Final
Environmental Assessment
for
Grow The Force

Marine Corps Base Hawaii - Kaneohe Bay
Island of O'ahu, Hawai'i

August 2011

Prepared for:

Naval Facilities Engineering Command Pacific
and
Marine Corps Base Hawaii - Kaneohe Bay

FINDING OF NO SIGNIFICANT IMPACT

Pursuant to the Council on Environmental Quality Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing the National Environmental Policy Act and the Marine Corps Order P5090.2A, Environmental Protection and Compliance Manual, the United States Marine Corps (USMC) gives notice that an EA has been prepared and an Environmental Impact Statement (EIS) is not required for implementation of the Grow the Force (GTF) initiative, at Marine Corps Base Hawaii (MCB Hawaii) - Kaneohe Bay, O'ahu, Hawai'i. This EA evaluates the environmental impacts of the proposed GTF.

PROPOSED ACTION

The proposed action is the construction of six Military Construction (MILCON) projects to support the additional personnel assigned to MCB Hawaii – Kaneohe Bay under the U.S. Marine Corps-wide GTF initiative. These projects construct new or renovate on-base facilities to provide adequate living, working, and training conditions at MCB Hawaii - Kaneohe Bay. The six MILCON projects include P-778 Existing Armory Addition and Renovation; P-842 New Consolidated Aid Station and Rehab Clinic; P-847 New Artillery Battery Complex and Company Command Post; P-852 New 3D Radio Battalion Complex; P-858 New Command Headquarters, Parking Structure, 107-room Bachelor Enlisted Quarters (BEQ), and Renovation of Existing BEQs 5070 and 5071; and P-885 Renovation of Existing Buildings 373, 388, and 1650 within the Marine Wing Support Services Headquarters Compound, New Combat Logistics Battalion Facilities and Communications Shop, and New 3D Radio Battalion Motor Pool Facility.

The GTF initiative would, through incremental increases to existing units at various Marine Corps installations nationwide, increase the end-strength of the Marine Corps from 180,000 to 202,000 active-duty personnel. Under the GTF initiative, an additional 579 active-duty personnel and an estimated 391 dependents (an approximate total of 970 persons) would be assigned to MCB Hawaii – Kaneohe Bay. The 970 persons represent a 5 percent increase from the approximately 20,592-person March 2010 baseline population (includes deployed and non-deployed active-duty, on-base dependents, and civilian employees). The GTF personnel started arriving in Fiscal Year (FY) 2008, with incremental additions expected through FY2012.

EXISTING CONDITIONS

MCB Hawaii – Kaneohe Bay comprises approximately 2,951 acres of land. The base is situated on a peninsula that is surrounded on three sides by water: Kāne'ohe Bay, Kailua Bay and the Pacific Ocean. Topography of the base is relatively flat, punctuated by three prominent geologic features, Pyramid Rock, Ulupa'u Crater and Pu'u Hawai'iloa. MCB Hawaii – Kaneohe Bay currently supports a population of roughly 20,500 persons, which include deployed and non-deployed Navy and Marine personnel, civilian workers, and on-base dependents. The various GTF MILCON project areas are located within the central and eastern portion of the base. Project sites are situated on Low-fill, Low, and Medium Archaeological Sensitivity Zones.

ALTERNATIVES ANALYZED

No Action

Under the No Action alternative, the six MILCON projects to support the additional personnel at MCB Hawaii – Kaneohe Bay would not be implemented. The GTF personnel would continue to be housed in temporary and inadequate facilities that do not meet mission and operational requirements. Consequently, an underperformance in the USMC's support in current and future domestic and international conflicts could result. The ability to maintain troop training and readiness for the USMC's missions would continue to be challenged. MCB Hawaii - Kaneohe Bay would continue to be short of adequate living spaces and be deficient in facilities to efficiently train its personnel.

Alternatives Eliminated from Further Consideration:

The following alternatives were considered, but eliminated from further consideration because they did not fulfill the minimum objectives and criteria to achieve the GTF goal of balancing the war-fighting capability of the USMC. They did not meet the immediate need to provide adequate training and continued mission readiness or increase operational efficiencies.

Relocate Proposed MILCON Projects to Other MCB Hawaii Installations on O'ahu

MCB Hawaii manages installations throughout the island of O'ahu, including Camp H.M. Smith, Kaneohe Bay, Marine Corps Training Area Bellows, Manana Family Housing Area, Pearl City Annex, and the Puuloa Range Complex. However, to effectively support the GTF initiative and mission goals, all proposed projects must be located at MCB Hawaii - Kaneohe Bay.

One of the goals of the proposed action is to increase operational efficiency of the affected units and the USMC as a whole. Locating these MILCON projects at MCB installations other than Kaneohe Bay would defeat this goal by splitting unit operations, thus introducing further operational inefficiencies. In addition, other MCB Hawaii installations either do not have enough land area or land area that is suitable for the types of facilities to be constructed, or do no have adequate infrastructure or security to support the additional facilities.

Internal Reorganization of the U.S. Marine Corps

As an alternative to the GTF initiative, the USMC could internally reorganize its operations and unit allocation to address the immediate need for increased personnel; however, this alternative would not meet the "total force" consideration goals. Reorganization would be costly and time-consuming, would threaten the USMC's ability to maintain its current mission, and would further strain the USMC by exacerbating existing challenges in meeting training requirements. Changing the force structure and reorganizing the USMC could result in operational delays or disruptions, and has the potential to further complicate, retard, and jeopardize the overall USMC mission. For these reasons, reorganization of the USMC was eliminated from further consideration.

Alternative Locations Nationwide

To expeditiously address the need to provide a sufficiently manned, well-trained, and properly equipped USMC that is capable of dealing with emerging challenges such as the Long War, the USMC is focusing manpower increases and providing Marines possessing the appropriate skill sets to existing units, particularly the MEFs. These units are already established at USMC bases nationwide; therefore, bed-down locations other than those contained in the proposed action are not reasonable because they would not meet the purpose and need for the proposed action.

Leasing Off-Base Facilities

Leasing an off-base facility to house personnel was considered as an alternative to building new BEQs on base. However, the USMC prefers to house its junior enlisted personnel together, as a unit. This living arrangement enhances unit integrity, cohesion, and troop readiness. No commercial facilities exist within the region that could satisfy the USMC's preference to house the personnel together, as well as meet the housing requirements for its enlisted personnel, which include meeting anti-terrorism/force protection requirements. Other concerns in using off-base facilities for other GTF MILCON projects include security, connectivity, unit integrity, and the ability to meet the mission of the unit. In addition, leasing off-base facilities is not considered a long-term solution for addressing the personnel increase at MCB Hawaii - Kaneohe Bay. For these reasons, leasing off-base facilities is not considered a reasonable alternative and was eliminated from further study.

No New Construction; Utilize Modified/Renovated Facilities to Accommodate the GTF Initiative

Under this alternative, new facilities would not be built to accommodate the GTF personnel increase. Instead, to support the GTF, existing on-base structures and buildings would have to be modified and/or renovated to accommodate the entire personnel increase at MCB Hawaii - Kaneohe Bay. However, there is not enough available/vacant space at MCB Hawaii – Kaneohe Bay to accommodate the personnel increase. Locating GTF personnel in existing facilities would displace other functions that would then have to find space in other facilities in which to relocate. Use of existing facilities would limit location options, which could hamper efforts to consolidate unit functions thereby decreasing efficiency and unit cohesion. Further, it may not be possible to configure existing facilities to accommodate some of the GTF functions, which could hamper efficient unit operation. This alternative would not satisfactorily support the increase in Marines at MCB Hawaii - Kaneohe Bay and could be less cost-efficient than new construction. Due to these reasons, this alternative would not satisfy the purpose and need of the proposed action and was eliminated from further study.

ANTICIPATED ENVIRONMENTAL EFFECTS

The proposed action is not expected to result in any significant short or long-term adverse effects on the natural or human environment, including infrastructure, public health and safety, education, and housing.

Section 106 consultation was conducted as required by the National Historic Preservation Act of 1966, as amended. The State Historic Preservation Division has concurred with MCB Hawaii's determination that the proposed action would have no adverse effect on historic properties. To mitigate any potential impacts that may result from inadvertent discoveries, archaeological monitoring will be conducted during excavation in areas that contain coralline beach sand, such as old utility trenches and below concrete slabs, and in high archaeological sensitivity areas, such as the original coastline. In the event of an inadvertent discovery, Standard Operating Procedures would be followed, including, but not limited to, immediate stoppage of land-disturbing work, protecting the resource from damage or loss, and contacting the base Cultural Resources Manager. Thus, no significant impacts on archaeological, cultural or historic resources are anticipated.

The GTF MILCON projects would result in an approximate net increase of 9.6 acres of impervious surface. This represents a roughly 400 percent increase above the approximately 2.4 acres of existing impervious surface at project sites. However, each project would comply with the Navy's Low-Impact Development policy, the goal of which is to manage storm water on-site and result in no net increase in storm water volume, flow rate, sediments or nutrient loading. Therefore, no significant long-term or cumulative impacts are expected on drainage or receiving waters and the wildlife habitats they provide.

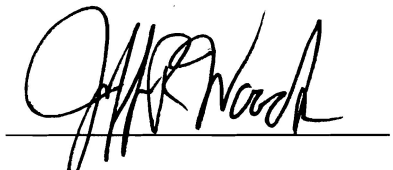
During the construction phase, temporary, minor impacts can be expected on air quality, noise, topography, or soils. However, adherence to Best Management Practices, National Pollution Discharge Elimination System permit requirements, and all applicable regulations would ensure that any construction-related impacts remain at insignificant levels.

FINDING

Based on information gathered during preparation of this EA, the proposed action—implementing six MILCON projects at MCB Hawaii – Kaneohe Bay to support the GTF personnel increase—would not have significant adverse environmental impacts. Consequently, an EIS is not required.

POINT OF CONTACT

The EA addressing this action is on file at, and interested parties may obtain a copy from: Naval Facilities Engineering Command Pacific, 258 Makalapa Dr, Suite 100, Pearl Harbor, Hawaii 96860-3134 (Attention: EV21/JB), telephone (808) 472-1196. A limited number of copies on compact disk are available to fill single-copy requests.



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J. R. WOODS
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base Hawaii

Date

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COVER SHEET

Proposed Action	Construction of six Military Construction (MILCON) projects to support a personnel increase of approximately 970 persons at MCB Hawaii – Kaneohe Bay due to the U.S. Marine Corps-wide Grow the Force initiative.
Type of Document	Environmental Assessment (EA)
Lead Agency	United States Marine Corps
For Further Information	Planner in Charge, Grow The Force EA, Code EV2 Naval Facilities Engineering Command, Pacific Pearl Harbor, HI 96860-3134 Telephone: (808) 472-1196

Abstract
The proposed action is the construction of six MILCON projects to support the additional personnel assigned to MCB Hawaii – Kaneohe Bay under the U.S. Marine Corps-wide Grow the Force (GTF) initiative. These projects construct new or renovate on-base facilities to provide adequate living, working, and training conditions at MCB Hawaii - Kaneohe Bay.

Under the GTF initiative, an additional 579 active-duty personnel and an estimated 391 dependents (an approximate total of 970 persons) would be assigned to MCB Hawaii – Kaneohe Bay. The GTF personnel started arriving in late Fiscal Year (FY) 2007, with incremental additions expected through FY2012. The 970 persons would be a 5 percent increase above the March 2010 baseline population of approximately 20,592 persons.

The six MILCON projects include:

- P-778 – Existing Armory Addition and Renovation;
- P-842 – New Consolidated Aid Station and Rehab Clinic;
- P-847 – Upgrades to Artillery Battery Complex and New Company Command Post;
- P-852 – New 3D Radio Battalion Complex;
- P-858 – New Command Headquarters, Parking Structure, and 107-room Bachelor Enlisted Quarters; and
- P-885 – Renovate existing buildings to create a Marine Wing Support Squadron (MWSS) Headquarters Compound, and construct new Combat Logistics Battalion (CLB-3) facilities and Communications Shop and a new 3D Radio Battalion Motor Pool.

The MILCON projects would result in an approximate net increase in impervious surface of 9.6 acres. This represents a roughly 400 percent increase above the approximately 2.4 acres of existing impervious surface at project sites. However, each project would comply with the Navy's Low-Impact Development mandate, the goal of which is to manage storm water on-site and result in no net increase in storm water volume, flow rate, sediments or nutrient loading. Compliance with the LID mandate would ensure no significant long-term or cumulative impacts on drainage or receiving waters and the wildlife habitats they provide.

During the construction phase, temporary, minor impacts would occur to the local air quality, the ambient noise levels, topography and soils. However, adherence to Best Management Practices, National Pollution Discharge Elimination System permit requirements, and all applicable regulations would ensure that any construction-related impacts remain at insignificant levels.

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ACRONYMS AND ABBREVIATIONS

1/3	1st Battalion, 3d Marines
1/12	1st Battalion, 12th Marines
2/3	2nd Battalion, 3d Marines
3/3	3rd Battalion, 3d Marines
A/C	air conditioning
AAQS	Ambient Air Quality Standard
ACM	asbestos-containing material
AICUZ	Air Installation Compatible Use Zone
AST	aboveground storage tank
AT/FP	Anti-terrorism/Force Protection
BCH	Belt Collins Hawaii
BEQ	Bachelor Enlisted Quarters
BMP	Best Management Practices
CAA	Clean Air Act
CATV	cable television
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	capital improvement project
CLB	Combat Logistics Battalion
cm	centimeters
CMU	concrete masonry unit
CRM	Cultural Resources Manager
CWA	Clean Water Act
cy	cubic yards
CZM	Coastal Zone Management
dB	decibel
DBEDT	State of Hawai'i Department of Business, Economic Development and Tourism
DDC	Direct Digital Controls
DoD	U.S. Department of Defense
DOH	State of Hawai'i Department of Health
DoN	Department of the Navy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EmB	Ewa silty clay loam
EMCS	Energy Management Control System
EO	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005

ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FL	Fill land
FONSI	Finding of No Significant Impact
ft	feet
FY	fiscal year
gpcd	gallons per capita per day
GTF	Grow the Force
HAR	Hawai'i Administrative Rules
HAZMAT	hazardous materials
HECO	Hawaiian Electric Company
HMLA	Marine Light Attack Helicopter Squadron
HPE	Hawaii Pacific Engineers
HVAC	heating, ventilation, air conditioning
ICRMP	Integrated Cultural Resources Management Plan
IBC	International Building Code
in	inch(es)
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
JP-5	Jet Propellant Grade 5
kph	kilometers per hour
kV	kilovolt
kvA	kilovolt ampere
LAN	local area network
LBP	lead-based paint
Ldn	day-night average sound level
LEED	Leadership in Energy and Environmental Design
LID	low impact development
LOS	Level-of-Service
m	meter(s)
MAG-24	Marine Air Group 24
MALS	Marine Aviation Logistics Squadron
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCCS	Marine Corps Community Services
MCB	Marine Corps Base
MCDC	Mōkapu Central Drainage Channel
MCM	1000's (M) of circular (C) mils (M), where 1 mil is equal to 1/1,000 of an inch
MCTAB	Marine Corps Training Area Bellows
MCW	Mōkapu Central Watershed

MEF	Marine Expeditionary Force
mgd	million gallons per day
mi	mile
MILCON	military construction
MMA	Multi-Mission Maritime Aircraft
MnC	Mamala sandy silty clay loam
mph	miles per hour
msl	mean sea level
MV-22	tilt-rotor aircraft, aka as the Osprey
MVA	megavolt ampere
MWSS	Marine Wing Support Squadron
NAVFAC	Naval Facilities Engineering Command
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PMA	Programmatic Memorandum of Agreement
POV	personally-owned vehicle
PTSF	Percent-of-Time-Following
SAIA	Sikes Act Improvement Act
SCIF	sensitive compartmented information facilities
sf	square feet
SHPD	State Historic Preservation Division
sm	square meters
SOPs	standard operating procedures
TIAR	Traffic Impact Assessment Report
UFC	Unified Facilities Criteria
U.S.	United States
USACHPPM	Unites States Army Center for Health Promotion and Preventive Medicine
USC	United States Code
USA	utility system assessment
USACE	United States Army Corps of Engineers
USMC	United States Marine Corps
UST	underground storage tank
WCP	Wil Chee – Planning & Environmental
WMA	Wildlife Management Area
WRF	water reclamation facility
WWTP	wastewater treatment plant
XFMR	transformer

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SUMMARY

To increase its end-strength while achieving balanced growth in capabilities, the United States Marine Corps (USMC) has implemented the Grow the Force (GTF) initiative. This initiative would, through incremental increases to existing units at various Marine Corps installations nationwide, increase the end-strength of the Marine Corps from 180,000 to 202,000 active-duty personnel.

Proposed Action. The proposed action is the construction of six Military Construction (MILCON) projects to support the additional personnel assigned to MCB Hawaii – Kaneohe Bay under the U.S. Marine Corps-wide Grow the Force (GTF) initiative. These projects construct new or renovate on-base facilities to provide adequate living, working, and training conditions at MCB Hawaii - Kaneohe Bay.

Under the GTF initiative, an additional 579 active-duty personnel and an estimated 391 dependents (an approximate total of 970 persons) would be assigned to MCB Hawaii – Kaneohe Bay. The 970 persons would be a 5 percent increase above the March 2010 baseline population[1] of approximately 20,592 persons, which includes deployed and non-deployed active-duty, on-base dependents, and civilian employees. The GTF personnel started arriving in late Fiscal Year (FY) 2007, with incremental additions expected through FY2012.

Alternatives. The No Action alternative is the only other alternative evaluated by this Environmental Assessment. Under the No Action alternative, MCB Hawaii would not implement the six MILCON projects to support the personnel increase.

Five other alternatives were considered, but eliminated from further consideration because they did not fulfill the minimum objectives and criteria to achieve the Marine Corps' goal of balancing its war-fighting capabilities, did not comply with MCB Hawaii's operations, and did not meet the GTF requirements. These alternatives were: (1) locating the proposed MILCON projects at other MCB Hawaii installations on O'ahu; (2) internally reorganizing the Corps' structure, unit allocation, and operations to compensate for the deficiency in personnel numbers; (3) focusing personnel increases at alternative locations nationwide; (4) leasing off-base facilities to accommodate the additional troops; and (5) utilizing modified/renovated facilities at MCB Hawaii - Kaneohe Bay to accommodate the GTF initiative.

Environmental Consequences. The proposed action is not expected to have any significant adverse impacts or unresolved issues. Potential impacts by topic are summarized below:

Climate. No impacts expected.

[1] The baseline population was derived by subtracting the number of GTF Marines estimated to already be at MCB Hawaii – Kaneohe Bay from the actual population numbers (i.e., current base population without the GTF Marines).

Air Quality. Air quality within the vicinity of the various project sites may be affected during the construction period because emissions and dust would be generated by construction equipment and vehicles. These impacts would be temporary and would cease when construction is completed. Contractors would be required to comply with control measures and permitting conditions, as well as to implement construction Best Management Practices (BMPs), as appropriate or indicated. BMPs may include, among others, erecting dust screens around the construction site, dust suppression of exposed soils and landscaping areas of bare earth as soon as practicable.

The proposed action is not expected to have a significant long-term impact on air quality. None of the construction or renovation projects encompassed by the proposed action would be a significant source of stationary emissions. In the long-term, a small increase in the amount of vehicular activity at MCB Hawaii - Kaneohe Bay is expected due to the increase in personnel. However, air quality impacts due to mobile sources associated with the proposed action are expected to be insignificant due to the overall low traffic volumes at MCB Hawaii – Kaneohe Bay.

Noise. Base personnel who live in nearby housing facilities may be affected in the short-term due to higher than average, but not detrimental, noise levels during the construction phase of the proposed action. Construction noise would be minimized by using properly-muffled equipment and conducting work during regular working hours. No long-term noise is expected.

Topography and Soils. In the short-term, impacts on soils and topography would be caused by land-disturbing activities associated with construction or renovation, such as clearing, excavating, grading, and filling. With appropriate implementation of BMPs, any potential impacts on soils and topography resulting from construction activities are expected to be less than significant. No significant long-term adverse impacts on topography or soils are anticipated as a result of implementing the proposed action.

Groundwater. No adverse impacts expected.

Surface Waters. Implementation of construction site BMPs, appropriate disposal of removed material and debris, and containing runoff from construction sites during the construction phase should result in no significant short-term adverse impacts on surface or marine waters. In the long-term, design features would be incorporated into each project, as needed, to filter and reduce or contain runoff in order to minimize potential adverse impacts on surface waters. Individual projects would be implemented in compliance with Low Impact Development (LID) standards and guidelines contained in Unified Facilities Criteria (UFC) 3-210-10 (LID Manual) and as mandated by Section 438 of the Energy Independence and Security Act of 2007 (EISA). Therefore, no long-term or cumulative impacts on surface waters are expected.

Drainage. The construction of new facilities, structures, and buildings could increase the amount of impermeable surface at each site. Consequently, there could be a resultant increase in the volume of surface runoff. However, in compliance with the Department of Defense's LID mandate and UFC 3-210-10, all projects would utilize low impact development strategies to

maintain pre-project hydrological conditions and should result in no net increase in runoff. Such strategies include design features to reduce or contain runoff in order to minimize potential adverse impacts on drainage at MCB Hawaii - Kaneohe Bay.

Wetlands. Adherence to the DoD LID mandate and LID guidelines would ensure no significant adverse impacts on wetlands.

Biological Resources. No federally listed endangered animals or plants reside in any of the project areas. Due to the abundance of birds found on the installation that are federally protected under either the Endangered Species or Migratory Bird Treaty Acts, and the known risk of non-shielded lights to these birds, each of the proposed action projects would incorporate downward-shielded exterior night lighting. This will reduce the risk of an unauthorized "take" of these birds through attraction to, collision with, disorientation, injury or death as a result of non-shielded lights. The proposed action is not expected to have significant adverse impacts on biological resources.

Natural Hazards. Proposed projects are not located in any tsunami inundation zone or flood zone and should not be susceptible to impacts related to these natural hazards. Regarding seismic activity, all projects would be constructed in accordance with applicable codes and requirements to protect occupants from this natural hazard.

Population, Housing and Education. The proposed action would support approximately 970 additional persons at MCB Hawaii – Kaneohe Bay (579 Marines and an estimated 391 of their dependents). This increase is being accommodated by the proposed construction projects to address housing, training, and operational needs. The gradual incremental increase in personnel over several years would minimize any potential for significant adverse impacts on population, housing and education.

Surrounding Land Use. The proposed projects are consistent with the base master plan and the Plus Up Development Plan and would not cause impacts on surrounding areas because operations at each of the new or renovated facilities would be compatible with surrounding land use.

Visual and Aesthetic Resources. All buildings proposed for construction would conform to standard building design and would be constructed to be visually consistent with the existing buildings on base. In general, they would not have a pronounced effect on the overall scenic vistas of the base or its environs.

Archaeological, Cultural and Historic Resources. The proposed actions are not anticipated to result in any significant adverse impacts on historic properties at MCB Hawaii - Kaneohe Bay. The various project areas are located in Low-fill, Low, and Medium Archaeological Sensitivity zones, where the probability of encountering archaeological or cultural resources is minimal. During Section 106 consultation, the State Historic Preservation Division (SHPD) concurred with MCB Hawaii's determination that the proposed action would have no adverse effect on historic properties.

Traffic and Circulation. The additional 970 GTF personnel and associated MILCON projects are not expected to result in any significant adverse impacts to traffic and circulation on or off base. After GTF is fully implemented, the two public roadways leading to the base (H-3 and Mōkapu Boulevard) and on-base intersections are projected to maintain the current levels-of-service (LOS). Turning movements into and out of future project driveways are also expected to have a high LOS.

Recreational Facilities. No recreational facilities would be lost as a result of the proposed action. Recreational facilities and programs may see an increase in users and participants with the additional troops and families assigned to the base; however, the incremental increase would not be significant in the context of the existing number of users.

Utilities, Infrastructure, and Solid Waste. Demand for utilities, infrastructure, and solid waste services would be expected to increase from the proposed action, as 970 persons would be relocating to MCB Hawaii - Kaneohe Bay. However, demand for these services is not anticipated to reach or exceed the operational capacities of the existing systems, including planned upgrades, at MCB Hawaii - Kaneohe Bay. No significant impacts on existing utilities or infrastructure are anticipated from the implementation of the proposed action.

Hazardous Materials and Waste. Several buildings programmed for demolition or renovation under P-842 and P-885 were constructed in the 1940s and 1950s and are assumed to contain asbestos-containing material (ACM) and lead-based paint (LBP). Chlordane-contaminated soil also may underlie the facilities to be demolished by P-842. Determination of chlordane contamination would be made during future planning and design for the project. Other buildings that would be demolished or renovated under P-778, P-842, P-847 and P-858 were constructed in the late 1980s and could contain suspect ACM.[2] Proper removal, handling, transport and disposal of demolition or renovation waste and soil would be conducted in compliance with all applicable state and federal health, safety, and environmental regulations by qualified professionals. Therefore, the proposed action would result in no significant adverse impacts related to hazardous materials or waste.

[2] Suspect ACM is any building material suspected of containing asbestos based on, among other things, its appearance, usage, and the construction date of the building, but has not been proven conclusively.

1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 INTRODUCTION

This Environmental Assessment (EA) addresses the proposed implementation of six Military Construction (MILCON) projects at MCB Hawaii – Kaneohe Bay. These MILCON projects would support additional personnel assigned to the base under the USMC's nationwide Grow the Force (GTF) initiative. This EA was prepared pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4321 et seq.), and its implementing regulations issued by the Council on Environmental Quality (40 CFR Part 1500 - 1508).

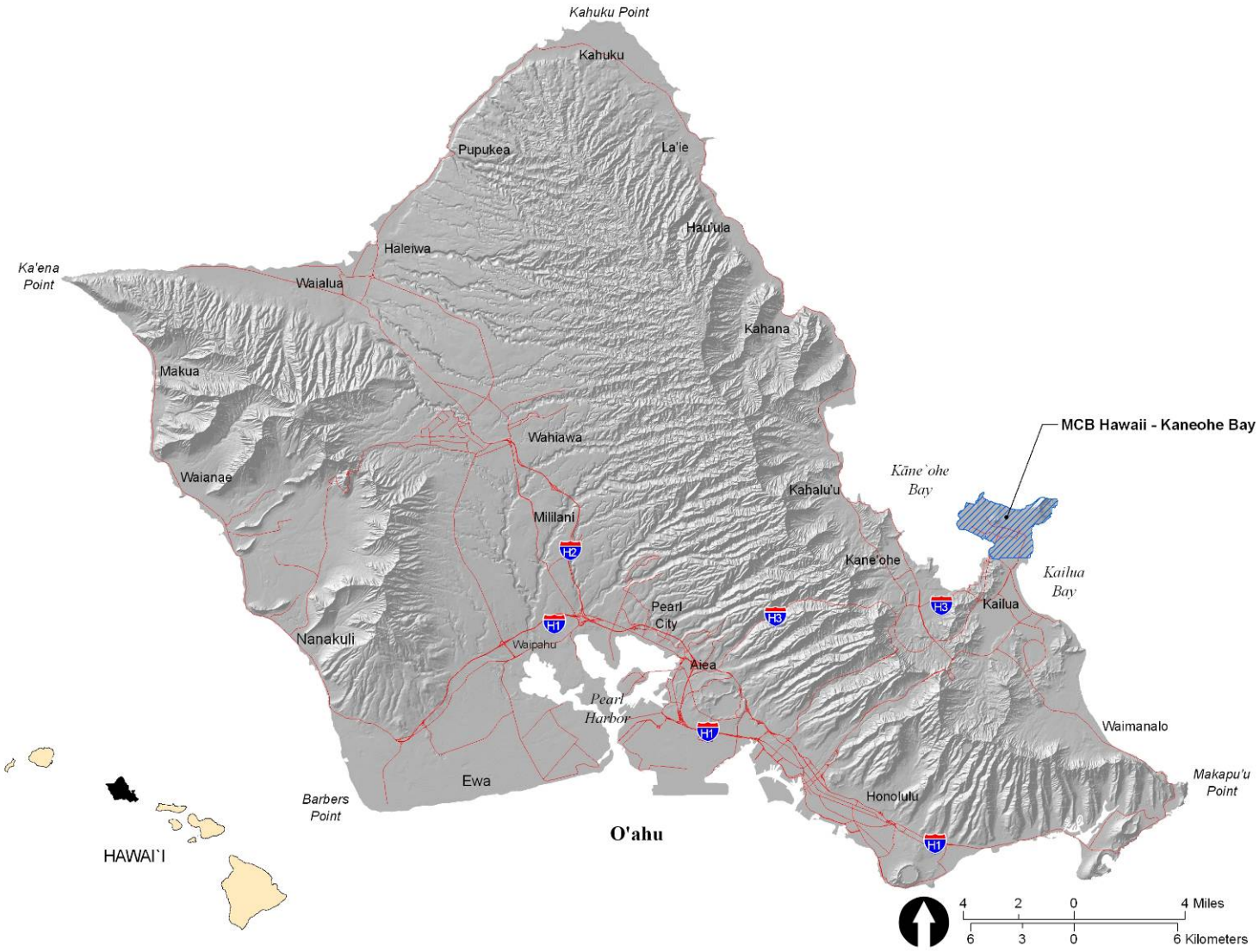
The goal of this EA is to ensure that comprehensive and systematic consideration is given to potential environmental impacts that may result from implementing the proposed action, or any reasonable alternative action, upon the natural, man-made, or social environment. The information presented in this EA would result in either a Finding of No Significant Impact (FONSI), lead to preparation of an Environmental Impact Statement, or no action on the proposal.

1.2 PROJECT LOCATION AND SURROUNDING ENVIRONMENT

The proposed action and alternatives are located at MCB Hawaii - Kaneohe Bay. MCB Hawaii - Kaneohe Bay encompasses 2,951 acres and is located on O'ahu's northeastern shore, on Mōkapu Peninsula. Mōkapu Peninsula is bounded by the waters of Kāne'ohe Bay on the west, the Pacific Ocean to the north, Kailua Bay to the east, and residential development to the south. Kailua and Kāne'ohe are the communities nearest to MCB Hawaii - Kaneohe Bay. Refer to Figure 1 for a map of the project location.

1.3 PROPOSED ACTION

The proposed action consists of six projects proposed for construction or renovation at MCB Hawaii – Kaneohe Bay. These projects would support the GTF increase in personnel and their missions by providing adequate living, working, and training conditions. Under the USMC's nationwide GTF initiative, an additional 579 active-duty personnel and an estimated 391 dependents would be incrementally assigned to MCB Hawaii – Kaneohe Bay. This increase represents MCB Hawaii's allocation of the nationwide GTF initiative, which aimed to increase the USMC's end-strength from 180,000 to 202,000 Marines through FY2011. The 970 persons would be a 5 percent increase above the March 2010 baseline population of approximately 20,592 persons, which includes deployed and non-deployed active-duty, on-base dependents, and civilian employees.



Grow The Force Environmental Assessment	Proposed Action Location Map	**Figure 1**

The facilities proposed for construction or renovation are as follows (project locations are shown on Figure 2 and preliminary site plans are provided in Appendix B):

- P-778 – Existing Armory Addition and Renovation
- P-842 – New Consolidated Aid Station and Rehab Clinic (includes demolition of facilities 1056, 1057, 1058, 1162, 1163, 1164, 4011, and 4021)
- P-847 – Upgrades to Artillery Battery Complex and New Company Command Post (includes demolition of buildings 5008, 5009, and 5031; renovation of existing buildings 5000, 5001, and 5011; and removal of three temporary fabric structures)
- P-852 – New 3D Radio Battalion Complex
- P-858 – New Command Headquarters, parking structure, 107-room bachelor enlisted quarters (BEQ) in the standard 2+0 USMC configuration, and renovation of existing BEQs 5070 and 5071 (includes the demolition of buildings 4010, 4017, 4019, 4020, 6705)
- P-885 – Renovate existing buildings (373, 388 and 1650) to create a Marine Wing Support Squadron (MWSS) Headquarters Compound; and construct a new Communications Shop and other facilities for the Combat Logistics Battalion (CLB-3) and a new 3D Radio Battalion Motor Pool

1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to support the GTF initiative. The action is needed to achieve a balanced growth in the USMC's capabilities and to ensure that the USMC is sufficiently manned, well-trained, and equipped to meet any current and future crises or conflicts.

1.4.1 Project Background

The USMC remains committed to providing support in continuing worldwide conflicts. The emergence of the Long War[3] has brought new challenges: defeating terrorist networks, defending the homeland, and preventing hostile states and non-state actors from acquiring or using weapons of mass destruction. As a result, Marines are deployed around the world in greater numbers and for longer periods. Therefore, balanced growth in capability must be achieved throughout the USMC, with a focus on the primary existing war-fighting organization, the Marine Expeditionary Force (MEF).

To meet these demands and achieve balanced growth, the USMC implemented its GTF initiative, which would increase the end-strength of the USMC from 180,000 to 202,000 active-duty persons. This increase is to be accomplished through annual incremental increases occurring

[3] A term established by the Administration of U.S. President George W. Bush, referring to United States (U.S.) actions against various governments and terrorist organizations in defense of the U.S. homeland, freedoms and way of life. It is characterized by current campaigns in the U.S. Central Command's area of responsibility, as well as by diverse and sustained global engagements.

between late FY2007 through FY2011. The additional Marines are to join existing units at already established USMC installations nationwide, where they are to be trained and stationed. This incremental increase of the USMC would ensure that Marines are properly prepared and trained to support the Long War. The GTF Marines assigned to MCB Hawaii - Kaneohe Bay started arriving in late FY2007. These personnel are currently being accommodated in temporary on-base facilities. The remainder of MCB Hawaii's GTF Marines would arrive through 2012, and possibly beyond.

The GTF efforts support the Secretary of Defense's intent to improve the deployment-to-dwell ratio from 1:1 to 1:2. The deployment-to-dwell ratio—the time a Marine is deployed versus the time stationed at home—should provide adequate time for units to train and prepare for their next deployment, to conduct the mission and to recover, while maintaining current military mission and readiness. The current 1:1 deployment-to-dwell ratio experienced by many units challenges the Marines Corps' ability to maintain training and readiness for its missions. Reduction of available training time complicates the Marine Corps' ability to provide combat-ready units across the spectrum of conflicts. Furthermore, the 1:1 deployment-to-dwell ratio has the potential to impact Marines' quality of life due to the increased time away from family and home. Implementing a 1:2 deployment-to-dwell ratio for all active units would alleviate the strain on units abroad, provide a better quality of life, and provide the proper training time necessary to conduct expeditionary operations and effectively carry out the Corps' mission.

Focused growth of the MEFs, coupled with improved deployment-to-dwell ratio, would enhance the irregular-warfare capabilities and increase the available training time for most units. In general, the manpower increase associated with Command, Ground Combat, Aviation Combat, and Logistics Combat elements would enable the manning rates to more closely approach full-unit strength. The result would be a USMC prepared as a "total force" that would meet the challenges and opportunities of a rapidly changing world and emerging threats.

1.5 ENVIRONMENTAL PERMITS AND CONSULTATIONS

The following list includes, but is not limited to, permits and agency consultations that may be required to implement the proposed action:

Permit or Consultation	Agency
National Historic Preservation Act (NHPA), Section 106 Consultation	Historic Preservation Division, Department of Land and Natural Resources, State of Hawai'i
National Pollution Discharge Elimination Permit System (NPDES)	Department of Health, State of Hawai'i
Air Permit	Department of Health, State of Hawai'i

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 DETAILED DESCRIPTION OF THE PROPOSED ACTION

The proposed action consists of six projects that construct new facilities or renovate existing structures to support the USMC's GTF initiative. Each project is funded as a MILCON project FY2011 and beyond. Figure 2 shows the location of each project. These MILCON projects would accommodate the additional 579 active-duty Marines and an estimated 391 dependents,[4] for an approximate total of 970 persons at MCB Hawaii – Kaneohe Bay.

2.1.1 Construction/Renovation Projects

All GTF construction or renovation projects would incorporate the required anti-terrorism/force protection (AT/FP) measures, in accordance with Unified Facilities Criteria (UFC) 4-010-01, Minimum Anti-Terrorism Standards for Buildings.[5] Additionally, each project would incorporate sustainable design features to achieve, at a minimum, a Leadership in Energy and Environmental Design (LEED) Silver rating; Low-Impact Development (LID) features in compliance with UFC 3-210-10 and Section 438 of the Energy Independence and Security Act; and energy reduction features in compliance with the Energy Policy Act of 2005, Executive Order (EO) 13123 Greening the Government Through Efficient Energy Management, and other pertinent regulations, laws and EOs. A description of each MILCON project associated with the proposed action is provided below. Figures showing specific MILCON site locations and proposed site plans are provided in Appendix B.

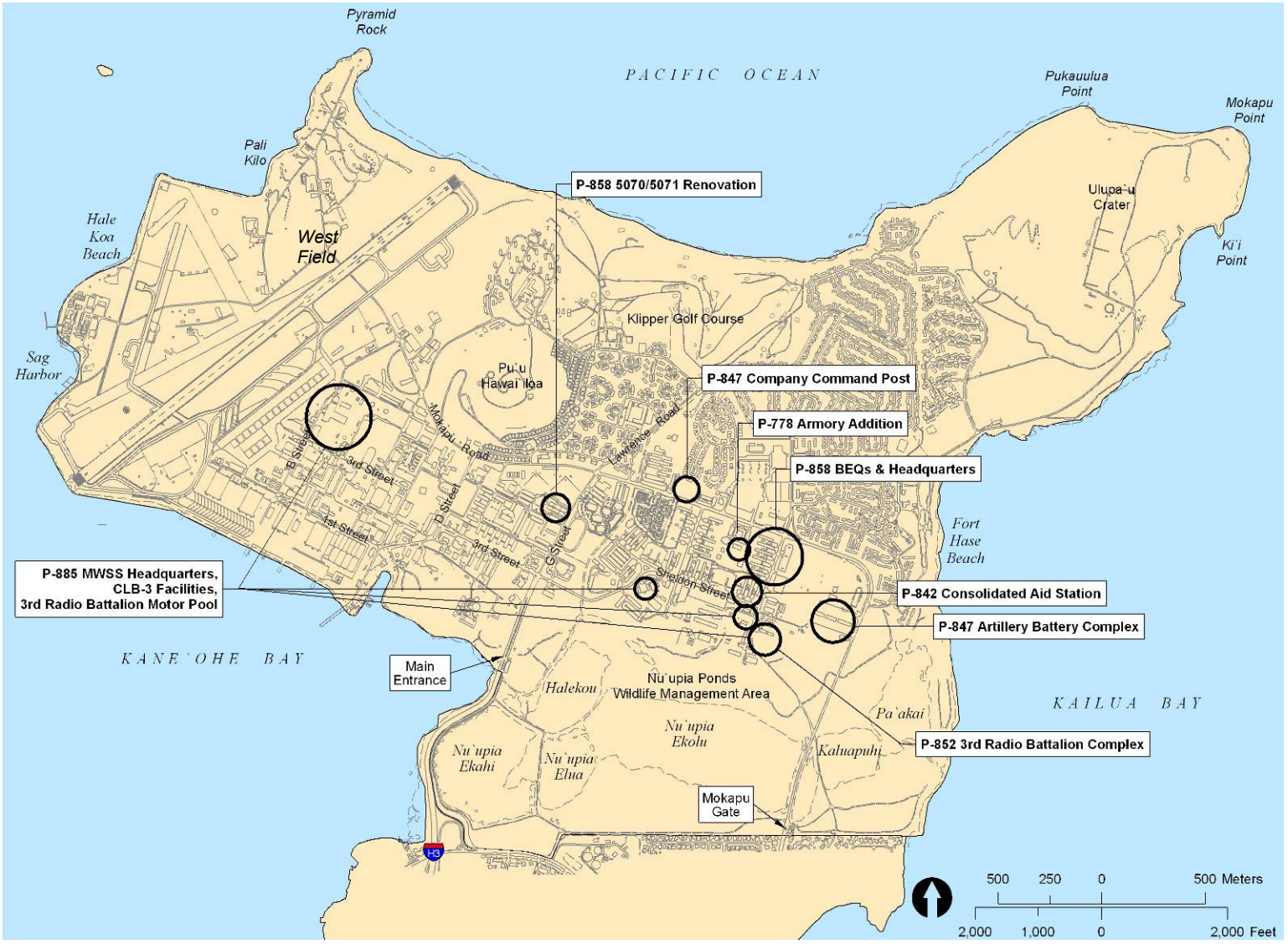
2.1.1.1 P-778 – Armory Addition and Renovation

Major elements of the 3d Marine Division are stationed at MCB Hawaii - Kaneohe Bay. A combined total of roughly 4,000 Marines and Sailors serve in the 1st Battalion, 3d Marines (1/3); 2nd Battalion, 3d Marines (2/3); and 1st Battalion, 12th Marines (1/12). The proposed armory addition and renovation is required to provide additional armory space to store and maintain arms used by these Marine and Navy units.

The existing armory—Building 4053—that serves the 1/3, 2/3 and 1/12 is located near the regimental headquarters in the block bounded by Mōkapu Road, Harris Avenue, Selden Street, and Craig Avenue. Figure B-1 shows the P-778 site location. The armory comprises 8,665 square feet (sf) (805 square meters [sm]) of floor area and 3,090 sf (287 sm) of existing covered cleaning area. P-778 proposes to renovate these existing spaces and construct an approximately 17,000 sf (1,580 sm) addition and approximately 2,300 sf (214 sm) of new covered cleaning area.

[4] The number of dependents is estimated using a general formula provided by the MCB Hawaii Family Housing Department: 1.5 dependents per married Marine; the marriage factor is 45 percent.

[5] *UFC 4-010-01, DoD Minimum Anti-Terrorism Standards for Buildings* was implemented in 2004 to minimize mass casualties from terrorist attacks on DoD buildings. Major strategies include, but are not limited to: maximizing standoff distances, maintaining unobstructed space, and incorporating structural features into building design to prevent building collapse and resist blast effects.



Grow The Force Environmental Assessment	MILCON Project Sites	**Figure 2**

Eight existing temporary modular armories, which are located to the east and south of Building 4053, would be relocated elsewhere on the base at sites to be determined at a later time. The proposed armory addition conforms with the current MCB Hawaii Draft Plus Up Development Plan (July, 2010). The proposed site plan for P-778 is shown in Figure B-2. Grassed landscaping is included in the project. A temporary landscape irrigation system would also be installed to establish vegetation growth.

Installation of water, power, lighting, sewer, and telecommunication systems are included in the proposed project budget. In addition, fire protection, public address, mass notification, and intrusion-detection systems would be included in the upgrade.

2.1.1.2 P-842 – Consolidated Aid Station and Rehab Clinic

The current aid stations provide acute and chronic care to over 4,400 Marines at MCB Hawaii - Kaneohe Bay. The aid stations are currently located in converted BEQ facilities that are over 50 years old and are deteriorated and inadequate. The buildings have spalling concrete (flaking or peeling of the concrete surface), inoperable windows, inadequate ventilation and climate control, deteriorated electrical and plumbing systems, and do not provide enough space for the aid station function. The layout and design of these facilities do not support cost-effective upgrading and renovation, and are beyond economical rehabilitation; therefore, they have been programmed for demolition.

MILCON P-842 would provide a permanent, low-rise, aid station and medical clinic that is approximately 19,000 sf (1,765 sm) in size. The project site is located at the corner of Selden Street and Harris Avenue. Figure B-3 shows the location of P-842. The demolition of six deteriorated facilities (which include the existing aid stations—Buildings 1056, 1057, 1058, 4011, and 4021) and connecting covered walkways (1162, 1163 and 1164) are included in this project. The demolition plan for these structures is shown in Figure B-4. The demolition of these structures would clear space and prepare the site for construction of the proposed new Consolidated Aid Station.

Consolidation of the aid stations would increase the medical treatment options available to garrisoned Marines and would provide the medical staff with an adequate, modern, and efficient facility to meet all mission requirements associated with the increased number of Marines at MCB Hawaii - Kaneohe Bay. The new aid station would provide two classrooms, a conference room, a medical library, patient-physician consultation rooms, private examination rooms, locker rooms, and administrative and supply storage areas. A treatment area for acute trauma, heat stress, and other casualties requiring immediate attention would also be provided. The project would consolidate the Regimental and Battalion Aid Stations (the only acute care facility for the base) for the 1/3, 2/3, 3/3, 1/12 and the 3D Radio Battalions. The aid stations also support the Combat Assault Company and a Headquarters Element. The general site plan for the Consolidated Aid Station is shown in Figure B-5.

The site would be graded and existing utilities relocated. The facility would have a reinforced concrete foundation floor on structural fill and be of concrete or masonry construction that would match adjacent buildings. Adequate building insulation would supplement the efficiency of the

heating, ventilation, and air-conditioning (HVAC) systems. Fire protection, alarm, electrical (including primary and secondary distribution) and telecommunication systems would also be included in the new facility. Site improvements include paved parking, directional signs, sidewalks, exterior site and building lighting, grading, and landscaping. Storm water controls would also be included. Building access and accommodations for injured and disabled personnel would be integrated into the design.

2.1.1.3 P-847 – Artillery Battery Complex

With the addition of the new Echo Firing Battery, the 1/12 currently uses temporary tension-fabric structures to store the unit's armaments, while using a former gun-storage building as an automotive shop. Use of the tension-fabric structures and the gun-storage building was intended to be temporary. As such, the current configuration is not adequate to meet the unit's long-term needs. An adequate and efficiently configured Artillery Battery Complex is required to accommodate the new battery.

P-847 proposes to construct a new heavy gun storage building and a new automotive organizational shop and to renovate buildings 5000, 5001 and 5011 for use as modern heavy gun storage buildings and a modern heavy gun shop. A paved lot for additional parking is included as part of new construction. Figure B-6 shows the project locations for structures associated with P-847 and the site plan for the Artillery Battery Complex is shown in Figure B-7. The implementation of this project would provide an adequately configured gun-storage facility and new privately-owned vehicle (POV) parking for 70 vehicles at the location of the existing 1/12 Artillery Battery Complex.

As part of this project, existing buildings 5008, 5009, and 5031 would be demolished and three existing temporary fabric tent structures would be removed. The lot would be slightly graded to convey storm water runoff into a below-grade storm water detention strip, where it would be retained. Connections to existing wastewater service, sewage pump stations, and force mains would be established.

The project would also construct a new two-story Company Command Post on Mōkapu Road, across from the Artillery Headquarters building (Building 1027). The command post would provide an open administration area for 12 persons, six private offices, storage, restrooms/showers, and mechanical/utility spaces. POV parking for 38 vehicles would be provided at the command post site. A below-grade storm water detention strip would be incorporated to address runoff from the parking lot. The site plan for the Company Command Post is shown in Figure B-8.

Site and building utility connections for water/fire and sanitary and storm sewers would be included. Information systems would include telephone, voice and data communications, local area network (LAN), and cable television (CATV). Site improvements would include paved parking, sidewalks, earthwork (fill/grading), and landscaping.

2.1.1.4 P-852 – 3D Radio Battalion Complex

The 3D Radio Battalion is currently housed in facilities at MCB Hawaii - Kaneohe Bay that are too small to support the additional Marines and expanded mission associated with the GTF effort. Further, these facilities are poorly configured to efficiently support their operations. The Radio Battalion was downsized earlier this decade. Accordingly, the facility footprint was reduced to match the basic facility requirement and, in the process, the existing facilities were adapted to these requirements. Consequently, space is being used for purposes which it was not designed (e.g., facilities that were designed to house sensitive/classified information [sensitive compartmented information facilities (SCIF)] are being used to accommodate storage and headquarters functions).

The recently commissioned Company B was added to the 3D Radio Battalion at MCB Hawaii - Kaneohe Bay. Because the 3D Radio Battalion had reduced its facility footprint, it no longer has excess space to accommodate the additional Marines and their expanded mission.

P-852 proposes to construct an approximately 16,500 sf (1,533 sm) integrated, low-rise complex for the 3D Radio Battalion to support the GTF increased end-strength. Approximately 9,500 sf (882 sm) of the complex would comprise the Battalion Headquarters, Company A and B offices, a high-security classified storage vault, an unclassified storage room, a Trojan vehicle storage area, and male and female showers and restrooms. In addition, a connected 7,000 sf (650 sm) Operational Storage Facility would be constructed to accommodate the growing battalion's storage requirements. The complex would be located adjacent to the 3D Radio Battalion's existing facility, at the southern end of Harris Avenue, to create a single compound, thereby increasing operational efficiency and simplifying security and infrastructure requirements. Figure B-9 shows the proposed location of the 3D Radio Battalion Complex. P-852 would provide adequate space and properly configured facilities to support current functions, while the existing facility would be used to support the expanded functions being performed by the additional personnel. Figures B-10 shows the proposed site plan for P-852.

The building would be constructed of reinforced CMU or concrete exterior walls supporting a steel-framed roof. The project would also have mechanical amenities that include fire suppression and alarm systems and humidity control for HVAC systems designed for communications equipment. Provisions for utility upgrades have been included. For instance, a new ductile iron 20-inch waterline would be installed and rerouted to replace the waterline that currently traverses the site. Power throughout the building would be provided by an underground electrical distribution system. The overhead telecommunications lines that are now routed through the site would be relocated underground. A wastewater pump station would be installed. The site would be graded for positive drainage and bioswales[6] would be provided. Perimeter security, parking lot, and walkway lighting would use downward-shielded exterior lighting systems.

[6] Bioswales are gently-sloped, vegetated ditches (or swales) that convey and partially treat stormwater, by removing silt and pollution from surface runoff.

2.1.1.5 P-858 – Multi-Story BEQs, Command Headquarters

P-858 would construct a new multi-story BEQ and a Command Headquarters facility. The project also includes the demolition of buildings 4010, 4017, 4019, 4020, 6705 to clear land area for construction of the BEQ and Command Headquarters, construction of a parking structure and upgrade of buildings 5070 and 5071. Figures B-11 and B-12 show the project sites associated with P-858. MCB Hawaii - Kaneohe Bay is currently deficient in the number of required bachelor living spaces. A facility inventory indicates that MCB Hawaii - Kaneohe Bay currently has 4,540 living spaces for unaccompanied personnel, a 1,978-living-space deficit from the 6,518-space requirement, which includes the living spaces needed to support the GTF personnel and other planned personnel increases.[7]

To help reduce the deficit, ease the critical need for additional living space, and support the GTF-generated increase in billeting requirements, MILCON P-858 proposes to construct a permanent, multi-story BEQ facility at MCB Hawaii - Kaneohe Bay. The new BEQ would have an approximate gross floor area of 54,000 sf (5,017 sm), providing a community service core area and 107 rooms with semi-private baths in the standard USMC Bachelor Housing 2+0 room configuration. The new BEQ would provide housing for 214 junior enlisted persons (E1 to E4).

Also included in this project is a new 10,400 sf (966 sm) Command Headquarters and a multi-level parking structure. Five command post facilities—buildings 4010, 4017, 4019, 4020—and building 6705 (totaling 14,187 sf [1,318 sm]) would be demolished to facilitate construction of the BEQ and Command Headquarters. The buildings to be demolished are shown on Figure B-13. Space constraints in the immediate vicinity of the new BEQ and Command Headquarters and the resultant inability to meet AT/FP stand-off distances preclude developing a surface parking lot near these facilities. Thus, a multi-story parking structure is proposed across Harris Avenue from the BEQ and Command Headquarters. The site plan for the BEQ, Command Headquarters and parking structure is shown on Figure B-14.

Mechanical systems would include plumbing, fire protection and HVAC systems. Electrical systems would include fire alarm and energy management control systems (EMCS). Information systems would include telephone, voice and data communications, LAN, and CATV. A telecommunications infrastructure room would be provided on each floor, to house communications and security system infrastructure.

Supporting facilities work would include site and building utility connections (water/fire, sanitary and storm sewers). Paving and site improvements would include access roads, fire access lanes, sidewalks, outdoor recreation facilities, courtyards, equipment and bike shelters, earthwork, and landscaping.

In addition to the proposed new construction, P-858 also proposes to install a central air conditioning (A/C) system in existing BEQs 5070 and 5071. Central A/C was not integrated into

[7] From Barracks Requirement Analysis dated November 2009. The 6,518 living space requirement represents a 100 percent requirement and no deduction for deployed units.

the BEQs' original design and, to contend with the humidity and warmer temperatures that summer conditions bring to Hawai'i, building residents have installed individual A/C units in their windows. The A/C units are frequently installed improperly, leading to broken windows and inadequate sealing around units. This causes inefficient A/C operation and contributes to high electricity consumption. Improper installation has also caused infiltration of outside precipitation and dust, which continues to damage the interior of the BEQs. Additionally, the buildings' electrical systems cannot support the increasing number of window units.

The new A/C systems would include a new CMU enclosure for a cooling tower and pumps, variable refrigerant volume units, and DDC. To support the new air conditioning system, new transformers and main distribution panels would also be installed. Existing louvered windows would be replaced with fixed-glass windows, in compliance with AT/FP requirements. Replacing the windows would result in a reduced window area, which would be filled with impact-resistant composite panels. To achieve LEED certification, sustainable features would include battery-storage photovoltaic systems, high-efficiency windows, and water-conserving plumbing fixtures for toilets.

2.1.1.6 P-885 – Marine Wing Support Squadron (MWSS) Headquarters

The MWSS provides ground support to aviation operations for the Marine Corps Air Station (MCAS) at MCB Hawaii - Kaneohe Bay. Three buildings house most of the MWSS operations; buildings 373, 388, and 1650, which comprise the MWSS compound. Buildings 373, 388 and 1650 were built in 1941, 1944, and 1975, respectively, and were configured to support an MWSS that was sustained at the base until the late 1990s. Portions of the buildings and compound are also currently used by the 3D Radio Battalion, Marine Aviation Logistics Squadron (MALS-24), and CLB-3. Figure B-15 shows the various project sites associated with P-885.

P-885 proposes to renovate buildings 373, 388, and 1650 to adequately support the new MWSS detachment to be assigned to MCB Hawaii - Kaneohe Bay. Renovations would provide a centralized MWSS headquarters, with facilities to accommodate engineering, motor transport, aviation operations, communications, and supply operations. The new facilities would provide office space, classrooms, maintenance bays, common areas, training areas, a communication equipment storage area, a dispatch facility, and areas to deliver, store, and dispose of HAZMAT elements. Modernization of its facilities would consolidate MWSS operations into a single compound and allow the MWSS to function efficiently as a unit. Refer to Figure B-16 for a site plan of the proposed MWSS Headquarters.

Additionally, P-885 would construct a new CLB-3 facility and a new Communications Shop to accommodate displacement of the CLB-3 functions currently housed in buildings 388 and 1650. The site plan for the new CLB-3 facility is shown in Figure B-17 and the CLB-3 Communications Shop is shown in Figure B-18.

Separately, P-852 - 3D Radio Battalion Complex, described above and slated for concurrent construction, would consolidate all 3D Radio Battalion operations into a single complex. An element of P-885 would construct a motor pool facility at the new 3D Radio Battalion Complex to replace the facilities to be displaced by the new MWSS Headquarters and would support

consolidation of the 3D Radio Battalion. Figure B-19 shows the site plan of the proposed motor pool facility for the 3D Radio Battalion.

Other improvements would include site lighting, paved POV parking, equipment-line vehicle parking, access roads, sidewalks, a storm water drainage system, earthwork, fencing, landscaping, and signage. On-site utilities included as provisions to this project include electric, water, sewerage, telecommunications, and fiber optics.

2.1.2 Increase in Personnel

The proposed action supports an increase in the number of active-duty personnel at MCB Hawaii - Kaneohe Bay by 579 persons, plus an estimated 391 dependents. Table 1 shows the incremental increase of troops from FY2008 through FY2012 and beyond, and the units to which they belong.

Table 1. Number of Military Personnel to be Added to Existing Units At MCB Hawaii - Kaneohe Bay

Unit	FY08	FY09	FY10	FY11	FY12	FY13 or beyond	Total
MWSS					93	126*	219
3D Radio	67	74					141
3d Marines	16		57				73
E2/12	146						146
Total	**229**	**74**	**57**	**0**	**93**	**126**	**579**

*The 126 persons from the MWSS are projected, but not yet approved.

As shown in Table 1, a portion of the additional Marines under the GTF initiative is already stationed at the base. These additional Marines are being accommodated in temporary on-base facilities. The proposed action would construct new or renovate existing facilities to remedy the inadequate housing, training, aid, and support facilities for the increased number of Marines aboard the installation.

2.2 SELECTION CRITERIA FOR ALTERNATIVES

Alternatives evaluated in this EA are those that reasonably support a comprehensive, long-term plan for permanently addressing the proposed increase to existing USMC units (basing action), while effectively sustaining the installation's carrying capacity and operations. Alternatives that did not satisfactorily meet minimum project objectives and criteria were eliminated from further detailed study.

Criteria used to determine the range of reasonable alternative basing scenarios are as follows:

1. Mission Support

Reasonable alternatives must promote, support, or be consistent with the national security, defense, and USMC mission requirements. Alternatives must support daily operations and

functions and should promote or enhance the mission operations of Marine Corps units. Alternative basing scenarios should not cause unnecessary delays or disruptions in current installation mission or function.

2. Economic Feasibility
Reasonable alternatives must be achievable for a reasonable cost, compared to other alternatives. Alternatives that are significantly more expensive to implement should have a proportionally increased benefit; those that do not were eliminated from detailed evaluation.

3. Sustainability
Reasonable alternatives must not hinder the sustainability of an installation and its mission. Basing alternatives that limit existing or future operations or training, without the possibility of mitigation, were not considered reasonable and were eliminated from detailed evaluation.

2.3 ALTERNATIVES EVALUATED

2.3.1 Alternative A: No Action

Under the No Action alternative, the six MILCON projects to support the additional personnel at MCB Hawaii – Kaneohe Bay would not be implemented. The GTF personnel would continue to be housed in temporary and inadequate facilities that do not meet mission and operational requirements. Consequently, an underperformance in the USMC's support in current and future domestic and international conflicts could result. The ability to maintain troop training and readiness for the USMC's missions would continue to be challenged. MCB Hawaii - Kaneohe Bay would continue to be short of adequate living spaces and be deficient in facilities to efficiently train its personnel.

Under the No Action alternative, the purpose of and need for action would not be met; fortification of the USMC as a "total force" would not be accomplished.

2.4 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

These alternatives were considered, but eliminated from further consideration because they did not fulfill the minimum objectives and criteria to achieve the GTF goal of balancing the war-fighting capability of the USMC. They did not meet the immediate need to provide adequate training and continued mission readiness or create more efficient operational processes.

2.4.1 Alternative B: Relocate Proposed MILCON Projects to Other MCB Hawaii Installations on O'ahu

MCB Hawaii manages the installations and natural resources on approximately 4,500 acres throughout the island of O'ahu, including Camp H.M. Smith, Kaneohe Bay, Marine Corps Training Area Bellows (MCTAB), Manana Family Housing Area, Pearl City Annex, and the Puuloa Range Complex.

However, none of the six MILCON projects encompassed by the EA can feasibly be built off-base. To support the GTF initiative and mission goals effectively, all proposed projects must be located at MCB Hawaii - Kaneohe Bay due to the proximity of the existing units tied to the GTF personnel.

Establishing the 3D Radio Battalion Complex at the proposed site would consolidate ground forces on the eastern portion of the base, for more efficient operational processes. The goal is to locate the complex close to training facilities and the units it serves. Constructing the complex at a different MCB Hawaii installation would defeat this purpose.

Additionally, 16,500 sf (1,533 sm) of space is required for the complex. Due to this, the three possible off-site locations that are able to accommodate this requirement are limited to MCTAB, the Pearl City Annex, and Camp Smith; however, other issues preclude these locations from further consideration. MCTAB does not have the wastewater facilities to support the complex and would require the construction of a new leach field. Security measures at the Pearl City Annex are not adequate to support the mission requirements of the 3D Radio Battalion Complex. The only available space at Camp Smith is where the horse stables are located. However, the mountainous terrain, combined with the severe lack of parking, would make it a difficult area for relocation of the complex. Maneuvering vehicles and equipment through the difficult terrain at Camp Smith would prove challenging and would not be an efficient use of resources.

A new MWSS detail is slated to be stationed at MCB Hawaii - Kaneohe Bay. The MWSS Detachment would provide aviation ground support to Marine Corps Aviation commands, units, and groups; therefore, its facility must be located close to the MCAS runway. Locating the MWSS on a different MCB Hawaii installation without an air station would not satisfy the operational requirements for this unit.

Equipment stored at the Artillery Battery Complex is used for daily operations and training by the Artillery Battery unit stationed at MCB Hawaii - Kaneohe Bay. Relocating the proposed Artillery Battery Complex would result in storing that equipment off base. Storage at an off-base location would limit the unit's ability to efficiently maintain its equipment and properly train its personnel.

The armory addition would construct an extension of the existing on-base armory. The construction of an entirely new off-base facility to store and maintain arms would be costly and operationally inefficient because the units that maintain the arms, the 1/3, 2/3, and 1/12, are all stationed at MCB Hawaii - Kaneohe Bay.

Land requirements for the construction of the proposed BEQ cannot be accommodated at any other MCB Hawaii installation. Additionally, as this BEQ would house Marines assigned for duty at MCB Hawaii - Kaneohe Bay, on the windward side of O'ahu, it would be operationally inefficient and less cost-effective to have Marines commute every day from Camp Smith, located on the leeward side of O'ahu. Further, according to the base master plan, the operational strategy is to build BEQs adjacent to their command headquarters for the purpose of consolidating units to reinforce unit integrity, cohesion, and functional relationships.

The proposed consolidated aid station co-locates the existing Battalion aid stations and the existing Regimental aid station for the 1/3, 2/3, 3/3, 1/12 and 3D Radio Battalion of MCB Hawaii - Kaneohe Bay. Co-locating the aid stations would improve coordination and collaboration, thus optimizing service to support the physical readiness and health of active-duty personnel at MCB Hawaii - Kaneohe Bay. Because it is the only acute-care facility for the installation, it is critical that the regimental aid station be located close to the operational and training facilities where accidents and injuries are likely to occur. Therefore, an off-base location for this facility is not feasible.

2.4.2 Alternative C: Internal Reorganization of the U.S. Marine Corps

As an alternative to the GTF initiative, the USMC could internally reorganize its operations and unit allocation to address the immediate need for increased personnel; however, this alternative would not meet the "total force" consideration goals. Reorganization would be costly and time-consuming and would threaten the USMC's ability to maintain its current mission. It would further strain the USMC and exacerbate the existing challenges in meeting training requirements. It is essential that existing force structure and organization are maintained. Thus, changing the force structure and reorganizing the USMC could result in operational delays or disruptions, and has the potential to further complicate, retard, and jeopardize the overall USMC mission. For these reasons, reorganization of the USMC was eliminated from further consideration.

2.4.3 Alternative D: Alternative Locations Nationwide

To expeditiously address the need to provide a sufficiently manned, well-trained, and properly equipped USMC that is capable of dealing with emerging challenges such as the Long War, the USMC is focusing manpower increases and providing Marines possessing the appropriate skill sets to existing units, particularly in the MEFs. These units are already established at USMC bases nationwide; therefore, basing locations other than those contained in the proposed action are not reasonable because they would not meet the purpose and need for the proposed action.

2.4.4 Alternative E: Leasing Off-Base Facilities

Alternative E would be to lease off-base facilities to accommodate personnel housing and operational needs associated with the additional Marines to be stationed at MCB Hawaii - Kaneohe Bay. While there are some facility types that may be available for lease in the private sector, they do not support the need for unit integrity, security, and span of control for these new units and would negatively impact the mission. Construction projects that propose to consolidate or make repairs to existing facilities cannot feasibly be situated off-base due to operational requirements. The MWSS, for instance, must be located close to the Marine Air Group 24 (MAG-24) and the MCAS, and due to this, leasing off-base facilities to house MWSS operations would not fulfill operational requirements.

Leasing an off-base facility to house personnel was considered as an alternative to building new BEQs on base. However, the USMC prefers to house its junior enlisted personnel together, as a unit. This living arrangement enhances unit integrity, cohesion, and troop readiness. No commercial facilities exist within the region that could satisfy the USMC's preference to house the personnel together, as well as meet the housing requirements for its enlisted personnel, which

include meeting AT/FP requirements. Other concerns in using off-base facilities for other MILCON projects associated with the proposed action include security, connectivity, unit integrity, and the ability to meet the mission of the unit. In addition, leasing off-base facilities is not considered a long-term solution for addressing the increase in personnel stationed MCB Hawaii - Kaneohe Bay. For these reasons, leasing off-base facilities is not considered a reasonable alternative and was eliminated from further study.

2.4.5 Alternative F: No New Construction; Utilize Modified/Renovated Facilities to Accommodate the GTF Initiative

Under Alternative FG, new facilities would not be built to accommodate the GTF personnel increase. Instead, to support the GTF efforts, existing on-base structures and buildings would have to be modified and/or renovated to accommodate the personnel increase at MCB Hawaii - Kaneohe Bay. However, there is not enough available/vacant facilities at MCB Hawaii – Kaneohe Bay to accommodate the personnel increase. Locating GTF personnel in existing facilities would displace other functions that would then have to find space in other facilities in which to relocate. Use of existing facilities would limit location options, which could hamper efforts to consolidate unit functions thereby decreasing efficiency and unit cohesion. Further, it may be possible that existing facilities cannot be ideally configured to accommodate some of the GTF functions, which could impede efficient unit operation. This alternative would not satisfactorily support the increase in Marines at MCB Hawaii - Kaneohe Bay and could be less cost-efficient than new construction. Due to these reasons, this alternative would not satisfy the purpose and need of the proposed action and was eliminated from further study.

At present, there is a deficit in living space aboard MCB Hawaii - Kaneohe Bay. There are not enough existing facilities available that can be modified into living quarters that would provide for the increase of personnel expected from the new mission. A facility inventory indicates that the base currently has 4,540 living spaces—a 1,978-living-space deficiency from the 6,518-space requirement. Construction of the new BEQ is required to address this shortage.

3.0 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes: (1) the environmental setting and baseline conditions of the existing environmental resources within and adjacent to the various project areas encompassed by the proposed action and No Action alternatives; and (2) the potential impacts on these resources that could result from the proposed action and No Action alternatives. For the purposes of this assessment, the multiple sites encompassed by the MILCON projects have been delineated into three project areas, as shown in Figures 3 through 5.

3.1 CLIMATE AND WEATHER

The Hawaiian Islands have a maritime/tropical climate, characterized by stable temperatures and mild weather throughout the year. Hawai'i experiences two distinct seasons, summer (May to October) and winter (November to April). Dominant summer season conditions comprise intense solar radiation, warmer temperatures, and the nearly-continual presence of trade winds (east-northeasterly winds). The winter season is characterized by cooler temperatures, interrupted trade wind patterns, and higher levels of rainfall. Trade winds occur on average 75 percent of the time, annually, with a winter average of about 45 percent and a summer average of about 90 percent. Average wind speed is about 14 miles per hour (mph) or 22.5 kilometers per hour (kph).

The prevalence of trade winds typically results in cooler temperatures and higher annual precipitation in Windward areas of O'ahu, as compared to Leeward O'ahu. All project areas are within MCB Hawaii - Kaneohe Bay, located in Windward O'ahu. Weather data for the area shows prevailing winds to be from the east-northeast, averaging about 11.5 mph (18.5 kph) and average annual precipitation of approximately 40 inches (in) or 100 centimeters (cm), per year. Average temperature on O'ahu is generally between 70 and 80 degrees Fahrenheit.

3.1.1 Potential Impacts

Project actions are determined to have a significant adverse environmental impact if noticeable climatic changes occur and are attributable to construction or operation of the proposed facilities.

3.1.1.1 Proposed Action

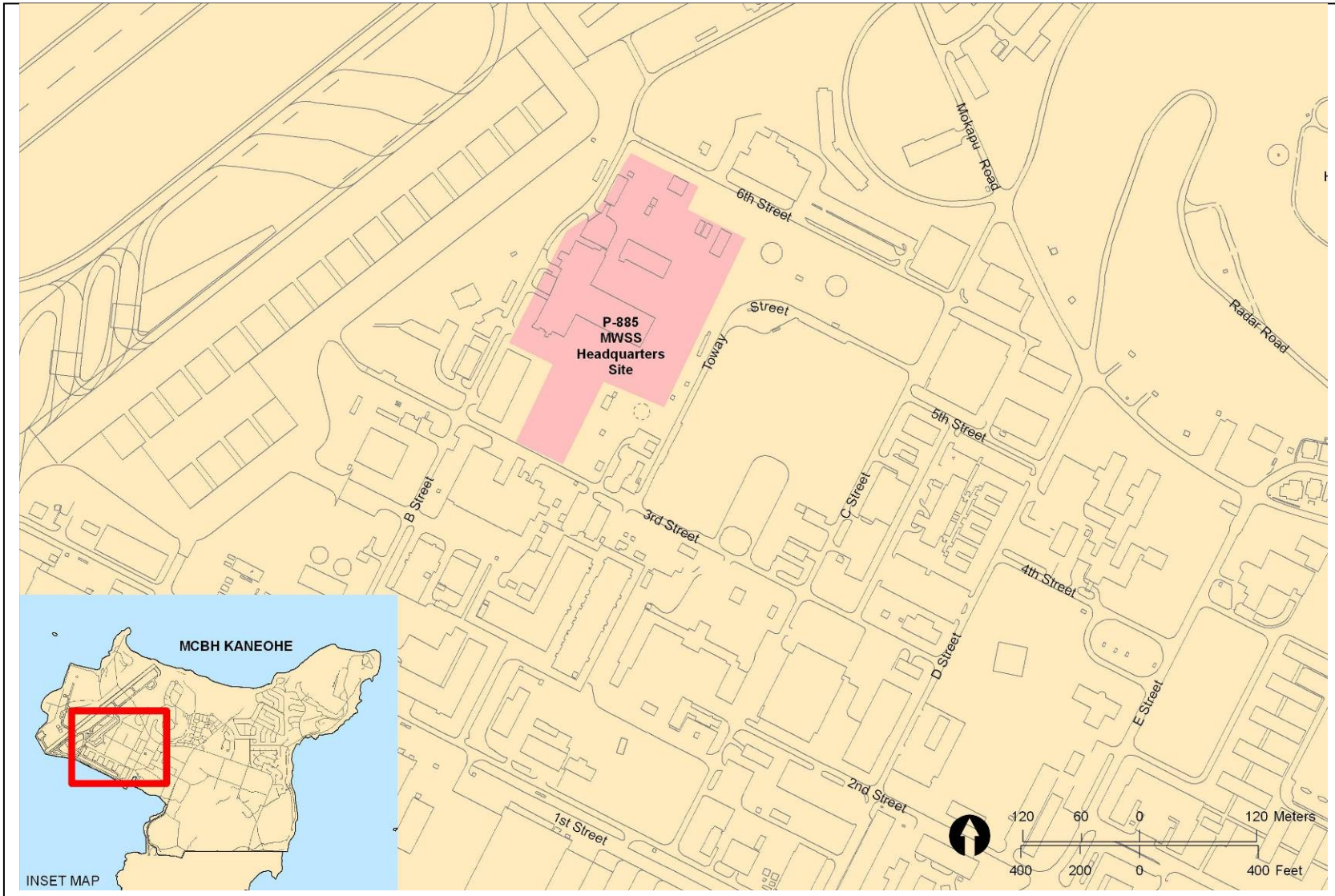
No impacts on climate are anticipated to result from implementing the proposed action.

3.1.1.2 No Action

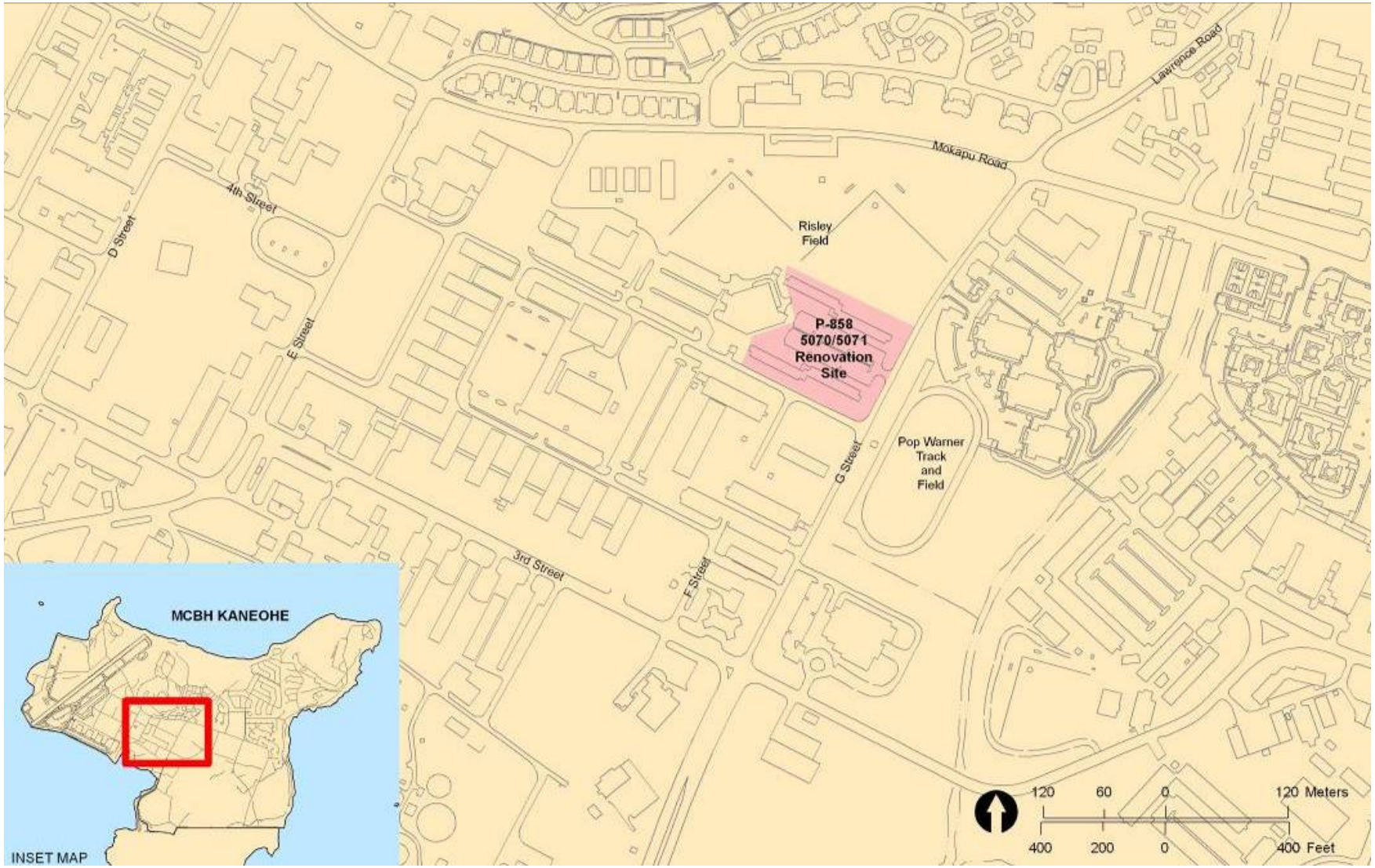
The No Action alternative would not result in impacts on climate.

3.1.2 Mitigation Measures

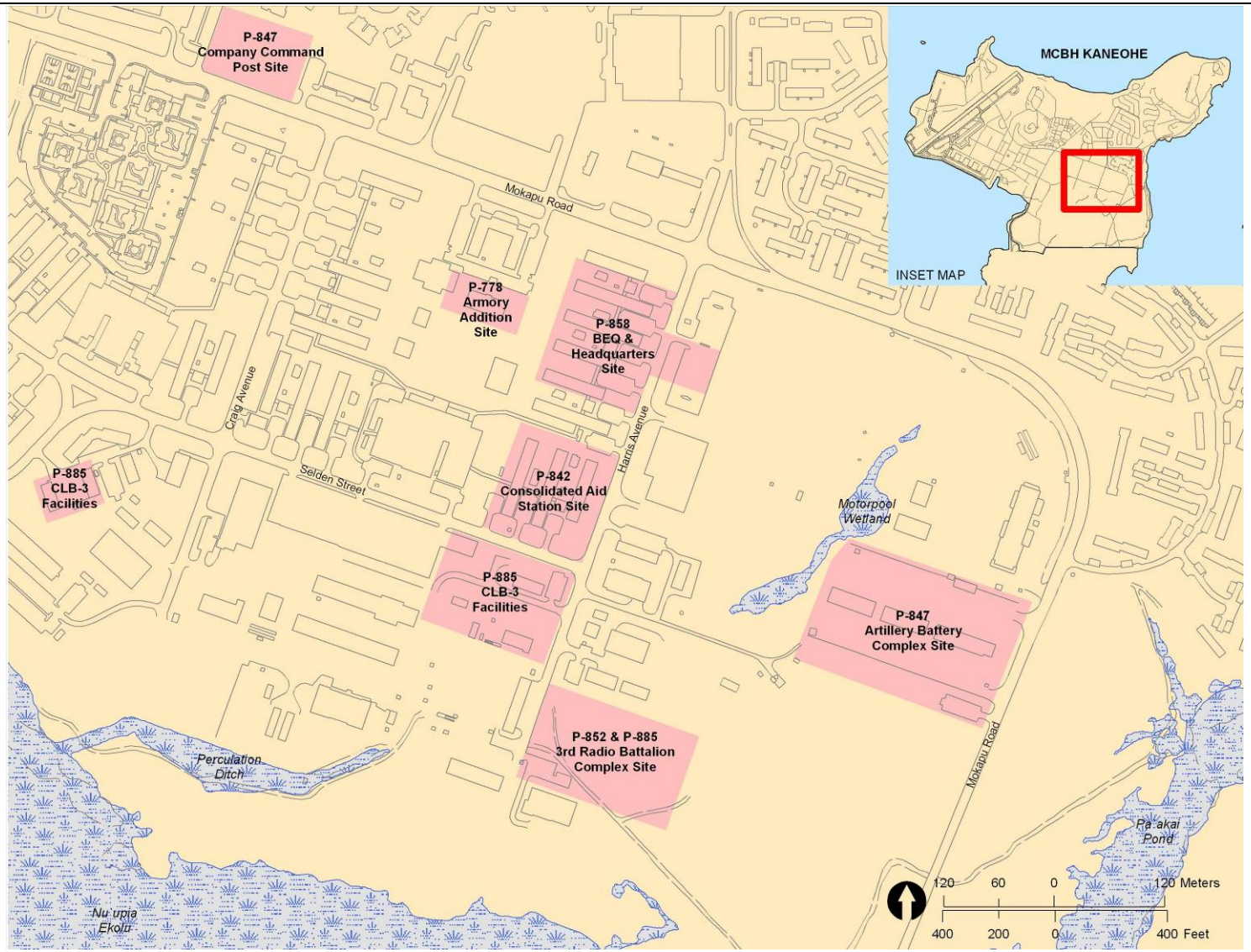
Mitigation measures are not warranted or proposed.



Grow The Force Environmental Assessment	Project Area A P-885 (MWSS Compound)	**Figure 3**



Grow The Force Environmental Assessment	Project Area B MILCON P-858 (BEQs 5070 & 5071)	**Figure 4**



Grow The Force Environmental Assessment	Project Area C MILCON P-778, P-842, P-847, P-852, P-858, P-885	**Figure 5**

3.2 AIR QUALITY

Ambient air pollution concentrations are regulated under the federal Clean Air Act (CAA) regulations found in 40 CFR Part 50 and under the State of Hawai'i Ambient Air Quality Standards (AAQS) found in Hawaii Administrative Rules (HAR) Title 11, Chapter 59. Federal AAQS are grouped into primary and secondary standards. Primary standards are intended to protect public health, with an adequate margin of safety, while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, animals, wildlife, man-made materials, visibility, climate, and economic values. State AAQS are intended to "protect public health and welfare and to prevent the significant deterioration of air quality."

The State Department of Health (DOH) operates a network of air quality monitoring stations across the state. In 2010, DOH had five monitoring stations on O'ahu, down from six in 2009. Recent data from the air quality monitoring stations reflect the generally good air quality in the City and County of Honolulu. In 2009, the State of Hawai'i was in attainment of all federal AAQS. Within the base, sources of airborne emissions generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators. There are no identified sources of air pollution on MCB Hawaii - Kaneohe Bay that would result in non-compliance with State standards. There is no difference in air quality among project areas.

3.2.1 Potential Impacts

Project actions are determined to have a significant adverse environmental impact on air quality if the following consequences occur: potential air emission concentrations from the implementation of a proposed action, combined with the ambient concentrations for criteria pollutants, exceed State or Federal AAQS or exposes the public (especially areas that house sensitive receptors [e.g., children, the elderly and the infirm] such as schools, day-care centers, hospitals, retirement homes, convalescence facilities, and residences) to substantial pollutant concentrations that are above acceptable health-effects levels.

3.2.1.1 Proposed Action

Air quality within the vicinity of the various project areas would likely be affected temporarily during the construction period. Emissions and dust would be generated by construction equipment and vehicles. Dust displaced during construction-related activities would increase the amount of particulate matter in the air. However the impacts these emissions would have on air quality are not expected to be significant, due to the emissions' short-term nature. Further, implementation of construction site Best Management Practices (BMPs) would minimize emissions and dust. BMPs include proper maintenance and management of construction vehicles and equipment and standard dust control measures, such as erecting dust screens around the construction site and dust suppression of exposed soils. Dust can be further minimized by landscaping areas of bare earth as soon as practicable. One project site, the P-847 Company Command Post for the Artillery Battery Complex (Project Area C), is located near family housing and an elementary school, both of which are considered sensitive receptors. These areas may experience a temporary impact on air quality during the construction phase; however, implementing BMPs and other dust control measures would minimize potential impacts to

insignificant levels. Any air permits, as required by DOH, would be obtained for construction-related activities, including operation of a concrete crusher, if applicable.

Off-site construction-related impacts could result from the operation of concrete and asphalt batching plants, which emit particulate matter and gaseous pollutants. However, off-site concrete and asphalt batching plants require DOH permits pursuant to state regulations. Issuance of necessary permits is contingent upon the ability of the batching plants to continuously comply with both emissions and ambient air quality standards.

The proposed action would increase the base's population, which would inherently increase vehicular activity at MCB Hawaii - Kaneohe Bay. Motor vehicles are considered an "indirect source" of air pollution, as defined in the federal CAA. However, long-term air quality impacts due to mobile sources associated with the proposed action are expected to be insignificant due to the overall low traffic volumes at the base and improved vehicular emissions controls. The proposed action would construct administrative space, living quarters, warehousing/storage spaces and shop space, none of which are expected to be a significant stationary source of emissions. Thus, the proposed action would result in no significant long-term impacts on air quality.

3.2.1.2 No Action
The No Action alternative would not change the air quality at MCB Hawaii - Kaneohe Bay.

3.2.2 Mitigation Measures
Mitigation measures are not warranted or proposed.

3.3 NOISE
The impacts of sound on the environment are determined by several factors, including sound level (loudness), duration of exposure to the noise, frequencies of the sound, and variations or fluctuations in noise levels during exposure.

For land use planning purposes, the base master plan—the *Marine Corps Base Hawaii, Final Master Plan, Volume 1 - Land Use Plan* (NAVFAC Hawaii, 2006)—delineates three noise zones that are defined by Ldn sound level contours. Ldn is an average sound level, represented in decibels (dB), which represents an average-day or busy-day 24-hour period, with sound levels of nighttime noise events emphasized by adding a 10 dB weighting. These Ldn sound level contours are developed through noise studies conducted through the Air Installation Compatible Use Zones program. Table 2 describes the three Noise Zones.

Table 2. Description of Designated Noise Zones at MCB Hawaii - Kaneohe Bay

Noise Zone	Criteria/Description
1	Areas with less than 65 Ldn; essentially areas of no impact
2	Areas with an Ldn between 65-74; moderate impact where some land use controls are needed
3	Areas with an Ldn of 75 or greater; the most-severely impacted areas, requiring the greatest degree of land use controls

PROJECT AREA A
Within Noise Zone 2, Project Area A is located in an area with an Ldn ranging from 65 to 70 dB. Of all the project areas, it is the closest to the MCAS runway. Located just east of the runway, it is often exposed to aircraft noise, which accounts for the slightly elevated sound levels.

PROJECT AREA B
Within Noise Zone 1, Project Area B is located in an area with an Ldn ranging from 55 to 60 dB. Ldn levels of 55 to 65 are typical of urbanized areas with medium to high levels of activity and street noise. It is far enough from the airfield that aircraft-related noise is not significant.

PROJECT AREA C
Within Noise Zone 1, Project Area C is located in an area with an Ldn of less than 55 dB. Ldn levels of 55 or less are typical of quiet rural or suburban areas. Noise within the vicinity of Project Area C consists largely of motor vehicle noise and general human activity.

3.3.1 Potential Impacts
Project actions are determined to have a significant adverse environmental impact on noise if construction-related or on-site operational noise levels exceed applicable regulations and guidelines, such as those contained in DoD's Operational Noise Manual (USACHPPM, 2005).

3.3.1.1 Proposed Action
Personnel living in family and bachelor housing facilities northeast of Project Areas B and C may temporarily be subjected to elevated, but not detrimental, noise levels associated with the construction phase of the proposed action. One site in Project Area C is located adjacent to family housing and an elementary school. Project Area A is within a land use zone that would not be significantly affected by construction or renovation projects because it is already located in a generally higher noise zone of the base.

Reducing construction-related noise to inaudible levels at any of the project sites is not a realistic goal. However, to attenuate the short-term noise effects on sensitive receptors near to Project Areas B and C (i.e., the elementary school and family housing), construction site BMPs would be implemented, properly-muffled construction equipment would be used, and construction would be conducted in accordance with all applicable noise regulations and time restrictions.

In the long-term, noises associated with daily human activity, including traffic-related noise, are anticipated to increase; however, the anticipated increases would not result in significant impacts

on the existing ambient noise environment. No anticipated long-term adverse impacts on the noise environment are anticipated due to the proposed action.

3.3.1.2 No Action
The No Action alternative would not result in impacts on the ambient noise environment.

3.3.2 Mitigation Measures
Mitigation measures are not warranted or proposed.

3.4 TOPOGRAPHY AND SOILS
Mōkapu Peninsula was formed by volcanic eruptions from four vents, subsequent sea level changes and associated growth of the coral reef, erosion, and alluvial deposits. The resulting geology of much of the peninsula consists of a relatively thin layer of surface soil with an underlying layer of rock and sediments. According to the *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (U.S. Department of Agriculture, Soil Conservation Service, 1972), the soils in the project areas consist of Fill land (FL), Ewa silty clay loam (EmB), and Mamala stony silty clay loam (MnC).

Shoreline areas of Mōkapu Peninsula begin at a topographical elevation of mean sea level (msl) and rise to approximately 600 ft (183 m), at the top of Ulupa'u Crater, the highest point on the peninsula. Other prominent geological features on the base are Pyramid Rock, located at the northwestern tip of the peninsula, and Pu'u Hawai'iloa, an approximately 400 ft (122 m) volcanic cone near the center of the base. Developed areas of MCB Hawaii - Kaneohe Bay are generally flat, with elevations ranging from msl to about 20 ft (6.1 m) above msl. Typical of central portions of the base, the topography of the various project areas is generally flat.

PROJECT AREA A
The soil occurring at the site of the proposed MWSS Headquarters is classified as FL. FL is typical of land developed for airports on O'ahu. Areas consistent with this soil-type are usually filled with material dredged from the ocean, excavated from nearby areas, or refuse. The surrounding compound has an average elevation of 10 ft (3 m) above msl.

PROJECT AREA B
Existing BEQs 5070 and 5071 are situated at the convergence of three soil series. BEQ 5071 sits on moderately shallow EmB, a series consisting of well-drained alluvial soils, derived from basic igneous rock and occurring in basins and alluvial fans. Its slope ranges from 3 to 6 percent, and its depth to coral limestone is approximately 20 to 50 inches (51 to 127 cm). A portion of the western end of BEQ 5070 sits on MnC. The slope range of this soil is 0 to 12 percent. Present at the surface is a dark, reddish-brown, 8-inch (20 cm), stony, silty layer that consists mostly of small stones and fragments of coral rock. Its subsurface is made up of silty clay underlain by coral limestone and calcareous sand, which occasionally makes the soil mildly alkaline. The soil is less stony at greater depths, and between 8 and 20 inches (20 to 51 cm), the coral limestone and sand become more prevalent. The soil series at the eastern end of BEQ 5070 transitions from MnC to FL. Project Area B has an elevation of approximately 10 ft (3 m) msl.

PROJECT AREA C

The soil in this area is within the MnC series. The elevation of the project sites west of Harris Avenue is 15 ft (4.6 m) msl. Sites east of Harris Avenue are between 10 and 20 ft (3 and 6 m) msl.

3.4.1 Potential Impacts

Project actions are determined to have a significant adverse impact on soils if there is an increase in erosion and transport of soils and sediment off site, particularly if the resulting transport of sediment would cause significant impacts on water quality or aquatic habitats. Project actions are determined to have a significant adverse environmental impact on topography if significant changes are made to the topography resulting from construction associated with the proposed action. Significant topographical changes are those of such a degree that they adversely impact on-site or adjacent land use, infrastructure, or drainage patterns. Topographical changes may include such actions as creating excessively steep slopes that produce unstable ground conditions.

3.4.1.1 Proposed Action

In the short-term, impacts on soils in all project areas could be caused by land-disturbing activities associated with construction or renovation, such as clearing, excavating, grading, and filling. Impacts on soils include erosion and sedimentation. During the construction phase of various projects, exposed soils are susceptible to erosion during heavy rain, which may result in silt runoff. Wind erosion may result in some unavoidable soil loss.

With appropriate implementation of construction BMPs, no significant impacts to soils or topography are expected to result from the proposed construction activities. BMPs may include berms, cut-off ditches, silt fences, vegetative ground cover, dust fences, and soil stabilization. No significant, long-term, adverse impacts on topography or soils are anticipated as a result of implementing the proposed action.

3.4.1.2 No Action

Under the No Action alternative, there would be no GTF-related construction or renovation activities and there would be no short- or long- term impacts on soils or topography within the project areas.

3.4.2 Mitigation Measures

Mitigation measures are not warranted or proposed.

3.5 GROUNDWATER

Groundwater results from the infiltration of water through surface soils and permeable rock materials. It is the principal source of potable water in Hawai'i and occurs in two modes: (1) high-level groundwater that is perched atop low-permeability strata or confined within a dyke system, or as (2) a basal aquifer (Juvik and Juvik, 1998). Mōkapu's thin layer of surface soil, combined with its layer of rock and sediments, provide little depth for groundwater drainage.

Mōkapu Peninsula is underlain by two aquifers: an unconfined, low salinity caprock aquifer above a confined, freshwater basalt aquifer. There are no potable groundwater wells on base because the peninsula sits atop an area known to have brackish basal groundwater. The project areas all share the same groundwater source. Over the years, groundwater recharge has been reduced as storm water runoff has been channelized into an extensive system of box culverts, pipes, and ditches (MCB Hawaii, 2001).

3.5.1 Potential Impacts

Project actions could be considered to have an adverse impact on the existing environment if the basic functions of groundwater systems are altered, if groundwater is contaminated, or the area available for groundwater recharge is significantly reduced.

3.5.1.1 Proposed Action

No significant adverse effects on groundwater quality or groundwater recharge are anticipated due to the proposed action. Construction and renovation projects would not involve deep digging, filling or grading that would breach the caprock aquifer to contaminate groundwater. Furthermore, potable groundwater does not exist at any of the project areas; therefore, contamination of drinking water is not a concern.

3.5.1.2 No Action

The No Action alternative would have no impacts on groundwater.

3.5.2 Mitigation Measures

Mitigation measures are not warranted or proposed.

3.6 SURFACE WATERS

Ocean waters on all sides of Mōkapu Peninsula are State of Hawai'i regulated waters. To the west are the waters of Kāne'ohe Bay, with Kailua Bay to the east. Both of these water bodies are used for recreation and as wildlife refuges. HAR 11-54 Water Quality Standards classifies Kailua Bay and the outer portions of Kāne'ohe Bay as Class A waters. Inner portions of Kāne'ohe Bay are classified as Class AA waters.

Within MCB Hawaii - Kaneohe Bay, surface waters consist of the eight delineated ponds of the Nu'upia Ponds Complex and the Mōkapu Central Drainage Channel (MCDC). A man-made, muddy-bottomed channel approximately 6,235 ft (1,900 meters) long, the MCDC was designed to facilitate rapid flow of storm water runoff from the relatively flat, low-lying inland areas of the peninsula to the Nu'upia Ponds Complex, where it eventually empties into the marine waters of Kāne'ohe Bay. The northern end of the MCDC originates at the southern edge of the Klipper Golf Course. From there, the channel flows south through the central area of the base, where an extensive system of box culverts, pipes, swales, and ditches conveys surface runoff into the MCDC.

It is typical of the Mōkapu Peninsula to receive an average of 40 in (102 cm) of rain every year. This leaves low-lying, open areas throughout the base subject to flooding. Depending on the

volume of precipitation and its duration, temporary pools or puddles can appear which eventually evaporate. In low-lying areas where there is sparse vegetation, transitory marshes may appear. These temporary areas of surface water have been documented to provide short-lived waterbird and shorebird habitat until they dry up and are considered a healthy part of the natural hydrologic system.

Project Area A
The coastal waters of Kāne'ohe Bay are approximately 0.54 mi (869 m) to the southwest of Project Area A. The MCDC is approximately 0.9 mi (1,448 m) east of Project Area A.

Project Area B
Project Area B is located centrally within MCB Hawaii - Kaneohe Bay and is the closest of the project areas to the MCDC. The MCDC lies approximately 700 ft (213 m) east of BEQs 5070 and 5071, just beyond the Pop Warner field and track (Facility 1259) and the proposed site of new BEQs being constructed by MILCON P-749 and P-750. To the southwest is Kāne'ohe Bay, approximately 0.5 mi (805 m) away.

Project Area C
Project Area C lies to the east of the MCDC. Of all sites within Project Area C, the proposed site for the Company Command Post is the closest to the MCDC. It lies approximately 0.15 mi (241 m) east of the intersection of the MCDC and Mōkapu Road. Kailua Bay is approximately 0.36 mi (580 m) due east of the proposed site for the Artillery Battery Complex.

3.6.1 Potential Impacts
Impacts on surface waters are considered to be significant if project actions affect water quality. Water quality may be affected when (1) soil-disturbing construction activities cause erosion of exposed soil from project areas—during heavy rains, runoff from these areas has the potential to enter surface waters, thereby increasing turbidity and sedimentation in receiving waters—or (2) operational activities associated with an action causes pollutants to be discharged into receiving waters.

3.6.1.1 Proposed Action
The proposed action is not expected to result in short-term adverse impacts on surface waters resulting from demolition, construction or renovation activities. Removed materials, debris, and soil resulting from demolition activities would be contained during the demolition period and properly disposed of, in accordance with all applicable regulations.

However, as with all construction activities that involve the disturbance of soil, the potential for temporary erosion, sedimentation, and runoff from a project site exists during storm events. Clean Water Act (CWA) mandated protective measures such as a general or individual National Pollution Discharge Elimination System (NPDES) permit, if required for any of the proposed action projects, would necessitate development of a Site-Specific Construction BMP Plan for storm water runoff prior to commencing construction activities. The Site-Specific Construction BMP Plan would identify the most effective erosion, sedimentation, and runoff control measures

to reduce the amount of soil and sediment transported off-site as a result of construction activities.

Project Area C is the only area in which new construction is proposed. The implementation of BMPs would confine sediment and silt runoff within the various project sites. As most of Project Area C has been previously developed, existing paved areas, roads, walkways, or parking lots could facilitate the movement of sediment-bound pollutants contained in runoff into drainage lines that discharge into the MCDC or the Nu'upia Pond Complex. Application of BMPs would ensure that the quality of any surface waters within or surrounding the base would not be degraded. BMPs for sediment control include the use of silt fences, storm drain inlet protection measures, sediment traps, and sediment basins.

In the long-term, the proposed action is not expected to result in adverse impacts to surface waters. Application of appropriate site drainage control measures, as discussed in Section 3.7 below, would minimize the potential for contaminants to be discharged into surface waters from runoff. In general, the presence of industrial activity close to surface waters also may present a concern, as it is often a source of contamination. The proposed action does not involve any industrial activities; therefore, the proposed action would not impact surface waters in this way.

3.6.1.2 No Action
The No Action alternative would not result in any impacts on surface water.

3.6.2 Mitigation Measures
Mitigation measures are not warranted or proposed.

3.7 DRAINAGE
Mōkapu Peninsula is located within the Mōkapu Central Watershed (MCW), which spans freshwater, marine, and estuarine ecosystems. The peninsula features two distinct drainage basins—Nu'upia Basin, which encompasses a portion of the southeastern area of the peninsula, and Mōkapu Drainage Basin, which accounts for most of the central and northern areas of the peninsula. The Mōkapu Central Drainage Basin area captures and releases, as surface water, roughly a hundred acre-feet (4,356,000 cubic feet) to the Nu'upia Basin and the MCDC during a single storm event (Wilcox et al., 1998). The MCDC receives surface runoff from approximately 482 acres that comprise the Mōkapu Drainage Basin, as delineated by a 2003 drainage study of the MCDC conducted by Hawaii Pacific Engineers (HPE, 2003).

Storm water runoff is channelized into an extensive system of box culverts, pipes, and ditches. There are 22 outlets ranging in size from a 24-inch pipe draining one catch basin to a 10-ft by 4-ft (3.1-m by 1.2-m) box culvert that drains much of the airfield area (NAVFAC Hawaii, 2006a). Four of the storm drain outlets discharge into Nu'upia Ponds, fourteen discharge into Kāne'ohe Bay, two discharge into the ocean at Ulupa'u Crater and two discharge into Kailua Bay (NAVFAC Hawaii, 2006a). In general, drainage water in the Mōkapu Drainage Basin and at all project areas is composed of surface runoff. Storm water drainage from this area is regulated under MCB Hawaii's storm water NPDES permit (Drigot, 2005).

Project Area A
Box culverts and existing drainage lines within the MWSS compound are installed underneath the paved areas to the eastern and southern sides of Building 373. Storm water runoff from the compound is conveyed to a main underground drainage line west of B Street that runs parallel to Taxiway C and eventually empties into Kāne'ohe Bay, in a discharge area south of the airfield.

Project Area B
BEQs 5070 and 5071 are situated on the southwestern boundary of the Mōkapu Drainage Basin. A drain system collects runoff from the grassed and paved areas immediately surrounding the BEQs, as well as from the on-site parking lot between the two buildings. Runoff is piped underneath G Street to a grassy area north of the Pop Warner field and track. This area also captures runoff from another drain system that originates at the southeastern base of Pu'u Hawai'iloa. All surface runoff and storm drainage from this area is eventually conveyed to the MCDC, roughly 700 ft (213 m) to the east of 5070 and 5071.

Project Area C
The proposed project site for the new Company Command Post (P-847) is located within the Mōkapu Drainage Basin. Drainage at the site flows into a single pipe that runs east to west from Cushman Avenue and directly into the MCDC.

The remaining sites in Project Area C are part of the Nu'upia Basin. The proposed location for the new CLB-3 facility would use existing drainage lines that direct water to a storm drain outlet that conveys runoff into the Percolation Ditch wetland. The project sites adjacent to Harris Avenue (P-778, P-842, P-852, P-858) are clustered within an area where drainage is managed by a below-ground system that extends to the southern end of Harris Avenue, turning west and ending at a box drain within 100 ft of Building 5095. Runoff collected at the box drain flows into the Percolation Ditch wetland, which can retain runoff up to the 10-year storm (USACE Honolulu, 2009, p. 28). Runoff beyond this amount is conveyed via spillway into Nu'upia Ponds.

North of the Artillery Battery Complex is a drain line that flows into the Motor Pool wetland.

3.7.1 Potential Impacts
Specific actions or occurrences that could be considered significant impacts related to drainage include the placement of structures and the alteration of a site's existing drainage patterns such that an increase in the rate or volume of surface or storm water runoff would substantially exceed the capacity of existing or planned storm water drainage systems. This could result in increased erosion and/or siltation, thereby eventually causing sediment-bound pollutants to be discharged to receiving waters. Increasing the potential for flooding on- or off-site would also be considered a significant impact related to drainage.

3.7.1.1 Proposed Action
Implementing the proposed action would entail constructing new buildings, structures, paved parking lots, and other facilities. This would increase the area of impermeable surface at some

sites and, accordingly, decrease the amount of pervious land area to absorb storm water and reduce surface runoff. The proposed action would result in a rough estimated net increase of 417,885 square feet or 9.60 acres of impervious surface.[8] A summary of the change in impervious surface is shown in Table 3 below.

Table 3. Change in Impervious Surface Summary

Project		Existing Impervious to be Removed	Proposed Impervious	Difference
P-778	Armory Expansion		17,231	17,231
P-842	Consolidated Aid Station	53,348	36,222	-17,126
P-847	Artillery Battery Complex & Command Post		275,415	145,806
P-822	3D Radio Battalion	10,000	56,652	46,652
P-858	BEQ	39,014	89,437	50,423
P-885	MWSS, 3D Motor Pool & CLB-3 Facilities		174,899	174,899
	Total	**102,362**	**520,247**	**417,885**

Due to the net increase in impervious surface, there could be a resultant increase in surface runoff volume and potential for localized flooding at each of the project areas. A rough evaluation, based on the preliminary site plans, estimates that the proposed action could result in an approximate net increase in storm water runoff flow of 22.69 cubic feet per second (cfs). This estimate is based on the rainfall intensity from a 10-year storm. A summary of the change in storm water flow is shown in Table 4 below (refer to Appendix F for preliminary storm water runoff calculations). The 22.69 cfs represents a worst-case scenario without consideration of any site design strategies and project features related to storm water management. Specific project features for storm water management would be developed during the design-build phase for each respective project.

Table 4. Summary of Change in Storm Water Flow

Site		Area (acres)	Existing Flow "Q" (cfs)	Proposed Flow "Q"(cfs)	Change in Flow (cfs)
P-778	Armory Expansion	0.40	0.32	1.27	0.95
P-842	Consolidated Aid Station	1.22	3.92	2.98	-0.94
P-847	Artillery Battery Complex	2.98	2.38	9.52	7.14
	Company Command Post	0.37	0.30	1.19	0.89
P-822	3D Radio Battalion	1.30	1.93	4.16	2.23
P-858	BEQ	2.05	3.79	6.57	2.78
P-885	Existing MWSS	1.34	1.07	4.29	3.22
	3D Radio Motor Pool	2.06	1.65	6.61	4.96
	CLB-3 facilities	0.61	0.49	1.95	1.46
	Total	**12.33**	**15.85**	**38.54**	**22.69**

[8] The estimated net increase was derived from preliminary site plans and building schemes as depicted in the respective DD1391 project planning documents for each MILCON project and should not be construed to be a refined calculation of the net increase of impermeable surface area.

The proposed action would be implemented in compliance with the Department of the Navy's low-impact development (LID) policy, the goal of which is to manage storm water on-site and result in no net increase in storm water volume, rate, sediment or nutrient loading from major construction or renovation projects. In accordance with this policy, site design strategies and features intended specifically to address storm water runoff would be incorporated within the various proposed action projects to reduce the rate of runoff, volume and pollutants. Strategies and project features could include, among others, bio-retention areas, permeable paving, vegetated swales, rainwater harvesting, and underground detention devices. As a result, any net increase in runoff is expected to be minimal and would not exceed the capacity of existing drainage systems. Thus, it is expected that the proposed action would not significantly impact drainage or receiving waters.

The following project features have been preliminarily identified for the proposed action to reduce the quantity and improve the quality of surface runoff. Additional features will be identified during the design phase of each project.

- P-847 (Artillery Battery Complex and Command Post) proposes to utilize below-grade storm water detention areas to contain site runoff, which would be regulated and released gradually into the storm drainage system. Current drainage infrastructure at these two sites conveys existing runoff via sheet flow to drain inlets.

- Site improvements for the P-852 (3D Radio Battalion Complex) would include bioswales, which are effective drainage features that naturally collect, minimize, and filter runoff.

- For P-778 (Armory expansion), rooftop runoff would be routed onto the ground surface via downspout. The runoff would be retained on-site to encourage increased percolation of storm water into the underlying aquifer. Additional measures, such as vegetated channels and swales, are also being considered to promote infiltration and improve runoff water quality.

In addition to the design features incorporated into the individual projects, short-term protective measures may include the development of a Construction BMP Plan for storm water runoff. The Construction BMP Plan would identify the most effective erosion, sedimentation, and runoff control measures to reduce the amount of soil and sediment that may be transported by runoff during the construction period. The BMPs would be intended to confine sediment and silt runoff to the project areas. Therefore, there should be no degradation of water quality in nearby bodies of water.

Significant adverse impacts on drainage are not expected due to specifically-designed features incorporated into each of the projects to minimize and filter runoff in compliance with the Navy's LID policy. Thus, the rate and volume of runoff would not exceed the capacity of

existing or planned drainage systems and would not contribute to the potential for flooding on- or off-site.

3.7.1.2 No Action
The No Action alternative would not have impacts on surface waters.

3.7.2 Mitigation Measures
Mitigation measures are not warranted or proposed.

3.8 WETLANDS
Of the 2,951 acres of Mōkapu Peninsula, approximately 131 acres are protected, jurisdictional wetlands (USACE Honolulu, 2009). A ground-based wetland survey was conducted between 2001 and 2002 and updated in 2009. These surveys delineated boundaries for eight wetland complexes identified at MCB Hawaii - Kaneohe Bay: (1) Hale Koa Wetland; (2) Sag Harbor Wetland; (3) Salvage Yard Wetland; (4) Percolation Ditch Wetland; (5) Motor Pool Wetland; (6) Kaneohe Klipper Golf Course Ponds; (7) Temporary Lodging Facility Wetland; and, (8) Nu'upia Pond Complex—a wetland habitat, a designated and protected Wildlife Management Area (WMA) that harbors endangered flora and fauna, and an established historic property that consists of eight ponds/delineated wetlands, including: Nu'upia 'Ekahi, Heleloa, Halekou, Nu'upia 'Elua, Nu'upia 'Ekolu, Nu'upia 'Eha, Kaluapuhi, and Pa'akai.

Wetlands on Mōkapu Peninsula provide essential habitat to many federally-protected native and migratory birds, native fish, and other aquatic fauna and flora. The wetlands also serve to filter sediments and pollution and help to reduce shoreline erosion.

PROJECT AREA A
The nearest wetland to Project Area A is the Salvage Yard Wetland, which is located approximately 0.6 mi (1,000 m) southeast.

PROJECT AREA B
The Temporary Lodging Facility Wetland and Halekou Pond, the northernmost element of the Nu'upia Ponds Complex, are approximately 0.25 mi (402 m) south and southeast, respectively, of Project Area B.

PROJECT AREA C
The Motor Pool Wetland is located to the north and northwest, and adjacent to the Artillery Battery Complex site. This wetland is part of large swale that runs in a generally north-south direction. Its main function is to filter pollutants from runoff, but does provide opportunistic foraging for shorebirds and waterbirds. Runoff from the adjacent motor pool parking lot is directed into the wetland/swale. Another wetland, the Percolation Ditch wetland is located roughly 250 ft (76 m) south of the CLB-3 facilities and west of the 3D Radio Battalion Complex site.

Of the proposed action projects, the proposed sites for the CLB-3 Comm Shop, the 3D Radio Battalion Complex and the Artillery Battery Complex are located closest to the Nu'upia Ponds Complex. Halekou and Nu'upia Ekolu Pond are approximately 0.15 mi (229 m) south of the CLB-3 Comm Shop and the 3D Radio Battalion Complex site, respectively. Pa'akai is located approximately 0.15 mi (229 m) east of the Artillery Battery Complex site.

Refer to Figure 6 for a map of the wetlands at MCB Hawaii – Kaneohe Bay and the proposed action project sites.

3.8.1 Potential Impacts

Significant impacts from project actions would result if destruction of wetlands at MCB Hawaii – Kaneohe Bay were to occur. Equally, project actions should not degrade water quality at delineated wetlands and designated wildlife management areas, or be detrimental to wildlife inhabiting these areas.

3.8.1.1 Proposed Action

Most of the project sites are not located within close proximity to any wetlands at MCB Hawaii - Kaneohe Bay. However, the Motor Pool Wetland is close enough to the proposed Artillery Battery Complex that construction-related activities could potentially degrade the wetland environment if measures are not taken to contain runoff that may be carrying sediment-bound pollutants.

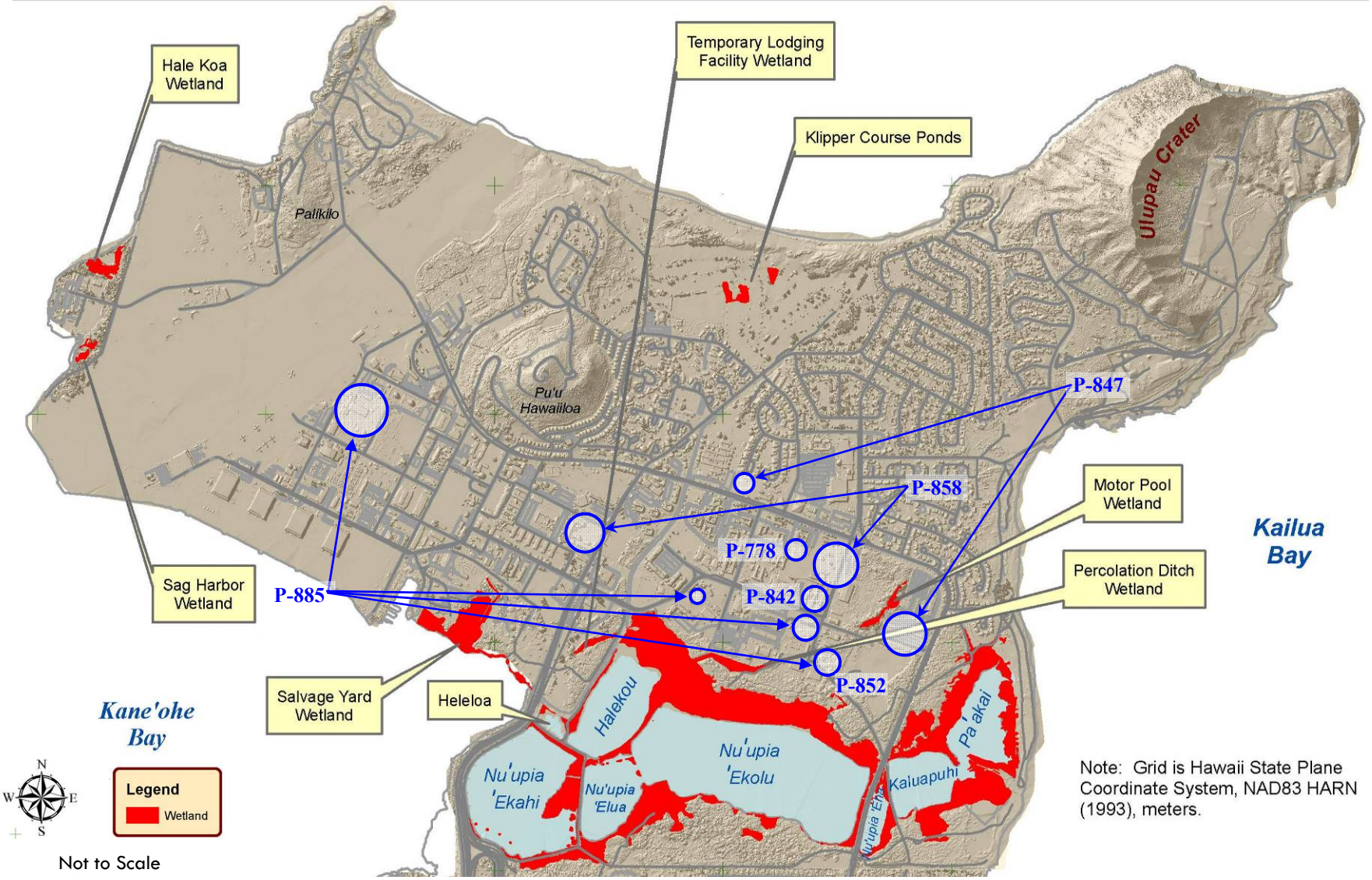
The proposed action is not expected to result in direct or indirect short- or long-term impacts to on-base wetlands. Application of BMPs during construction, NPDES permit conditions, and LID site design features that minimize runoff and prevent or minimize the pollutants and sediment conveyed by surface runoff would ensure that significant adverse impacts to wetlands are avoided.

3.8.1.2 No Action

The No Action alternative would not have impacts on the wetlands at MCB Hawaii - Kaneohe Bay.

3.8.2 Mitigation Measures

Mitigation measures are not warranted or proposed.



Grow The Force Environmental Assessment	MCB Hawaii – Kaneohe Bay Wetlands Source: Wetlands of Marine Corps Base Hawaii (July, 2009)	**Figure 6**

3.9 BIOLOGICAL RESOURCES

Among the most visible of faunal resources on Mōkapu Peninsula are the numerous bird species. All of these are federally protected under either the Endangered Species Act (ESA) or the Migratory Bird Treaty Act (MBTA). Along the approximately 11 miles (17.6 km) of MCB Hawaii - Kaneohe Bay shoreline, over 50 species of waterbirds, shorebirds, and seabirds have been noted in 50 years of bird count records (MCBH INRMP, 2001). Among the MBTA-protected birds, commonly observed are Great Frigate Birds ('iwa or *Fregata minor palmerstoni*), native Black-crowned Night Herons ('auku'u or *Nycticorax nycticorax hoactli*), the and Pacific Golden Plovers (kolea, *Pluvialis fulva*).

Among the numerous MBTA-protected birds on Mōkapu Peninsula are two prominent seabird colonies. The 23-acre Ulupa'u Head WMA supports one of two protected colonies of red-footed boobies ('a or *Sula sula rubripes*) in the main Hawaiian Islands. Boobies have been established in this colony since the 1940s. Today the population is at least 3,000. Several hundred nesting burrows of Wedge-tailed Shearwaters (*Puffinis pacificus*) have been counted within an earthen berm and along the eastern pond-dune shoreline in the Nu'upia Ponds WMA (referred to as the Ulupa'u Dunes).

The Nu'upia Ponds complex at MCB Hawaii - Kaneohe Bay is designated as a WMA that also provides refuge to endangered Hawaiian waterbirds such as the Hawaiian gallinule ('alae 'ula, *Gallinula cholopus sandvicensis*), Hawaiian Coot ('alae ke'oke'o, *Fulica alai*), Hawaiian Duck (Koloa moali, *Anas wyvilliana*) and the Hawaiian stilt (a'eo, *Himantopus mexicanus knudseni*). The ponds also support native fish species such as mullet ('ama'ama, *Mugil cephalus*), milkfish (awa, *Chanos chanos*), ladyfish (awa'aua, *Elops hawaiiensis*), Pacific threadfin (moi, *Polydactylis sexfilis*), flagtail (aholehole, *Kuhlia sandvicensis*), bonefish (o'io, *Albula vulpes*) goby (o'opu-kai, *Oxyurichthys lonchotus*) and barracuda (kaku, *Sphyraena barracuda*).

Although native plants significant to Hawaiian culture exist on base (including a recent self-colonized population of the Listed Endangered 'Ohai plant (*Sesbania tomentosa*) (Dr. Drigot, pers. comm.), none are known to occur in any of the project areas. Introduced species such as koa haole (*Leucaena leucocephala*), mesquite (kiawe, *Prosopis pallida*), patches of invasive grasses such as guinea grass (*Panicum maximum*), California grass (*Brachiaria mutica*), and Christmas berry (*Schinus terebinthifolius*) are typical of vegetation in each of the project areas.

PROJECT AREA A

A large portion of Project Area A is already developed. However, there is a small, open grassy area containing sparse patches of weeds and small koa haole located immediately east of the existing 3D Radio Battalion Motor Pool Facility, at the MWSS compound. A wire fence runs along the perimeter of the grassy area. On occasion, foraging birds, native and non-native alike, can be seen frequenting the patches of exposed soil and gravel. These species include, but are not limited to, Cattle Egret (*Bubulcus ibis*), Spotted Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), Common Myna (*Acridotheres tristis*), and the Northern Cardinal (*Cardinalis cardinalis*). When present during the winter months, the migratory Pacific Golden Plover (Kolea) may occasionally forage on the site. The site of the proposed MWSS facility and its surrounding area does not host any plant or animal life that is considered threatened or endangered under the ESA.

PROJECT AREA B

A few shade trees appear around the perimeter of the parking area between buildings 5070 and 5071. Grassy areas fronting G Street have a few smaller kiawe trees. A single eucalyptus (*Eucalyptus* sp.) tree stands across the parking lot, by the entrance of BEQ 5070. There are no purposely planted or natural occurrences of flora currently listed or pending listing as threatened or endangered under the ESA.

PROJECT AREA C

According to the MCB Hawaii Master Plan, the proposed site for the 3D Radio Battalion Complex is an undeveloped parcel designated within Koa Haole Shrubland. The lot is overrun by non-native vegetation, primarily by thick stands of koa haole, California grass and Guinea grass. Christmas berry and other weedy species are sparsely distributed throughout the project site. It is common to see non-native birds such as doves, cardinals, and red-vented bulbuls (*Pycnotus cafe*) within the parcel.

A small portion of the proposed Artillery Battery Complex site is located in an undeveloped, weedy lot. South of the perimeter fenceline of the existing compound is an area overgrown with non-native grasses that provide habitat for rats (*Rattus rattus*), including Polynesian rats (*Rattus exulans*) and roof rats, and mongoose (*Herpestes auropunctatus*).

The Artillery Battery Complex and the 3D Radio Battalion sites are located close to the Nu'upia Ponds Complex. The ponds attract various species of wetland birds, as mentioned above.

Along the perimeter of the P-842 site, on the west side of Harris Avenue, royal palms (*Roystonea* sp.) line the edge of the sidewalk, and a few ornamental shrubs have been planted.

The proposed site for the new parking structure for P-858 is across Harris Avenue, adjacent to koa haole shrubland that was once the site of the Quarry Landfill. The landfill has since been filled with compacted soil and rocks and is currently used as a recreational paintball field; thus the vegetation has been purposely allowed to grow dense to create a natural arena.

In addition to shorebirds, cane toads (*Bufo marinus*) may occasionally be observed in project areas, especially after it rains.

There are no known natural occurrences of plants pending, or currently listed, as threatened or endangered under the ESA within Project Area C.

3.9.1 Potential Impacts

Project actions are determined to have a significant adverse environmental impact on plant life if there are any disturbances to or removal of threatened or endangered species. In determining the extent of impacts on fauna, criteria such as the extent of habitat loss or gain and the presence or absence of threatened, endangered, or protected species, including migratory avifauna, are used. The loss of sensitive habitat is indicative of significant impacts, whereas minor relocation or modification of habitats is indicative of adverse, but not significant, impacts.

3.9.1.1 Proposed Action
Non-shielded, non-directed exterior lighting can attract fledgling seabirds and waterfowl, which become disoriented and collide with power lines, buildings, trees, or the light structures themselves, and fall to the ground. Once grounded, they are vulnerable to predators such as mongooses; they can also be injured or killed by vehicles, or die of starvation or dehydration. If non-shielded, non-directed lighting were used it could impact seabirds and shorebirds that frequent Nu'upia Ponds. Properly shielded lights reduce the potential for light shining upward, thereby providing less of an attractant to birds.

The proposed action would incorporate downward-shielded exterior lighting to minimize the potential for impacts on seabirds and shorebirds. Thus, no significant adverse impacts on faunal resources are expected to result from the proposed action.

There are no known natural occurrences of plants that are pending, or currently listed, as threatened or endangered under the ESA within any of the project areas. The proposed action would have no impacts on these resources.

3.9.1.2 No Action
The No Action alternative would not have impacts on biological resources.

3.9.2 Mitigation Measures
Mitigation measures are not warranted or proposed.

3.10 NATURAL HAZARDS
Floodplains and Flooding
As directed by Executive Order 11988, federal agencies must evaluate the potential effects of actions occurring in a floodplain to reduce the risk of flood loss; impacts to human health, safety and welfare; and to preserve the natural and beneficial functions served by floodplains. Actions must consider direct and indirect impacts on floodplains. The term "floodplain" generally refers to a defined area that is subject to inundation by a flood. A 100-year flood is an event that, based on historical records and calculated statistical probabilities, has a one in 100 chance (a one percent chance) of occurring in any given year.

There are two types of flood-designated areas at MCB Hawaii - Kaneohe Bay. The first are the flood zones as shown on the Flood Insurance Rate Maps (FIRM), prepared and distributed by the Federal Emergency Management Agency (FEMA). FEMA-designated flood zones are defined by varying levels of risk and reflect the type and severity of flooding to which an area may be subject. The FEMA-designated flood zones are located along the coastal areas of the Mōkapu Peninsula. In addition to the FEMA-designated flood zones, MCB Hawaii has conducted independent flood studies related to the MCDC, the latest of which was completed in 2003 by HPE. The MCDC floodplains are not reflected on FEMA's Flood Insurance Rate maps.

According to the FIRM, City and County of Honolulu, Panel 280 of 395, Map Number 15003C0280F, dated September 2004 (FEMA), all project areas are located within Flood Zone D. Zone D comprises areas in which flood hazards are undetermined, but possible.

None of the project areas are located within any of the delineated 10-year or 100-year flood zones related to the MCDC. Project Area B is the nearest site to an MCDC-related flood zone. It is located approximately 500 ft (152 m) west of the MCDC 100-year flood zone. Figure 7 shows the location of each project site in relation to the FEMA-designated flood zones and the MCDC floodplain boundaries.

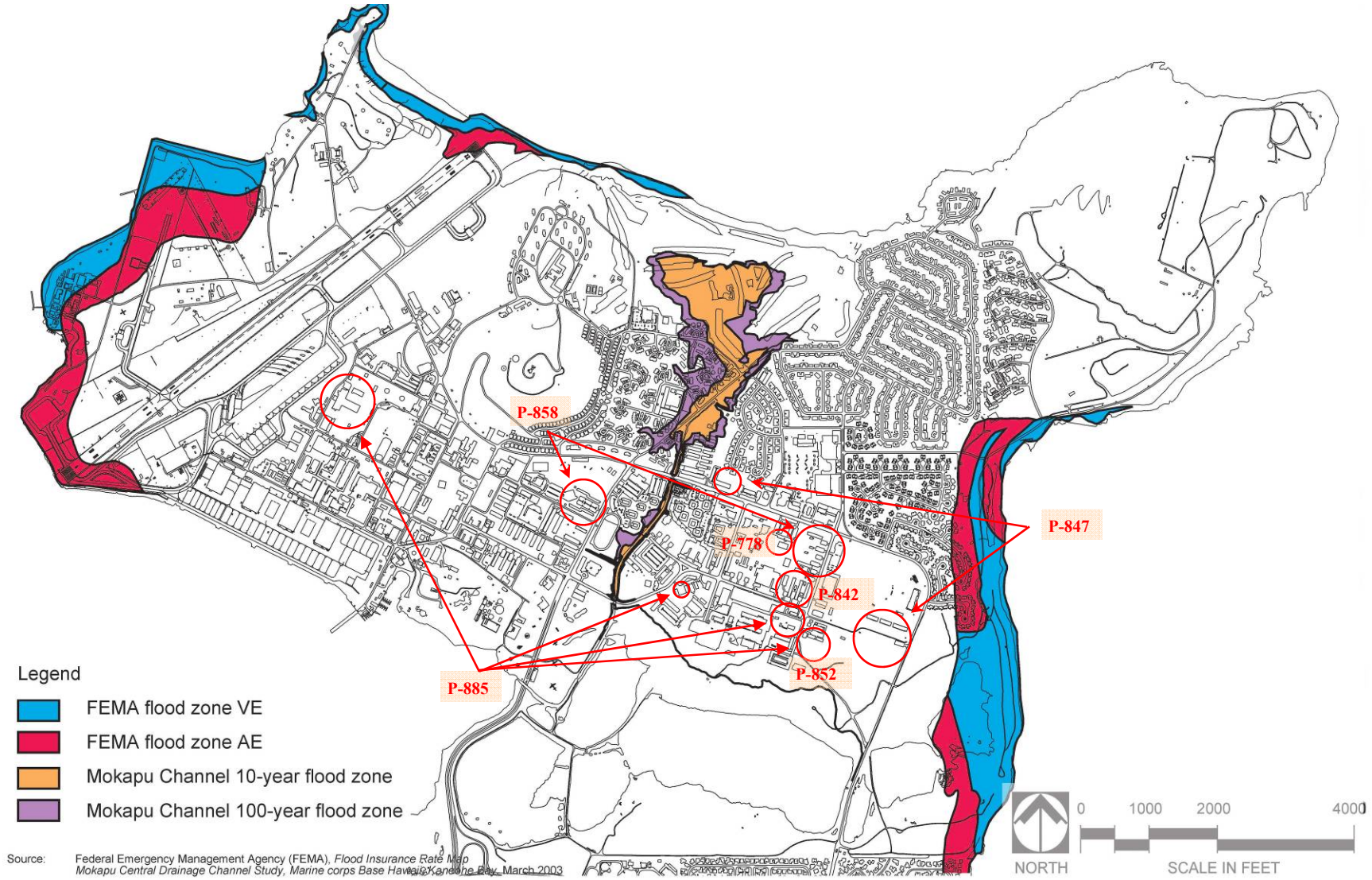
Seismic Activity
The entire state of Hawai'i is susceptible to seismic activity. Most earthquakes in Hawai'i are harmonic tremors associated with volcanic activity. Severe seismic activity can damage or destroy buildings and other structures, including infrastructure, which often results in disruption of service. The most recent earthquake of note that was felt on O'ahu occurred on October 15, 2006. This earthquake was centered off Kiholo Bay on the Island of Hawai'i and had a magnitude of 6.7. The International Building Code (IBC) provides minimum structural design requirements to resist the effects of earthquakes. Structural requirements vary and are based on the predicted potential strength of ground movement in a particular geographic area.

Hurricanes and Tsunamis
The peninsula's coastal areas, beaches, and low-lying areas within the installation are subject to storm hazards and hurricanes and could be inundated in the event of a tsunami. MCB Hawaii has identified and delineated areas on base that would need to be evacuated in such events. Emergency evacuation shelters have been established for persons living or working in these areas.

The project areas are not located within any MCB Hawaii-designated tsunami evacuation areas, and they are not located within any of the MCB Hawaii-designated hurricane evacuation areas (NAVFAC Hawaii, 2006a).

3.10.1 Potential Impacts
Project actions are determined to have a significant adverse environmental impact if they increase the potential for exposure, harm, or damage to people or properties from hazards such as earthquakes, floods, or tsunamis. It is important to note that the threat from these hazards always exists because humans have no control over the frequency or intensity of these relatively unpredictable events.

3.10.1.1 Proposed Action
The proposed action would have no effect on the frequency or severity of the occurrences of the natural hazards to which Mōkapu Peninsula may be exposed. However, the proposed action could minimally increase the potential for exposure to these events. All projects would be constructed in accordance with applicable codes and requirements to protect occupants from natural hazards.



Grow The Force Environmental Assessment	MCB Hawaii – Kaneohe Bay Flood Zones Source: Marine Corps Base Hawaii Master Plan Volume 1 – Land Use Plan (2006)	**Figure 7**

As a standard operating procedure (SOP) to increase the safety of personnel, newly stationed personnel and their dependents are briefed regarding the safety issues and suitable response actions associated with the natural hazards that may be encountered at MCB Hawaii - Kaneohe Bay. Evacuation procedures are outlined, emergency shelters are identified, and the necessary planning mechanisms are emplaced, in the interest of the safety of base personnel and residents.

3.10.1.2 No Action

The No Action alternative would not have any impact on the severity of natural hazards to which the base is exposed.

3.10.2 Mitigation Measures

Mitigation measures are not warranted or proposed.

3.11 POPULATION AND HOUSING

Excluding the GTF personnel, the population in March 2010 was estimated to be 20,592 persons (also referred to in this EA as the baseline population). The GTF-related addition of an approximately 970 persons (579 Marines and an estimated 391 dependents) would increase the population assigned to MCB Hawaii - Kaneohe Bay to 21,562, which represents a roughly 5 percent increase above the baseline.

It is important to note that the number of persons assigned to a base is not static and constantly fluctuates due to deployments and reassignments. The approximately 20,592 baseline population in March 2010 includes all active-duty personnel assigned to MCB Hawaii – Kaneohe Bay (Navy and Marine deployed and non-deployed), on-base dependents and civilian employees. The de facto population is substantially less as roughly one-third of active-duty personnel are deployed at any given time. During March 2010, the de facto population at MCB Hawaii – Kaneohe Bay was roughly 16,100 persons.

The U.S. Marine Corps has determined that providing on-base housing for the proposed increased personnel is a critical measure to facilitate training and to achieve the mission of troop readiness. On-base housing consists of military family housing and bachelor housing. Currently, there are 10,135 on-base residents, which consist of 7,200 persons (2,300 service members plus 4,900 dependents) (per. comm., D. Gonzales, February, 2010) in family housing and 2,935 single active duty persons in bachelor housing (per. comm., R. Rippel, February, 2010). Under the proposed action, the only change to the supply of on-base housing is the renovation and new construction of BEQs for unaccompanied personnel.

3.11.1 Potential Impacts

Project actions would have an adverse environmental impact if it resulted in a significant and sudden change in the population of an area. A significant impact to housing would result should the number of off-base residences be insufficient to accommodate the increase in personnel such that it strains the availability and increases housing costs (i.e., rents and sales prices) in the off-base housing market.

Housing military personnel off-base would not be considered a strain on the O'ahu housing market area unless the total demand for off-base housing exceeds the level of natural vacancies within the market area, which ranges between 4 and 12 percent and is currently estimated at 9 percent (Department of the Navy, 2008). In 2009, the gross vacancy rate for the City and County of Honolulu was 10.9 percent and rose to 11.5 percent in 2010 (DBEDT, 2011, Table 21.23) Natural vacancies in the housing market, which result from renovations, tenant movement, and other factors, are not considered part of the available supply of housing. An increased demand for off-base housing that exceeds the level of natural vacancies creates pressure on the availability of rental units in an area and could potentially inflate rental prices (USACE Louisville, 2009).

3.11.1.1 Proposed Action

The GTF initiative would bring 579 Marines and an estimated 391 dependents to MCB Hawaii - Kaneohe Bay over a period of five years, for an approximate total of 970 additional people. This would represent a 5 percent increase, above the March 2010 baseline population of 20,592 persons.

This relatively small increase in personnel assigned to the base over the five-year implementation period would affect the on-base housing supply only minimally and should not significantly exacerbate the current on-base housing deficit. The proposed construction of new BEQs by MILCON P-858 would help alleviate the housing deficit at MCB Hawaii - Kaneohe Bay by providing additional bachelor living-spaces on base.

The P-858's proposal to renovate BEQs 5070 and 5071 would improve living conditions for personnel housed in these buildings. The USMC believes that substandard housing is a detriment to mission readiness and troop morale. Renovating these facilities would contribute to overall mission-readiness and promote the well-being of enlisted personnel.

The phased implementation of the proposed personnel increase over a five-year period, in combination with the proposed construction of P-858 and renovation of BEQs 5070 and 5071, would decrease the likelihood of a sudden increase in demand in the off-base housing market. This would reduce the potential for inflated rental prices and decreased rates of availability for rental units off-base as a result of the proposed action. It is expected that the O'ahu housing market could absorb the incremental increase over the five-year period.

This population growth at MCB Hawaii - Kaneohe Bay would result in positive economic impacts to Oahu's local economy in terms of direct, indirect and induced employment, income, and tax revenue. This would ultimately translate to increased revenues for the State of Hawai'i.

3.11.1.2 No Action

Under the No Action alternative, construction of the six MILCON projects to support the GTF increase would not occur, including the new and renovated BEQs. This could affect the off-base housing market as it would have to absorb the GTF Marines that would otherwise be housed in these BEQs. Further, Marines living off base would not support the USMC's strategy of housing

its junior enlisted personnel together as a unit, which enhances unit integrity, cohesion, and troop readiness.

3.11.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.12 EDUCATION

School-aged dependents of MCB Hawaii - Kaneohe Bay personnel utilize the public and private educational opportunities throughout the island of O'ahu; however, the Kalaheo Public Schools Complex would be expected to support the majority of these students. The Kalaheo Complex serves MCB Hawaii - Kaneohe Bay and adjacent communities.

There are six public schools in the Kalaheo Complex. They are Mōkapu Elementary, 'Aikahi Elementary, Kailua Elementary, Kainalu Elementary, Kailua Intermediate, and Kalaheo High School. There are also a number of private schools available to dependents of base personnel. Mōkapu Elementary is the only on-base school, and approximately 89 percent of the enrolled students are military dependents (Department of the Navy, 2008). Enrollment of military dependents at the other five public schools that serve base personnel ranges between approximately 12 percent and 24 percent (Department of the Navy, 2008).

The number of students enrolled within the Kalaheo Complex fluctuates yearly. Over the past three years enrollment has declined from 4,023 students during the 2006–2007 school year to 3,717 during the 2008–2009 school year,[9] a difference of 306 students (Department of Education, 2009).

3.12.1 Potential Impacts

Impacts to the Kalaheo Complex or individual schools are difficult to assess and would depend upon a number of factors, including the number and age of dependents that would accompany the increased personnel at MCB Hawaii - Kaneohe Bay. An impact would be considered significant if a drastic and sudden demand for public school services, in the form of a sudden increase in enrollment, exceeded the public school complex's enrollment capacity and forced classroom sizes above limits established by the state Department of Education.

3.12.1.1 Proposed Action

Under the proposed action, no additional education facilities are proposed to support the GTF personnel increase; however, no significant adverse impacts on the existing educational system are expected. The estimated GTF-related increase in population at MCB Hawaii - Kaneohe Bay is 579 Marines and 391 dependents. It can be estimated that approximately 130 of the 391 dependents would be non-spousal dependents, some of which would be school-aged children.[10]

[9] Data for the 2009–2010 school year was not yet available when this EA was drafted.
[10] This estimate was derived from the general formula for estimating dependents for married Marines used by the MCB Hawaii Family Housing Department: 1.5 dependents/married Marine with a marriage factor of 45 percent.

Not all of the children would be school-aged upon arrival at MCB Hawaii - Kaneohe Bay; however, were they all school-aged, an increase of up to 130 students over a period of five years into the Kalaheo public school complex would be small relative to the enrollment range that the public school complex has experienced over the past three years.

3.12.1.2 No Action

There would be no change to the enrollment trend within the Kalaheo public school complex under the No Action Alternative.

3.12.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.13 SURROUNDING LAND USE

MCB Hawaii - Kaneohe Bay is a multiple-use facility designed to fit the needs of the USMC. The base has various land use designations to address and minimize conflicts among those needs. Current land use designations include: Operational; Training; Maintenance; Supply and Storage; Medical and Dental; Administration; Family Housing; Troop Housing; Community Facilities; Recreational; Open Space; Utilities and Landfill; and Constrained Open Space.

PROJECT AREA A

Project Area A is within a designated Maintenance area. Most maintenance land use at MCB Hawaii - Kaneohe Bay is related to air or ground operations, with aircraft maintenance facilities clustered in the southwest portion of the peninsula, closest to the airfield.

Although Building 373 currently serves the 3D Radio Battalion, it was originally configured to support an early MWSS that was sustained at the base until the late 1990s. Portions of the building are still used for air maintenance operations by MALS-24, a unit of MAG-24.

Just west of Project Area A is the MCAS, an area designated for Operational land use. Aboveground storage tanks (ASTs) containing jet and motor fuel lie immediately to the northeast and southeast of the MWSS compound. Supply/storage areas border the site to the north.

PROJECT AREA B

On-base housing facilities generally serve as either bachelor or family housing. Bachelor housing facilities are generally within the south-central and eastern portions of MCB Hawaii - Kaneohe Bay, while family housing areas are in the north-central and eastern portions, further from the higher noise zones of the base. Project Area B encompasses BEQs 5070 and 5071 and is within a designated bachelor Troop Housing area, amidst Community and Recreational land use designations.

Therefore 579 x .45 = 260.55 married Marines; 260.55 x 1.5 = 391 dependents; 391 dependents – 260.55 spouses = 130 non-spousal dependents (e.g., children, dependent adults).

PROJECT AREA C

Project Area C has Operational, Administrative, Community Facilities, and Training land use designations. Table 5 lists and describes the characteristics of the various land use designations within Project Area C:

Table 5. Description of Land Use Designations within Project Area C

Land Use Designation	Description	Existing Facilities Located within Designation
Administrative	Administrative space and headquarters to conduct day-to-day operations of Marine regiments.	4010, 4017, 4019, 4020, 6705
Community Facilities	Community and personnel support facilities that include family services, child care, and retail services.	Parking
Training	Areas where various training exercises and maneuvers are conducted.	Aid Stations

A family housing area north of Mokapu Road is also located in the proximity of Project Area C.

3.13.1 Potential Impacts

Project actions are determined to have a significant adverse environmental impact if they conflict with surrounding land use or the base master/development plan.

3.13.1.1 Proposed Action

Most of the proposed action projects renovate existing facilities or demolish and construct new facilities at already developed sites (P-778, P-842, P-847, P-858, and P-885) to accommodate the same or similar use. Therefore these projects would not represent a change in use and would not result in adverse impacts to surrounding land use. Table 6 below shows the existing and future land use for the various proposed action sites.

MILCON P-858 proposes to demolish administrative buildings 4010, 4017, 4019, 4020 and 6705 to support construction of a new Command Headquarters and two BEQs. The new Command Headquarters would consolidate administrative operations that currently occupy the facilities to be demolished. Troop housing would be added to an area currently designated in the base master plan for Administrative use. However, conflicts are not expected to result from this action. MCB Hawaii prefers to house the enlisted personnel near to their work areas (in this case the new Command Headquarters), to reduce traffic and parking issues within the base. Further, this site was previously occupied by BEQs, which were demolished a few years ago.

The only projects that propose new construction on vacant/undeveloped sites are the Company Command Post of P-847, and P-852/P-885, the 3D Radio Battalion Complex and motor pool facility. These new facilities also are not expected to result in any adverse impacts to surrounding land use, since they would be located near similar functions.

Table 6. Existing and Future Land Use

MILCON Project	Existing Use	Future Use
P-778 Armory	armory	expanded armory
P-842 Consolidated Aid Station	aid stations	consolidated aid station
P-847 Artillery Battery Complex	artillery battery complex	artillery battery complex
	vacant	new company command post
P-852 3D Radio Battalion	undeveloped	new 3D Radio Battalion Complex
P-858 BEQ	B5070 & B5071 (BEQs)	renovated BEQs
	command HQs	new BEQs and new consolidated command HQs
P-885 MWSS	3D Radio Motor Pool, CLB-3 warehouse	renovate existing buildings for MWSS
	undeveloped	new 3D Radio Battalion Motor Pool facility
	warehouse 1097	renovate for new communications shop
	CLB complex	new controlled humidity storage within existing complex

The projects encompassed by the proposed action are consistent with the Plus Up Development Plan and with the land use surrounding the various project sites. Thus, no adverse impacts on surrounding land use would result from the proposed action.

3.13.1.2 No Action

Implementing the No Action alternative would result in no changes to existing land use and would therefore result in no impacts.

3.13.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.14 VISUAL AND AESTHETIC RESOURCES

The natural features of Mōkapu Peninsula create a scenic and photogenic landscape in windward O'ahu. Overall, the base has a remarkable sense of place, openness, and scale, as the characteristics of its natural environment has been complemented by good planning and development practices. Among the many visual and aesthetic resources of Mōkapu Peninsula are the wetland/wildlife areas of Nu'upia Ponds; the marine coastline surrounding the peninsula to the east, north, and west; undeveloped conservation lands; the slopes of Ulupa'u Crater; and the crest of Pu'u Hawai'iloa.

3.14.1 Potential Impacts

Aesthetic/visual impacts would be considered significant if project actions would substantially degrade the character of the area, degrade existing viewsheds or scenic vistas, or alter the character of the viewshed by the introduction of anomalous structures or elements. Significant aesthetic/visual impacts would also be considered to occur if project actions would substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic

buildings or if they would create new sources of substantial light or glare that would adversely affect night views from or to the shoreline and other areas.

3.14.1.1 Proposed Action

The proposed action would not result in significant impacts on visual or aesthetic resources. Facilities to be constructed under the proposed action are generally low-profile in character. With the exception of the multi-story BEQ and multi-story parking structure, all buildings are one and two stories high. This is consistent with the height of surrounding facilities and would not restrict views from the adjacent buildings. As currently proposed, the parking structure and BEQs on Harris Avenue would be four-stories. Although taller than other facilities, four stories are not significantly inconsistent with the surrounding buildings, which are two and three stories, and would not significantly degrade the viewshed of nearby buildings. All buildings proposed for construction would conform to standard building design and would be designed to be visually consistent with surrounding buildings. The proposed action would not have a pronounced effect on the overall scenic vistas of the base and surrounding environs.

Most of the proposed action projects renovate existing facilities or demolish and construct new facilities at already developed sites (P-778, P-842, P-847, P-858, and P-885). The only projects that propose new construction on vacant/undeveloped sites are the Company Command Post of P-847 and the 3D Radio Battalion Complex and motor pool facility (P-852/P-885). Therefore, the proposed action would result in the loss of some open space at the base. Open space can be considered an aesthetic resource as it provides some visual relief in an urban landscape. However, the vacant/undeveloped sites to be developed by the proposed action would not be considered prime open spaces such as park land, recreational space, conservation land or natural reserve areas, and thus its loss would be an adverse impact, but not be considered significant.

3.14.1.2 No Action

The No Action alternative would result in no impacts on visual or aesthetic resources.

3.14.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.15 ARCHAEOLOGICAL, CULTURAL, AND HISTORIC RESOURCES

The *Integrated Cultural Resources Management Plan 2006 – 2010* (ICRMP) divides the base into four Archaeologically Sensitive Zones: high, medium, low, and low-fill. High sensitivity zones are known to contain archaeologically significant findings or historic or culturally sensitive resources. Examples of such areas on Mōkapu Peninsula are the Fishponds and the Mōkapu Burial Complex (the latter is listed on the National Register of Historic Places (NRHP)). These areas have significant value in Hawaiian history and culture. Medium sensitivity zones are areas where sites may exist, but in which the probability of encountering cultural resources is low. Low-sensitivity zones are areas where no cultural resources have been found and in which there is almost no probability of finding any cultural resources. In areas designated as low-fill, there is virtually no probability of encountering cultural resources, since these are areas that consist of fill materials. An exception is that sand, presumably mined from the Mōkapu Dunes,

was used as construction fill during initial base development and up to the early 1970s. For this reason, human remains are often encountered, mixed with sand-fill, in utility trenches and under building foundations. Therefore, archaeological monitoring is conducted during work involving pre-1970s facilities.

The ICRMP also lists the NRHP status of buildings and structures constructed prior to 1960. These resources meet or would meet the NRHP's 50-year eligibility criterion during the period covered by the current ICRMP. Buildings and structures are designated as either being listed in the NRHP; eligible for listing, as determined by previous studies; not eligible; or not evaluated. A study is currently being conducted by MCBH to evaluate buildings and structures constructed during the Cold War era, defined for the purposes of that study as being between 1945 and 1991. The findings contained in the draft Historic Context and Building Inventory (MCB Hawaii, 2010) are included in the discussion below.

Project Area A

The eastern half of Building 373 is within a Low Archaeological Sensitivity Zone. However the western half of Building 373 is within a Medium Archaeological Sensitivity Zone. The southern portion of the project area transitions from a Low Archaeological Sensitivity Zone to a Low-fill Archaeological Sensitivity Zone. Situated between these two zones is an approximately 100-foot-wide strip running in a northwest-to-southeast direction that is designated as a Medium Archaeological Sensitivity Zone. This strip demarcates a segment of the original coastline of Mōkapu Peninsula. The northern portion of the project area is within the Low Archaeological Sensitivity Zone.

Buildings 373 and 388, which would be renovated under P-885, were constructed in 1943 and 1944, respectively. Building 373 was determined ineligible for listing on the NRHP. Building 388 is not covered by the Programmatic Memorandum of Agreement (PMA) regarding wooden temporary buildings because MCB Hawaii intends to renovate this structure, rather than demolish it. During Section 106 consultation, the State Historic Preservation Division (SHPD) concurred with MCB Hawaii's determination the proposed action would have no adverse effect on historic properties.

Project Area B

Project Area B is situated completely within a Low Archaeological Sensitivity Zone. Buildings 5070 and 5071, which would be renovated under P-858, were both built in 1988 and do not meet the 50-year eligibility criterion for listing in the NRHP. Further, these structures were evaluated as "…a small ancillary building or structure that supports the general needs of the base, and exists in multiples. Typically this type of building or structure is not related to military missions of the Cold War, and is not assessed as having the exceptional significance required to meet Criteria Consideration G" (MAI and WCP, 2010). Properties meeting Criterion G are less than 50 years old, but are of exceptional importance and are thus considered eligible for listing on the NRHP.

Project Area C

Most of Project Area C is within a Low Archaeological Sensitivity Zone. However, portions of P-847 (construction of a new Company Command Post adjacent to Building 1088), P-852 (construction of a new 3D Radio Battalion Complex north of Building 6003), and P-885 (CLB-3 Comm. Shop behind Building 1086, and a motor pool and automotive/utility shop for the 3D Radio Battalion, east of Building 6003), are situated within a Medium Archaeological Sensitivity Zone.

None of the existing buildings proposed for renovation or demolition within Project Area C have been evaluated as eligible for listing in the NRHP. Table 7, below, lists the facilities affected within Project Area C and their NRHP-eligibility status. Data for this table was culled from the ICRMP and from the draft Historical Context and Building Inventory study.

Table 7. NRHP Status of Affected Facilities in Project Area C

MILCON Project	Facility Number	Year Constructed	Proposed Action	NRHP Status
P-778	4053	1986	Renovation and addition	Not Eligible
P-842	1056	1953	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a nondistinctive type and typically would not be interpreted as potentially eligible for the NRHP.
	1057	1953	Demolition	Not Eligible
	1058	1953	Demolition	Not Eligible
	1162	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a nondistinctive type and typically would not be interpreted as potentially eligible for the NRHP.
	1164	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a nondistinctive type and typically would not be interpreted as potentially eligible for the NRHP.
	1165	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a nondistinctive type and typically would not be interpreted as potentially eligible for the NRHP.
	4011	1988	Demolition	Not Eligible
	4021	1988	Demolition	Not Eligible
P-847	5000	1987	Renovation	Not Eligible
	5001	1987	Renovation	Not Eligible
	5011	1987	Renovation	Not Eligible
	5008	1987	Demolition	Not Eligible
	5009	1987	Demolition	Not Eligible
	5031	1987	Demolition	Not Eligible
P-858	4010	1988	Demolition	Not Eligible
	4017	1988	Demolition	Not Eligible
	4019	1988	Demolition	Not Eligible
	4020	1988	Demolition	Not Eligible
	6705	1991	Demolition	Not Eligible

3.15.1 Potential Impacts

Project actions would be considered to have significant impacts if (1) they adversely affect the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association, or (2) result in the physical destruction, damage or alteration of visual, audible, or atmospheric elements that are defining characteristics of the property or its setting.

3.15.1.1 Proposed Action

The proposed action is not anticipated to result in any significant adverse impacts on historic, archaeological, or cultural resources at MCB Hawaii - Kaneohe Bay. The various project areas are located in Low-fill, Low, and Medium Archaeological Sensitivity Zones, where the probability of encountering archaeological or cultural resources is minimal. However, as with any construction activity that involves ground disturbance, there exists the potential, although unlikely, of uncovering previously unidentified subsurface resources. In the event of inadvertent discovery of cultural resources or cultural remains during construction, appropriate measures would be undertaken as discussed below, in Section 3.15.2 *Mitigation Measures*. Inadvertent discoveries of cultural resources or cultural remains would be most likely to occur in the Medium Archaeologically Sensitive Zone.

None of the buildings or structures encompassed by the proposed action is located within MCB Hawaii - Kaneohe Bay's three potentially eligible historic districts—the Aviation District, the Administration District, and the Hilltop Officers' Housing District—and therefore, the integrity of these areas would not be affected. MCB Hawaii has determined that the proposed action would result in no adverse effect on historic properties based upon the following:

1) The various project sites are all located in areas that have been disturbed previously by initial base construction, and none are located within the boundaries of archaeological sites.
2) Building 373 has been determined ineligible for the NRHP and the proposed renovations to Building 388 would not adversely affect the integrity of this historic property. The remaining buildings and structures affected by the proposed action have been evaluated as either ineligible for the NRHP or would not be interpreted to be potentially eligible for the NRHP.
3) Archaeological monitoring will be conducted during excavation in areas that contain coralline beach sand, such as old utility trenches and below concrete slabs, and in high archaeological sensitivity areas, such as the original coastline.

In accordance with Section 106 of the NHPA, MCB Hawaii has consulted with the SHPO who has concurred with MCB Hawaii's determination. Section 106 consultation correspondence attached to this EA as Appendix D.

3.15.1.2 No Action

The No Action alternative would result in no impacts on archaeological, cultural or historic resources.

3.15.2 Mitigation Measures

In addition to the archaeological monitoring in areas with coralline beach sand and in high sensitivity areas, additional monitoring may be conducted. To mitigate any potential impacts that may result from inadvertent discoveries during ground-disturbing activities, monitoring by a professional archaeologist would be conducted only in the unlikely event that something is found. An archaeological monitoring plan may also be developed, if warranted. In the event of an inadvertent discovery, SOPs, as enumerated in the ICRMP, would be carried out. SOPs include, but are not limited to, immediate stoppage of land-disturbing work, protecting the resource from damage or loss, and contacting the base CRM.

3.16 TRAFFIC AND CIRCULATION

Vehicles enter and exit the base through one of two guarded gates. The primary entrance is via the H-3 Freeway. The other entrance is at Mōkapu Gate, located at the end of Mōkapu Boulevard, near 'Aikahi Park, in Kailua. Within the base, Mōkapu Boulevard transitions into Mōkapu Road, which crosses the base on an east-west axis, ending in West Field. On-base traffic flow is controlled by five signalized intersections and several stop signs. The five signalized intersections are located at: G Street/Lawrence Road and Mokapu Road; G Street and 3rd Street; Mōkapu Road and Harris Avenue; and one at either side of Runway 4/22, to control runway-crossing traffic on Mōkapu Road. Except for the MWSS Headquarters Compound, all of the GTF project sites are located in the central to eastern half of the base. The major on-base roadways that would service the project sites include Mōkapu Road, Selden Street and Harris Avenue. The MWSS Compound is located just off B Street, on the western side of the base.

Existing peak hour traffic volumes at the approach to the base's two gates were assessed to identify the baseline level-of-service (LOS). For purposes of the Traffic Impact Assessment Report (TIAR), baseline conditions were defined as the March 2010 population at MCB Hawaii – Kaneohe Bay, excluding the GTF personnel that are already stationed at the base. The population count includes deployed and non-deployed active duty personnel (Navy and Marines), civilian workers, and on-base dependents. Baseline conditions represent a worst-case scenario to show the maximum impact the entire base population would have on traffic conditions.

The morning and afternoon peak hours were determined to be from 7:00 AM to 8:00 AM and from 4:00 PM to 5:00 PM.[11] At the H-3 gate, the morning peak hour traffic volume entering (northbound) and exiting (southbound) was 1,035 and 291vehicles, and during the afternoon peak hour, the volume entering and exiting was 347 and 1,040.[12] For baseline conditions, the northbound (entering) and southbound (exiting) traffic along the H-3 had a baseline LOS of either A or B during both the morning and afternoon peak hours. For the Mōkapu gate, the morning peak volume entering and exiting was 356 and 256 and the afternoon peak hour volume

[11] Peak traffic hours were determined using the State of Hawaii Department of Transportation's 24-hour traffic counts along the H-3 freeway at Kaneohe Bay Drive, the nearest intersection to the base's H-3 gate.
[12] Traffic volume counts at the base's two gates were taken in April 2010.

entering and exiting was 268 and 413. The resultant baseline conditions for both the morning and afternoon peak hours had an LOS of either C or D along Mōkapu Boulevard. Table 8 below shows the baseline LOS breakdown for the morning and afternoon peak hours for both H-3 and Mōkapu Boulevard.

Table 8. Baseline LOS for H-3 and Mokapu Boulevard

Time Period and Direction	H-3 LOS	Mōkapu Boulevard LOS
AM Northbound (entering)	B	C
AM Southbound (exiting)	A	C
PM Northbound (entering)	A	C
PM Southbound (exiting	B	D

There are six levels-of-service, A through F. The level-of-service letter designation relates to driving conditions, with A being the best, representing free-flow conditions and no congestion and F representing severe congestion with stop-and-go-conditions. In urban areas, an LOS of D is considered acceptable during peak hour conditions. The LOS of C and D for Mōkapu Boulevard was based on the Percent Time-Spent-Following (PTSF), which is a measure of the percent of time a vehicle will spend following another vehicle along the segment of highway being analyzed; the higher the PTSF, the lower the LOS.

Internal to the base, the existing LOS for selected intersections was also identified. Table 9 below summarizes both the morning and afternoon peak hour LOS for these intersections. As Table 9 shows, these intersections operate at an overall LOS of A or B, which is considered good. Some intersections did experience a "minor movement" (e.g., turns and side street approaches) LOS of D; however, even an LOS of E or F for short periods during peak hours are considered acceptable for minor movements, as long as the overall intersection operates at an LOS D or better.

Table 9. Existing (2010) LOS for Selected On-base Intersections

Intersection and Movement	AM Peak Hour		PM Peak Hour	
	Delay [1]	LOS [2]	Delay	LOS
Mokapu Boulevard at Harris Avenue	***21.6***	***C***	***14.8***	***B***
Eastbound Left, Thru & Right	14.4	B	20.2	C
Westbound Left, Thru & Right	16.6	B	8.8	A
Northbound Left, Thru & Right	10.5	B	13.4	B
Southbound Left, Thru & Right	33.1	C	13.0	B
Selden Street at Harris Avenue	***0.0***	***A***	***0.0***	***A***
Eastbound Left & Right	0.0	A	0.0	A
Northbound Left & Thru	0.0	A	0.0	A
Mokapu Boulevard at Craig Avenue	***6.6***	***A***	***5.3***	***A***
Westbound Left & Thru	3.6	A	3.5	A
Northbound Left & Right	33.7	D	24.0	C
Selden Street at Craig Avenue	***9.9***	***B***	***7.1***	***A***
Eastbound Left, Thru & Right	3.1	A	3.0	A
Westbound Left, Thru & Right	0.5	A	0.5	A
Northbound Left, Thru & Right	22.7	C	18.1	C
Southbound Left, Thru & Right	30.6	D	18.6	C
Selden Street at Third Street	***10.1***	***B***	***8.1***	***A***
Westbound Left & Thru	6.9	A	7.2	A
Northbound Left & Right	14.5	B	12.8	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

3.16.1 Potential Impacts

Project actions are determined to have a significant adverse impact if the project results in an increase in traffic volume such that existing levels-of-service are degraded to a point requiring substantial road improvements to increase the capacity of relevant street systems.

3.16.1.1 Proposed Action

In the short-term, traffic and circulation in the immediate vicinity of each project site may be affected during construction. Transportation of construction materials to and from the site, construction worker vehicles, as well as installation of utilities and roadwork could temporarily disrupt traffic patterns and movement. These impacts are temporary in nature and are expected to be less than significant.

Construction-related, short-term impacts on traffic could be alleviated by implementing standard construction site procedures including detouring and flagging operations, maintaining access to other driveways near project sites, and scheduling construction to minimize disruption to normal traffic flow and patterns. If warranted, a traffic management plan could also be developed to alleviate traffic inconveniences caused by construction activities.

A TIAR was conducted to assess the potential impacts the proposed action would have on traffic and circulation. The TIAR is attached to the EA as Appendix E. The TIAR looked at potential impacts on traffic entering and exiting the base at H-3 and Mōkapu Boulevard, selected intersections internal to the base, and at specific project site driveways.

H-3 AND MOKAPU BOULEVARD

The vehicle counts from April 2010 were used to project the number of trips that would be generated by the additional 970 GTF personnel and the resultant effect on the LOS along H-3 and Mōkapu Boulevard. Under a worst-case scenario, the GTF increase could be expected to generate an additional 115 morning peak hour trips and 124 afternoon peak hour trips. These trips would be divided between the H-3 and Mōkapu Boulevard. Tables 10 and 11 below show the results of the LOS analysis for H-3 and Mōkapu Boulevard. As these tables indicate, even under worst-case conditions, the additional trips generated by the GTF personnel would have no effect on the existing LOS for each of these roadways. Therefore the proposed action would not have any significant impacts on these public roadways leading to the base.

Table 10. Results of LOS Analysis for H-3

Time Period & Direction	Baseline Conditions		Baseline Plus GTF Conditions		Changes	
	pc/mi/lane	Level-of-Service	pc/mi/lane	Level-of-Service	pc/mi/lane	Level-of-Service
AM Northbound (Inbound)	14.3	B	15.0	B	0.7	No Change
AM Southbound (Outbound)	4.5	A	4.7	A	0.2	No Change
PM Northbound (Inbound)	4.6	A	4.8	A	0.2	No Change
PM Southbound (Outbound)	13.5	B	14.2	B	0.7	No Change

Notes:
(1) pc/mi/lane = passenger cars per mile per lane
(2) GTF = Grow the Force

Table 11. Results of LOS Analysis for Mokapu Boulevard

Time Period & Direction	Baseline Conditions			Baseline Plus GTF Conditions		
	%	V/C	Level-of-Service	%	V/C	Level-of-Service
AM Northbound (Inbound)	58.0	0.33	C	59.6	0.35	C
AM Southbound (Outbound)	61.7	0.30	C	63.3	0.31	C
PM Northbound (Inbound)	55.6	0.25	C	57.4	0.26	C
PM Southbound (Outbound)	74.1	0.51	D	75.4	0.54	D

Notes:
(1) V/C = Volume-to-Capacity Ratio
(2) % = Percent of Time Following
(3) GTF = Grow the Force

SELECTED ON-BASE INTERSECTIONS

Table 12 below summarizes the effects the proposed action would have on selected on-base intersections. The proposed action may degrade the LOS for some minor movements at some intersections. For example, the northbound movement at the Mōkapu Road and Craig Avenue intersection is expected to worsen from LOS D to E. The same is true for the southbound movement at the Selden Street and Craig Avenue intersection. As stated previously, an LOS of E or F for minor movements is acceptable for short periods during peak hours as long as the overall intersection maintains an LOS of D or higher. Despite the lower LOS for these minor movements, the overall LOS at all intersections is expected to remain unchanged, with the lowest LOS of C during the morning peak hour at the Mōkapu Road and Harris Avenue intersection. An LOS of C generally indicates light congestion with occasional backups and average traffic delays. The remaining intersections would have an overall LOS of A or B.

Table 12. Future LOS for Selected On-base Intersections

	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
Intersection and Movement	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS
Mokapu Boulevard at Harris Avenue	***21.6***	***C***	***26.4***	***C***	***14.8***	***B***	***17.4***	***B***
Eastbound Left, Thru & Right	14.4	B	15.7	B	20.2	C	24.1	C
Westbound Left, Thru & Right	16.6	B	18.7	B	8.8	A	9.7	A
Northbound Left, Thru & Right	10.5	B	14.2	B	13.4	B	17.4	B
Southbound Left, Thru & Right	33.1	C	44.4	D	13.0	B	14.9	B
Selden Street at Harris Avenue	***0.0***	***A***	***2.8***	***A***	***0.0***	***A***	***3.3***	***A***
Eastbound Left & Right	0.0	A	8.6	A	0.0	A	8.8	A
Northbound Left & Thru	0.0	A	2.4	A	0.0	A	0.7	A
Mokapu Boulevard at Craig Avenue	***6.6***	***A***	***7.8***	***A***	***5.3***	***A***	***6.2***	***A***
Westbound Left & Thru	3.6	A	3.8	A	3.5	A	3.8	A
Northbound Left & Right	33.7	D	**40.8**	**E**	24.0	C	29.4	D
Selden Street at Craig Avenue	***9.9***	***B***	***12.4***	***B***	***7.1***	***A***	***7.8***	***A***
Eastbound Left, Thru & Right	3.1	A	3.2	A	3.0	A	3.1	A
Westbound Left, Thru & Right	0.5	A	0.5	A	0.5	A	0.5	A
Northbound Left, Thru & Right	22.7	C	26.2	D	18.1	C	20.7	C
Southbound Left, Thru & Right	30.6	D	**42.2**	**E**	18.6	C	21.5	C
Selden Street at Third Street	***10.1***	***B***	***10.7***	***B***	***8.1***	***A***	***8.4***	***A***
Westbound Left & Thru	6.9	A	6.8	A	7.2	A	7.1	A
Northbound Left & Right	14.5	B	15.9	C	12.8	B	13.8	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

PROJECT DRIVEWAYS

An LOS analysis was also conducted for future project driveways. For analysis purposes, it was assumed that project driveways would be configured as one lane inbound and one lane outbound and that no separate left turn lanes into project driveways would be provided. This scenario would represent a worst-case condition. Table 13 below summarizes the LOS for project driveway intersections. The minor movements and associated delays include vehicles waiting to

exit a driveway onto the roadway and vehicles on the roadway waiting to turn into a driveway. All project driveway intersections would maintain an overall LOS of A, with minor movements ranging from LOS A to C. The minor movements with an LOS of C occur during the afternoon peak hour Eastbound (outbound from the driveway) at the P-847 Artillery Battery Complex and Southbound (outbound from the driveway) at the P-847 Command Post.

Table 13. Future LOS for Project Driveways

Intersection and Movement	AM Peak Hour		PM Peak Hour	
	Delay [1]	LOS [2]	Delay	LOS
Mokapu Boulevard at P-847 Battalion Complex	***0.3***	***A***	***1.0***	***A***
Eastbound Left & Right	12.6	B	15.5	C
Northbound Left & Thru	0.4	A	0.1	A
Harris Avenue at P-858 BEQ Parking Garage	***1.8***	***A***	***1.9***	***A***
Westbound Left & Right	11.6	B	12.6	B
Southbound Left & Thru	0.5	A	2.8	A
Harris Avenue at P-852	***7.1***	***A***	***8.2***	***A***
Westbound Left & Right	8.3	A	8.4	A
Southbound Left & Thru	7.3	A	7.2	A
Mokapu Avenue at P-847 Command Post	***0.0***	***A***	***0.0***	***A***
Eastbound Left & Thru	0.1	A	0.0	A
Southbound Left & Right	0.0	A	15.1	C
'B' Street at P-885 MWSS	***0.9***	***A***	***1.7***	***A***
Westbound Left & Thru	12.0	B	14.7	A
Southbound Left & Thru	1.5	A	0.3	A
3rd Street at P-885 CLB Comm Shop	***0.2***	***A***	***0.2***	***A***
Westbound Left & Right	13.3	B	10.7	B
Southbound Left & Thru	0.4	A	0.0	A

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

3.16.1.2 No Action

The No Action alternative would have no impacts on on-base or off-base traffic.

3.16.2 Mitigation Measures

Based on the results of the LOS analysis for approach roadways, on-base intersections, and future project driveways, no mitigation is required. After implementation of the proposed action, approach roadways, on-base intersections, and project driveways are anticipated to operate at an LOS of D or better during peak hours, which is considered acceptable.

3.17 RECREATIONAL FACILITIES

On-base recreational facilities are managed to provide recreational opportunities within the limits of the military's mission and the constraints of available resources. On-base recreational facilities are well-used and at times high usage can result in indirect effects on parking in the

vicinity of these facilities. Recreational activities at MCB Hawaii - Kaneohe Bay utilize both the natural environment and developed facilities. Outdoor-recreation activities that utilize the base's natural resource assets include water sports (e.g., sailing, kayaking, snorkeling, and windsurfing), camping, fishing (permitted in designated areas only), beach swimming and picnicking, typical at areas such as Fort Hase Beach, Marina Cove, Hale Koa Beach, North Beach, and Pyramid Rock Beach. The Marina and Outdoor Recreation Center provides lessons and equipment rentals to base personnel for these outdoor-recreation activities.

Developed recreational facilities at the base include football and softball fields; tennis, basketball, and volleyball courts; the Klipper Golf Course; Tiki Island (miniature golf, bumper boats and a batting cage); Hawaii Loa skate park; K-Bay Lanes; swimming pools; and the Semper Fit Gymnasium. Theses facilities are managed by Marine Corps Community Services (MCCS) for recreational use by base personnel. Most of these constructed recreational facilities are centrally located and are easily accessible to bachelor and family housing areas.

Project Area A
There are no recreational areas within Project Area A. The closest recreational area, comprising two baseball/softball fields, is approximately 310 ft (95 m) to the east. The fields can be accessed from C Street or 3rd Street.

Project Area B
Project Area B is a designated Troop Housing area. There are several recreational facilities within a short walking distance of the BEQs. Directly across from the BEQs are Pop Warner Track and Field and the Semper Fit Gymnasium. To the southwest, two basketball courts and the Kaneohe Bay Main Pool (Building 274) are located south of 5th Street. To the north, two baseball/softball fields at Risley Field, as well as tennis courts, can be easily accessed from the BEQs.

Project Area C
An outdoor paintball arena is located immediately southeast of the proposed location of the parking lot to be constructed at the northern end of Harris Avenue.

3.17.1 Potential Impacts
Project actions are determined to have a significant adverse impact if there is a significant loss of usable recreational facilities.

3.17.1.1 Proposed Action
No recreational facilities or areas would be lost as a result of the proposed action; therefore no significant adverse impacts would result. However, recreational facilities and programs may see an increase in users and participants from among the additional troops and families assigned to the base. Increased demand for use of existing recreational facilities and areas should be insignificant with only an approximate 5 percent increase in population. In addition, there are a multitude of recreational opportunities in the surrounding communities of Kāne'ohe and Kailua, and throughout the island of O'ahu that are available to base personnel.

3.17.1.2 No Action
The No Action alternative would have no impacts on recreational facilities.

3.17.2 Mitigation Measures
No mitigation measures are warranted or proposed.

3.18 UTILITIES, INFRASTRUCTURE, AND SOLID WASTE
The utility, infrastructure, and solid waste services required for the proposed action would be provided by existing infrastructure and service providers. Utility connections, including water and sanitary and storm sewers would be required for new facilities. As part of the proposed action, upgrades to electrical utilities and installation of other features to promote efficient and sustainable use of infrastructure systems and utilities are being proposed to achieve, at minimum, a LEED Silver rating.

ELECTRICITY
Electrical power is supplied to MCB Hawaii - Kaneohe Bay by Hawaiian Electric Company (HECO). HECO's main service enters at the HECO Mōkapu Substation, near the H-3/Main Gate. Three transformers (XFMR) at the Mōkapu Substation step down the incoming 46 kV to the base distribution of 11.5 kV. MCBH owns and operates the electrical distribution system within the base. The main components of the base's electrical distribution system include a main incoming switching station and three downstream switching stations (Substations 1, 2 and 3). Substations 1 and 2 are centrally located near housing and community facilities. Substation 3 largely serves the industrial-type facilities, such as the hangars and the airfield. From these three substations, primary feeders distribute power throughout the base. The existing percent loading on the various feeders serving the three substations range from 0.0 percent to 87.7 percent (NAVFAC Pacific, 2010, Table 1).

WASTEWATER
Wastewater at MCB Hawaii - Kaneohe Bay is treated at the installation's water reclamation facility (WRF). The WRF has the following design capacity: 2.0 million gallons per day (mgd) for average daily influent flow, 3.0 mgd for maximum daily influent flow, and 5.0 mgd for peak influent flow. In calendar year 2007, the average influent flow was 1.211 mgd, which represents 60.5 percent of the WRF capacity. The maximum daily influent flow for 2007 was 2.97 mgd. This occurred in November 2007.

The WRF at MCB Hawaii – Kaneohe Bay provides secondary treatment using a trickling filter as the treatment process. Treated effluent from the WRF is typically used to irrigate the Klipper Golf Course, but can be pumped to the City and County of Honolulu's Kailua Wastewater Treatment Plant (WWTP) for ocean disposal via the Mōkapu Outfall (HDR|HPE, 2008). MCB Hawaii compensates the City and County of Honolulu to use the outfall based on how much flow is sent to the Kailua WWTP.

Due to the recent inability to meet the R-2 requirements[13] for re-use on the golf course, all treated effluent from the base has been disposed of through the Mōkapu Outfall. A new disinfection system is being installed that would help meet the R-2 requirements for re-use. The WRF currently lacks redundancy for its treatment systems (primary clarifier, trickling filter, and secondary clarifier). A project is being programmed to add redundancy to the WRF.

SOLID WASTE

Most of the solid waste produced at MCB Hawaii - Kaneohe Bay, including that from administrative, industrial, military, commercial, bachelor quarters areas, is disposed of in the MCB Hawaii - Kaneohe Bay sanitary landfill, which is located on the southern slope of Ulu'pau Crater. Solid waste produced from the family housing areas is collected by a commercial contractor and disposed of at the City and County of Honolulu's H-Power Plant, or in the case when the H-Power Plant is not operating, at the Waimanalo Gulch Landfill. Solid waste from various construction and renovation projects is also disposed of off-base. MCB Hawaii has an aggressive recycling program and diverts as much solid waste as possible from the landfill. There is an on-base recycling center, located in Building 132, which accepts all traditional recyclable materials, wood pallets, and reusable materials from operations, administrative, and community support areas. Hazardous and regulated waste is not accepted at the MCB Hawaii – Kaneohe Bay landfill.

During the reporting period July 2007 through June 2008 (state of Hawai'i FY2008), MCB Hawaii – Kaneohe Bay generated 11,385 tons of solid waste. Of the 11,385 tons, 5,258 tons (46 percent) were disposed of off-base, 3,929 tons (35 percent) were recycled, and 2,198 tons (19 percent) were disposed of at the on-base landfill (2,178 tons as refuse and 20 tons of cover material). The estimated capacity of the MCB Hawaii – Kaneohe Bay landfill is 1,204,000 cubic yards (cy). As of FY2008, the remaining capacity was estimated to be 715,070 cy, or 59.4 percent of available landfill space.

POTABLE WATER

There are no potable water wells at MCB Hawaii - Kaneohe Bay. MCB Hawaii purchases potable water from the City and County of Honolulu Board of Water Supply. By agreement, BWS supplies an estimated daily maximum demand of 3.0 mgd; however, MCB Hawaii – Kaneohe Bay is neither obligated to use nor restricted to this estimated amount. A system of distribution lines, which are owned and maintained by MCB Hawaii, distribute water throughout the base. In FY2008 (October 2007 – September 2008), total water consumption at MCB Hawaii - Kaneohe Bay was 674 million gallons (pers. comm., B. Nutting, 14 Jan 2011). The average daily use during this period was 1.81 mgd.

[13] Secondary treated recycled water that has been oxidized and disinfected. R-2 water has restrictions on uses and applications.

3.18.1 Potential Impacts

An impact would be considered significant if the proposed action caused demand for electrical, water, wastewater, to exceed the capacity of existing and planned systems, including system upgrades.

3.18.1.1 Proposed Action

Demand for electrical, water, and wastewater is anticipated to increase slightly under the proposed action, as 970 additional personnel would be relocating to MCB Hawaii - Kaneohe Bay. A slight increase in solid waste may also be expected from the additional personnel. Demand for these services is not anticipated to reach or exceed the operational capacities of the base's existing systems. Any projections discussed in the following section are preliminary and based on estimated per capita usage. During each project's design phase, a more refined estimate can be produced taking into consideration selected systems, which would include sustainable features that would reduce the per-person demand for utilities and other infrastructure services at MCB Hawaii – Kaneohe Bay. Projects would be designed to achieve, at a minimum, a LEED Silver rating.

ELECTRICITY

An Electrical Utilities System Assessment (USA) was recently prepared for MCB Hawaii – Kaneohe Bay (NAVFAC Pacific, 2010). The USA evaluated the current system, estimated the projected loads the GTF and the aviation-related projects would have on system capabilities, and recommended upgrades where needed.

Table 14 below shows the GTF projects and the substation from which each is served. The majority of the GTF projects would be served by Substation 1, with components of P-858 (renovation of 5070 and 5071) and P-885 (MWSS compound) served by Substations 2 and 3, respectively.

Table 14. GTF Projects and Substation Assignments

MILCON	Substation 1	Substation 2	Substation 3
P-778	Armory Renovation and Expansion		
P-842	Consolidated Aid Station		
P-847	Artillery Battery Complex and Command Post		
P-852	3D Radio Battalion Complex		
P-858	New BEQ, Command HQ and Parking Garage	Renovation of existing BEQs 5070 and 5071	
P-885	3D Radio Motor Pool; CLB-3 Facilities and Comm Shop		MWSS HQ Compound

The GTF projects are estimated to result in a net electrical demand increase of 1,246 kVA, distributed as follows: 869 kVA to Substation 1, 259 kVA to Substation 2, and 118 kVA to Substation 3 (NAVFAC Pacific, 2010). This net increase represents approximately 4.6 percent of the total peak load demand of 27.36 MVA projected for FY2018 and beyond. Records indicate that the past peak load demand of the entire base reached 19.36 MVA in November 2009. Based on a worst-case scenario in which all future projects are constructed as currently planned (GTF projects and aviation-related projects to support basing of the MV-22, the HMLA, and the P-8A aircraft), the overall demand is projected to increase an additional 8 MVA, to an estimated peak load demand of 27.36 MVA. HECO's Mōkapu Substation has adequate transformer capacity (37.5 MVA) to support MCB Hawaii – Kaneohe Bay's planned growth. Therefore, no significant adverse impact on HECO's system is expected to result from the proposed action.

Within the base, the existing electrical distribution system, with planned upgrades, is considered adequate to support the planned growth. Substation 1 has adequate feeder capacity and transformer capacity to accommodate the future peak load demand resulting from the GTF projects. Substation 2 is fed power from HECO XFMR #2 via tie-feeder 2A. Based on the Electrical USA, renovation of 5070 and 5071 (P-858) would cause tie-feeder 2A to become overloaded in the in FY2013 – FY2014 time frame and it is recommended that this MILCON project fund a utility upgrade. The recommended upgrade is that tie-Feeders 2A and 2B be double-circuited or upgraded to two 500 MCM conductors. Implementing the recommended upgrades would ensure that Substation 2 has adequate capacity to serve P-858 as well as other planned projects within its service area. Tie-feeder 3B, which provides power from HECO XFMR #1 to Substation 3, is expected to become overloaded in the FY 2016 time from one of several aviation-related projects planned for FY2015. The study recommends one of the aviation MILCON projects fund the needed upgrades to tie-feeders 3A and 3B. With implementation of these upgrades, Substation 3 would have adequate capacity to support the MWSS Headquarters Compound.

Overall, the Electrical USA concluded that HECO's Mōkapu Substation has adequate transformer capacity to support the planned future growth at MCB Hawaii – Kaneohe Bay. It also concluded that the base's primary distribution system has adequate provisions for back-up capabilities. However, the study does recommend some system improvements and upgrades to accommodate the planned growth from the GTF and aviation-related projects.

WASTEWATER

Wastewater services for the proposed action would be provided by existing systems at MCB Hawaii - Kaneohe Bay. Connections to the existing wastewater system would be provided for newly constructed and renovated sites.

The proposed additional personnel could result in an estimated influent flow increase of 77,600 gpd (based on 80 gpcd for residents). This increase would result in a total estimated average influent flow of 1.289 mgd, a 6 percent increase over the 2007 average of 1.211 mgd. The 1.289 mgd would still be well below the 75 percent threshold of the WRF's 2.0 mgd capacity, at which point plans to increase plant capacity should be undertaken (Annual Pollution Prevention Report,

2007). To achieve LEED certification, conservation and sustainable design features, including water-conserving plumbing fixtures and dual-flush controls for toilets, would be incorporated into the wastewater systems. Thus, the actual sewage flow likely would be less than the per capita estimate.

SOLID WASTE

Based on the FY2008 reporting period, the per capita generation of solid waste at MCB Hawaii – Kaneohe Bay is approximately 4.13 pounds per person per day. Therefore, based on this per capita estimate, the additional 970 persons could generate roughly 4,006 pounds of solid waste per day or 731 tons per year. This represents an approximately 6.4 percent increase from FY2008 levels. The amount of solid waste would be reduced by the base's continuing recycling efforts. Solid waste generated at the various project sites would be collected and disposed of in the same manner as is currently conducted. In FY2008, 19 percent of the solid waste generated at the base was disposed of at the on-base landfill. Applying the same rate to the estimated amount of solid waste from the proposed action, 139 tons (19 percent of 731 tons) of additional solid waste would be directed toward the on-base landfill annually. The on-base landfill has sufficient available capacity; therefore, no significant adverse impacts related to solid waste are expected to result from the proposed action.

POTABLE WATER

Facilities constructed under the proposed action would be served by the existing potable water infrastructure at MCB Hawaii - Kaneohe Bay. Based on the per capita guidelines contained in UFC 3-230-19N Water Supply Systems, the proposed action could result in an estimated 0.17 mgd increase in the average day demand for potable water, assuming all 970 GTF personnel and dependents reside on base. This would represent a 9 percent increase above the FY2008 average daily use of 1.81 mgd. However, in order to achieve a LEED Silver rating, it is expected that sustainable features that reduce inefficiencies and waste, as well as overall water consumption, would be incorporated into each project. Thus, actual water consumption is likely to be lower than the per capita estimate.

With implementation of planned and recommended upgrades, the proposed action should not exceed the capacity of existing systems. Thus, no significant impacts on utilities or infrastructure are anticipated from the proposed action.

3.18.1.2 No Action

The No Action alternative would have no impacts on utilities, infrastructure or solid waste.

3.18.2 Mitigation Measures

No mitigation measures are warranted or proposed.

3.19 HAZARDOUS MATERIALS AND WASTE

MCB Hawaii conducts an Installation Restoration (IR) program that manages sites where remediation or other efforts are being undertaken due to the release of hazardous materials or

petroleum products. Handling and disposal of hazardous materials at MCB Hawaii - Kaneohe Bay are regulated by policies set forth by the EPA and the State of Hawaii DOH.

Project Area A

Building 373 is located close to former underground storage tank (UST) sites, the Fuel Farm, and presently, a few above-ground storage tanks (ASTs). Just northeast of the facility is AST 1253, which holds Jet Propellant Grade 5 (JP-5). Previous investigations (NAVFAC, 1989) have confirmed a past leak (1987), which contaminated the subsurface soil. Data from this investigation was used to construct a "fuel thickness contour map" indicating that the JP-5 had migrated approximately 315 ft from the center of AST 1253, with a thickness ranging up to 71 inches at its thickest (NAVFAC Pacific, 2009). Although the extent of the free-phase product is not expected to increase, the estimated extent of contamination encroaches upon the MWSS compound proposed to be paved as a feature of MILCON P-885.

Site IR-16,[14] is located at the southwest corner of B373. Site IR-16 has not been investigated. Due to the calcareous nature of the soils in the area, it was expected that the acids would have quickly been neutralized and the small quantities of metals they contained would have been adsorbed onto clay particles in the soil. Therefore, no confirmation study was proposed for site IR-16 at the time of its initial register. NAVFAC Hawaii has programmed funding for additional site sampling of IR-16 in FY2012 and 2013.

Project Area B

There are no known hazardous materials or IR sites within Project Area B.

Project Area C

The proposed parking garage for P-858 may be located partially within an IR site, an area filled with compacted dirt and soil that was once the Quarry Landfill. If development were to take place atop the previous landfill site, further action may be required. Several buildings to be demolished under P-842 (Consolidated Aid Station) were constructed in 1953 and 1956 and likely contain LBP and ACM. The land beneath these to-be-demolished structures may have chlordane-contaminated soil.[15] Contamination would be determined during a future phase of the project's planning and design. Other buildings that would be demolished in Project Area C, including 4011, 4021, 5008, 5009, 5031, 4010, 4017, 4019, and 4020 were all constructed in the late 1980s and could contain suspect ACM.

[14] From approximately 1959 through the mid-1970s, an estimated five gallons of sulfuric acid electrolyte were disposed of directly into the ground near the battery shop on the southwest corner of Building 373 (Naval Energy & Environmental Support Activity, 1984).

[15] Chlordane was used as a pesticide. The EPA banned chlordane use in 1983, with the exception for termite control. Chlordane was completely banned in 1988.

3.19.1 Potential Impacts

A project action is determined to have a significant adverse environmental impact if it results in the release of hazardous or toxic materials, particularly if it increases the potential for human exposure.

3.19.1.1 Proposed Action

Groundwater at Project Area A is at approximately 12 ft (4 m) below ground surface. Repaving the parking area and renovations to buildings within the MWSS compound would not require excavations down to groundwater, where contact with free product may result. Two years of groundwater monitoring has been programmed to start in FY2010. Results obtained from the investigation would provide more data prior to construction of P-885, which is programmed for FY2012–2013 MILCON. Because site conditions are not completely known at this time, remediation measures for the P-885 site, as well as the P-858 site, may be needed based on sampling results and information gathered during future site investigations.

Although radon has not been detected in MCB Hawaii – Kaneohe Bay facilities, as a precaution against potential radon gas infiltration, the armory addition to Building 4053 would include features such as the installation of sealed floor slabs and under-floor vapor barriers. Openings in the existing armory floor slab will be sealed to reduce the potential infiltration of radon gas into the armory facility.

Proper removal, handling, transport and disposal of hazardous materials from the premises of buildings that contain LBP and ACM would be conducted by qualified professionals, in compliance with all applicable state and federal health, safety, and environmental regulations. In accordance with HAR 11-501 Asbestos Requirements, DOH would be notified of any demolition or renovation work involving asbestos, if required. BMPs would be employed during demolition or renovation work to prevent and/or minimize the release of hazardous materials and to protect workers. This would minimize the risk of persons on base being exposed to health hazards associated with these hazardous materials.

In the long-term, any hazardous materials used or stored during GTF-related operations would continue to be handled and managed in accordance with established protocol. This includes bar coding and tracking of material by the base's Hazard Minimization Center, waste-screening, and disposal of hazardous waste at the base's Hazardous Waste 90-day accumulation site. Hazardous waste is not allowed in base dumpsters or in the base landfill.

No significant short-term or long-term adverse impacts related to hazardous materials are expected to result from the proposed action.

3.19.1.2 No Action

The No Action alternative would not increase the risk of release of hazardous materials or waste, increase the risk to base personnel of exposure to hazardous waste, or affect IR sites near project areas. However it would leave in place hazardous materials known to exist in some buildings, and potential exposure of base personnel to the materials would be possible. Health and safety concerns due to the ACMs and LBP in these buildings would remain.

3.19.2 Mitigation Measures

The existing protocols in place and regulations for hazardous material and wastes handling and disposal would be used; thus, no mitigation measures are warranted or proposed.

3.20 CUMULATIVE IMPACTS

Cumulative impacts are the result of two or more individual effects that, when considered together, compound or increase the overall impact. Cumulative impacts can arise from the individual effects of a single action or from the combined effects of past, present and/or future actions. Therefore, cumulative impacts can result from individually minor actions that collectively amount to significant actions over time.

The projects listed in Table 15 below were considered in conducting the cumulative impact analysis. Capital improvement projects (CIP) at MCB Hawaii - Kaneohe Bay comprise the majority of projects in the list. A handful of projects are planned for off-base locations, within the nearby civilian community. Projects listed in Table 15 are planned to be constructed concurrent with or shortly after the GTF projects encompassed by the proposed action. Many of the CIP projects at MCB Hawaii - Kaneohe would accommodate the basing of the MV-22 Osprey, the Marine Light Attack Helicopter (HMLA) and P-8A Multi-mission Maritime Aircraft, their supporting units, and other aviation-related improvements. The Navy completed an Environmental Impact Statement (EIS) in 2008 for the introduction of the P-8A Multi-Mission Maritime Aircraft (MMA) into the Navy fleet. Another EIS is currently being prepared for projects that support the basing of the Marine Corps MV-22 and HMLA aircraft at MCB Hawaii – Kaneohe Bay. In addition, EAs or EISs have been or are being completed for the listed projects located within the nearby civilian community.

Table 15. Construction Projects Considered in the Cumulative Impact Analysis

Project Number	Title	Description	Project Proponent	Year
DoD Projects				
P-049/P-067 (Navy)	Construct P-8A Hangar and Training Facilities	Construct a new 2-bay hangar and adjacent parking; new aircraft access apron; new aircraft warehouse/support equipment storage building; upgrade the existing Aircraft Rinse Facility; renovate the 1st floor of existing Building 6468 and construct an addition for classrooms, offices, and specialized trainers.	U.S. Navy	2014/2015
P-822	MCAS Operations Complex	Construct new MCAS command operations facility, passenger air terminal, and cargo terminal in a combined low-rise structure, and a one-story Aircraft Rescue and Firefighting Command Center.	USMC	2012
P-836	MAG-24 Headquarters and Parking Structure	Construct a new multi-story Marine Air Group-24 (MAG-24) Headquarters and multi-story parking structure to support an expanded MAG-24.	USMC	2014 or beyond
P-844/P-892	MV-22	Construct new aircraft maintenance hangar,	USMC	2013/2014

	Infrastructure Upgrades Phases I and II	parking apron and supporting facilities (warehouses, washrack, POV parking, etc.) to support the MV-22 squadrons to be based in Hawai'i. Will involve demolition of warehouses and their replacement facilities (new buildings or renovation of existing buildings).		
P-863	HMLA Infrastructure Upgrades	Renovate Hangar 101, upgrade and repair an existing aircraft parking apron and construct an interim aid station and other supporting facilities.	USMC	2013
P-864	MALS-24 Aircraft Maintenance Expansion	Expand Building 5069 and other facility upgrades to support aircraft maintenance activities.	USMC	2014 or beyond
P-882	Runway Clear Zone Demolition and Airfield Improvements	Demolition of buildings that lie within the Runway Clear zone (750 feet from runway center) and the required replacement facilities. Reconfigure taxiway to bring taxiing aircraft out of the clear zone and create additional aircraft parking areas.	USMC	2018 or beyond
P-884	Mission Support Facility (Aviation Trainer)	Construct a new centralized training facility to accommodate new aviation simulators in support of the MV-22, HLMA, and Marine Heavy Helicopter (HMH) squadrons.	USMC	2014 or beyond
P-886	BEQ (Aviation Support)	Construct new BEQs to support the additional personnel that belong to the HMLA and MV-22 squadrons.	USMC	2013
P-887	MV-22 Landing Zone Improvements	Constructs one additional Landing Zone to accommodate the MV-22 at MCB Hawaii - Kaneohe Bay. Improves existing landing zones at selected sites located within the Hawaiian Islands	USMC	2014 or beyond
P-749/P-750	BEQs	Construct new BEQs	USMC	
P-835	Child Development Center	Expand the existing Child Development Center to meet the increased demand for infant and child care at MCB Hawaii - Kaneohe Bay.	USMC	2010
P-816	Waterfront Operations Facility	Construct new facility to replace the Waterfront Operations existing deteriorated facilities.	USMC	2011
P-875	Wastewater Treatment Plant Redundancy and Electrical Upgrade	Upgrades to the installation WWTP to provide redundant treatment systems.	USMC	2015
P-881	Communications and Information Systems Department Facilities	Construct facility to consolidate the Communications and Information Systems Department facilities.	USMC	2016
P-837	Enlisted Dining Facility	Construct replacement facility for aging and deteriorated mess hall.	USMC	2017
P-843	Multi-Purpose Training Complex	Construct facility to support individual and small unit training using simulators.	USMC	2016
P-823	Installation Personnel Administration Center	Administrative support center for the Marine Corps Pacific region.	USMC	2017
P-879	Ordnance Storage Magazines	Relocate ordnance storage magazines to address waiver condition on the landfill and road to Ulupau Range	USMC	2015

Non-DoD Projects				
	Kalaheo Repeater Project	Relocate the existing Kalaheo Repeater on Oneawa Ridge in Kaneohe.	Hawaiian Electric Co.	2011*
	Kaneohe-Kailua Wastewater Conveyance and Treatment Facility	Construct system to provide backup conveyance from the Kaneohe Wastewater Pre-treatment Facility to the Kailua Regional Wastewater Treatment Plant	City & County of Honolulu, Dept. of Environmental Services	2011*
	Kapaa Light Industrial Park	Expansion of an existing industrial park that would add an additional 606,000 square feet to the existing 283,000 square feet of warehouse space.	Kapaa I, LLC	2011*
	Kawainui Marsh Restoration	Restoration plans would increase scenic open space, reduce upland runoff and remove alien weeds from the marsh.	U.S. Army Corps of Engineers and the State Dept. of Land and Natural Resources, Division of Forestry and Wildlife	2011*

* Estimated project start date as discussed in each respective EA or EIS document.

Climate

Greenhouse gas (GHG) emissions result from both natural processes and human activities. GHGs trap heat in the atmosphere and re-radiate some of that heat downward. Common GHGs emissions include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The natural greenhouse effect regulates Earth's temperature; however, this natural process is being intensified by human activity, primarily the combustion of fossil fuels and deforestation, and contributes to climate change. Due to the global nature of GHG emissions, individual projects are not likely to have an appreciable effect on climate change, though could contribute to cumulative impacts. In compliance with various federal laws, EOs, and DoD mandates, each proposed action project would utilize sustainable design, including reducing energy consumption and reducing GHG emissions by incorporating LEED-rated design principles. As a result, the proposed action could contribute to cumulative effects on GHG emissions, but this would be minimized through sustainable design and practices.

Air Quality

Implementing the proposed action is not expected to result in any cumulative impacts on air quality. Potential temporary and short-term impacts during construction under the proposed action, or any project listed in Table 15, would be addressed by applying standard construction BMPs to reduce construction vehicle and dust emissions. While the proposed action would result in an increase in on-base personnel and associated vehicular activity, it would be a marginal increase above existing conditions. Further, long-term air quality impacts from mobile sources (i.e., vehicle movements) associated with the proposed action are expected to be insignificant due to the relatively low traffic volumes within MCB Hawaii – Kaneohe Bay.

Noise

The proposed action would not result in cumulative significant adverse impacts on noise. Construction-related noise impacts would be temporary and short-term. During operation, any human and vehicular traffic noise associated with the facilities is expected to be minimal and confined to the immediate vicinity of each project area.

Topography and Soils

No cumulative impacts on topography or soils are expected to result from the proposed action. During the construction phase, land disturbing activities could result in soil loss from erosion and sedimentation, particularly during heavy rain. However, application of construction site BMPs would minimize the potential for soil loss. It is expected that all construction projects would similarly implement standard construction site BMPs and adhere to NPDES permit conditions, so that there would be no cumulative impacts on soils.

The proposed action is expected to have no impact on topography and thus would not contribute to cumulative impacts.

Water Resources

The proposed action should not result in any cumulative adverse impacts on groundwater, surface waters or water quality. In compliance with the Navy's LID policy, it is expected that each individual project encompassed by the proposed action would incorporate design features to control drainage and runoff within project limits so that no significant adverse impacts on surface waters or water quality are expected. Similar to the proposed action, it is expected that each individual project listed in Table 15, above, would also incorporate features to minimize and filter surface runoff, so that no cumulative impacts on water resources are anticipated.

No significant adverse cumulative impacts on groundwater are expected from the proposed action or any of the potential projects listed in Table 15. The groundwater underlying the base is not a source of potable water.

Drainage

The proposed action is not expected to result in cumulative adverse impacts relating to drainage. In compliance with the Navy's LID policy, each individual project would incorporate design features to maintain drainage patterns and control surface drainage within project limits, so that there would be no significant increase in the amount of surface runoff entering receiving waters or degradation of the quality of receiving waters. Further, the proposed action is not expected to increase the rate or volume of surface runoff such that it would exceed the capacity of existing or planned storm water infrastructure. It is expected that each project listed in Table 15 would similarly incorporate design features to address drainage.

Wetlands

Proposed action projects would incorporate site design strategies and features that minimize and filter runoff; therefore, implementation is not expected to result in any cumulative adverse impacts on jurisdictional wetlands. Implementation of BMPs and provisions of the CWA would ensure that any planned construction project, whether the proposed action or any project listed in Table 15, would not adversely affect jurisdictional wetlands. Thus, no cumulative impacts on wetlands are expected.

Biological Resources

The proposed action is not expected to result in any cumulative adverse impacts on flora or fauna. The various project areas encompassed by the proposed action are either already

developed with a managed landscape or are undeveloped parcels covered with weeds and non-native vegetation (e.g., koa haole, Christmas berry). The various project sites do not provide habitat for any threatened or endangered faunal species. Further, the projects would incorporate down-shielded lighting, providing less of an attractant to endangered seabirds, thus minimizing the potential for collisions and fallouts.

Natural Hazards

The proposed action would not result in cumulative adverse impacts related to natural hazards. None of the project areas are located within flood zones or tsunami inundation areas and therefore would not cumulatively contribute to any risk related to these natural hazards.

Population

The USMC proposes to bring approximately 2,128 persons to MCB Hawaii – Kaneohe Bay to support the basing of the MV-22 and HMLA aircraft. The 2,128 persons would be incrementally brought aboard through 2018 and includes an estimated 1,000 active-duty Marines; the remaining persons consisting of dependents and civilian workers. During this same period, two heavy Marine helicopter units currently stationed at MCB Hawaii – Kaneohe Bay would be leaving. Thus, by 2018 a net increase of roughly 323 active duty military personnel is projected to result from the proposed changes to these Marine Corps aviation units at MCB Hawaii – Kaneohe Bay.

Separate from the changes to the Marine Corps aviation units, the U.S. Navy intends to replace the P-3C Orion aircraft with the P-8A MMA. Thus, the three P-3C squadrons currently assigned to MCB Hawaii – Kaneohe Bay would transition to three P-8A MMA fleet squadrons beginning in 2012 and completed by 2019. Due to the smaller crew size and fewer support personnel required for the P-8A MMA, the transition is anticipated to result in a net loss of approximately 737 active-duty personnel at the base (Department of the Navy, 2008).

This growth in population would result in positive economic impacts to Oahu's local economy in terms of direct, indirect and induced employment (e.g., construction jobs), income, and tax revenue. This would ultimately translate to increase revenues for the State of Hawai'i.

Growth within MCB Hawaii - Kaneohe Bay is being met with the construction of new facilities to accommodate more efficient training, operations and adequate living conditions. However, there may be a future need to house personnel off-base if the number of on-base living spaces required to house the additional personnel cannot be met. In this case, off-base housing needs would be expected to increase. However, the proposed construction of P-858, P-886 and renovation of BEQs 5070 and 5071 combined with the gradual incremental increase of personnel over several years (until 2018/2019) would minimize the likelihood of a sudden increase in demand for off-base housing. This would reduce the risk of inflated rental prices and decreased rates of availability of off-base rental units as a result of the planned personnel increase.

Significant cumulative adverse impacts are not expected to result from the anticipated increase in population expected at MCB Hawaii - Kaneohe Bay.

Existing and Surrounding Land Use

The aviation-related capital improvement projects and the projects encompassed by the proposed action are consistent with the land use designations contained in the base master plan and Plus Up Development Plan. Thus, the proposed action, when viewed collectively with the projects listed in Table 15, is not expected to result in cumulative impacts on existing and surrounding land use.

Visual and Aesthetic Resources

Except for the four-story parking structure and BEQ, all of the proposed action projects are one to two stories high and would be designed to be visually compatible with surrounding structures. While slightly higher than surrounding buildings, the parking structure and BEQ would not be significantly inconsistent with these buildings, which are two to three stories. However, the proposed action would result in less than significant adverse impacts to visual and aesthetic resources due to the loss of some open space. Similar to the proposed action, most of the aviation-related capital improvement projects would either renovate existing facilities or demolish and construct new on already developed sites. However, it could be reasonably expected that there would be some loss of open space in the western portion of the base, near the aviation facilities. Cumulatively, the proposed action would contribute to the continued loss of open space at the base, which would have an adverse impact.

Archaeological, Cultural, and Historic Resources

The proposed action would have no adverse impacts on archaeological, cultural, or historic resources and therefore would not contribute to cumulative adverse impacts. The various project areas are located in Low-fill, Low, and Medium Archaeological Sensitivity Zones, where the probability of encountering archaeological or cultural resources is minimal, and it has been determined that no historic properties would be adversely affected by the proposed action.

Traffic and Circulation

The GTF initiative itself is not expected to result in significant adverse impacts on the on-base LOS or for approach roads. Even under worst-case conditions, MCB Hawaii – Kaneohe Bay generally has a fairly low volume of traffic and maintains a moderate to high LOS along the approach roads and within the base. However, when evaluated collectively with other planned personnel increases and construction projects, the proposed action could contribute to LOS degradation. All of the aviation-related projects are located within the central to western half of the base, away from the GTF project sites. Those projects would have the most profound effect on the roadways in the immediate vicinity of those project sites, on the other side of the base, away from the GTF projects. However, it can be expected that during the morning and afternoon peak hours the collective personnel increase could affect traffic and circulation on base and on approach roadways.

A comprehensive basewide traffic study is being conducted to project the full impact of all the personnel increases and construction projects being planned for MCB Hawaii – Kaneohe Bay to support the GTF and the basing of the MV-22, the HMLA, and the Navy's P-8A. Depending on the results of this basewide traffic study, some roadway improvements may be recommended to accommodate the overall growth and resultant increase in traffic.

Recreational Facilities

The proposed action would not result in significant cumulative impacts on recreational facilities. None of the projects encompassed by the proposed action displaces or interferes with the use of any existing recreational facility. However, the overall increase in the base population would place additional pressure on existing recreational facilities, on-base and within the larger community, which would result in some cumulative impacts.

Utilities, Infrastructure, and Solid Waste

Assuming implementation of planned or recommended upgrades, the proposed action is not expected to result in cumulative adverse impacts upon base utilities, infrastructure, or solid waste. Several projects encompassed by the proposed action and those listed in Table 15 would incorporate upgrades to existing utilities and infrastructure. Cumulatively, this would improve service to these and other on-base facilities. Additionally, goals related to reducing energy, recycling, and other saving mechanisms would further reduce the consumption/demand resulting from these project.

Hazardous Materials and Waste

The proposed action is not expected to result in any impacts as a result of hazardous materials or waste and, therefore, would not contribute to any cumulative impacts.

3.21 SUMMARY OF ENVIRONMENTAL IMPACTS

Based on the analysis of environmental impacts of the proposed action and the No Action alternative, this EA concludes that no significant adverse environmental impacts are expected as a result of implementing the proposed action. Table 16, below, summarizes the potential impacts that could result from the alternatives evaluated.

Table 16. Comparison of Alternatives

Environmental Resource	Proposed Action	No Action
Climate	No Impact	No Impact
Air Quality	Short-term, temporary impacts during construction.	No Impact
Noise	Short-term, temporary impacts during construction.	No Impact
Topography and Soils	Short-term, temporary impacts during construction	No Impact
Groundwater	No Adverse Impact	No Impact
Surface Waters	No Impact	No Impact
Drainage	Addition of non-permeable surfaces could increase rate and volume of storm water runoff.	No Impact
Wetlands	No Impact	No Impact
Biological Resources	No Impact	No Impact
Natural Hazards	No Impact	No Impact

Environmental Resource	Proposed Action	No Action
Population, Housing, and Education	Addition of 970 persons would increase total base population by roughly 5 percent. This increase is not expected to have significant adverse effects on population, housing or education.	Could affect off-base housing market, as no new BEQs would be built. No significant impacts on population and education.
Surrounding Land Use	Land currently designated as Administrative would be used for Bachelor Housing.	No Impact
Visual and Aesthetic Resources	Less than significant adverse impact due to loss of open space.	No Impact
Archaeological, Cultural and Historic Resources	No Impact	No Impact
Traffic and Circulation	Short-term, temporary impacts during construction. Some on-base LOS degradation for minor movements; however, the overall LOS for public roadway approaches to the base, on-base intersections, and project driveways are expected to remain at acceptable levels.	No Impact
Recreational Facilities	Facilities and programs may see an increase in use and participants.	No Impact
Utilities, Infrastructure, Solid Waste	Slight increase in demand for services; however, demand is not anticipated to reach or exceed the operational capacities of the existing facilities and planned upgrades.	No Impact
Hazardous Materials and Waste	No Impact	Continued existence of ACM and LBP in facilities to be demolished by P-842, P-847 and P-858.

In general, most expected impacts resulting from the proposed action would be construction-related and temporary. Adherence to standard construction BMPs would minimize potential construction-related impacts.

Potential long-term resource impacts on drainage and surrounding land uses could result from the implementating proposed action. The increased base population is being met with the proposed MILCON projects to accommodate housing, training, and operational needs. The addition of impermeable surfaces within the project areas could potentially increase the rate and volume of storm water runoff. However, LID design features would be incorporated into each of the proposed projects to mitigate drainage issues that may be encountered due to this increase. A minor change in land use would result, since an area currently designated for Administrative functions would be used for Troop Housing, due to the construction of new BEQs on the site. Conflicts are not expected to arise due to this change in land use.

Table 17 summarizes, for each environmental factor, the protective measures incorporated as part of the proposed action that would minimize any potential impacts.

Table 17. Summary of Project Features that Minimize Potential Impacts

Environmental Factor	Project Feature
Climate	None required.
Air Quality	BMP dust control measures; dust screens, frequent watering of exposed soils; landscaping of bare earth.
Noise	Use of properly muffled construction equipment, adherence to all applicable noise regulations.
Topography and Soils	BMP erosion and sedimentation control measures during construction (e.g., berms, cut-off ditches, silt fences, vegetative ground cover, soil stabilization).
Groundwater	None required.
Surface Water	BMP sediment control measures (e.g., silt fences, storm drain inlet protection, sediment traps) and site grading.
Drainage	Incorporate LID features into project design, such as bioswales, below grade detention devices and addition of drainage infrastructure at undeveloped sites.
Wetlands	Same as for Drainage.
Biological Resources	Installation of downward-shielded exterior lighting.
Natural Hazards	Briefing of personnel and dependents regarding safety issues and suitable responses to natural hazards.
Population	None required.
Surrounding Land Use	None required.
Visual and Aesthetic Resources	None required.
Archaeological, Cultural, and Historic Resources	If warranted, development of an Archaeological Monitoring Plan and site monitoring during construction by a professional archaeologist.
Traffic and Circulation	Traffic Management Plan, detouring, flagging operations, and construction scheduling to minimize temporary traffic inconveniences.
Recreational Facilities	None required.
Utilities, Infrastructure, and Solid Waste	Implement recommended electrical system upgrades.
Hazardous Materials and Waste	Installation of sealed floor slabs and under-floor vapor barriers to Building 4053 and armory additions. Adherence to all applicable regulations during removal and transport of any hazardous materials or waste.

3.22 SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The proposed action would result in long-term land use changes and represents the long-term loss of open space at MCB Hawaii - Kaneohe Bay. Construction of new facilities on their individual sites also precludes use of these sites for other potential uses. However, the proposed action would result in improved long-term productivity because the addition of personnel would result in a better balanced, better trained, and better-prepared USMC. The USMC would be able to maintain a consistently high level of mission-readiness and approach full-unit end strength to enhance defense against emerging threats. The proposed action contributes to the nationwide GTF initiative, alleviating stresses that other USMC bases nationwide may otherwise encounter. Furthermore, the supporting MILCON projects would provide additional on-base housing and updated facilities to boost morale among troops and improve training operations.

3.23 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The use of raw materials for construction and renovation of buildings, structures, and facilities, as well as the use of fuels to power construction vehicles and equipment represents the irreversible and irretrievable commitment of those resources that would result from implementing the proposed action.

Constructing the proposed action projects could also result in the irreversible and irretrievable commitment of open space resources at the base. With continued growth, undeveloped land area that provides visual relief and variety to the base's increasingly urbanized landscape, is becoming less available. In addition to visual relief, open space can serve a variety of other functions including groundwater recharge, air and water pollution abatement.

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4.0 CONSISTENCY WITH FEDERAL POLICIES AND EXECUTIVE ORDERS

The proposed action is consistent the following regulations: NHPA (36 CFR 800); CWA (33 USC. 1251 et seq.); Sikes Act Improvement Act (SAIA) of 1997; EO 11990 – Protection of Wetlands; EO 12898 – Environmental Justice in Minority Populations and Low-Income Populations; EO 13045 – Environmental Health Risks and Safety Risks to Children; EO 13123 – Greening the Government Through Efficient Energy Management; EO 13186 – Protection of Migratory Birds.

4.1 FEDERAL POLICIES

4.1.1 The National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 CFR 800), require federal agencies, while reviewing and evaluating their programs, to identify and consider the potential effects of their proposed actions on historic, archaeological, and architectural resources. Before approval of an undertaking, agencies are required to consult under Section 106.

The various project areas are located in Low-fill, Low, and Medium Archaeological Sensitivity Zones, where the probability of encountering archaeological or cultural resources is minimal. During Section 106 consultation, SHPD concurred with MCB Hawaii's determination that the proposed action would have no adverse effect on historic resources. Building 373, constructed in 1943, was determined ineligible for listing on the NRHP and Building 388, constructed in 1944, is not covered by the PMA for wooden temporary buildings.

The proposed action is not expected to result in significant impacts on archaeological, cultural, or historic resources. Adherence to SOPs contained in the ICRMP will ensure that appropriate measures are taken in the unlikely event that inadvertent discoveries occur during construction. The proposed action is, therefore, in compliance with the NHPA.

4.1.2 The Clean Water Act

The Clean Water Act, 33 USC 1251 et seq., is the major piece of federal legislation that makes it illegal for any person, including federal agencies, to discharge pollutants from a point source into waters of the U.S. without a permit. The CWA also provides for establishment of the NPDES program for issuance of such permits. The CWA Amendments of 1987 also require that the NPDES permitting program include permits for the discharge of storm water (non-point sources of water pollution). Any construction activity that results in the disturbance of at least 1 acre, which includes clearing, grading, and excavating, must apply for an NPDES general permit for the discharge of storm water associated with construction activities.

If warranted, an NPDES permit would be obtained from the DOH Clean Water Branch prior to initiating construction. Also, the implementation of BMPs would confine sediment and silt runoff to the project areas, resulting in no degradation of water quality in any nearby body of

water. Further, removed materials, debris, and soil resulting from the proposed action would be contained during demolition or construction and properly disposed of in accordance with all applicable regulations. Therefore, the proposed action would be in compliance with the CWA.

4.1.3 Sikes Act

The Sikes Act seeks to promote effectual planning and coordination of conservation and rehabilitation efforts for wildlife, fish, and game on military land. It provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, developing, and maintaining fish and wildlife resources on military reservations throughout the U.S.

In compliance with the SAIA of 1997, an *Integrated Natural Resources Management Plan* (INRMP) was developed for MCB Hawaii in 2001 and underwent a required five-year review and update in 2006 by the Environmental Compliance and Protection Department. The proposed action complies with the guidelines contained in the INRMP and supports "no net loss" in capability of the base's land and waters to support the installation's mission, while not adversely impacting fish and wildlife or other natural resources covered by the INRMP's implementation program.

4.1.4 Coastal Zone Management Act

The Coastal Zone Management (CZM) Act of 1972, as amended (16 USC 1451 et seq.), is administered in Hawai'i by the State Department of Business Economic Development and Tourism's (DBEDT) Office of Planning. The CZM program objectives and policies are to provide coastal recreational opportunities; preserve and protect historic, scenic and coastal ecosystem resources; provide economic uses; reduce coastal hazards; improve public awareness in coastal zone management; and manage development within the coastal zone.

The proposed action is located on federal land and is excluded from the state (Hawai'i) coastal zone under the CZM Act. However, the CZM Act requires federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent with the State's CZM program.

By letter date 9 June 2009, DBEDT concurred with DoN's proposed modifications to the Navy/Marine Corps list of de minimis activities under the CZM Act. Modifications included expansion of coverage to MCB Hawaii – Kaneohe Bay. Provided that the proposed action complies with the items listed under "Mitigation / Conditions," no significant direct or indirect impacts on the coastal zone are expected. Thus the proposed action would be in compliance with the CZM Act. Correspondence and the Navy/Marine Corps de minimis list under the CZM Act is attached to the EA as Appendix C.

4.2 EXECUTIVE ORDERS

4.2.1 Executive Order 11990 – Protection of Wetlands

EO 11990 necessitates that federal agencies implement measures that prevent the degradation of wetlands, and that construction in a wetland be the last option if no other practical alternatives can be taken. Although none of the proposed action sites are located in a wetland, wetland areas exist near the project areas. Distances to wetlands from the three project areas range between 0.1 and 1.2 miles.

The proposed action is not anticipated to increase or pose any risk to the wetlands in the vicinity of the project areas. Construction is not occurring within a wetland area, and no impacts are anticipated to the surrounding wetlands. Protective measures, such as containing runoff, controlling drainage, and phasing the development of projects to minimize adverse impacts, would be implemented to reduce or eliminate risk to the wetland habitats that surround MCB Hawaii - Kaneohe Bay. The proposed action would be in compliance with EO 11990.

4.2.2 Executive Order 12898 – Environmental Justice in Minority Populations and Low-Income Populations

EO 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires federal agencies to identify and address disproportionately high and adverse effects on the health and the environment of minority and low-income populations resulting from federal programs, policies, and activities. A presidential memorandum that accompanied EO 12898 specified that federal agencies "shall analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority communities, when such analysis is required by the National Environmental Policy Act of 1969, 42 U.S. Code Section 4321 et seq." The memorandum further stated that federal agencies "shall provide opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of meetings, crucial documents, and notices."

No significant environmental impacts are anticipated as a result of the proposed action. Due to the limited scope and location of the proposed action, which is contained entirely within MCB Hawaii - Kaneohe Bay, no significant adverse impacts—including economic or social impacts or impacts on human health—upon minority or low income communities are expected to result from the proposed action.

4.2.3 Executive Order 13045 – Environmental Health Risks and Safety Risks to Children

On April 20, 1997, EO 13045, entitled *Protection of Children from Environmental Health Risks and Safety Risks,* was issued. EO 13045 requires that federal agencies make it a priority to identify and assess environmental health and safety risks that may disproportionately affect children. It also requires that agencies ensure that their policies, programs, activities, and standards address such risks.

The proposed action does not present any risks to environmental health and safety that would affect children. The new BEQs would not house children, and the new support facilities would not be frequented by children. Neither would the proposed action introduce harmful products or substances into locations where children might come into contact with them or ingest them.

4.2.4 Executive Order 13123 – Greening the Government Through Efficient Energy Management

EO 13123, dated June 3, 1999, states that the federal government "shall significantly improve its energy management in order to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change." Further, EO 13123 asserts that federal agencies are required to reduce the following: greenhouse gas emissions, energy consumption per square foot of facility, the use of petroleum in its facilities, and water consumption. It also requires that agencies allow use of renewable energy where possible.

The proposed action and the No Action Alternative would not increase inefficient energy use at MCB Hawaii - Kaneohe Bay. While the No Action Alternative would have no effect on energy consumption, the proposed action includes features that promote sustainable design standards and comply with the goals of EO 13123 by reducing energy consumption per square foot by using energy efficient windows and reducing greenhouse gas emissions by implementing LEED-rated design principles. Through innovative design principles and use of energy-efficient technologies, the proposed action would be in compliance with EO 13123.

4.2.5 Executive Order 13186 – Protection of Migratory Birds

EO 13186 was issued to assist federal agencies with their efforts to comply with the Migratory Bird Treaty Act (MBTA) (16 USC 703-711). It should be noted that the EO does not constitute any legal authorization that in any way supersedes the requirements outlined in the MBTA. The EO directs federal agencies undertaking actions that have, or are likely to have, a measurable adverse impact on migratory bird populations to develop and implement a Memorandum of Agreement with the U.S. Fish and Wildlife Service addressing the conservation of these populations.

The implementation of the proposed action is not anticipated to negatively impact migratory bird species. Migratory birds at MCB Hawaii - Kaneohe Bay are found mostly along the peninsula's shoreline and in the Nu'upia Wetland Management Area. Any displacement or disturbance of individual birds by implementing the proposed action would not result in measurable adverse impacts on their populations. To further reduce the potential for any impacts on migratory and local bird populations, downward-shielded exterior lighting would be used to minimize the potential for lighting to interfere with the natural behavior of birds and to prevent disorientation and the resulting collisions between birds and surrounding objects and structures. The proposed action would be in compliance with EO 13186 by implementing proper protective measures such as the aforementioned.

5.0 CONSULTATION AND COORDINATION

5.1 LIST OF AGENCIES CONSULTED

State

Hawai'i Department of Land and Natural Resources, Historic Preservation Division

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8.0 REFERENCES

Annual Pollution Prevention Report for Marine Corps Base (MCB) Hawaii, National Pollutant Discharge Elimination System (NPDES) Permit Number HI 0110078, Reporting Period: January – December 2007.

Belt Collins Hawaii Ltd. (BCH). (2010 Jul). *Draft Marine Corps Hawaii Plus Up Development Pla*n. Prepared for Marine Corps Base Hawaii and Naval Facilities Engineering Command, Pacific Division.

Byrd, G. Vernon, Jonathan R. Reed, John L. Sincock, Thomas C. Telfer. (1987). "Attraction of Hawaiian Seabirds to Lights: Conservation Efforts and Effects of Moon Phase". *Wildlife Society Bulletin*; 15:406-413.

Department of Education, State of Hawaii. (2009). *Kalaheo Complex Trend Report: Educational and Fiscal Accountability Complex Report for School Year 2008-2009.*

Department of the Navy (U.S. Fleet Forces Command). (2008 Nov). *Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet.*

Department of the Navy, Naval Facilities Engineering Command Hawaii (NAVFAC Hawaii). (2009 May). *Environmental Hazard Evaluation/Management Plan for Above Ground Storage Tank 1253*.

Department of the Navy, Naval Facilities Engineering Command Hawaii (NAVFAC Hawaii). (2006a). *Marine Corps Base Hawaii Master Plan, Volume I—Land Use Plan*.

Department of the Navy, Naval Facilities Engineering Command Hawaii (NAVFAC Hawaii). (2006b). *Marine Corps Base Hawaii Master Plan, Volume II—Capital Improvements Plan*.

Drigot, Diane. (2005 Jul). *Final Environmental Assessment for Restore Watershed/Repair Mokapu Central Drainage Channel (MCDC) (Project No. HI20010)*. Prepared for the U.S. Marine Corps, Marine Corps Base Hawaii.

Federal Emergency Management Agency (FEMA). (2004). *Flood Insurance Rate Maps, City and County of Honolulu, Hawaii*. Map Number 15003C0280F.

FY09 Secretary of Defense Environmental Award, Environmental Quality, Non-Industrial Installation.

Hailman, Jack P., Jonathan R. Reed, John L. Sincock. (1985). "Light Attraction in Endangered Procellariiform Birds: Reduction By Shielding Upward Radiation". *Auk*; 102(2):377-383.

Hawaii Pacific Engineers (HPE). (2003 Sep). *Utility Technical Study (UTS) for Potable Water System, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii*. Prepared for Pacific Division, Naval Facilities Engineering Command.

Hawaii Pacific Engineers (HPE). (2002 Feb, revised 2003 Mar). *Mokapu Central Drainage Channel Study Marine Corps Base Hawaii, Kaneohe Bay*. Prepared for Pacific Division Naval Facilities Engineering Command.

HDR|Hawaii Pacific Engineers (HDR|HPE). (2008 Sep). *Update Utility System Assessment for Wastewater System at MCBH Kaneohe Bay, Final Submittal*. Prepared for NAVFAC Hawaii.

Horsch Planning & Engineering, PLC and Wil Chee – Planning, Inc. (HPE and WCP). (2009 Jul). *Marine Corps Base Hawaii, Kaneohe Bay Air Installations Compatible Use Zones Study Update*. Prepared for Marine Corps Base Hawaii.

Marine Corps Base Hawaii (MCB Hawaii). (2009). *Unaccompanied Personnel Housing Campaign Plan.* Prepared by MCB Hawaii UPH Division.

Marine Corps Base Hawaii (MCB Hawaii). (2006 Nov). *Final Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (MCBH INCRMP) (2007 – 2011)*. Prepared by Environmental Compliance & Protection Department, G4, MCB Hawaii and Sustainable Resources Group Int'l, Inc.

Marine Corps Base Hawaii (MCB Hawaii). (2001 Nov). *Marine Corps Base Hawaii Integrated Natural Resources Management Plan and Environmental Assessment (MCBH INRMP/EA) (2002 – 2006)*. Prepared by the Environmental Department, MCB Hawaii and Sustainable Resources Group Int'l, Inc.

Mason Architects and Wil Chee – Planning, Inc. (MAI and WCP). (2010 Feb). *Draft Marine Corps Base Hawaii Historic Inventory and Context Report*. Prepared for Marine Corps Base Hawaii.

Naval Facilities Engineering Command (NAVFAC). (1989 May). *Investigation of Underground Fuel Contamination from Main Jet Fuel Tank at Marine Corps Air Station, Kaneohe Bay*.

Naval Facilities Engineering Command, Hawaii (NAVFAC Hawaii). (2009 May). *Draft Environmental Hazard/Environmental Management Plan for Aboveground Storage Tank 1253, Marine Corps Base Hawaii, Kaneohe, Hawaii.* Prepared by AECOM Technical Services, Inc. and Wil Chee – Planning, Inc.

Naval Facilities Engineering Command, Pacific (NAVFAC Pacific). (2010 Nov). *Electrical Utilities System Assessment (USA), MCBH Kaneohe, Hawaii* (Preliminary Formal Report).

Naval Facilities Engineering Command, Pacific (NAVFAC Pacific). (2007 July 19). *EA Hawaii PPV Housing Phase 4, Marine Corps Base Hawaii, Kaneohe, Hawaii – Final.*

Phillip Rowell and Associates. (2010 Dec). *Traffic Impact Assessment Report for Marine Corps Base Hawaii 202K Program*.

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Operational Noise Program, Directorate of Environmental Health Engineering. (2005 Nov). Operational Noise Manual.

U.S. Army Corps of Engineers, Honolulu District (USACE Honolulu). (2009 Jul). *Wetlands of Marine Corps Base Hawaii, Island of Oahu, Hawaii*.

U.S. Army Corps of Engineers, Honolulu Engineer District (USACE Honolulu). (2006 Nov). *Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii (MCBH)*. Prepared by Wil Chee – Planning, Inc.

U.S. Army Corps of Engineers, Louisville District (USACE Louisville). (2009 Dec). *Final Report, 2009 Housing Market Analysis Update, Marine Corps Base Hawaii, Oahu, Hawaii.*

U.S. Department of Agriculture (USDA) Soil Conservation Service. (1972). *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

U.S. Environmental Protection Agency (EPA). (2009 Nov). *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2008*.

U.S. Green Building Council. (2006). *New Construction Version 2.2 Reference Guide. Third Edition, October 2007*.

Wil Chee – Planning, Inc. (1997). *Draft Outdoor Recreational Management Plan, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii*. Prepared for the U.S. Army Engineer District, Pacific Ocean Division.

Wilcox, B.A., Guinther, E.B., Duin, K.N. & Maybaum, H. (1998). *Mōkapu: Manual for Watershed Health and Water Quality*. Prepared for Marine Corps Base Hawaii.

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Appendix A:
Project Site Photographs

MILCON P-778, Armory Addition

Photo 1. Looking south at the northern wall of Building 4053, the site for P-778.

Photo 2. Looking southwest at the northern wall of Building 4053, the site for P-778.

MILCON P-842, Consolidated Aid Station and Rehabilitation Clinic

Photo 3. Looking northwest at the proposed site for P-842. Buildings 1056, 1057 and 1058 are programmed for demolition.

Photo 4. Looking north at Building 1080. Building 1080 is programmed for demolition and would be replaced by the new consolidated aid station facility.

MILCON P-847, Artillery Battery Complex and Company Command Post

Photo 5. Looking north at the site for P-847. The temporary tension fabric structures in the foreground would be removed in order to construct a new Gun Storage Building and a new Automotive Org Shop. The three buildings behind the temporary tension fabric structures would be renovated and upgraded for use as modern Heavy Gun Storage Buildings and a modern Heavy Gun Shop.

Photo 6. Looking southeast toward Building 1088. The proposed site for Company Command Post is the grassed area between the paved parking lot in the foreground and Building 1088.

Photo 7. Additional parking for the Company Command Post is proposed for the grassed area between the paved parking lot in the foreground and the residences in the background.

MILCON P-852, 3D Radio Battalion Complex

Photo 8. Looking north at the undeveloped site proposed for the 3D Radio Battalion Complex.

Photo 9. The site is overgrown with weeds, grasses, and non-native plants.

MILCON P-858, BEQs, Headquarters and 5070/5071 Renovation

Photo 10. Looking west at Building 5071 from across G Street. Renovations to buildings 5070 and 5071 are elements of P-858. The paved parking area is shared by both BEQs.

Photo 11. Damage sustained by Building 5070 as a result of improper installation of an air-conditioning unit.

Photo 12. Looking north at the south-facing wall of Building 4017. Building 4017 would be demolished, along with buildings 4010, 4019, and 4020, in order to construct a new multi-story BEQ and the Command Headquarters.

Photo 13. Looking west at Building 6705, also programmed for demolition. This is the proposed site for the construction of a new multi-story BEQ and the Command Headquarters.

MILCON P-885, MWSS Headquarters, CLB-3 Comm Shop and Facilities, and 3D Radio Battalion Motor Pool

Photo 14. Looking north at Building 373. P-885 proposes to renovate the building to accommodate the new MWSS detail. The gravel area in the foreground would be paved for additional parking of vehicles and heavy equipment.

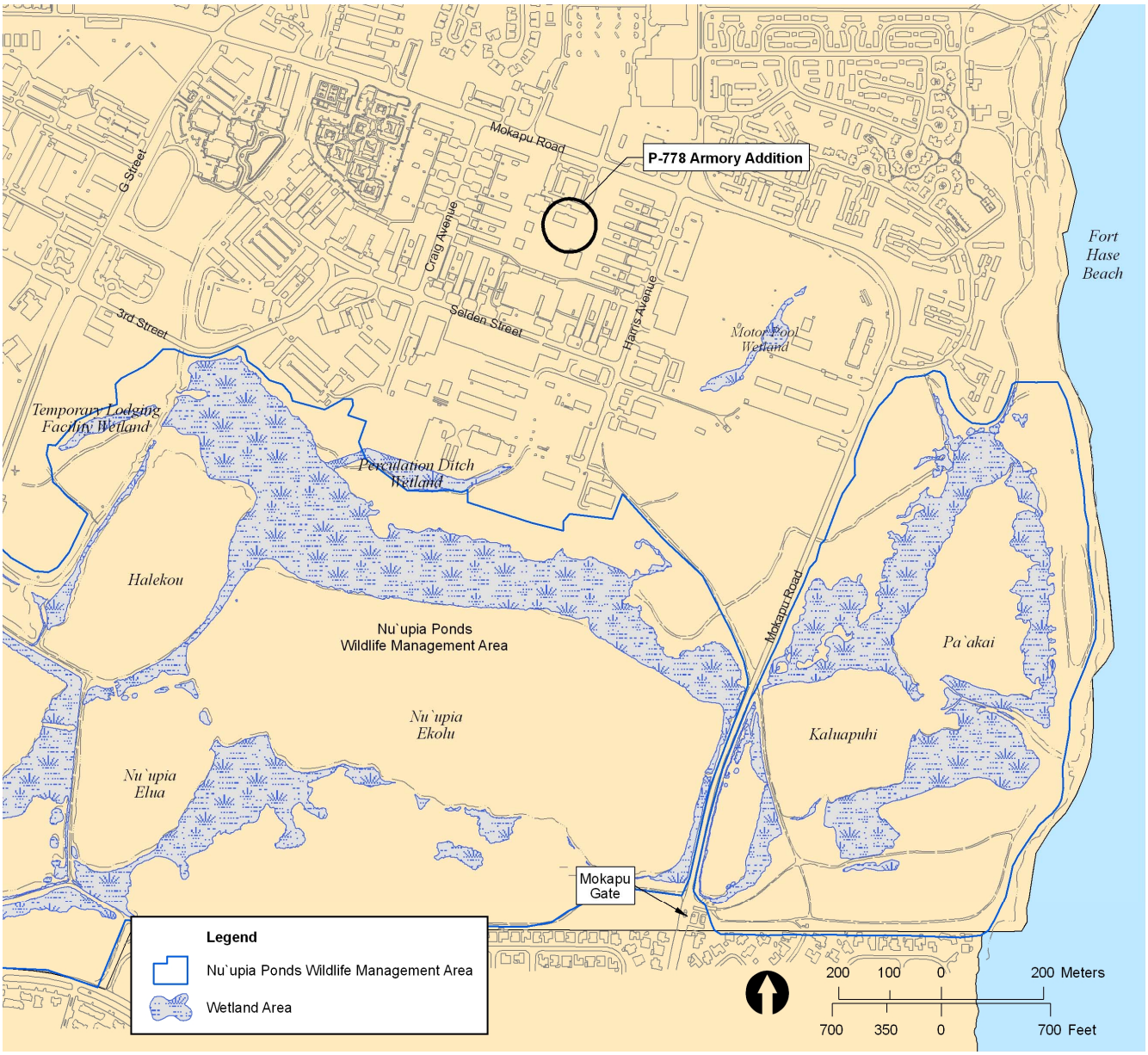
Photo 15. Facing east from the MWSS compound. The grassy area within the fence line would be paved. The above-ground storage tank, at the right side of the photo, is outside of the P-885 project site.

Photo 16. Looking westward toward the proposed site for the CLB-3 Comm Shop located at the rear of Building 1086.

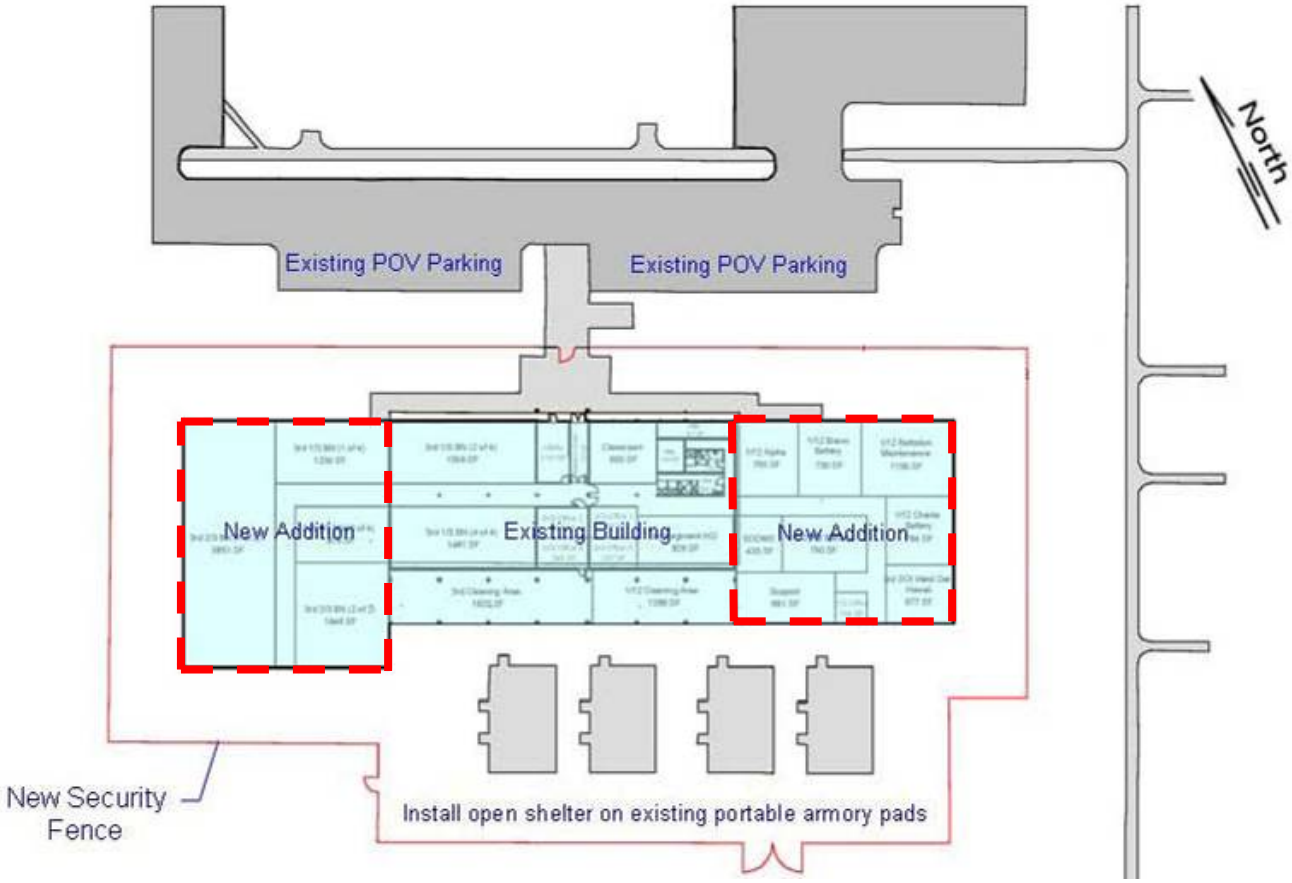
Photo 17. Looking southwest toward the proposed site for the CLB-3 Facilities located at the corner of Selden Street and Harris Avenue.

Appendix B
Project Locations and Site Plans

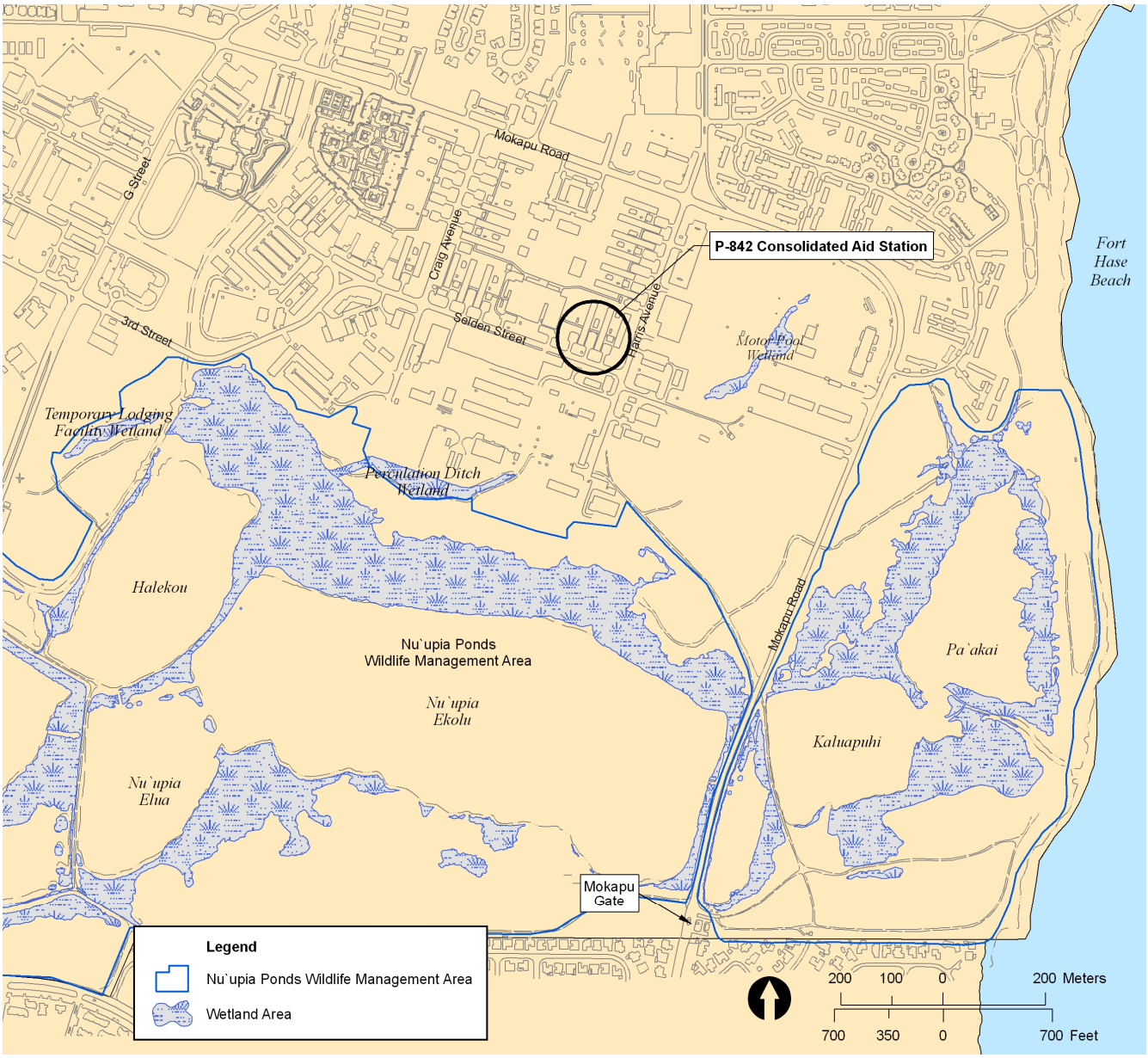
LIST OF FIGURES IN APPENDIX B:



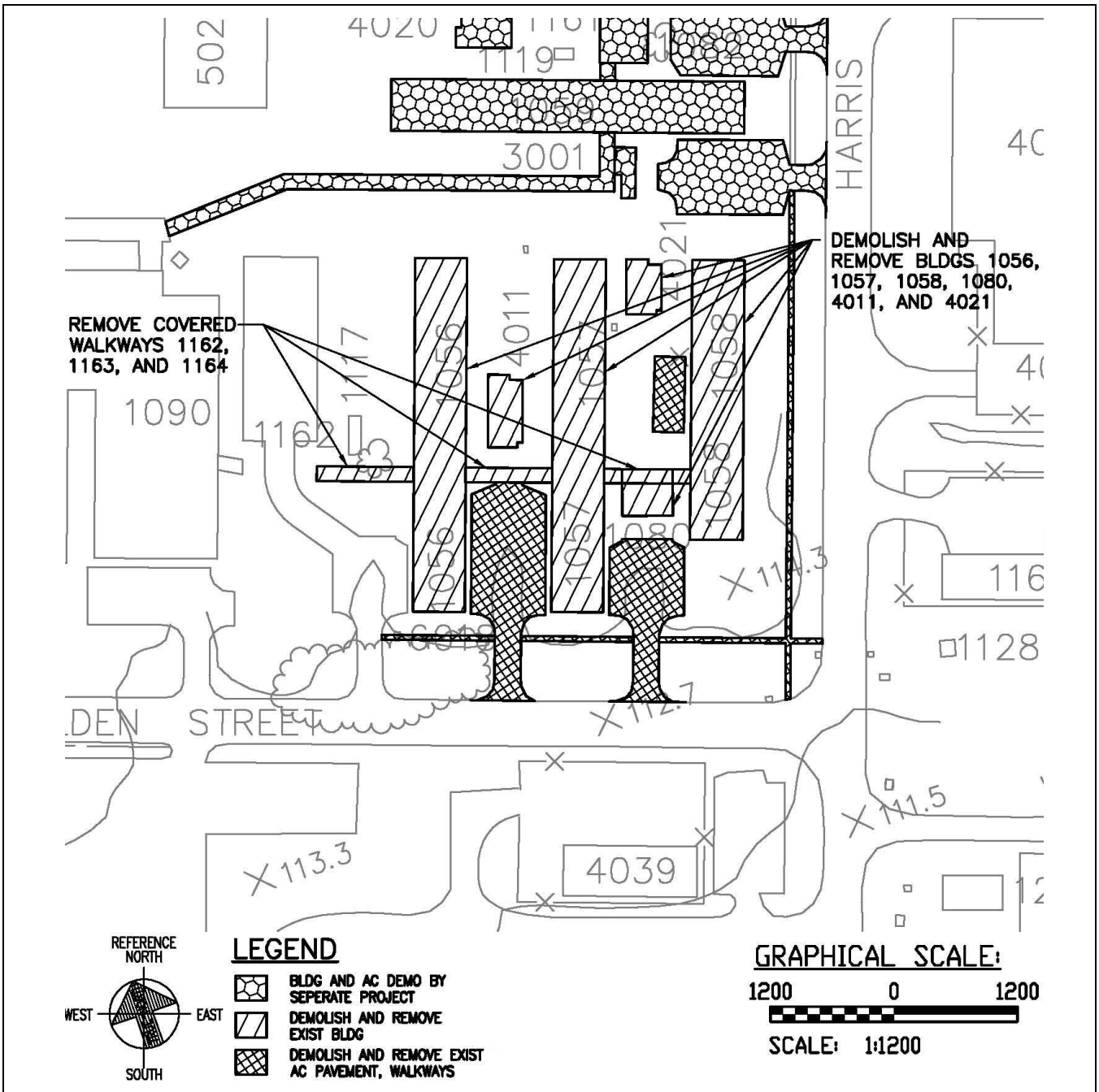
Grow the Force Environmental Assessment	Project Location for MILCON P-778, Armory Addition	**Figure B-1**



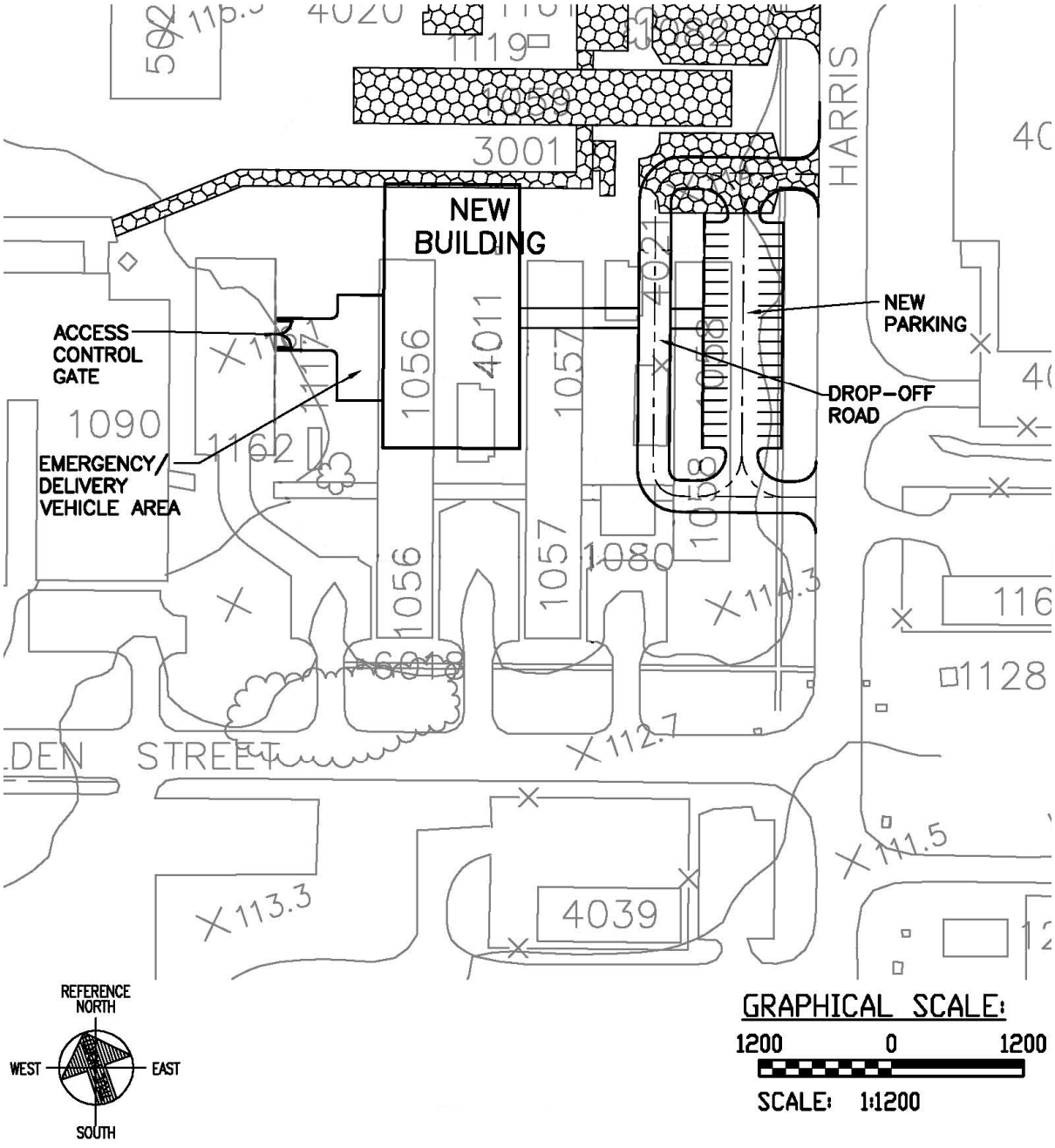
Grow the Force Environmental Assessment	Armory Addition Site Plan for MILCON P-778	**Figure B-2**



Grow the Force Environmental Assessment	Project Location for MILCON P-842, Consolidated Aid Station	**Figure B-3**

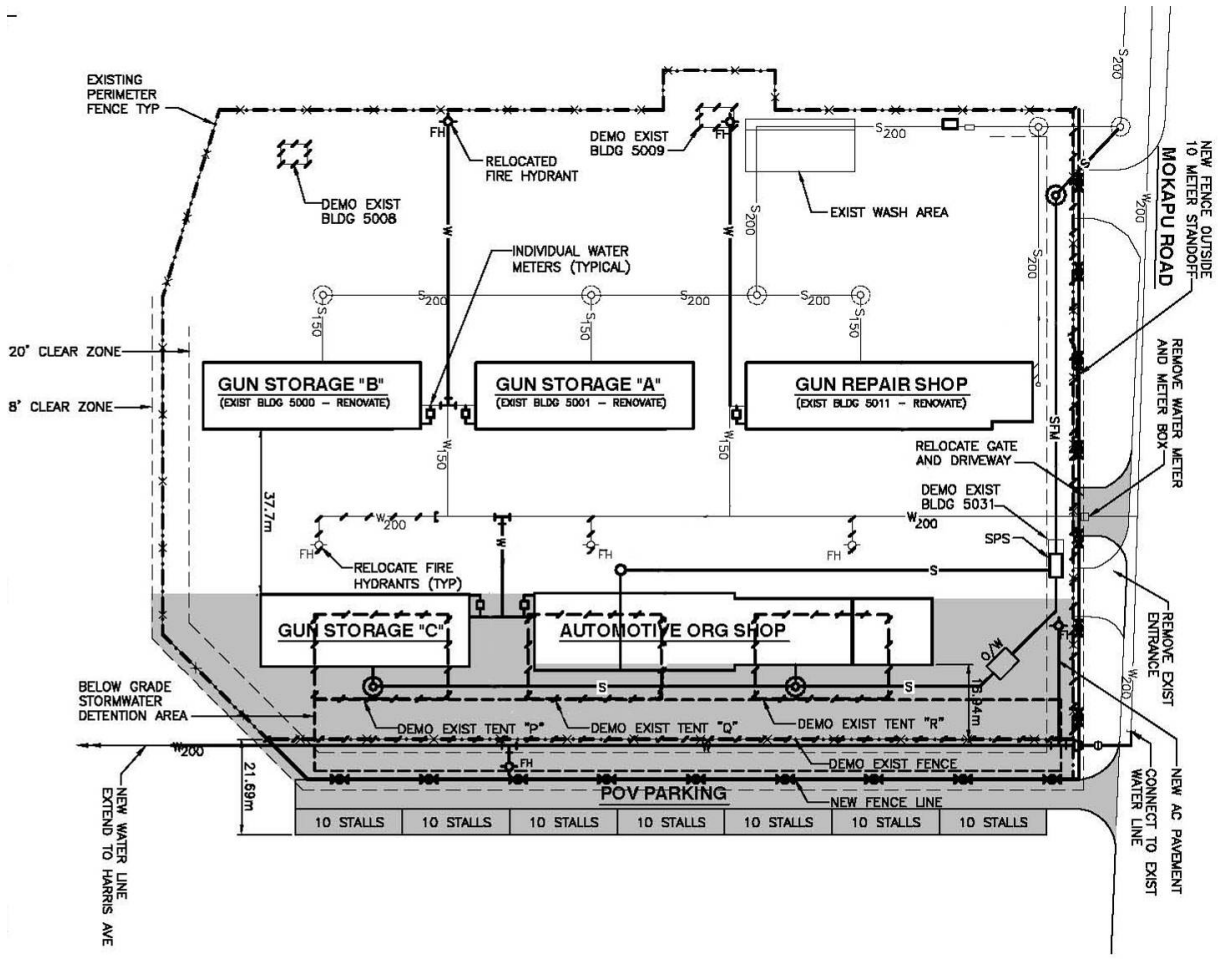


Grow the Force Environmental Assessment	Demolition Plan for MILCON P-842	**Figure B-4**

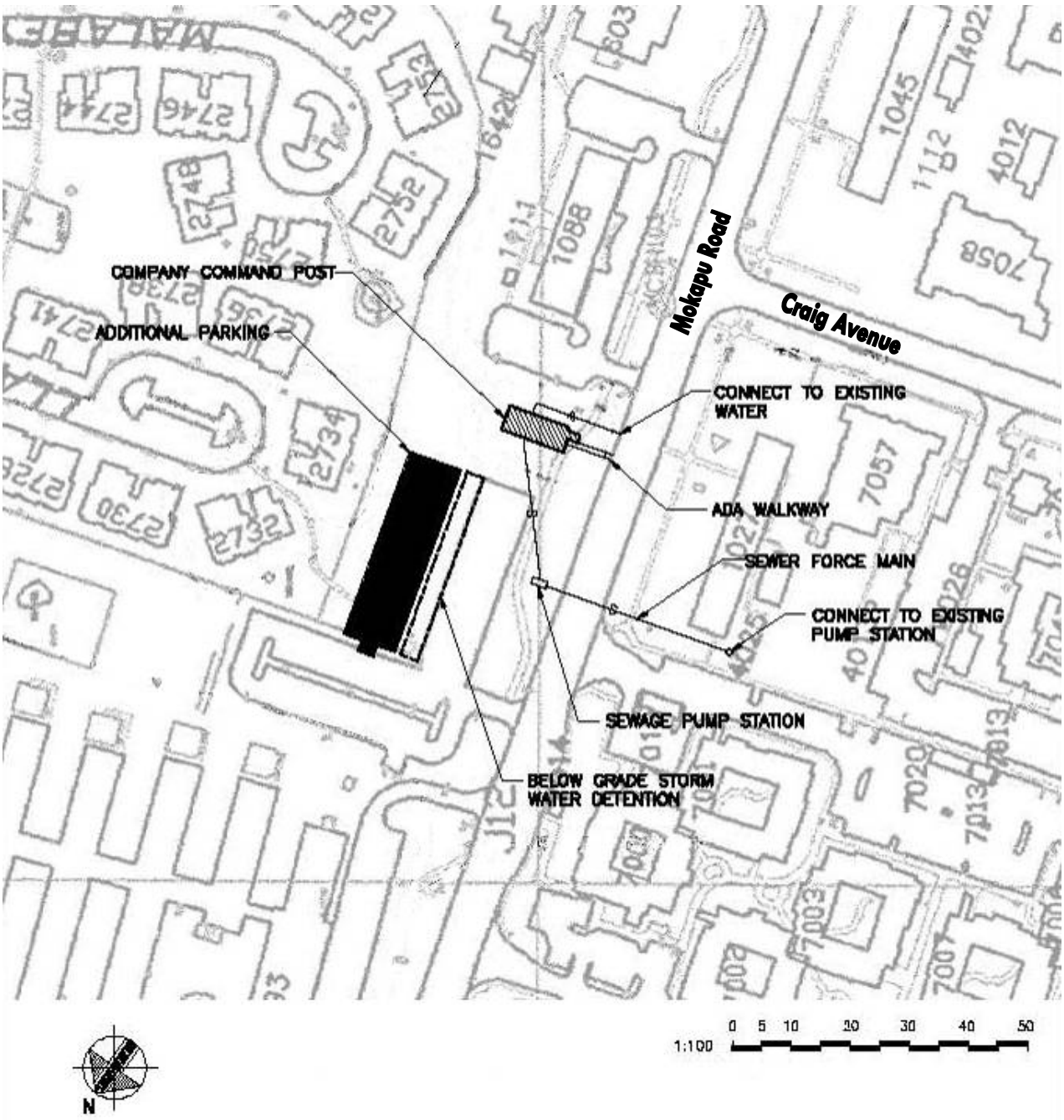


Grow the Force Environmental Assessment	Consolidated Aid Station Site Plan for MILCON P-842	**Figure B-5**

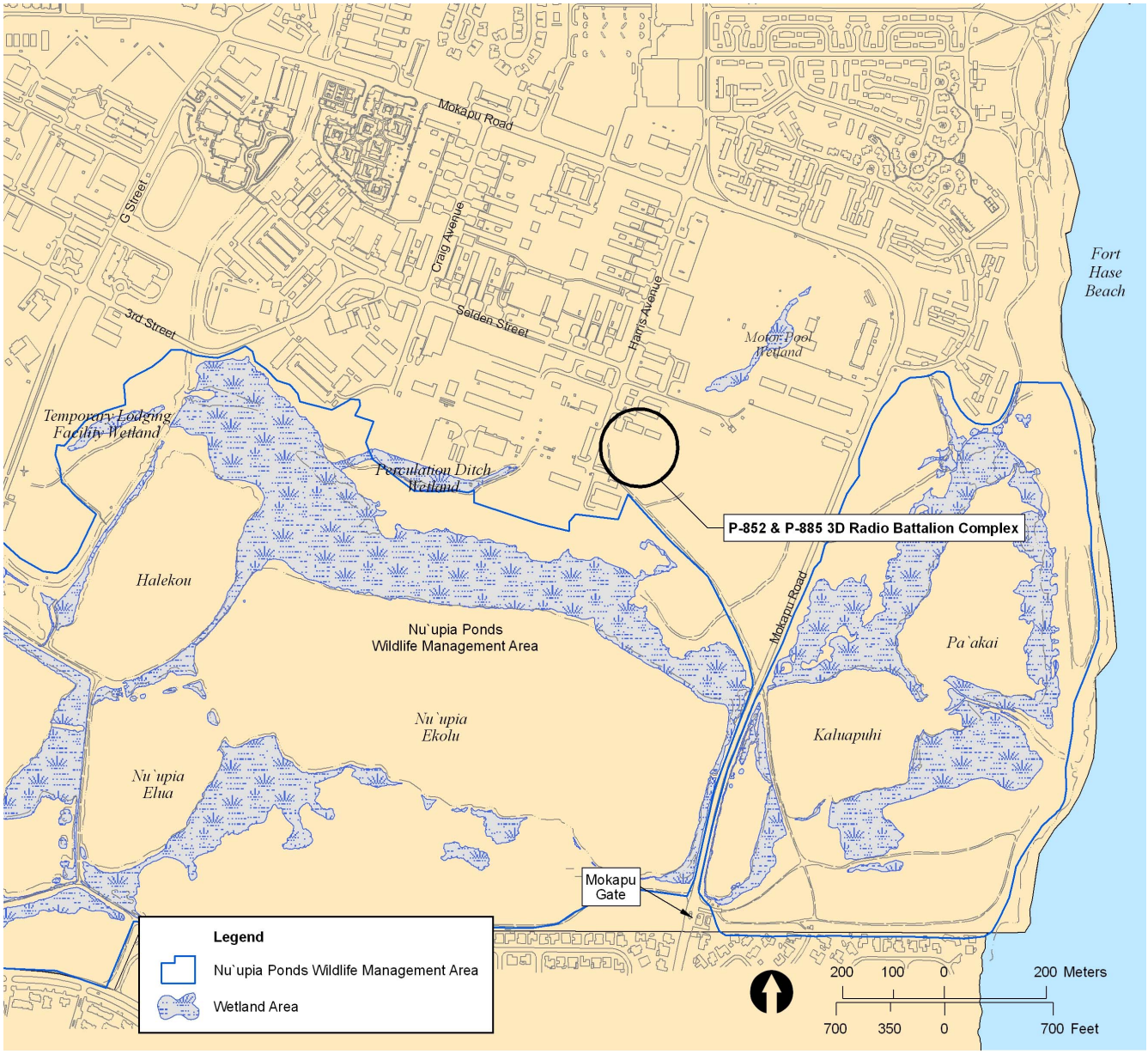
Grow the Force Environmental Assessment	Project Location for MILCON P-847, Artillery Battery Complex and Company Command Post	**Figure B-6**



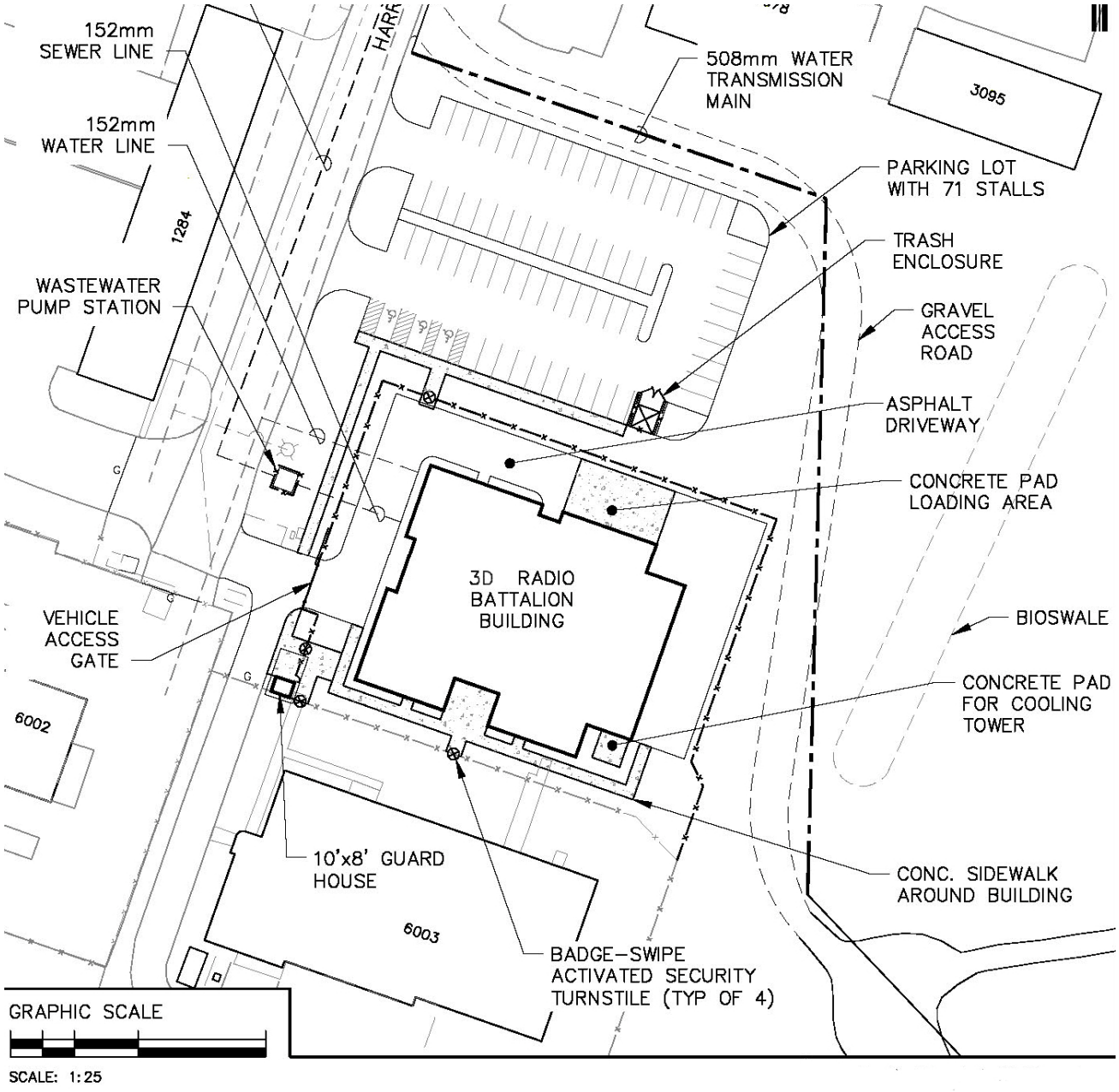
Grow the Force Environmental Assessment	Artillery Battery Complex Site Plan for MILCON P-847	**Figure B-7**



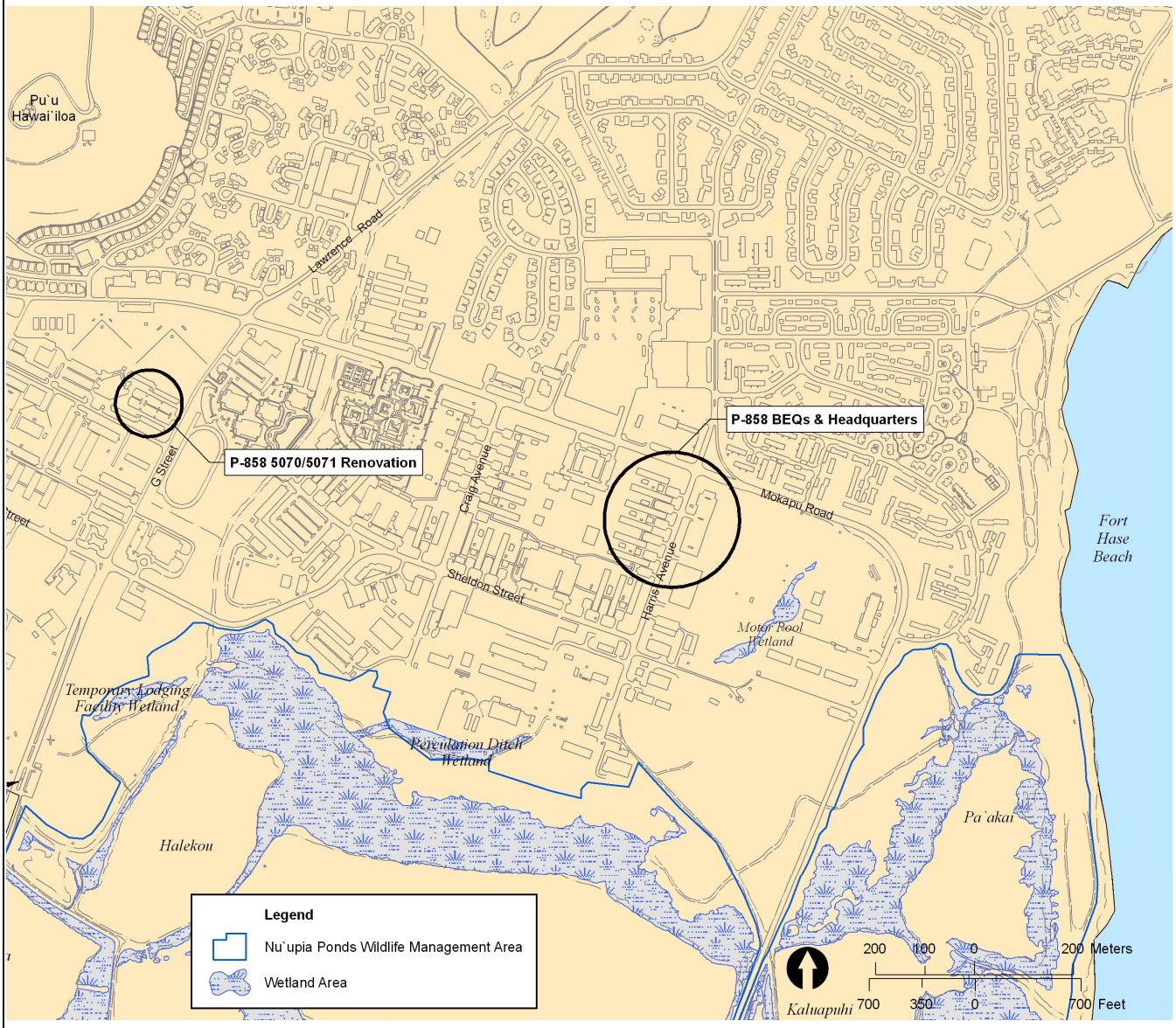
Grow the Force Environmental Assessment	New Company Command Post Site Plan for MILCON P-847	**Figure B-8**



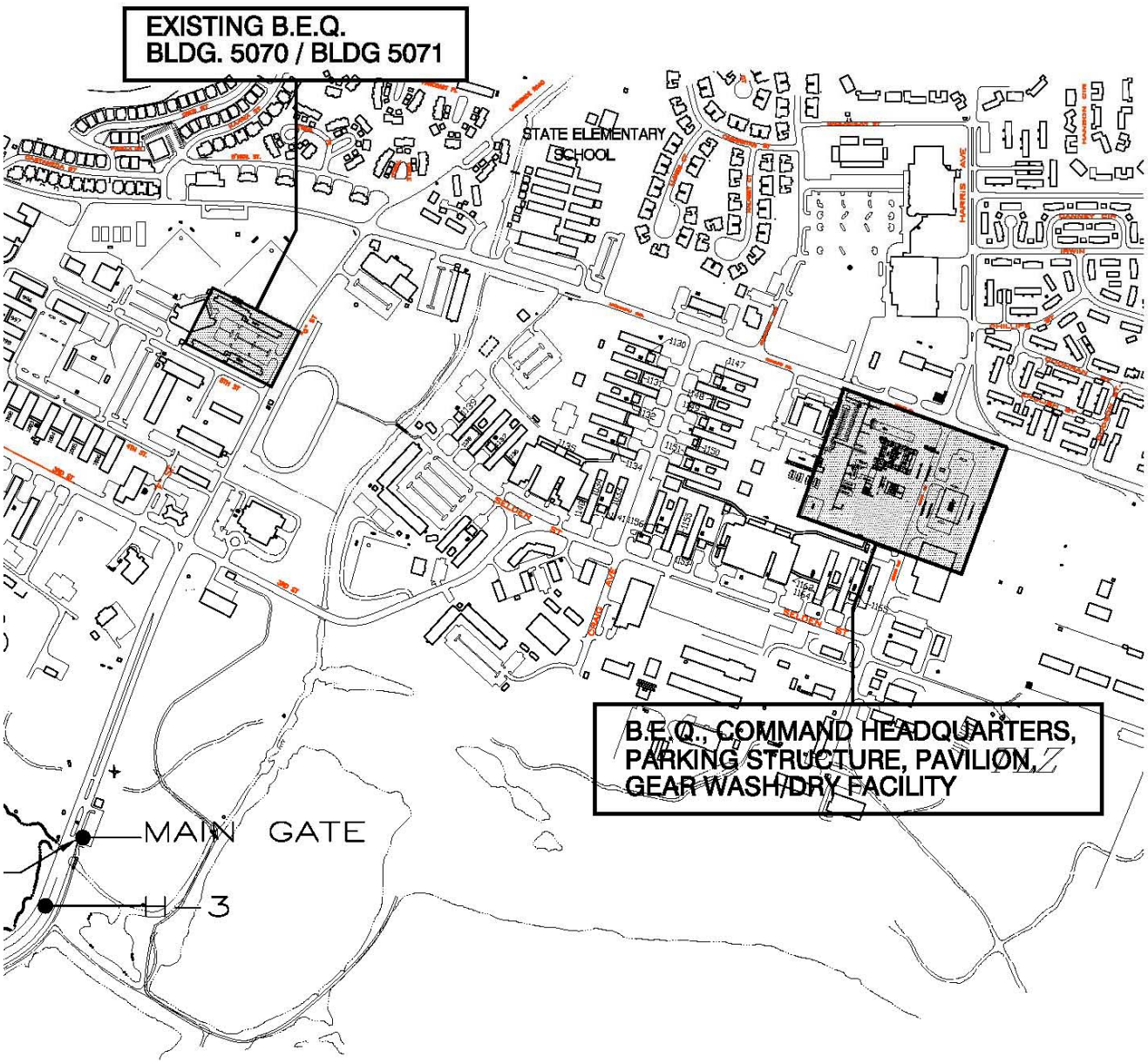
Grow the Force Environmental Assessment	Project Location for MILCON P-852, 3D Radio Battalion Complex	**Figure B-9**



Grow the Force Environmental Assessment	3d Radio Battalion Complex Site Plan for MILCON P-852	**Figure B-10**

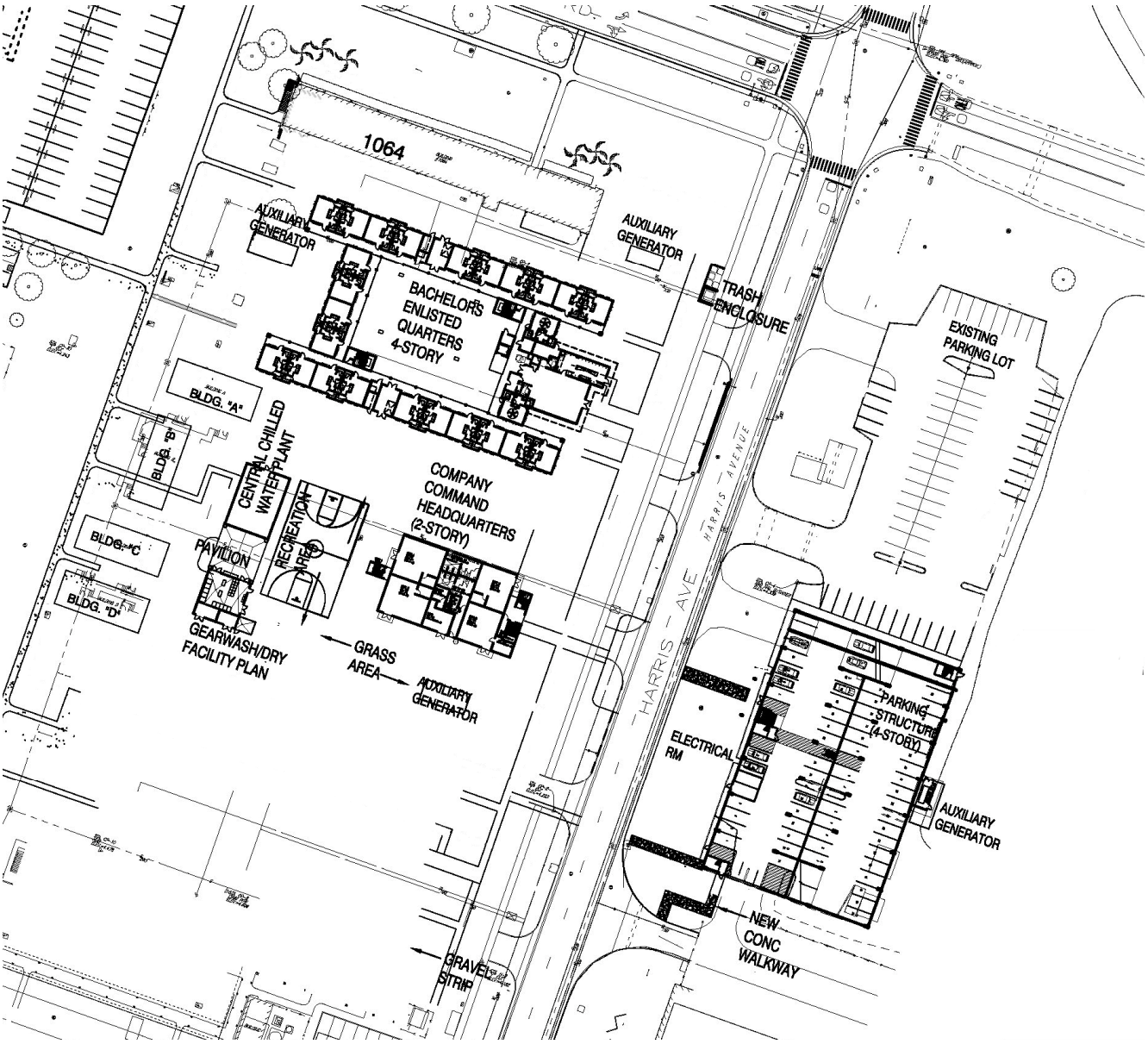


Grow the Force Environmental Assessment	Project Location for MILCON P-858, BEQs, Command Headquarters and 5070/5071 Renovation	**Figure B-11**

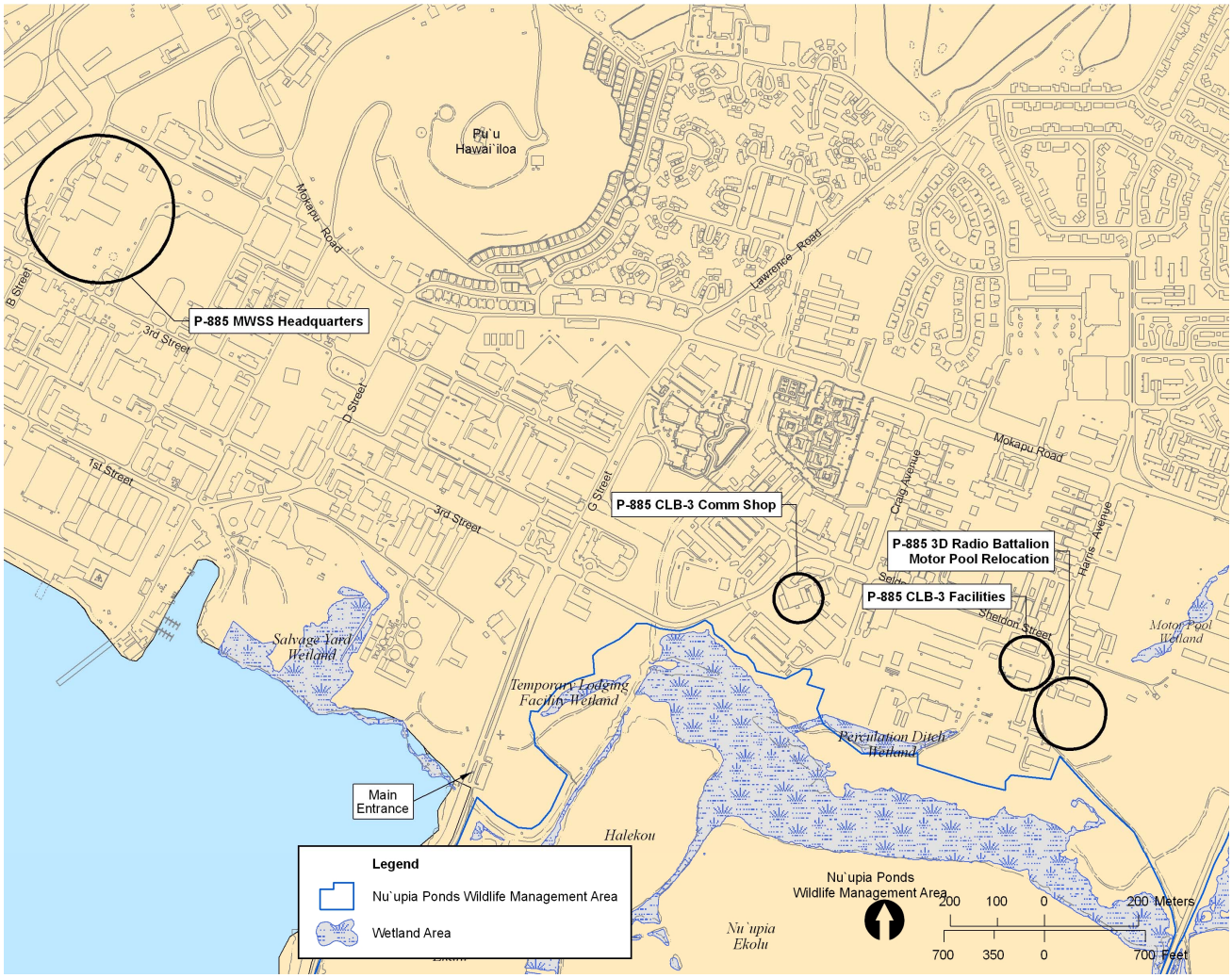


Grow the Force Environmental Assessment	Overall Site Plan for MILCON P-858	**Figure B-12**

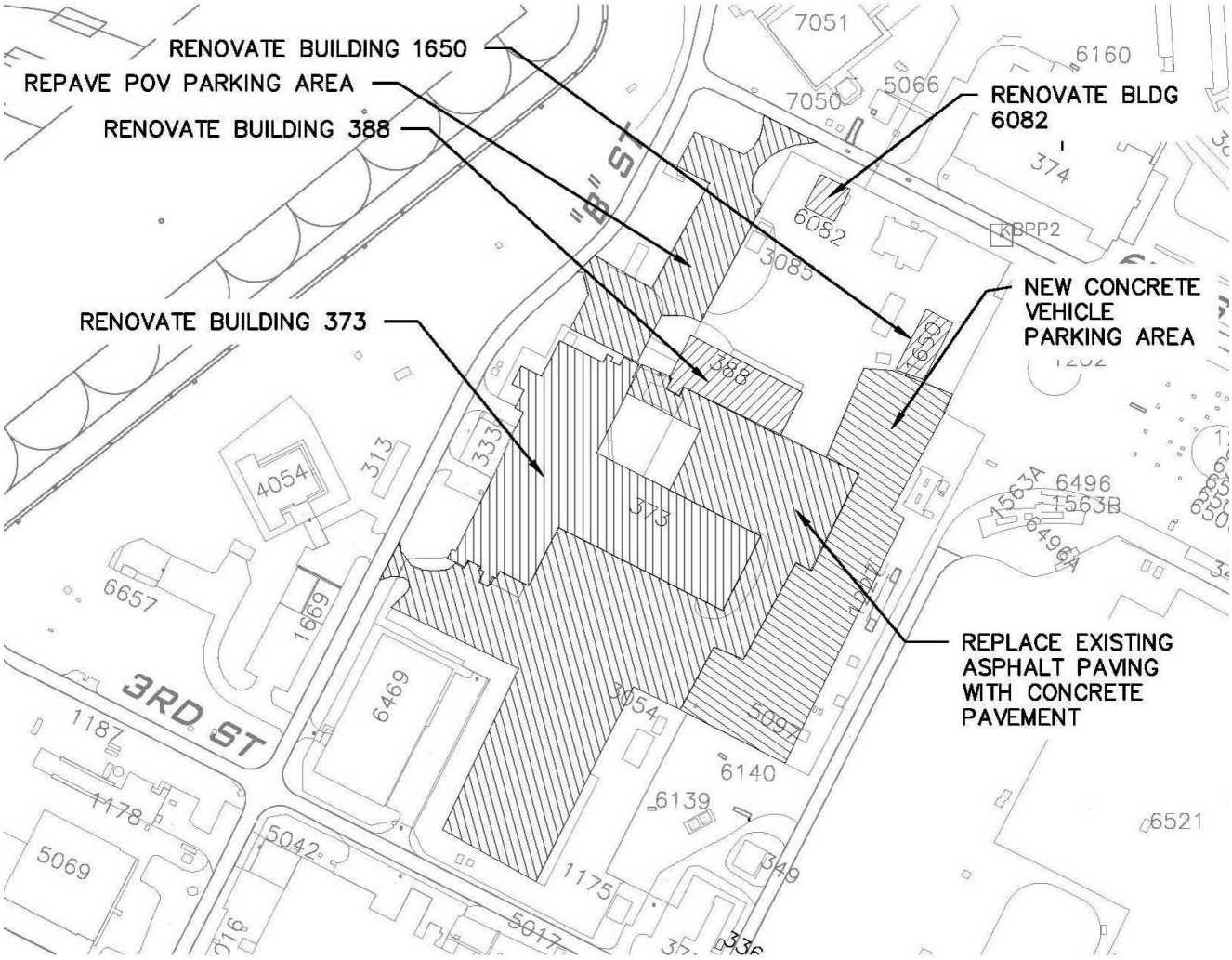
Grow the Force Environmental Assessment	Demolition Plan for MILCON P-858	**Figure B-13**



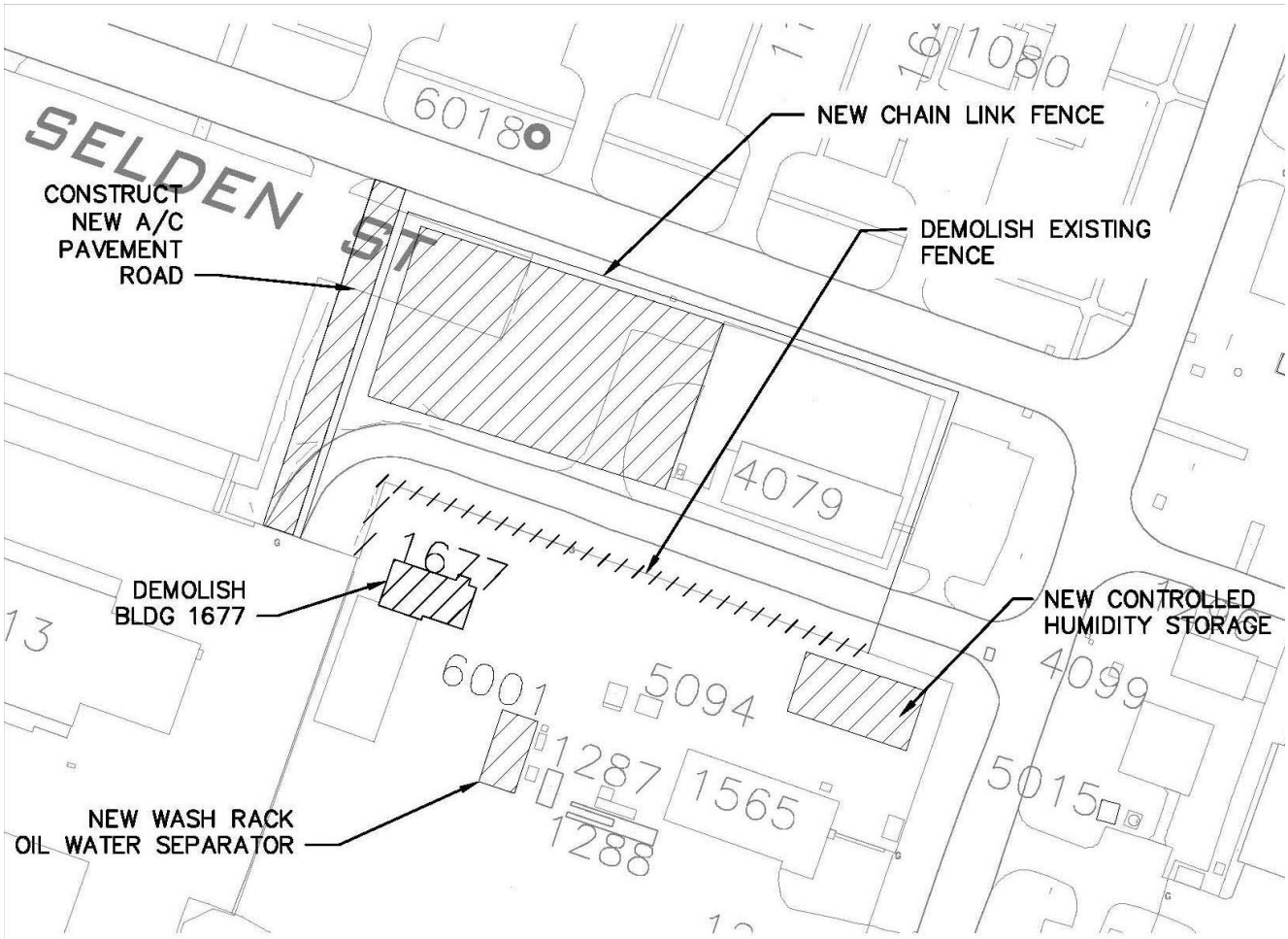
Grow the Force Environmental Assessment	BEQ and Parking Structure Site Plan for MILCON P-858	**Figure B-14**



Grow the Force Environmental Assessment	Project Location for MILCON P-885, MWSS Headquarters, CLB-3 Communications Shop and Facilities, and 3D Radio Battalion Motor Pool Facility	**Figure B-15**

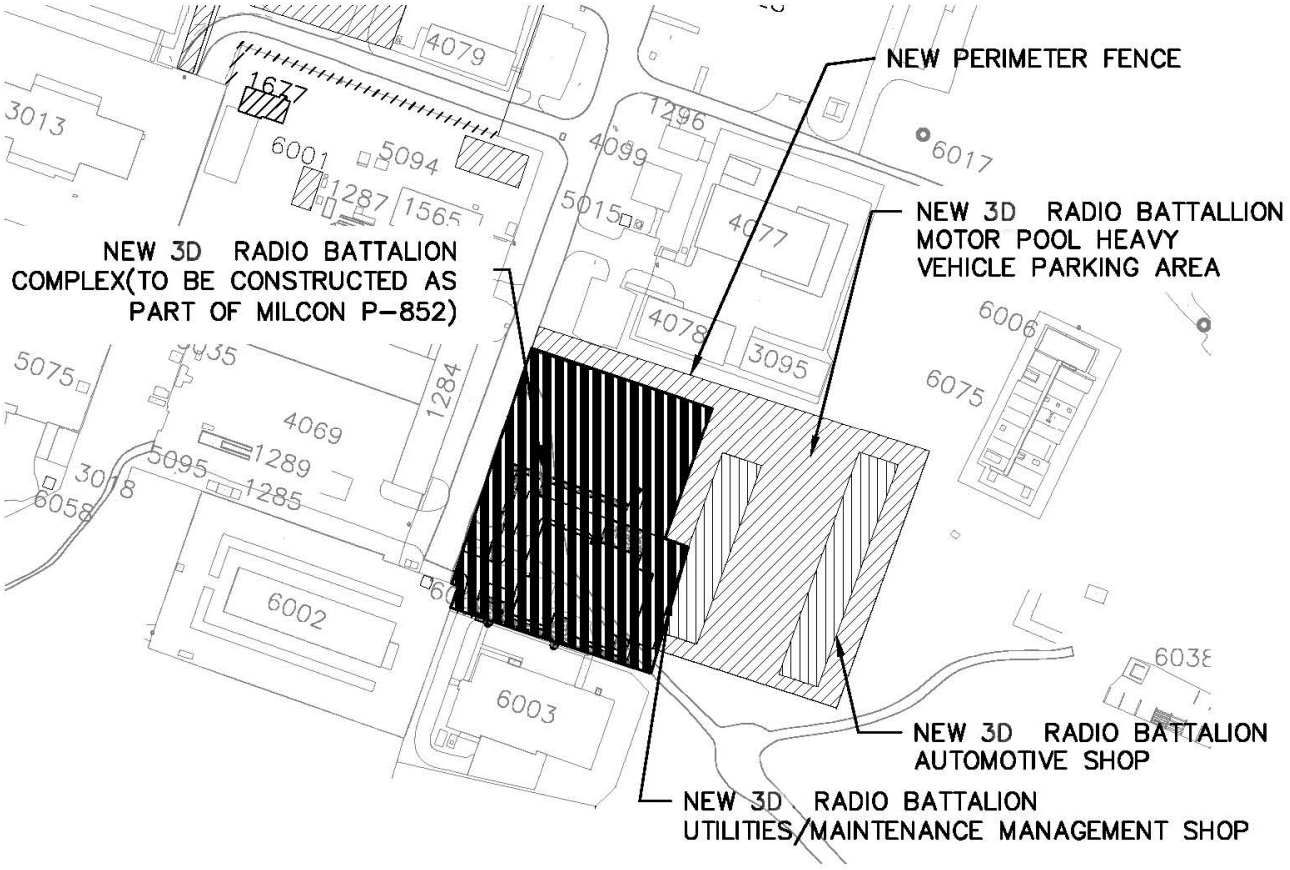


Grow the Force Environmental Assessment	MWSS Complex Site Plan for MILCON P-885	**Figure B-16**



Grow the Force Environmental Assessment	CLB-3 Facilities Site Plan for MILCON P-885	**Figure B-17**

Grow the Force Environmental Assessment	CLB-3 Communications Shop Site Plan for MILCON P-885	**Figure B-18**



Grow the Force Environmental Assessment	New 3D Radio Battalion Motor Pool Facility Site Plan for MILCON P-885	**Figure B-19**

Appendix C
Navy/Marine Corps De Minimis Activities under the CZM Act

DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-5101

5090
Ser N4/ 04163
01 JUN 2009

CERTIFIED MAIL NO. 7007 2560 0002 0326 9580

Mr. Abbey Mayer
Office of Planning
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu HI 96804

Dear Mr. Mayer:

SUBJECT: REQUEST FOR CONCURRENCE WITH MODIFICATIONS TO THE DEPARTMENT OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy/Marine Corps de minimis activities under the CZMA. The attached de minimis list will amend the current de minimis list which was established on April 2, 2007. The new de minimis list will include the Marine Corps, and will cover areas in the Pearl Harbor Naval complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station Pacific, Pacific Missile Range Facility on Kauai, Kaneohe Marine Corps Base Hawaii, Camp Smith and all associated installations/facilities/equipment located outside of those Navy/Marine Corps properties.

The Navy and Marine Corps have determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR part 930.33 (3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brian Yamada at 472-1449, by facsimile transmission at 474-5419, or by email at brian.yamada@navy.mil.

Sincerely,

E. J. D'ANDREA
Lieutenant Commander, CEC, U. S. Navy
Assistant Regional Engineer
By direction of the
Commander

Enclosure: 1.Navy De minimis Activities Under CZMA

Navy/Marine Corps De Minimis Activities Under CZMA

***covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties**

No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeting and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingrants/outgrants and/or 50 acres or more where existing land use will change.	14, 16

ENCLOSURE(/)

14	Mission Changes	Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.	14, 16
15	Limitation of Access to Property	Permanent closure or limitation of access to any areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.)	14, 16
16	Environmental Management Activities	Environmental management activities within Navy/Marine Corps controlled areas including, but not limited to, activities such as vegetation and mangrove removal, ditch clearing, sediment removal, invasive species removal, construction related to protecting endangered species and wildlife, and actions prescribed by the Integrated Natural Resources Management Plan (INRMP)	2, 13, 14, 16
17	Towers	Installation, operation, and maintenance of towers (such as communication towers, cellular phone antennas, wind-energy towers) within Navy/Marine Corps controlled areas.	1, 2, 6, 8,9 , 12, 13, 14, 16
18	Alternative Energy Research	Installation, operation, replacement, and removal of alternative energy research structures/equipment taking place within Navy/Marine Corps controlled areas.	1, 2, 3, 5, 6, 12, 13, 14, 16
19	Army Corps Nation Wide Permits	Work subject to an Army Corps of Engineers Nationwide permit (which are applicable to Hawaii)	16

Project Mitigation / General Conditions

1) Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.
2) If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
3) Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
4) Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
5) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
6) No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
7) All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
8) No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.
9) Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10) Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11) Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hyrdroseeding, etc.).
12) Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
13) Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
14) The National Environmental Policy Act (NEPA) review process will be completed.
15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
16) Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA). Notification can be sent via email: to JNakagaw@dbedt.hawaii.gov

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12644

July 9, 2009

Lieutenant Commander E. J. D'Andrea
Assistant Regional Engineer
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brian Yamada

Dear Lt. Commander D'Andrea:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Concurrence with Modifications to the Department of the Navy De Minimis Activities in Hawaii under the Coastal Zone Management Act (CZMA)

The Hawaii CZM Program has completed the federal consistency review of the proposed modifications to the list of Department of the Navy de minimis activities under the CZMA, including changes to various activity categories, adding new activity categories, and expanding the coverage to Marine Corps Base Hawaii Kaneohe Bay and Camp Smith. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control's publication, *The Environmental Notice*, on June 23, 2009. The public was provided an opportunity to participate in the review through July 7, 2009. There were no public comments received.

We concur that the activities identified on the modified list entitled, "Navy/Marine Corps De Minimis Activities Under CZMA" are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects, and should not be subject to further review by the Hawaii CZM Program on the basis and condition that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions."

The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the "Navy/Marine Corps De Minimis Activities Under CZMA" list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency

concurrence does not convey approval with any other regulations administered by any State or County agency.

Modifying and expanding the list of Navy de minimis activities under the CZMA was a cooperative effort between our Office and Mr. Brian Yamada from the Department of the Navy, who interned with the Hawaii CZM Program in September 2008. We appreciate the efforts of Mr. Yamada in working with our CZM staff. The de minimis activities list will result in more efficient compliance with CZMA federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch (w/ copy of de minimis list)
Ms. Rebecca Hommon, Region Counsel, Navy Region Hawaii

Appendix D
Section 106 Correspondence

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

DATE: December 16, 2010

LOG: 2010.3439
DOC: 1012RS32

TO: D. R. George
Captain, US Marine Corps
Director, Environmental Compliance and Protection Department
Marine Corps Base Hawaii
Box 63002, Kaneohe Bay, HI 96863-3002

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Consultation / Renovation and Reuse**
Permit # (None)
Building Owner: United States Marine Corps
Location: Buildings 373 and 388, Kaneohe MCBH
Tax Map Key: (1) 4-4-008:001

This letter is in response to your communication of October 5, 2010, received by our office on October 15, 2010, re renovation and reuse of Buildings 373 and 388.

Building 373 is currently used as office and warehouse space and as a motor vehicle repair shop. It was originally a wooden structure facing "B" Street and later acquired a perpendicular addition in the back.

Building 388 is a one story wooden structure with horizontal wood tongue and groove siding, and features a continuous horizontal vent at the top of the wall below the eave for ventilation.

The project would renovate Building 373 for office, classroom, aviation ground support operations, vehicle maintenance, hazmat delivery, and use and storage of communications equipment. Fire protection upgrades, heating, ventilation, and air conditioning (HVAC) upgrades, installation of overhead cranes, replacement of plumbing fixtures, installation of photovoltaic panels, electrical upgrades and other repairs would be undertaken.

The project would renovate Building 388 by upgrading fire alarm systems, installing sprinkler lines; improving electrical wiring and lights; upgrading existing offices and adding more office space. Termite damaged wood would also be replaced in kind. No external changes are anticipated.

The area of potential effect for the project would be the building footprints.

Building 373 was constructed in 1943. However, the building was declared ineligible for the National Register of Historic Places in a 1992 report by Wil Chee Planning and given a Category IV rating "Of Little or No Importance" in a 2004 report by Fung and Associates and Mason Architects, Inc.

Building 388 was constructed in 1944. It is not covered by the Programmatic Memorandum of Agreement re wooden temporary buildings because the Corps is proposing to renovate, rather than demolish, the structure. The Fung and Associates and Mason Architects 2004 report gave the building a Category III rating "Of Minor Importance".

The Corps has provided documentation in the forms of internal and external photographs.

Based upon the above information and the fact that the project proposes reuse of these buildings, **this office concurs that the project will have no adverse effect on historic property.**

Any questions should be addressed to Ross W. Stephenson, SHPD Historian, at (808) 692-8028 (office), (808) 497-2233 (cell) or ross.w.stephenson@hawaii.gov.

Mahalo for the opportunity to comment.

Pua Aiu
Administrator

In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/229-11
May 6, 2011

CERTIFIED MAIL NO.: 7008 2810 0002 1219 7233

Mr. William Aila
State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Mr. Aila:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 REVIEW, PROPOSED GROW THE FORCE (GTF) INITIATIVE ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF KOOLAUPOKO, AHUPUAA OF KANEOHE, ON THE ISLAND OF OAHU TMK 1-4-4-08:001 AND 1-4-4-09:003.

Marine Corps Base (MCB) Hawaii is consulting with your office in compliance with Section 106 of the National Historic Preservation Act regarding six Military Construction (MILCON) projects associated with the United States Marine Corps' nationwide Grow the Force (GTF) initiative. MCB Hawaii is conducting an Environmental Assessment (EA) for the proposed basing of 579 active-duty personnel and an estimated 391 dependents at MCB Hawaii. The additional 970 persons represent a five percent increase above the current base population. The six MILCON projects would construct new or renovate existing facilities to provide adequate living, working, and training infrastructure [Enclosure 1]. In accordance with the NHPA Section 106 Implementing Regulations, we have reviewed the project and determined that this project is an undertaking as defined in 36 CFR 800.16 (y).

PROJECT BACKGROUND

The US Marine Corps (USMC) has begun implementation of its GTF initiative, which proposes to increase the end-strength of the USMC worldwide from 180,000 to 202,000. This increase is to be accomplished through annual incremental increases occurring between late FY2007 through FY2011.[1] The additional Marines are to join existing units at already established USMC installations nationwide, where they are to be trained and stationed. This incremental increase of the USMC would ensure that Marines are properly prepared and trained to meet the challenges and opportunities of a rapidly changing world and emerging threats.

PROJECT DESCRIPTION

Six MILCON projects are programmed for FY2011 and beyond. Enclosure 1 shows the location of each project.

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[1] Some of the additional Marines to be stationed at MCB Hawaii are already at the base. These additional personnel are being accommodated in existing facilities The proposed action is intended to provide permanent facilities for training, aid and support functions, as well as housing for unaccompanied persons for the to support this personnel increase.

As shown in Enclosure 2, a portion of the additional Marines under the GTF Initiative is already stationed at the base. These additional Marines are being accommodated in existing facilities.

The GTF MILCON projects at MCB Hawaii [see Enclosures 1, 3-5 for locations] include:

P-778 - Armory Addition and Renovation

The proposed armory addition and renovation is required to provide additional armory space to store and maintain arms used by Marine and Navy units.

The existing armory, Building 4053, that serves the 1st Battalion, 3d Marines (1/3); 2nd Battalion, 3d Marines (2/3); and 1st Battalion, 12th Marines (1/12) is located near the regimental headquarters in the block bounded by Mōkapu Road, Harris Avenue, Selden Street, and Craig Avenue. The armory comprises 8,665 square feet (sf) (805 square meters [sm]) of floor area and 3,090 sf (287 sm) of existing covered cleaning area. P-778 proposes to renovate these existing spaces and construct an approximately 17,000 sf (1,580 sm) addition and approximately 2,300 sf (214 sm) of new covered cleaning area. Eight existing temporary modular armories, which are located to the east and south of Building 4053, would be relocated elsewhere on the base at sites to be determined at a later time.

Grassed landscaping is included in the project. A temporary landscape irrigation system would also be installed to establish vegetation growth.

Installation of water, power, lighting, sewer, and telecommunication systems are included in the proposed project budget. In addition, fire protection, public address, mass notification, and intrusion-detection systems would be included in the upgrade.

P-842 - Consolidated Aid Station and Rehab Clinic

The current aid stations provide acute and chronic care to over 4,400 Marines at MCB Hawaii. The aid stations are currently located in converted Bachelor Enlisted Quarters (BEQ) facilities (Buildings 1056, 1057, 1058, 4011, and 4021) that were constructed in the 1950s and 1980s. The buildings do not provide enough space for the aid station function. The layout and design of these facilities do not support cost-effective upgrading and renovation, and are beyond economical rehabilitation; therefore, they have been programmed for demolition.

MILCON P-842 would provide a permanent, low-rise, aid station and medical clinic that is approximately 19,000 sf (1,765 sm) in size. The project site is located at the corner of Selden Street and Harris Avenue. The demolition of six deteriorated facilities (which include the existing aid stations—Buildings 1056, 1057, 1058, 4011, and 4021) and connecting covered walkways (1162, 1163 and 1164) are included in this project. The demolition of these structures would clear space and prepare the site for construction of the proposed new Consolidated Aid Station.

Consolidation of the aid stations would increase the medical treatment options available to garrisoned Marines and would provide the medical staff with an adequate, modern, and efficient facility to meet all mission requirements associated with the increased number of Marines at MCB Hawaii.

The site would be graded and existing utilities relocated. The facility would have a reinforced concrete foundation floor on structural fill and be of concrete or masonry construction that would match adjacent buildings. Adequate building insulation would supplement the efficiency of the heating, ventilation, and air-conditioning (HVAC) systems. Fire protection, alarm, electrical (including primary and secondary distribution) and telecommunication systems would also be included in the new facility.

Site improvements include paved parking, directional signs, sidewalks, exterior site and building lighting, grading, and landscaping. Storm water controls would also be included. Building access and accommodations for injured and disabled personnel would be integrated into the design.

P-847 - Artillery Battery Complex

P-847 proposes to construct a new heavy gun storage building and a new automotive organizational shop and to renovate Buildings 5000, 5001 and 5011 for use as modern heavy gun storage buildings and a modern heavy gun shop. A paved lot for additional parking is included as part of new construction. The implementation of this project would provide an adequately configured gun-storage facility and new privately-owned vehicle (POV) parking for 70 vehicles at the location of the existing 1/12 Artillery Battery Complex. As part of this project, existing Buildings 5008, 5009, and 5031, which were all buildings were constructed in 1987, would be demolished and three existing temporary fabric tent structures would be removed. The lot would be slightly graded to convey storm water runoff into a below-grade storm water detention strip, where it would be retained. Connections to existing wastewater service, sewage pump stations, and force mains would be established.

The project would also construct a new two-story Company Command Post on Mōkapu Road, across from the Artillery Headquarters building (Building 1027). The command post would provide an open administration area for 12 persons, six private offices, storage, restrooms/showers, and mechanical/utility spaces. POV parking for 38 vehicles would be provided at the command post site. A below-grade storm water detention strip would be incorporated to address runoff from the parking lot.

Site and building utility connections for water/fire and sanitary and storm sewers would be included. Information systems would include telephone, voice and data communications, local area network (LAN), and cable television (CATV). Site improvements would include paved parking, sidewalks, earthwork (fill/grading), and landscaping.

P-852 - 3D Radio Battalion Complex

P-852 proposes to construct an approximately 16,500 sf (1,533 sm) integrated, low-rise complex for the 3D Radio Battalion to support the GTF increased end-strength. Approximately 9,500 sf (882 sm) of the complex would comprise the Battalion Headquarters, Company A and B offices, a high-security classified storage vault, an unclassified storage room, a Trojan vehicle storage area, and male and female showers and restrooms. In addition, a connected 7,000 sf (650 sm) Operational Storage Facility would be constructed to accommodate the growing battalion's storage requirements. The complex would be located adjacent to the 3D Radio Battalion's existing facility, at the southern end of Harris Avenue, to create a single compound, thereby increasing operational efficiency and simplifying security and infrastructure requirements.

P-852 would provide adequate space and properly configured facilities to support current functions, while the existing facility would be used to support the expanded functions being performed by the additional personnel.

The building would be constructed of reinforced concrete masonry unit (CMU) or concrete exterior walls supporting a steel-framed roof. The project would also have mechanical amenities that include fire suppression and alarm systems and humidity control for HVAC systems designed for communications equipment. Provisions for utility upgrades have been included. For instance, a new ductile iron 20-inch waterline would be installed and rerouted to replace the waterline that currently traverses the site. Power throughout the building would be provided by an underground electrical distribution system. The overhead telecommunications lines that are now routed through the site would be relocated underground. A wastewater pump station would be installed. The site would be graded for positive drainage and bioswales would be provided. Perimeter security, parking lot, and walkway lighting would use downward-shielded exterior lighting systems.

P-858 - Multi-Story BEQs, Command Headquarters

P-858 would construct new two-story BEQs and a Command Headquarters facility. The project also includes the demolition of Buildings 4010, 4017, 4019, 4020, 6705, which were constructed in 1988 and 1991) to clear land area for construction of the BEQs and Command Headquarters, construction of a parking structure and upgrade of Buildings 5070 and 5071.

MCB Hawaii is currently deficient in the number of required bachelor living spaces. A facility inventory indicates that MCB Hawaii currently has 4,540 living spaces for unaccompanied personnel, a 1,978-living-space deficit from the 6,518-space requirement, which includes the living spaces needed to support the GTF personnel and other planned personnel increases. To help reduce the deficit, ease the critical need for additional living space, and support the GTF generated increase in billeting requirements, MILCON P-858 proposes to construct a permanent, multi-story BEQ facility at MCB Hawaii.

The new BEQ would have an approximate gross floor area of 54,000 sf (5,017 sm), providing a community service core area and 107 rooms with semi-private baths in the standard USMC Bachelor Housing 2+0 room configuration. The new BEQs would provide housing for 214 junior enlisted persons (E1 to E4).

Space constraints in the immediate vicinity of the new BEQs and Command Headquarters and the resultant inability to meet AT/FP stand-off distances precludes developing a surface parking lot near these facilities. Thus, a multi-story parking structure is proposed across Harris Avenue from the BEQs and Command Headquarters. The site plan for the BEQs, Command Headquarters and parking structure is shown on Figure B-14.

Mechanical systems would include plumbing, fire protection and HVAC systems. Electrical systems would include fire alarm and energy management control systems (EMCS). Information systems would include telephone, voice and data communications, LAN, and CATV. A telecommunications infrastructure room would be provided on each floor, to house communications and security system infrastructure.

Supporting facilities work would include site and building utility connections (water/fire, sanitary and storm sewers). Paving and site improvements would include access roads, fire access lanes, sidewalks, outdoor recreation facilities, courtyards, equipment and bike shelters, earthwork, and landscaping.

In addition to the proposed new construction, P-858 also proposes to install a central air conditioning (A/C) system in existing BEQs 5070 and 5071. Central A/C was not integrated into the BEQs' original design and, to contend with the humidity and warmer temperatures that summer conditions bring to Hawai'i, building residents have installed individual A/C units in their windows. The A/C units are frequently installed improperly, leading to broken windows and inadequate sealing around units. This causes inefficient A/C operation and contributes to high electricity consumption. Improper installation has also caused infiltration of outside precipitation and dust, which continues to damage the interior of the BEQs. Additionally, the buildings' electrical systems cannot support the increasing number of window units.

The new A/C systems would include a new CMU enclosure for a cooling tower and pumps, variable refrigerant volume units, and division data center (DDC). To support the new air conditioning system, new transformers and main distribution panels would also be installed. Existing louvered windows would be replaced with fixed-glass windows, in compliance with AT/FP requirements. Replacing the windows would result in a reduced window area, which would be filled with impact-resistant composite panels. To achieve LEED certification, sustainable features would include battery-storage photovoltaic systems, high-efficiency windows, and water-conserving plumbing fixtures with dual flush controls for toilets.

P-885 - Marine Wing Support Squadron (MWSS) Headquarters

P-885 proposes to renovate Buildings 373, 388, and 1650 to adequately support the new MWSS detachment to be assigned to MCB Hawaii. Renovations would provide a centralized MWSS headquarters, with facilities to accommodate engineering, motor transport, aviation operations, communications, and supply operations. The new facilities would provide office space, classrooms, maintenance bays, common areas, training areas, a communication equipment storage area, a dispatch facility, and areas to deliver, store, and dispose of HAZMAT elements. Modernization of its facilities would consolidate MWSS operations into a single compound and allow the MWSS to function efficiently as a unit.

Additionally, P-885 would construct a new CLB-3 facility and a new Communications Shop to accommodate displacement of the CLB-3 functions currently housed in Buildings 388 and 1650.

Separately, P-852 - 3D Radio Battalion Complex, described above and slated for concurrent construction, would consolidate all 3D Radio Battalion operations into a single complex. An element of P-885 would construct a motor pool facility at the new 3D Radio Battalion Complex to replace the facilities to be displaced by the new MWSS Headquarters and would support consolidation of the 3D Radio Battalion.

Other improvements would include site lighting, paved POV parking, equipment-line vehicle parking, access roads, sidewalks, a storm water drainage system, earthwork, fencing, landscaping, and signage. On-site

utilities included as provisions to this project include electric, water, sewerage, telecommunications, and fiber optics.

IDENTIFICATION OF HISTORIC PROPERTY

The proposed project is located in three general regions on base, which will are designated as Area A (western section), Area B (middle section), and Area C (eastern section) for this report. Enclosures 3, 4, and 5 depict these areas with the associated project. Area A consists of MILCON P-885, Area B consists of MILCON P-858, and Area C consists of MILCON P-778, P-842, P-847, P-852, P-858, and P-885.

Project Area A

The eastern half of Building 373 is within a Low Archaeological Sensitivity Zone [Enclosure 6]. The western half of Building 373 is, however, within a Medium Archaeological Sensitivity Zone. The southern portion of the project area transitions from a Low Archaeological Sensitivity Zone to a Low-fill Archaeological Sensitivity Zone. Situated between these two zones is an approximately 100-foot-wide strip running in a northwest-to-southeast direction that is designated as a Medium Archaeological Sensitivity Zone. This strip demarcates a segment of the original coastline of Mōkapu Peninsula. The northern portion of the project area is within the Low Archaeological Sensitivity Zone.

Buildings 373 and 388, which would be renovated under P-885, were constructed in 1943 and 1944, respectively. (Enclosure 7 includes a list of the facilities affected by the proposed actions associated with the GTF initiative.) Building 373 was determined ineligible for listing on the NRHP. Building 388 is a wooden temporary building that MCB Hawaii intends to renovate. During Section 106 consultation, the State Historic Preservation Division (SHPD) concurred with MCB Hawaii's determination that the proposed action would have no adverse effect on historic properties (Log No 2010.3439 Doc 1012RS32 dated 16 DEC 2010).

Project Area B

Project Area B is situated completely within a Low Archaeological Sensitivity Zone. Buildings 5070 and 5071, which would be renovated under P-858, were both built in 1988 and do not meet the 50-year eligibility criterion for listing in the NRHP. Further, these structures were evaluated as "…a small ancillary building or structure that supports the general needs of the base, and exists in multiples. Typically this type of building or structure is not related to military missions of the Cold War, and is not assessed as having the exceptional significance required to meet Criteria Consideration G" (Wil Chee-Planning, Inc. and Mason Architects 2010). Properties meeting Criterion G are less than 50 years old, but are of exceptional importance and are thus considered eligible for listing on the NRHP.

Project Area C

Most of Project Area C is within a Low Archaeological Sensitivity Zone. However, portions of P-847 (construction of a new Company Command Post adjacent to Building 1088), P-852 (construction of a new 3D Radio Battalion Complex north of Building 6003), and P-885 (CLB-3 Comm. Shop behind Building 1086, and a motor pool and automotive/utility shop for the 3D Radio Battalion, east of Building 6003), are situated within a Medium Archaeological Sensitivity Zone.

None of the existing buildings proposed for renovation or demolition within Project Area C have been evaluated as eligible for listing in the NRHP. Enclosure 7, below, lists the facilities affected and their NRHP-eligibility status. Data for this table was compiled from the ICRMP and from the draft Historical Context and Building Inventory study (Wil Chee-Planning, Inc., and Mason Architects, Inc 2009; Environmental Compliance and Protection Department Marine Corps Base Hawaii 2011).

It is possible that sand may be discovered below the concrete sidewalk and in areas where buildings once stood. Sand, which may contain human remains, was used on Mokapu Peninsula during the 1940s and 1950s as fill below building foundations and around buried utilities.

AREA OF POTENTIAL EFFECT

The area of potential effect (APE) has been determined to include only the footprint of the proposed MILCON projects associated with the GTF initiative at MCB Hawaii.

DETERMINATION OF AFFECT

MCB Hawaii has determined that the proposed increase in the number of Marines stationed at MCB Hawaii to support the United States Marine Corps' nationwide GTF initiative along with its associated MILCON projects will result in no adverse effect to historic properties in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) the proposed MILCON projects associated with the GTF initiative are located in areas that have been previously disturbed by initial base construction activities and are not located within the boundaries of archaeological sites; 2) archaeological monitoring will be conducted during excavation in areas that contain coralline beach sand, such as old utility lines and below concrete slabs, and in areas of high archaeological sensitivity such as the old coastline; and 3) prior consultation with the SHPO determined that the proposed renovations to Building 388 will have no adverse effect on historic properties.

We request your review of and concurrence with our determinations of effect and of the APE as stated above. As defined in 36 CFR 800.5(c) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. Should you or your staff have any questions or concerns please contact the MCB Hawaii Cultural Resources Management staff, Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil or Coral Rasmussen at 257-7134 or via email at coral.rasmussen@usmc.mil.

Sincerely

D. R. GEORGE
Captain, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

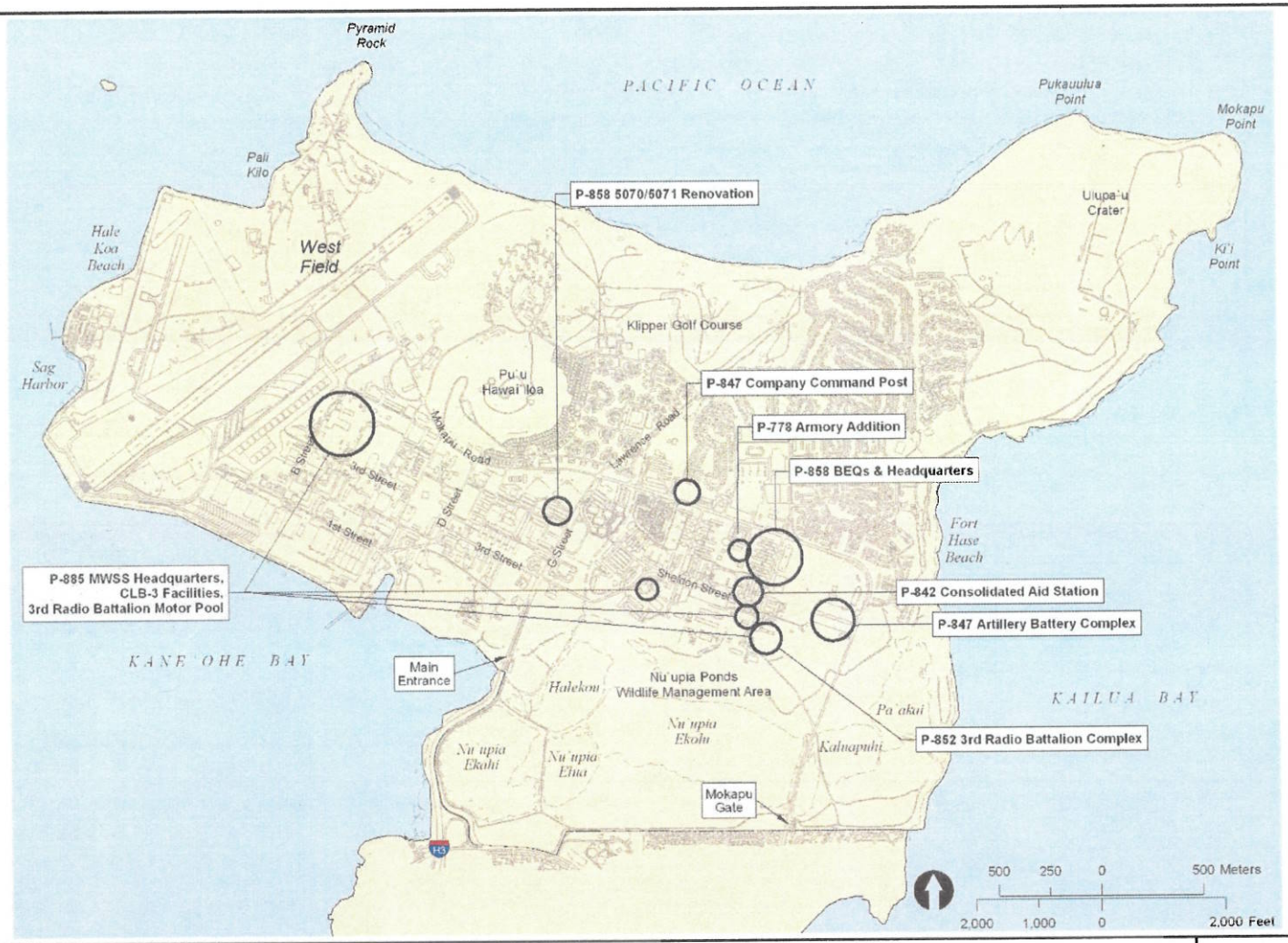
Enclosures:
1. MILCON Project Sites at MCB Hawaii.
2. Number of Personnel to be Added to Existing Units Aboard MCB Hawaii.
3. Project Area A, MILCON Project P-885 at MCB Hawaii.
4. Project Area B, MILCON Project P-858 at MCB Hawaii.
5. Project Area C, MILCON Project P-778, P-842, P-847, P-852, P-858, and P-855 at MCB Hawaii.
6. Location of the MILCON projects associated with the GTF Initiative aboard MCB Hawaii.
7. NRHP Status of Affected Facilities at MCB Hawaii

References:

Environmental Compliance and Protection Department Marine Corps Base Hawaii
2011 *Historic Building Inventory: World War II Era Buildings aboard Marine Corps Base Hawaii, Kaneohe Bay.* Draft report prepared by Environmental Compliance and Protection Department Marine Corps Base Hawaii, Kaneohe Bay, Hawai'i.

U.S. Army Corps of Engineers
2006 *Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, O'ahu, Hawai'i.* Prepared for Installation Commander, Marine Corps Base Hawaii. U.S. Army Corps of Engineers, Honolulu Engineer District, Fort Shafter, Hawai'i.

Wil Chee-Planning, Inc., and Mason Architects, Inc.
2009 *Historic Context and Building Inventory Marine Corps Base Hawaii.* Draft prepared for Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Wil Chee-Planning and Mason Architects, Inc., Honolulu.



Grow The Force Environmental Assessment	MILCON Project Sites	

Enclosure 1. MILCON Project Sites at MCB Hawaii.

Enclosure 2. Number of Personnel to be Added to Existing Units Aboard MCB Hawaii.

Unit	FY08	FY09	FY10	FY11	FY12	FY13 or beyond	Total
MWSS					93	126*	219
3D Radio	67	74					141
3d Marines	16		57				73
E2/12	146						146
TOTAL	**229**	**74**	**57**	**0**	**93**	**126**	**579**

* The 126 persons from the MWSS are projected, but not yet approved.

Grow The Force Environmental Assessment	Project Area A P-885 (MWSS Compound)	

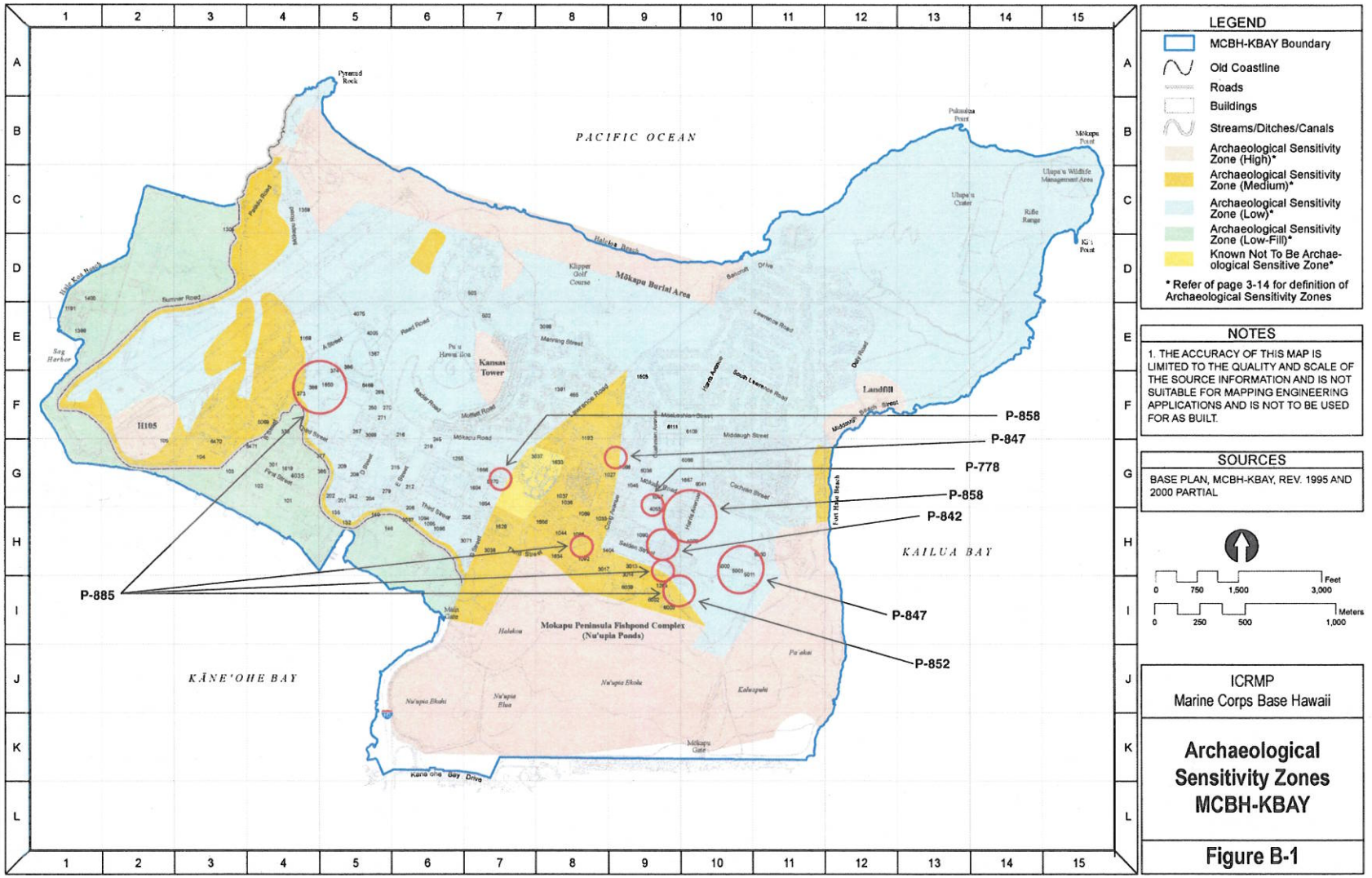
Enclosure 3. Project Area A, MILCON Project P-885 at MCB Hawaii.

Grow The Force Environmental Assessment	Project Area B MILCON P-858 (BEQs 5070 & 5071)	

Enclosure 4. Project Area B, MILCON Project P-858 at MCB Hawaii.

Grow The Force Environmental Assessment	Project Area C MILCON P-778, P-842, P-847, P-852, P-858, P-885	

Enclosure 5. Project Area C, MILCON Project P-778, P-842, P-847, P-852, P-858, and P-855 at MCB Hawaii.



Enclosure 6. Location of the MILCON projects associated with the GTF Initiative aboard MCB Hawaii (U.S. Army Corps of Engineers 2006:Fig. B-1).

Enclosure 7. NRHP Status of Affected Facilities at MCB Hawaii.

MILCON PROJECT	FACILITY NUMBER	YEAR CONSTRUCTED	PROPOSED ACTION	NRHP STATUS
P-778	4053	1986	Renovation and addition	Not Eligible
P-842	1056	1953	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a non-distinctive type and typically would not be interpreted as potentially eligible for the National Register.
	1057	1953	Demolition	Not Eligible
	1958	1953	Demolition	Not Eligible
	1162	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a non-distinctive type and typically would not be interpreted as potentially eligible for the National Register.
	1164	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a non-distinctive type and typically would not be interpreted as potentially eligible for the National Register.
	1165	1956	Demolition	Although the structure is more than 50 years old, a preliminary evaluation determined that this facility is infrastructure of a non-distinctive type and typically would not be interpreted as potentially eligible for the National Register.
	4011	1988	Demolition	Not Eligible
	4021	1988	Demolition	Not Eligible
P-847	5000	1987	Renovation	Not Eligible
	5001	1987	Renovation	Not Eligible
	5011	1987	Renovation	Not Eligible
	5008	1987	Demolition	Not Eligible
	5009	1987	Demolition	Not Eligible
	5031	1987	Demolition	Not Eligible
P-858	4010	1988	Demolition	Not Eligible
	4017	1988	Demolition	Not Eligible
	4019	1988	Demolition	Not Eligible
	4020	1988	Demolition	Not Eligible
	5070	1988	Renovation	Not Eligible
	5071	1988	Renovation	Not Eligible
	6705	1991	Demolition	Not Eligible
P-885	373	1943	Renovation	Not Eligible
	388	1988	Renovation	Eligible for the NRHP; temporary wooden structure

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAHUHIHEWA BUILDING
601 KAMOKILA BLVD, KAPOLEI HI 96706

DATE: June 23, 2011

LOG: 2011.1343
DOC: 1106AW19

TO: D.R. George
Captain, U.S. Marine Corps
Director, Environmental Compliance & Protection Department
P.O. Box 63002 Kaneohe Bay
Kaneohe Marine Corps Base, Hawaii 96863-3002

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Consultation**
Project: Grow the Force Initiative – Six (6) MILCON Projects
Building Owner: Marine Corps Base Hawaii
Location: Kaneohe Marine Corps Base Hawaii
Tax Map Key: (1)4-4-08:001

This letter is in response to a communication dated May 6, 2011, received by our office on May 10, 2011. Under the GTF Initiative the following projects are proposed:

1. **P778** – Armory Addition and Renovation: 17,000+ square foot addition to Facility 4053 (built 1986).
2. **P-842** – Consolidated Aid Station and Rehab Clinic: Demolition of Facilities 1056, 1057, 1058 (built 1953); 1162, 1163, 1164 (built 1956); 4011, 4021 (built 1988) to accommodate a new 19,000 square foot medical treatment facility.
3. **P-847** – Artillery Battery Complex – Renovation of Facilities 5000-1, 5011, and demolition of Facilities 5008-9, 5031 (all built 1987). Project would also construct new two-story Company Command Post.
4. **P-852** – 3D Radio Battalion Complex: Construction of a new 16,500 square foot low-rise complex for the Radio Battalion.
5. **P-858** - Multi-Story BEQs, Command Headquarters: Demolition of Facilities 4010, 4017, 4019-20, 5070-1(built 1988) and 6705 (built 1991) to accommodate the construction of two-story BEQs, a Command Headquarters, and a multi-story parking structure.
6. **P-885** – Marine Wing Support Squadron (MWSS) Headquarters: Renovation of Facility 373 (built 1943) and Facility 388 (built 1988) to house the MWSS detachment.

Only projects P-842 and P-885 involve buildings that are potentially eligible for inclusion in the National Register at this time**;** all others do not yet meet the 50 year threshold. The seven (7) buildings which are over 50 years old are considered infrastructure, non-distinct or temporary; or have been previously determined to be ineligible (Facility 343 as per SHPD DOC 2010.3439).

SHPD concurs that the projects as outlined will have no adverse effect on historic property. It is noted that archeological monitoring will be conducted if sand fill is discovered during excavations for any of the proposed work.

We would like to request a copy of the referenced *2006 Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, Oahu, Hawaii* document which we do not seem to have. Thank you for providing a copy of the *Historic Context and Building Inventory Marine Corps Base Hawaii* (2009 Draft).

Any questions should be addressed to Angie Westfall, SHPD Architecture Branch Chief, at (808) 692-8032, or angie.r.westfall@hawaii.gov.

Mahalo

Angie Westfall
Architecture Branch Chief

Appendix E
Traffic Impact Assessment Report

TRAFFIC IMPACT ASSESSMENT REPORT FOR

MARINE CORPS BASE HAWAII 202K PROGRAM

IN KANEOHE, OAHU, HAWAII

Prepared For

WIL CHEE - PLANNING & ENVIRONMENTAL, INC.

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street
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February 28, 2011

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1. INTRODUCTION

Phillip Rowell and Associates have completed the following Traffic Impact Assessment Report (TIAR) to assess the traffic impacts of the proposed growth in the number of personnel assigned to Marine Corps Base Hawaii (MCBH) as part of the Marine Corps 202K Plus Up (aka Grow the Force) Program. This introductory chapter discusses the location of the project, the proposed development, the study methodology and order of presentation.

Project Location and Description

MCBH is located on the windward (south) side of Oahu adjacent to the Kailua and Kaneohe areas of the island. See Figure 1.

The proposed action is an increase in the number of military personnel assigned to MCBH. Based on the information provided, it is anticipated that an additional 970 personnel will be assigned to MCBH by 2012 as part of the Grow the Force (GTF) program. A summary is provided as Table 1.

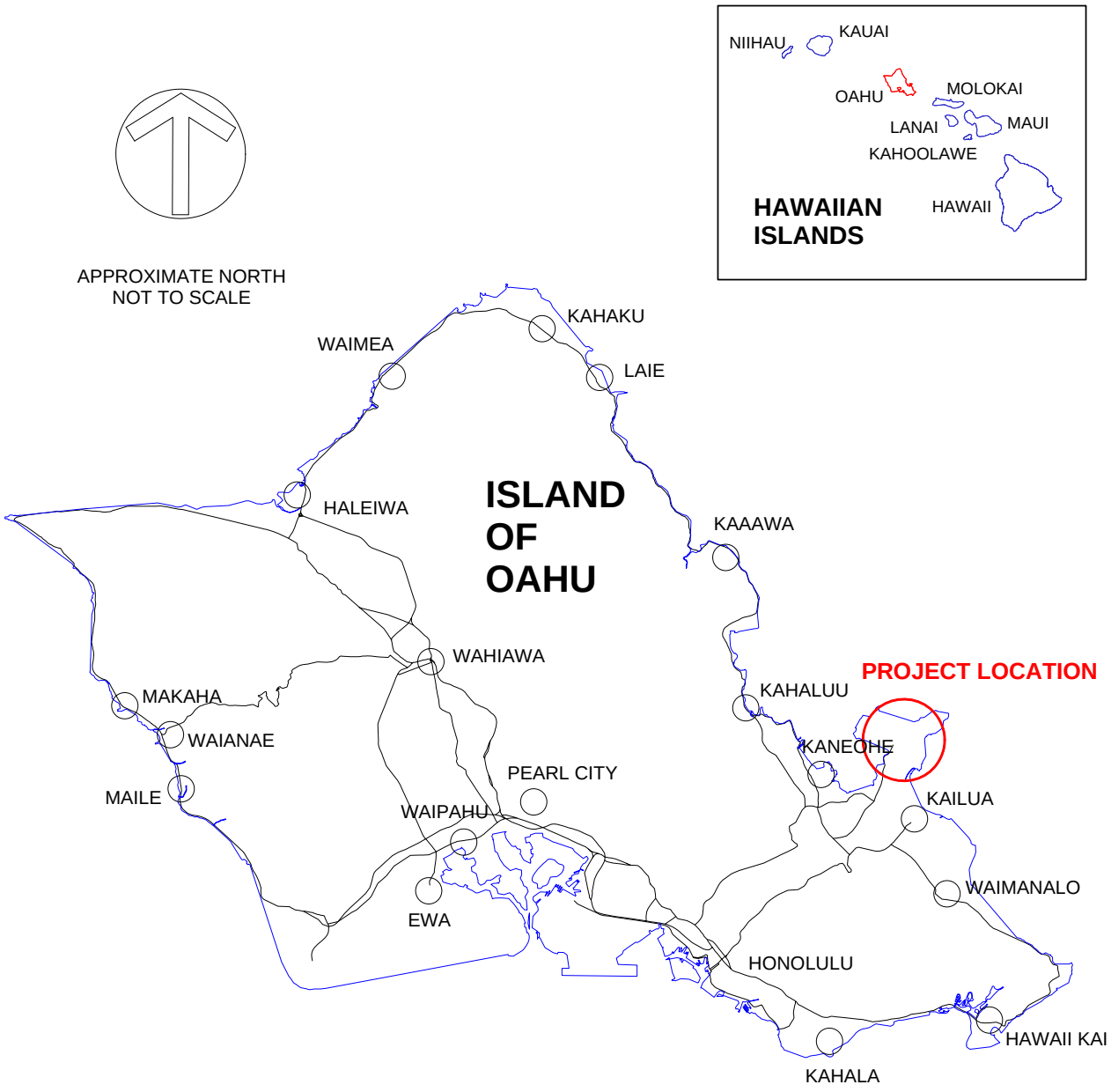

Figure 1
PROJECT LOCATION MAP

Table 1 MCBH Population Data

	Population [1]
2010	20,895 [2]
Baseline (2010 minus GTF add-ons)	20,592
Baseline Plus GTF	21,562
Growth the Force Personnel	970

Access to and egress from MCBH is via two gates, the H-3 Gate and the Mokapu Gate. The H-3 Gate is located at the north terminus of H-3. There are two northbound (inbound) lanes but the roadway narrows to one lane at the gate. There are two southbound (outbound) lanes. The nearest intersection is H-3 at Kaneohe Bay Drive. This intersection is approximately one-mile south of the H-3 Gate.

The Mokapu Gate is located at the north end of Mokapu Boulevard. There is one lane northbound (inbound) and one southbound (outbound) in the immediate vicinity of the gate. The nearest signalized intersection of Mokapu Boulevard at Kaneohe Bay Drive/North Kalaheo Avenue, which is 0.5 mile south of the gate.

In addition to the increase in the number of Marines assigned to the base, there are six projects to provide physical facilities. These buildings will be used by new Marines assigned to MCBH and Marines already on the base.

These new facilities are described in further detail in Chapter 4 and are summarized as follows:

1. P-778 Armory Addition and Renovation

This project is located along the south side of Mokapu Road between Harris Avenue and Craig Avenue. The project consists of renovation of existing buildings and construction of addition building to provide additional storage space.

2. P-842 Consolidated Aid Station and Rehab Clinic

This project is located in the northwest quadrant of the intersection of Harris Avenue at Selden Street. The project consists of consolidation and replacement of existing facilities.

3. P-847 Artillery Battery Complex and Command Post

This project consists of two components. The first is the replacement of existing temporary facilities (tents) located along the west side of Mokapu Road north of the Mokapu Gate. These facilities are used for storage and maintenance of large guns. A maximum of 80 and 125 persons may be on this site at one time.

The second component is a new command post to be located along the north side of Mokapu Road west of Craig Street. The command post will provide work space for approximately 20 persons.

4. P-852 3rd Radio Battalion Complex

This project will be located along the east side of Harris Avenue south of Selden Street. The proposed action consists of the relocation of 26 persons from a location near the airfield and construction of a 9,500 square foot building that will be used by the Battalion Headquarters, offices, storage, showers and restrooms.

5. P-858 Multi-Story BEQ's, Command Complex

This project is located along Harris Road south of Mokapu Road. The BEQs and the Command Headquarters will be along the west side of Harris Road. The BEQs will provide 214 units. The Command HQ will provide workspace for 12 persons. A parking structure will be constructed along the east side of Harris Road across from the BEQs and Command HQ for parking. The parking structure will have 191 spaces.

6. P-885 Marine Wing Support Services (MWSS) Headquarters

The MWSS will be located along the east side of "B" Street adjacent to the airfield. The current occupants of the building will be relocated. The building will then be renovated to provide space for 219 persons. The building is currently used by the 3rd Radio Battalion (26 persons) and CLB-3 (30 persons). The 3rd Radio Battalion will relocated to a new facility along Harris Road as discussed above (P-852). A new CLB-3 facility and Comm Shop will be constructed. The CLB-3 facility will be located along the south side of Selden Street east of Harris Avenue and will be used primarily for storage. The CLB-3 Comm Shop will be located along the east side of 3rd Street and will provide space for the 30 persons to be relocated from the building adjacent to the airfield.

These projects are located at various locations on MCBH. Some projects will also have components located at more than one location on the base.

Study Approach

The first task was to define the scope of the project. There are two primary components. The first is the increase in the total number of persons assigned to MCBH. The second component is the new buildings and facilities. Separate approaches were used for each component.

The approach for the overall growth in personnel was straight-forward.

The Institute of Transportation Engineers requirements for TIARs are based on the estimated number of peak hour trips that a project will generate. A trip generation study of the amount of traffic that MCBH generates was performed to determine trip generation rates. These rates were then used to estimate the number of additional trips that the GTF program will generate. The scope of work was then determined.

Existing traffic volumes along H-3 and Mokapu Boulevard were counted during April 2010. Estimates of the number of Marines currently assigned to MCBH and the number that will be added as part of the GTF and other programs were obtained .

Background, or baseline, traffic conditions are defined as traffic conditions without the proposed project. The design horizon year does not necessarily represent the project completion date of that phase. It is a date for which future background traffic projections were estimated. For this project, we have used a design, or horizon, year of 2012 and have referred to this condition as "Baseline + GTF."

The number of peak-hour trips that the proposed action will generate was estimated using standard trip generation procedures outlined in the *Trip Generation Handbook*[1] and assumptions based on our understanding of the project. These trips were distributed between H-3 and Mokapu Boulevard, inbound and outbound, based on the approach and departure patterns of existing traffic and assigned based on the available approach and departure routes.

[1] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998

The traffic impacts of the project were assessed by analyzing the levels-of-service along the two approach roadways, H-3 and Mokapu Boulevard. H-3 was analyzed as a basic freeway section and Mokapu Boulevard was analyzed as a two-way, two-lane roadway. Inbound and outbound directions were analyzed separately.

Study Approach for Individual Projects

The study approach for the buildings is more complicated as the buildings will be used by new personnel and personnel already assigned to MCBH. The total number of persons using the various buildings is greater than the total number of new persons to be located at MCBH. Each building and site had to be assessed as a separate project to determine the traffic impacts of each project as well as the total impacts of the GTF program.

Each project's traffic characteristics were identified and the scope of work for each defined using criteria established by the Institute of Transportation Engineers. In most cases, the project was defined as an "access location and design review" assessment as described by the Institute of Transportation Engineers[2]. These are projects that generate fewer than 100 trips per hour during the peak hour.

Background, or baseline, traffic conditions of the roadways adjacent to the proposed projects were estimated. For this project, existing traffic volumes were obtained and used as background conditions. This is because (1) a significant portion of the GTF personnel are already on MCBH and (2) the scope of work, as defined by the Institute of Transportation Engineers, needs only to assess the overall, cumulative conditions and confirm that traffic operates at acceptable levels-of-service.

Peak hour traffic that the proposed project will generate was estimated using trip generation analysis procedures recommended by the Institute of Transportation Engineers. Project-generated traffic was assigned to the adjacent roadway network and a level-of-service analysis for future traffic conditions with traffic generated by the study project was performed. The trip assignments used for the level-of-service analysis are the sum of the traffic generated by all six projects.

The impacts of traffic generated by the proposed projects along the adjacent street at nearby intersections were quantified and summarized. Locations where traffic operating conditions would be significantly impacted by project generated traffic were then identified.

Order of Presentation

Chapter 2 describes baseline traffic conditions, the Level-of-Service (LOS) concept and the results of the Level-of-Service analysis of existing conditions.

Chapter 3 describes the process used to estimate 2012 background traffic volumes and the resulting background traffic projections. Background conditions are defined as future background traffic conditions without traffic generation by the study project.

Chapter 4 describes the methodology used to estimate the traffic characteristics of the proposed project, including 2012 background plus project traffic projections.

Chapter 5 describes the traffic impacts of the proposed project, conclusions of the impact analysis and recommended mitigation measures.

[2] Institute of Transportation Engineers, *Transportation and Land Development*, 2002, Washington, D.C., page 3-6

2. ANALYSIS OF EXISTING CONDITIONS

This chapter presents the existing traffic conditions on the roadways adjacent to the proposed project. The level-of-service (LOS) concept and the results of the LOS analysis for existing conditions are also presented. The purpose of this analysis is to establish the base conditions for the determination of the impacts of the project which are described in a subsequent chapter.

Existing Streets and Intersection Controls

As previously noted, access to and egress from MCBH is via H-3 and Mokapu Boulevard. Access to and egress from the separate projects is provided by Mokapu Boulevard, Harris Avenue, Craig Avenue, Selden Street and 'B' Street.

Existing Peak Hour Traffic Volumes

State of Hawaii Department of Transportation provides 24-hour traffic counts along H-3 at Kaneohe Bay Drive. The most recent counts available at the time this report was written were completed February 8, 2008. The data indicated that the morning and afternoon peak hours are from 7:00 AM to 8:00 AM and from 4:00 PM to 5:00 PM, respectively. Since these were counts of vehicles entering and exiting MCBH via the H-3 Gate, these hours represent the peak hours of traffic generated by MCBH. These hours were counted to estimate peak hour traffic volumes. These counts were performed during April 2010.

The morning peak hour traffic volume entering and exiting MCBH via the H-3 Gate was 1,035 and 291, respectively. The total hourly volume was 1,326. The afternoon peak hour volume entering and exiting MCBH via the H-3 Gate was 347 and 1,040, respectively.

It was assumed that the peak hours of traffic using the Mokapu Gate were consistent with traffic using the H-3 Gate. The morning peak hour traffic volume entering and exiting MCBH via the Mokapu Gate was 356 and 236, respectively. The total hourly volume was 592. The afternoon peak hour volume entering and exiting MCBH via the H-3 Gate was 268 and 413, respectively. The total hourly volume was 681.

These volumes are summarized in Table 2.

Table 2 Summary of Traffic Volumes Entering and Exiting MCBH

Time	H-3 Gate			Mokapu Gate			Total		
Interval	In	Out	Total	In	Out	Total	In	Out	Total
7:00 AM to 7:15 AM	281	64	345	69	20	89	350	84	434
7:15 AM to 7:30 AM	309	56	365	98	60	158	407	116	523
7:30 Am to 7:45 AM	234	97	331	81	96	177	315	193	508
7:45 AM to 8:00 AM	211	74	285	108	60	168	319	134	453
AM Peak Hour Total	1,035	291	1,326	356	236	592	1,391	527	1,918
4:00 PM to 4:15 PM	67	293	360	57	95	152	124	388	512
4:15 PM to 4:30 PM	100	231	331	62	116	178	162	347	509
4:30 PM to 4:45 PM	80	281	361	82	101	183	162	382	544
4:45 PM tp 5:00 PM	100	235	335	67	101	168	167	336	503
PM Peak Hour Total	347	1,040	1,387	268	413	681	615	1,453	2,068

The existing peak hour traffic volumes of the individual intersections within MCBH are shown in Figures 2 and 3.

1. The traffic counts include buses, trucks, motorcycles, mopeds and other large vehicles. Bicycles and pedestrians were not counted.

2. The traffic volumes shown are the peak hour volume of the total intersection.

3. The traffic volumes of adjacent intersections may not match the volumes shown for an adjacent intersection because the peak hours of the adjacent intersections may not coincide and there are driveways between the intersections.

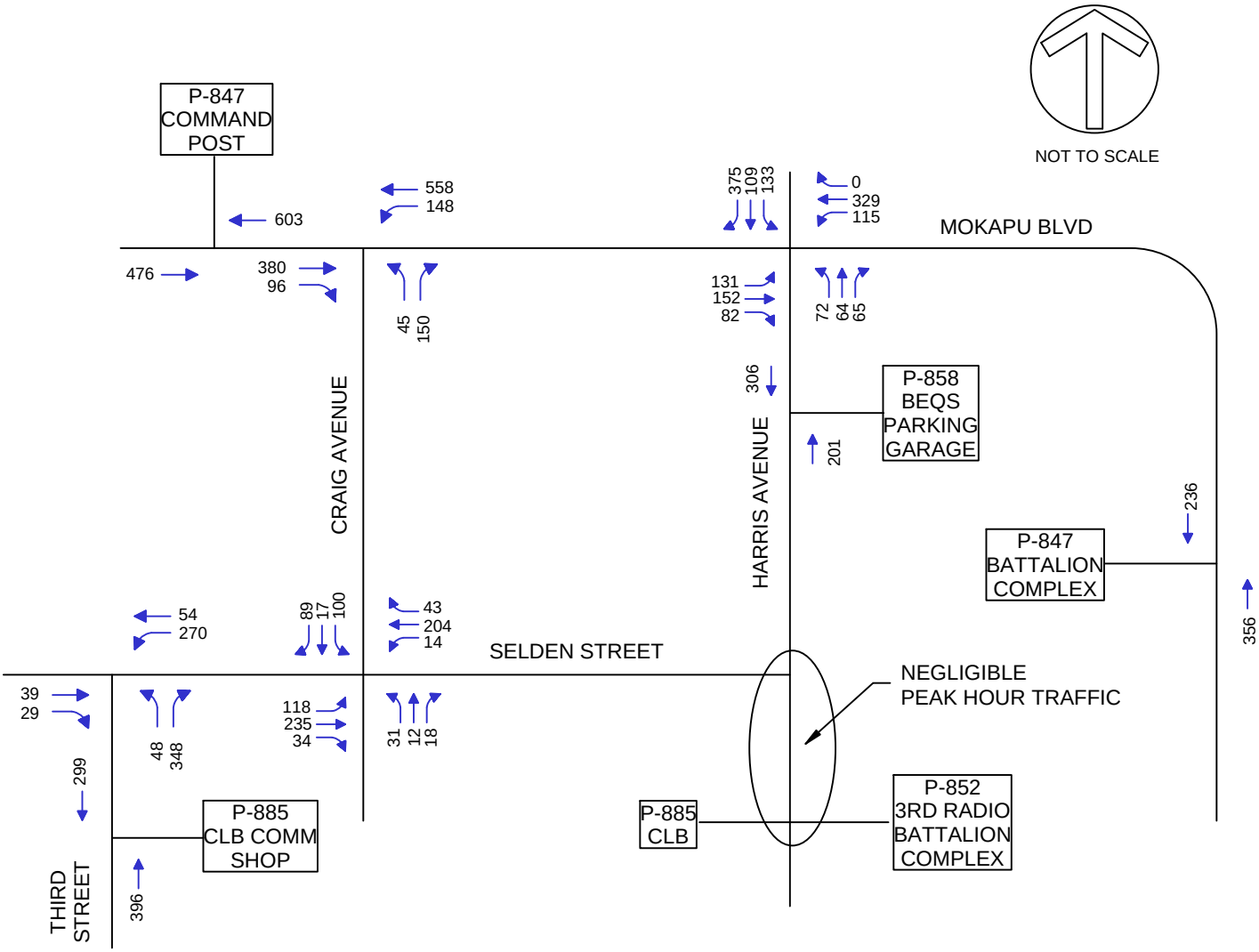

Figure 2
EXISTING (2010) AM PEAK HOUR TRAFFIC VOLUMES

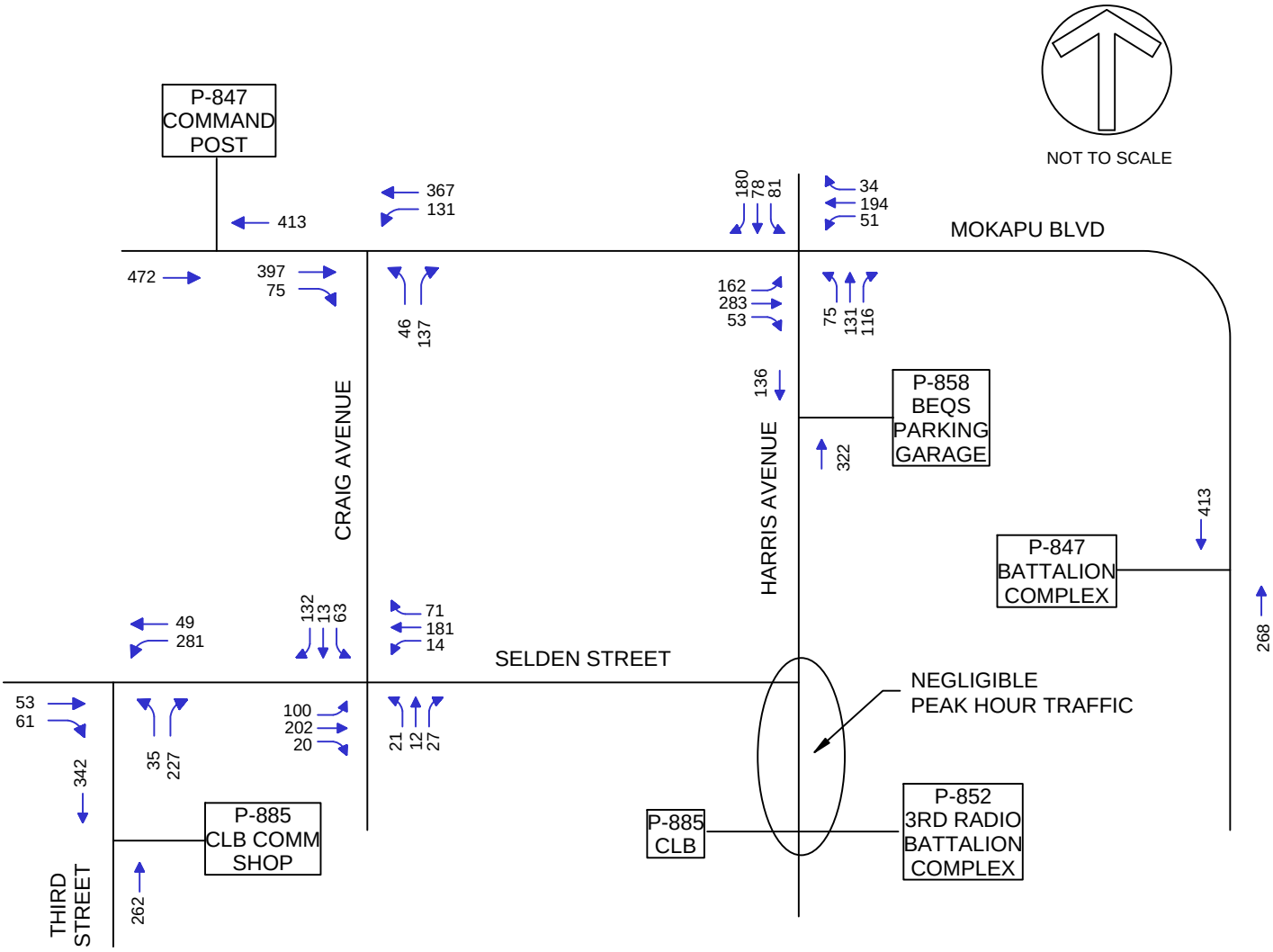

Figure 3
EXISTING (2010) PM PEAK HOUR TRAFFIC VOLUMES

Level-of-Service Concept

Signalized Intersections

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 3. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.[3]

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 3 Level-of-Service Definitions for Signalized Intersections(1)

Level of Service	Interpretation	Volume-to-Capacity Ratio(2)	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

[3] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development*, Washington, D.C., 2006, page 56 - 60

Unsignalized Intersections

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 4 summarizes the definitions for level-of-service and the corresponding delay.

Table 4 Level-of-Service Definitions for Unsignalized Intersections(1)

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

Basic Freeway Section

H-3 was analyzed as a basic freeway section between Kaneohe Bay Drive and the H-3 Gate as there are no on-ramps or off-ramps along this section of roadway. Level-of-Service is defined by the density of passenger cars. Density is expressed as cars per mile per lane. These definitions are summarized in Table 5.

Table 5 Level-of-Service Definitions for Freeways(1)

Level-of-Service	Density Range (pc/mile/lane)
A	0 - 11
B	> 11 - 18
C	>11 - 26
D	> 26 - 35
E	> 35 - 45
F	> 45

Notes:
(1) Source: *Highway Capacity Manual*, 2000, page 23-3

Two-Lane, Two-Way Roadway

The level-of-service of Mokapu Boulevard was analyzed using the roadway segment methodology described in the *Highway Capacity Manual*. The level-of-service is defined by the percent of time that a vehicle will spend following another vehicle along the segment of highway being analyzed. The criteria for the level-of-service analysis is summarized in Table 6.

Table 6 Level-of-Service Criteria for Class I Two-Lane Highway(1)

Level-of-Service	Percent Time-Spent-Following
A	≤ 35.0
B	> 35 to 50
C	> 50 to 65
D	> 65 to 80
E	> 80
F	See Note (2) Below

Notes:
(1) Source: Institute of Transportation Engineers, *Highway Capacity Manual*, 2000, page 20-3.
2. LOS F applies whenever the flow rate exceeds the segment capacity.

Level-of-Service Analysis of Existing Conditions

The existing levels-of-service of the signalized study intersections are summarized in Table 7. The results shown in the table are the volume-to-capacity ratios, delays and levels-of-service of the overall intersections and each controlled lane group.

Table 7 Existing (2010) Levels-of-Service

Intersection and Movement	AM Peak Hour		PM Peak Hour	
	Delay [1]	LOS [2]	Delay	LOS
Mokapu Boulevard at Harris Avenue	***21.6***	***C***	***14.8***	***B***
Eastbound Left, Thru & Right	14.4	B	20.2	C
Westbound Left, Thru & Right	16.6	B	8.8	A
Northbound Left, Thru & Right	10.5	B	13.4	B
Southbound Left, Thru & Right	33.1	C	13.0	B
Selden Street at Harris Avenue	***0.0***	***A***	***0.0***	***A***
Eastbound Left & Right	0.0	A	0.0	A
Northbound Left & Thru	0.0	A	0.0	A
Mokapu Boulevard at Craig Avenue	***6.6***	***A***	***5.3***	***A***
Westbound Left & Thru	3.6	A	3.5	A
Northbound Left & Right	33.7	D	24.0	C
Selden Street at Craig Avenue	***9.9***	***B***	***7.1***	***A***
Eastbound Left, Thru & Right	3.1	A	3.0	A
Westbound Left, Thru & Right	0.5	A	0.5	A
Northbound Left, Thru & Right	22.7	C	18.1	C
Southbound Left, Thru & Right	30.6	D	18.6	C
Selden Street at Third Street	***10.1***	***B***	***8.1***	***A***
Westbound Left & Thru	6.9	A	7.2	A
Northbound Left & Right	14.5	B	12.8	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

Existing Deficiencies

We have used the Institute of Transportation Engineers standard that Level-of-Service D is the minimum acceptable Level-of-Service and that the criteria is applicable to the overall intersection rather than each controlled lane group. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better.

Using this standard, no deficiencies were identified at the study intersections. All intersections and controlled movements operate at Level-of-Service D, or better.

3. PROJECTED BASELINE TRAFFIC CONDITIONS

The purpose of this chapter is to discuss the assumptions and data used to estimate background traffic conditions. Background traffic conditions are defined as future traffic volumes without the proposed project.

Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This growth factor also considers traffic associated with minor, or small, projects for which no traffic data are available.

The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

Design Year for Traffic Forecasts

The design, or horizon, year of a project is the future year for which background traffic conditions are estimated. The design year is typically several years after completion of the study project. The year 2012 is used in this study to be compatible with the traffic studies for other major projects within and adjacent to the study area.

Background Traffic Growth

Typically, a background growth factor is applied to major traffic movements at the study intersection. This growth factor considers ambient background regional traffic growth. Since the study projects are within a closed area where outside growth would not affect the traffic projections at the study intersections, a background growth factor was not used.

Related Projects

Related projects are also know as “other known development projects.” These are projects within or adjacent to the study area that will generate traffic that will impact traffic conditions of the study intersections. No other projects were identified adjacent to the study projects that would be completed before 2012, the design year for these traffic projections.

There are other projects and development plans that will affect traffic projections beyond 2012.

2012 Background Traffic Projections

Since use of a background growth factor was not considered appropriate and no related projects were identified, existing peak hour traffic volumes were considered as background without project traffic volumes.

4. PROJECT-RELATED TRAFFIC CONDITIONS

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. This chapter presents the generation, distribution and assignment of project generated traffic and the background plus project traffic projections. The result of the level-of-service analysis of background plus project conditions is presented in the following chapter.

Trip Generation Methodology and Analysis

Typically, future traffic volumes generated by a proposed project are estimated using the procedures described in the *Trip Generation Handbook*[4] and data provided in *Trip Generation*[5]. This method uses trip generation rates or equations to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent streets.

For the proposed project, the standard references do not provide any trip generation data. The number of peak hour trips that would be generated by the GTF program into and out of MCBH were estimated using trip generation rates based on the existing traffic volumes into and out of MCBH. The peak hour trips generated by the various new and/or renovated facilities were estimated using rates of comparable land uses for the trip generation data as provided for in *Trip Generation*.

[4] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

[5] Institute of Transportation Engineers, *Trip Generation*, 7th Edition, Washington, D.C., 2003

Total Growth the Force Traffic

The number of trips that the GTF program will generate was estimated by calculating trip generation rates using the results of the traffic counts at the two gates and the number Marine personnel on MCBH at the time of the counts. The calculation of the trip generation rates is summarized in Table 8. Separate rates were calculated for each gate since it is assumed that the distribution of trips between the two gates will be the same for future conditions as for existing conditions.

Table 8 Trip Generation Rates Calculations

Period & Direction		H-3 Gate		Mokapu Gate		Totals	
		Trips Counted	Trips Per 1,000 Marines	Trips Counted	Trips Per 1,000 Marines	Trips Counted	Trips Per 1,000 Marines
AM Peak Hour	Inbound	1,035	64.107	356	22.050	1,391	86.157
	Outbound	291	18.024	236	14.618	527	32.642
	Total	1,326	82.131	592	36.668	1,918	118.799
PM Peak Hour	Inbound	347	21.493	268	16.600	615	38.093
	Outbound	1,040	64.416	413	25.581	1,453	89.997
	Total	1,387	85.909	681	42.181	2,068	128.090

Note:
1. Calculations are based on 16,145 persons which is the estimated number of persons on MCBH at the time of the traffic surveys. This number includes non-deployed military (Navy plus Marines), civilians and on-base dependents.

Based on personnel information provided, the morning and afternoon peak hour volumes of traffic entering and exiting MCBH were estimated by applying the rates calculated above to the estimated number of Marines at MCBH without the project, referred to "Baseline" conditions, and with the project, referred to as "Baseline + GTF." The information provided is summarized as follows:

1. The total estimated population of MCBH is 20,592 for Baseline conditions.

2. The total estimated population of MCBH at the time of the traffic counts (March 2010) is 16,145.

3. The total estimated population of MCBH is 21,562 for Baseline + GTF conditions.

Using the data summarized above, the number of trips generated by the GTF program was estimated for the number of personnel upon completion of the GTF program and for the baseline conditions. The resulting traffic generation calculations are summarized in Table 9. As shown in the table, the proposed action would generate 83 inbound trips and 32 outbound trips during the morning peak hour. During the afternoon peak hour the proposed action would generate 36 inbound trips and 88 outbound trips.

The Institute of Transportation Engineers recommends that a traffic impact study should be performed if, in lieu of another locally preferred criterion, development generates an additional 100 vehicle trips in the peak direction (inbound or outbound) during the site's peak hour.[6] Based on the criterion, a traffic impact study is not warranted.

[6] Institute of Transportation, *Traffic Access and Impact Studies for Site Development*, 2006, page 5.

Table 9 Trip Generation Calculations

Time Period & Direction	H-3 Gate				Mokapu Gate				Totals			
	Trips per 1000 Marines	Trips			Trips per 1000 Marines	Trips			Trips per 1000 Marines	Trips		
		Baseline 20592	Baseline Plus GTF 21562	GTF 970		Baseline 20592	Baseline Plus GTF 21562	GTF 970		Baseline	Baseline Plus GTF	GTF
AM In	64.107	1320	1382	62	22.050	454	475	21	86.157	1774	1857	83
AM Out	18.024	371	389	18	14.618	301	315	14	32.642	672	704	32
AM Total	82.131	1691	1771	80	36.668	755	790	35	118.799	2446	2561	115
PM In	21.493	443	463	20	16.600	342	358	16	38.093	785	821	36
PM Out	64.416	1326	1389	63	25.581	527	552	25	89.997	1853	1941	88
PM Total	85.909	1769	1852	83	42.181	869	910	41	128.090	2638	2762	124

P-778 Armory Addition and Renovation

The project is the renovation of existing facilities and the addition of additional space for storage and maintenance of arms. Storage spaces do not typically generate traffic. Therefore, any traffic generated by this project would be minimal or during off-peak hours.

P-842 Consolidated Aid Station and Rehab Clinic

This project consists of the consolidation and upgrade of existing facilities. Peak hour trip generation estimates are typically based on the number of doctors or beds in the facility. It is understood that there will be no increase in the number of doctors or beds at this facility. Therefore, there should be no increase in the amount of peak hour traffic into or out of this facility. Any peak hour traffic would be minimal.

P-847 Artillery Battery Complex and Command Post

This project consist of two components. The first is the replacement of existing temporary facilities along Mokapu Road. This site may be occupied by 80 to 125 persons. It was assumed that these persons would have arrival and departure patterns comparable to employees of a typical office building. The patterns may not have the same hours as an office building, but it was assumed that these trips would coincide with the peak hour of the adjacent street (Mokapu Road) and would therefore represent a worst case condition.

The trip generation estimates for the Artillery Battery Complex are summarized in Table 10. The trip generation estimates are based on the maximum estimated population (125 persons) on the site. As shown, the Artillery Battery Complex would generate 53 inbound and 7 outbound trips during the morning peak hour. During the afternoon peak hour, the complex would generate 10 inbound trips and 48 outbound trips.

Table 10 Trip Generation Analysis Artillery Battery Complex

Period & Direction		General Office Buildings (LU Code 710)		
		Trips per Unit or Percent	Personnel	Trips
AM Peak Hour	Total	0.48	125	60
	Inbound	88%		53
	Outbound	12%		7
PM Peak Hour	Total	0.46		58
	Inbound	17%		10
	Outbound	83%		48

The trip generation estimates for the Artillery Battery Command Post are summarized in Table 11. The trip generation estimates are based on the estimated number of personnel that would work in the building, which is 20 persons, based on the preliminary office floor plan. As shown, the Artillery Battery Command Post would generate 10 trips during the morning peak hour and 9 trips during the afternoon peak hour.

Table 11 Trip Generation Analysis Artillery Command Post

Period & Direction		General Office Buildings (LU Code 710)		
		Trips per Unit or Percent	Personnel	Trips
AM Peak Hour	Total	0.48	20	10
	Inbound	88%		9
	Outbound	12%		1
PM Peak Hour	Total	0.46		9
	Inbound	17%		2
	Outbound	83%		7

P-852 3rd Radio Battalion Complex

This project would be located along the east side of Harris Avenue south of Selden Street. The proposed action consists of the relocation of 26 persons from a location near the airfield and construction of a 9,500 square foot building that would be used for the Battalion Headquarters, offices, storage, showers and restrooms.

The trip generation calculations are shown as Table 12.

Table 12 Trip Generation Analysis 3rd Radio Battalion Complex

Period & Direction		Relocated Personnel General Office Buildings (LU Code 710) Trips per Unit or Percent	Personnel	Trips	Relocated Personnel General Office Buildings (LU Code 710) Trips per Unit or Percent	1,000 Square Feet	Trips	Total Trips
AM Peak Hour	Total	0.48	26	12	1.55	9.500	15	27
	Inbound	88%		11	88%		13	24
	Outbound	12%		1	12%		2	3
PM Peak Hour	Total	0.46		12	1.49		14	26
	Inbound	17%		2	17%		2	4
	Outbound	83%		10	83%		12	22

P-858 Multi-Story BEQ's and Command Headquarters

The proposed BEQs and Command HQ would be located along the west side of Harris Avenue south of Mokapu Road. The trips generated by the BEQs was estimated using trip generation rates for apartments, which is the most comparable land use for which trip generation data is available. These rates have been used in previous traffic studies to estimate trips for university and college dormitories, which are comparable to the description of the proposed BEQs. The trip generation calculations are summarized in Table 13.

Table 13 Trip Generation Analysis BEQ's

Period & Direction		Apartments (LU Code 220) Trips per Unit or Percent	Apartments or Units	Trips
AM Peak Hour	Total	0.51	214	109
	Inbound	20%		22
	Outbound	80%		87
PM Peak Hour	Total	0.62		133
	Inbound	65%		86
	Outbound	35%		47

P-885 Marine Wing Support Services (MWSS) Headquarters

The current occupants of this building would be relocated, the building renovated and expanded and then occupied by the MWSS HQ. It us understood that the building is currently occupied by the 3rd Radio Battalion (26 persons) and the CLB (30 persons). The new MWSS would consist of 219 persons. Therefore, when completed there would be an increase of 219 - 56 , or 163 additional persons on the site. However, the trip generation analysis is based on 219 persons in order to properly assess the traffic entering and exiting the site. The trip generation analysis is summarized in Table 14.

Table 14 Trip Generation Analysis MWSS

Period & Direction		General Office Buildings (LU Code 710)		
		Trips per Unit or Percent	Personnel	Trips
AM Peak Hour	Total	0.48	219	105
	Inbound	88%		92
	Outbound	12%		13
PM Peak Hour	Total	0.46		101
	Inbound	17%		17
	Outbound	83%		84

To make room for the MWSS, the 30 persons that comprise CLB-3 Comm Shop would be relocated to a new site along the east side to 3rd Street off Selden Street. The number of peak hour trips that would be generated to and from this new CLB site is summarized in Table 15. The CLB-3 facility to be located along the south side of Selden Street west of Harris Avenue would be used mostly for storage and therefore would not generate traffic.

Table 15 Trip Generation Analysis New CLB-3 Comm Shop

Period & Direction		General Office Buildings (LU Code 710)		
		Trips per Unit or Percent	Personnel	Trips
AM Peak Hour	Total	0.48	30	14
	Inbound	88%		12
	Outbound	12%		2
PM Peak Hour	Total	0.46		14
	Inbound	17%		2
	Outbound	83%		12

2012 Background Plus Project Projections

The overall growth of traffic using the two gates (H-3 and Mokapu) was distributed based on the existing distribution of traffic and was presented earlier in this chapter.

Project generated traffic was distributed based on available approach and departure routes and observed traffic approach and departure patterns for existing buildings in the vicinity of the projects. The project trip assignments of the six development projects are shown on Figures 4 and 5.

Background plus project traffic conditions are defined as 2012 background traffic conditions plus project related traffic. The incremental difference between background and background plus project is the traffic impact of the project under study.

2012 background plus project traffic projections were estimated by superimposing the peak hour traffic generated by the proposed project on the 2012 background peak hour traffic volumes presented in Chapter 3. The 2012 background plus the project traffic projections are shown on Figures 6 and 7.

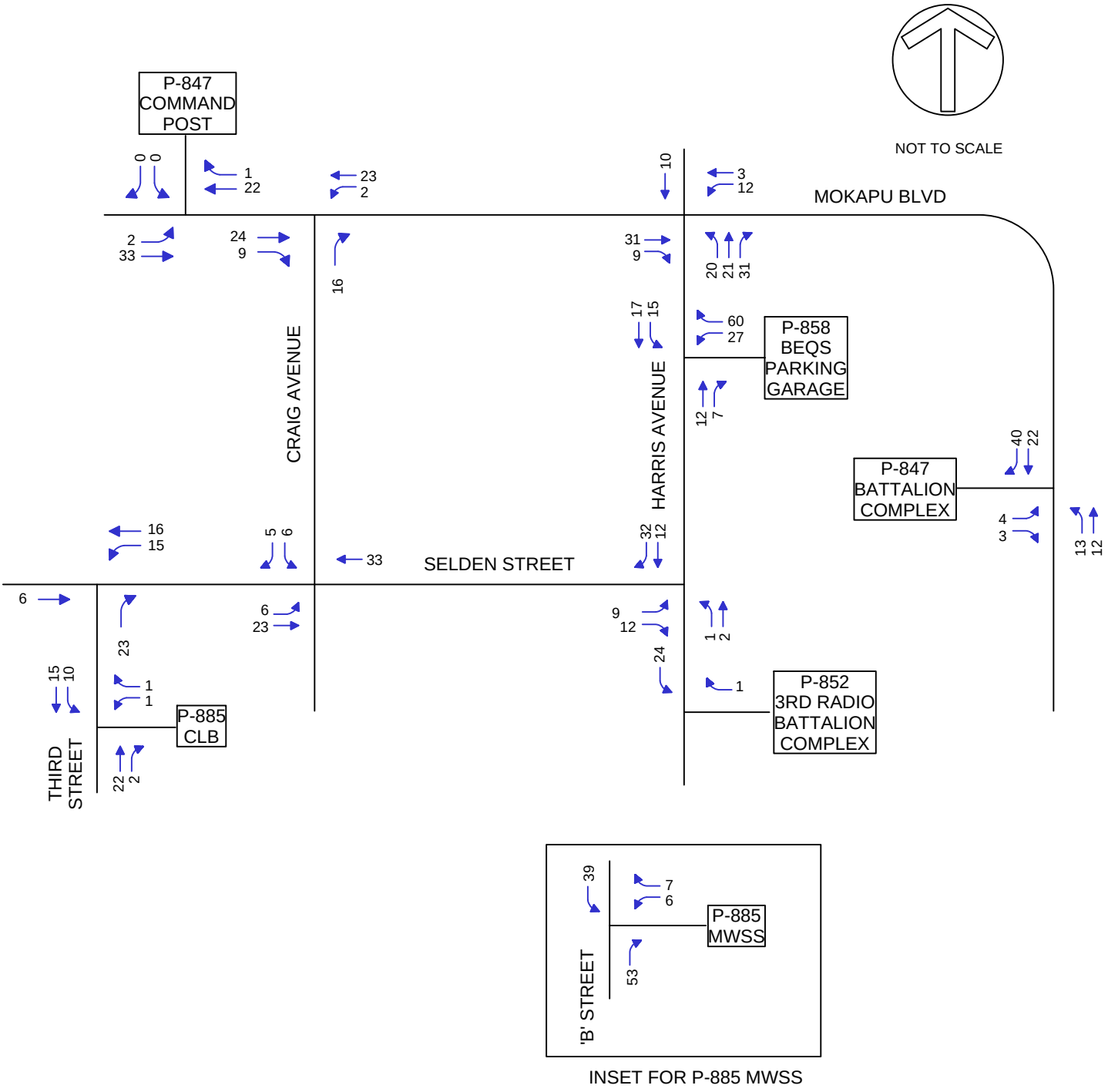

Figure 4
PROJECT TRIP ASSIGNMENTS - AM PEAK HOUR

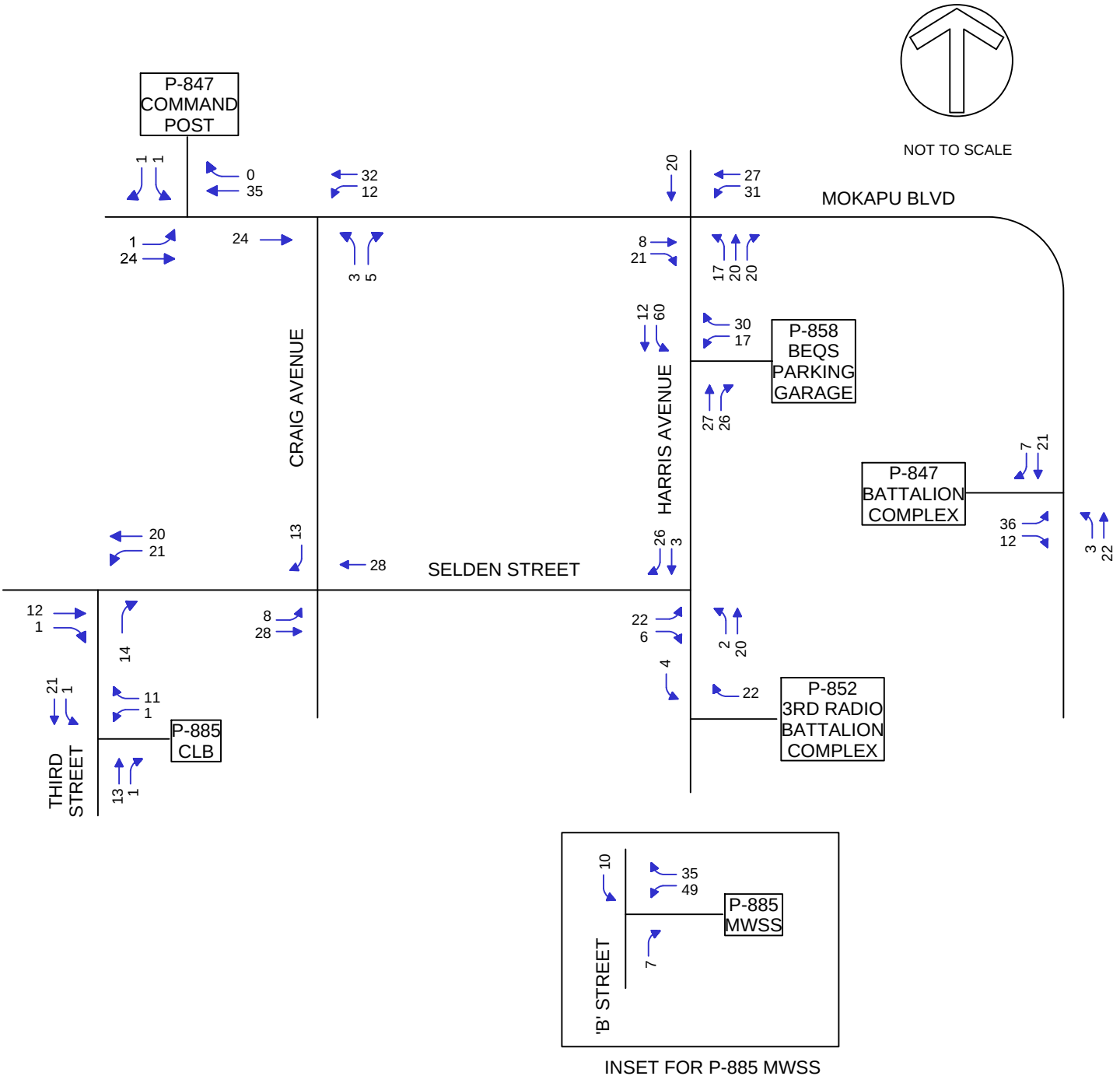

Figure 5
PROJECT TRIP ASSIGNMENTS - PM PEAK HOUR

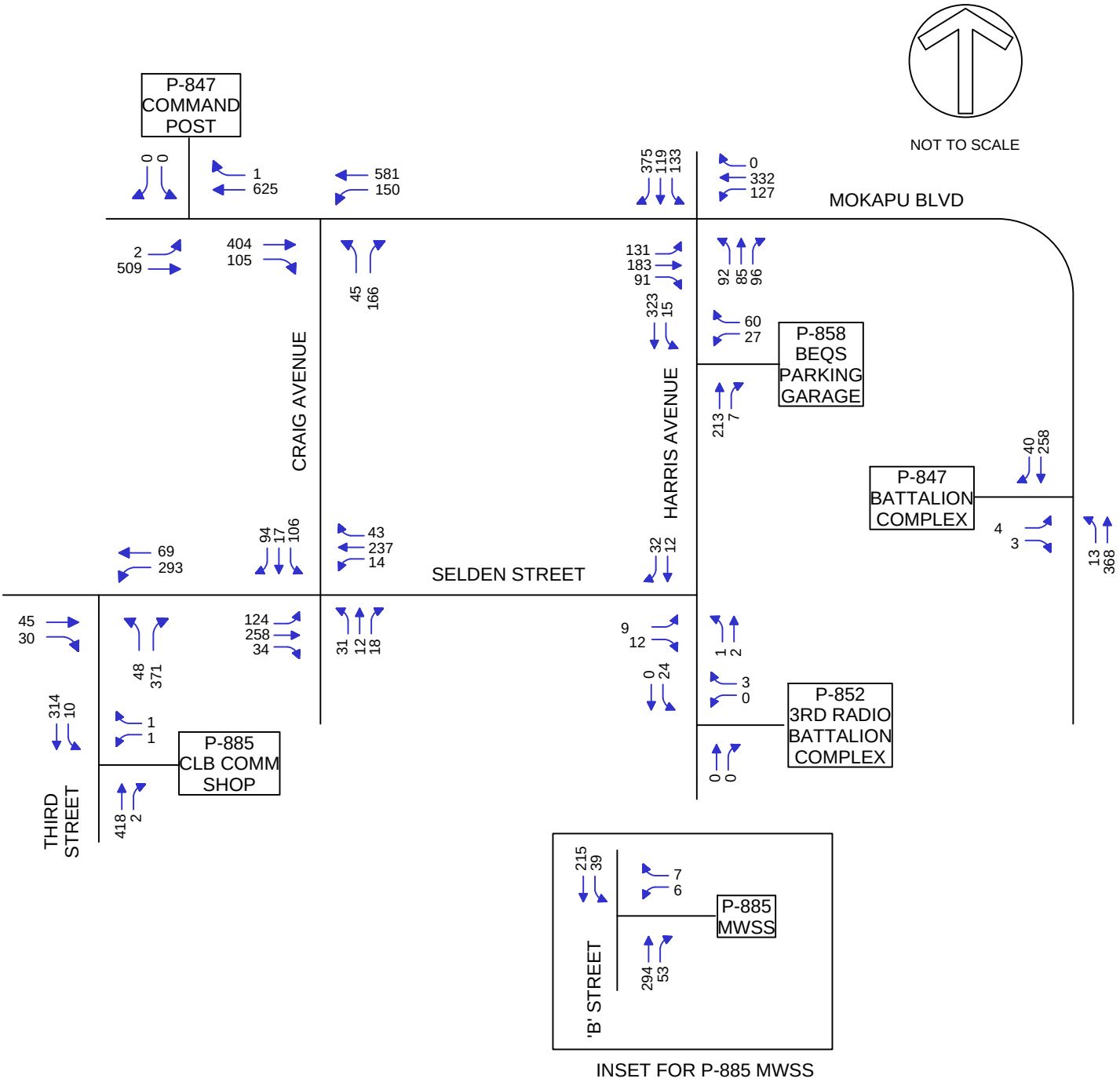

Figure 6
BACKGROUND PLUS PROJECT AM PEAK HOUR TRAFFIC PROJECTIONS

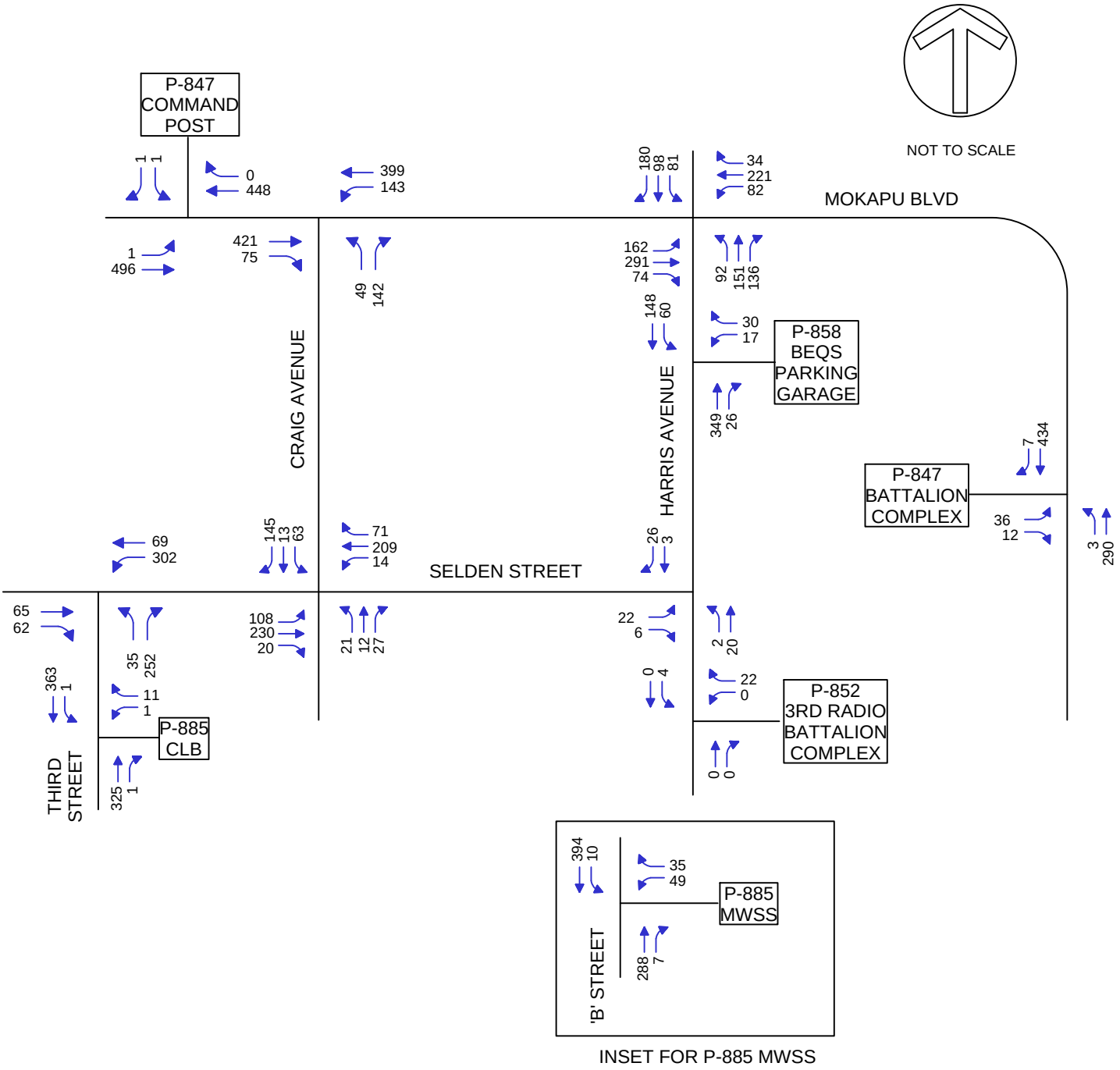

Figure 7
BACKGROUND PLUS PROJECT PM PEAK HOUR TRAFFIC PROJECTIONS

5. TRAFFIC IMPACT ANALYSIS

The impact of the project was assessed by analyzing the changes in level-of-service at the study intersections. This chapter presents the levels-of-service without and with project generated traffic.

The traffic impacts of the project were assessed by quantifying changes in the level-of-service from baseline conditions to baseline plus GTF conditions along H-3 and along Mokapu Boulevard. The results of the level-of-service analysis for H-3 are summarized in Table 16. During the morning peak hour, the northbound (inbound) direction would operate at Level-of-Service B and the southbound (outbound) direction would operate at Level-of-Service A. During the afternoon peak hour the northbound (inbound) direction would operate at Level-of-Service A and the southbound (outbound) direction would operate at Level-of-Service B. Level-of-Service B is considered a high level-of-service. There are no changes in the levels-of-service as a result of additional traffic generate by the GFT action.

Table 16 Results of Level-of-Service Analysis for H-3

Time Period & Direction	Baseline Conditions		Baseline Plus GTF Conditions		Changes	
	pc/mi/lane	Level-of-Service	pc/mi/lane	Level-of-Service	pc/mi/lane	Level-of-Service
AM Northbound (Inbound)	14.3	B	15.0	B	0.7	No Change
AM Southbound (Outbound)	4.5	A	4.7	A	0.2	No Change
PM Northbound (Inbound)	4.6	A	4.8	A	0.2	No Change
PM Southbound (Outbound)	13.5	B	14.2	B	0.7	No Change

Notes:
(1) pc/mi/lane = passenger cars per mile per lane
(2) GTF = Grow the Force

The results of the level-of-service for Mokapu Boulevard are summarized in Table 17. During the morning peak hour, the northbound (inbound) direction would operate at Level-of-Service C and the southbound (outbound) direction would operate at Level-of-Service C, without and with GTF traffic. During the afternoon peak hour, the northbound (inbound) direction would operate at Level-of-Service C, without and with GTF traffic, and the southbound (outbound) direction would operate at Level-of-Service D without and with GTF traffic. There are no changes in the levels-of-service as a result of traffic generated by the GTF action.

Table 17 Results of Level-of-Service Analysis for Mokapu Boulevard

Time Period & Direction	Baseline Conditions			Baseline Plus GTF Conditions		
	%	V/C	Level-of-Service	%	V/C	Level-of-Service
AM Northbound (Inbound)	58.0	0.33	C	59.6	0.35	C
AM Southbound (Outbound)	61.7	0.30	C	63.3	0.31	C
PM Northbound (Inbound)	55.6	0.25	C	57.4	0.26	C
PM Southbound (Outbound)	74.1	0.51	D	75.4	0.54	D

Notes:
(1) V/C = Volume-to-Capacity Ratio
(2) % = Percent of Time Following
(3) GTF = Grow the Force

The results of the Level-of-Service analysis are summarized in Table 18. Shown are level-of-service delays and levels-of-service of controlled lane groups. As shown, all controlled lane groups would operate at Level-of-Service D or better, except the northbound left and right turn lane group along Craig Avenue at Mokapu Boulevard, and the northbound approach of Craig Avenue at Selden Street. These lane groups would operate at Level-of-Service E during the morning peak hour. Based on the delay, this approach would operate at Level-of-Service E for a short period, which is acceptable using the standard described in Chapter 2.

Table 18 2012 Levels-of-Service of Study Intersections

	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
Intersection and Movement	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS
Mokapu Boulevard at Harris Avenue	***21.6***	***C***	***26.4***	***C***	***14.8***	***B***	***17.4***	***B***
Eastbound Left, Thru & Right	14.4	B	15.7	B	20.2	C	24.1	C
Westbound Left, Thru & Right	16.6	B	18.7	B	8.8	A	9.7	A
Northbound Left, Thru & Right	10.5	B	14.2	B	13.4	B	17.4	B
Southbound Left, Thru & Right	33.1	C	44.4	D	13.0	B	14.9	B
Selden Street at Harris Avenue	***0.0***	***A***	***2.8***	***A***	***0.0***	***A***	***3.3***	***A***
Eastbound Left & Right	0.0	A	8.6	A	0.0	A	8.8	A
Northbound Left & Thru	0.0	A	2.4	A	0.0	A	0.7	A
Mokapu Boulevard at Craig Avenue	***6.6***	***A***	***7.8***	***A***	***5.3***	***A***	***6.2***	***A***
Westbound Left & Thru	3.6	A	3.8	A	3.5	A	3.8	A
Northbound Left & Right	33.7	D	**40.8**	**E**	24.0	C	29.4	D
Selden Street at Craig Avenue	***9.9***	***B***	***12.4***	***B***	***7.1***	***A***	***7.8***	***A***
Eastbound Left, Thru & Right	3.1	A	3.2	A	3.0	A	3.1	A
Westbound Left, Thru & Right	0.5	A	0.5	A	0.5	A	0.5	A
Northbound Left, Thru & Right	22.7	C	26.2	D	18.1	C	20.7	C
Southbound Left, Thru & Right	30.6	D	**42.2**	**E**	18.6	C	21.5	C
Selden Street at Third Street	***10.1***	***B***	***10.7***	***B***	***8.1***	***A***	***8.4***	***A***
Westbound Left & Thru	6.9	A	6.8	A	7.2	A	7.1	A
Northbound Left & Right	14.5	B	15.9	C	12.8	B	13.8	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

The results of the level-of-service of the project driveways is summarized in Table 19. For the level-of-service analysis, it was assumed that there are no separate lanes for left turns into the projects and that the driveways are one lane inbound and one lane outbound. Therefore, a worse case condition was assessed. As shown, all movements would operate at Level-of-Service C, or better. Therefore, no mitigation is required.

Table 19 2012 Levels-of-Service of Driveways

	AM Peak Hour		PM Peak Hour	
Intersection and Movement	Delay [1]	LOS [2]	Delay	LOS
Mokapu Boulevard at P-847 Battalion Complex	***0.3***	***A***	***1.0***	***A***
Eastbound Left & Right	12.6	B	15.5	C
Northbound Left & Thru	0.4	A	0.1	A
Harris Avenue at P-858 BEQ Parking Garage	***1.8***	***A***	***1.9***	***A***
Westbound Left & Right	11.6	B	12.6	B
Southbound Left & Thru	0.5	A	2.8	A
Harris Avenue at P-852	***7.1***	***A***	***8.2***	***A***
Westbound Left & Right	8.3	A	8.4	A
Southbound Left & Thru	7.3	A	7.2	A
Mokapu Avenue at P-847 Command Post	***0.0***	***A***	***0.0***	***A***
Eastbound Left & Thru	0.1	A	0.0	A
Southbound Left & Right	0.0	A	15.1	C
'B' Street at P-885 MWSS	***0.9***	***A***	***1.7***	***A***
Westbound Left & Thru	12.0	B	14.7	A
Southbound Left & Thru	1.5	A	0.3	A
3rd Street at P-885 CLB Comm Shop	***0.2***	***A***	***0.2***	***A***
Westbound Left & Right	13.3	B	10.7	B
Southbound Left & Thru	0.4	A	0.0	A

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

Mitigation Measures

Based on the results of the level-of-service analysis, all controlled lane groups at the study intersections and the future driveways would operate at Level-of-Service D or better, except the northbound left and right turn lane group along Craig Avenue at Mokapu Boulevard, and the northbound approach of Craig Avenue at Selden Street. These lane groups would operate at Level-of-Service E during the morning peak hour. Based on the delay, this approach would operate at Level-of-Service E for a short period, which is acceptable using the standard described in Chapter 2. Accordingly, no additional mitigation is required or recommended.

Appendix F
Preliminary Storm Water Runoff Calculations

The storm water (drainage) hydrologic calculations were made using the "Rational" method, Q=CIA, where:

Q = Flow rate in cubic per second (cfs)
C = Runoff coefficient:
  Existing soil/yard C = 0.2
  Roof/pavements C = 0.8
I = Rainfall intensity in inches per hour for a duration equal to the time of concentration.*
  1-Hour Rainfall for T_m-10 yr = 2.0 inches, and
  Assumed Time of Concentration (Tc) is 15minutes
  With the assumed Tc, the correction factor = 2; therefore, I = 4.0 inches/hour
A = Drainage area in acres

* Rainfall intensity was derived using the guidelines in the City & County of Honolulu's *Rules Relating to Storm Drainage Standards* (January 2000).

Summary

	Site	Area (acres)	Existing Flow "Q" (cfs)	Proposed Flow "Q"(cfs)	Change in Flow (cfs)
P-778	Armory Expansion	0.40	0.32	1.27	0.95
P-842	Consolidated Aid Station	1.22	3.92	2.98	-0.94
P-847	Artillery Battery Complex	2.98	2.38	9.52	7.14
	Company Command Post	0.37	0.30	1.19	0.89
P-822	3d Radio Battalion	1.30	1.93	4.16	2.23
P-858	new BEQs	2.05	3.79	6.57	2.78
P-885	Existing MWSS	1.34	1.07	4.29	3.22
	3d Radio Motor pool	2.06	1.65	6.61	4.96
	CLB-3 facilities	0.61	0.49	1.95	1.46
	Total	**12.33**	**15.85**	**38.54**	**22.69**

Existing Drainage

Site	Area (acres)	Runoff Coefficient	Character of Ground	Flow "Q" (cfs)
Armory Expansion	0.40	0.2	grassed	0.32
Total	**0.40**			**0.32**
Consolidated Aid Station	1.22	0.8	paved	3.92
Total	**1.22**			**3.92**
Artillery Battery Complex	2.98	0.2	grassed	2.38
Total	**2.98**			**2.38**
Company Command Post	0.37	0.2	grassed	0.30
Total	**3.35**			**2.68**
BEQs	0.90	0.8	paved	2.87
	1.15	0.2	grassed	0.92
Total	**2.05**			**3.79**
3d Radio Battalion	0.37	0.8	paved	1.19
	0.93	0.2	grassed	0.74
Total	**1.30**			**1.93**
Relocated 3d Radio Motor Pool	2.06	0.2	grassed	1.65
Total	**2.06**			**1.65**
CLB-3	0.61	0.2	grassed	0.49
Total	**0.61**			**0.49**
MWSS	1.34	0.2	grassed	1.07
Total	**1.34**			**1.07**

Proposed Drainage

Site	Area (acres)	Runoff Coefficient	Character of Ground	Flow "Q" (cfs)
Armory Expansion	0.40	0.8	paved	1.27
Total	**0.40**			**1.27**
Consolidated Aid Station	0.83	0.8	paved	2.66
	0.39	0.2	grassed	0.31
Total	**1.22**			**2.98**
Artillery Battery Complex	2.98	0.8	paved	9.52
Total	**2.98**			**9.52**
Company Command Post	0.37	0.8	paved	1.19
Total	**0.37**			**1.19**
BEQs	2.05	0.8	paved	6.57
Total	**2.05**			**6.57**
3d Radio Battalion	1.30	0.8	paved	4.16
Total	**1.30**			**4.16**
Relocated 3d Radio Motor Pool	2.06	0.2	paved	6.61
Total	**2.06**			**6.61**
CLB-3	0.61	0.8	paved	1.95
Total	**0.61**			**1.95**
MWSS	1.34	0.8	paved	4.29
Total	**1.34**			**4.29**