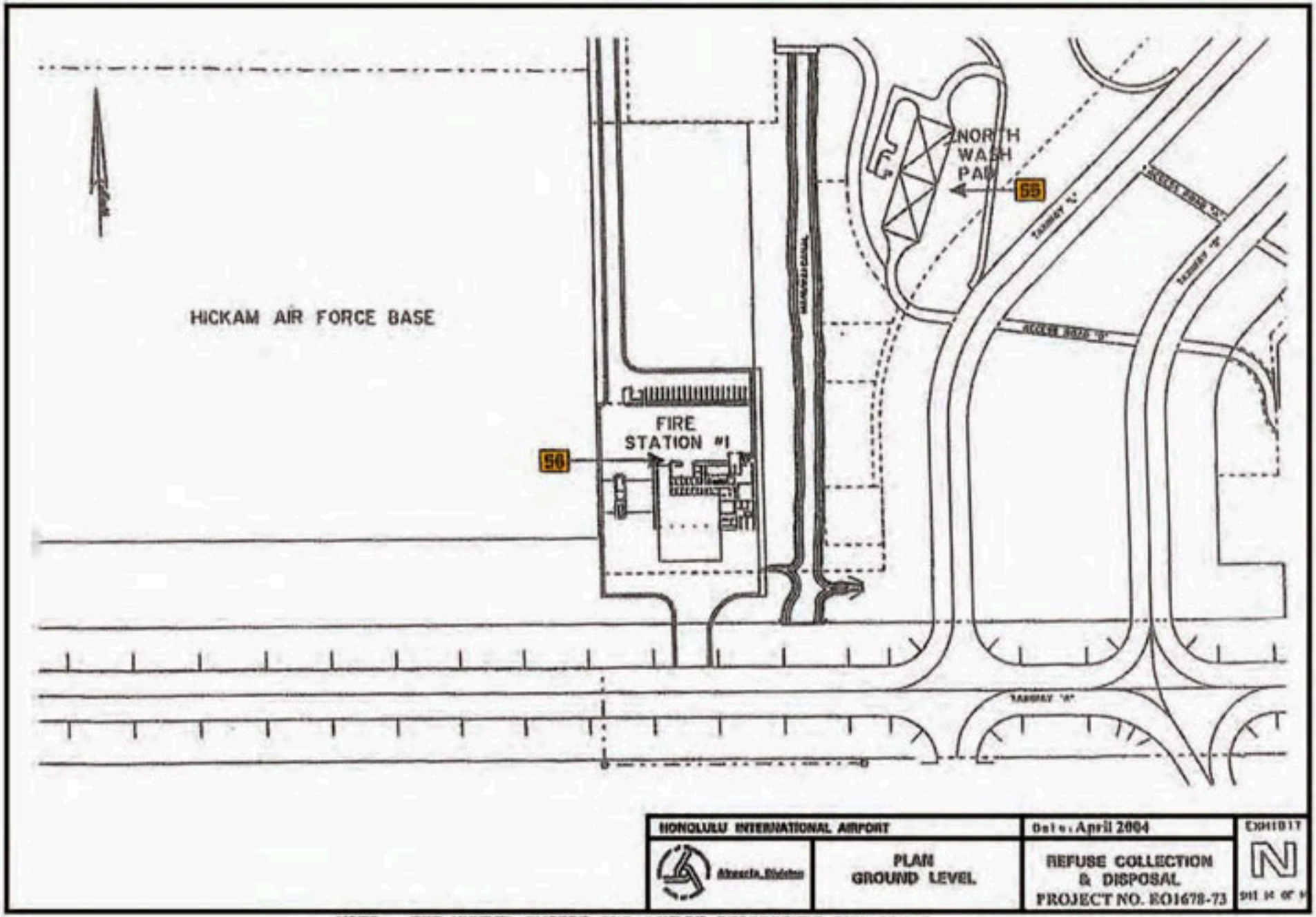


HONOLULU INTERNATIONAL AIRPORT		Date: April 2004	EXHIBIT
Airports Division	PLAN MAINTENANCE BASEYARD GROUND LEVEL	REFUSE COLLECTION & DISPOSAL PROJECT NO. EO1678-73	M Sht 6 of 11

NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.



NOTE: THE NUMBER INSIDE THE SQUARE REPRESENTS THE BIN # POINTING TO ITS DESIGNATED LOCATION AS PRESCRIBED ON SECTION 10 OF THE SPECIFICATIONS.

APPENDIX B

HNL WASTE STREAM ASSESSMENT QUESTIONNAIRE

HNL WASTE STREAM ASSESSMENT QUESTIONNAIRE

Name:		
Department:		
Email:	Phone #:	Date:

FACILITIES BACKGROUND

Number of employees	*Number of Buildings*	*Number of Floors*	*Occupied Square Footage*

Are freight elevators available?	☐ ***NO***	☐ ***YES***
Does the building have a loading dock?	☐ ***NO***	☐ ***YES***
Are there any special needs that may affect recycling: (Space Limitations, Accessibility, etc.)?	☐ ***NO***	☐ ***YES***

CURRENT TRASH SERVICES

Quantity and equipment used for trash collection and disposal:

Type	Number of containers	Size	Additional Comments
Dumpster			
Receptacles			
Compactor			
Shredder			

WASTE REDUCTION/RECYCLING

Do you have a recycling program? If yes, please describe your recycling program and indicate how long your program has been operating. If no, why not?	☐ ***NO***	☐ ***YES***	***Years*** ***Months***
Has the program been successful? Why or why not?	☐ ***NO***	☐ ***YES***	☐ ***N/A***
Do employees participate in the formulation of waste reduction policies?	☐ ***NO***	☐ ***YES***	
If yes, are they rewarded?	☐ ***NO***	☐ ***YES***	
Are employees educated about recycling and waste reduction programs? If yes, how so?	☐ ***NO***	☐ ***YES***	

☐ ***Company Events*** ☐ ***Paycheck Inserts*** ☐ ***Newsletters*** ☐ ***Posters*** ☐ ***Other***

Indicate whether you have any of the following:

Waste Reduction Policy	☐ ***NO***	☐ ***YES***
Waste Reduction Plan	☐ ***NO***	☐ ***YES***
Buy Recycled Policy	☐ ***NO***	☐ ***YES***
Waste Reduction Team	☐ ***NO***	☐ ***YES***
Green Building Policy	☐ ***NO***	☐ ***YES***
Waste Reduction Goal	☐ ***NO***	☐ ***YES***

What is your waste reduction goal? Click all that apply.

☐ ***Reduce Waste*** ☐ ***Reduce waste cost*** ☐ ***To be environmentally responsible*** ☐ ***Other***

At what capacity does the recycling program cover (i.e. office areas, maintenance areas, deplaned waste, etc.)? ☐ ***N/A***

If there is a recycling program, who monitors/regulates the collection process?			☐ *N/A*
Who is your recycling service provider?			☐ *N/A*
What materials do you wish to recycle that you currently are not?			☐ *N/A*
Are company purchased products made with recycled content (i.e. paper, binders, pens and pencils, clipboards, bio-plastics etc.) If yes, please list.	☐ *NO*	☐ *YES*	
If the DOT-A started a recycling program, would you participate? If no, why not?	☐ *NO*	☐ *YES*	
Describe any waste reduction practices in which your office participates (duplex printing, re-use of packing materials, exchange of unwanted supplies, equipment, furniture, etc.).			☐ *N/A*
Is recycling adding additional cost? Or saving cost?			☐ *N/A*

RECEPTACLES AND STAGING			
Do you currently have receptacles to collect recyclables? If yes, how are they designated?	☐ *NO*	☐ *YES*	
Is there a general staging area for recyclables? If yes, where is it located?	☐ *NO*	☐ *YES*	☐ *N/A*
Are there container overflow problems? If yes, site examples.	☐ *NO*	☐ *YES*	☐ *N/A*
Indicate any specific disposal restrictions affecting your facility.			

WASTE GENERATION

Estimate what percentage of your waste generation is recycled: ☐ *0-24%* ☐ *25-49%* ☐ *50-74%* ☐ *75-100%*

Are there seasonal fluctuations in waste generation? If so, site examples. ☐ *NO* ☐ *YES*

What type of waste is being generated?						
	Material	**Yes ✓**	**No ✓**	**Destination of Waste**	**Frequency of Pickup**	**Additional Comments**
	Newspaper					
	Paper					
	Cardboard					
	Glass					
	Plastic					
	Aluminum					
	Food Waste					
	E-Waste (electronics including monitors)					
	General Waste					
Maintenance (if applicable)	Gas/Oil Filters					
	Motor Oil/Anti-Freeze					
	Scrap Metal					
	Batteries					
	Light Bulbs					
	Tires					
	Wood Pallets					
	Electrical Wiring					
	Hazardous Materials and Spent Solvents					
	General Waste					

Are there any waste streams or material of special concern? If yes, indicate so. ☐ *NO* ☐ *YES*

AIRPLANE WASTE MANAGEMENT (IF APPLICABLE)

What is the process for handling deplaned waste?

What is the process for handling recycled waste? Segregation in-flight? Comingled and sorted on ground?

Is there anything that would help the process of deplaned waste? ☐ *NO* ☐ *YES*

ADDITIONAL COMMENTS

APPENDIX C – OAHU REDEMPTION CENTERS MAP

Distance from Honolulu International Airport

A **5.1 mi**	**ʻAiea** Aiea Shell 99-170 Moanalua Rd	**G** **3.0 mi**	207 Puʻuhale Rd (HRS)	**M** **3.4 mi**	**Kapalama** Kuhio Park Terrace (Reynolds) 1485 Linapuni St.
B **5.5 mi**	**Downtown Honolulu** Honolulu Municipal Building (Reynolds) 650 S. King St.	**H** **3.0 mi**	1803 Dillingham (ICR)	**N** **4.4 mi**	**Moanalua** Coast Guard Housing (RRR) 205 Kou Place *Limited access
C **4.0 mi**	**Fort Shafter** Child Development Center (RRR) Hase Dr.	**I** **3.6 mi**	**Sand Island** 1020 Ulupono St. (RRR) *Accepts large loads.	**O** **1.3 mi**	**Pearl Harbor** Pearl Harbor Navy Exchange Mobile Trailer (HRS) *Limited access
D **5.8 mi**	**Hālawa** Hālawa Recycling Plant (Reynolds) 99-1160 Iwaena St.	**J** **2.9 mi**	CM Recycling 204 Sand Island Access Rd	**P** **6.5 mi**	**Pearl Ridge** Kam Swap Meet (RRR) (Corner of Moanalua Rd & Kaonohi St.)
E **2.6 mi**	**Hickam Air Force Base** Bldg. 1715, Kuntz Ave. *Limited access	**K** **5.6 mi**	50D Sand Island Rd. (HRS)	**Q** **4.5 mi**	**Salt Lake** Stadium Sack-n-Save (RRR) 4561 Salt Lake Blvd
F **4.7 mi**	**Kalihi** 693 N. King St. (RRR)	**L** **2.1 mi**	Goodwill Industries 2610 Kilihau St.		

APPENDIX D – U.S. PAPER RECYCLING INDEX

US Paper Recycling Index

Spot Market Prices : Wednesday July 22, 2009

Grade	LTL	TL	Units	Funds
Corrugated Cardboard	45.00	120.00	ton	USD
Old Newprint	28.50	85.50	ton	USD
BoxBoard	26.71	71.25	ton	USD
Old Magazines	6.41	19.00	ton	USD
Mixed Paper	11.50	33.00	ton	USD
Sorted Office Paper	74.25	121.00	ton	USD
White Ledger	132.00	308.00	ton	USD
White Envelope	156.75	429.00	ton	USD

Source : http://www.scrapindex.com/paper.html