Draft Environmental Assessment for Runway 8-26 Reconstruction

Volume 2: Appendices

Rafael Hernandez Airport, Puerto Rico

July 2020

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APPENDIX A

Runway Length Tables

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Table 2-4 Key Aircraft Performance Characteristics for Runway Length Requirements Analysis

Airline	Aircraft Type/Weight	Manufacturer	Engines	MTOW (lbs)	Max Zero Fuel Weight (lbs)	Operating Empty Weight (lbs)	Max Payload (lbs)	Usable Fuel (lbs) *(no auxiliary tanks)*[1]	Destination		
									City	Airport ID (IATA)	Distance (nm)
United Airlines	B-737/900 ER	Boeing	CFM56-27	164,000		98,495	39,308	46,063	Newark, NJ (EWR)	EWR	1377
	B-737/900 ER w/winglets	Boeing	CFM56-28	187,700		98,495	50,805	46,063		EWR	1377
	B-737/800 w/winglets	Boeing	CFM56-7-B26	174,200		91,300	47,000	46,063		EWR	1377
Jet Blue Airways	A-320 169,000 lbs	Airbus	IAE V2527-A5	169,756	133,380	93,380	40,000	37,303	New York, NY (JFK)	JFK	1369
	EMB 190 114,200 lbs	Embraer	GE CF-34-10E	114,199	90,169	61,509	28,660	28,660		JFK	1369
	A-321-200	Airbus	IAE-V2533-AE	196,211	162,701	112,201	50,500	33,510		JFK	1369
Spirit Airlines	A-319-100 166,425 lbs[2]	Airbus	IAE-V2524-A5	166,449	125,663	87,663	38,000	40,786	Fort Laudardale, FL (FLL)	FLL	854
	A-320-232	Airbus	IAE-V2527-A5	169,756	133,380	93,380	40,000	37,258		FLL	854
	A321-231	Airbus	IAE-V2533-A7	196,211	162,701	112,201	50,500	33,510		FLL	854
	A320 NEO	Airbus	PW 1127G	169,756	138,450	97,950	40,500	32,188		FLL	854
Federal Express	DC-10/10 440,000 lbs	Mc Donnell/Douglas	CF-6	440,000	335,000	215,444	119,556	145,810	Indianapolis, IN (IND)	IND	1613
	MD-11 (freighter)	Mc Donnell/Douglas	CF-6	602,500	451,300	248,567	202,733	258,721	Memphis, TN (MEM)	MEM	1569
	B-767-300F	Boeing	CF-6-80C2B4	413,000		188,000	121,000	161,740		MEM	1569
	B-767-300F	Boeing	CF-6-80C2B75	413,000		188,000	121,000	161,740		MEM	1569
Lufthansa Cargo	MD-11/ 630,515[3]	Mc Donnell/Douglas	CF-6-80C2	602,500	451,300	248,567	202,733	258,721	Frankfurt, Germany (FRA)	FRA	4016
Martin Air Holland	MD-11/ 630,515[3]	Mc Donnell/Douglas	CF-6-80C3	602,500	451,300	248,567	202,733	258,721	Amsterdam, Netherlands (AMS)	AMS	3874
Cargo Lux	B-747/400F 875,000 lbs	Boeing	CF6-80C2B1	875,000		363,954	271,046	382,336	Maastricht Aachen, Netherlands (MST	MST	3909
	B-747/800F	Boeing	Genx 2B67	987,000		434,600	292,400	400,218	Luxenburg (LUX)	LUX	3925

Source: Boeing Airplane Characteristics for Airport Planning http://www.boeing.com/commercial/airports/plan_manuals.page
Embraer Airport Planning Manual http://www.embraercommercialaviation.com/AMPS/APM_190.pdf
Airbus Aircraft Characteristics http://www.airbus.com/support/maintenance-engineering/technical-data/aircraft-characteristics/
Trip Distance - Great Circle Mapper http://www.gcmap.com/

Note 1: Boeing and MD-11 fuel requirements calculated from provided charts. Airbus, DC-10 and Embraer fuel requirement was estimated as the ratio of trip distance to total range applied to maximum fuel load.

Note 2: Performance charts in APM for A319 indicate same runway takeoff lengths for ISA and ISA+590 conditions.

Note 3: 630k MTOW provided for Lufthansa and Martin MD-11 correspond with "Passenger ER" model in manufacturer APM. Assume these are actually "freighter" models per the carrier website. 602k MTOW used.

Table 2-5 Runway Length Requirements Results Analysis

Airline	Aircraft Type/Weight	F.A.R. Takeoff Runway Length (Feet) - Dry				Load Factor						F.A.R. Landing Length (w/highest flap setting& adjusted 440' for runway gradient)			Reported Airline Runway Length Requirement (Feet)[3]
		70% LF	80% LF	90% LF	100% LF	7000	9000'	9500'	10000'	10500'	11000'	MLW (lbs)	Dry (ft)	Wet (ft)	
United Airlines	B-737/900 ER	6,500	6,950	7,400	7,950	88%	100%	100%	100%	100%	100%	157,300	6,040	6,840	9,300
	B-737/900 ER w/winglets	7,450	8,050	9,050	10,500	68%	90%	96%	98%	100%	100%	157,300	6,040	6,840	
	B-737/800 w/winglets	6,350	6,950	7,600	8,000	89%	100%	100%	100%	100%	100%	146,300	6,240	7,140	9,300
Jet Blue Airways	A-320 169,000 lbs	4,300	4,550	4,950	5,250	100%	100%	100%	100%	100%	100%	142,198	5,240	6,026	5,200
	EMB 190 114,200 lbs	4,450	4,900	5,350	5,650	100%	100%	100%	100%	100%	100%	97,003	4,540	5,221	5,200
	A-321-200	4,850	5,150	5,400	5,750	100%	100%	100%	100%	100%	100%	171,520	6,140	7,061	5,200
Spirit Airlines	A-319-100 166,425 lbs[1]	4,000	4,000	4,200	4,400	100%	100%	100%	100%	100%	100%	134,482	4,940	5,681	
	A-320-232	4,100	4,350	4,550	4,700	100%	100%	100%	100%	100%	100%	142,198	5,240	6,026	
	A321-231	4,550	4,850	4,950	5,450	100%	100%	100%	100%	100%	100%	171,520	6,140	7,061	
	A320 NEO	4,150	4,500	4,700	4,950	100%	100%	100%	100%	100%	100%	146,166	5,340	6,141	
Federal Express	DC-10/10 440,000 lbs	6,000	6,400	6,800	7,400	94%	100%	100%	100%	100%	100%	363,500	6,240	7,176	8,500
	MD-11 (freighter)	7,300	7,500	8,100	8,500	min=7200'	100%	100%	100%	100%	100%	471,500	7,940	9,040	8,500
	B-767-300F	5,900	6,450	7,200	7,800	88%	100%	100%	100%	100%	100%	326,000	6,890	6,140	8,500
	B-767-300F	5,500	5,800	6,400	6,800	100%	100%	100%	100%	100%	100%	326,000	6,890	6,140	8,500
Lufthansa Cargo	MD-11/ 630,515[2]	9,800	10,800	Load Restricted	Load Restricted	min=7200'	64%	69%	76%	79%	82%	471,500	7,940	9,040	11,000
Martin Air Holland	MD-11/ 630,515[2]	9,300	10,500	11,600	Load Restricted	min=7200'	67%	74%	79%	81%	84%	471,500	7,940	9,040	
Cargo Lux	B-747/400F 875,000 lbs	9,000	10,000	11,150	11,750	49%	70%	77%	80%	85%	89%	666,000	7,240	8,240	10,500
	B-747/800F	8,550	9,450	10,250	11,200	51%	76%	83%	87%	94%	98%	763,000	7,840	8,940	10,500

Source: Boeing Airplane Characteristics for Airport Planning http://www.boeing.com/commercial/airports/plan_manuals.page
Embraer Airport Planning Manual http://www.embraercommercialaviation.com/AMPS/APM_190.pdf
Airbus Aircraft Characteristics http://www.airbus.com/support/maintenance-engineering/technical-data/aircraft-characteristics/
Trip Distance - Great Circle Mapper http://www.gcmap.com/

Note 1: Performance charts in APM for A319 indicate same runway takeoff lengths for ISA and ISA+590 conditions.

Note 2: 630k MTOW provided for Lufthansa and Martin MD-11 correspond with "Passenger ER" model in manufacturer APM. Assume these are actually "freighter" models per the carrier website. 602k MTOW used.

Note 3: Information provided by aircrfat operator

APPENDIX B

Biological Resources

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FLORA AND FAUNA SURVEY
FOR
RAFAEL HERNÁNDEZ AIRPORT
RECONSTRUCTION
AGUADILLA, PUERTO RICO

JUNE-2018

Prepared for:

URS Caribe, LLP
954 Ponce de León Ave. Suite 304,
San Juan, Puerto Rico 00907

Prepared by:

PO Box 8972
San Juan PR 00910-0972
(787) 748-5435-voice
(787) 748-5390-fax

Participants:
Alejandro Cubiñá, M.S.

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Location and Proposed Work

The Rafael Hernández International Airport (BQN), formerly known as the Borinquen Army Airfield, is located in the northwestern tip of Puerto Rico within the town of Aguadilla. Main access from the east is thru road 110, and Borinquen Avenue from the west. The airport covers an area of approximately 1,600 acres. The airport currently handles civilian passenger and cargo operations. In addition, a unit of to the U.S. Coast Guard (U.S.C.G. Air Station Borinquen) and the U.S. Customs and Border Protection are stationed in the airport and adjacent areas.

Runway 8-26 is 11,700 feet long by 200 feet wide with 50-foot shoulders, and is serviced by two partial parallel taxiways. The Puerto Rico Ports Authority (PRPA) has proposed improvements to the runway in order to improve operations in the airport. Most of the work proposed will be south of the existing runway as shown in the five alternatives included in Appendix 1.

Climate

The study site is located within the subtropical moist forest life zone (Ewel & Whitmore 1973), characterized by a mean annual rainfall of 1100 mm to 2200 mm and a mean temperature ranging from 18 to 24^{o} c. The subtropical moist forest life zone is the dominant life zone in the island, covering more than 58 % of the total land area.

Soils

According to the National Resource Conservation Service there are two mapping units in the study area (Appendix 2). These are NOTCOM AND BeB. NOTCOM comprises 99.7 % of the proposed new runway. Land south of the airport boundary is dominated by the Bejucos component thus, it is very likely that the mapped NOTCOM areas extend northward into the study area. Below is a description of the mapping units:

> **BeB – Bejucos sandy loam, 2 to 5 percent slopes** (The Bejucos component is on interior valleys on coastal plains. The parent material consists of coarse material over fine texture sediments. The natural drainage class is well drained. Water movement in the most restrivctive layer is moderately high.)
>
> **NOTCOM – No digital data available** (The NOTCOM is an area not mapped. This designation is used to identify spatial areas that have not been surveyed.

Methodology

Field work was conducted during the day on May 17, 2018 by Alejandro Cubiñá accompanied by Ivelisse Lorenzo from the PRPA. Prior to commencing field work, recent aerial photography, and available data bases for natural resources and protected species were reviewed. The proposed alternative runways were totally covered by foot, with the exception of the brushy-woody patch located in the southeastern end of the airport which was sampled on its periphery.

All plant species occurring within the surveyed areas were recorded. If any plant could not be identified in the field, a single specimen was collected for later identification at the

University of Puerto Rico Herbarium in Río Piedras. Nomenclature for flora follows Axelrod (2011).

The vertebrate fauna was determined by visual (with the aid of binoculars) and acoustic means. Rock and fallen branches were frequently turned to detect cryptic species. Any skeletal remains were identified. Nomenclature for the herpetofauna follows Schwartz and Henderson (1991) and Raffaele *et al*. (1998) for the avifauna.

The existing vegetative cover was characterized with special attention to wetlands and drainages. Any existing drainages and wetlands were delineated in the field. In addition, the vegetative communities on site were evaluated for the suitability of viable habitat for protected species. Finally, on June 11, 2018 Alejandro Cubiñá consulted with the Department of Natural and Environmental Resources' (DNER) Natural Heritage office in order to review their threatened and endangered species distribution maps.

Results

Flora – A total of 59 plant species were recorded during the field effort (see Table 1). No state or federally threatened and endangered species of plants were recorded. In addition, none of the flora found in the project area is listed as an "elemento crítico" by the DNER. The "elemento crítico" plant list is not included in the DNER's rules and regulations for threatened and endangered species. The list includes 596 plant species. However, it must be noted that the Puerto Rico palmetto (*Sabal causiarum*) is present within the airport and surrounding areas. *S. causiarum* is listed as an "elemento crítico"

Three distinct plant communities occur in the property. These are:

1 – Grass fields – The dominant cover type consists of various grass and weedy species. Representative species include hurricane grass (*Bothriocloa pertusa*), white moneywort (*Alysicarpus vaginalis*), and Guinea grass (*Megathyrus maximus*). These areas are regularly mowed either by PRPA or cut for hay by an outside party. Within the pastures, the white lead tree (*Leucaena leucocephala*), a shrub or small tree, has become established. However, new shoots are mowed every time these areas are mowed or harvested.

2 – Secondary forest patch – A small patch of secondary forest measuring about 2.5 acres is found towards the eastern end of the airport. This patch is dominated by shrubby vegetation and small trees. The terrain is slightly elevated and is characteristic of the limestone haystack hills found throughout northern Puerto Rico. The dominant tree species are gumbo limbo (*Bursera simaruba*), wattapama (*Poitea florida*), and yellow balsam (*Croton flavens*). Tree height doesn't exceed 25 feet.

3 – Building surroundings – This cover type is found outside the southern perimeter fence. It is characterized by vegetation growing in close proximity to the structures found outside the operations area. This area is mowed sporadically and contains scattered trees and patches of the white lead tree. Some of the tree species observed in this association are the rubber tree (*Ficus elastica*), coconut palms (*Cocos nucifera*), and tropical almond (*Terminalia catappa*).

Fauna – Fourteen birds, 5 reptiles, and 4 amphibian, were recorded in the study area (see Table 2). No state or federally threatened and endangered species of animals were recorded.

Drainages and Wetlands –According to the Wetland Inventory Map there is a potential riverine wetland area in the easternmost part of the project area (Appendix 3). Another potential wetland area is mapped on the other side of the airport over the taxiway in front of a hangar (Appendix 3). This is obviously a misrepresentation since the area is paved. During the field work six drainages were observed along the proposed site. These drainages are manmade ditches for storm water discharge. None of these drainages coincides with the riverine unit present in the NWI map.

The drainages are shallow, covered with herbaceous vegetation and some shrubs, and drain towards the north. From there, water is diverted outside the airport by an underground storm water drainage system. In a few areas some old culverts and broken concrete are present within the drainage path. Besides the drainages, no other potential wetland areas occur within the proposed alternatives.

All six ditches are shown in Appendix 4. No standing water was observed in any of the ditches. Given that the plant species growing within the drainages are not plants that

typically occur in wetlands and that the ditches do not drain wetlands, it is unlikely that these storm water management structures would be considered “waters of the U.S.”

Habitat for Protected Species – According to DNER’s Natural Heritage program data bank, there are no sightings or records of protected species of plants or animals in the study site. Protected species, like sea turtles nest along some of the beaches in Aguadilla, according to the DNER database. Furthermore, the U.S. Fish and Wildlife Service doesn’t have any critical habitat designated within the airport and vicinity. Finally, the Environmental Sensitivity Index Map included in Appendix 6 does not show valuable resources in the project area.

As mentioned earlier, pastures dominate the landscape at the proposed site. This vegetative cover does not attract that many native species, especially when these areas are mowed regularly. With a few exceptions, most threatened and endangered plant and animal species on the island occur or depend on wooded habitats. The forest patch found in the eastern end of the airport and the abandoned buildings south of the project site could offer suitable habitat for the Puerto Rican boa (*Chilabothrus inornatus*). However, during a yearlong wildlife survey for the preparation of the Wildlife Hazard Assessment for the airport, not a single individual of the protected boa was sighted. Moreover, interviews with airport personnel did not indicate the presence of the species.

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http://plants.usda.gov/

http://www.itis.usa.gov/

http://www.soils.usda.gov/

Table 1. Flora

Scientific name	Common name (E)	Common name (Sp.)	Family
Shrubs and Trees			
Albizia lebbeck (L.) Benth.	Woman's tongue	Lengua viperina	FAB.-MIMOSOIDEAE
Albizia procera (Roxb.) Benth.	Tall albizia	Albicia	FAB.-MIMOSOIDEAE
Bourreria virgata (Sw.) G. Don	Bodywood	Roble de guayo	BORAGINACEAE
Bursera simaruba (L.) Sarg.	Gumbo limbo	Almácigo	BURSERACEAE
Cestrum diurnum L.		Dama de día	SOLANACEAE
Citharexylum fruticosum (L.)	Florida fiddlewood	Péndula	VERBENACEAE
Clusia rosea Jacq.	Scotch attorney	Cupey	CLUSIACEAE
Cocos nucifera L.	Coconut palm	Palma de coco	ARECACEAE
Colubrina arborescens (Mill.) Sarg.	Greenheart	Abeyuelo	RHAMNACEAE
Comocladia glabra Spreng.		Carrasco	ANACARDIACEAE
Cordia collococca L.	Red manjack	Cerezo	BORAGINACEAE
Croton flavens L.	Yellow balsam	Adormidera	EUPHORBIACEAE
Erythroxylum brevipes DC.	Brisselet	Jibá	ERYTHROXYLACEAE
Ficus elastica Roxb ex Hornem.	Indiand rubberplant	Árbol de goma	MORACEAE
Lantana involucrata L.	Wild lantana	Cariaquillo Santa María	VERBENACEAE
Leucaena leucocephala (Lam.) de Wit	White lead tree	Tamarindillo	FAB.-MIMOSOIDEAE
Pithecellobium dulce (Roxb.) Benth.	Monkeypod	Guamá americano	FAB.-MIMOSOIDEAE
Poitea florida (Vahl) Lavin	Wattapama	Retama	FAB.-FABOIDEAE
Randia aculeata L.	Christmas tree	Tintillo	RUBIACEAE
Roystonea borinquena O.F. Cook	Royal palm	Palma real	ARECACEAE
Spathodea campanulata Beauv.	African tulip tree	Tulipán africano	BIGNONIACEAE
Terminalia catappa L.	Tropical almond	Almendro	COMBRETACEAE

Table 1. Flora (continued)

Scientific name	Common name (E)	Common name (Sp.)	Family
Herbaceous Plants			
Alysicarpus vaginalis (L.) DC.	White moneywort	Hierba de contrabando	FAB.-FABOIDEAE
Abylgaardia ovata (Burm. f.)			CYPERACEAE
Bidens alba (L.) DC.		Margarita	CASTERACEAE
Bothriochloa pertusa (L.) Camus	Hurricane grass	Hierba huracán	POACEAE
Commelina sp.			COMMELINACEAE
Cyanthillium cinereum (L.) H. Rob.	Little ironweed	Rabo de buey	COMPOSITAE
Cynodon nlemfuensis Vanderyst		Hierba de Estrella	POACEAE
Cyperus odoratus L.			CYPERACEAE
Desmodium adscendens (Sw) DC		Zarzabacoa galana	FAB.-PAPILIONOIDEAE
Digitaria ciliaris (Retz.) Koeler	Southern crabgrass	Pata de gallina	POACEAE
Eupatorium odoratum L.	Bitter bush	Santa María	COMPOSITAE
Euphorbia hirta L.	Pillpod sandmat	Lechecillo	EUPHORBIACEAE
Euphorbia hypericifolia	Graceful sandmat	Hierba niña	EUPHORBIACEAE
Fimbristylis sp.			CYPERACEAE
Hymenocallis caribae (L.) Herb.	White lily, spider lily	Lirio blanco	AMARYLLICACEAE
Macroptilium lathyroides (L.) Urban	Wild bush bean	Habichuela parada	LEG.-PAPILIONOIDEAE
Megathyrsus maximus (Jacq.) B.. Simon & S.W.L. Jacobs		Hierba de Guinea	POACEAE
Paspalum notatum Flügé	Bahia grass	Hierba bahía	POACEAE
Phyla nodiflora (L.) Greene		Hierba de sapo	VERBENACEAE
Sacoila lanceolata (Aubl.) Garay	Orchid	Orquídea	ORCHIDACEAE
Saccharum officinarum L.	Sugar cane	Caña de azucar	POACEAE
Setaria geniculata (Lam.) Beauv.	Yellow foxtail	Arrocillo	POACEAE
Sida sp.			MALVACEAE
Sphaegneticola trilobata (L.) Pruski in Acevedo-Rodríguez		Margarita del pasto	ASTERACEAE
Spermacoce ocymifolia Willd. Ex Roem. & Schult.		Poaya	RUBIACEAE
Spermacoce verticillata L.		Botón blanco	RUBIACEAE
Spigelia anthelmia L.		Lombricera	LOGANIACEAE
Sporobolus jacquemontii Kunth		Matojo de burro	POACEAE

Table 1. Flora (continued)

Scientific name	Common name (E)	Common name (Sp.)	Family
Herbaceous plants			
Stenotaphrum secundatum (Walt.) O. Kuntze	St. Augustine grass	Grama dulce	POACEAE
Tridax procumbens L.		Pancha	COMPOSITAE
Vines			
Centrosema sp.			
Cissus verticillata (L) Nicolson & C.E. Jarvis	Seasonvine	Bejuco de caro	VITACEAE
Ipomoea tiliacea (Willd.) Choisy *ex* DC.		Bejuco de puerco	CONVOLVULACEAE
Merremia dissecta (Jacq.) Hallier f.		Noyó	CONVOLVULACEAE
Merremia quinquefolia (L) Hallier f.		Batatilla blanca	CONVOLVULACEAE
Mikania sp.			COMPOSITAE
Stigmaphyllon floribundum (DC.) C.E. Anderson		Bejuco de toro	MALPIGHIACEAE

Table 2. Fauna

Scientific name	Common name (Eng.)	Common name (Sp.)	Family
Birds			
Ardea alba	Great Egret	Garza real	ARDEIDAE
Bubulcus ibis	Cattle Egret	Garza ganadera	ARDEIDAE
Buteo jamaicensis	Red-tailed hawk	Guaraguao	ACCIPITIDAE
Charadrius vociferus	Killdeer	Playero sabanero	CHARADRIIDAE
Coereba flaveola	Bananaquit	Reinita común	EMBERIZIDAE
Columba livia	Rock Dove	Paloma casera	COLUMBIDAE
Columba passerina	Comon ground-Dove	Rolita	COLUMBIDAE
Crotophaga ani	Smooth-billed Ani	Judío	CUCULIDAE
Mimus polyglottos	Northern Mockingbird	Ruiseñor	MIMIDAE
Quiscalus niger	Greater Antillean Grackle	Chango	EMBERIZIDAE
Passer domesticus	House Sparrow	Gorrión ingles	PASSERIDAE
Tyrannus dominicensis	Gray kingbird	Pitirre	TYRANNIDAE
Zenaida asiatica	White-winged Dove	Tortola aliblanca	COLUMBIDAE
Zenaida aurita	Zenaida Dove	Tortola cardosantera	COLUMBIDAE
Reptiles			
Anolis cristatellus	Common anole	Lagartijo común	POLYCHROTIDAE
Anolis pulchellus	Puerto Rican bush anole	Lagartijo jardinero	POLYCHROTIDAE
Ameiva exsul	Common P.R. ameiva	Siguana común	TEIIDAE
Iguana iguana	Green iguana	Gallina de palo	IGUANIDAE
Sphaerodactylus macrolepis	Common ground gecko	Salamanquita común	GEKKONIDAE
Ampibians			
Bufo marinus	Cane toad	Sapo marino	BUFONIDAE
Eleutherodactylus antillensis	Antillean coqui	Coquí churí	LEPTODACTYLIDAE
Eleutherodactylus brittoni	Grass coqui	Coquí de las hierbas	LEPTODACTYLIDAE
Eleutherodactylus coqui	Common coqui	Coquí común	LEPTODACTYLIDAE

Appendix 1 – Proposed Alternatives.

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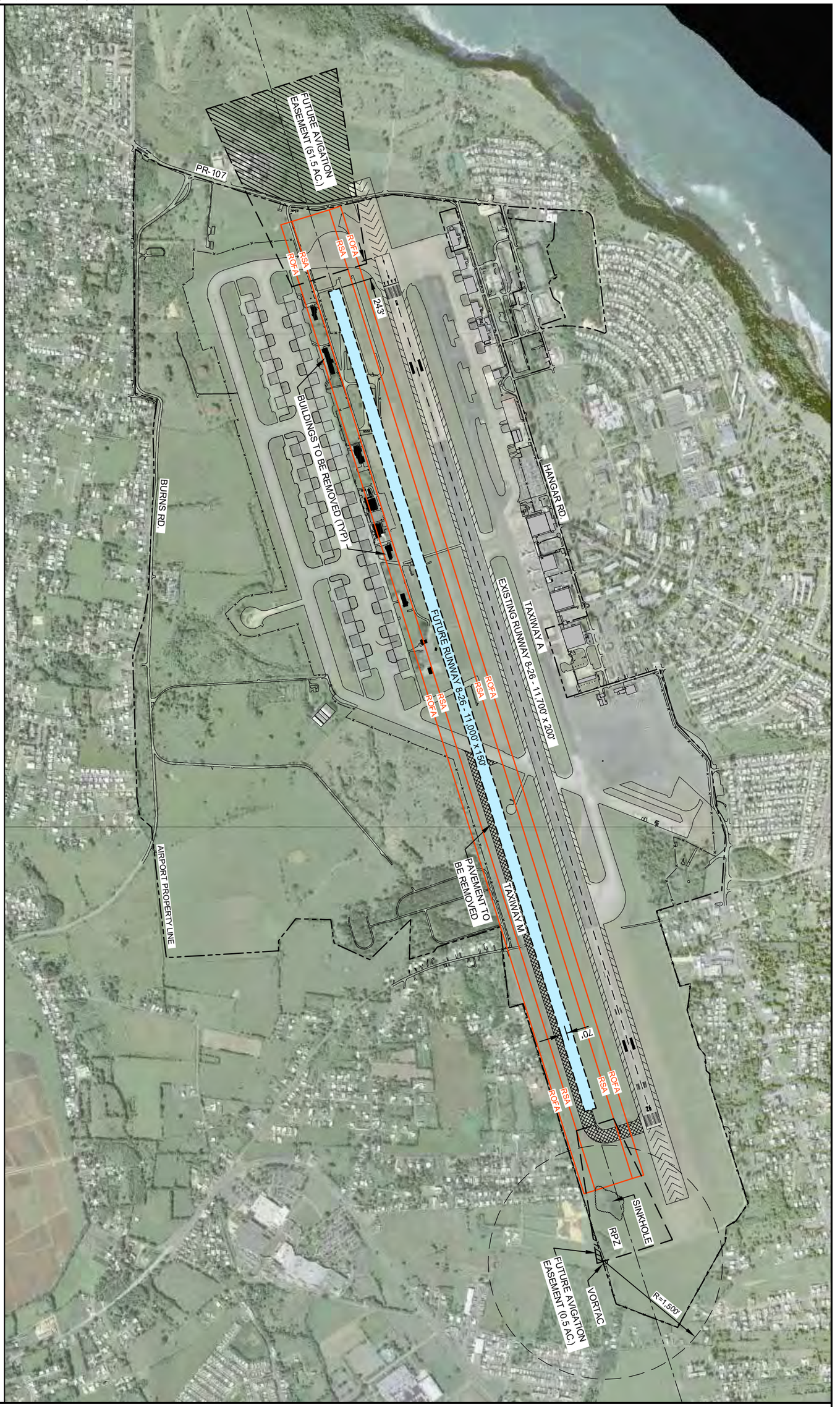


1000 0 1000
GRAPHIC SCALE IN FEET

N

FIGURE 2.1-1

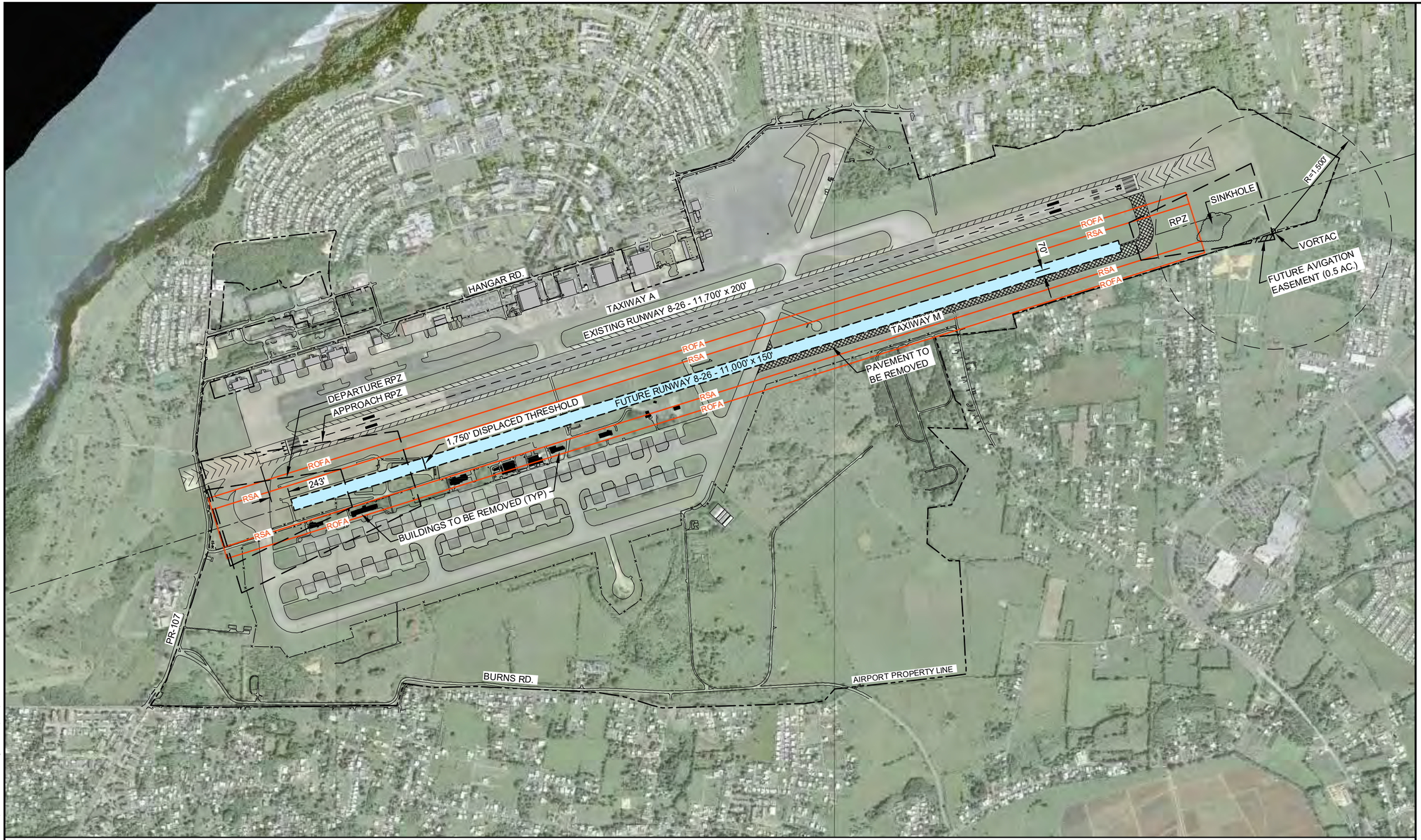
ALTERNATIVE 1A

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1B



DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	11,000'	9,250'
26	10,085'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

FIGURE
2.3-1

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S:\Projects_APPLAN\BQN\Figures\FIG 2.3-2.dwg 06/01/2018 13:03

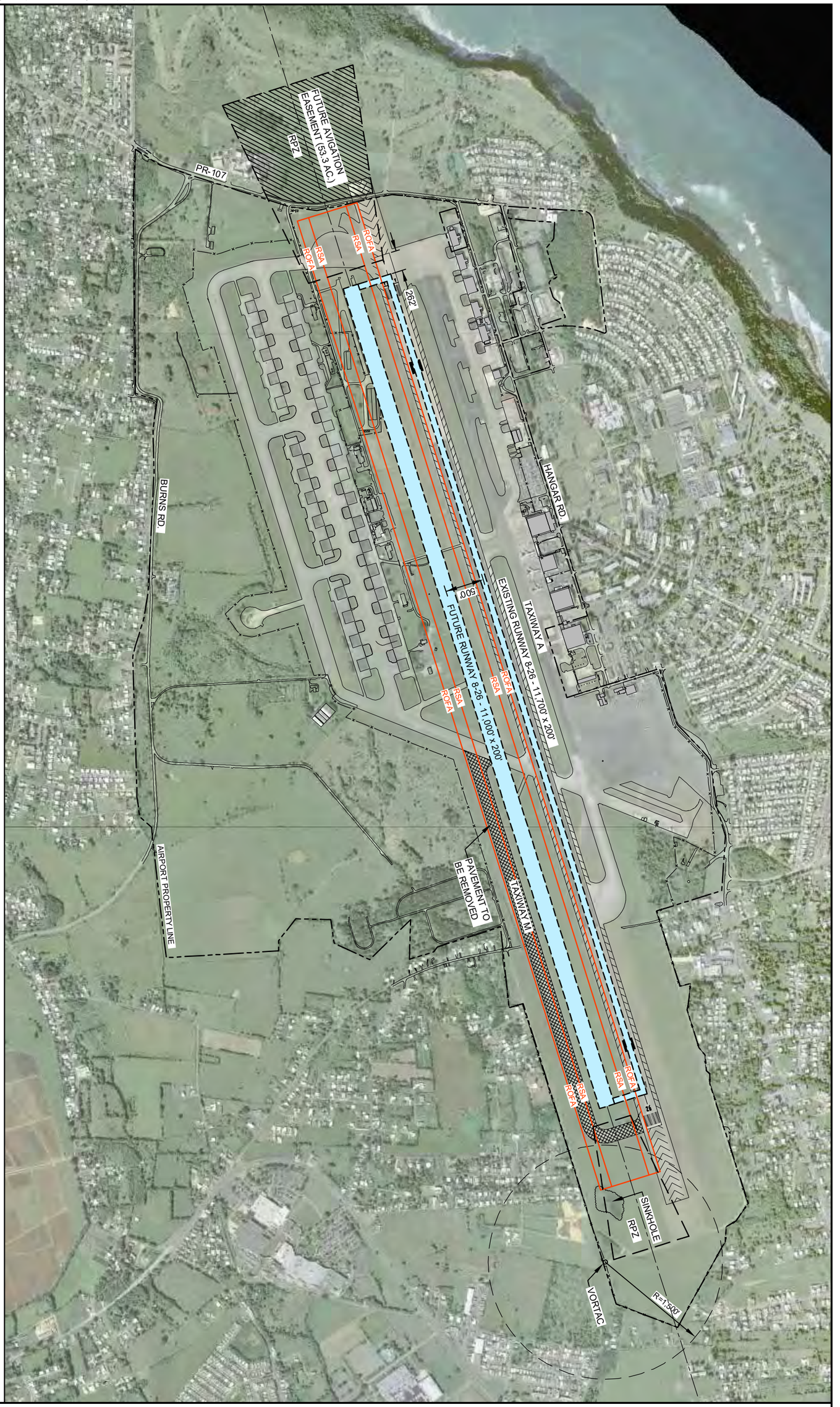


FIGURE 2.3-2

ALTERNATIVE 2A

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

HANGAR RD.
TAXIWAY A
EXISTING RUNWAY 8-26 - 11,700' x 200'
FUTURE RUNWAY 8-26 - 11,000' x 200'
TAXIWAY M
PAVEMENT TO BE REMOVED
SINKHOLE
RPZ
VORTAC
R=1,500'
DEPARTURE RPZ
APPROACH RPZ
1,152' DISPLACED THRESHOLD
1,050'
862'
ROFA
RSA
PR-107
BURNS RD.
AIRPORT PROPERTY LINE

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	11,000'	9,848'
26	10,697'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

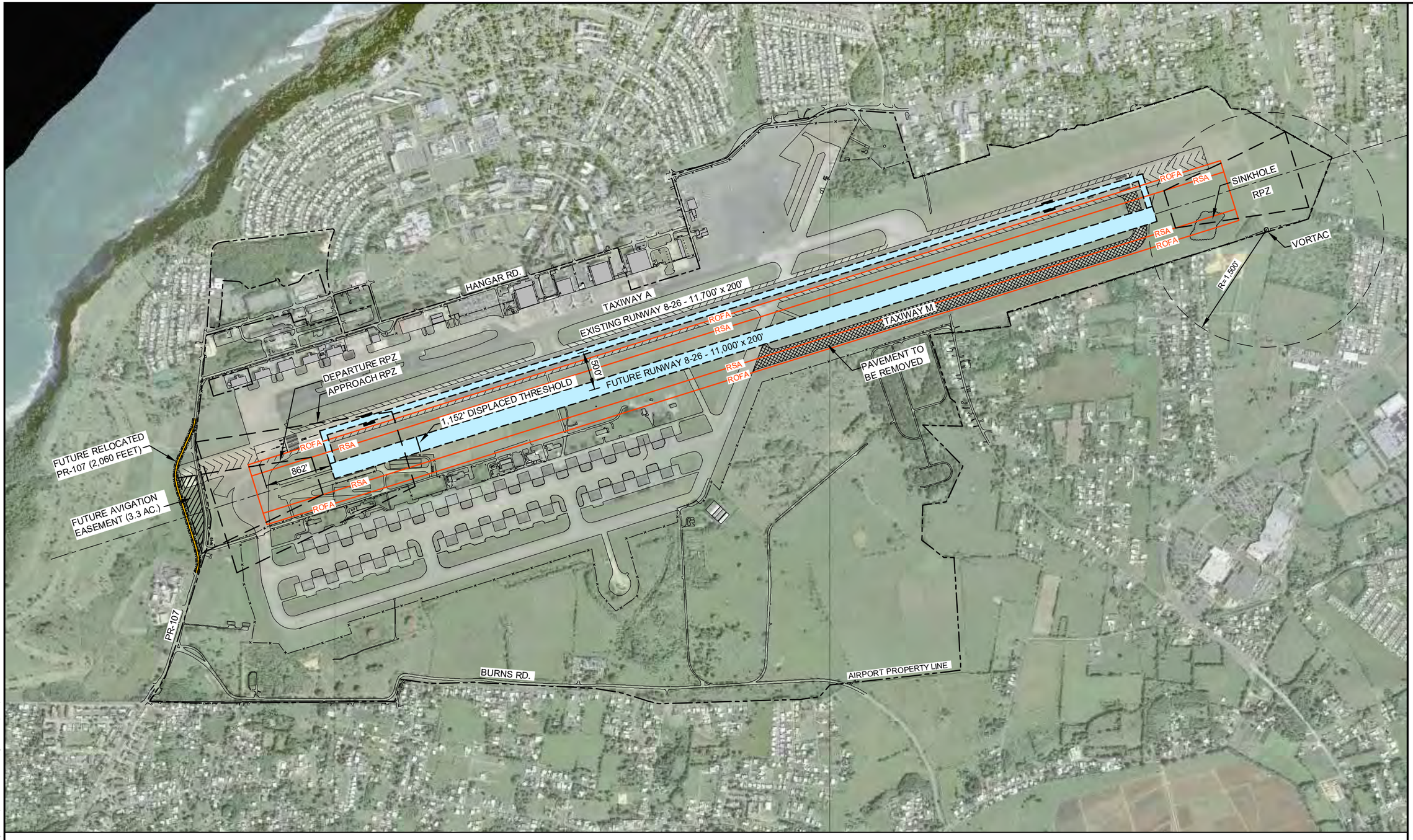
FIGURE 2.3-3

S:\Projects_APPLAN\BQN\Figures\FIG 2.3-3.dwg 06/01/2018 13:07

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2C



DECLARED DISTANCES				
RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	11,000'	9,848'
26	11,000'	11,000'	11,000'	11,000'

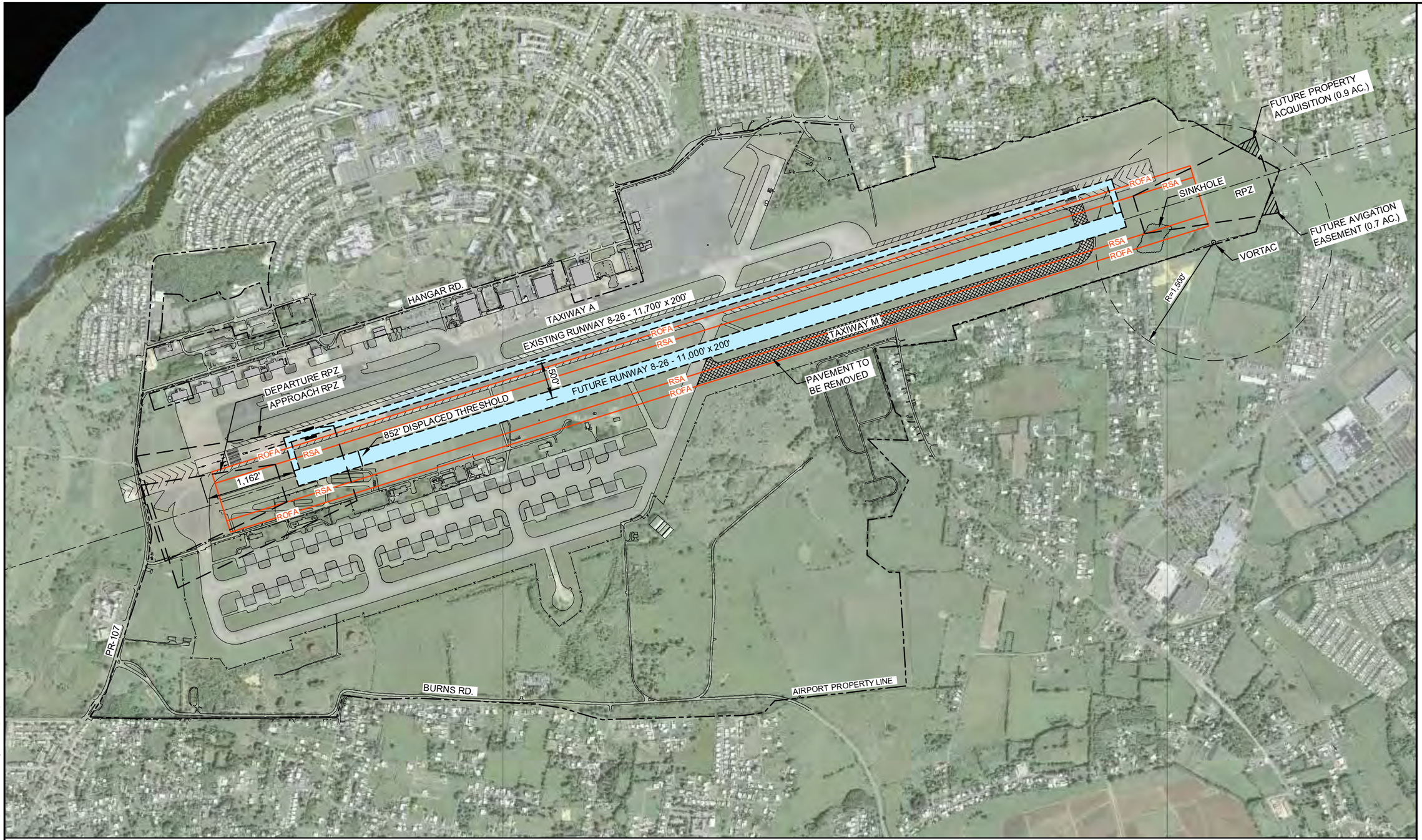
N

1000 0 1000

GRAPHIC SCALE IN FEET

FIGURE
2.3-4

S:\Projects_APPLAN\BQN\Figures\FIG 2.3-4.dwg 06/01/2018 13:09



DECLARED DISTANCES				
RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	11,000'	10,148'
26	11,000'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

FIGURE 2.3-5

S:\Projects_APPLAN\BQN\Figures\FIG 2.3-5.dwg 06/01/2018 13:11

Appendix 2 – Soils.

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67° 8' 55" W
67° 6' 17" W
695500
696000
696500
697000
697500
698000
698500
699000
699500
700000
18° 30' 25" N
18° 28' 48" N
2047300
2046800
2046300
2045800
2045300
2044800
2044300
Hook Rd
Cliff Rd
Carr 110
Carr 107
San Antonio
Wing
Crown Rd
BeB
Bromon
Arch Rd
NOTCOM
Carr 468
Carretera 107
Carretera 110
Burns Rd
Rampa
Map Scale: 1:21,300 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 300 600 1200 1800
Feet
0 1000 2000 4000 6000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

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Appendix 3 – NWI Map.

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U.S. Fish and Wildlife Service
National Wetlands Inventory

BQN West

June 11, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

U.S. Fish and Wildlife Service
National Wetlands Inventory

BQN East

June 11, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix 4 – Drainages Map.

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Drainage Map
Legend
Drainage
Maleza Alta
Maleza Baja
Google earth
Image © 2018 DigitalGlobe
N
2000 ft

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Appendix 5 – Field photos

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Figure 1. Dominant vegetation cover.

Figure 2. Buildings south of perimeter fence.

Figure 3. Forest patch on the right side of photograph.

Figure 4. Drainage.

Figure 5. Hay harvester working outside perimeter fence.

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Appendix 6 – ESI Map

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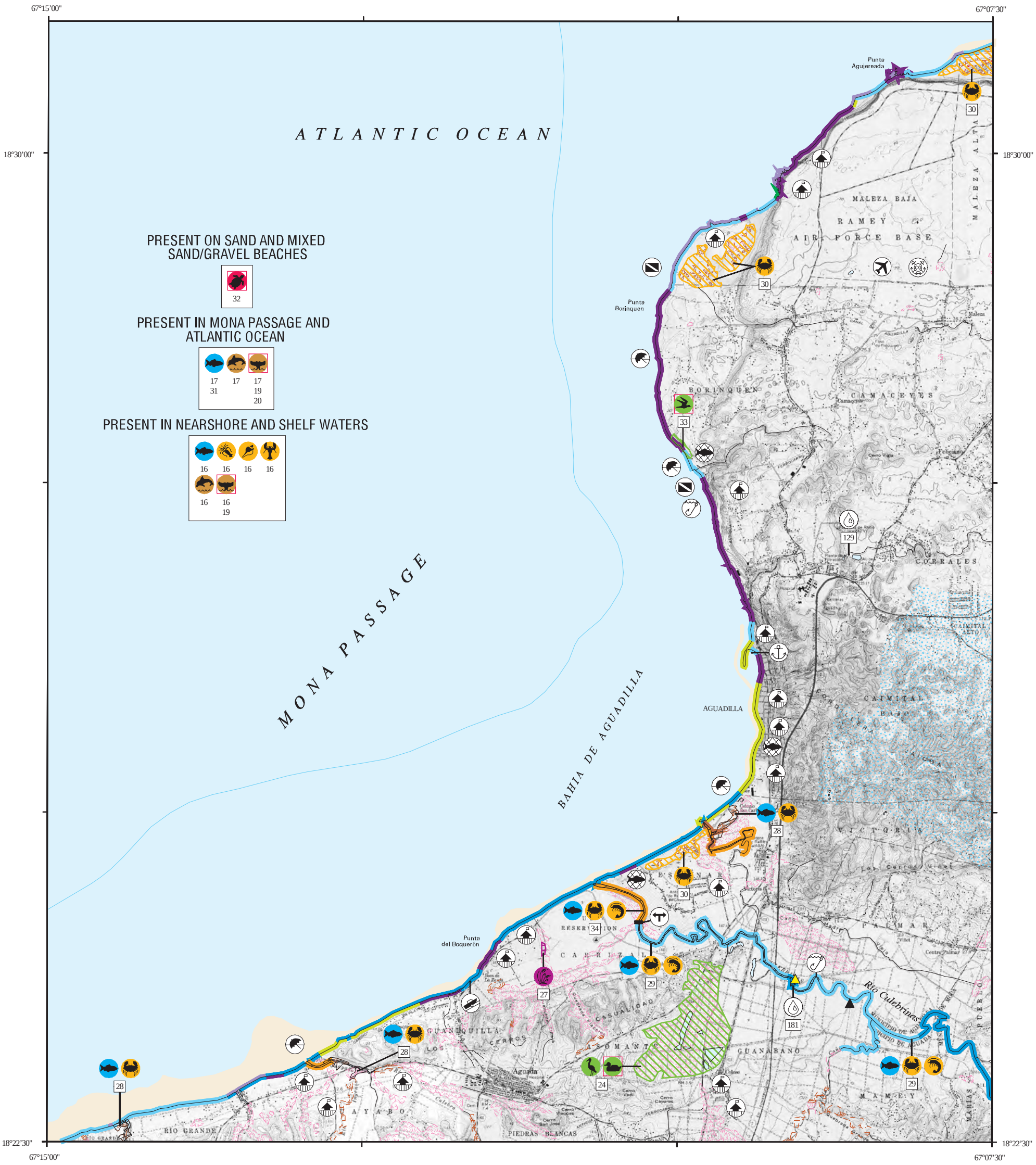
ENVIRONMENTAL SENSITIVITY INDEX MAP



SHORELINE HABITATS (ESI)

- 1A EXPOSED ROCKY CLIFFS
- 1B EXPOSED, SOLID MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN BEDROCK
- 2B SCARPS AND STEEP SLOPES IN MUDDY SEDIMENTS
- 3A FINE- TO MEDIUM-GRAINED SAND BEACHES
- 4 COARSE-GRAINED SAND BEACHES
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B RIPRAP
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES
- 8B SHELTERED, SOLID MAN-MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED VEGETATED LOW BANKS
- 10D MANGROVES
- SALT- AND BRACKISH-WATER MARSHES
- FRESHWATER MARSHES
- FRESHWATER SWAMPS
- FRESHWATER SCRUB/SHRUB

STREAM REACHES (RSI)

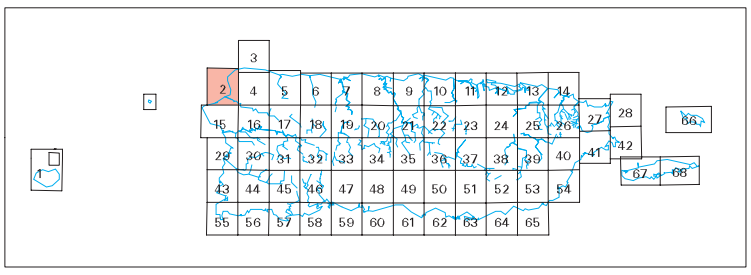
- 1 QUIET POOL; LOW-SENSITIVE BANKS
- 2 STRAIGHT CHANNEL WITH CURRENTS; LOW-SENSITIVE BANKS (MUD DOMINANT)
- 3 MEANDERING CHANNEL; SAND POINT BARS
- 4 MEANDERING CHANNEL; VEGETATED POINT BARS
- 5 RAPIDS OVER BEDROCK
- 6 MEANDERING CHANNEL; SAND AND GRAVEL POINT BARS
- 7 SPLIT CHANNEL WITH COARSE GRAVEL; SOME RAPIDS
- 8 SMALL FALLS; BOULDERS IN CHANNEL
- 9 LARGE FALLS; BOULDERS IN CHANNEL
- 10 CHANNELS WITH ASSOCIATED VULNERABLE WETLANDS
- KARST

N W E S

SCALE 1:55000

1 .5 0 1 KILOMETER

1 .5 0 1 MILE



Not For Navigation

Published: May 2000

Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

AGUADILLA, P.R. (1960) PR-2

PUERTO RICO - ESIMAP 2

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting
24	American coot			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Caribbean coot	S	T	LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Common moorhen			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Masked duck	S	T	LOW	X	X	X	X	X	X	X	X	X	X	X	X	MAY-AUG
	Pied-billed grebe			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Purple gallinule			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Ruddy duck	S	T	LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	Wading birds			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
	West Indian whistling-duck	S	T	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC
33	Brown pelican	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC

FISH:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
16	Pelagic fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
	Reef fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
17	Pelagic fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
28	Nursery fish				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	-
	Snook				X	X	X	X	X	X	X	X	X	X	X	X	APR-FEB	APR-FEB	JAN-DEC	JAN-DEC	JAN-DEC
	Tarpon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	MAY-DEC	JAN-DEC	JAN-DEC
29	Native stream fish				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	APR-MAY AUG-NOV	JAN-DEC	JAN-DEC
31	Blue marlin			HIGH					X	X	X	X	X	X	X		MAY-NOV	MAY-NOV	MAY-NOV	-	MAY-NOV
34	Native stream fish							X	X			X	X	X	X		-	-	APR-MAY AUG-NOV	-	-
	Nursery fish				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	-
	Snook				X	X	X	X	X	X	X	X	X	X	X	X	APR-FEB	APR-FEB	JAN-DEC	JAN-DEC	JAN-DEC
	Tarpon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	MAY-DEC	JAN-DEC	JAN-DEC

PLANT:

RAR#	Species	S/F	T/E	Conc	J	F	M	A	M	J	J	A	S	O	N	D
27	Pterocarpus swamp				X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
16	Caribbean spiny lobster				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
	Octopus				X	X	X	X	X	X	X	X	X	X	X	X	DEC-MAR	DEC-APR	-	JAN-DEC	JAN-DEC
	Queen conch				X	X	X	X	X	X	X	X	X	X	X	X	APR-OCT	APR-OCT	APR-OCT	JAN-DEC	JAN-DEC
28	Blue land crab				X	X	X	X	X	X	X	X	X	X	X	X	JUL-AUG	JUL-AUG	JUL-SEP	JAN-DEC	JAN-DEC
29	Freshwater crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	-	JAN-DEC	JAN-DEC
	Native stream shrimp				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	APR-MAY AUG-NOV	JAN-DEC	JAN-DEC
30	Blue land crab				X	X	X	X	X	X	X	X	X	X	X	X	JUL-AUG	JUL-AUG	JUL-SEP	JAN-DEC	JAN-DEC
34	Blue land crab				X	X	X	X	X	X	X	X	X	X	X	X	JUL-AUG	JUL-AUG	JUL-SEP	JAN-DEC	JAN-DEC
	Native stream shrimp							X	X			X	X	X	X		-	-	APR-MAY AUG-NOV	-	-

MARINE MAMMAL:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving
16	Dolphins				X	X	X	X	X	X	X	X	X	X	X	X	-	-
	Whales				X	X	X	X	X	X	X	X	X	X	X	X	-	-
17	Dolphins				X	X	X	X	X	X	X	X	X	X	X	X	-	-
	Whales				X	X	X	X	X	X	X	X	X	X	X	X	-	-
19	Humpback whale	S/F	E/E	VERY HIGH	X	X	X	X	X					X	X		NOV-MAY	NOV-MAY
20	Sperm whale	S/F	E/E	HIGH	X	X	X	X	X	X	X		X	X	X	X	-	-

REPTILE:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
32	Green sea turtle	S/F	E/T		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	-	JAN-DEC	JAN-DEC
	Hawksbill sea turtle	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	-	JAN-DEC	JAN-DEC
	Leatherback sea turtle	S/F	E/E			X	X	X	X	X	X	X					FEB-JUN	APR-SEP	-	APR-SEP	FEB-JUN

HUMAN USE RESOURCES:

WATER INTAKE:

HUN#	Name	Owner/Manager	Location	Phone
129	AGUADILLA FILTER PLANT	PRASA	PR 459, KM 0.3	787/891-0520
181	CULEBRINAS DRINKING WATER INTAKE			

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

APPENDIX C

Agency Coordination

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APPENDIX C.1

Early Agency Coordination and Scoping Comments

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FEDERAL AGENCIES

Federal Emergency Management Agency
Caribbean Division
Attn: Delyris Aquino-Santiago
P.O. Box 70105
San Juan, PR 00936-8105

National Oceanic and Atmospheric Administration
NOAA/Fisheries Southeast Regional Office
Attn: Bill Arnold, Branch Leader
263 13th Avenue South
St. Petersburg, FL 33701

U.S. Army Corps of Engineers
Antilles Area Office
Attn: Eng. Sindulfo Castillo, Director, Environmental Permits
Annex Building, Fundacion Angel Ramos
383 Franklin Delano Roosevelt Ave, Suite 202
San Juan, PR 00918

U.S. Department of Transportation
Federal Highway Administration
Puerto Rico and US Virgin Islands Division Office
Attn: Mr. James Christian
350 Carlos Chardon Ave, Suite 210
San Juan PR 00918-2161

U.S. Environmental Protection Agency Region 2
Caribbean Environmental Protection Division
Attn: Ms. Brenda Reyes – NEPA Coordinator
City View Plaza II - Suite 7000
#48 Rd 165, km 1.2
Guaynabo, PR 00968-8069

U.S. Fish & Wildlife Service
Caribbean Ecological Field Office
Attn: Mr. Edwin Muñiz
P.O. Box 491
Boqueron, PR 00622

STATE AGENCIES

Puerto Rico Aqueduct and Sewer Authority
Attn: Mr. Eli Díaz Atienza, Esq.
P.O. Box 7066
San Juan, PR 00916-7066

Puerto Rico Department of Agriculture
Mayagüez Region
Attn: Agro. Julio Colón Pérez
P.O. Box 10163
Santurce, PR 00909

Puerto Rico Department of Economic Development and Commerce
Attn: Mr. Manuel Laboy, Esq.
P.O. Box 362350
San Juan, PR 00936-2350

Puerto Rico Department of Health
Attn: Mr. Rafael Rodríguez Mercado MD
P.O. Box 70184
San Juan, PR 00936-0184

Puerto Rico Department of Natural and Environmental Resources
Aguadilla Regional Office
Attn: Mr. Antonio Pérez Muñiz
P.O. Box 366147, Puerta de Tierra Station
San Juan, PR 00936

Puerto Rico Department of Natural and Environmental Resources
Coastal Zone Management Program
Attn: Mr. Ernesto Diaz
P.O. Box 366147, Puerta de Tierra Station
San Juan, PR 00936

Puerto Rico Department of Transportation and Public Works
Aguadilla Region
Attn: Ing. Pedro A. Vázquez Sánchez
P.O. Box 41269, Minillas Station
San Juan, PR 00940-1269

Puerto Rico Electric Power Authority
Attn: Mr. Walter Higgins
P.O. Box 364267
San Juan, PR 00936-4267

Puerto Rico Environmental Quality Board
Mayagüez Region
Attn: Mr. José Alvarado
828 Ave. Hostos, Suite 201
Mayagüez, PR 00682-1536

Puerto Rico Permits Management Office (OGPe)
Attn: Eng. Ian Carlos Serna
P.O. Box 41179
San Juan, PR 00940-1179

Puerto Rico State Historic Preservation Office
Attn: Ms. Marines Colon Gonzalez
P.O. Box 9023935
San Juan, PR 00902-3935

Puerto Rico Planning Board
Federal Proposals Review Office
Attn: Ms. Maria Gordillo, Chairwoman
P.O. Box 41119
San Juan, PR 00940-1119

Puerto Rico Tourism Company
Attn: Mr. Carlos Campos Vidal, Esq.
P.O. Box 9023960
San Juan, PR 00902-3960

LOCAL AGENCIES

Municipality of Aguadilla
Attn: Mr. Carlos Méndez Martínez, Mayor
P.O. Box 1008
Aguadilla, PR 00605-1008

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AECOM
7650 West Courtney Campbell Cswy
Tampa, Florida
33607
www.aecom.com

813.675.6843 tel
813.287.8229 fax

Memorandum

To	Felicia Reeves (FAA); Romel Pedraza (PRPA)	Page	1
CC	Aimee McCormick (FAA); Anthony Vazquez (FAA); Ivelisse Lorenzo (PRPA); Milagros Rodriguez (PRPA); Reinaldo Vazquez (PRPA); Victor Morales (AECOM); Joe Rodriguez (AECOM); Adelis Caban (Marlin)		
Subject	Rafael Hernandez Airport Runway 8-26 Environmental Assessment Agency Scoping Comment Summary		
From	Paul Sanford, AECOM		
Date	22 August 2018		

An early agency scoping meeting was held by FAA and PRPA for the above-referenced EA at BQN on 01 Aug 2018, subsequent to the FAA issuing early scoping notification letters and project information to interested agencies, and soliciting comments by 20 Aug 2018. A variety of federal, state and local agency representatives attended this meeting either telephonically or in person (see **TAB1** for sign-in sheet), where the PRPA and AECOM briefed the attendees on the project, alternatives and EA process.

As a result of this process, comments were received either by email or by written correspondence from the following federal, state and local agencies:

- City of Aguadilla
- Puerto Rico Department of Planning and Environmental Resources
- Puerto Rico Electric Power Authority
- Puerto Rico Planning Board
- Puerto Rico Tourism Company
- U.S. Fish and Wildlife Service

Attached herewith is a summary of agency comments received during the early scoping process (**TAB2**), along with reference copies of the communications received (**TAB3**). AECOM has developed proposed responses to these comments for FAA and PRPA consideration (**TAB2**).

Each received communication was reviewed and evaluated by AECOM for relevant comments to consider during the EA development process. Comments were coded and entered into a comment/response database for inclusion in the EA and administrative record. The database will be updated and amended throughout the EA process with additional public and agency comment information as it is received.

For reference, the comment coding system is described in the following narrative.

AECOM
7650 West Courtney Campbell Cswy
Tampa, Florida
33607
www.aecom.com

813.675.6843 tel
813.287.8229 fax

Memorandum

Comment Letter Coding

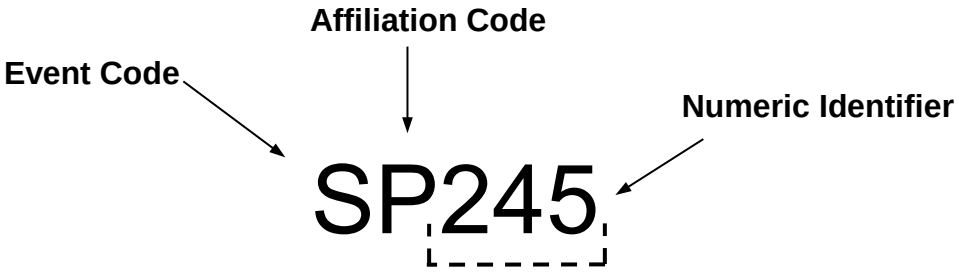
The database index identifies the name of each party that provided comments and assigns a unique Identifier Code to each comment letter. The Identifier Code consists of five alphanumeric characters that represent three fields of information. The first character serves as an "Event Code," which describes the study phase in which the comment was submitted. There are two primary Event Codes used for the EA:

S = Comment received during the EA Scoping process
D = Comments received during the Draft EA public/agency review period

The second character represents the "Affiliation Code" that places the commenting party into one of five categories:

F = Comment from a Federal agency or Native American Indian tribe
S = Comment from a State or Regional agency
L = Comment from a Local agency or an Elected Official
P = Comment from the general Public
N = Comment by Petition

The last three characters identify the specific comment letter numerically. For example, Identifier Code "**SP245**" describes the comment letter as being submitted during the **Scoping** process by a member of the **public,** and being the **245**th letter/form received from that category of respondent.



Within each comment letter, Comment Codes are used to identify and organize summarized comments and the responses applicable to that particular submittal. The summarized comments and responses are organized into 28 categories listed below. For example, Comment Code "**1-15**" describes the comment was made in regard to the purpose of and need for the Proposed Project and the particular was the 15th comment recorded under that category.

Category Number	Description
1	Purpose and Need
2	Alternatives
3	Air Quality
4	Biological Resources
5	Climate

AECOM
7650 West Courtney Campbell Cswy
Tampa, Florida
33607
www.aecom.com

813.675.6843 tel
813.287.8229 fax

Memorandum

6	Coastal Resources
7	DOT Section 4(f)
8	Farmlands
9	Hazardous Materials, Pollution Prevention and Solid Waste
10	Historical, Architectural, Archaeological and Cultural Resources
11	Land Use
12	Natural Resources and Energy Supply
13	Noise and Noise Compatible Land Use
14	Socioeconomics, Environmental Justice, Children's Health and Safety Risks
15	Light Emissions and Visual Effects
16	Wetlands
17	Floodplains
18	Surface/Groundwater Resources
19	Wild and Scenic Rivers
20	Quality of Life
21	Safety
22	Cost Considerations
23	Other Considerations
24	Cumulative Impacts
25	Mitigation Measures
26	Coordination and Public Involvement
27	In Support of the Project
28	In Opposition to the Project

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TAB 1
MEETING SIGN IN SHEET

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GOVERNMENT OF PUERTO RICO
Ports Authority

ATTENDANCE SHEET
INTERAGENCIAL MEETING RUNWAY 8-26 RECONSTRUCTION
TRAINING ROOM ARFF, BQN AIRPORT
DATE: *August 1st, 2018* – *TIME: 10:00 A.M.*
TRAINING ROOM ARFF, BQN AIRPORT

NAME	POSITION	COMPANY	PHONE NO.	EMAIL	SIGN
1. Antonio Pérez Muñiz					
2. Bill Arnold					
3. ~~Brenda Reyes~~ Jose Soto	Env. Scientist	USEPA	787-977-5829	~~jbas~~ sotajose@epa.gov	
4. Carla Campos Vidal					
5. Carlos A. Rubio Cancela					
6. Carlos Méndez Martínez	PLAN. MANUEL HIDALGO DIRECTOR	AGUADILLA CITY	(787)891-1005 X2096	mhidalgo@aguadilla-city	
7. Delyris Aquino-Santiago					
8. Edwin Muñiz					
9. Eli Díaz Atienza					
10. Ernesto Díaz					
11. Jaime Green Héctor Rodríguez	Director DECA OGPe	OGPe	787-614-8399	jaimegreen@ogpe.pr.gov	
12. Ivelisse Lorenzo Torres	Env. Insp.	PRPA	729-8715 *3231	ilorenzo@prpa.pr.gov	
13. James Christian					
14. José Alvarado					
15. José A. Riollano Irizarry	Airport Management Director	P.R.P.A.	787-375-6330	JARiollano@prpa.pr-gov	
16. José Rodríguez	Principal Planning	AECOM	723-3332	jose.s.rodriguez@aecom	

ATTENDANCE SHEET
INTERAGENCIAL MEETING RUNWAY 8-26 RECONSTRUCTION
TRAINING ROOM ARFF, BQN AIRPORT
DATE: *August 1st, 2018* – *TIME: 10:00 A.M.*
TRAINING ROOM ARFF, BQN AIRPORT
Page 2

NAME	POSITION	COMPANY	PHONE NO.	EMAIL	SIGN
17. Julio Colón Pérez					
18. Manuel Laboy					
19. María Gordillo					
20. Milagros Rodríguez	Env. Manager	PRPA	(787)729-8715 xt. 3229		mirodriguez@prpa.pr.gov
21. Paul Sanford	Consultant	AECOM	813. 875. 6843	paul.sanford@aecom.com	
22. Pedro A. Vázquez					
23. Rafael Rodríguez					
24. Reinaldo Vázquez	Planning	PRPA			
25. Romel Pedraza Claudio	Engineering Director	PRPA	(787)729-8715x3187	rvazquez@prpa.pr.gov	
26. Sindulfo Castillo			by phone		
27. Víctor Morales	AECOM	PM	787-516-3770	victor.morales@aecom.com	
28. ~~Walter Higgins~~ José Ortiz	JOEL RIVERA PREPA-AGUADILLA	PREPA	787-501-8330 787-307-4506	JOEL.RIVERA@PREPA.COM	
29. ~~Edgar~~ Sierra	OPS MGR	PRPA	939-271-5600	ESIERRA@PRPA.PR.GOV	
30. Felicia Reeves	FAA	FAA	404-305-6708	felicia.johnson@faa.gov	
31. ~~Anthony Vazquez~~	FAA	FAA	939 489 8750	anthony.M.Vazquez@faa.gov	
32. Aimee McCormick	FAA	FAA	404-305-6709	aimee.mccormick@faa.gov	
33. Adelis Cabán	Martin Environ.	Martin	787.923.7021	acaban@martinenvironmental.com	
34. Pablo Collazo Cortés	Asesor Junta Propia	Junta de Planificación	787-349-4492	collazo_p@jp.pr.gov	
35. Miguel Santiago	Compañía de Turismo	D. Regional	787-248-0303	miguel.santiago@turismo.pr.gov	
Lissette Rodríguez	Special Assistant	OGPE	787-313-4165	RODRIGUEZ-LI@OGPE.PR.GOV	
(x#9) Miguel Sanchez	OGPE Coord.	AAA	652-1260	miguel.sanchez@aeropuertospr.com	

TAB 2
AGENCY COMMENT/RESPONSE MATRIX

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Comment Response Matrix

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

AGENCY SCOPING COMMENTS SUMMARY

August 2018

#	Letter Code	Comment Code	Comment	Commenter	Response
1	SL001	2-01	For the past 20 years the City of Aguadilla has been developed with the same vision outlined in our Master Plan and one of our main goals is the full development of the BQN and the Aguadilla Aerospace and Technology Cluster. To achieve these goals, the City is working on a new economic development strategy that would result in the creation of the first Aerotropolis on the island, the Aerotropolis of Aguadilla. With this vision, our BQN will become the first air cargo gateway of Puerto Rico, the first Maintenance/Repair/Overhaul facility in PR, the second port of entry into PR and the main economic engine for the region. Our idea of development is supported by the following public policy: • Plan for Puerto Rico: Socioeconomic Transformation Model • Puerto Rico Ports Authority (PRPA) Regional Airports Strategic Plan • Rafael Hernandez Airport Master Plan • Comprehensive Economic Development Strategy (CEDS) Puerto Rico • Regional Economic Development Strategy for the Porta del Sol Region • Comprehensive and Feasibility Study for the Municipality of Aguadilla • Transformation and Innovation in the Wake of Devastation: An Economic and Disaster Recovery Plan for Puerto Rico Therefore, regarding the project for the reconstruction of Runway 8-26, the City endorses the ALTERNATIVE 1A because is the only alternative that will allow the full development of our plans.	Carlos Méndez Martínez, Mayor, City of Aguadilla	Thank you for your comment. The Purpose of the Proposed Project as outlined in the Draft EA is to 1) provide an air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN; and 2) maintain adequate runway length for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and construction. The Need for the Proposed Project is tied to deteriorating pavement conditions, runway length requirements, and FAA's mission to ensure safe and efficient use of navigable airspace in the United States and its territories. In accordance with this Purpose and Need, the alternatives analysis for the Draft EA can and does consider factors such as BQN's role in the local economy and the importance of maintaining existing resiliency and support services. The alternatives analysis therefore does consider compatibility of the alternatives considered with planned airport development. Accordingly, the cited public policy, and local preferences based on that policy, is important to reference as underpinning of these considerations. To this end, the referenced public policy objectives will be discussed in the EA as appropriate. However, for clarification, the objective of the Proposed Project is not to induce or enable capacity for BQN operations above and beyond existing and approved forecasted conditions. Plans to expand the airport's air cargo functionality, or introduce MRO capabilities, are related to, but separate from, the EA Purpose and Need. Airfield and facility development requirements to support these separate objectives are not within the purview of the EA, would need to be justified independently of the EA within airport master planning processes, and would be subject to separate NEPA approvals prior to approval or construction.
2	SL001	2-02	In terms of resiliency, we need to think that the BQN is the main operational airport in the island on a disaster event, because the Luis Munoz Marin International Airport (SJU) gets easily flooded, that's why must of the recovery staff and supplies arrived at the Aguadilla Airport. Given the above, we recommend keeping the temporary runway ready to become a second full runway as the one that exists in the Saipan International Airport of the Northern Mariana Islands.	Carlos Méndez Martínez, Mayor, City of Aguadilla	Thank you for your comment. This comment is consistent with the Purpose and Need of the Proposed Project studied in the EA. The Purpose and Need of the Proposed Project as presented in the Draft EA will acknowledge the importance of maintaining resiliency at BQN, and BQN's role in providing disaster relief support within the territory.
3	SS001	4-01	After reviewing the information enclosed with your letters, the DNER has determined that since the Proposed Project is to be done over an already developed footprint, no significant impacts on natural and environmental resources under our jurisdiction should be expected. Therefore, the DNER has no objection to the Proposed Project, as described in your letters of July 20, 2018.	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Thank you for your comment. The DNER's position will be documented in the Draft EA coordination summary and supporting materials.
4	SS001	26-01	Be advised that, once circulated, the FAA must submit the EA to the Puerto Rico Office of Permit Management (OGPe, by its initials in Spanish). This is to be done as part of the process for obtaining a Determination of Environmental Compliance for the project, pursuant to Chapter IV, Rule 114(L) of Regulation No. 8858 of November 23, 2016, the Regulation for the Environmental	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and	Thank you for your comment. The OGPe is included on the agency coordination list for the Draft EA, and will be provided the opportunity to review the Draft EA such that the OGPe can determine whether the documentation complies with Regulation No. 8858, supra., and qualifies for issuance of a

Comment Response Matrix

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

AGENCY SCOPING COMMENTS SUMMARY

August 2018

#	Letter Code	Comment Code	Comment	Commenter	Response
			Review Process, issued by the Environmental Quality Board (EQB). Rule 114(L) states that NEPA-compliant lead agencies submitting an EA or an Environmental Impact Statement (EIS) to federal agencies, do not need to prepare a new environmental document to obtain a Determination of Environmental Compliance from the OGPe, as long as the environmental document complies with the requirements of Regulation No. 8858, supra.	Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Determination of Environmental Compliance.
5	SS001	18-01	We would also like to note that BQN is located within Karst Zone Special Planning Area (APE-ZC, by its initials in Spanish). The APE-ZC is created by Regulation No. 8486 of June 16, 2014, known as the Plan and Regulation of the Karst Special Planning Area (PRAPEC, by its initials in Spanish), for compliance with the policy stated in Law No. 292 of August 21, 1999, as amended, which governs the protection and conservation of the karst physiography of Puerto Rico. Activities in APE-ZC areas may be authorized under the appropriate conditions, complying with the required permits, endorsements and franchises required by applicable laws and regulations, as long as these activities do not undermine the policy of Law No. 292, supra. The EA for the Proposed Project must then pay special attention to the presence of karst-related features at the Proposed Project site, especially sinkholes. This is very important, as Figures 2 and 3 in your enclosures show what appears to be a sinkhole or other depression near the east end of current Taxiway M (which is shown in both figures as "Pavement to be Removed"). Therefore, the following must be considered: • As part of the EA process, studies for determining the stability of soils at the area of the Proposed Project must be performed, as well as those studies identifying land areas where the subsoil is likely to fail due to collapses induced by the solution-collapse dynamics typical of karst zones. In the event that these studies identify other suspect karst features that could be affected, including sinkholes and areas of soil subsidence, best management practices (BMP) for stormwater management and erosion control must be implemented as part of the Proposed Project.	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Thank you for your comment. The Draft EA will acknowledge BQN's location in the APE-ZC and any related requirements. A geotechnical study is included as part of the EA process and the study is currently underway. The study results will be used to inform refinements to EA alternatives and to identify any potential environmental impacts (e.g., water resources) and mitigations required for the project.
6	SS001	23-01	The Proposed Project must comply with Law No. 267 of September 11, 1998, as amended, which enables the Center for the Coordination of Excavations and Demolitions in the Puerto Rico Public Service Commission, and with Regulation No. 7245 of November 9, 2006, enacted under that law. This will apply both to the removal of the pavement of the existing Taxiway M (Figures 2 and 3) and to building removal for the PRPA-sponsored alternative (Figure 2).	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Thank you for your comment. The impact analysis for the Draft EA will reference the need to comply with all applicable federal, state and local regulations regarding construction activities in the vicinities of structures and underground installations.
7	SS001	9-01	In attention to the airport nature of the BQN facilities, and to address safety concerns that may arise, all construction debris and leftover materials must be removed from the Proposed Project site as soon as possible. Upon completion of construction work in the Proposed Project, all of these debris and materials should have been removed completely. Disposal of construction debris and leftover materials should be done in a certified sanitary landfill system, or other approved solid waste disposal facility.	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Thank you for our comment. The impact analysis for the Draft EA will reference the need to comply with all applicable federal, state and local regulations and programs regarding the generation, handling, transport and disposition of construction and demolition debris associated with the project.
8	SS001	18-02	In the event that a surface or underground water body, whether perennial or intermittent, is found within the area of the Proposed Project, such finding must be reported immediately to the DNER	Moisés Sánchez-Loperena, Assistant Secretary, Office	Thank you for your comment. A wetland and waters of the United States evaluation, including a jurisdictional determination of wetlands with the U.S.

Comment Response Matrix

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

AGENCY SCOPING COMMENTS SUMMARY

August 2018

#	Letter Code	Comment Code	Comment	Commenter	Response
			and other concerned agencies. Not reporting such findings, as well as mitigation measures that must be implemented to protect those natural resources, could result in this no objection letter being revoked and could form the basis for legal actions by the DNER in the available forums.	of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Army Corps of Engineers if warranted, is included as part of the EA. In accordance with Executive Order 11990, Protection of Wetlands, Section 404 of the Clean Water Act, and any local implementing regulations, any wetland or Waters of the United States impacts will be identified, disclosed, and made available for public and agency comment during the NEPA process. If wetland/waters impacts are identified, appropriate mitigations will be proposed and coordinated with jurisdictional agencies, and included in the FAA's environmental finding for the EA.
9	SS001	23-02	This endorsement applies only to the statement of facts and data as presented and reviewed in the case. The Secretary of the ONER reserves the right to reevaluate, vary or modify the endorsement at any moment, prior to permit issuance or to the corresponding administrative action by the applicant agency or proponent, when new, specific official information, stating that the applicable law or the environmental conditions of the site have changed substantially, becomes available, or when the original endorsement was issued under false or fraudulent assumptions. Please note that this endorsement does not constitute a permit or an authorization to begin construction work on the Proposed Project.	Moisés Sánchez-Loperena, Assistant Secretary, Office of the Assistant Secretary of Permits, Endorsements and Specialized Services, Puerto Rico Department of Natural and Environmental Resources	Acknowledged. Thank you for your comment.
10	SS002	12-01	Here is the map with the location of the lines that are within the proposed work site at Rafael Hernández Airport. As shown in the document, there is an underground section of the distribution line at 4,160 V that crosses the entire runway from "Hangar Road" to "Parallel road". We also have another segment of the distribution line that locates all along "Parallel road" including a 38 KV substation in the vicinity of the PR 107 Street. On the underground section of the distribution line that crosses the runway we cannot rule out that said line is free of hazardous substances such as lead. If you have further questions, please don't hesitate to contact us	Joel A. Rivera Prado, P.E., Supervisor Engineer, Aguadilla Technical Operations Office, Puerto Rico Electric Power Authority	Thank you for your comment. Assessment of alternatives, construction impacts, hazardous materials impacts, and impacts to energy supply in the Draft EA will acknowledge and discuss the information provided.
11	SS003	11-01	The airport has an urban land classification (SU) according to the Land Use Plan of 2015 and a general public use qualification (DT-G), in accordance with the activity carried out on the property.	Maria del C. Gordillo Pérez, PPL, Chairwoman, Puerto Rico Planning Board	Thank you for your comment. On- and off-airport land uses will be identified and disclosed within EA study areas in a manner consistent with the referenced Land Use Plan. Any changes to these land uses will be identified and discussed in the Draft EA document.
12	SS003	6-01	A portion of the property to the west-southwest is within the limits of the coastal zone; therefore, a Certification of Federal Consistency with the Puerto Rico Coastal Management Program must be requested as part of the construction permit process.	Maria del C. Gordillo Pérez, PPL, Chairwoman, Puerto Rico Planning Board	Thank you for your comment. The need for the referenced certificate will be identified in the Draft EA. This comment affirms that the airport is located in the coastal zone. Accordingly, there is an additional consultation obligation for the FAA to coordinate a Federal Coastal Zone Consistency Determination per Section 307(c)(1)(C) of the Coastal Zone Management Act, which is required to show compliance of the project with the enforceable policies of the Puerto Rico Coastal Zone Management Program.
13	SS003	17-01	The property is outside the limits of flood zone, natural conservation and other risks.	Maria del C. Gordillo Pérez, PPL, Chairwoman, Puerto Rico Planning Board	Thank you for your comment. The Puerto Rico Planning Board's position will be documented in the Draft EA coordination summary and supporting materials.
14	SS004	1-01	After reviewing the information and the two proposed options enclosed in your letter, one by Airport Sponsor (PRPA) and the second one by the Federal Aviation Administration (FAA), the PRTC understands and recognizes that improvements are necessary and important; and that they will help airport operations. However, potential environmental impacts and their results must be taken into consideration.	Carlos J. Romo-Aledo, Director, Planning and Development Office, Puerto Rico Tourism Company	Thank you for your comment. The Puerto Rico Tourism Company's position will be documented in the Draft EA coordination summary and supporting materials.
15	SS004	23-03	The Rafael Hernandez Airport is very important in PRTC's efforts to increase tourism according to Porta del Sol's Tourism Plan for Puerto Rico's Western Region.	Carlos J. Romo-Aledo, Director, Planning and Development Office, Puerto	Thank you for your comment. The impact of BQN on economic vitality and planning will be acknowledged and discussed in the EA Purpose and Need statement.

Comment Response Matrix

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

AGENCY SCOPING COMMENTS SUMMARY

August 2018

#	Letter Code	Comment Code	Comment	Commenter	Response
				Rico Tourism Company	
16	SS004	26-02	We would like to receive a copy of the EA when available in order to provide our final comments.	Carlos J. Romo-Aledo, Director, Planning and Development Office, Puerto Rico Tourism Company	Thank you for your comment. The Tourism Company is included on the agency coordination list for the Draft EA, and will be provided the opportunity to review and comment the Draft EA once available.
17	SF001	4-02	Based on the information provided, project nature and site characteristics, we determined that the project proposed would not result in effects to listed species or designated critical habitat. Therefore, no consultation pursuant Section 7 of the Endangered Species Act, as amended, is required.	Marelisa Rivera, Caribbean ES Field Supervisor, US Fish and Wildlife Service	Thank you for your comment. The environmental consequences portion of the Draft EA will be structured to meet the requirements of a Biological Assessment at 50 CFR 402.12, and will be prepared in accordance with FAA Order 1050.1F, Environmental Impacts, Policies and Procedures. However, per this comment, the FAA as lead federal agency will not initiate Section 7 Endangered Species Act consultation with the Service.

TAB 3
AGENCY LETTERS RECEIVED

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August 6, 2018

Mrs. Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
Collage Park, GA 30337

RE: ENVIRONMENTAL ASSESSMENT FOR RECONSTRUCTION OF RUNWAY 8-26 AT RAFAEL HERNANDEZ INTERNATIONAL AIRPORT, (BQN) AGUADILLA, PUERTO RICO

Dear Mrs. Reeves:

Greetings and best wishes from Aguadilla, Puerto Rico, the "Atlantic Garden".

For the past 20 years the City of Aguadilla has been developed with the same vision outlined in our Master Plan and one of our main goals is the full development of the Rafael Hernandez International Airport (BQN) and the Aguadilla Aerospace and Technology Cluster. To achieve these goals, the City is working on a new economic development strategy that would result in the creation of the first Aerotropolis on the island, the Aerotropolis of Aguadilla. 2-01

With this vision, our BQN Airport will become the first air cargo gateway of Puerto Rico, the first Maintenance/Repair/Overhaul facility in PR, the second port of entry into PR and the main economic engine for the region.

Our idea of development is supported by the following public policy:

- Plan for Puerto Rico: Socioeconomic Transformation Model
- Puerto Rico Ports Authority (PRPA) Regional Airports Strategic Plan
- Rafael Hernandez Airport Master Plan
- Comprehensive Economic Development Strategy (CEDS) Puerto Rico
- Regional Economic Development Strategy for the Porta del Sol Region
- Comprehensive and Feasibility Study for the Municipality of Aguadilla
- Transformation and Innovation in the Wake of Devastation: An Economic and Disaster Recovery Plan for Puerto Rico

Therefore, regarding the project for the reconstruction of runway 8-26, **the city endorses the ALTERNATIVE 1A**, because is the only alternative that will allow the full development of our plans. 2-01

In terms of resiliency, we need to think that the Rafael Hernandez International Airport (BQN) is the main operational airport in the island on a disaster event, because the Luis Muñoz Marín International Airport (SJU) gets easily flooded, that's why must of the recovery staff and supplies arrived at the Aguadilla Airport. 2-02

Given the above, we recommend keeping the temporary runway ready to become a second full runway as the one that exists in the Saipan International Airport of the Northern Mariana Islands.

Cordially yours,

CARLOS MÉNDEZ MARTÍNEZ
Mayor

SS001

GOVERNMENT OF PUERTO RICO

Department of Natural and Environmental Resources

RECEIVED
AUG 0 6 2018
BY:

AUG 0 6 2018

MS FELICIA K REEVES
FEDERAL AVIATION ADMINISTRATION
ATLANTA AIRPORT DISTRICT OFFICE
1701 COLUMBIA AVE RM 220
COLLEGE PARK GA 30337

Dear Ms. Reeves:

Proposed Environmental Assessment for Reconstruction of Runway $^{8}/_{26}$ at the Rafael Hernández Airport (BQN) Borinquen, Maleza Alta, Maleza Baja and Aguacate Wards, Aguadilla

O-PA-EEA03-SJ-00731-26072018

MF

This is in reply to your two letters, both dated on July 20, 2018, seeking input and comments from the Department of Natural and Environmental Resources (DNER) on the above referenced subject. The Puerto Rico Ports Authority (PRPA) is proposing improvements to Runway $^{8}/_{26}$ at the Rafael Hernández Airport (IATA code: BQN) in Aguadilla (hereafter, the Proposed Project). These improvements are necessary, due to the deteriorating pavement conditions in the runway that preclude safe aircraft operations over time. In accordance with the *National Environmental Policy Act* of 1969 (NEPA) (PL 91-190, 42 USC 4321–4347), and Federal Aviation Administration (FAA) implementing regulations, the PRPA is preparing an Environmental Assessment (EA) to consider and document potential impacts associated with the Proposed Project.

For the purposes of the EA, the following development concepts are being considered for the Proposed Project:

- Alternative 1A (PRPA-sponsored) (shown in Figure 2 enclosed with each letter):
  1. Construct a new temporary runway (11,000' long × 150' wide), 720' south of the existing runway;
  2. Reconstruct the existing runway (11,000' long × 200' wide, with 30' shoulders on each side) in place for permanent use; and
  3. Convert the temporary runway to a full, permanent parallel taxiway (11,000' long × 75' wide, plus shoulders), upon completion of the existing runway reconstruction.
- Alternative 2A (FAA-sponsored) (shown in Figure 3 enclosed with each letter):
  1. Construct a new permanent runway (11,000' long × 200' wide, plus 30' shoulders on each side), 500' south of the existing runway; and

2. Reconstruct in place the existing runway as a permanent, parallel taxiway (11,000' long × 75' wide, plus shoulders).

Additional variations are also being considered to the development concepts described above, seeking to address operational and construction issues inherent to implementing the Proposed Project, such as construction phasing and usable runway length, compliance with FAA airport design and safety standards, land use compatibility, avoidance of sensitive natural or environmental resources, and other considerations. Direct and Indirect Study Areas within the Proposed Project site have been preliminary delineated for potential impact identification and consideration (as shown in Figure 4 of your enclosures). The former encompasses areas of direct ground disturbance associated with the Proposed Project, inclusive of a 100' buffer to account for indirect ground disturbances occurring during construction, while the latter will be used to identify and characterize any potential impacts not related to project construction.

As part of their coordinating efforts, the FAA, on behalf of the PRPA, advises the DNER about the preparation of the EA and requests any relevant information that our Department may have, regarding key issues or concerns that will need to be addressed in the NEPA process for the Proposed Project.

mft

After reviewing the information enclosed with your letters, the DNER has determined that since the Proposed Project is to be done over an already developed footprint, no significant impacts on natural and environmental resources under our jurisdiction should be expected. Therefore, the DNER has no objection to the Proposed Project, as described in your letters of July 20, 2018. 4-01

Be advised that, once circulated, the FAA must submit the EA to the Puerto Rico Office of Permit Management (OGPe, by its initials in Spanish). This is to be done as part of the process for obtaining a Determination of Environmental Compliance for the project, pursuant to Chapter IV, Rule 114(L) of Regulation No. 8858 of November 23, 2016, the *Regulation for the Environmental Review Process*, issued by the Environmental Quality Board (EQB). Rule 114(L) states that NEPA-compliant lead agencies submitting an EA or an Environmental Impact Statement (EIS) to federal agencies, do not need to prepare a new environmental document to obtain a Determination of Environmental Compliance from the OGPe, as long as the environmental document complies with the requirements of Regulation No. 8858, *supra*. 26-01

We would also like to note that BQN is located within Karst Zone Special Planning Area (APE-ZC, by its initials in Spanish). The APE-ZC is created by Regulation No. 8486 of June 16, 2014, known as the *Plan and Regulation of the Karst Special Planning Area* (PRAPEC, by its initials in Spanish), for compliance with the policy stated in Law No. 292 of August 21, 1999, as amended, which governs the protection and conservation of the karst physiography of Puerto Rico. Activities in APE-ZC areas may be authorized under the appropriate conditions, complying with the required permits, endorsements and franchises required by applicable laws and regulations, as long as these activities do not undermine the policy of Law No. 292, *supra*. 18-01

The EA for the Proposed Project must then pay special attention to the presence of karst-related features at the Proposed Project site, especially sinkholes. This is very important, as Figures 2 and 3 in your enclosures show what appears to be a sinkhole or other depression near the east end of current Taxiway M (which is shown in both figures as "Pavement to be Removed"). Therefore, the following must be considered:

- As part of the EA process, studies for determining the stability of soils at the area of the Proposed Project must be performed, as well as those studies identifying land areas where the subsoil is likely to fail due to collapses induced by the solution-collapse dynamics typical of karst zones. In the event that these studies identify other suspect karst features that could be affected, including sinkholes and areas of soil subsidence,

→ Will it require additional funding?

AUG 0 6 2018

best management practices (BMP) for stormwater management and erosion control must be implemented as part of the Proposed Project.

Please note that the Proposed Project must also comply with the following requirements:

- The Proposed Project must comply with Law No. 267 of September 11, 1998, as amended, which enables the Center for the Coordination of Excavations and Demolitions in the Puerto Rico Public Service Commission, and with Regulation No. 7245 of November 9, 2006, enacted under that law. This will apply both to the removal of the pavement of the existing Taxiway M (Figures 2 and 3) and to building removal for the PRPA-sponsored alternative (Figure 2). 23-01

- In attention to the airport nature of the BQN facilities, and to address safety concerns that may arise, all construction debris and leftover materials must be removed from the Proposed Project site as soon as possible. Upon completion of construction work in the Proposed Project, all of these debris and materials should have been removed completely. Disposal of construction debris and leftover materials should be done in a certified sanitary landfill system, or other approved solid waste disposal facility. 9-01

- In the event that a surface or underground water body, whether perennial or intermittent, is found within the area of the Proposed Project, such finding must be reported immediately to the DNER and other concerned agencies. Not reporting such findings, as well as mitigation measures that must be implemented to protect those natural resources, could result in this no objection letter being revoked and could form the basis for legal actions by the DNER in the available forums. 18-02

This endorsement applies only to the statement of facts and data as presented and reviewed in the case. The Secretary of the DNER reserves the right to reevaluate, vary or modify the endorsement at any moment, prior to permit issuance or to the corresponding administrative action by the applicant agency or proponent, when new, specific official information, stating that the applicable law or the environmental conditions of the site have changed substantially, becomes available, or when the original endorsement was issued under false or fraudulent assumptions. Please note that this endorsement does not constitute a permit or an authorization to begin construction work on the Proposed Project. 23-02

The DNER would like to thank you for the opportunity to comment on this matter, and looks forward to collaborate further with the FAA and the PRPA, especially on avoiding, minimizing or mitigating adverse environmental impacts to natural resources under our jurisdiction, once the development concept for the Proposed Project has been finally selected.

Cordially,

Moisés Sánchez-Lorenza
Assistant Secretary
Office of the Assistant Secretary of Permits,
Endorsements and Specialized Services

MSL/GIFS/LDBB/ldbb

SS002

12-01

Norman, Tia

From: felicia.reeves@faa.gov
Sent: Friday, August 17, 2018 12:56 PM
To: Sanford, Paul
Subject: FW: RECONSTRUCTION OF RUNWAY 8-26 AT AGUADILLA INTERNATIONAL AIRPORT (BQN) - PREPA DISTRIBUTION LINES
Attachments: 18.08.09 RAMEY AIRPORT PREPA DISTRIBUTION LINE.pdf

Categories: BQN

V/R
Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park GA 30337
404-305-6708
Federal Aviation Administration

From: Joel A Rivera Prado
Sent: Friday, August 10, 2018 11:12 AM
To: Reeves, Felicia (FAA)
Cc: CHRISTIAN FELICIANO BONILLA ; victor.morales@aecom.com
Subject: RECONSTRUCTION OF RUNWAY 8-26 AT AGUADILLA INTERNATIONAL AIRPORT (BQN) - PREPA DISTRIBUTION LINES

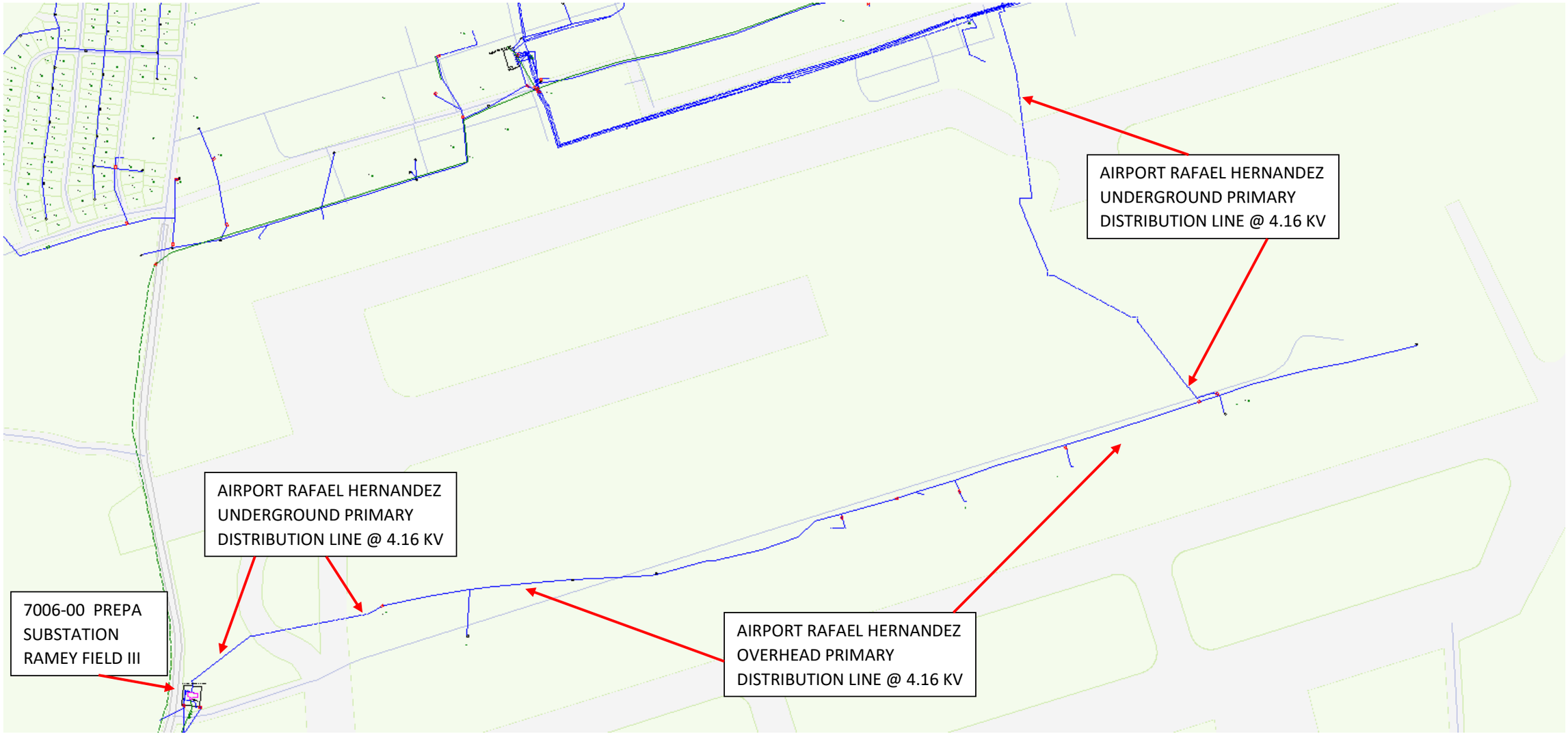
Dear Felicia K. Reeves,

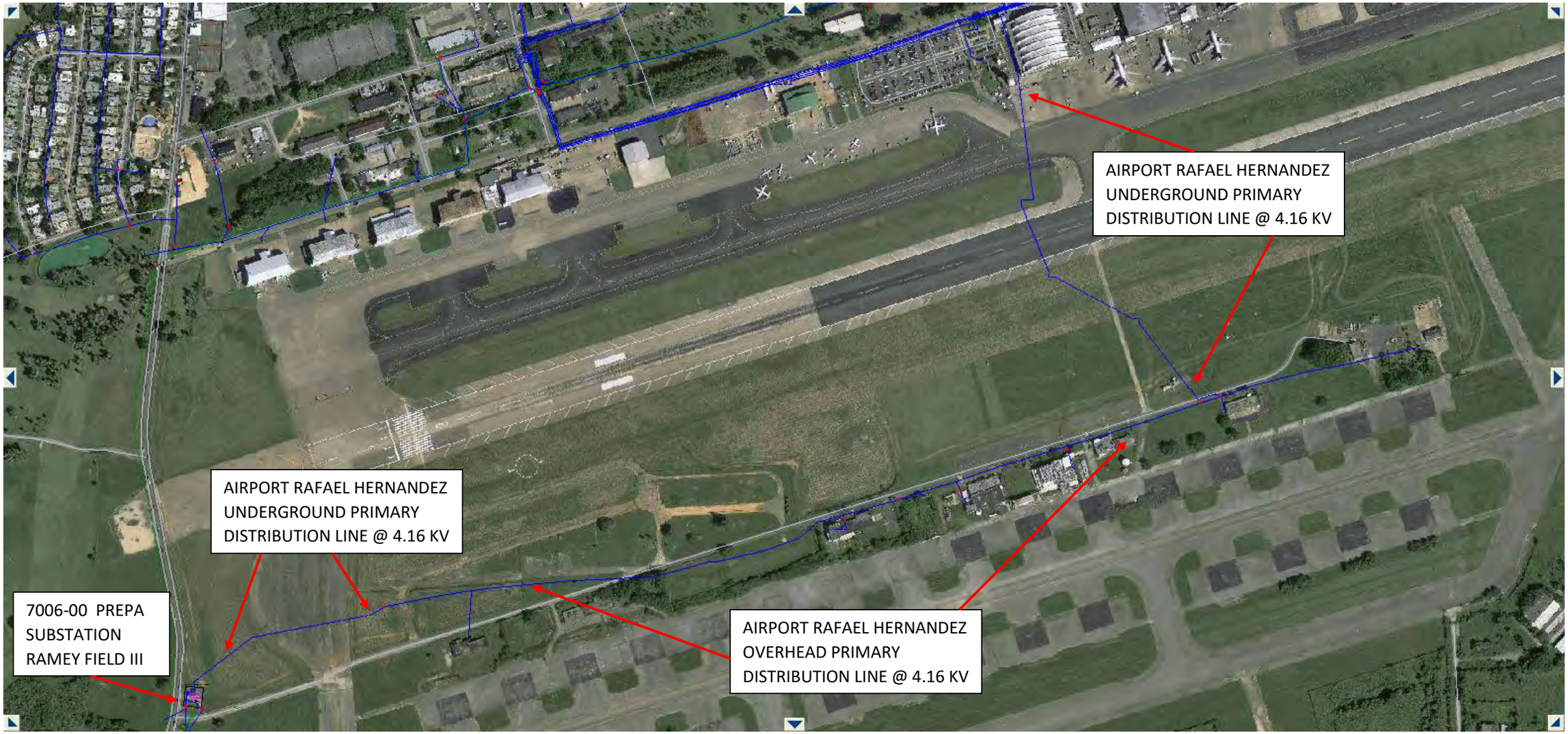
Here is the map with the location of the lines that are within the proposed work site at Rafael Hernández Airport. As shown in the document, there is an underground section of the distribution line at 4,160 V that crosses the entire runway from "Hangar Road" to "Parallel road". We also have another segment of the distribution line that locates all along “Parallel road" including a 38 KV substation in the vicinity of the PR 107 Street. On the underground section of the distribution line that crosses the runway we cannot rule out that said line is free of hazardous substances such as lead.

If you have further questions, please don’t hesitate to contact us.

Regards,

Joel A. Rivera Prado, P.E.
Supervisor Engineer
Aguadilla Technical Operations Office
Puerto Rico Electric Power Authority
Tel: (787)521-8331


AIRPORT RAFAEL HERNANDEZ
UNDERGROUND PRIMARY
DISTRIBUTION LINE @ 4.16 KV
AIRPORT RAFAEL HERNANDEZ
UNDERGROUND PRIMARY
DISTRIBUTION LINE @ 4.16 KV
7006-00 PREPA
SUBSTATION
RAMEY FIELD III
AIRPORT RAFAEL HERNANDEZ
OVERHEAD PRIMARY
DISTRIBUTION LINE @ 4.16 KV


AIRPORT RAFAEL HERNANDEZ
UNDERGROUND PRIMARY
DISTRIBUTION LINE @ 4.16 KV
AIRPORT RAFAEL HERNANDEZ
UNDERGROUND PRIMARY
DISTRIBUTION LINE @ 4.16 KV
7006-00 PREPA
SUBSTATION
RAMEY FIELD III
AIRPORT RAFAEL HERNANDEZ
OVERHEAD PRIMARY
DISTRIBUTION LINE @ 4.16 KV

SS003

GOVERNMENT OF PUERTO RICO

Puerto Rico Planning Board

August 20, 2018

felicia.reeves@faa.gov

Ms. Felicia K. Reeves

Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, GA 30337

ENVIROMENTAL ASSESMENT FOR RECONSTRUCTION OF RUNWAY 8-26 AT RAFAEL HERNÁNDEZ AIRPORT (BQN), AGUADILLA, PUERTO RICO

Dear Ms. Reeves:

The Puerto Rico Planning Board received a request for submit comments to the Environmental Assessment (EA) for reconstruction of runway 8-26 at Rafael Hernández Airport in Aguadilla, also, we were represented at the meeting held on August 1, 2018 in airport facilities.

After evaluating the proposed project our comments to the EA are:

1. The airport has an urban land classification (SU) according to the Land Use Plan of 2015 and a general public use qualification (DT-G), in accordance with the activity carried out on the property. 11-01

2. A portion of the property to the west-southwest is within the limits of the coastal zone; therefore, a Certification of Federal Consistency with the Puerto Rico Coastal Management Program must be requested as part of the construction permit process. 6-01

3. The property is outside the limits of flood zone, natural conservation and other risks. 17-01

Therefore, the Puerto Rico Planning Board has no additional comments regarding the reconstruction of the runway at the Rafael Hernández Airport in Aguadilla.

Sincerely,

María del C. Gordillo Pérez, PPL
Chairwoman

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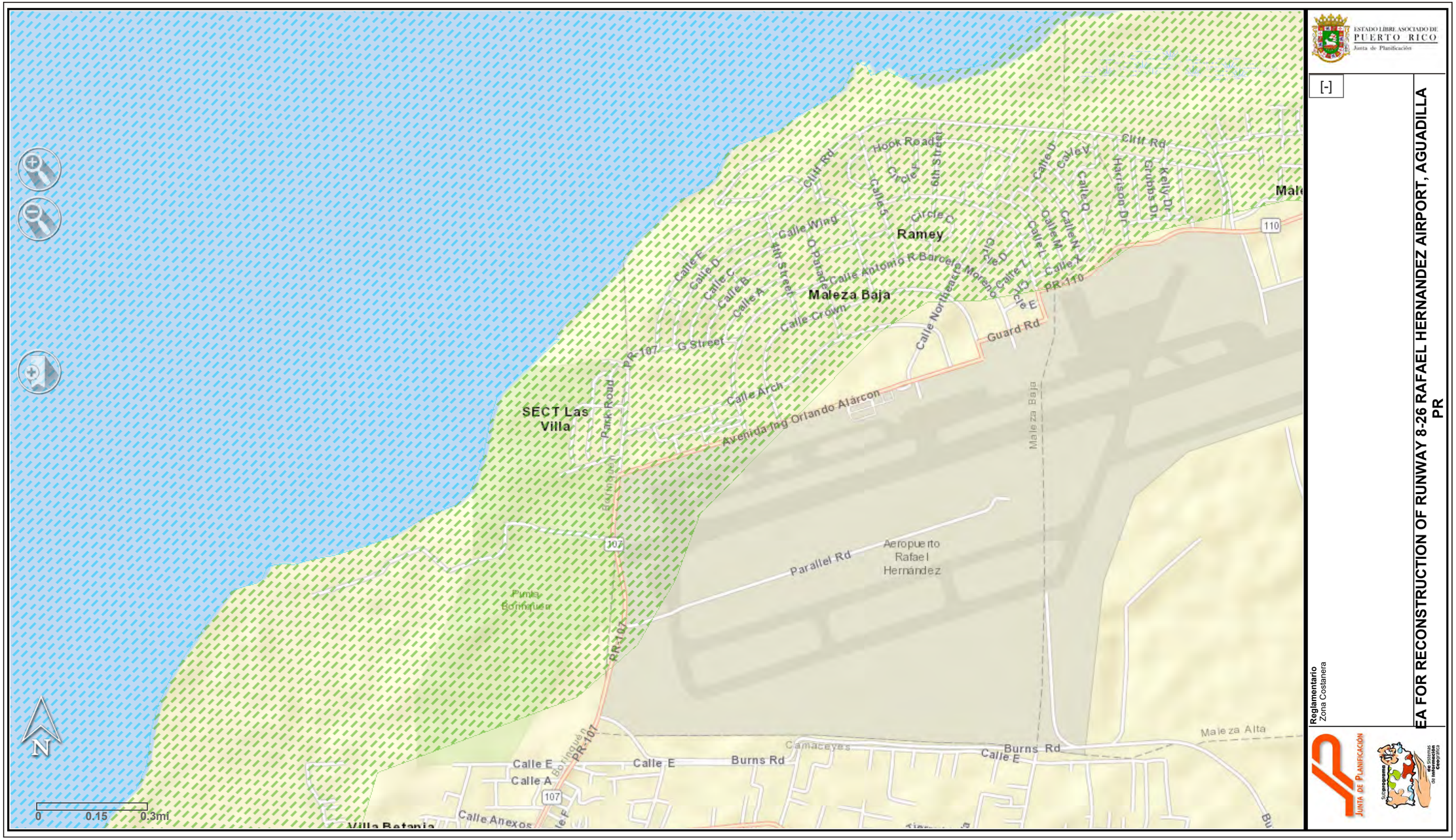
ESTADO LIBRE ASOCIADO DE PUERTO RICO
Junta de Planificación
[-]
AREA FOR RECONSTRUCTION OF RUNWAY 8-26 RAFAEL HERNANDEZ AIRPORT, AGUADILLA PR
Reglamentario
Zona Costanera
JUNTA DE PLANIFICACIÓN
Ramey
Maleza Baja
SECT Las Villa
Villa Betania
Aeropuerto Rafael Hernández
Punta Borinquen
Parallel Rd
Park Road
Cliff Rd
Hook Road
6th Street
4th Street
G Street
Calle Wing
Calle Crown
Calle Arch
Calle Northeast
Guard Rd
Avenida Tag Orlando Alarcon
Maleza Baja
Maleza Alta
Camaceyes
Burns Rd
Calle E
Calle A
Calle Anexos
Harrison Dr
Grubbs Dr
Kelly Dr
PR-107
PR-110
110
107
0
0.15
0.3mi
N

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SS004

GOVERNMENT OF PUERTO RICO

Puerto Rico Tourism Company

E-mail: Felicia.reeves@faa.gov

August 20, 2018

Ms Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337

ENVIRONMENTAL ASSESSMENT FOR RECONSTRUCTION OF RUNWAY 8-26 AT RAFAEL HERNÁNDEZ AIRPORT (BQN) AGUADILLA, PUERTO RICO

Dear Ms Reeves:

This is in reply to your letter of July 20, 2018, received by The Puerto Rico Tourism Company (PRTC) on July 25, 2018, on the above referenced matter. According to your letter, the Puerto Rico Ports Authority (PRPA) is in the process of preparing an Environmental Assessment (EA) for the proposed improvements to Runway 8-26 at the Rafael Hernández Airport, located in the city of Aguadilla.

After reviewing the information and the two proposed options enclosed in your letter, one by Airport Sponsor (PRPA) and the second one by the Federal Aviation Administration (FAA), the PRTC understands and recognizes that improvements are necessary and important; and that they will help airport operations. However, potential environmental impacts and their results must be taken into consideration. 1-01

The Rafael Hernández Airport is very important in PRTC's efforts to increase tourism according to Porta del Sol's Tourism Plan for Puerto Rico's Western Region. 23-03

We would like to receive a copy of the EA when available in order to provide our final comments. 26-02

Cordially,

Carlos J. Romo-Aledo
Director
Planning and Development Office

WC/mrd

U.S. Department
of Transportation
**Federal Aviation
Administration**

SF001
4-02

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

July 20, 2018

Mr. Edwin Muñiz
Field Supervisor
U.S. Fish & Wildlife Service
Caribbean Ecological Field Office
P.O. Box 491
Boquerón, PR 00622

RE: Environmental Assessment for Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico

Dear Mr. Muñiz:

The Puerto Rico Port Authority (i.e., PRPA or Airport Sponsor) is proposing improvements to Runway 8-26 at Rafael Hernandez Airport (BQN), hereinafter referred to as the Proposed Project. Runway improvements are necessary due to deteriorating pavement conditions that could preclude safe aircraft operations over time. For reference, **Figure 1** depicts the geographic location of the Proposed Project.

In accordance with the National Environmental Policy Act of 1969 (NEPA) and Federal Aviation Administration (FAA) implementing regulations, the PRPA is preparing an Environmental Assessment (EA) to consider and document the potential air quality, noise, traffic-related, social, economic, and environmental impacts associated with the Proposed Project. For the EA, two separate development concepts are being considered for the implementation of the Proposed Project, shown on the enclosed **Figures** and comprised of the development actions described below:

Airport Sponsor's Proposed Project – also referred to as Alternative 1A (**Figure 2**):

- Construct new temporary runway approximately 11,000' long x 150' wide approximately 720' south of existing runway (for temporary use during reconstruction of original runway to avoid airport runway closure to all users)
- Re-construct existing runway in place for permanent use approx. 11,000' in length and 150' wide (with 30' shoulders on each side)

- Convert temporary runway into a full parallel taxiway 11,000' long x 75' wide (plus shoulders) for permanent use

FAA's Proposed Project – also referred to as Alternative 2A (**Figure 3**):

- Construct new permanent runway approximately 11,000' long x 200' wide (plus 30' shoulders on each side) 500' south of existing runway
- Re-construct existing runway as parallel taxiway for permanent use (approx. 11,000' long x 75' wide (plus shoulders) in place

The FAA and PRPA are also considering additional variations to the two Proposed Project Alternatives described above as part of the EA process. These variations seek to address operational and construction issues inherent to the implementing the Proposed Project, such as construction phasing and usable runway length, compliance with FAA airport design and safety standards, land use compatibility, avoidance of sensitive natural or environmental resources, and other considerations.

During the course of the EA, potential impacts related to Proposed Project will be identified and considered, within the Direct and Indirect Study Areas preliminarily depicted on enclosed **Figure 4**. The Direct Study Area is large enough to encompass the areas of direct ground disturbance associated with the Proposed Project, inclusive of a 100-foot buffer to account for any indirect ground disturbance activities that may occur during construction, such as materials and equipment staging. The Direct Study Area will be used to identify and disclose potential construction-related impacts. The Indirect Study Area approximates the extent of the 60 decibel day-night average sound level noise contour (DNL 60 dB) for these Alternatives, and will be used to identify and characterize any potential impacts not directly related to project construction.

As part of our early coordination efforts for the EA, and on behalf of the PRPA, we are attempting to identify preliminary key issues that will need to be addressed in the NEPA process. To accomplish this we would like to receive your comments relative to the proposed improvements as they relate to your specific area of expertise or regulatory jurisdiction, including permitting or mitigation requirements.

Of note, additional project data and information will be developed during preparation of the EA, including locations of potential ancillary project elements such as onsite staging and materials storage areas, construction haul routes, and locations of batch plants, that may prompt you to provide additional comments on issues to be considered in the EA. Consequently, you will be invited to review and provide additional comments on the Draft EA upon publication.

To facilitate early notification of the Proposed Project and receipt of agency comments, an agency scoping meeting is being offered on August 1st, 2018 at 10:00 a.m. at the venue identified below. I encourage you to attend this meeting to discuss any questions or concerns your agency may have on the Proposed Project and/or materials included in this letter.

Aguadilla International Airport (BQN)
Conference Room – 2nd Floor
Air Rescue Building
Hangar St.
Aguadilla, Puerto Rico

If you are unable to attend this scoping meeting, your written comments are still requested. In order to sufficiently address any preliminary key project issues and maintain the project schedule, any written comments are requested by August 20th, 2018. Please respond to me at the address provided below and feel free to contact me if you have any questions or concerns.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708
felicia.reeves@faa.gov

Enclosures (4)

Copy: Romel Pedraza, PRPA
Paul Sanford, AECOM
Victor Morales, AECOM

U.S. FISH & WILDLIFE SERVICE

Based on the information provided, project nature and site Characteristics, we determined that the project proposed would not result in effects to listed species or designated critical habitat. Therefore, no consultation pursuant section 7 of the Endangered Species Act, as amended, is required.

Reviewer [signature] Date: 7/31/2018

for [signature] Date: 8/1/2018
Caribbean ES Field Supervisor

APPENDIX C.2

USFWS Consultation

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

July 20, 2018

Mr. Edwin Muñiz
Field Supervisor
U.S. Fish & Wildlife Service
Caribbean Ecological Field Office
P.O. Box 491
Boquerón, PR 00622

RE: Environmental Assessment for Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico

Dear Mr. Muñiz:

The Puerto Rico Port Authority (i.e., PRPA or Airport Sponsor) is proposing improvements to Runway 8-26 at Rafael Hernandez Airport (BQN), hereinafter referred to as the Proposed Project. Runway improvements are necessary due to deteriorating pavement conditions that could preclude safe aircraft operations over time. For reference, **Figure 1** depicts the geographic location of the Proposed Project.

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As part of our early coordination efforts for the EA, and on behalf of the PRPA, we are attempting to identify preliminary key issues that will need to be addressed in the NEPA process. To accomplish this we would like to receive your comments relative to the proposed improvements as they relate to your specific area of expertise or regulatory jurisdiction, including permitting or mitigation requirements.

Of note, additional project data and information will be developed during preparation of the EA, including locations of potential ancillary project elements such as onsite staging and materials storage areas, construction haul routes, and locations of batch plants, that may prompt you to provide additional comments on issues to be considered in the EA. Consequently, you will be invited to review and provide additional comments on the Draft EA upon publication.

To facilitate early notification of the Proposed Project and receipt of agency comments, an agency scoping meeting is being offered on August 1st, 2018 at 10:00 a.m. at the venue identified below. I encourage you to attend this meeting to discuss any questions or concerns your agency may have on the Proposed Project and/or materials included in this letter.

Aguadilla International Airport (BQN)
Conference Room – 2nd Floor
Air Rescue Building
Hangar St.
Aguadilla, Puerto Rico

If you are unable to attend this scoping meeting, your written comments are still requested. In order to sufficiently address any preliminary key project issues and maintain the project schedule, any written comments are requested by August 20th, 2018. Please respond to me at the address provided below and feel free to contact me if you have any questions or concerns.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708
felicia.reeves@faa.gov

Enclosures (4)

Copy: Romel Pedraza, PRPA
Paul Sanford, AECOM
Victor Morales, AECOM

U.S. FISH & WILDLIFE SERVICE

Based on the information provided, project nature and site Characteristics, we determined that the project proposed would not result in effects to listed species or designated critical habitat. Therefore, no consultation pursuant section 7 of the Endangered Species Act, as amended, is required.

Reviewer Date: 7/31/2018

Date: 8/1/2018
Caribbean ES Field Supervisor

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APPENDIX C.3

USACE Consultation

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
ANTILLES OFFICE
FUND. ÁNGEL RAMOS ANNEX BLDG., SUITE 202
383 FRANKLIN DELANO ROOSEVELT AVE.
SAN JUAN, PUERTO RICO 00918

REPLY TO ATTENTION OF

September 14, 2018

Regulatory Division
South Permits Branch
Antilles Permits Section
SAJ-2018-02710 (NPR-DCM)

Ms. Felicia K. Reeves
Noise/Environmental Program Manager
Federal Aviation Administration
Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337

Dear Ms. Reeves:

Reference is made to your letter dated July 20, 2018, requesting comments regarding proposed improvements to the Rafael Hernández (BQN) Airport, which is located within the premises of the former Ramey Air Force Base, Roads PR-107 & PR-110, Municipality of Aguadilla, Puerto Rico. Reference is also made to a Jurisdictional Wetland Assessment Report dated June 20, 2018, that was conducted for the referenced project, and which was submitted to our office on August 15, 2018. This case was assigned number SAJ-2018-02710 (NPR-DCM). Please refer to this number in future correspondence concerning this project.

According to the information provided, the proposed project would specifically consist of improvements to the currently deteriorated Runway 6-28 of the above-referenced airport, as to ensure safe aircraft operations. Two potential alternatives are currently being considered for this project. The first alternative entails the construction of a temporary runway 720 ft south of the existing runway, reconstruction of the existing runway, and conversion of the new temporary runway into a permanent full parallel taxiway (upon completion of the reconstruction of the existing runway). The second alternative entails the construction of a new permanent runway 500 ft south of the existing runway, and reconstruction of the existing runway into a permanent parallel taxiway. Any of the above-described alternatives would require discharges of dredge or fill material into waters of the United States.

Based on the information provided, the U.S. Army Corps of Engineers (Corps) has determined that the project as proposed will not require a Department of the Army (DA) permit in accordance with Section 10 of the Rivers and Harbors Act of 1899 as it is not located within the navigable waters of the United States. Furthermore, a permit will not be required in accordance with Section 404 of the Clean Water Act as it will not involve

the discharge of dredged or fill material into waters of the United States. Provided the work is done in accordance with the information and drawings provided, DA authorization will not be required.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination/decision, you may request an administrative appeal under Corps' regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination/decision, you must submit a completed RFA form to the South Atlantic Division Office at the following address:

Mr. Jason Steele
South Atlantic Division
U.S. Army Corps of Engineers
CESAD-CM-CO-R, Room 9M15
60 Forsyth St., SW.
Atlanta, Georgia 30303-8801.

Mr. Steele can be reached by telephone number at 404-562-5137, or by facsimile at 404-562-5138.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division office within 60 days of the date of the RFA. Should you decide to submit an RFA form, it must be received at the above address by **November 13, 2018**. It is not necessary to submit an RFA form to the Division office, if you do not object to the determination/decision in this letter.

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work. Please be advised this determination reflects current policy and regulations and is valid for a period of no longer than 5 years from the date of this letter unless new information warrants a revision of the determination before the expiration date. If after the 5-year period, the Corps has not specifically revalidated this determination, it will automatically expire. Any reliance upon this determination beyond the expiration date may lead to possible violation of current Federal laws and/or regulation.

This letter does not obviate the requirement to obtain any other Federal, State, or local permits that may be necessary for your project. Should you have any questions, please contact Mrs. Deborah J. Cedeño-Maldonado, Project Manager, at the letterhead address, by email at Deborah.J.Cedeno-Maldonado@usace.army.mil, or by telephone at 787-289-7036.

Thank you for your cooperation with our permit program. The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to take a few minutes to visit http://per2.nwp.usace.army.mil/survey.html and complete our automated Customer Service Survey. Your input is appreciated – favorable or otherwise. Please be aware this web address is case sensitive and should be entered as it appears above.

Sincerely,

for Sindulfo Castillo
Chief, Antilles Regulatory Section

Enclosures

Regulatory Program

INTERIM APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers
This form should be completed by following the instructions provided
in the Interim Approved Jurisdictional Determination Form User Manual.

SECTION I: BACKGROUND INFORMATION

A. COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (AJD): Septemer 14, 2018

B. ORM NUMBER IN APPROPRIATE FORMAT (e.g., HQ-2015-00001-SMJ): SAJ-2018-02710-DCM

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State:PR County/parish/borough: City: Aguadilla
Center coordinates of site (lat/long in degree decimal format): Lat. 18.492122°, Long. -67.134479°.
Map(s)/diagram(s) of review area (including map identifying single point of entry (SPOE) watershed and/or potential jurisdictional areas where applicable) is/are: ☒ attached ☐ in report/map titled BQN Airport Aguadilla - Review Area.
☐ Other sites (e.g., offsite mitigation sites, disposal sites, etc.) are associated with this action and are recorded on a different jurisdictional determination (JD) form. List JD form ID numbers (e.g., HQ-2015-00001-SMJ-1): .

D. REVIEW PERFORMED FOR SITE EVALUATION:
☒ Office (Desk) Determination Only. Date: September 14, 2018.
☐ Office (Desk) and Field Determination. Office/Desk Dates: Field Date(s): .

SECTION II: DATA SOURCES

Check all that were used to aid in the determination and attach data/maps to this AJD form and/or references/citations in the administrative record, as appropriate.
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant. Title/Date: Maps and information provided by applicant in document titled Final Report Jurisdictional Wetland Assessment - Rafael Hernandez Airport (BQN) Runway Improvements, submitted on August 15, 2018.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Data sheets/delineation report are sufficient for purposes of AJD form. Title/Date: .
☐ Data sheets/delineation report are not sufficient for purposes of AJD form. Summarize rationale and include information on revised data sheets/delineation report that this AJD form has relied upon: .
Revised Title/Date: .
☐ Data sheets prepared by the Corps. Title/Date: .
☐ Corps navigable waters study. Title/Date: .
☐ CorpsMap ORM map layers. Title/Date: .
☐ USGS Hydrologic Atlas. Title/Date: .
☐ USGS, NHD, or WBD data/maps. Title/Date: .
☐ USGS 8, 10 and/or 12 digit HUC maps. HUC number: .
☐ USGS maps. Scale & quad name and date: .
☐ USDA NRCS Soil Survey. Citation: .
☒ USFWS National Wetlands Inventory maps. Citation: USFWS National Wetland Inventory Wetland Mapper (https://www.fws.gov/wetlands/Data/Mapper.html).
☐ State/Local wetland inventory maps. Citation: .
☐ FEMA/FIRM maps. Citation: .
☒ Photographs: ☒ Aerial. Citation: Google Earth; March 30, 2016. or ☐ Other. Citation: .
☐ LiDAR data/maps. Citation: .
☐ Previous JDs. File no. and date of JD letter: .
☐ Applicable/supporting case law: .

☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

SECTION III: SUMMARY OF FINDINGS

Complete ORM "Aquatic Resource Upload Sheet" or Export and Print the Aquatic Resource Water Droplet Screen from ORM for All Waters and Features, Regardless of Jurisdictional Status – Required

A. RIVERS AND HARBORS ACT (RHA) SECTION 10 DETERMINATION OF JURISDICTION:
☐ "*navigable waters of the U.S.*" within RHA jurisdiction (as defined by 33 CFR part 329) in the review area.
- **Complete Table 1 - Required**

NOTE: If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Section 10 navigable waters list, DO NOT USE THIS FORM TO MAKE THE DETERMINATION. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Section 10 RHA navigability determination.

B. CLEAN WATER ACT (CWA) SECTION 404 DETERMINATION OF JURISDICTION: "*waters of the U.S.*" within CWA jurisdiction (as defined by 33 CFR part 328.3) in the review area. **Check all that apply.**
☐ (a)(1): All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide. (Traditional Navigable Waters (TNWs))
- **Complete Table 1 - Required**

☐ This AJD includes a case-specific (a)(1) TNW (Section 404 navigable-in-fact) determination on a water that has not previously been designated as such. Documentation required for this case-specific (a)(1) TNW determination is attached.

☐ (a)(2): All interstate waters, including interstate wetlands.
- **Complete Table 2 - Required**

☐ (a)(3): The territorial seas.
- **Complete Table 3 - Required**

☐ (a)(4): All impoundments of waters otherwise identified as waters of the U.S. under 33 CFR part 328.3.
- **Complete Table 4 - Required**

☐ (a)(5): All tributaries, as defined in 33 CFR part 328.3, of waters identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 5 - Required**

☐ (a)(6): All waters adjacent to a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.
- **Complete Table 6 - Required**

☐ Bordering/Contiguous.
Neighboring:
☐ (c)(2)(i): All waters located within 100 feet of the ordinary high water mark (OHWM) of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3.
☐ (c)(2)(ii): All waters located within the 100-year floodplain of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3 and not more than 1,500 feet of the OHWM of such water.
☐ (c)(2)(iii): All waters located within 1,500 feet of the high tide line of a water identified in paragraphs (a)(1) or (a)(3) of 33 CFR part 328.3, and all waters within 1,500 feet of the OHWM of the Great Lakes.

☐ (a)(7): All waters identified in 33 CFR 328.3(a)(7)(i)-(v) where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 7 for the significant nexus determination. Attach a map delineating the SPOE watershed boundary with (a)(7) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☐ (a)(8): All waters located within the 100-year floodplain of a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3 not covered by (c)(2)(ii) above and all waters located within 4,000 feet of the high tide line or OHWM of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3 where they are determined on a case-specific basis to have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 8 for the significant nexus determination. Attach a map delineating the SPOE watershed boundary with (a)(8) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

C. NON-WATERS OF THE U.S. FINDINGS:

Check all that apply.

☐ The review area is comprised entirely of dry land.

☐ Potential-(a)(7) Waters: Waters that DO NOT have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.

- **Complete Table 9 and attach a map delineating the SPOE watershed boundary with potential (a)(7) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☐ Potential-(a)(8) Waters: Waters that DO NOT have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.

- **Complete Table 9 and attach a map delineating the SPOE watershed boundary with potential (a)(8) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☒ Excluded Waters (Non-Waters of U.S.), even where they otherwise meet the terms of paragraphs (a)(4)-(a)(8):

- **Complete Table 10 - Required**

☐ (b)(1): Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA.

☐ (b)(2): Prior converted cropland.

☐ (b)(3)(i): Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

☐ (b)(3)(ii): Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

☒ (b)(3)(iii): Ditches that do not flow, either directly or through another water, into a water identified in paragraphs (a)(1)-(a)(3).

☐ (b)(4)(i): Artificially irrigated areas that would revert to dry land should application of water to that area cease.

☐ (b)(4)(ii): Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds.

☐ (b)(4)(iii): Artificial reflecting pools or swimming pools created in dry land.[1]

☐ (b)(4)(iv): Small ornamental waters created in dry land.[1]

☐ (b)(4)(v): Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water.

☐ (b)(4)(vi): Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways.[1]

☐ (b)(4)(vii): Puddles.[1]

☐ (b)(5): Groundwater, including groundwater drained through subsurface drainage systems.[1]

☐ (b)(6): Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.[1]

☐ (b)(7): Wastewater recycling structures created in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

☐ Other non-jurisdictional waters/features within review area that do not meet the definitions in 33 CFR 328.3 of (a)(1)-(a)(8) waters and are not excluded waters identified in (b)(1)-(b)(7).

- **Complete Table 11 - Required.**

D. ADDITIONAL COMMENTS TO SUPPORT AJD: Based on the information provided by the applicant and other supplementary data evaluated for this JD (see checked items in Section II of this form), there are no Corps' jurisdictional waters within the review area.

[1] In many cases these excluded features will not be specifically identified on the AJD form, unless specifically requested. Corps Districts may, in case-by-case instances, choose to identify some or all of these features within the review area.

Non-Jurisdictional Waters

Table 1. Non-Waters/Excluded Waters and Features

Paragraph (b) Excluded Feature/Water Name	Rationale for Paragraph (b) Excluded Feature/Water and Additional Discussion.
EXCLDB3III	The review area for this JD includes man-made ditches excavated in uplands as part of the construction of the stormwater infrastructure of the BQN Airport. According to the information provided by the applicant, including a jurisdictional wetland assessment report conducted for the project area, and other supplementary information reviewed by the Corps, including aerial photography, these ditches are not connected downstream or upstream to any other aquatic feature, and do not flow, directly or through another water, into a traditional navigable water, interstate water, or territorial sea ((a)(1)-(a)(3) waters).

Waters_Name	State	Cowardin Code	Hgm Co	Meas Type	Amount	Units	Waters_Type	Latitude	Longitude	Loca	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Simil	Sim !	Adjc	Func	Func	Func	Func	Func	Func	Func	Func	Ix	Prov	Life Cycle	Depdnt
Ditches	PR	R6-RIVERINE, EPHEMERAL		AREA	0.5	ACRES	EXCLDB3III	18.49212	-67.13448																																					

APPENDIX C.4

Section 106 NHPA Consultation and Memorandum of Agreement

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Atlanta Airports District Office

1701 Columbia Avenue
Suite 220
College Park, Georgia 30337

June 11, 2015

Ms. Marinés Colón González, M.A.
Historic Property Specialist
Archaeology
State Historic Preservation Office
P.O. Box 9023935
San Juan, Puerto Rico 00902-3935

Re: National Historic Preservation Act, Section 106 Consultation - National Register Eligibility Determination for Eligible Resources at the Aguadilla Rafael Hernandez (BQN) Airport

Dear Ms. Gonzáles:

The Puerto Rico Ports Authority (PRPA) is preparing a planning and justification study to evaluate alternatives for the reconstruction of Runway 8-28 at the Aguadilla Rafael Hernandez (BQN) Airport. The planning study is partially funded by the Federal Aviation Administration. As part of the over-all planning study effort, Kimley Horn, utilizing the archaeological consulting services of AM Group, completed a Cultural Resource Assessment Survey (CRAS) of the area and included a IA-IB-level archaeological survey(encl). The survey was performed in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966 (Public Law 102-575) as amended in 1992, 36 CFR Part 800: Protection of Historic Properties from the Advisory Council on Historic Preservation, the guide to archaeological investigations of the State Historic Preservation Officer and the *Reglamento para la Radicación y Evaluación Arqueológica de Proyectos de Construcción y Desarrollo del Consejo para la Protección del Patrimonio Aequeológico Terrestre de Puerto Rico* designated to the Puerto Rican Cultural Institute (ICP, Spanish Acronymn).

The objective of the CRAS was to identify National Register (NR) listed, eligible, and potentially eligible properties located in the Runway 8-28 project area. The study scope also included eligibility evaluations, in accordance with the criteria at 36 CFR 60.4, for all potentially eligible properties not previously evaluated.

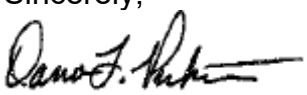
The archaeological field work found remnants of foundations from structures previously demolished during the construction and demolition of the Rafael Hernández Airport. The research indicates that foundation ruins located east of Taxiway Charlie are likely remnants of the village of San Antonio that was relocated when the Army built or expanded the air base. West of Taxiway Charlie, the foundation ruins are likely those of buildings built by the U.S. military. While the foundation ruins discovered are more than 50 years old, triggering an eligibility review, we conclude they are not eligible for listing in the NR per the information contained in the CRAS and that no further study is required.

The purpose of this letter is to seek your concurrence with our finding that resources identified in the CRAS, as requiring a NR eligibility evaluation, do not meet the necessary criteria for listing and no further study is required.

We recognize the volume of coordination letters processed by your office and as always we appreciate your expeditious review and response by whatever means is easiest and most and efficient for you. You may provide your response to the above address; via facsimile, (404) 305-7155; or via e-mail, dana.perkins@faa.gov.

If you have questions or need additional information, please contact me at the above e-mail address or by phone at (404) 305-6749.

Sincerely,



Dana L. Perkins
Environmental Program Manager

Enclosure:
Alternatives for the Reconstruction of Runway 08/26, Rafael Hernandez Airport Aguadilla PR, Stage I Archaeological Survey Report

cc (w/o encl):
Mr. Jorge Suarez Pérez-Guerra/Ms. Milagros Rodriguez Castro, PRPA
Ms. Eileen M. Vélez-Vega, PE, Kimley Horn Puerto Rico, LLC
Mr. Arql. Fernando Alvarado Muñoz, AM Group

COMMONWEALTH OF
PUERTO RICO
Ports Authority

August 7, 2015

Marinés Colón González, M.A.
Historic Property Specialist
Archaeology
State Historic Preservation Office
P.O. Box 9023935
San Juan, P.R. 00902-3935

RE: Cultural Resource Assessment Survey for the Alternatives Study for the Reconstruction of Runway 8-26 at the Aguadilla Rafael Hernandez (BQN) Airport

Enclosed please find the completed Cultural Resource Assessment Survey (CRAS) for the above-referenced project that is being submitted for review. The following documents are attached:

- One electronic copy of the CRAS Final Report

The objective of this survey was to assess potentially significant cultural resources considered to be eligible for listing on the National Register of Historic Places (NRHP) according to the criteria set forth in 36 CFR Section 60.4. The field work was conducted in compliance with the provisions of Section 106 of the National Historic Preservation Act of 1966 (Public Law 102-575) as amended in 1992, 36 CFR Part 800: Protection of Historic Properties from the Advisory Council on Historic Preservation, and with the regulations of the Law 112, better known as the Protection of the Terrestrial Archaeological Heritage Law of Puerto Rico.

The Puerto Rico Ports Authority (PRPA) retained the services of Kimley-Horn Puerto Rico, LLC (KHPR) to evaluate alternatives for the reconstruction of Runway 8/26 at Rafael Hernandez Airport (BQN) in Aguadilla.

Runway 8-26 is an 11,700 foot runway which is the longest runway in the Caribbean. It is the only runway at the airport. Runway pavements consists of both Asphaltic Concrete and Portland Cement Concrete sections. The main objective of this study is to determine the best phasing alternative for the rehabilitation/reconstruction of the runway that minimizes operational impacts at the airport, provides the most reasonable construction costs and generates the lowest economic impact to the airport and the airlines' operations. The study includes several alternatives for the Runway 8-26 reconstruction including the extension of Taxiway Mike which would be used as a temporary runway during the reconstruction of Runway 8-26.

A Cultural Resource Assessment Survey was conducted for the project and included a phase IA-IB-level archaeological inquiry, taking into consideration the guide to archaeological investigations of the State Historic Preservation Officer and the "*Reglamento para la Radicación y Evaluación Arqueológica de Proyectos de Construcción y Desarrollo del Consejo para la Protección del*

P.O. Box 362829
San Juan, PR 00936-2829
www.prpa.pr.gov

PUERTO RICO PORTS AUTHORITY

Patrimonio Arqueológico Terrestre de Puerto Rico" designated to the Puerto Rican Cultural Institute (ICP, Spanish acronym).

We are seeking funding for the project from the Federal Aviation Administration (FAA) and will be preparing documentation to show compliance with the National Environmental Policy Act (NEPA). As such, we are requesting your concurrence on the findings in the CRAS. If you have any questions regarding the subject project, please contact Eileen M Vélez-Vega, Kimley-Horn Puerto Rico, LLC at 787-782-5050.

Sincerely,

Jorge Suárez Pérez-Guerra
Assistant Executive Director for
Planning, Engineering, Construction
and Environmental Affairs
Puerto Rico Ports Authority

c: Dana Perkins, FAA Atlanta ADO
Eileen M Vélez-Vega, PE, Kimley-Horn Puerto Rico, LLC
Arql. Fernando Alvarado Muñoz, AM Group

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Oficina Estatal de Conservación Histórica
State Historic Preservation Office

Received 12/7/15 eew

December 1, 2015

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

Our Office has received and reviewed a cultural resources assessment survey report (Stage I) titled "Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport, Aguadilla, PR".

The State Historic Preservation Officer (SHPO) advises and assists federal agencies and other responsible entities in the identification, evaluation and assessment of effects on historic properties (district, site, buildings, structure or object) of projects, activities or programs requiring a Federal permit, license or approval. The authority for these procedures is contained in the National Historic Preservation Act, as amended. In order for the SHPO better assist you in fulfilling your section 106 responsibilities, please provide us with the following documentation:

1. Section 106 delivery control form. Please include total amount of federal funds to be assigned.

2. A detailed written description of the project, including related activities to be carried out in conjunction with the project. If an application was submitted for Federal funding, licenses, or permits, please provide a copy of the application.

3. Project information:
   a) Area of the project in acres.
   b) As-found or as-built plans of the building/structure(s) to be affected by the project saved as a PDF file and included with printed copies, size 11"x17".
   c) Schematic or preliminary drawings (floor plans, elevations, sections) that show the proposed project design saved as a PDF file and included with printed

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.gobierno.pr

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OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE
OFFICE OF THE GOVERNOR
OECH

copies, size 11"x17".

4. Determine and document the proposed boundaries of the project's Area of Potential Effect (APE) - geographic area where the project could have a direct or indirect effect on historic properties.

5. Measures taken to provide the public with information about this undertaking and its effects on historic properties, as well as to seek public comment and input.

Regarding the Stage I report and pending a formal definition of the project's APE, we hereby submit some initial comments and recommendations for your consideration. The document should omit that the survey was requested by the Puerto Rico State Historic Preservation Office (page 51) as this is the first submittal to us related to this undertaking. All drawings contained in the document are printed in a very small scale; please reprint and include at a legible scale. After analyzing the results of the archival research, we can infer that there is a high probability of historic structures remains; therefore, the implementation of a 50 meter interval subsurface testing strategy at the West side of the taxiway appears too large.

The Rafael Hernández International Airport [Borinquen (BQN) Airport], is located within the boundaries of the former *Ramey Air Force Base*, a potentially eligible district to the *National Register of Historic Places*. As a result of this survey, several structures remains - allegedly made of concrete and lime - of unknown significance were identified in the surveyed area that perhaps are associated with the San Antonio village (c. late XIX century) and with the military use of the land (c. early XX century – WWII – Cold War context). The Stage I report does not evidence the application of the *National Register of Historic Places* criteria and their associated aspects of integrity in evaluating the historic significance of these properties; therefore, we believe that any determination of eligibility or finding of effect on historic properties regarding this undertaking, at this time, would be premature.

You should evaluate the historic significance of these properties in consultation with our Office as per 36 CFR 800.4 (c)(1). An intensive survey should be carried out consistent with the Secretary of the Interior Standards and Guidelines for Identification and Evaluation; therefore we request an intensive survey work plan for our review and concurrence prior to implementation.

Cuartel de Ballajá (Tercer Piso)
Calle Norzagaray Esquina Beneficencia Viejo San Juan, PR 00901

PO Box 9023935 San Juan, PR 00902-3935
Tel. 787-721-3737 Fax 787-721-3773
www.oech.gobierno.pr

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STATE HISTORIC PRESERVATION OFFICE

SHPO: 10 29 15 07 RECONSTRUCTION OF RUNWAY 8 26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

As soon as we receive the requested information, the revised Stage I survey report and the intensive survey work plan, we will continue with our review of this project. If you have any questions, please contact Archaeologist Marinés Colón, Historic Property Specialist, at mcolon@prshpo.pr.gov or (787) 721-3737.

Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez-Vega, PE, Kimley Horn Puerto Rico, LLC

Cuartel de Ballajá (Tercer Piso)
Calle Norzagaray, Esquina Beneficencia Viejo San Juan, PR 00901

PO Box 9023935, San Juan, PR 00902-3935
Tel. 787-721-3737 Fax 787-721-3773
www.oech.gobierno.pr

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State Historic Preservation Office

January 8, 2016

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

A meeting was requested by the archaeology consultant in order to clarify comments included in our letter dated December 1, 2015 related to the archaeological reconnaissance survey report prepared for the above referenced project. At said meeting, held in our Office on December 14, 2015, the archaeology consultant handed us a set of documents with highlighted and flagged pages without a cover letter.

These documents comprise a 15-page "Scope of Services" prepared by Kimley Horn Puerto Rico, LLC for the Puerto Rico Ports Authority (PRPA), a 32-page "Professional Services Agreement" between PRPA and Kimley Horn, and a 137-page "Evaluation of Alternatives", also prepared by Kimley Horn for PRPA that includes condition and operational assessments, formulation of alternatives and technical considerations, an alternative analysis and selection of preferred alternatives and an environmental and funding analysis with recommendations.

These documents do not address the information requested in our December 1 letter. It is still unclear to us as to what is the undertaking. We need a detailed written description of the project, including related activities to be carried out in conjunction with the project. Also, as commented in our last letter dated December 1, 2015, all drawings presented are printed in an unreadable scale; to review please enlarge and resubmit at a legible scale, saved as a PDF file and included with printed copies size 11"x17".

Also pending is a formal determination and documentation of the project's Area of Potential Effect boundaries by the federal agency. Please fill out and submit include the "Section 106 Delivery Control Form" (enclosed and also available on our web

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.gobierno.pr

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SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

page www.oech.pr.gov).

As soon as we receive the requested information, the revised Stage I survey report and the intensive archaeological survey work plan, we will continue with our review of this project. If you have any questions, please contact Archaeologist Marinés Colón, Historic Property Specialist, at mcolon@prshpo.pr.gov or (787) 721-3737.

Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez-Vega, PE, Kimley Horn Puerto Rico, LLC

Enclosure

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
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State Historic Preservation Office

Formulario para el control de entrega.
Proyectos de sección 106

(Delivery control form 106 Section)

SHPO OECH
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OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE
OFFICE OF THE GOVERNOR

Sección A. Información a ser llenada por el proponente* **(Section A. Information to be filled by proponent)**			
Nombre del Proyecto/ Project's name			Número de referencia federal/ Reference federal number
Municipio/ Municipality	Barrio/ Ward	Nombre del Proponente/ Proponent's name	
Agencia Federal/ Federal Agency		Total de fondos federales solicitados/ Total of federal funds to be requested	Total de acres/ Total amount of acres
Nombre de la persona que entrega/ Name of person who delivers		Firma/Signature	
Sección B. Información a ser llenada por la OECH al momento de la entrega del proyecto **(Section B. Information to be filled by SHPO upon delivery)**			
Fecha de entrega en la OECH/ SHPO delivery date		Nombre y firma de la persona que recibe/ Name and signature of person who received	

* **Para poder cumplir su labor ministerial la OECH requiere que la Sección A de este formulario sea completada en su totalidad. Por tal razón, no se aceptarán proyectos que incumplan este requerimiento.**
(To carry out our duties, the SHPO requires that Section A of this form be totally filled-out. For this reason, we will not accept an incomplete form.)

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica
State Historic Preservation Office

Wednesday, August 15, 2018

Ms. Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves:

Our Office received correspondence on July 25, 2018 related to the above referenced project. Said submission includes a cover letter and 4 drawings over a segment of a topographic map (Figure 1) and aerial photographs (Figures 2-4).

According to information submitted, the Puerto Rico Ports Authority will consider two separate development concepts for this undertaking, named Alternative 1A and 2A (with variations), to be evaluated as part of the Environmental Assessment (EA). Your letter proposes an Area of Potential Effects (APE) within which this undertaking may directly or indirectly cause alterations to the character or use of historic properties.

Considering that the proposed undertaking, as presented, only encompasses the reconstruction of Runway 8-26 and no additional vertical features, we believe the APE proposed for the historic architectural resources - that comprises the predicted composite 60 decibel day-night average sound level (DNL 60 dB) noise contour - is appropriate. However, the identification of all buildings and/or structures within the agreed APE should be included in the new cultural resources assessment.

Regarding the Area of Potential Effects where any degree of ground disturbance - including demolition - is foreseen, we hereby request it depicted in a scale drawing over each alternative including the proposed 100 feet buffer. Once submitted and evaluated, we'll determine our concurrence.

As stated in your letter, our comments and recommendations regarding previous identification efforts should be considered in the preparation of a new cultural resources (above-ground and archaeological) assessment report to be

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.pr.gov

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SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

included in the EA.

Please be advised that your agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in 36 CFR 800.3 through 800.6, if the SHPO and the Advisory Council on Historic Preservation have been notified in advance that he/she intends to do so and the standards set forth in §800.8 (c) (1) are met.

As soon as we receive the requested information, we will continue with our review of this project. If you have any questions, please contact our Office at (787) 721-3737.

Sincerely,

Carlos A. Rubio Cancela
State Historic Preservation Officer

CARC/GMO/BRS/MDT/MC

c Eng. Romel Pedraza, Assistant Executive Director in Planning, Engineering and Construction, Puerto Rico Ports Authority

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.gobierno.pr

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

August 13, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

On 13 Feb 19, the Federal Aviation Administration (FAA), in conjunction with the Puerto Rico Port Authority (PRPA), conducted a meeting with the Puerto Rico State Historic Preservation Office (PR-SHPO). The purpose of the meeting was to brief your office on the status of the Environmental Assessment (EA), ongoing cultural resources studies and identify/discuss any concerns of the PR-SHPO.

Per the 13 Feb 19 teleconference, the FAA understands 1) we are in the identification phase of the Section 106 National Historic Preservation Act (NHPA) consultation; 2) consultations are a federal-to-federal interaction between the PR-SHPO and the FAA; 3) the FAA needs to demonstrate consideration of avoidance alternatives for any significant resources; and 4) to support the identification phase, the PR-SHPO request additional analysis of potentially important features within the Areas of Potential Effect (APEs). For reference, see enclosed exhibits.

Regarding item #4, to date, the analysis has focused on archaeological excavation in areas of proposed runway pavement, as well as a NHPA criteria appraisal of potentially significant architectural structures to the south of the proposed runway alternatives, which are slated for demolition. During the 13 Feb 19 teleconference, the PR-SHPO recommended that additional analysis be conducted in our APEs to support the identification phase of this consultation. We understood this to entail conducting an NHPA appraisal of <u>all</u> buildings and/or structures in our APEs, even if they are not expected to be impacted or altered by the proposed undertaking, as well as an equal appraisal of existing runway pavements in our APEs.

The FAA seeks to ensure full compliance with the additional work as described in this letter. Please confirm the FAA understands the PR-SHPO's comments per 13 Feb 19 meeting.

The FAA issued a grant to PRPA to initiate this EA in 2017. The FAA understands PRPA recently changed contractor support. The FAA concurs with this change however it has delayed further consultation with your office. Additionally, the FAA understands the new contract support is responsible for completing the cultural resources analysis and assisting the FAA's consultation with your office (see enclosed Scope of Work and exhibits). Consequently, prior to performing additional work, the FAA seeks assistance from your office to fully understand PR-SHPO's 13 Feb 19 requests.

Based on PR-SHPO's response to this letter, PRPA will provide a draft detailed work plan to the FAA outlining additional investigative work required. The FAA will consult with your office on the draft work plan prior to proceeding.

Please contact me via email or phone for additional information.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708
felicia.reeves@faa.gov

Enclosure (1)

Copy: Romel Pedraza, PRPA
Paul Sanford, AECOM
Victor Morales, AECOM

SCOPE OF WORK
CULTURAL RESOURCES SUPPORT SERVICES
FOR RUNWAY 08-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT
AT
RAFAEL HERNANDEZ AIRPORT
(rev1, 09 June 2019)

BACKGROUND

AECOM is currently assisting the Puerto Rico Ports Authority (PRPA) and the Federal Aviation Administration (FAA) Atlanta Airports District Office (ADO) in preparing an Environmental Assessment (EA) for the reconstruction of Runway 8-26 at Rafael Hernandez Airport, Aguadilla, Puerto Rico (BQN). The EA focuses on two primary alternatives for project implementation.

As proposed, the alternatives being studied in the EA (**Attachment A**) have high potential to significantly adversely affect historic and archaeological resources in the project area. Pursuant to Section 106 of the National Historic Preservation Act (NHPA), consultation with the Puerto Rico State Historic Preservation Office (PR-SHPO) has been initiated by the FAA ADO and is ongoing.

To date, cultural resources assessment services have been rendered for this project by a subcontractor to AECOM. The subcontractor has been participating in the project since inception of planning studies in 2014-2015. Based on independent technical review, FAA review, and PR-SHPO comments on their work products, FAA has determined that the documentation produced to date is insufficient to meet the requirements of the NHPA, the National Environmental Policy Act (NEPA), and FAA's NEPA implementation Orders (i.e., 1050.1F, *Environmental Impacts, Policies and Procedures,* and Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*).

Further, in a 13 February 2019 teleconference between the FAA, the PRPA, AECOM and the PR-SHPO, the PR-SHPO has requested that, to support the investigation phase of the Section 106 consultation, additional investigation (above and beyond what has been studied to date be previous subcontractor) should be performed in the project Areas of Potential Effect (APE) as outlined on **Attachment A**.

It is the position of the FAA ADO that the reports will be rejected until such a time that all internal review and PR-SHPO comments have been adequately addressed. PRPA concurs with this determination and has requested a plan of action from AECOM to further the Section 106 process required for the EA. See **Attachment B** for the related FAA/PRPA communications on this matter.

This Scope of Work has been issued such that AECOM can provide data collection, field reconnaissance, documentation, consultation and mitigation support services necessary to

complete Section 106 consultation procedures for the EA, such that the EA can advance. AECOM's proposed fee for these services is included as **Attachment C**.

TASK 1 DATA COLLECTION/BACKGROUND RESEARCH

Task 1.1 Historic Architecture

AECOM will develop historic and architectural contexts for historic resources identified within the project's historic architecture Area of Potential Effects (APE). These resources will include hangars and other resources associated with the former Borinquen Field Army Air Base and resources associated with Borinquen's successor, Ramey Air Force Base (AFB). Research will be conducted: at libraries and historical associations within Aguadilla and San Juan, including the collections of the Ramey AFB Historical Association and Museum; at the research libraries of Duke University, North Carolina State University, and the University of North Carolina at Chapel Hill; and at online digital repositories, including those of the Department of Defense Legacy Resource Management Program. AECOM will additionally develop historical and architectural contexts for any other historic resources identified within the APE.

Task 1.2 Archaeology

The project will include background research to gain further information on archaeological sites in the region to provide a context for identifying likely locations of unrecorded archaeological sites that may remain within the current project area. To achieve this goal, AECOM will review archaeological reports, archaeological site files, historic period maps, and other secondary documents and histories. In addition, data on past land use modifications will be collected and reviewed, such as historic maps, historic aerial photography, and soils mapping.

Deliverable(s): None

TASK 2 FIELD SURVEY AND RECONNAISSANCE

Task 2.1 Work Plan Development and Coordination with PR-SHPO

AECOM will develop draft work plans for historic architectural and archaeological resources for submission to the PR-SHPO. AECOM will prepare final work plans that address comments by the PR-SHPO.

Deliverable(s): One (1) Draft and one (1) Final Work Plan. Electronic Format

Task 2.2 Historic Architecture Survey

AECOM will conduct an intensive-level field survey that includes identifying, analyzing and evaluating all properties 50 years old and older, or of exceptional importance, within the historic architecture APE. Potentially significant airfield pavements at BQN will be included in this appraisal per PR-SHPO request. This survey will include digital photography of resources,

settings, landscape features, and any alterations to resources that might affect their integrity. It will also document the relationship of resources to each other and any potential historic district.

Deliverable(s): None

Task 2.3 Archaeology Survey

Archaeological fieldwork will begin with systematic pedestrian reconnaissance of the entire APE to evaluate current conditions and identify any archaeological resources visible on the surface. This will be followed by systematic shovel test pit excavation where needed. Specific field testing methodologies will be refined in the work plan for SHPO review, but in general, shovel test transects will be spaced at either 25 meter (75 foot) intervals, 50 meter (150 foot), and 100 meter (300 foot) intervals and shovel test pits (STPs) along transects likewise will be spaced at 25 meter (75 foot) intervals, 50 meter (150 foot), and 100 meter (300 foot) intervals. STPs will be square, approximately 50 centimeters (18 inches) in diameter, and excavated by natural stratigraphy with a long handled shovel into culturally sterile subsoil or to a maximum of one meter in depth. All soils removed from the STP will be screened using quarter-inch wire mesh for uniform artifact recovery. Detailed notes for each STP will be recorded on standardized field forms. Where cultural materials are recovered, a series of close-interval (10 meter/33 feet) STPs will be deployed to determine the horizontal extent of the archaeological site. The locations of all STPs will be recorded in the field using a differentially corrected sub-meter accurate GPS device.

The scope of work assumes that AECOM will be able to sample areas previously investigated within the project area to validate the results of the earlier work and will not have to conduct systematic shovel testing over the entire APE. If this approach is not allowed by the PR-SHPO, additional field efforts would be required in a modification to this Scope.

Deliverable(s): None

TASK 3 CULTURAL RESOURCES ASSESSMENT SURVEY REPORT

Task 3.1 Historic Architecture

AECOM will prepare a draft historic architectural Cultural Resource Assessment Survey (CRAS) Report for submittal to the PR-SHPO. The CRAS will include a project description, methodology, relevant historic and architectural contexts, and bibliography. It will also include histories and descriptions of each individual recorded historic resource and historic district, as well as integrity and significance statements that will support recommendations of National Register of Historic Places (NRHP) eligibility of the recorded resources. To assist in its eligibility recommendations, AECOM will consult previous Department of Defense Legacy Program studies that include histories of, contexts for, and proposed NRHP eligibility requirements for Army Air Fields, Air Force Bases, and their associated resources dating from World War II and the Cold War. Following review, AECOM will prepare a final historic architectural CRAS that addresses comments by the PR-SHPO.

Task 3.2 Archaeology

AECOM will prepare a draft archaeological Cultural Resource Assessment Survey (CRAS) Report for submittal to the PR-SHPO. The CRAS will include a project description, methodology, relevant archaeological contexts, and bibliography. It will also include descriptions of any archaeological resources identified, as well as integrity and significance statements that will support recommendations of National Register of Historic Places (NRHP) eligibility of the recorded resources. Following review, AECOM will prepare a final archaeological CRAS that addresses comments by the PR-SHPO.

Deliverable(s): One (1) Draft and three (3) Final CRAS. The Draft will be provided to FAA and PRPA electronically for review and comment. The Final will be delivered both electronically and in hard copy (1) to the PR-SHPO under FAA Atlanta ADO signature. Hard copies (2) will also be provided to PRPA and FAA. AECOM is responsible for all printing, reproduction and shipping costs associated with report transmittal.

TASK 4 SHPO CONSULTATION SUPPORT

AECOM will provide cultural resources subject matter experts in archaeology and architectural history to facilitate discussion, review, and consultation between the FAA and the PR SHPO. The current scope assumes that no in-person meetings in Puerto Rico will be required for this task.

Deliverable(s): None

TASK 5 MITIGATION PLANNING AND MEMORANDUM OF AGREEMENT SUPPORT SERVICES

Task 5.1 Development of Mitigation Options

If project plans cannot be altered in order to prevent impacts to historic or archaeological properties that are eligible for listing on the NRHP, treatment plans must be developed that limit adverse effects or allow for alternative mitigation measures. AECOM will develop mitigation plans for resources that cannot be avoided through project re-design, but implementation of any required mitigation measures are not included in this Proposal. The current scope assumes that no in-person meetings in Puerto Rico will be required for this task.

Deliverable(s): One (1) Draft and one (1) Final Mitigation Plan. Electronic Format

Task 5.2 Memorandum of Agreement Development

Mitigation of impacts to historic or archaeological properties that are eligible for listing on the NRHP will also require development of a Memorandum of Agreement (MOA) between the FAA and the SHPO. AECOM will facilitate and support the development and drafting of an MOA, if

needed. The current scope assumes that no in-person meetings in Puerto Rico will be required for this task.

Deliverable(s): One (1) Draft and up to two (2) Final MOA Documents. The Draft will be provided to FAA and PRPA electronically for review and comment. The Final will be delivered both electronically and in hard copy (1) to the FAA. One (1) hard copy can also be sent to PR-SHPO under this scope of work.

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ATTACHMENT A – EA ALTERNATIVES AND AREAS OF POTENTIAL EFFECT

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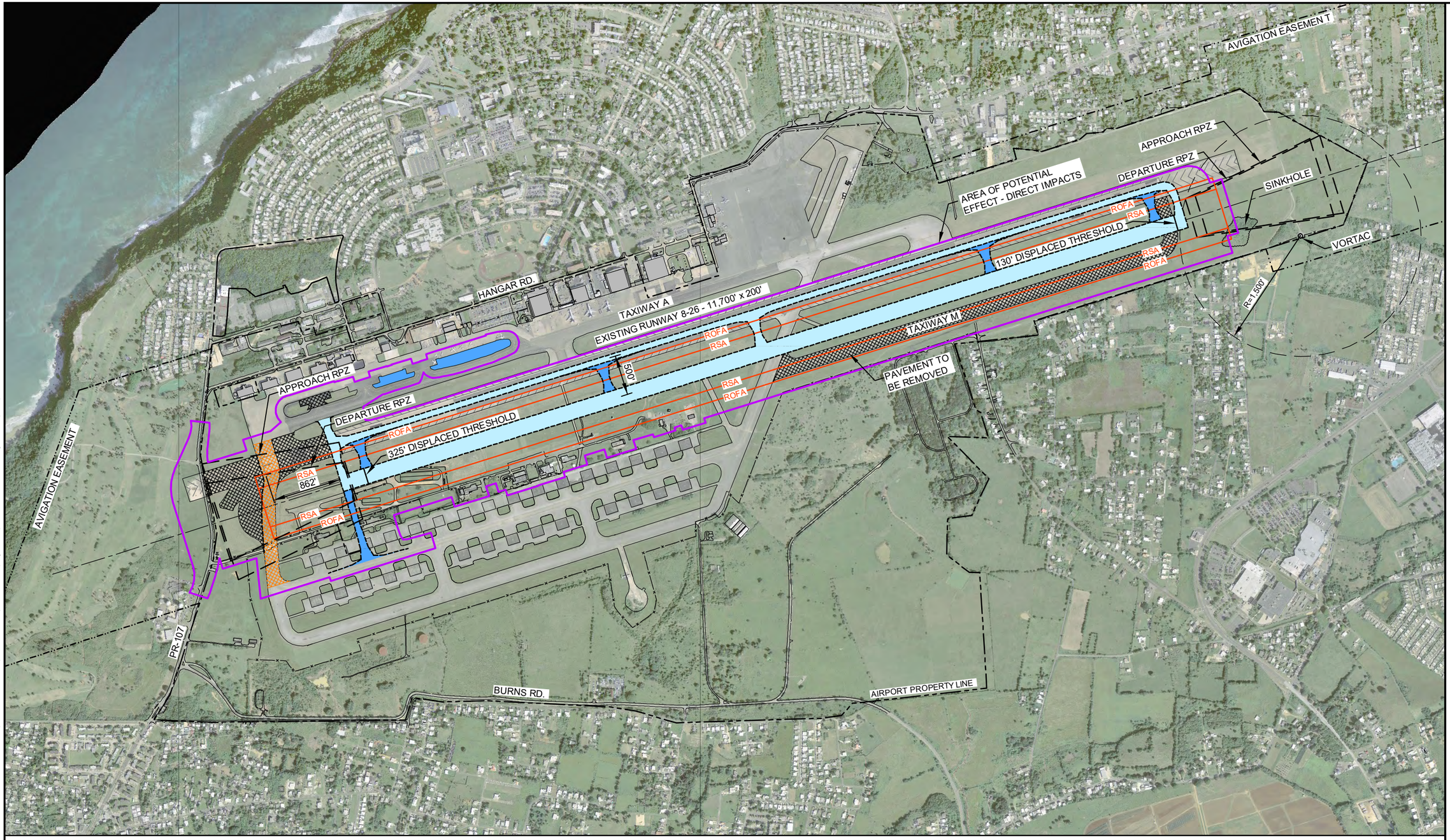

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH
- AREA OF POTENTIAL EFFECT - DIRECT IMPACTS

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

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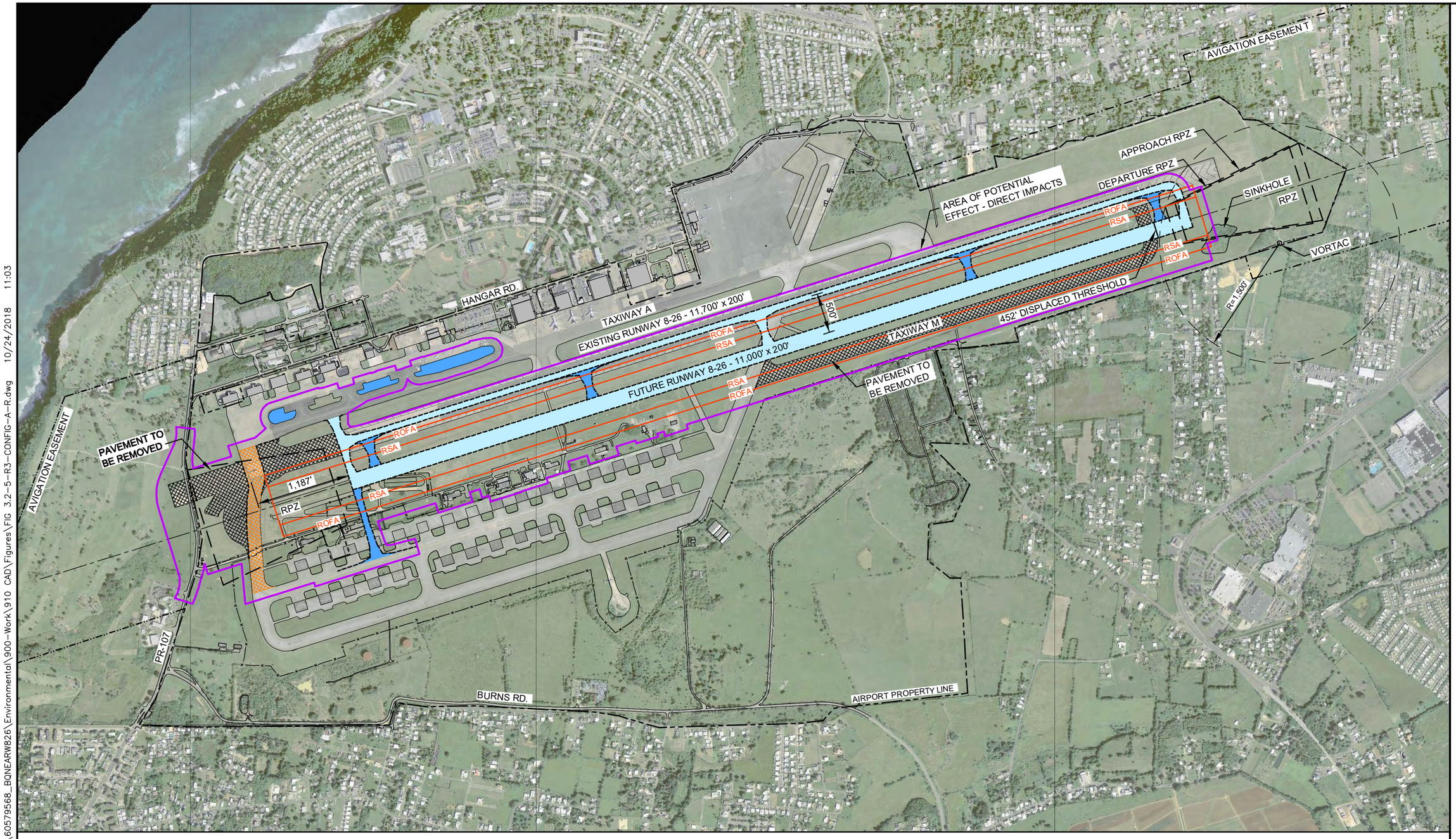

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH
- AREA OF POTENTIAL EFFECT - DIRECT IMPACTS

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

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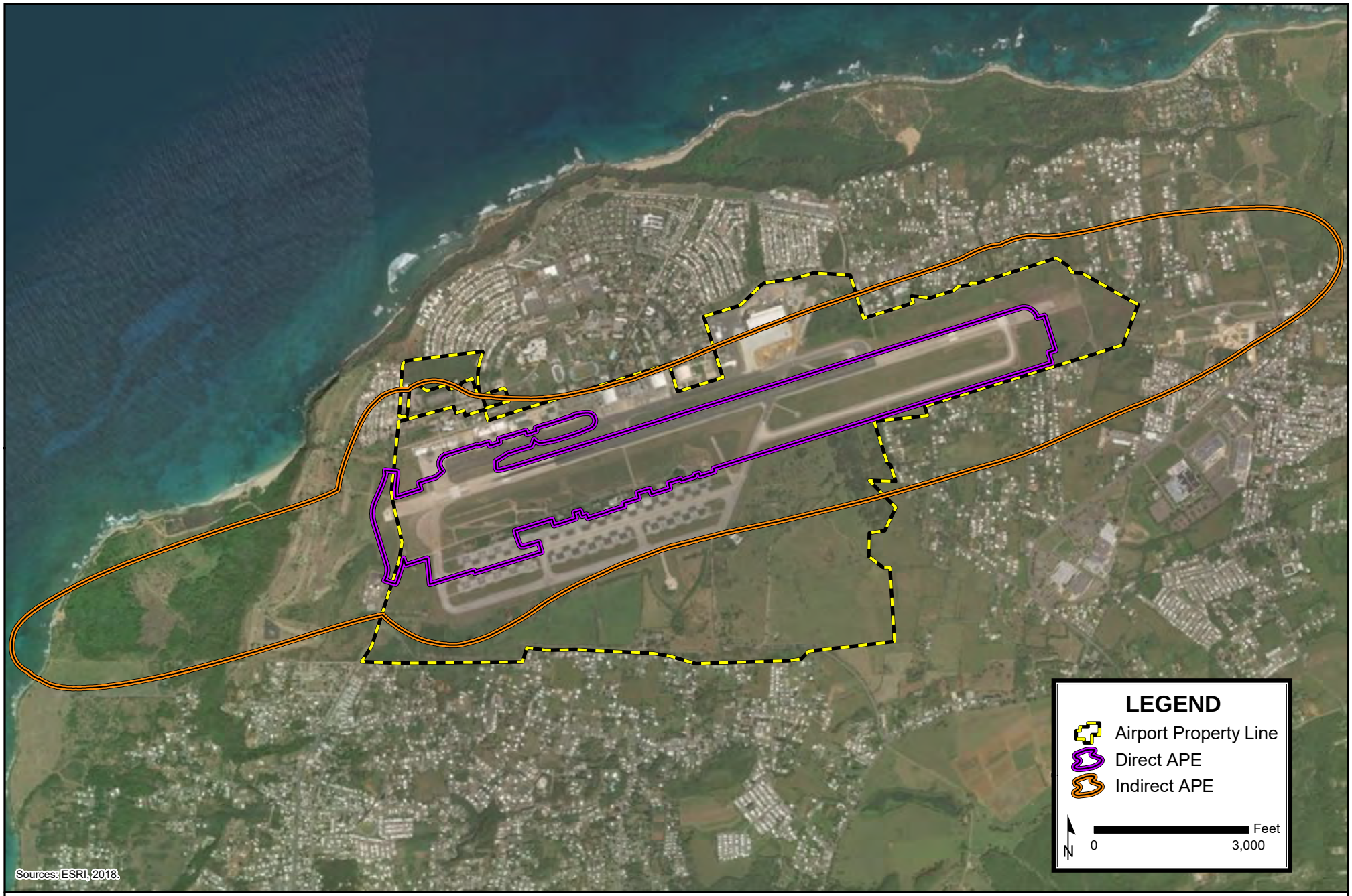

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RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT (APE)

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ATTACHMENT B – FAA AND PRPA CORRESPONDENCE

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GOVERNMENT OF PUERTO RICO
Ports Authority

June 4, 2019

Mr. Víctor Morales, PE
Project Manager
AECOM Caribe, LLP
954 Ponce de León Ave.
Suite 304
San Juan, Puerto Rico 00907

RE: Environmental Assessment (EA) for Reconstruction of Runway 8-26 at Rafael Hernández Airport (BQN), Aguadilla, Puerto Rico

Dear Mr. Morales:

AECOM Caribe, LLP (AECOM, hereafter) and the Puerto Rico Ports Authority (PRPA) signed an agreement AP-17-18-(5)-065 on January 30, 2018. This contract specifies that AECOM must conduct an Environmental Assessment (EA) to comply with the Federal Aviation Administration (FAA) regarding the NEPA process.

On May 21, 2019 PRPA received a letter from FAA in relation to the above mentioned project. This letter summarizes the works performed by AECOM, in order to comply with the Section 106 of the National Historic Preservation Act, in accordance to the National Environmental Policy Act of 1969. For this purpose, FAA is requesting PRPA to submit a plan in compliance with this federal requirement.

The PRPA's Historical Archeological and the Historical Architectural Survey, both cultural resources studies prepared by AM Group, firm subcontracted by AECOM for this purpose, were reviewed by FAA. This federal agency determined that both documents are unacceptable, based on the four (4) bullets described in a letter, as explained in its letter of May 22, 2019. Also, these documents do not comply with the Puerto Rico State Historic Preservation Office (PRSHPO) requirements, according to the letter dated December 1, 2015 and January 16, 2016 issued by this federal agency. For this reason, FAA has decided not to submit these resources studies reports to PRSHPO.

Also, FAA indicates that the Historical Architectural Survey Report requires additional field work. It is important to mention that PRPA agrees with FAA's determination.

PRPA is requesting AECOM seeks alternatives to comply with the contract, regarding the mentioned issues, in order to comply with Section 106. Therefore, PRPA requires AECOM to submit a plan which explain how these requirements will be fulfilled. As soon as possible PRPA receives and reviews this plan, in order to be accepted by FAA, it will be submitted to FAA for evaluation and approval.

If you need additional information, don't hesitate to contact the subscriber at 787-729-8715, extension 3178 or Milagros Rodríguez Castro, Environmental Affairs Manager, extension 3229.

Cordially,

RPC

Romel Pedraza Claudio, PE
Assistant Executive Director for Planning,
Engineering and Construction

Enclosure: FAA's letter dated May 21, 2019

PUERTO RICO PORTS AUTHORITY
P.O. Box 362829, San Juan, PR 00936-2829 • Calle Lindbergh 64, Antigua Base Naval Miramar, San Juan, PR 00907
Tel. 787.729.8715, Ext. 2281 • Fax 787.729.8540 • ilopez@prpa.pr.gov • www.prpa.pr.gov

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

U.S. Department
of Transportation
**Federal Aviation
Administration**

May 21, 2019

Romel Pedraza, P.E.
Chief of Studies and Designs
Puerto Rico Ports Authority (PRPA)
64 Lindbergh Street
Former Miramar Naval Base
San Juan, PR 00907

RE: Environmental Assessment (EA) for Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico

Dear Mr. Pedraza;

Puerto Rico Port Authority (PRPA or Airport Sponsor) in conjunction with the Federal Aviation Administration (FAA), began the Alternative Analysis for Reconstruction of Runway 8-26 at Rafael Hernández Airport in 2014 per Airport Improvement Program (AIP) Grant 3-72-0020-26-2014. The grant closed with a deliverable to the FAA entitled "Evaluation of Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport (BQN)". The Prime consultant was Kimley-Horn (KH) Puerto Rico. The sub consultant responsible for the cultural resources studies was AM Group.

On August 7, 2015 PRPA sent the Puerto Rico State Historic Preservation Office (PR SHPO) a Cultural Resources Assessment Survey (CRAS). The PR SHPO responded directly to the FAA requesting additional information on January 8, 2016. SHPO determined the submittal was insufficient and needed to evaluate the historic significance and integrity of the various buildings within the project area. Additionally, PR SHPO requested an intensive survey work plan for their review and concurrence. AIP Grant 3-72-0020-26-2014 closed prior to responding to the SHPO.

Projects funded by the FAA require decisions and approvals by the FAA in accordance to the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA, FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions, and FAA Order 1050.1F Environmental Impacts: Policies and Procedures.

On January 30, 2018, PRPA signed a contract with AECOM CARIBE, LLP, to conduct an EA for the Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN) "Proposed Project" under Professional Services Agreement No. AP-17-18-(5)-065. A Supplemental Agreement was signed June 5, 2018. AECOM CARIBE, LLP subcontracted with AM Group to complete the cultural resources for the Proposed Project started under AIP Grant 3-72-0020-26-2014.

PRPA/ FAA determined, the alternatives to advance in the EA consisted of the 10 options developed in the KM "Evaluation of Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport (BQN)" in addition to the following;

a) Do nothing alternative
b) Alternative 10.2 (PRPA preferred alternative)
c) Alternative 2 & Hybrid Alternative. This one is similar to the combination of alternatives 2 and 7 as described in the KH study.

An Interagency Agency Scoping Meeting was held August 1, 2018 to present the Proposed Project to federal and local agencies. PR SHPO provided comments reaffirming its prior comments (2015 and 2016) regarding the CRAS survey and the historic significance evaluation of various buildings to be demolished.

On September 18, 2018 the FAA received the BQN Runway 8-26 EA: Archaeological Report (CRAS). Based on review, the FAA informed PRPA September 21, 2018 the document was unacceptable based on the following:

- PRPA submitted virtually the same document submitted May 28, 2015. Closed AIP# 3-72-0020-26-2014.
- PRPA submitted virtually the same document submitted June 17, 2016. Closed AIP# 3-72-0020-26-2014.
- Non responsive to 1 Dec 2015 letter per PR SHPO
- Non responsive to 8 Jan 2016 letter per PR SHPO.

PRPA addressed some of FAA's comment matrix and submitted a second document entitled Historical Architectural Survey Report January 2019. In an effort to prevent further delay, on February 13, 2019 the FAA/PRPA conducted a conference call with the PR SHPO. The purpose of the meeting was to brief PR SHPO on the status of the EA, ongoing cultural resources studies and identify/discuss any concerns of the PR SHPO. During the meeting, PR SHPO commented:

- The alternatives presented February 13, 2019 were different from the alternatives in the Evaluation of Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport (BQN). The PR SHPO was not consulted.
- A work plan for the cultural resources evaluation was not presented to PR SHPO for review and concurrence prior to field work.
- The Proposed Project is in the identification phase of the Section 106 National Historic Preservation Act (NHPA) consultation.
- Consultations are a federal-to-federal interaction between the PR-SHPO and the FAA.
- FAA needs to demonstrate consideration of avoidance alternatives for any significant resources.
- Request additional analysis of potentially important features within the Areas of Potential Effect, specifically the runway and historic nature of the former Ramsey Air Force Base.

Based on meeting, the FAA decided not to submit PRPA's Historical Archeological or the Historical Architectural Survey Report to the PR SHPO. The FAA requested PRPA have the prime consultant use their internal reach back capabilities within company to review the sub consultant's reports. This review resulted in over 200 comments which the FAA has determined are substantial.

May 9, 2019, FAA held a conference call with PRPA to discuss the current status of both Section 106 Consultation and the EA. Meeting included: Larry Clark, ATL-ADO Manager, Parks Preston, ATL-ADO Assistant Manager; Rob Rau, ATL-ADO Lead Planner and Jackie Sweatt-Essick, Southern Region EPS and myself. The FAA noted it fully supports the Reconstruction of Runway 8/26 Rafael Hernández Airport (BQN). Additionally, the FAA informed PRPA all comments received to date associated with both the Historical Archeological and the Historical Architectural Survey Report require addressing, additional field work etc. to comply with Section 106 of the National Historic Preservation Act; a requirement of NEPA.

As you are aware, consultation with the PR SHPO is a federal to federal interaction. Request PRPA provide a plan for submitting a Section 106 compliant deliverable to the FAA. Once received, the FAA will then proceed to consult with PR SHPO on the Proposed Project.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708
felicia.reeves@faa.gov

cc: Larry Clark, ATL-ADO Manager
Steve Hicks, ASO Director

ATTACHMENT C – FEE BACKUP (TO BE PROVIDED UPON FAA/PRPA SCOPE APPROVAL)

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

September 13, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

Per the August 13, 2019 Federal Aviation Administration (FAA) letter to your office, please find the attached Cultural Resources Work Plan for your review. The FAA seeks to ensure full compliance with Section 106 consultation.

The Proposed Project is based on runway improvements necessary at Rafael Hernandez Airport (BQN) due to deteriorating pavement conditions. These deteriorations preclude safe aircraft operations over time. As such, the Puerto Rico Port Authority (PRPA), Airport Sponsor, and the FAA fully support the Proposed Project. In addition, the FAA has a statutory mandate to ensure the safe and efficient use of the national airspace system.

Please contact me via email or phone with any comments.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office 1701 Columbia Ave Room 220
College Park, GA 30337 404.305.6708
felicia.reeves@faa.gov

Enclosure (2) August 13, 2019 ltr to SHPO and Runway 8-26 Reconstruction EA CR Work Plan

Copy: Romel Pedraza, PRPA
Victor Morales, AECOM
Paul Sanford, AECOM

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

August 13, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

On 13 Feb 19, the Federal Aviation Administration (FAA), in conjunction with the Puerto Rico Port Authority (PRPA), conducted a meeting with the Puerto Rico State Historic Preservation Office (PR-SHPO). The purpose of the meeting was to brief your office on the status of the Environmental Assessment (EA), ongoing cultural resources studies and identify/discuss any concerns of the PR-SHPO.

Per the 13 Feb 19 teleconference, the FAA understands 1) we are in the identification phase of the Section 106 National Historic Preservation Act (NHPA) consultation; 2) consultations are a federal-to-federal interaction between the PR-SHPO and the FAA; 3) the FAA needs to demonstrate consideration of avoidance alternatives for any significant resources; and 4) to support the identification phase, the PR-SHPO request additional analysis of potentially important features within the Areas of Potential Effect (APEs). For reference, see enclosed exhibits.

Regarding item #4, to date, the analysis has focused on archaeological excavation in areas of proposed runway pavement, as well as a NHPA criteria appraisal of potentially significant architectural structures to the south of the proposed runway alternatives, which are slated for demolition. During the 13 Feb 19 teleconference, the PR-SHPO recommended that additional analysis be conducted in our APEs to support the identification phase of this consultation. We understood this to entail conducting an NHPA appraisal of <u>all</u> buildings and/or structures in our APEs, even if they are not expected to be impacted or altered by the proposed undertaking, as well as an equal appraisal of existing runway pavements in our APEs.

The FAA seeks to ensure full compliance with the additional work as described in this letter. Please confirm the FAA understands the PR-SHPO's comments per 13 Feb 19 meeting.

The FAA issued a grant to PRPA to initiate this EA in 2017. The FAA understands PRPA recently changed contractor support. The FAA concurs with this change however it has delayed further consultation with your office. Additionally, the FAA understands the new contract support is responsible for completing the cultural resources analysis and assisting the FAA's consultation with your office (see enclosed Scope of Work and exhibits). Consequently, prior to performing additional work, the FAA seeks assistance from your office to fully understand PR-SHPO's 13 Feb 19 requests.

Based on PR-SHPO's response to this letter, PRPA will provide a draft detailed work plan to the FAA outlining additional investigative work required. The FAA will consult with your office on the draft work plan prior to proceeding.

Please contact me via email or phone for additional information.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708
felicia.reeves@faa.gov

Enclosure (1)

Copy: Romel Pedraza, PRPA
Paul Sanford, AECOM
Victor Morales, AECOM

Rafael Hernandez Airport
Runway 8-26 Reconstruction Environmental Assessment
Cultural Resources Work Plan

September 5, 2019

Prepared For:
Federal Aviation Administration
Puerto Rico Ports Authority

1. Introduction

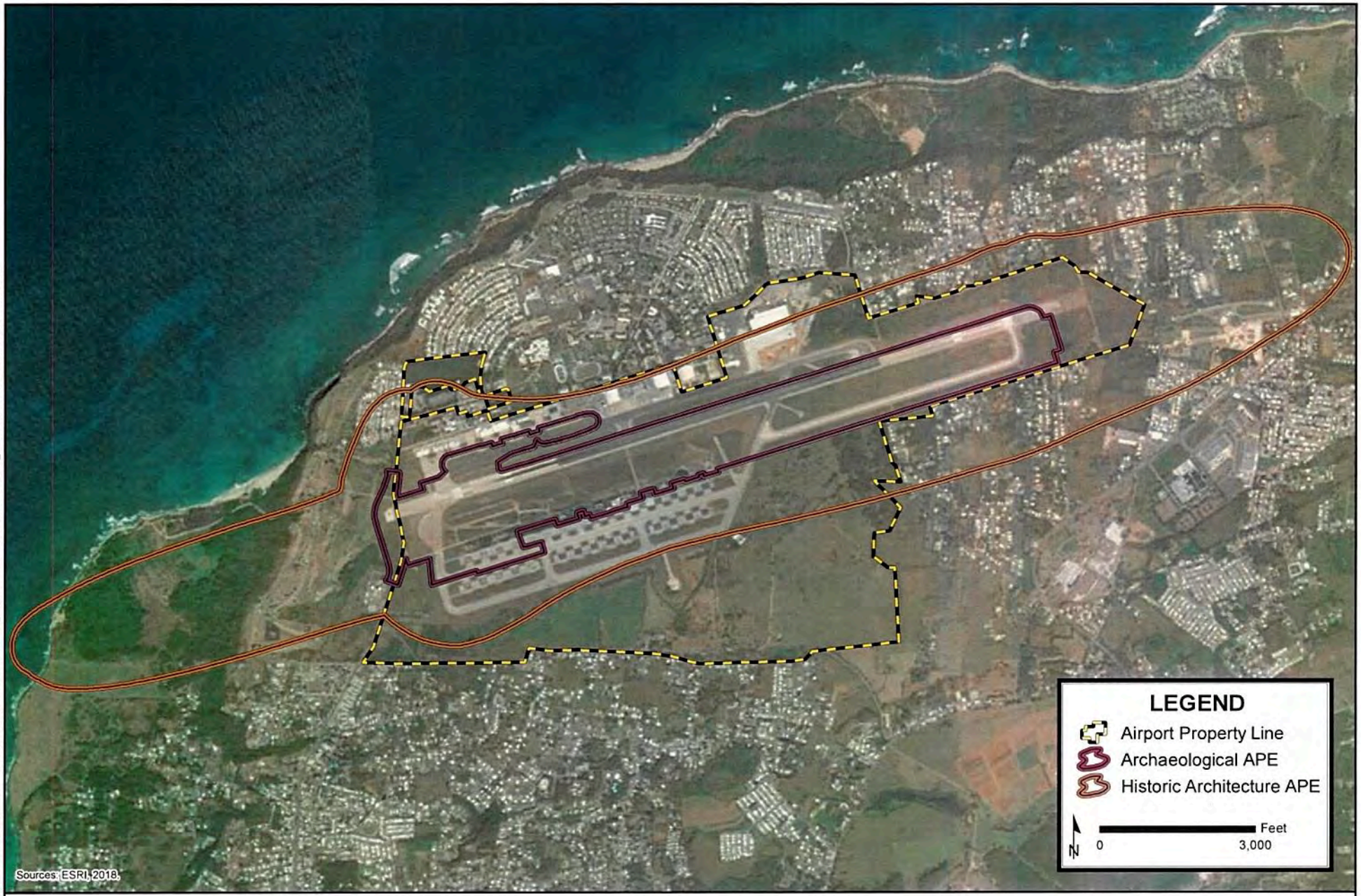
AECOM is assisting the Puerto Rico Ports Authority (PRPA) and the Federal Aviation Administration (FAA) Atlanta Airports District Office (ADO) in preparing an Environmental Assessment (EA) for the reconstruction of Runway 8-26 at Rafael Hernandez Airport, Aguadilla, Puerto Rico (BQN).

The EA focuses on two primary alternatives for project implementation, although multiple alternatives were explored by PRPA and FAA during the master planning and EA processes. These two alternatives are known as Alternatives 2B and 2D, each of which would construct a new permanent Runway 8-26 500 feet to the south of the existing runway alignment, and would convert the existing runway to a parallel taxiway. The principal difference between these two alternatives is the eastward/westward location of runway endpoints and the application of operational restrictions on the runway end(s), called declared distances, to ensure safe operation of arriving and departing aircraft while maximizing available runway length. Both of these alternatives would impact a series of buildings on the south campus of BQN because they would become located in the object free areas and airspace clearance surfaces of the proposed Runway 8-26.

As proposed, the alternatives being studied in the EA have high potential to significantly adversely affect historic and archaeological resources in the project area. Pursuant to Section 106 of the National Historic Preservation Act (NHPA), consultation with the Puerto Rico State Historic Preservation Office (PR-SHPO) has been initiated by the FAA ADO and is ongoing.

In a 13 February 2019 teleconference between the FAA, the PRPA, AECOM and the PR-SHPO, the PR-SHPO requested that, to support the investigation phase of the Section 106 consultation, additional investigation (above and beyond what has been studied to date by a previous subcontractor) should be performed in the project Areas of Potential Effect (APE) as outlined in **Figure 1**. The current document describes AECOM's work plan for conducting these additional investigations using AECOM staff.

For the evaluation of archaeological resources, the APE has been defined as areas of direct ground disturbance, inclusive of a 100-foot buffer to account for any indirect ground disturbance activities that may occur during construction, such as materials and equipment staging. Of note, this APE encompasses all alternatives studied in the EA process, not just Alternatives 2B and 2D. For the evaluation of historic architectural resources, the APE corresponds to the area large enough to encompass the predicted composite 60 decibel day-night average sound level (DNL 60 dB) noise contour of the Proposed Project and retained Alternatives. This APE will be used to identify, disclose and evaluate potential impacts on eligible historic architectural resources protected by the NHPA.



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RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT (APE)

FIGURE 1

2. Summary of Previous Studies

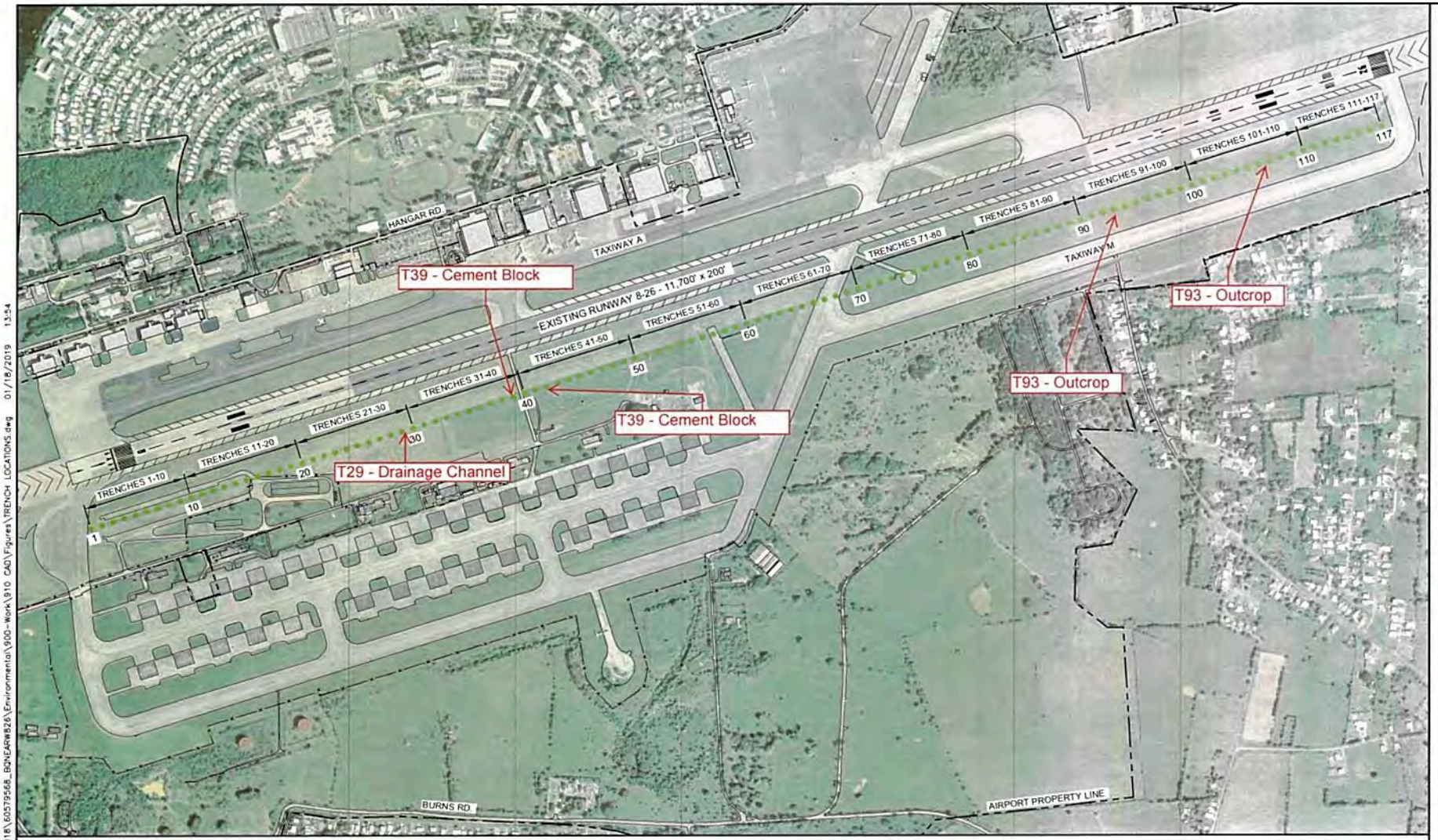
Two previous episodes of archaeological investigations have been conducted at the airport by the AM Group under the direction of archaeologist Fernando Alvarado Munoz. The first survey was conducted in 2015, and the second was conducted in 2018. A January 2019 document entitled *Rafael Hernandez Airport Runway 8-26 Reconstruction Stage I Archaeological Survey Report* describes the results of the combined studies. This report describes the survey as consisting of systematic visual surface inspection followed by excavation of approximately 113 backhoe trenches. The trenches were placed in a systematic transect down the alignment of the new proposed runway, approximately in the center of the current APE. Spaced approximately 30 meters apart, the trenches were dug about three meters long and were approximately 60 cm wide. Their depth varied from 50 cm to 1 meter. After excavation with the backhoe, the floor and walls of the trenches were cleaned with hand tools, inspected for presence of archaeological artifacts or features, and then photographed. The text of the report states that "all material obtained was screened using a ¼ inch mesh" (AM Group 2019:143), but based on the photographs of fieldwork and back dirt piles in the report, the systematic use of screening for all backhoe excavated soil cannot be confirmed.

The trenching survey documented that the soils typically consisted of a top layer of dark brown compact clay underlain by a reddish brown extremely compact clay. And limestone rocks were frequently encountered. Near the eastern end of the proposed runway alignment, Trenches 93 and 107 exposed limestone bedrock outcrops (**Figure 2**). In the 2015 report, these outcrops had been identified as possible structure foundations, but the 2019 report stated that additional investigations confirmed that they were natural and not cultural features.

Toward the western end of the survey transect, three trenches uncovered evidence of man-made features (**Figure 2**) Trench 29 uncovered a narrow (25 cm) channel cut into the bedrock that was interpreted as some kind of drainage feature, Trench 39 exposed a block of concrete with a steel hook eye embedded in it (a possible anchor for a tension cable) and Trench 42 exposed concrete with a steel rod embedded. Both of these latter two features likely result from military airfield construction. No other archaeological evidence was reported in any of the other trenches.

A December 2018 document entitled *Historical/Architectural Documentation for 21 Buildings for Rafael Hernandez Airport Runway 8-26* describes the results of architectural history research compiled by Marlene Ramos Velez and Adolfo Norcisa Lopez for AG Group. It provides historic background information, describes 21 buildings located along the southwestern edge of the current APE (**Figures 3 and 4**), and recommends that some of these structures may contribute to a potential, but undefined historic district.

The 2018 archaeological survey provided substantial exposure and evaluation of the long narrow strip of land that will be directly impacted by construction of the new main runway, but it did not adequately document the conditions within the entire archaeological APE. Additional field survey will be required to assess soil integrity and site potential in the remainder of the archaeological APE. Similarly, the 2018 architectural history study only documented buildings within the demolition footprint of the project. It did not evaluate other structure associated with Ramey Air Base, including intact airfield pavements, and it did not assess whether there were NRHP-eligible resources within the broader historic architectural APE defined by the DNL 60 dB noise contour. In addition, the resources that were evaluated in 2018 were not fully evaluated within the broader historic context of Cold War-era U.S. Military Bases.



PREVIOUS FINDINGS (AM GROUP 2018)
T29 - DRAINAGE CHANNEL
T39 - CEMENT BLOCK
T42 - CEMENT BLOCK
T93 - OUTCROP
T107 - OUTCROP

N

800 0 800

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

PREVIOUS ARCHAEOLOGICAL SURVEY LOCATIONS (AM GROUP 2018)

FIGURE 2

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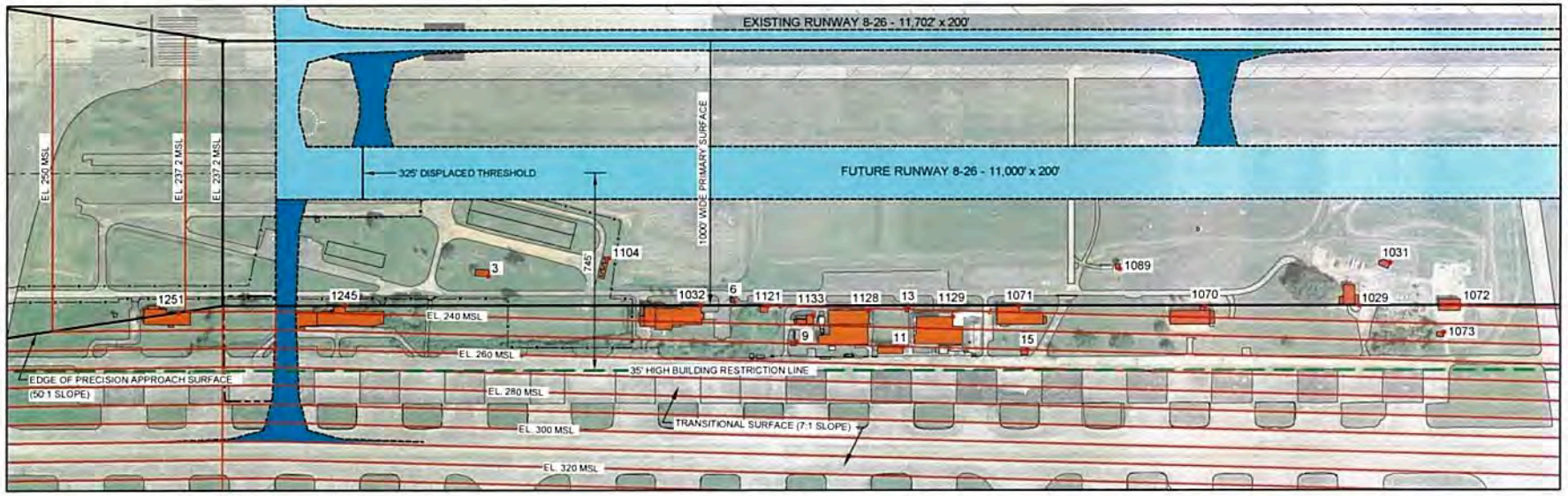
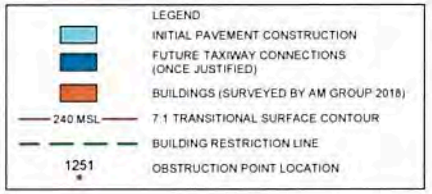


PLAN VIEW

OBSTRUCTION DATA TABLE

NO.	DESCRIPTION	LATITUDE	LONGITUDE	GROUND ELEVATION FEET (MSL)	BUILDING HEIGHT (FEET)	BUILDING ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	SURFACE ELEVATION FEET (MSL)	PENETRATION (FEET)
1251	BUILDING	N 18°29'15.74"	W 067°08'35.79"	245	15	260	RUNWAY 8 APPROACH	240.5	19.5
1245	BUILDING	N 18°29'17.84"	W 067°08'29.67"	238	12	250	PRIMARY	236.2	13.8
3	BUILDING	N 18°29'20.52"	W 067°08'24.70"	242	12	254	PRIMARY	234.1	19.9
1104	BUILDING	N 18°29'22.49"	W 067°08'20.43"	240	12	252	PRIMARY	232.3	19.7
1032	BUILDING	N 18°29'21.85"	W 067°08'16.44"	233	25	258	PRIMARY	230.9	27.1
6	BUILDING	N 18°29'22.33"	W 067°08'15.25"	231	15	246	PRIMARY	230.4	15.6
1121	BUILDING	N 18°29'22.56"	W 067°08'13.94"	231	15	246	7:1 TRANSITIONAL	230.5	15.5
1133	BUILDING	N 18°29'22.77"	W 067°08'12.16"	234	20	254	7:1 TRANSITIONAL	234.3	19.7
9	BUILDING	N 18°29'21.63"	W 067°08'12.47"	234	15	249	7:1 TRANSITIONAL	249.0	0.0
1128	BUILDING	N 18°29'23.55"	W 067°08'10.15"	231	30	261	7:1 TRANSITIONAL	231.2	29.8
11	BUILDING	N 18°29'22.63"	W 067°08'08.43"	232	25	257	7:1 TRANSITIONAL	250.4	6.6
13	BUILDING	N 18°29'24.10"	W 067°08'08.71"	232	15	247	7:1 TRANSITIONAL	229.0	18.0
1129	BUILDING	N 18°29'24.29"	W 067°08'06.95"	232	30	262	7:1 TRANSITIONAL	233.1	28.9
15	BUILDING	N 18°29'23.95"	W 067°08'03.78"	231	12	243	7:1 TRANSITIONAL	249.8	-6.8
1071	BUILDING	N 18°29'25.42"	W 067°08'04.61"	231	15	246	PRIMARY	226.2	19.8
1089	BUILDING	N 18°29'27.85"	W 067°08'01.32"	230	25	255	PRIMARY	224.7	30.3
1070	BUILDING	N 18°29'27.46"	W 067°07'57.70"	228	15	243	7:1 TRANSITIONAL	224.3	18.7
1029	BUILDING	N 18°29'29.24"	W 067°07'52.02"	223	30	253	PRIMARY	221.2	31.8
1031	BUILDING	N 18°29'31.11"	W 067°07'51.34"	226	15	241	PRIMARY	220.7	20.3
1072	BUILDING	N 18°29'30.38"	W 067°07'48.25"	225	20	245	PRIMARY	219.7	25.3
1073	BUILDING	N 18°29'29.23"	W 067°07'48.53"	223	12	235	7:1 TRANSITIONAL	234.5	0.5



RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 3

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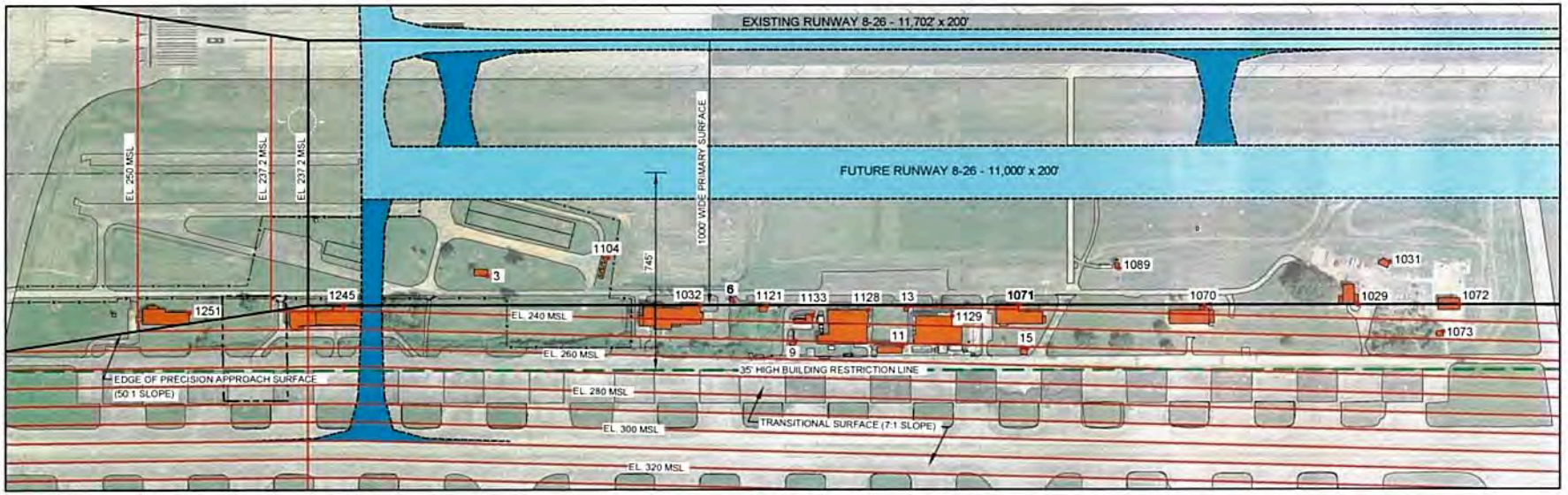

PLAN VIEW

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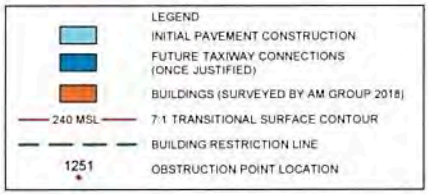

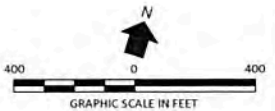

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 4

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3. Research Design and Methods

Background Research

Background data collection will be conducted prior to initiating field work and on an ongoing basis as needed to identify and interpret resources identified during the study. The project will include background research to gain further information on archaeological sites and historic structures in the region to provide a context for identifying and evaluating resources that may remain within the current project area. To achieve this goal, AECOM will review cultural resource survey reports, archaeological site files, historic period maps, and other secondary documents and histories. In particular, the summary report *Sitios Arqueológicos de Aguadilla* prepared by the Oficina Estatal de Conservación Histórica will be consulted as a valuable regional synthesis. In addition, data on past land use modifications will be collected and reviewed, such as historic maps, historic aerial photography, and soils mapping. The reports prepared previously for the project by a subcontractor will be used as a starting point for information gathering.

Archaeological Survey

Archaeological fieldwork will begin with systematic pedestrian reconnaissance of the entire APE to evaluate current conditions and identify any archaeological resources visible on the surface. This will be followed by systematic shovel test pit excavation where needed. Specific field testing methodologies will be refined based on field conditions, but in general, shovel test pits will be spaced at either 25 meter (75 foot) intervals, 50 meter (150 foot), and 100 meter (300 foot) intervals and shovel test pits (STPs) along transects likewise will be spaced at 25 meter (75 foot) intervals, 50 meter (150 foot), and 100 meter (300 foot) intervals. STPs will be approximately 50 centimeters (18 inches) in diameter, and excavated by natural stratigraphy with a long handled shovel into culturally sterile subsoil or to a maximum of one meter in depth. All soils removed from the STP will be screened using quarter-inch wire mesh for uniform artifact recovery.

Upon completion, the walls of each STP will be inspected for the presence of additional artifacts, evidence of subsurface features, and/or intact subsurface deposits. Standardized data will be recorded for each STP. This information will include (but is not limited to) thickness, color, and texture of encountered soil horizons; presence/absence and number of cultural materials recovered from each stratum; and other general information (e.g., provenience data, excavators, excavation date). After the STP has been excavated and recorded, it will be backfilled; positive STPs will be marked with either a pin flag or flagging tape.

Detailed notes for each STP will be recorded on standardized field forms. Where cultural materials are recovered, a series of close-interval (10 meter/33 feet) STPs will be deployed to determine the horizontal extent of the archaeological site. The locations of all STPs will be recorded in the field using a differentially corrected sub-meter accurate GPS device.

This work plan assumes that AECOM will be able to sample areas previously investigated within the project area by AG Group to validate the results of the earlier work and will not have to conduct systematic shovel testing over the entire APE.

The archaeologist in charge of fieldwork will also maintain a field log book with additional details including, but not limited to: areas worked, resources identified, sketch maps and drawings. Photographs

will be taken, and a photo log maintained, to document each work area, general conditions in the APE, each site identified, and unit profiles.

Treatment of Human Remains

If historic or prehistoric human remains are encountered, the remains will be left in situ and work in their vicinity shall cease immediately. Appropriate local government officials will be immediately notified. The treatment of any human remains discovered within the project area will comply with Puerto Rico laws concerning archaeological sites and treatment of human remains. No additional excavation will be conducted until the Principal Investigator is notified by regulatory officials with instructions on how to proceed.

Laboratory Analysis and Curation

Following completion of the fieldwork, AECOM will analyze and report the results of the previous tasks. Artifacts will be processed, cleaned, and analyzed. The first laboratory task will be to wash, analyze, and catalog artifacts from the field investigations. Processing of any specialized samples such as soil flotation, radiocarbon, bone, etc. will be completed, and spatial analysis will be conducted to identify horizontal and vertical limits of any occupations.

Before cleaning, each artifact will be inspected to determine its condition (i.e., fragility, material composition); thereafter, each item will be cleaned in a manner appropriate for their raw material. Most will be washed in clean water and air-dried, although fragile artifacts may be dry brushed or left uncleaned. Each artifact will be individually catalogued, including its site provenience, and analyzed by a variety of categories including, but not limited to, class, material, type, variety, technology, size, date, and comments.

Initial prehistoric lithic analysis will focus on sorting artifacts into tool and debitage classes and tabulating them by raw materials. Detailed analysis of lithics will commence after preliminary sorting of the assemblage by raw material and tool/artifact class has been completed. Debitage analysis will focus on identification of flake type and recording of basic size attributes. Flakes are identified by their place in a reduction sequence as well as by the amount of cortex exhibited on the surface. These data can then be quantified to represent reduction stages present (within any one lithic raw material group) for each site, or component within a site. Bifaces and other lithic tool categories will be described by raw material and form/function. Other classes of lithic artifacts (e.g. cores, scrapers, hammer stones) will be described by the raw materials from which they were manufactured. Diagnostic projectile points will be identified based on established typologies for the region.

Prehistoric ceramics will be analyzed based on various characteristics such as paste, temper, interior and exterior surface treatments and decorations, rim form, and vessel shape or type as applicable. Ceramics will be typed according to established typologies for the region.

Historic artifacts will be analyzed in terms of material type, form, function, and temporal attributes following established procedures. Detailed analyses for the historic artifacts will include the identification of the Terminus Post Quem (TPQ) of artifacts for each context; research on the manufacturing date ranges of ceramic, glass, and other types of datable artifacts; and generation of mean beginning and end dates for assemblages.

Reporting

AECOM will prepare a draft archaeological Cultural Resource Assessment Survey (CRAS) Report for submittal to the PR-SHPO. The CRAS will include a project description, methodology, relevant archaeological contexts, and bibliography. Report figures and tables will be presented in a professional manner and the report will include descriptions of site boundaries within the text, Universal Transverse Mercator (UTM) coordinates, site location map illustrations, and updated state site forms. It will also include descriptions of any archaeological resources identified, as well as integrity and significance statements that will support recommendations of National Register of Historic Places (NRHP) eligibility of the recorded resources. Following review, AECOM will prepare a final archaeological CRAS that addresses comments by the PR-SHPO.

Historic Structures Survey

AECOM will conduct an intensive-level architectural field survey that includes identifying, analyzing and evaluating all properties 50 years old and older, or of exceptional importance, within the historic architecture APE. Potentially significant airfield pavements will be included in this appraisal per PR-SHPO request. This survey will include digital photography of resources, settings, landscape features, and any alterations to resources that might affect their integrity. It will also document the relationship of resources to each other and any potential historic district.

AECOM will prepare a draft historic architectural Cultural Resource Assessment Survey (CRAS) Report for submittal to the PR-SHPO. The CRAS will include a project description, methodology, relevant historic and architectural contexts, and bibliography. It will also include histories and descriptions of each individual recorded historic resource and historic district, as well as integrity and significance statements that will support evaluations of National Register of Historic Places (NRHP) eligibility of the recorded resources. To assist in its eligibility recommendations, AECOM will consult previous Department of Defense Legacy Program studies that include histories of, contexts for, and proposed NRHP eligibility requirements for Army Air Fields, Air Force Bases, and their associated resources dating from World War II and the Cold War. Following review, AECOM will prepare a final historic architectural CRAS that addresses comments by the PR-SHPO

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GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

September 26, 2019

Ms. Felicia Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves,

We acknowledge the receipt of your letter dated August 13, 2019 and the draft Scope of Work to carry out additional work for the Environmental Assessment regarding the above referenced project. It includes data collection, field reconnaissance, documentation, consultation and mitigation support. As agreed in the telephone conversation you held with Santiago Gala Aguilera of our Office on September the 13th, we would like to confirm you that both an electronic copy of the Environmental Assessment Cultural Resources Work Plan prepared by AECOM (September 5, 2019) was forwarded that same day to Mr. Gala and a hard copy was personally submitted by the Puerto Rico Port Authority two days later. We are currently evaluating the document and will provide you our comments accordingly via separate letter, aware that the proposed field survey is to be conducted within thirty days upon the receipt of work plan.

Once you receive our comments on the proposed plan and carry out the field survey, we look forward to receiving the documents for our review and concurrence.

If you have any questions concerning our comments, do not hesitate to contact our Office.

Sincerely,

Carlos A. Rubio-Cancela
State Historic Preservation Officer

CARC/GMO/SGA/srf

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica
State Historic Preservation Office

Tuesday, October 15, 2019

Ms. Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves:

Our Office received correspondence on September 17, 2019 related to the above referenced project by the Puerto Rico Ports Authority (PRPA) and the Federal Aviation Administration (FAA). Said submission includes two letters, dated August 13 and September 13, 2019, and a document titled "Rafael Hernández Airport Runway 8-26 Reconstruction Environmental Assessment Cultural Resources Work Plan", dated September 5, 2019, prepared by your consultants AECOM.

Regarding the above-ground resources, Section 2 of the proposed 2019 work plan (Summary of Previous Studies) mentions a 2018 document titled *Historical / Archaeological Documentation for 21 Buildings of Rafael Hernández Airport Runway 8-26*. The Historic Structures Survey is being proposed to be carried out on an intensive level, but we believe its scope in terms of volume of resources, could have been deemed adequate should the 2018 documentation be submitted for our review and comments. Since our February 2019 meeting, this request has not been fulfilled.

The work plan also references the first archaeological survey conducted in 2015. In letters to the FAA dated December 1, 2015 and January 8, 2016 (enclosed), we requested that this report be revised, although this, apparently, has not occurred. Likewise, reference is made to a second archaeological survey carried out in 2018 that produced a report entitled *Rafael Hernández Airport Runway 8-26 Reconstruction Stage I Archaeological Survey Report* which, allegedly, "describes the results of the combined studies". Our office has not received a copy of this report either.

Considering the above, and in order to adequately evaluate the 2019 work plan, we request a copy of each archaeological survey report carried out so far for the proposed project, as well as any architectural documentation. Surveys and reports should be consistent with the *Secretary of the Interior's Standards and*

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.pr.gov

SHPO
OECH
OFICINA ESTATAL DE CONSERVACIÓN HISTÓRICA
OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE
OFFICE OF THE GOVERNOR

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Guidelines for *Identification* and *Evaluation*. Once all the information on the previous archeological work and above-ground documentation is available, the SHPO will be in a better position to offer comments to FAA on the proposed work plan.

No additional archaeological surface or sub-surface testing, as well as demolition, should be carried out in the APE of the proposed undertaking until our Office has evaluated the adequacy of identification efforts carried out so far.

As soon as we receive the requested information, we will continue with our review of this project. If you have any questions, please contact our Office at (787) 721-3737.

Sincerely,

Carlos A. Rubio Cancela
State Historic Preservation Officer

CARC/GMO/SG/MC

c Eng. Romel Pedraza, Assistant Executive Director in Planning, Engineering and Construction, Puerto Rico Ports Authority

Enclosures

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.pr.gov

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STATE HISTORIC PRESERVATION OFFICE
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ESTADO LIBRE ASOCIADO DE
PUERTO RICO
Oficina Estatal de Conservación Histórica
State Historic Preservation Office

December 1, 2015

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

Our Office has received and reviewed a cultural resources assessment survey report (Stage I) titled "Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport, Aguadilla, PR".

The State Historic Preservation Officer (SHPO) advises and assists federal agencies and other responsible entities in the identification, evaluation and assessment of effects on historic properties (district, site, buildings, structure or object) of projects, activities or programs requiring a Federal permit, license or approval. The authority for these procedures is contained in the National Historic Preservation Act, as amended. In order for the SHPO better assist you in fulfilling your section 106 responsibilities, please provide us with the following documentation:

1. Section 106 delivery control form. Please include total amount of federal funds to be assigned.

2. A detailed written description of the project, including related activities to be carried out in conjunction with the project. If an application was submitted for Federal funding, licenses, or permits, please provide a copy of the application.

3. Project information:
   a) Area of the project in acres.
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Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.gobierno.pr

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STATE HISTORIC PRESERVATION OFFICE
OFFICE OF THE GOVERNOR

copies, size 11"x17".

4. Determine and document the proposed boundaries of the project's Area of Potential Effect (APE) - geographic area where the project could have a direct or indirect effect on historic properties.

5. Measures taken to provide the public with information about this undertaking and its effects on historic properties, as well as to seek public comment and input.

Regarding the Stage I report and pending a formal definition of the project's APE, we hereby submit some initial comments and recommendations for your consideration. The document should omit that the survey was requested by the Puerto Rico State Historic Preservation Office (page 51) as this is the first submittal to us related to this undertaking. All drawings contained in the document are printed in a very small scale; please reprint and include at a legible scale. After analyzing the results of the archival research, we can infer that there is a high probability of historic structures remains; therefore, the implementation of a 50 meter interval subsurface testing strategy at the West side of the taxiway appears too large.

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You should evaluate the historic significance of these properties in consultation with our Office as per 36 CFR 800.4 (c)(1). An intensive survey should be carried out consistent with the Secretary of the Interior Standards and Guidelines for Identification and Evaluation; therefore we request an intensive survey work plan for our review and concurrence prior to implementation.

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Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, PR 00901

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SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

As soon as we receive the requested information, the revised Stage I survey report and the intensive survey work plan, we will continue with our review of this project. If you have any questions, please contact Archaeologist Marinés Colón, Historic Property Specialist, at mcolon@prshpo.pr.gov or (787) 721-3737.

Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez Vega, PE, Kimley Horn Puerto Rico, LLC

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PUERTO RICO
Oficina Estatal de Conservación Histórica
State Historic Preservation Office

January 8, 2016

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

A meeting was requested by the archaeology consultant in order to clarify comments included in our letter dated December 1, 2015 related to the archaeological reconnaissance survey report prepared for the above referenced project. At said meeting, held in our Office on December 14, 2015, the archaeology consultant handed us a set of documents with highlighted and flagged pages without a cover letter.

These documents comprise a 15-page "Scope of Services" prepared by Kimley Horn Puerto Rico, LLC for the Puerto Rico Ports Authority (PRPA), a 32-page "Professional Services Agreement" between PRPA and Kimley Horn, and a 137-page "Evaluation of Alternatives", also prepared by Kimley Horn for PRPA that includes condition and operational assessments, formulation of alternatives and technical considerations, an alternative analysis and selection of preferred alternatives and an environmental and funding analysis with recommendations.

These documents do not address the information requested in our December 1 letter. It is still unclear to us as to what is the undertaking. We need a detailed written description of the project, including related activities to be carried out in conjunction with the project. Also, as commented in our last letter dated December 1, 2015, all drawings presented are printed in an unreadable scale; to review please enlarge and resubmit at a legible scale, saved as a PDF file and included with printed copies size 11"x17".

Also pending is a formal determination and documentation of the project's Area of Potential Effect boundaries by the federal agency. Please fill out and submit include the "Section 106 Delivery Control Form" (enclosed and also available on our web

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Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez-Vega, PE, Kimley Horn Puerto Rico, LLC

Enclosure

U.S. Department
of Transportation
Federal Aviation
Administration

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

October 18, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

The FAA has received your October 15, 2019 response to the FAA's September 17, 2019 submittal of the Cultural Resources Work Plan for SHPO's review/comment.

The FAA concurs with SHPO's statement "*Surveys and reports should be consistent with the Secretary of the Interior's Standards and Guidelines for Identification and Evaluation*". And as you are aware, federal agencies have a responsibility to independently evaluate contractor-submitted information to determine the accuracy of the information and compliance with regulations/guidelines.

As detailed in FAA's August 13, 2019 letter to SHPO, based on the significant comments raised by your office during our February 14, 2019 teleconference, the FAA subsequently performed an internal technical and legal sufficiency review of AM Group 2018/2019 reports. The FAA concluded the reports do not comply with 36 CFR 800 or the Secretary of Interior's Standards and Guidelines for Identification and Evaluation. Further, the reports do not comply with FAA Order 1050.1F, Environmental Impacts, Policies, and Procedures, and Order 5050.4B National Environmental Policy Act Implementing Instructions for Airport Actions in multiple ways:.

- The APE investigated for archaeological resources should encompass all areas of possible direct ground disturbance that may occur during construction, including activities such as materials and equipment staging. AM Group conducted archaeological field survey only along the direct alignment of the proposed new runway, and did not provide sufficient information to document that all other portions of the APE are clear of archaeological sites.
- For the evaluation of historic architectural resources, the APE should correspond to the area large enough to encompass the predicted composite 65 decibel day-night average sound level (DNL 65 dB) noise contour of the Proposed Project and retained Alternatives, but may be larger. Due to the potential for airport noise impacts, FAA elected to use the larger DNL 60 dB contour for APE delineation. AM Group did not survey all potential historic structures within this APE.
- It is necessary to put the buildings and the former air base into a broader historic context, but this was not done. They should be compared to similar resources, rather than just the local architecture. For example, the PR SHPO has already developed a publication called In the Service of Ares: the United States Military Bases in Puerto Rico (1898-2000) Historic Context completed in 1999 by Arleen Pabón, which would be extremely relevant.

- In addition to historic context, there is a need to discuss and justify whether a building retains integrity as defined by the National Register criteria, regardless of a building's condition or whether it is economically recoverable. What must be addressed is whether a building retains enough architectural integrity to support its significance. AM Group's documentation does not accomplish this objective.

Thus, the FAA did not submit these reports to your office. FAA is the lead agency for the referenced action. There are no cooperating agencies. Pursuant to FAA's consultation responsibilities under Section 106 and NEPA, FAA has the authority to determine what is submitted to SHPO and ACHP. AM Group's submittals do not comply with 36 CFR 800 or the Secretary of Interior's Standards and Guidelines for Identification and Evaluation or FAA Order 1050.1F, and thus cannot be forwarded to your office.

The FAA anticipates field survey to begin shortly in accordance with the Cultural Resources Work Plan submitted to your office September 17, 2019. Please let me know if SHPO has additional areas of concern per BQN.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office 1701 Columbia Ave Room 220
College Park, GA 30337 404.305.6708
felicia.reeves@faa.gov

Copy: Romel Pedraza, PRPA
Victor Morales, AECOM
Paul Sanford, AECOM

GOBIERNO DE PUERTO RICO

Oficina Estatal de Conservación Histórica

November 20, 2019

Ms. Felicia K. Reeves

Noise/Environmental Program Manager
FAA South Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park GA 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves,

We acknowledge receipt of your letter dated October 18, 2019, regarding the above referenced project.

If you have any questions concerning our comments, do not hesitate to contact our Office.

Sincerely,

por

Carlos A. Rubio-Cancela
State Historic Preservation Officer

CARC/GMO/SG/srf

U.S. Department
of Transportation
Federal Aviation
Administration

Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337
404.305.6708

December 3, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

The FAA received your email acknowledging receipt of our October 18, 2019 letter (attached).

As detailed in numerous correspondence, based on the significant comments raised by your office during our February 14, 2019 teleconference, the FAA determined a new Cultural Resources Work Plan was necessary and submitted it to your office September 13, 2019.

AECOM, PRPA's consultant for subject EA, will conduct a field survey at BQN Dec 16-20, 2019. The survey will be conducted according to the Cultural Resources Work Plan. Additionally, Mr. Marvin Brown, will visit your office to conduct necessary research for the study.

Please let me know if SHPO has any areas of concern per BQN.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office 1701 Columbia Ave Room 220
College Park, GA 30337 404.305.6708
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U.S. Department
of Transportation
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Airports District Office
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404.305.6708

October 18, 2019

Mr. Carlos A. Rubio Cancela
Puerto Rico State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

RE: Section 106 Consultation Reconstruction of Runway 8-26 at Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico (SHPO 10-29-15-07)

Dear Mr. Cancela:

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The FAA anticipates field survey to begin shortly in accordance with the Cultural Resources Work Plan submitted to your office September 17, 2019. Please let me know if SHPO has additional areas of concern per BQN.

Sincerely,

Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office 1701 Columbia Ave Room 220
College Park, GA 30337 404.305.6708
felicia.reeves@faa.gov

Copy: Romel Pedraza, PRPA
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GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

December 9, 2019

Felicia Reeves
Noise / Environmental Program Manager
FAA Southern Region / Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNANDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves,

We acknowledge the receipt of your letter dated December 3, 2019 regarding the above referenced project. An official, hard copy of your October 18, 2019 letter, electronically forwarded to us that same day, was also provided.

We again appreciate the opportunity to express any areas of concern regarding your responsibilities under Section 106. Our concerns, as expressed in our letter dated October 15, 2019 (enclosed), remain in effect.

If you have any questions concerning our comments, do not hesitate to contact our Office.

Sincerely,

Carlos A. Rubio-Cancela
State Historic Preservation Officer

c. Mr. Romel Pedraza, Puerto Rico Ports Authority

CARC/GMO/SG/MB

Enclosure

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica
State Historic Preservation Office

Tuesday, October 15, 2019

Ms. Felicia K. Reeves
Noise/Environmental Program Manager
FAA Southern Region/Atlanta Airports District Office
1701 Columbia Ave. Room 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Reeves:

Our Office received correspondence on September 17, 2019 related to the above referenced project by the Puerto Rico Ports Authority (PRPA) and the Federal Aviation Administration (FAA). Said submission includes two letters, dated August 13 and September 13, 2019, and a document titled "Rafael Hernández Airport Runway 8-26 Reconstruction Environmental Assessment Cultural Resources Work Plan", dated September 5, 2019, prepared by your consultants AECOM.

Regarding the above-ground resources, Section 2 of the proposed 2019 work plan (Summary of Previous Studies) mentions a 2018 document titled *Historical / Archaeological Documentation for 21 Buildings of Rafael Hernández Airport Runway 8-26*. The Historic Structures Survey is being proposed to be carried out on an intensive level, but we believe its scope in terms of volume of resources, could have been deemed adequate should the 2018 documentation be submitted for our review and comments. Since our February 2019 meeting, this request has not been fulfilled.

The work plan also references the first archaeological survey conducted in 2015. In letters to the FAA dated December 1, 2015 and January 8, 2016 (enclosed), we requested that this report be revised, although this, apparently, has not occurred. Likewise, reference is made to a second archaeological survey carried out in 2018 that produced a report entitled *Rafael Hernández Airport Runway 8-26 Reconstruction Stage I Archaeological Survey Report* which, allegedly, "describes the results of the combined studies". Our office has not received a copy of this report either.

Considering the above, and in order to adequately evaluate the 2019 work plan, we request a copy of each archaeological survey report carried out so far for the proposed project, as well as any architectural documentation. Surveys and reports should be consistent with the *Secretary of the Interior's Standards and*

Cuartel de Ballajá (Tercer Piso),
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SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Guidelines for *Identification* and *Evaluation*. Once all the information on the previous archeological work and above-ground documentation is available, the SHPO will be in a better position to offer comments to FAA on the proposed work plan.

No additional archaeological surface or sub-surface testing, as well as demolition, should be carried out in the APE of the proposed undertaking until our Office has evaluated the adequacy of identification efforts carried out so far.

As soon as we receive the requested information, we will continue with our review of this project. If you have any questions, please contact our Office at (787) 721-3737.

Sincerely,

Carlos A. Rubio Cancela
State Historic Preservation Officer

CARC/GMO/SG/MC

c Eng. Romel Pedraza, Assistant Executive Director in Planning, Engineering and Construction, Puerto Rico Ports Authority

Enclosures

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

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State Historic Preservation Office

December 1, 2015

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

Our Office has received and reviewed a cultural resources assessment survey report (Stage I) titled "Alternatives for the Reconstruction of Runway 8/26 Rafael Hernández Airport, Aguadilla, PR".

The State Historic Preservation Officer (SHPO) advises and assists federal agencies and other responsible entities in the identification, evaluation and assessment of effects on historic properties (district, site, buildings, structure or object) of projects, activities or programs requiring a Federal permit, license or approval. The authority for these procedures is contained in the National Historic Preservation Act, as amended. In order for the SHPO better assist you in fulfilling your section 106 responsibilities, please provide us with the following documentation:

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SHPO: 10-29-15 07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

As soon as we receive the requested information, the revised Stage I survey report and the intensive survey work plan, we will continue with our review of this project. If you have any questions, please contact Archaeologist Marinés Colón, Historic Property Specialist, at mcolon@prshpo.pr.gov or (787) 721-3737.

Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez Vega, PE, Kimley Horn Puerto Rico, LLC

Cuartel de Ballajá (Tercer Piso)
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State Historic Preservation Office

January 8, 2016

Ms. Dana L. Perkins
Environmental Program Manager
Atlanta Airports District Office
Federal Aviation Administration
1701 Columbia Ave.
Suite 220
College Park, Georgia 30337

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Perkins:

A meeting was requested by the archaeology consultant in order to clarify comments included in our letter dated December 1, 2015 related to the archaeological reconnaissance survey report prepared for the above referenced project. At said meeting, held in our Office on December 14, 2015, the archaeology consultant handed us a set of documents with highlighted and flagged pages without a cover letter.

These documents comprise a 15-page "Scope of Services" prepared by Kimley Horn Puerto Rico, LLC for the Puerto Rico Ports Authority (PRPA), a 32-page "Professional Services Agreement" between PRPA and Kimley Horn, and a 137-page "Evaluation of Alternatives", also prepared by Kimley Horn for PRPA that includes condition and operational assessments, formulation of alternatives and technical considerations, an alternative analysis and selection of preferred alternatives and an environmental and funding analysis with recommendations.

These documents do not address the information requested in our December 1 letter. It is still unclear to us as to what is the undertaking. We need a detailed written description of the project, including related activities to be carried out in conjunction with the project. Also, as commented in our last letter dated December 1, 2015, all drawings presented are printed in an unreadable scale; to review please enlarge and resubmit at a legible scale, saved as a PDF file and included with printed copies size 11"x17".

Also pending is a formal determination and documentation of the project's Area of Potential Effect boundaries by the federal agency. Please fill out and submit include the "Section 106 Delivery Control Form" (enclosed and also available on our web

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray, Esquina Beneficencia, Viejo San Juan, P.R. 00901

PO Box 9023935, San Juan, P.R. 00902-3935
Tel: 787-721-3737 Fax: 787-721-3773
www.oech.gobierno.pr

SHPO
OECH
OFICINA ESTATAL DE CONSERVACIÓN HISTÓRICA
OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE
OFFICE OF THE GOVERNOR

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

page www.oech.pr.gov).

As soon as we receive the requested information, the revised Stage I survey report and the intensive archaeological survey work plan, we will continue with our review of this project. If you have any questions, please contact Archaeologist Marinés Colón, Historic Property Specialist, at mcolon@prshpo.pr.gov or (787) 721-3737.

Sincerely,

Diana López Sotomayor

Diana López Sotomayor, Archaeologist
State Historic Preservation Officer

DLS/NAPT/BRS/MC

c Mr. Jorge Suárez, Assistant Executive Director for Planning, Engineering, Construction and Environmental Affairs, Puerto Rico Ports Authority
Ms. Eileen M. Vélez-Vega, PE, Kimley Horn Puerto Rico, LLC

Enclosure

Cuartel de Ballajá (Tercer Piso),
Calle Norzagaray Esquina Beneficencia, Viejo San Juan, PR 00901

PO Box 9023935, San Juan, PR 00902-3935
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GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

Tuesday, April 21, 2020

Lee Kyker
Environmental Protection Specialist
US Department of Transportation
Federal Aviation Administration
Atlanta Airports District Office
1701 Columbia Ave., Campus Bldg.
Atlanta, GA 30337-2747

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26 AT THE AGUADILLA RAFAEL HERNÁNDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Kyker,

On March 24, 2020, our Office received three (3) documents titled: "Rafael Hernandez Airport Runway 8-26 Reconstruction, Aguadilla, Puerto Rico, Stage I Archaeological Survey Report" prepared by AM Group, dated April 22, 2019; "Historical/Architectural Documentation for Twenty-one Buildings for Rafael Hernandez Airport Runway 8-26 Reconstruction Project, Aguadilla, PR" prepared by AM Group, dated June 18, 2019; and "Rafael Hernandez Airport Runway 8-26 Reconstruction Environmental Assessment, Phase I Cultural Resources Assessment Survey" prepared by AECOM, dated March 2020.

In response to initial efforts to identify historic properties made in 2015 by AM Group - first project submission to our office - we requested additional basic information pertaining the undertaking (e. g., Area of Potetial Effects, project description, schematic drawings, etc.), a revised archaeological survey report and an intensive archaeological survey work plan for our review and concurrence prior to its implementation (letter dated December 1, 2015). Although we have had several meetings, telephone conversations, emails and formal letters over the past four (4) years, in which the need for additional information was reiterated, we are still awaiting to receive all of the information requested.

As the result of archaeological surveys (2015, 2018 and 2019), structures were identified (i. e., cement blocks, channel segment, building/structure foundations) whose eligibility to the National Register of Historic Places is not adequately discussed in reports. Specifically, although recommendations regarding eligibility are presented, the basis for such recommendations is not included. We hereby request the submission of a single archaeological survey report integrating the entirety of archaeological identification and evaluation work carried out so far, attaching all related letters by the SHPO, and including the aforementioned evaluation of eligibility.

If additional subsurface testing is deemed necessary to accomplish this – and considering that previous interventions ranged from surface inspection to excavation with mechanical methods of more than one-hundred 3.00 meters long trenches - a work plan for our review and concurrence prior to implementation is again requested.

At a minimum, we believe the runway is eligible for listing on the National Register of Historic Places under Criteria **A** (Cold War) and **C** (design/construction) and that implementation of the undertaking meets the criteria of **adverse effect** by altering the use of the structure. If the Federal Aviation Administration (FAA) agrees with this opinion, you should notify the Advisory Council on Historic Preservation and continue consultation with the consulting parties to seek ways to resolve the adverse effects. In general, we believe architectural documentation and greater historic background research would be adequate treatment measures. A Memorandum of Agreement (MOA) should be developed, as per 36 CFR 800.6, to formalize the treatment measures to be implemented. The MOA should also include language that provides for the completion of any outstanding (phased) identification efforts regarding archaeological properties. Execution of the MOA, as far as Section 106 is concerned, would make way for the expenditure of Federal funds for this project, while still providing a process for completing identification efforts prior to project construction.

If you have any questions concerning our comments, do not hesitate to contact our Office.

Sincerely,

Carlos A. Rubio-Cancela
State Historic Preservation Officer

CARC/GMO/MDT/MB/MC

U.S. Department
of Transportation
**Federal Aviation
Administration**

Atlanta Airports District Office
1701 Columbia Ave.
College Park, GA 30337-2747

Phone: 404-305-7150

May 20, 2020

Mr. John M. Fowler
Executive Director
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

**RE: FAA Section 106 Notification of Adverse Effect – Runway Replacement
Rafael Hernandez Airport, Aguadilla, Puerto Rico (BQN)**

Dear Mr. Fowler:

The Federal Aviation Administration (FAA) is the lead federal agency for an undertaking, as defined by Section 106 of the National Historic Preservation Act, at the Rafael Hernandez Airport, Aguadilla, Puerto Rico. The undertaking includes financial grant assistance to the airport sponsor to construct a new permanent Runway 8-26, 500 feet south of the existing Runway 8-26 centerline, to replace the existing Runway 8-26. The existing Runway 8-26 would be converted to a full length partial parallel taxiway. The FAA hereby notifies the Advisory Council on Historic Preservation (ACHP) that the undertaking will result in an adverse effect.

The undertaking is within an area that is a potentially eligible for listing in the National Register of Historic Places (NRHP) as a historic district. The potentially eligible historic district is comprised of the runway and buildings/structures associated with the former Ramey Air Force Base. The proposed action under consideration will affect the physical use of Section 106/4(f) resources by the demolition of buildings and realignment of the runway. The action diminishes the setting by removal of resources that may be eligible for listing in the National Register, if not by individual designation, by physical removal of structures and realignment of the runway, that may as a whole, be designated as a historic district. Therefore, the FAA has determined that the proposed action will result in substantial impairment to 4(f) resources.

FAA is in consultation with the Puerto Rico State Historic Preservation Office to mitigate the adverse effect through a Memorandum of Agreement (MOA). Please note that the attached Historic Architecture Survey Report supplements the preliminary determination and provides additional context on the undertaking. This report will be assimilated with previous work conducted into a single report as requested by PR SHPO.

If you have any questions or concerns, please contact me at 404-305-6708 or email at lee.kyker@faa.gov.

Sincerely,

Lee Kyker

Lee Kyker
Environmental Protection Specialist, Atlanta Airports District Office

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Atlanta Airports District Office
1701 Columbia Ave., Campus Bldg.
Atlanta, GA 30337-2747
Phone: (404) 305-7150

May 20, 2020

Mr. Carlos Rubio – Cancela, SHPO
State Historic Preservation Office
P.O. Box 9023935
San Juan, PR 00902-3935

Reference: Section 106 Determination – Runway Replacement

Dear Mr. Rubio-Cancela:

The Federal Aviation Administration (FAA) Atlanta Airports District Office (ATL-ADO) has issued a Section 106 Determination for the undertaking at the Rafael Hernandez Airport, Aguadilla, Puerto Rico (BQN). The undertaking involves the following improvements:

- Construction of a new permanent Runway 8-26, 500 feet south of the existing Runway 8-26 centerline, to replace the existing Runway 8-26. The runway would measure 11,000 feet by 200 feet, comprised of Portland Cement Concrete (PCC) with asphalt overlay.

- The existing Runway 8-26 would be converted to a full length partial parallel taxiway.

The FAA concurs in the PR SHPO's position that the undertaking will have an adverse effect on the potentially eligible historic district. The proposed action under consideration will affect the physical use of Section 106 resources by the demolition of buildings/structures and realignment of the runway. The action diminishes the setting by removal of resources that may be eligible for listing in the National Register of Historic Places (NRHP), if not by individual designation, by physical removal of structures and realignment of the runway that may as a whole, be designated as a historic district. The FAA and project proponent have elected to develop a Memorandum of Agreement (MOA) to mitigate the adverse effect for the undertaking. On May 20, 2020, the FAA notified the Advisory Council on Historic Preservation (ACHP) of it's determination of adverse effect and invited ACHP to join the consultation. The determination as to whether additional archaeological investigation is needed has not been completed. If additional subsurface testing is determined necessary, there is the potential for the identification of additional properties which will be addressed in the Memorandum of Agreement.

On behalf of the agency, and the project proponent, I thank you and your staff for your assistance and cooperation in the Section 106 process and look forward to continued collaboration in the

development of the MOA. An initial draft MOA is enclosed for your review and comment. If you have any questions or concerns regarding the determination, please give me a call at (404) 305-6708 or email at lee.kyker@faa.gov.

Sincerely,

Lee Kyker

Lee Kyker
Environmental Protection Specialist, Atlanta Airports District Office

Enclosure – Draft MOA

From: Carlos A. Rubio Cancela Director Ejecutivo
To: Kyker, Lee (FAA)
Subject: RE: BQN - Section 106 Determination - MOA
Date: Thursday, May 21, 2020 5:45:29 PM
Attachments: image003.png

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

Good afternoon,

Thank you, Lee. I will forward your letter and the MOA draft to my staff for evaluation and comments.

Best regards,

Carlos

Carlos A. Rubio-Cancela
Director Ejecutivo / Oficial Estatal de Conservación Histórica
Executive Director / State Historic Preservation Officer
P.O. Box 9023935
San Juan, P.R. 00902-3935
T. (787) 721-3737
F. (787) 721-3773

SHPO OFICINA ESTATAL DE CONSERVACIÓN HISTÓRICA OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE OFFICE OF THE GOVERNOR
OECH

From: Kyker, Lee (FAA) [mailto:Lee.Kyker@faa.gov]
Sent: Wednesday, May 20, 2020 4:02 PM
To: Carlos A. Rubio Cancela Director Ejecutivo <carubio@prshpo.pr.gov>
Subject: BQN - Section 106 Determination - MOA

Good Afternoon,

The attached letter is a follow up to our call of May 12th to formalize our agreement that the proposed undertaking will have an Adverse Effect. Also attached is an initial draft of a Memorandum of Agreement for your review and comment. Please let me know if I can assist in making any edits to this draft document or if you would like me to set up another call to discuss any suggested revisions to the MOA in more detail.

Thank you again for your assistance in this proposed project.

Lee

Lee Kyker
Environmental Specialist
Atlanta Airports District Office
(404) 305-6708

From:	Carlos A. Rubio Cancela Director Ejecutivo
To:	Kyker, Lee (FAA)
Cc:	Gloria Ortiz
Subject:	RE: BQN - Section 106 Determination - MOA
Date:	Monday, June 01, 2020 6:41:26 PM
Attachments:	image006.png image004.png

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

Good afternoo!

Thank you for letting us know about the PRPA desition to continue with the discussed scope of work. In a few days, we will be sending our comments of the MOA draft submitted.

Thank you,

Carlos

Carlos A. Rubio-Cancela
Director Ejecutivo / Oficial Estatal de Conservación Histórica
Executive Director / State Historic Preservation Officer
P.O. Box 9023935
San Juan, P.R. 00902-3935
T. (787) 721-3737
F. (787) 721-3773

SHPO OFICINA ESTATAL DE CONSERVACIÓN HISTÓRICA OFICINA DEL GOBERNADOR
STATE HISTORIC PRESERVATION OFFICE
OECH

From: Kyker, Lee (FAA) [mailto:Lee.Kyker@faa.gov]
Sent: Monday, June 1, 2020 5:39 PM
To: Carlos A. Rubio Cancela Director Ejecutivo <carubio@prshpo.pr.gov>
Subject: RE: BQN - Section 106 Determination - MOA

Good Afternoon,

I learned today the PRPA has decided to continue with the current proposed project scope at BQN which is a realignment of the runway. I wanted to update you on this decision since I had mentioned during our last discussion that FAA has requested that the PRPA revisit the possibility of reconstruction of the runway in place due to a reduction in global operations during the pandemic. This alternative, which had originally been considered several years ago, was again rejected.

I have a telcon tomorrow morning and anticipate I'll be asked for an update on status of the draft MOA. I wanted to check in to see how the review was going and if there's any additional information I need to provide at this time. Also, any estimate on when you think PR SHPO will have comments on the MOA?

Thank you,

Lee

Lee Kyker
Environmental Specialist
Atlanta Airports District Office
(404) 305-6708

From: Carlos A. Rubio Cancela Director Ejecutivo <carubio@prshpo.pr.gov>
Sent: Thursday, May 21, 2020 5:45 PM
To: Kyker, Lee (FAA) <Lee.Kyker@faa.gov>
Subject: RE: BQN - Section 106 Determination - MOA

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

Good afternoon,

Thank you, Lee. I will forward your letter and the MOA draft to my staff for evaluation and comments.

Best regards,

Carlos

Carlos A. Rubio-Cancela
Director Ejecutivo / Oficial Estatal de Conservación Histórica
Executive Director / State Historic Preservation Officer
P.O. Box 9023935
San Juan, P.R. 00902-3935
T. (787) 721-3737
F. (787) 721-3773

From: Kyker, Lee (FAA) [mailto:Lee.Kyker@faa.gov]
Sent: Wednesday, May 20, 2020 4:02 PM
To: Carlos A. Rubio Cancela Director Ejecutivo <carubio@prshpo.pr.gov>
Subject: BQN - Section 106 Determination - MOA

Good Afternoon,

The attached letter is a follow up to our call of May 12th to formalize our agreement that the proposed undertaking will have an Adverse Effect. Also attached is an initial draft of a Memorandum of Agreement for your review and comment. Please let me know if I can assist in making any edits to this draft document or if you would like me to set up another call to discuss any suggested revisions to the MOA in more detail.

Thank you again for your assistance in this proposed project.

Lee

Lee Kyker
Environmental Specialist
Atlanta Airports District Office
(404) 305-6708

GOBIERNO DE PUERTO RICO
Oficina Estatal de Conservación Histórica

June 03, 2020

Lee Kyker
Environmental Protection Specialist
Federal Aviation Administration
Atlanta Airports District Office
1701 Columbia Ave., Campus Bldg.
Atlanta, GA 30337-2747

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNANDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Dear Ms. Kyker,

We have reviewed the draft memorandum of agreement prepared for the above referenced project and have the following observations

In the WHEREAS section, the Ramey Air Force Base Historical Association (Association) is missing and only mentioned on the signature page. It is not clear whether the Federal Aviation Administration (FAA) has consulted with them regarding this undertaking. Also, while according to the draft, the US Coast Guard has been invited to consult on the project, we are not aware of their views regarding the effects on the undertaking on historic properties. The US Coast Guard and Association should not merely be given the agreement to sign, but should also be given opportunity to consult on its development. Also, since invited signatories may terminate or seek to amend an MOA, the Association should, instead be a concurring party, not an invited signatory. The agreement should record the Advisory Council on Historic Preservation's decision regarding direct participation. Also, a graphic depiction of the area of potential effects should be included as an appendix.

The introduction to the Stipulations section should refer to the FAA and not Puerto Rico Ports Authority (PRPA). The stipulations themselves may state the responsibilities (activities to be carried out) PRPA will assume. The MOA also needs to be consistent regarding the use of "PRPA" or "Sponsor" when referring to the Ports Authority.

Stipulation I (Archaeology), since the FAA will be carrying out phased identification and evaluation, needs to contain language for consensus determinations of eligibility, assessment of effects and resolution of effects.

Lee Kyker
June 3, 2020

SHPO: 10-29-15-07 RECONSTRUCTION OF RUNWAY 8-26, RAFAEL HERNANDEZ (BQN) AIRPORT, AGUADILLA, PUERTO RICO

Historical Documentation (Stipulation II) appears to be a summary of what PR SHPO personnel suggested, as a for instance, in the conference call. Ramey was not a Strategic Air Command (SAC), but part of it. We believe the former Ramey Air Force Base's Cold War history is much more complex than is commonly known and the Association's web site only gives us a hint of that history. The mission and history of the SAC should be explored and Ramey's contribution to this command.

We are not familiar with the language of Stipulation IV (Public Domain of Agency Records) and we question whether it is necessary or applicable. The agency in question was not even identified. Would this apply to all the reports we have received prior to the MOA?

The above comments should be taken into account in revising the draft MOA.

If you have any questions concerning our comments, do not hesitate to contact our Office.

Sincerely,

Carlos A. Rubio-Cancela
State Historic Preservation Officer

CARC/GMO/MB

MEMORANDUM OF AGREEMENT
AMONG
FEDERAL AVIATION ADMINISTRATION (FAA),
PUERTO RICO PORT AUTHORITY (PRPA),
AND THE
PUERTO RICO HISTORIC PRESERVATION OFFICER (PR SHPO)
REGARDING
THE RUNWAY 8/26 RECONSTRUCTION
AT RAFAEL HERNANDEZ AIRPORT, AGUADILLA, PUERTO RICO
SHPO10-29-15-07

WHEREAS, the FAA has conditionally approved the Airport Layout Plan and plans for possible Federal Funding to reconstruct Runway 8/28 at Rafael Hernandez Airport, Aguadilla, Puerto Rico (undertaking) pursuant to 49 U.S.C. § 47101; and

WHEREAS, the undertaking consists of construction of a new permanent Runway 8-26, 500 feet south of the existing Runway 8-26 centerline, to replace the existing Runway 8-26. The runway would measure 11,000 foot by 200 foot, comprised of Portland Cement Concrete (PCC) with asphalt overlay. The existing Runway 8-26 would be converted to a full length partial parallel taxiway that meets all FAA design and safety standards; and

WHEREAS, FAA has defined the undertaking's area of potential effect (APE) in accordance with 36 CFR Part 800.16(d), in consultation with the PR SHPO. For archaeological resources, the Archaeological APE corresponds to areas of planned construction and demolition activities for all alternatives evaluated in the EA. Additionally, to account for indirect ground disturbance activities that may occur during construction, such as materials and equipment staging, the archaeological APE includes a 100-foot buffer around planned construction areas. For evaluation of historic architectural resources, a separate APE was delineated to assess potential impacts not related to the construction footprint and corresponds to the original area of the Ramey Air Force Base; and

WHEREAS, the undertaking is owned and operated by the Puerto Rico Port Authority (Sponsor) and therefore, the Sponsor has been asked to participate and sign this Memorandum of Agreement (MOA); and

WHEREAS, FAA, in consultation with PR SHPO, has found the former Ramey AFB eligible for listing as a historic district; and

WHEREAS, FAA approval of the proposed action would constitute an adverse effect to the historic district; and

WHEREAS, FAA has consulted with the public through public notice and solicitation of public comment during the NEPA process, and with PR SHPO regarding the effects of the

undertaking on historic properties. *To be completed* comments were received concerning historic properties; and

WHEREAS, the Ramey Air Force Base Historical Association (RAFBHA) is a non-benefit association with the sole mission of keeping the historical backdrop of Ramey AFB alive has been invited to participate in the development of this MOA as a concurring party; and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), FAA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation and invited the ACHP to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii) and the ACHP has concluded that Appendix A, Criteria for Council Involvement in Reviewing Individual Section 106 Cases, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking ; and

NOW, THEREFORE, the FAA, PR SHPO, PRPA agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The FAA shall ensure that the following measures are carried out by a professional who meets the applicable Secretary of Interior Professional Qualifications Standards:

I. ARCHAEOLOGICAL INVESTIGATION

A. As the result of archaeological surveys (2015, 2018 and 2019), structures were identified (i. e., cement blocks, channel segment, building/structure foundations) whose eligibility to the National Register of Historic Places is not adequately discussed in reports. A single archaeological survey report will be prepared by PRPA that integrates the entirety of archaeological identification and evaluation work carried out so far and will include all related letters by the SHPO, and an evaluation of eligibility with the basis for such recommendations. This single report will be submitted to the PR SHPO for review.

B. If additional subsurface testing is deemed necessary, a work plan will be submitted to the PR SHPO for review and concurrence prior to implementation. FAA will obtain consensus determinations of eligibility, assessment of effects and resolution of effects from PR SHPO.

II. HISTORICAL SITE DOCUMENTATION

A. The PRPA (Sponsor) will prepare a report to document the architectural and cultural history of the airfield to include the following:

1) History of the airport's role during the Cold War

2) Documentation of Ramey Air Force Base's role in the use of reconnaissance planes during the Cold War
3) Oral histories from a locals' perspective in how the Air Force Base affected the economy of Puerto Rico
4) The role of Ramey Air Force Base as part of a strategic air command (SAC) which will include the mission and history of the SAC and exploration of Ramey's contribution to this command.
5) Discussion of Ramey Air Force Base's influence on life including education, employment, and people's views concerning the base.

III. PERMANENT ARCHIVAL RECORD

A. Prior to acquisition and demolition of buildings, digital photographs will be taken of the buildings and landscape within the Area of Potential Affect including views of the exterior and interior of all buildings, structural or decorative. Digital photographs showing the overall complex and its setting will also be included.
B. The photographer shall comply with the minimum level standards necessary for document retention at PR SHPO pursuant to the *Guidelines for Establishing a Photographic Permanent Archival Record*. A draft copy of the PAR will be provided to PR SHPO for a 30-day review and comment period. PRPA will respond to PR SHPO comments regarding the draft PAR within 30-days of receipt. After the draft has been reviewed, a final archival copy of the PAR will be provided to PRSHPO and to RAFBHA.

IV. DURATION

This MOA shall expire if its terms are not carried out within five (5) years from the date which the fully executed MOA is filed with ACHP. Prior to such time, FAA may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation VIII, below.

V. POST-REVIEW DISCOVERIES

If potential cultural resources are discovered or unanticipated effects on cultural resources found during design or construction, all work shall promptly stop and the FAA, PRPA, and PR SHPO will be notified and consulted on how to proceed pursuant to 36 CFR Part 800.13.

VI. MONITORING AND REPORTING

Each year following the execution of this MOA until it expires or is terminated, the PRPA (Sponsor) shall provide all parties to this MOA a summary report detailing work undertaken

pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the Sponsor's efforts to carry out the terms of this MOA.

VII. DISPUTE RESOLUTION

Should any signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, FAA shall consult with such party to resolve the objection. If FAA determines that such objection cannot be resolved, FAA will:

A. Forward all documentation relevant to the dispute, including the FAA's proposed resolution, to the ACHP. The ACHP shall provide FAA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FAA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. FAA will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the thirty- (30) day time period, FAA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FAA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the MOA and provide them and the ACHP with a copy of such written response.

C. The responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

VIII. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

IX. TERMINATION

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per StipulationVIII, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, work shall stop on the undertaking. Prior to work continuing on the undertaking, FAA shall either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP

under 36 CFR § 800.7. FAA shall notify the signatories as to the course of action it will pursue.

Execution of this MOA by the FAA, PR SHPO, and the PRPA, its submission to the ACHP in accordance with 36 CFR 800.6(b)(1)(iv), and implementation of its terms, is evidence that the FAA has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

FEDERAL AVIATION ADMINISTRATION

BY:_____DATE:_____
Larry F. Clark, Manager, Atlanta Airports District Office

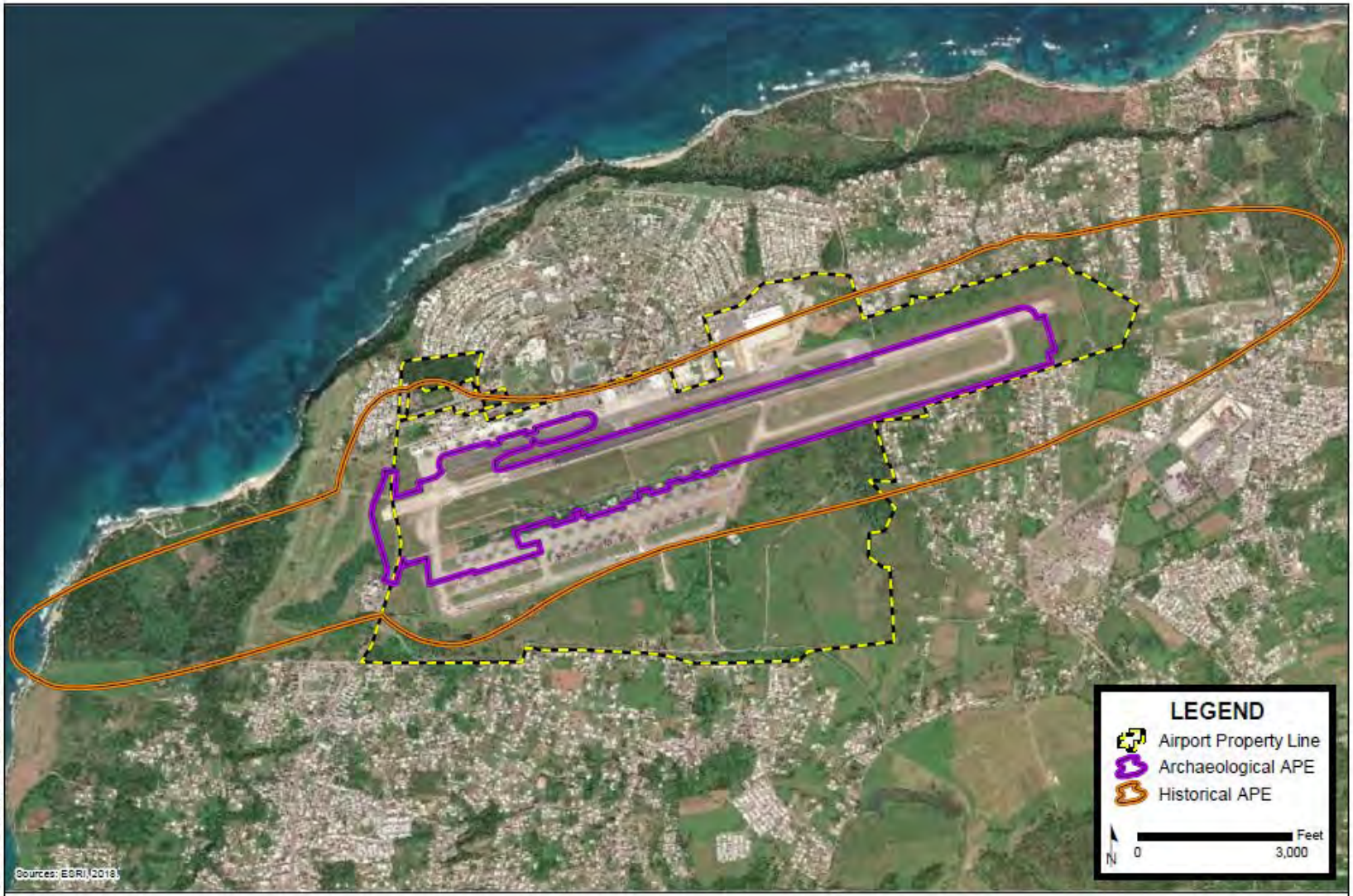
PUERTO RICO STATE HISTORIC PRESERVATION OFFICER

BY:_____DATE:_____
Carlos A. Rubio-Cancela, Executive Director / State Historic Preservation Officer

PUERTO RICO PORT AUTHORITY

BY:_____DATE:_____
Joel A. Pizá Batiz, Acting Executive Director

Appendix – Areas of Potential Effect



RAFAEL HERNANDEZ AIRPORT
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT

FIGURE
1.3-1

June 22, 2020

Mr. Lee Kyker
Environmental Protection Specialist
Federal Aviation Administration
Atlanta Airports District Office
1701 Columbia Avenue
College Park, GA 30337

Ref: *Proposed Runway Replacement Project at Rafael Hernandez Airport*
Aguadilla, Puerto Rico
ACHP Project Number: 15443

Dear Mr. Kyker:

The Advisory Council on Historic Preservation (ACHP) has received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and it is determined that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Puerto Rico State Historic Preservation Officer (SHPO), and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA, and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the notification of adverse effect. If you have any questions or require further assistance, please contact Anthony Guy Lopez at (202) 517-0220 or by email at alopez@achp.gov.

Sincerely,

LaShavio Johnson

LaShavio Johnson
Historic Preservation Technician
Office of Federal Agency Programs

MEMORANDUM OF AGREEMENT
AMONG
FEDERAL AVIATION ADMINISTRATION (FAA),
PUERTO RICO PORTS AUTHORITY (PRPA),
AND THE
PUERTO RICO STATE HISTORIC PRESERVATION OFFICER (PR SHPO)
REGARDING
THE RUNWAY 8/26 RECONSTRUCTION
AT RAFAEL HERNANDEZ AIRPORT, AGUADILLA, PUERTO RICO
SHPO10-29-15-07

WHEREAS, the FAA has y approved the plans for possible Federal Funding to reconstruct Runway 8/26 at Rafael Hernandez Airport, Aguadilla, Puerto Rico (undertaking) pursuant to 49 U.S.C. § 47101; and

WHEREAS, the undertaking consists of construction of a new permanent Runway 8-26, 500 feet south of the existing Runway 8-26 centerline, to replace the existing Runway 8-26. The runway would measure 11,000 foot by 200 foot, comprised of Portland Cement Concrete (PCC) with asphalt overlay. The existing Runway 8-26 would be converted to a full length partial parallel taxiway that meets all FAA design and safety standards; and

WHEREAS, FAA has defined the undertaking's area of potential effect (APE) in accordance with 36 CFR Part 800.16(d), in consultation with the PR SHPO. For archaeological resources, the Archaeological APE corresponds to areas of planned construction and demolition activities for all alternatives evaluated in the EA. Additionally, to account for indirect ground disturbance activities that may occur during construction, such as materials and equipment staging, the archaeological APE includes a 100-foot buffer around planned construction areas. For evaluation of historic architectural resources, a separate APE was delineated to assess potential impacts not related to the construction footprint and corresponds to the original area of the Ramey Air Force Base; and

WHEREAS, the undertaking is owned and operated by the PRPA, as project Sponsor and therefore, the PRPA has been asked to participate and sign this Memorandum of Agreement (MOA); and

WHEREAS, FAA, in consultation with PR SHPO, has found the former Ramey AFB eligible for listing in the National Register of Historic Places (NRHP) as a historic district; and

WHEREAS, FAA approval of the proposed action would constitute an adverse effect to the historic district, but also potentially to archaeological sites once they have been evaluated; and

WHEREAS, FAA has consulted with PR SHPO regarding the effects of the undertaking on historic properties and will also consult with the public through public notice and solicitation

of public comment during the NEPA process; and

WHEREAS, the Ramey Air Force Base Historical Association (RAFBHA) is a non-benefit association with the sole mission of keeping the historical backdrop of Ramey AFB alive has been invited to participate in the development of this MOA as a concurring party; and

WHEREAS, the USCG was invited to sign this agreement, but declined to do so; and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), FAA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation and invited the ACHP to participate in the consultation and the ACHP has chosen not to participate at this time; and

WHEREAS, the proposed project is as described in the Draft Environmental Assessment for Runway 8-26 Reconstruction, June 2020 contained as an attachment to this MOA and the APE, as shown in the attached Figure 1.3-1, is inclusive of the area of the former Ramey Air Force Base containing 16 historically significant structures as well as the existing Runway 8-26.

NOW, THEREFORE, the FAA, PR SHPO, PRPA agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The FAA shall ensure that the following measures are carried out:

I. ARCHAEOLOGICAL INVESTIGATION

A. As the result of archaeological surveys (2015, 2018 and 2019), structures were identified (i. e., cement blocks, channel segment, building/structure foundations) whose eligibility to the National Register of Historic Places is not adequately discussed in reports. A single archaeological survey report will be prepared by PRPA that integrates the entirety of archaeological identification and evaluation work carried out so far and will include all related letters by the SHPO, and an evaluation of eligibility with the basis for such recommendations. This single report will be submitted to the PR SHPO for review.

B. In accordance with 36 CFR 800.4 through 800.6, the FAA will consult with the PR SHPO regarding determinations of eligibility, assessment of effects and resolution of effects.

II. HISTORICAL SITE DOCUMENTATION

A. The PRPA will prepare a report to document the architectural and cultural history of the airfield to include the following:

1) History of the airport's role during the Cold War

2) Documentation of Ramey Air Force Base's role in the use of reconnaissance planes during the Cold War
3) Oral histories from a locals' perspective in how the Air Force Base affected the economy of Puerto Rico
4) The role of Ramey Air Force Base as part of a Strategic Air Command (SAC) which will include the mission and history of the SAC and exploration of Ramey's contribution to this command.
5) Discussion of Ramey Air Force Base's influence on life including education, employment, and people's views concerning the base.

III. PERMANENT ARCHIVAL RECORD

A. Prior to acquisition and demolition of buildings, digital photographs will be taken of the buildings and landscape within the Area of Potential Affect including views of the exterior and interior of all buildings, structural or decorative. Digital photographs showing the overall complex and its setting will also be included.
B. The photographer shall comply with the minimum level standards necessary for document retention at PR SHPO pursuant to the *Guidelines for Establishing a Photographic Permanent Archival Record.* A draft copy of the Permanent Archival Record (PAR) will be provided to PR SHPO for a 30-day review and comment period. PRPA will respond to PR SHPO comments regarding the draft PAR within 30-days of receipt. After the draft has been reviewed, a final archival copy of the PAR will be provided to PRSHPO and to RAFBHA.

IV. DURATION

This MOA shall expire if its terms are not carried out within five (5) years from the date which the fully executed MOA is filed with ACHP. Prior to such time, FAA may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with StipulationVIII, below.

V. POST-REVIEW DISCOVERIES

If potential cultural resources are discovered or unanticipated effects on historic properties found during design or construction, all work shall promptly stop and the FAA, PRPA, and PR SHPO will be notified and consulted on how to proceed pursuant to 36 CFR Part 800.13.

VI. MONITORING AND REPORTING

Each year following the execution of this MOA until it expires or is terminated, the PRPA shall provide all parties to this MOA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the PRPA's efforts to carry out the terms of this MOA.

VII. DISPUTE RESOLUTION

Should any signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, FAA shall consult with such party to resolve the objection. If FAA determines that such objection cannot be resolved, FAA will:

A. Forward all documentation relevant to the dispute, including the FAA's proposed resolution, to the ACHP. The ACHP shall provide FAA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FAA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. FAA will then proceed according to its final decision.

B. If the ACHP does not provide its advice regarding the dispute within the thirty- (30) day time period, FAA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FAA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the MOA and provide them and the ACHP with a copy of such written response.

C. The responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

VIII. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

IX. TERMINATION

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per StipulationVIII, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, work shall stop on the undertaking. Prior to work continuing on the undertaking, FAA shall either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. FAA shall notify the signatories as to the course of action it will pursue.

Execution of this MOA by the FAA, PR SHPO, and the PRPA, its submission to the ACHP in accordance with 36 CFR 800.6(b)(1)(iv), and implementation of its terms, is evidence that the

FAA has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

FEDERAL AVIATION ADMINISTRATION

BY: _____ **DATE:** July 15, 2020
Larry F. Clark, Manager, Atlanta Airports District Office

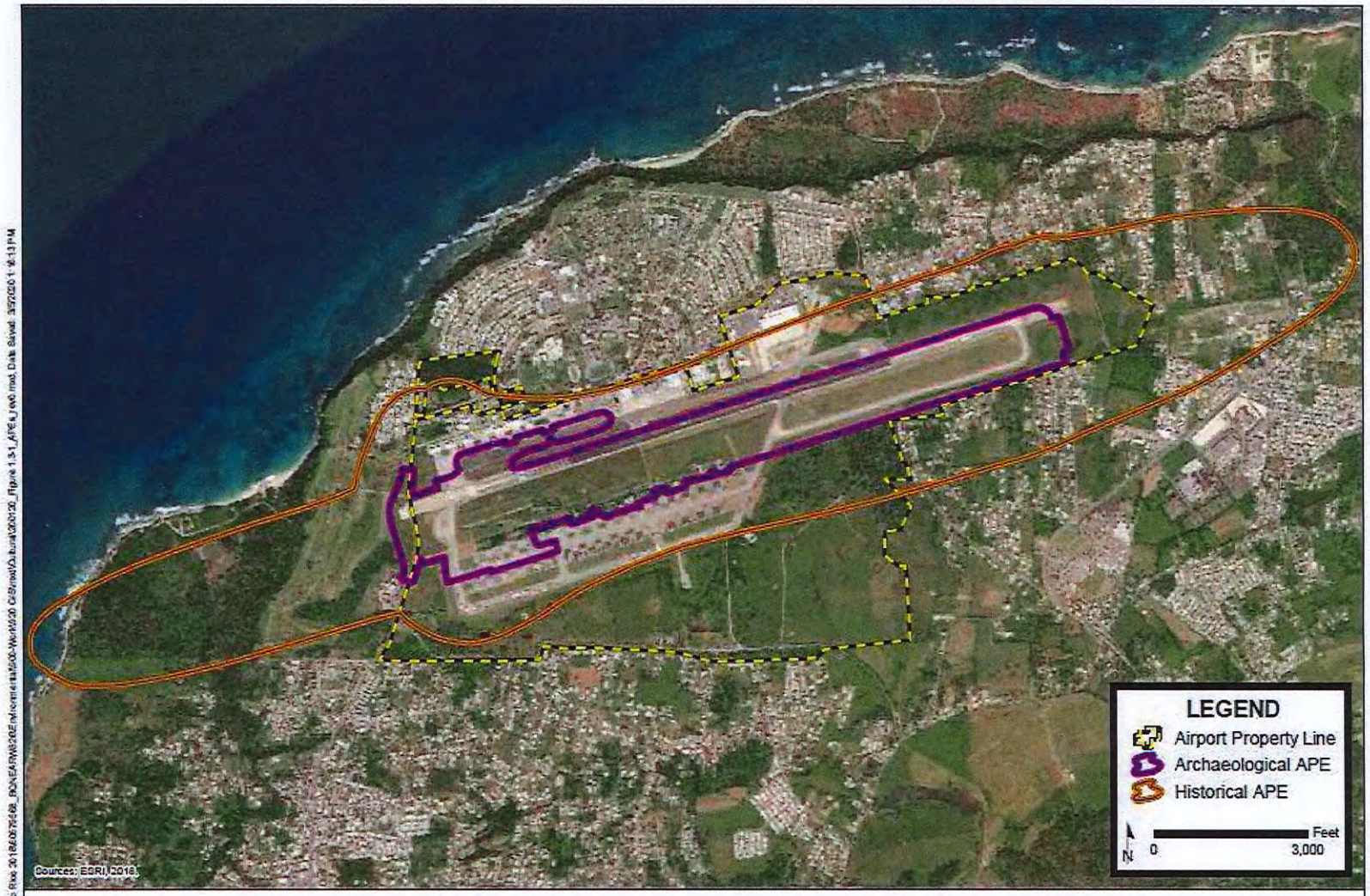
PUERTO RICO STATE HISTORIC PRESERVATION OFFICER

BY: _____ **DATE:** July 15, 2020
Carlos A. Rubio-Cancela, Executive Director / State Historic Preservation Officer

PUERTO RICO PORT AUTHORITY

BY: _____ **DATE:** July 14, 2020
Joel A. Pizá Batiz, Executive Director

Attachments – Draft Environmental Assessment for Runway 8-26 Reconstruction, June 2020
APE Figure 1.3-1



RAFAEL HERNANDEZ AIRPORT
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT

FIGURE
1.3-1

APPENDIX D

Air Quality Analysis Technical Report

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Rafael Hernandez Airport
Runway 8-26 Reconstruction
Environmental Assessment

Air Quality Technical Report

Prepared for:

Puerto Rico Port Authority
and
Federal Aviation Administration

Prepared by:

AECOM

November 2019

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LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ACEIT	Airport Construction Emissions Inventory Tool
ACRP	Airport Cooperative Research Program
AVMT	Annual Vehicle Miles of Travel
BMP	Best Management Practice
BQN	Rafael Hernandez Airport
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
EF	Emissions Rate
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse Gas
HP	Horsepower
MOVES	Motor Vehicle Emissions Simulator
mph	miles-per-hour
NO_x	Nitrogen Oxides
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter equal to or less than 2.5 micrometers in diameter
PM_{10}	Particulate Matter equal to or less than 10 micrometers in diameter
SO_2	Sulfur Dioxide
TPY	Tons Per Year
TSP	Total Suspended Particulate
VOC	Volatile Organic Compounds

CHAPTER 1 INTRODUCTION

This *Air Quality Technical Report* details the assessment scope, calculation methodology, input data and other technical information used in the analysis of air quality impacts associated with the proposed Runway 8-26 Reconstruction at the Rafael Hernandez Airport (i.e., BQN, or the Airport), hereinafter referred to as the Proposed Project.

1.1. ANAYSIS METHODOLOGY

1.1.1. OPERATIONAL EMISSIONS

None of the Proposed Project Alternatives (2B, 2D and No-Action) would result in a change in aircraft fleet mix and operations, and therefore would not result in a change in operational emissions at BQN. A baseline operational emissions inventory was prepared to disclose emissions from existing aircraft operations in 2016 conditions. Emissions from aircraft were calculated using FAA's Aviation Environmental Design Tool (AEDT). Air emission analyses for airports are required to use AEDT for these sources. The analysis used AEDT default emission factors for specific aircraft airframe and engine combinations applied to aircraft operations, including taxi in and out, take off, climb out, approach descent, and aircraft Auxiliary Power Unit (APU) use. The fleet mix and total annual operations by aircraft type used for the analysis was provided by the BQN Air Traffic Control Tower and is shown on Table **1.1-1**.

Table 1.1-1 2016 Annual Fleet Mix and Operations

Aircraft	Engine Model	Total
Airbus A300F4-600 Series	PW4x58	2
Airbus A310-300 Series	CF6-80C2A2	91
Airbus A319-100 Series	V2522-A5	61
Airbus A320-200 Series	V2527-A5	2,960
Bell 429	TPE331-1	11
Bell AH-1W SuperCobra	T700-GE-401 -401C	11,445
Boeing 737-400 Series	CFM56-3C-1 (Rerated)	1
Boeing 737-700 Series	CFM56-7B24	19
Boeing 737-800 Series	CFM56-7B26/2	635
Boeing 747-200 Series	JT9D-7	2
Boeing 747-400 Series	PW4056	313
Boeing 747-800 Series	CF6-80C2B1F	113
Boeing 767-200 Series Freighter	JT9D-7R4D, -7R4D1	5
Boeing 767-300 Series	PW4060	1
Boeing DC-10-10 Series	CF6-6D	571
Boeing DC-3	R-1820	14
Boeing MD-11	CF6-80C2D1F	1,308
Boeing MD-83	JT8D-219	2
Bombardier Challenger 600	ALF 502L-2	55
Bombardier Learjet 35A/36A (C-21A)	TFE731-2/2A	174
Britten-Norman BN-2 Islander	250B17B	60
Cessna 172 Skyhawk	TSIO-360C	2,027
Cessna 182	IO-360-B	436
Cessna 206	TIO-540-J2B2	901

Aircraft	Engine Model	Total
Cessna 208 Caravan	PT6A-114	2,101
Cessna 441 Conquest II	TPE331-8	128
Cessna 500 Citation I	JT15D-4series	27
Cessna 560 Citation XLS	BIZMEDIUMJET_F	12
Cessna 650 Citation III	TFE731-3	9
Cessna 680 Citation Sovereign	BIZMEDIUMJET_F	8
Cessna 750 Citation X	AE3007C1	5
CESSNA CITATION 510	UNKNOWN	21
Convair CV-580	501 D13 alternative 2	620
Dassault Falcon 20-D	CF700-2D	9
DeHavilland DHC-6-200 Twin Otter	PT6A-27	1,592
DeHavilland DHC-8-100	PW121A	1
Dornier 328-100 Series	PW119C	540
EADS Socata TB-9 Tampico	IO-320-D1AD	676
Eclipse 500 / PW610F	PW610F-A	2
Embraer EMB120 Brasilia	PW118	886
Embraer ERJ145	AE3007A1/1	8
Embraer ERJ190	CF34-10E6A1	3
Fokker F100	TAY Mk620-15	6
Gulfstream G550	BR700-710A1-10	2
Gulfstream IV-SP	TAY Mk611-8	26
Hawker HS748-2B	DART 552	2
Israel IAI-1125 Astra	TFE731-3	7
Lockheed C-130 Hercules	T56-A-7	1,024
Mitsubishi MU-300 Diamond	JT15D-5, -5A, -5B	47
Piper PA-24 Comanche	TIO-540-J2B2	7,207
Piper PA-28 Cherokee Series	IO-320-D1AD	1,425
Piper PA-30 Twin Comanche	IO-320-D1AD	180
Piper PA-42 Cheyenne Series	PT6A-41	3
Raytheon Beech Baron 58	TIO-540-J2B2	535
Robinson R44 Raven / Lycoming O-540-F1B5	TIO-540-J2B2	34
Saab 340-B	CT7-9B	401
Shorts 330-200 Series	PT6A-45R	1,697
	Total	**40,451**

Sources: Air Traffic Control Tower, AEDT 2d

1.1.2. CONSTRUCTION EMISSIONS

Construction period emission inventories of the following criteria pollutants and their precursors were prepared for the Proposed Project: carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM), and volatile organic compounds (VOC). Greenhouse gas (GHG) emissions, expressed in metric tons of carbon dioxide equivalent (CO_2e) emissions, were also computed. The inventories include annual emissions from the following construction emissions sources: off-road equipment, on-road vehicles, and fugitive sources including asphalt paving and dust generation from site-wide construction activities. Off-road equipment and on-road vehicle emissions were computed using **Equations 1** and **2**, respectively.

Annual hours of off-road equipment operation and on-road annual vehicle miles of travel (AVMT) were derived using an engineering estimate of probable materials quantities and construction cost developed for the Proposed Project. This information was input to the Airport Cooperative

Research Program Airport Construction Emissions Inventory Tool (ACRP ACEIT), which then estimates the number and types of equipment to be used on the project and the deployment schedule (monthly and annually). Annual construction equipment and vehicle activity is summarized on **Table 1.2-1.**

Equation 1:

$$\text{Emissions}_{(tpy)} = \sum_{v=i}^{n} EF_v \times HP_v \times \frac{\text{hours}}{\text{day}} \times \frac{\text{days}}{\text{year}} \div 2{,}000 \div 453.59$$

Where:

$\text{Emissions}_{(tpy)}$ = annual emissions (tons per year)

EF_v = emissions rate for equipment v(i)…v(n) (grams per horsepower-hour of operation)

HP_v = rated horsepower for equipment v(i)…v(n)

2,000 = pounds per ton

453.59 = grams per pound

Equation 2:

$$\text{Emissions}_{(tpy)} = \sum_{v=i}^{n} EF_v \times \frac{\text{miles}}{\text{day}} \times \frac{\text{days}}{\text{year}} \div 2{,}000 \div 453.59$$

Where:

$\text{Emissions}_{(tpy)}$ = annual emissions (tons per year)

EF_v = emissions rate for vehicle v(i)…v(n) (grams per mile)

2,000 = pounds per ton

453.59 = grams per pound

Table 1.2-1: Estimated Annual Construction Activity

Off-road Equipment	Fuel	Annual Operating Hours			
		2020	2021	2022	2023
Air Compressor	Gasoline	307.2	306.0	304.8	304.8
Asphalt Paver	Diesel	156.3	155.7	155.1	155.1
Bob Cat	Diesel	739.8	736.9	734.1	734.1
Chain Saw	Gasoline	604.1	601.8	599.5	599.5
Chipper/Stump Grinder	Diesel	604.1	601.8	599.5	599.5
Concrete Saws	Gasoline	307.2	306.0	304.8	304.8
Concrete Truck	Diesel	1,351.8	1,346.6	1,341.4	1,341.4
Dozer	Diesel	4,838.6	4,820.1	4,801.6	4,801.6
Dump Truck	Diesel	2,220.1	2,211.6	2,203.1	2,203.1
Dump Truck (12 cy)	Diesel	4,826.8	4,808.3	4,789.9	4,789.9
Excavator	Diesel	2,852.8	2,841.9	2,831.0	2,831.0
Excavator with Bucket	Diesel	369.9	368.5	367.1	367.1
Flatbed Truck	Diesel	328.1	326.9	325.6	325.6
Generator Sets	Gasoline	369.9	368.5	367.1	367.1
Grader	Diesel	99.4	99.0	98.7	98.7
Hydroseeder	Gasoline	68.7	68.4	68.2	68.2
Loader	Diesel	409.1	407.6	406.0	406.0
Off-Road Truck	Diesel	68.7	68.4	68.2	68.2
Other General Equipment	Diesel	2,152.9	2,144.7	2,136.5	2,136.5
Pickup Truck	Diesel	9,910.1	9,872.2	9,834.4	9,834.4
Pumps	Gasoline	201.4	200.6	199.8	199.8
Roller	Diesel	1,876.6	1,869.5	1,862.3	1,862.3
Rubber Tired Loader	Diesel	307.2	306.0	304.8	304.8
Scraper	Diesel	865.4	862.1	858.8	858.8
Skid Steer Loader	Diesel	530.7	528.7	526.7	526.7
Slip Form Paver	Diesel	307.2	306.0	304.8	304.8
Surfacing Equipment (Grooving)	Gasoline	507.3	505.3	503.4	503.4
Tractors/Loader/Backhoe	Diesel	690.8	688.2	685.5	685.5
Water Truck	Diesel	1,446.9	1,441.4	1,435.9	1,435.9
Total, Off-road Equipment		**39318.7**	**39,318.7**	**39,168.6**	**39,018.6**
Onroad Vehicles	**Fuel**	**Annual Vehicle Miles of Travel (AVMT)**			
		2020	**2021**	**2022**	**2023**
Asphalt 18 Wheeler	Diesel	12,046.5	12,000.5	11,954.5	11,954.5
Cement Mixer	Diesel	191,989.2	191,256.4	190,523.7	190,523.7
Dump Truck	Diesel	707,142.8	704,443.8	701,744.7	701,744.7
Dump Truck - Asphalt	Diesel	17,065.7	17,000.5	16,935.4	16,935.4
Dump Truck Subbase Material	Diesel	102,394.3	102,003.5	101,612.6	101,612.6
Passenger Car	Gasoline	1,898,558.8	1,891,312.4	1,884,065.9	1,884,065.9
Total, On-road Vehicles		**2,929,197.2**	**2,918,017.0**	**2,906,836.9**	**2,906,836.9**

Because construction equipment and vehicle emissions rates contained in ACEIT are not sufficiently representative of local conditions, equipment and vehicle emissions rates were instead generated using the current version of the U.S. Environmental Protection Agency Motor Vehicle Emissions Simulator (EPA MOVES2014a). MOVES2014a was invoked at the project-level using input databases specific to Aguadilla Municipio, Puerto Rico. Input databases were adapted from EPA's most recent National Emissions Inventory, which incorporates Aguadilla Municipio-specific

information to the extent it was submitted to the EPA by state and local air quality and transportation agencies.

Vehicle age distributions, inspection and maintenance programs (to the extent applied), fuel supply and other data were held constant for future years; that is, projections or adjustments were not applied unless available from locally-developed data. A summer design hour representative of a July weekday in Aguadilla Municipio from 1400 to 1500 was selected for emissions rate modeling based on the worst-case temperature/humidity hourly condition, according to the MOVES 'ZoneMonthHour' input database. Emissions rates for on-road vehicles were generated for five mile-per-hour (mph) increments ranging from 5 to 65 mph. For the purposes of emissions calculations it was assumed that all on-road vehicles would travel at an average speed of 35 miles per hour. **Tables 1.2-2a** through **1.2-2e** specify the annual off-road equipment and on-road vehicle emissions rates applied in the analysis.

Equation 3 was used to estimate dust emissions from site-wide construction activities, adapted from EPA's AP-42 methodology[1]. EPA studies have concluded that ten percent of the dust emissions in the PM_{10} or less size fractions are $PM_{2.5}$.[2] Therefore, uncontrolled PM_{10} dust emissions were factored by 0.10 to derive the $PM_{2.5}$ component. Further, dust suppression and erosion control Best Management Practices (BMPs) during construction, such as site watering and track-out prevention measures, will ensure that PM impacts from construction activities are minimized. According to EPA, adherence to these BMPs can result in a dust control efficiency of 75 percent, which was applied to the calculation to represent controlled PM emissions.[3]

Estimation of annual evaporative VOC emissions from asphalt curing is based upon the EPA methods outlined in AP-42[4] as well as the Emissions Inventory Improvement Program[5]. **Equation 4** outlines this method. Because the asphalt characterization is not known, assuming that 35 percent of liquefied asphalt is diluent that can evaporate as VOC, 95 percent of this diluent would evaporate during asphalt curing, and that the density of the diluent is 1.98 pounds per liter of diluent applied.

[1] U.S. Environmental Protection Agency. *Compilation of Air Pollutant Emissions Factors (AP-42). Fifth Edition, Volume I Chapter 13: Miscellaneous Sources*. 1995.
[2] Pace, Thompson G. *Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions From PM10.* Presented at the Environmental Protection Agency 14th International Emission Inventory Conference. Las Vegas, NV, 2005
[3] U.S. Environmental Protection Agency. *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*. OAQPS, EPA-450/2-92-004. 1992.
[4] U.S. Environmental Protection Agency. *Compilation of Air Pollutant Emission Factors (AP-42). Fifth Edition Volume I Chapter 4.5: Asphalt Paving Operations*. 1995.
[5] U.S. Environmental Protection Agency. *Emissions Inventory Improvement Program (EIIP), Volume III: Chapter 17, "Asphalt Paving".* 2001.

Table 1.2-2a: 2020 Off-Road Equipment Emissions Rates

Equipment	Fuel Type	Load	Horsepower	2020 Emission Rate (grams per horsepower-hour at operating load)						
				CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Air Compressors	Gasoline	0.56	5.19	207.231	2.158	0.378	0.348	0.007	9.828	1247.329
Chain Saws < 6 HP (com)	Gasoline	0.7	3.92	266.028	1.528	9.748	8.968	0.004	73.279	710.948
Chippers/Stump Grinders (com)	Diesel	0.43	84.47	1.670	2.974	0.283	0.274	0.003	0.363	589.667
Commercial Turf Equipment (com)	Gasoline	0.6	5.22	203.350	2.019	0.316	0.291	0.007	7.469	1247.841
Concrete/Industrial Saws	Gasoline	0.78	4.53	266.029	1.528	9.748	8.968	0.004	63.423	710.953
Crawler Tractor/Dozers	Diesel	0.59	136.10	0.282	0.719	0.050	0.049	0.003	0.165	536.670
Excavators	Diesel	0.59	137.60	0.228	0.558	0.036	0.035	0.003	0.160	536.676
Generator Sets	Gasoline	0.68	8.82	273.202	1.675	0.113	0.104	0.006	7.886	1060.731
Graders	Diesel	0.59	231.20	0.196	0.649	0.027	0.026	0.003	0.161	536.674
Off-highway Trucks	Diesel	0.59	419.90	0.195	0.524	0.021	0.020	0.003	0.157	536.680
Other Construction Equipment	Diesel	0.59	442.60	0.955	2.244	0.131	0.127	0.003	0.204	536.542
Pavers	Diesel	0.59	134.60	0.379	0.911	0.077	0.075	0.003	0.172	536.660
Pumps	Gasoline	0.69	4.63	205.309	2.089	0.348	0.320	0.007	10.373	1247.583
Rollers	Diesel	0.59	84.76	1.208	1.216	0.140	0.136	0.003	0.187	595.957
Rubber Tire Loaders	Diesel	0.59	136.30	0.442	1.042	0.095	0.092	0.003	0.178	536.651
Scrapers	Diesel	0.59	422.50	0.525	1.294	0.077	0.075	0.003	0.168	536.659
Skid Steer Loaders	Diesel	0.21	57.67	4.264	4.652	0.616	0.598	0.004	0.861	694.026
Surfacing Equipment	Gasoline	0.49	8.92	276.425	1.727	0.124	0.114	0.006	6.344	1060.449
Tractors/Loaders/Backhoes	Diesel	0.21	87.17	3.935	3.037	0.535	0.519	0.004	0.647	694.778

Source: EPA MOVES2014a

Table 1.2-2b: 2021 Off-Road Equipment Emissions Rates

Equipment	Fuel Type	Load	Horsepower	2021 Emission Rate (grams per horsepower-hour at operating load)						
				CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Air Compressors	Gasoline	0.56	5.19	207.231	2.158	0.378	0.348	0.007	9.828	1247.329
Chain Saws < 6 HP (com)	Gasoline	0.7	3.92	266.029	1.528	9.748	8.968	0.004	73.280	710.951
Chippers/Stump Grinders (com)	Diesel	0.43	84.47	1.550	2.746	0.258	0.250	0.003	0.339	589.739
Commercial Turf Equipment (com)	Gasoline	0.6	5.22	203.351	2.019	0.316	0.291	0.007	7.469	1247.840
Concrete/Industrial Saws	Gasoline	0.78	4.53	266.029	1.528	9.748	8.968	0.004	63.423	710.951
Crawler Tractor/Dozers	Diesel	0.59	136.10	0.241	0.578	0.039	0.038	0.003	0.162	536.674
Excavators	Diesel	0.59	137.60	0.198	0.438	0.027	0.026	0.003	0.158	536.678
Generator Sets	Gasoline	0.68	8.82	273.068	1.666	0.113	0.104	0.006	7.854	1060.706
Graders	Diesel	0.59	231.20	0.173	0.525	0.022	0.021	0.003	0.159	536.677
Off-highway Trucks	Diesel	0.59	419.90	0.174	0.416	0.017	0.016	0.003	0.157	536.681
Other Construction Equipment	Diesel	0.59	442.60	0.864	2.031	0.119	0.116	0.003	0.197	536.564
Pavers	Diesel	0.59	134.60	0.290	0.725	0.052	0.051	0.003	0.166	536.669
Pumps	Gasoline	0.69	4.63	205.309	2.089	0.348	0.320	0.007	10.373	1247.583
Rollers	Diesel	0.59	84.76	0.969	0.989	0.102	0.099	0.003	0.178	595.973
Rubber Tire Loaders	Diesel	0.59	136.30	0.354	0.855	0.070	0.068	0.003	0.171	536.661
Scrapers	Diesel	0.59	422.50	0.445	1.116	0.064	0.062	0.003	0.165	536.665
Skid Steer Loaders	Diesel	0.21	57.67	3.961	4.499	0.564	0.547	0.004	0.788	694.232
Surfacing Equipment	Gasoline	0.49	8.92	276.425	1.727	0.124	0.114	0.006	6.344	1060.451
Tractors/Loaders/Backhoes	Diesel	0.21	87.17	3.642	2.761	0.485	0.470	0.004	0.589	694.926

Source: EPA MOVES2014a

Table 1.2-2c: 2022 Off-Road Equipment Emissions Rates

Equipment	Fuel Type	Load	Horsepower	2022 Emission Rate (grams per horsepower-hour at operating load)						
				CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Air Compressors	Gasoline	0.56	5.19	207.231	2.158	0.378	0.348	0.007	9.828	1247.329
Chain Saws < 6 HP (com)	Gasoline	0.7	3.92	266.029	1.528	9.748	8.968	0.004	73.280	710.952
Chippers/Stump Grinders (com)	Diesel	0.43	84.47	1.447	2.537	0.237	0.230	0.003	0.320	589.795
Commercial Turf Equipment (com)	Gasoline	0.6	5.22	203.351	2.019	0.316	0.291	0.007	7.469	1247.839
Concrete/Industrial Saws	Gasoline	0.78	4.53	266.029	1.528	9.748	8.968	0.004	63.423	710.948
Crawler Tractor/Dozers	Diesel	0.59	136.10	0.211	0.464	0.031	0.030	0.003	0.159	536.677
Excavators	Diesel	0.59	137.60	0.176	0.382	0.020	0.020	0.003	0.157	536.679
Generator Sets	Gasoline	0.68	8.82	273.010	1.662	0.113	0.104	0.006	7.841	1060.693
Graders	Diesel	0.59	231.20	0.155	0.425	0.018	0.018	0.003	0.158	536.679
Off-highway Trucks	Diesel	0.59	419.90	0.159	0.367	0.014	0.013	0.003	0.156	536.680
Other Construction Equipment	Diesel	0.59	442.60	0.780	1.830	0.108	0.105	0.003	0.191	536.582
Pavers	Diesel	0.59	134.60	0.249	0.594	0.041	0.040	0.003	0.163	536.673
Pumps	Gasoline	0.69	4.63	205.310	2.089	0.348	0.320	0.007	10.373	1247.581
Rollers	Diesel	0.59	84.76	0.761	0.787	0.068	0.066	0.003	0.171	595.985
Rubber Tire Loaders	Diesel	0.59	136.30	0.278	0.689	0.048	0.047	0.003	0.166	536.668
Scrapers	Diesel	0.59	422.50	0.372	0.954	0.051	0.049	0.003	0.163	536.670
Skid Steer Loaders	Diesel	0.21	57.67	3.670	4.353	0.514	0.499	0.004	0.720	694.424
Surfacing Equipment	Gasoline	0.49	8.92	276.424	1.727	0.124	0.114	0.006	6.344	1060.447
Tractors/Loaders/Backhoes	Diesel	0.21	87.17	3.360	2.497	0.436	0.423	0.004	0.534	695.064

Source: EPA MOVES2014a

Table 1.2-2d: 2023 Off-Road Equipment Emissions Rates

Equipment	Fuel Type	Load	Horsepower	2023 Emission Rate (grams per horsepower-hour at operating load)						
				CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Air Compressors	Gasoline	0.56	5.188	207.231	2.158	0.378	0.348	0.007	9.828	1247.329
Chain Saws < 6 HP (com)	Gasoline	0.7	3.916	266.029	1.528	9.748	8.968	0.004	73.280	710.950
Chippers/Stump Grinders (com)	Diesel	0.43	84.47	1.350	2.338	0.217	0.211	0.003	0.302	589.846
Commercial Turf Equipment (com)	Gasoline	0.6	5.217	203.352	2.019	0.316	0.291	0.007	7.469	1247.839
Concrete/Industrial Saws	Gasoline	0.78	4.532	266.029	1.528	9.748	8.968	0.004	63.423	710.946
Crawler Tractor/Dozers	Diesel	0.59	136.1	0.188	0.406	0.024	0.023	0.003	0.158	536.679
Excavators	Diesel	0.59	137.6	0.161	0.344	0.016	0.015	0.003	0.156	536.681
Generator Sets	Gasoline	0.68	8.816	272.984	1.660	0.113	0.104	0.006	7.835	1060.688
Graders	Diesel	0.59	231.2	0.141	0.378	0.015	0.015	0.003	0.157	536.680
Off-highway Trucks	Diesel	0.59	419.9	0.150	0.334	0.012	0.012	0.003	0.156	536.681
Other Construction Equipment	Diesel	0.59	442.6	0.703	1.643	0.098	0.095	0.003	0.186	536.598
Pavers	Diesel	0.59	134.6	0.221	0.487	0.033	0.032	0.003	0.161	536.675
Pumps	Gasoline	0.69	4.631	205.310	2.089	0.348	0.320	0.007	10.373	1247.582
Rollers	Diesel	0.59	84.76	0.668	0.643	0.053	0.052	0.003	0.166	595.992
Rubber Tire Loaders	Diesel	0.59	136.3	0.243	0.571	0.039	0.038	0.003	0.163	536.672
Scrapers	Diesel	0.59	422.5	0.305	0.806	0.039	0.038	0.003	0.161	536.673
Skid Steer Loaders	Diesel	0.21	57.67	3.407	4.219	0.468	0.454	0.004	0.660	694.591
Surfacing Equipment	Gasoline	0.49	8.918	276.425	1.727	0.124	0.114	0.006	6.344	1060.447
Tractors/Loaders/Backhoes	Diesel	0.21	87.17	3.090	2.246	0.390	0.378	0.004	0.483	695.191

Source: EPA MOVES2014a

Table 1.2-2e: On-Road Vehicle Emissions Rates

Vehicle Type	Fuel Type	2020 Emission Rate (grams per vehicle mile traveled)						
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Light commercial truck	Diesel	3.528	1.183	0.097	0.052	0.005	0.206	641.754
Single unit short-haul truck	Diesel	1.507	3.133	0.386	0.235	0.010	0.460	1181.443
Passenger car	Gasoline	3.762	0.170	0.044	0.009	0.007	0.140	337.979
Passenger truck	Gasoline	6.249	0.426	0.049	0.011	0.009	0.237	445.886
Vehicle Type	**Fuel Type**	**2021 Emission Rate (grams per horsepower-hour at operating load)**						
		CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO_2e**
Light commercial truck	Diesel	3.260	1.057	0.089	0.046	0.005	0.176	629.770
Single unit short-haul truck	Diesel	1.383	2.885	0.361	0.213	0.010	0.417	1175.092
Passenger car	Gasoline	3.595	0.148	0.044	0.009	0.007	0.131	329.246
Passenger truck	Gasoline	5.853	0.373	0.049	0.010	0.009	0.216	433.546
Vehicle Type	**Fuel Type**	**2022 Emission Rate (grams per horsepower-hour at operating load)**						
		CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO_2e**
Light commercial truck	Diesel	3.011	0.928	0.083	0.040	0.005	0.147	617.562
Single unit short-haul truck	Diesel	1.259	2.648	0.339	0.192	0.010	0.372	1168.854
Passenger car	Gasoline	3.451	0.130	0.044	0.009	0.006	0.123	320.096
Passenger truck	Gasoline	5.485	0.326	0.049	0.010	0.008	0.196	420.582
Vehicle Type	**Fuel Type**	**2023 Emission Rate (grams per horsepower-hour at operating load)**						
		CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO_2e**
Light commercial truck	Diesel	2.763	0.827	0.078	0.035	0.005	0.125	605.516
Single unit short-haul truck	Diesel	1.161	2.424	0.318	0.174	0.010	0.337	1162.434
Passenger car	Gasoline	3.296	0.116	0.044	0.009	0.006	0.116	310.489
Passenger truck	Gasoline	5.151	0.287	0.049	0.010	0.008	0.179	407.085

Source: EPA MOVES2014a

Equation 3:**

$$PM_{10(tpy)} = EF_{TSP} \times \frac{days}{year} \times \frac{acres}{day} \times 0.45 \div 2{,}000$$

Where:

$PM_{10(tpy)}$= annual PM_{10} dust emissions (tons per year)

EF_{TSP}= total suspended particulate (TSP) emissions rate (80 pounds per acre-day)

0.45 = estimated ratio of PM_{10} to TSP

2,000 = pounds per ton

**Represents uncontrolled emissions of PM_{10}. Controlled emissions are derived by applying a 75% control factor.

$PM_{2.5} = PM_{10} \times 0.10$

Equation 4:

$$VOC_{(tpy)} = A \times AR \times VD \times EF \times D \div 2{,}000$$

Where:

$VOC_{(tpy)}$= annual VOC paving emissions (tons per year)

A = area of pavement in square meters(m^2)

AR = asphalt application rate (0.679 liter/m^2)

VD = volume fraction of diluent (0.35)

AF = mass fraction of diluent which evaporates as VOC (0.95)

D = solvent density (1.98 pounds/liter)

2,000 = pounds per ton

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APPENDIX E

Preliminary Coastal Federal Consistency Certification

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JP-833
Rev. MAR 2005

Commonwealth of Puerto Rico
Office of the Governor
Puerto Rico Planning Board
Physical Planning Area
Land Use Planning Bureau

Application for Certification of Consistency with the Puerto Rico Coastal Management Program

General Instructions:

A. Attach a 1:20,000 scale, U.S. Geological Survey topographic quadrangular base map of the site. (See Item 6)

B. Attach a reasonably scaled plan or schematic design of the proposed object, indicating the following: (See Item 6)

1. Peripheral areas

2. Bodies of water, tidal limit and natural systems.

C. You may attach any further information you consider necessary for proper evaluation of the proposal. (See Item 6)

D. If any information requested in the questionnaire does not apply in your case, indicate by writing "N/A"(not applicable).

E. Submit a minimum of seven (7) copies of this application.

DO NOT WRITE IN THIS BOX

Type of application: _____ Application Number: _____

Date received: _____ Date of Certification: _____

Evaluation result: ☐ Objection ☐ Acceptance ☐ Negotiation

Technician: _____ Supervisor: _____

Comments: _____

1. Name of Federal Agency: Federal Aviation Administration

2. Federal Program Catalog Number: _____

3. Type of Action:

☐ Federal Activity ☐ License or permit ☒ Federal Assistance

4. Name of Applicant: Eng. Romel Pedraza on behalf of Ms. Felicia Reeves

Postal Address: Southern Region/ Atlanta Airports District Office , 1701 Columbia Ave. Room 220
College Park, GA, 30337

Telephone: 404-305-67808 Fax: _____

5. Project name: Environmental Assessment for Reconstruction of Runway 8-26 at Rafael Hernández Airport

6. Physical Description of Project Location (area, facilities such as vehicular access, drainage, storm and sanitary sewer placement, etc.): Please see Section 3 of enclosed Wetland Assessment Report

Lambert Coordinates: X = _____ Y = _____

Note: lat/long in degree decimal format: Lat. 18.492122°, Long. -67.134479°.

7. Type of construction or other work proposed:

☐ drainage ☐ channeling ☐ landfill ☐ sand extraction

☐ pier ☐ bridge ☐ residential ☐ tourist

others (specify and explain) See description of proposed work below.

Description of proposed work:

The proposed project would specifically consist of improvements to the currently deteriorated Runway 8-26 of the above-referenced airport, as to ensure safe aircraft operations. Two potential alternatives are currently being considered for this project. The first alternative entails the construction of a temporary runway 720 ft south of the existing runway, reconstruction of the existing runway, and conversion of the new temporary runway into a permanent full parallel taxiway (upon completion of the reconstruction of the existing runway). The second alternative entails the construction of a new permanent runway 500 ft south of the existing runway, and reconstruction of the existing runway into a permanent parallel taxiway. None of the above-described alternatives would require discharges of dredge or fill material into waters of the United States.

8. Natural,` artificial, historic or cultural systems likely to be affected by the project

Place an X opposite any of the systems indicated below that are in the project area or its surroundings, which are likely to be affected by that activity. Indicate the distance from the project to any outside system that would likely be affected.

System	Within Project	Outside Project	Distance (meters)	Local name of affected system
beach, dunes	N/A	N/A		
marshes	N/A	N/A		
coral, reefs	N/A	N/A		
river, estuary	N/A	N/A		
bird sanctuary	N/A	N/A		
pond, lake, lagoon	N/A	N/A		
agricultural unit	N/A	N/A		
forest, wood	N/A	N/A		
cliff, breakwater	N/A	N/A		
cultural or tourist area				
other (explain)	N/A	N/A		

Describe the likely impact of the project on the identified system (s).

Positive ☐ Negative ☐

Explain:

No impacts are expected .

9. Indicate permits, approvals and endorsements of the proposal by Federal and Puerto Rican government agencies. Evidence of such support should be attached to the proposal.

	Yes	No	Pending	Application Number
a. Planning Board	☐	☐	☐	_____
b. Regulation and Permits Administration	☐	☐	☐	_____
c. Environmental Quality Board	☐	☐	☐	_____
d. Department of Natural Resources	☐	☐	☐	_____
e. State Historic Preservation Office	☐	☐	☐	_____
f. U.S. Army Corps of Engineers	☒	☐	☐	SAJ-2018-02710 (NPR-DCM)
g. U.S. Coast Guard	☐	☐	☐	_____
h. Other (s) (specify)	☐	☐	☐	_____

CERTIFICATION

I CERTIFY THAT (project name) Reconstruction of Runway 8-26 Project at Rafael Hernández Airport is consistent with the Puerto Rico Coastal Zone Management Program, and that to the best of my knowledge the above information is true.

Eng. Romel Pedraza
Name (legible)

_____
Signature

PRPA Acting Executive Director for Engineering and Construction
Position

_____
Date

Regulatory Program

INTERIM APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers
This form should be completed by following the instructions provided
in the Interim Approved Jurisdictional Determination Form User Manual.

SECTION I: BACKGROUND INFORMATION

A. COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (AJD): Septemer 14, 2018

B. ORM NUMBER IN APPROPRIATE FORMAT (e.g., HQ-2015-00001-SMJ): SAJ-2018-02710-DCM

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State:PR County/parish/borough: City: Aguadilla
Center coordinates of site (lat/long in degree decimal format): Lat. 18.492122°, Long. -67.134479°.
Map(s)/diagram(s) of review area (including map identifying single point of entry (SPOE) watershed and/or potential jurisdictional areas where applicable) is/are: ☒ attached ☐ in report/map titled BQN Airport Aguadilla - Review Area.
☐ Other sites (e.g., offsite mitigation sites, disposal sites, etc.) are associated with this action and are recorded on a different jurisdictional determination (JD) form. List JD form ID numbers (e.g., HQ-2015-00001-SMJ-1): .

D. REVIEW PERFORMED FOR SITE EVALUATION:
☒ Office (Desk) Determination Only. Date: September 14, 2018.
☐ Office (Desk) and Field Determination. Office/Desk Dates: Field Date(s): .

SECTION II: DATA SOURCES

Check all that were used to aid in the determination and attach data/maps to this AJD form and/or references/citations in the administrative record, as appropriate.
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant. Title/Date: Maps and information provided by applicant in document titled Final Report Jurisdictional Wetland Assessment - Rafael Hernandez Airport (BQN) Runway Improvements, submitted on August 15, 2018.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Data sheets/delineation report are sufficient for purposes of AJD form. Title/Date: .
☐ Data sheets/delineation report are not sufficient for purposes of AJD form. Summarize rationale and include information on revised data sheets/delineation report that this AJD form has relied upon: .
Revised Title/Date: .
☐ Data sheets prepared by the Corps. Title/Date: .
☐ Corps navigable waters study. Title/Date: .
☐ CorpsMap ORM map layers. Title/Date: .
☐ USGS Hydrologic Atlas. Title/Date: .
☐ USGS, NHD, or WBD data/maps. Title/Date: .
☐ USGS 8, 10 and/or 12 digit HUC maps. HUC number: .
☐ USGS maps. Scale & quad name and date: .
☐ USDA NRCS Soil Survey. Citation: .
☒ USFWS National Wetlands Inventory maps. Citation: USFWS National Wetland Inventory Wetland Mapper (https://www.fws.gov/wetlands/Data/Mapper.html).
☐ State/Local wetland inventory maps. Citation: .
☐ FEMA/FIRM maps. Citation: .
☒ Photographs: ☒ Aerial. Citation: Google Earth; March 30, 2016. or ☐ Other. Citation: .
☐ LiDAR data/maps. Citation: .
☐ Previous JDs. File no. and date of JD letter: .
☐ Applicable/supporting case law: .

☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

SECTION III: SUMMARY OF FINDINGS

Complete ORM "Aquatic Resource Upload Sheet" or Export and Print the Aquatic Resource Water Droplet Screen from ORM for All Waters and Features, Regardless of Jurisdictional Status – Required

A. RIVERS AND HARBORS ACT (RHA) SECTION 10 DETERMINATION OF JURISDICTION:
☐ "*navigable waters of the U.S.*" within RHA jurisdiction (as defined by 33 CFR part 329) in the review area.
- **Complete Table 1 - Required**

NOTE: If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Section 10 navigable waters list, DO NOT USE THIS FORM TO MAKE THE DETERMINATION. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Section 10 RHA navigability determination.

B. CLEAN WATER ACT (CWA) SECTION 404 DETERMINATION OF JURISDICTION: "*waters of the U.S.*" within CWA jurisdiction (as defined by 33 CFR part 328.3) in the review area. **Check all that apply.**
☐ (a)(1): All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide. (Traditional Navigable Waters (TNWs))
- **Complete Table 1 - Required**

☐ This AJD includes a case-specific (a)(1) TNW (Section 404 navigable-in-fact) determination on a water that has not previously been designated as such. Documentation required for this case-specific (a)(1) TNW determination is attached.

☐ (a)(2): All interstate waters, including interstate wetlands.
- **Complete Table 2 - Required**

☐ (a)(3): The territorial seas.
- **Complete Table 3 - Required**

☐ (a)(4): All impoundments of waters otherwise identified as waters of the U.S. under 33 CFR part 328.3.
- **Complete Table 4 - Required**

☐ (a)(5): All tributaries, as defined in 33 CFR part 328.3, of waters identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 5 - Required**

☐ (a)(6): All waters adjacent to a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.
- **Complete Table 6 - Required**

☐ Bordering/Contiguous.
Neighboring:
☐ (c)(2)(i): All waters located within 100 feet of the ordinary high water mark (OHWM) of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3.
☐ (c)(2)(ii): All waters located within the 100-year floodplain of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3 and not more than 1,500 feet of the OHWM of such water.
☐ (c)(2)(iii): All waters located within 1,500 feet of the high tide line of a water identified in paragraphs (a)(1) or (a)(3) of 33 CFR part 328.3, and all waters within 1,500 feet of the OHWM of the Great Lakes.

☐ (a)(7): All waters identified in 33 CFR 328.3(a)(7)(i)-(v) where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 7 for the significant nexus determination. Attach a map delineating the SPOE watershed boundary with (a)(7) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☐ (a)(8): All waters located within the 100-year floodplain of a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3 not covered by (c)(2)(ii) above and all waters located within 4,000 feet of the high tide line or OHWM of a water identified in paragraphs (a)(1)-(a)(5) of 33 CFR part 328.3 where they are determined on a case-specific basis to have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.
- **Complete Table 8 for the significant nexus determination. Attach a map delineating the SPOE watershed boundary with (a)(8) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

C. NON-WATERS OF THE U.S. FINDINGS:

Check all that apply.

☐ The review area is comprised entirely of dry land.

☐ Potential-(a)(7) Waters: Waters that DO NOT have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.

- **Complete Table 9 and attach a map delineating the SPOE watershed boundary with potential (a)(7) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☐ Potential-(a)(8) Waters: Waters that DO NOT have a significant nexus to a water identified in paragraphs (a)(1)-(a)(3) of 33 CFR part 328.3.

- **Complete Table 9 and attach a map delineating the SPOE watershed boundary with potential (a)(8) waters identified in the similarly situated analysis. - Required**

☐ Includes water(s) that are geographically and physically adjacent per (a)(6), but are being used for established, normal farming, silviculture, and ranching activities (33 USC Section 1344(f)(1)) and therefore are not adjacent and require a case-specific significant nexus determination.

☒ Excluded Waters (Non-Waters of U.S.), even where they otherwise meet the terms of paragraphs (a)(4)-(a)(8):

- **Complete Table 10 - Required**

☐ (b)(1): Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA.

☐ (b)(2): Prior converted cropland.

☐ (b)(3)(i): Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

☐ (b)(3)(ii): Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

☒ (b)(3)(iii): Ditches that do not flow, either directly or through another water, into a water identified in paragraphs (a)(1)-(a)(3).

☐ (b)(4)(i): Artificially irrigated areas that would revert to dry land should application of water to that area cease.

☐ (b)(4)(ii): Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds.

☐ (b)(4)(iii): Artificial reflecting pools or swimming pools created in dry land.[1]

☐ (b)(4)(iv): Small ornamental waters created in dry land.[1]

☐ (b)(4)(v): Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water.

☐ (b)(4)(vi): Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways.[1]

☐ (b)(4)(vii): Puddles.[1]

☐ (b)(5): Groundwater, including groundwater drained through subsurface drainage systems.[1]

☐ (b)(6): Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.[1]

☐ (b)(7): Wastewater recycling structures created in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

☐ Other non-jurisdictional waters/features within review area that do not meet the definitions in 33 CFR 328.3 of (a)(1)-(a)(8) waters and are not excluded waters identified in (b)(1)-(b)(7).

- **Complete Table 11 - Required.**

D. ADDITIONAL COMMENTS TO SUPPORT AJD: Based on the information provided by the applicant and other supplementary data evaluated for this JD (see checked items in Section II of this form), there are no Corps' jurisdictional waters within the review area.

[1] In many cases these excluded features will not be specifically identified on the AJD form, unless specifically requested. Corps Districts may, in case-by-case instances, choose to identify some or all of these features within the review area.

Non-Jurisdictional Waters

Table 1. Non-Waters/Excluded Waters and Features

Paragraph (b) Excluded Feature/Water Name	Rationale for Paragraph (b) Excluded Feature/Water and Additional Discussion.
EXCLDB3III	The review area for this JD includes man-made ditches excavated in uplands as part of the construction of the stormwater infrastructure of the BQN Airport. According to the information provided by the applicant, including a jurisdictional wetland assessment report conducted for the project area, and other supplementary information reviewed by the Corps, including aerial photography, these ditches are not connected downstream or upstream to any other aquatic feature, and do not flow, directly or through another water, into a traditional navigable water, interstate water, or territorial sea ((a)(1)-(a)(3) waters).

Waters_Name	State	Cowardin Code	Hgm Co	Meas Type	Amount	Units	Waters_Type	Latitude	Longitude	Loca	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Ohw	Simil	Sim !	Adjc	Func	Func	Func	Func	Func	Func	Func	Func	Ix	Prov	Life Cycle	Depdnt
Ditches	PR	R6-RIVERINE, EPHEMERAL		AREA	0.5	ACRES	EXCLDB3III	18.49212	-67.13448																																					

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
ANTILLES OFFICE
FUND. ÁNGEL RAMOS ANNEX BLDG., SUITE 202
383 FRANKLIN DELANO ROOSEVELT AVE.
SAN JUAN, PUERTO RICO 00918

REPLY TO ATTENTION OF

September 14, 2018

Regulatory Division
South Permits Branch
Antilles Permits Section
SAJ-2018-02710 (NPR-DCM)

Ms. Felicia K. Reeves
Noise/Environmental Program Manager
Federal Aviation Administration
Southern Region/Atlanta Airports District Office
1701 Columbia Ave Room 220
College Park, GA 30337

Dear Ms. Reeves:

Reference is made to your letter dated July 20, 2018, requesting comments regarding proposed improvements to the Rafael Hernández (BQN) Airport, which is located within the premises of the former Ramey Air Force Base, Roads PR-107 & PR-110, Municipality of Aguadilla, Puerto Rico. Reference is also made to a Jurisdictional Wetland Assessment Report dated June 20, 2018, that was conducted for the referenced project, and which was submitted to our office on August 15, 2018. This case was assigned number SAJ-2018-02710 (NPR-DCM). Please refer to this number in future correspondence concerning this project.

According to the information provided, the proposed project would specifically consist of improvements to the currently deteriorated Runway 6-28 of the above-referenced airport, as to ensure safe aircraft operations. Two potential alternatives are currently being considered for this project. The first alternative entails the construction of a temporary runway 720 ft south of the existing runway, reconstruction of the existing runway, and conversion of the new temporary runway into a permanent full parallel taxiway (upon completion of the reconstruction of the existing runway). The second alternative entails the construction of a new permanent runway 500 ft south of the existing runway, and reconstruction of the existing runway into a permanent parallel taxiway. Any of the above-described alternatives would require discharges of dredge or fill material into waters of the United States.

Based on the information provided, the U.S. Army Corps of Engineers (Corps) has determined that the project as proposed will not require a Department of the Army (DA) permit in accordance with Section 10 of the Rivers and Harbors Act of 1899 as it is not located within the navigable waters of the United States. Furthermore, a permit will not be required in accordance with Section 404 of the Clean Water Act as it will not involve

the discharge of dredged or fill material into waters of the United States. Provided the work is done in accordance with the information and drawings provided, DA authorization will not be required.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination/decision, you may request an administrative appeal under Corps' regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination/decision, you must submit a completed RFA form to the South Atlantic Division Office at the following address:

Mr. Jason Steele
South Atlantic Division
U.S. Army Corps of Engineers
CESAD-CM-CO-R, Room 9M15
60 Forsyth St., SW.
Atlanta, Georgia 30303-8801.

Mr. Steele can be reached by telephone number at 404-562-5137, or by facsimile at 404-562-5138.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division office within 60 days of the date of the RFA. Should you decide to submit an RFA form, it must be received at the above address by **November 13, 2018**. It is not necessary to submit an RFA form to the Division office, if you do not object to the determination/decision in this letter.

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work. Please be advised this determination reflects current policy and regulations and is valid for a period of no longer than 5 years from the date of this letter unless new information warrants a revision of the determination before the expiration date. If after the 5-year period, the Corps has not specifically revalidated this determination, it will automatically expire. Any reliance upon this determination beyond the expiration date may lead to possible violation of current Federal laws and/or regulation.

This letter does not obviate the requirement to obtain any other Federal, State, or local permits that may be necessary for your project. Should you have any questions, please contact Mrs. Deborah J. Cedeño-Maldonado, Project Manager, at the letterhead address, by email at Deborah.J.Cedeno-Maldonado@usace.army.mil, or by telephone at 787-289-7036.

Thank you for your cooperation with our permit program. The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to take a few minutes to visit http://per2.nwp.usace.army.mil/survey.html and complete our automated Customer Service Survey. Your input is appreciated – favorable or otherwise. Please be aware this web address is case sensitive and should be entered as it appears above.

Sincerely,

for Sindulfo Castillo
Chief, Antilles Regulatory Section

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Ms. Felicia Reeves (FAA)	File Number: **SAJ-2018-02710**	Date: Sep 14, 2018
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- *ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.*

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- *ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.*

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- *ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.*

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT		
REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)		
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.		
POINT OF CONTACT FOR QUESTIONS OR INFORMATION:		
If you have questions regarding this decision and/or the appeal process you may contact: **Project Manager as noted in letter**	If you only have questions regarding the appeal process you may also contact: **Jason Steele** **404-562-5137**	
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.		
_____ Signature of appellant or agent.	Date:	Telephone number:

JURISDICTIONAL WETLAND ASSESSMENT

RAFAEL HERNÁNDEZ AIRPORT (BQN) RUNWAY IMPROVEMENTS

Abstract

This work evaluates the current wetland status to be impacted by the Rafael Hernández Airport (BQN) Runway 8-26 improvement project. Evaluation criteria used was based on those required for an official jurisdictional wetland determination in compliance with CWA Section 404, administered by the US Army Corp of Engineers (USACE)

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Notice

This document and its contents have been prepared and are intended solely for the AECOM Caribe and the Puerto Rico Ports Authority information and used in relation to the Rafael Hernandez Airport (BQN) Runway 8-26 Improvements Project

MARLIN assumes no responsibility to any other party in respect of, or arising out of, or in connection with this document and/or its contents.

This document has 22 pages, including the cover.

Document History

Job number:			**Document Ref:**			
Version	Purpose/Description	Originated	Checked	Reviewed	Authorized	Date
Ver. 1	Draft Final	ACA/RDC	ACA	ACA		June 5, 2018
Ver. 2	Final Document	ACA	ACA	VM/PS		June 20, 2018

Table of Contents

Table of Figures

1 Introduction

Marlin Engineering was retained by AECOM Caribe to perform a Jurisdictional Wetland Assessment to determine the presence of wetland indicators, and measure potential impacts from the proposed reconstruction of Runway 8-26. Wetland specialist, Raúl DiCristina, and environmental engineer, Adelís Cabán evaluated the current wetland status within the provided project footprint area in the Rafael Hernández Airport (BQN) located at the Municipality of Aguadilla, Puerto Rico. The criteria used to evaluate this property were based on those required for an official jurisdictional wetland determination regulated by the US Army Corp of Engineers (USACE).

2 Definition of Wetland and Waters of the United States

For the purposes of the Clean Water Act, 33 United States Code (U.S.C.) 1251 et. seq. and its implementing regulations, the term "*waters of the United States*" means: (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters, including interstate wetlands; and (3) The territorial seas. These three categories include impoundments of waters otherwise identified as waters of the United States (U.S.) under this section, tributaries, waters adjacent to wetlands, ponds, lakes, oxbows, impoundments, and similar waters. In addition, all where they are determined, on a case-specific basis, to have a significant nexus to a water of the U.S.

As stated in Section 404(b)(1) of the Clean Water Act: Definition of Waters of the U.S. (40 Code of Federal Regulation [CFR] 230.3) defines wetlands as "*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typical adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*"

The Classification of Wetlands and Deepwater Habitats of the United States, Cowardin et al. (1979) states that "Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface."

Another definition described by Cowardin et al. (1979) is: "Wetlands are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is

covered by shallow water. Wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year".

The single characteristic that most wetlands share is that the soil or substrate is at least periodically saturated with or covered by water. This condition creates severe physiological problems for many plants and animals that are not adapted for life in water or in saturated substrates. According to the definitions stated above, and following the *Regional Supplement of the Corps of Engineers Wetland Manual: Caribbean Islands Region (Version 2.0) (USACE 2011)*, wetlands have to meet the following general characteristics:

- hydrophytic vegetation;
- hydric soils; and
- hydrological conditions (inundated or saturated).

3 Description of the Study Area

The project is located at the BQN, Roads PR-107 and PR-110, in the Quemados Ward, Municipality of Aguadilla, Puerto Rico. The project coordinates are *Latitude 18°29'40.13"N and Longitude 67° 7'58.37"W* (**Figure 1, Project Location**).

FIGURE 1 ***RAFAEL HERNÁNDEZ AIRPORT (BQN), IN THE MUNICIPALITY OF AGUADILLA. THE RED LINE SHOWS THE STUDY AREA.***

3.1 Topography

According to the U.S. Geological Survey (USGS) Aguadilla topographic quadrant, revised in 1960, the project area is located at an average of 70 meters above sea level (**Figure 2, USGS Topographic Map**).

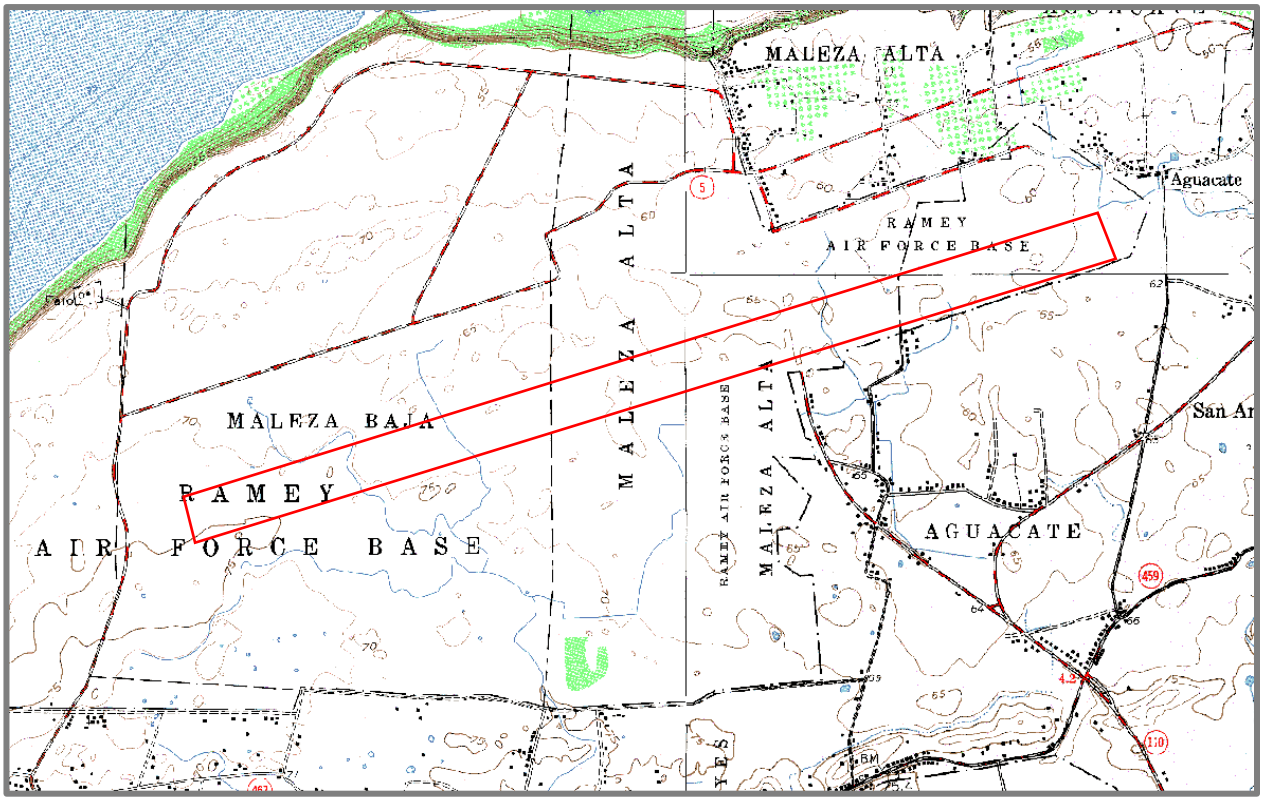

FIGURE 2 USGS TOPOGRAPHIC MAP OF THE RAFAEL HERNÁNDEZ AIRPORT (BQN).

3.2 Soils

Based on the U.S. Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) Web Soil Survey, Mayagüez Area, Puerto Rico Western Part (**Version 13, Oct 28, 2017**) the soils within the project area are classified as NOTCOM: No Digital Data Available.

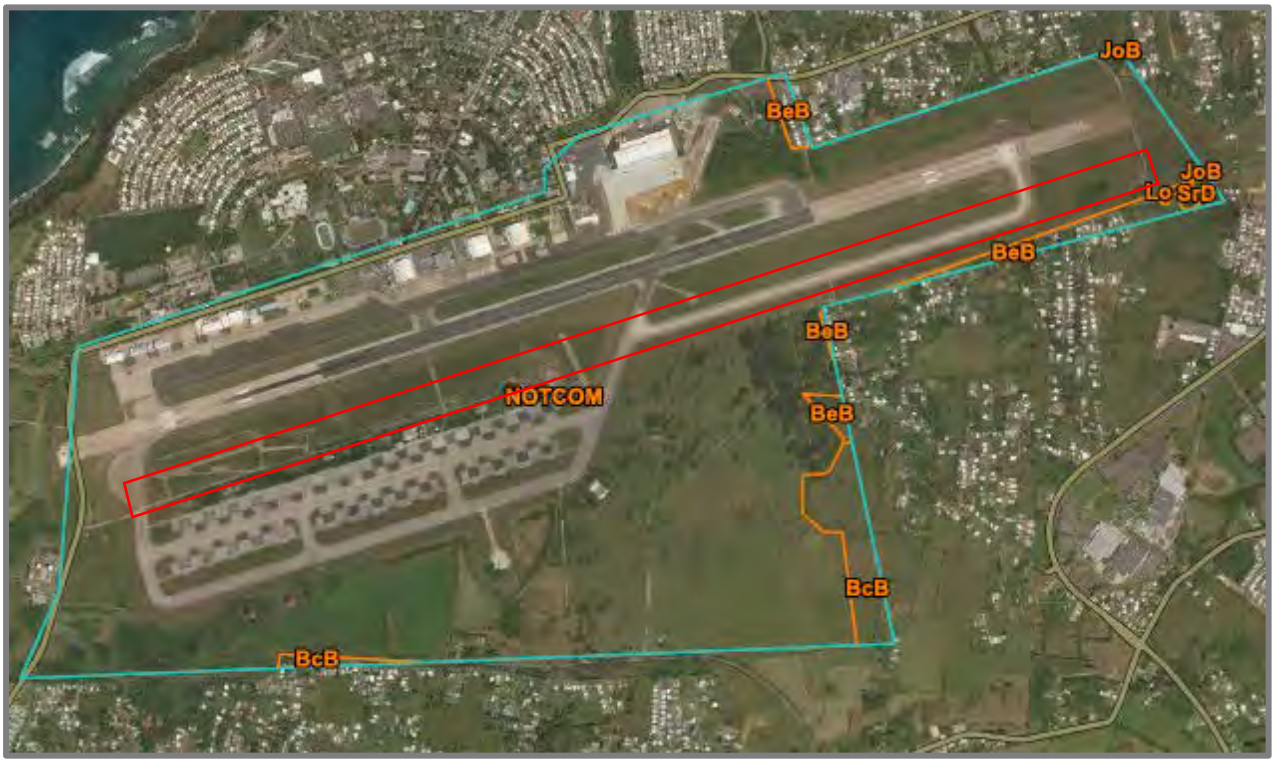

FIGURE 3 USDA/NRCS SOIL MAP OF THE RAFAEL HERNÁNDEZ AIRPORT (BQN).

3.3 National Wetlands Inventory (NWI) Map

The US Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (**Figure 4, USFWS National Wetlands Inventory Map**) shows the area that has been proposed for the project is located **in a non-wetland area**. However, a small wetland area identified by the NWI as *Riverine* is located at the southeast portion of the project area, near the project limit. Based on the Cowardin classification (1979) of the NWI map, this riverine area is defined as: *Riverine Unknown Perennial Unconsolidated Bottom, Permanently Flooded (R5UBH*).

FIGURE 4 NATIONAL WETLAND INVENTORY (NWI) MAP

3.4 Historic and Current Uses

BQN is currently used as a joint civil-military airport located in Aguadilla, Puerto Rico. It is the second largest international airport in Puerto Rico, as well as being home to the Coast Guard Air Station Borinquen. BQN mainly serves Puerto Ricans living in the western region of the island.

In 1939, Major George C. Kenney from the U.S. Army was sent to Puerto Rico to conduct a preliminary survey of possible air base sites on the island. He examined a total of 42 sites and declared that Punta Borinquen was the best site for a major air base.

Before the area was converted for military purposes, the land was originally used for the cultivation of sugar cane, which covered some 3,796 acres (see **Historical Photographic Documentation**). These lands were purchased by the government for military use in the first week of September 1939 at a cost of $1,215,000. Later that year, Major Karl S. Axtater assumed command of what was to become Borinquen Army Air Field.

With the establishment of an independent U.S. Air Force in 1947, the complex was renamed Ramey Air Force Base (AFB) in 1948. Ramey AFB was home to a Strategic Air Command bombardment wing and housed a number of B-36 Peacemaker intercontinental bombers. The B-36s were later B-52 Stratofortress heavy bombers and KC-135 Stratotanker aerial refueling aircraft, while a tenant weather reconnaissance squadron operated WB-47 Stratojet and WC-130 Hercules aircraft. Due to

the size and weight of the B-36, the runway at Ramey AFB had to be built to a length of 11,702 feet and a width of 200 ft.

The closure of what became Ramey AFB began in 1971 and lasted until 1973. Following its closure, it was converted into a civilian airport, receiving mostly domestic commercial flights.

In 2004, the Puerto Rico Ports Authority (PRPA) announced that it would be remodeling and expanding BQN to accommodate more flights and passengers. An expansion of the terminal building and a new parking lot were among the projects in mind, with said expansion being inaugurated on July 12, 2005.

The capacity of the airport and its role as the main gateway to western region has led local officials to take the position that the airport is extremely underserved in a region which accounts for one third of the total population of Puerto Rico.

On February 20, 2012, it was announced by both the mayor of Aguadilla and the U.S. Secretary of Commerce that the airport will be designated a "free trade zone" (FTZ), as are many other airports in the U.S., a move that is believed will improve the development of the airport and surrounding areas.

On April 10, 2014, Lufthansa Technik announced the creation of a maintenance, repair and overhaul center (MRO) at the airport, starting operations July 21, 2015. Current Lufthansa Technik Puerto Rico facility covers a total area of 215, 000 square feet providing maintenance services for Airbus 320.

4 Site Evaluation

The methodology employed for this study consisted preliminarily in an overall assessment of existing literature and geographic maps to determine the potential jurisdictional wetlands within the project area. To identify wetland areas that are under the jurisdiction of Section 404 of the Clean Water Act and under the jurisdiction of the USACE, a detailed screening analysis was performed using Geographic Information System (GIS) tools, aerial photographs and a field evaluation by wetland specialists. The evaluation was focused on identifying the presence of the attributes that wetland areas meet: (1) hydrophytic vegetation; (2) hydric soils; and (3) hydrological conditions (inundated or saturated).

4.1 Literature Evaluation

According to the NWI map, the only area under the jurisdiction of Section 404 is a small riverine area on the southeast part of the project site; however, the images used by the NWI were from 1983.

On the topographic map, some creeks were identified within the airport property. However, the map was created in 1937, with the hydrographic data compiled in 1957, and revised in 1960. As the historical data shows, the area has been used as a military airport base since 1939 (see Historical Photographic Documentation in Appendix 1).

4.2 Field Evaluation

The field work consisted of walking the entire project area, mostly focusing on the stormwater infrastructure and the sinkhole areas. During the field evaluation, it was confirmed that the project site has been modified for airport activities, and that the unpaved areas were altered to control stormwater coming from the runway and taxiway areas.

No wetland areas were observed along the project site. The riverine wetland identified in the NWI map was not observed during the site visit. Apparently, the riverine system was eliminated after the development of the stormwater infrastructure at the airport.

Hydric conditions were not observed within the project site. Man-made ditches can be observed as part of the stormwater system within the project area of the airport. These ditches do not present any wetland attributes and do not meet the criteria to be classified as “water of the U.S.” because the ditches do not flow directly or through another water of the U.S.

According to the geological map provided by “Mi Puerto Rico Interactivo (MIPR)” from the Puerto Rico Planning Board. (**Figure 5**), the BQN airport is located over many sinkholes, characteristic of

the limestone/karst typical of the northern portions of the island of Puerto Rico. Most of these sinkholes and depressions were filled during the construction of the airport. At the eastern section of the project area, a sinkhole is still present. This area can be observed in the aerial photograph as a forested area. This sinkhole is also identified in the Topographic maps and in the geological maps provided by MIPR.

FIGURE 5 GEOLOGICAL MAP; THE LOCATION OF THE SINKHOLE IS MARKED BY THE RED CIRCLE.

The vegetation on the project site consists mostly of grasses and herbaceous vegetation typical of impacted upland areas. The dominant species and its wetland indicators (in parenthesis) are *Sporobulus indicus (FACU), Megathyrsus maximus (FACU), Ipomoea tiliasea (UPL), Chloris barbata (FACU), Digitaria eriantha (FACU) and Leucaena leucocephala (FACU).* Although the project areas have channels related to the stormwater system, no different species were identified within these areas. The dominant species within the sinkhole area, are *Leucaena leucocephala (FACU)* and *Pennisetum purpureum (FAC)*. The following table shows the ***Former USFWS Wetland Plant Indicator Status Categories***.

TABLE 1 FORMER USFWS WETLAND PLANT INDICATOR STATUS CATEGORIES

Wetland Indicator	Code	Definition	Estimate Probability
Obligate wetland	OBL	Occurs almost always under natural conditions in wetlands	>99%
Facultative Wetland	FACW	Usually occur in wetlands, but occasionally found in non-wetlands	67-99%
Facultative	FAC	Equally likely to occur in wetlands or non-wetlands	34-66%
Facultative Upland	FACU	Usually occur in non-wetlands, but occasionally found in wetlands	67-99%
Obligate Upland	UPL	Occur in wetlands in another region but occur almost always under natural conditions in non-wetlands in the region specified.	>99%

According to the USACE 2016 National Wetlands Plant List, the site is dominated by vegetation species that are not hydrophytic or cannot adapt for life in water or in saturated substrates. In addition, all vegetated areas within airport boundaries are subject to mowing, preventing any establishment of additional species.

5 Conclusion

The wetland assessment confirmed that the project site has been modified for airport activities. The riverine wetland identified in the NWI map was not observed during the site visit, seemingly, the riverine system was eliminated after the development of the stormwater infrastructure at the airport, as well as unpaved areas that have been altered to convey stormwater runoff coming from the runway and taxiway areas.

No wetland areas were observed along the project site, validating preliminary research of existing literature and aerial photographs indicating that **no wetland areas** were present within the project site. Furthermore, the project site does not meet the attributes for hydric soils, dominance of hydrophytic vegetation or hydrological conditions that are required to classify the site as a wetland. Hence, there will be no impacts to U.S. waters under the jurisdiction of the Section 404 of the Clean Water Act.

6 References

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7 Field Assessment Photo-Documentation

This image shows the sinkhole area at the eastern side of the project area dominated by *Leucaena leucocephala* and *Pennisetum purpureum*.

This image shows green areas beside the runway and taxiways dominated by *Megathyrsus maximus* and *Leucaena leucocephala)*

This image shows green areas beside the runway and taxiways dominated by *Megathyrsus maximus and Sporobulus indicus*.

This image shows green areas beside the runway and taxiways dominated by *Digitaria eriantha* and *Chloris barbata*

This image shows green areas beside the runway and taxiways dominated by *Megathyrsus maximus.*

This image shows one (the main) man-made ditch part of the stormwater system dominated by *Megathyrsus maximus*.

These images show part of the stormwater system (ditches and inlets) at the airport.

Soil pit made to verify wetland indicators.

The image shows green areas impacted by filled material and used by airport security patrol.

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Appendix 1

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Historical Photographic Documentation

Image No. 1

Image No. 2

Images 1 and 2 show BQN's undeveloped lands on the 1930 (images provided by http://pr1930.revistatp.com/). It is remarkable to see that the soils were used for agricultural purpose.

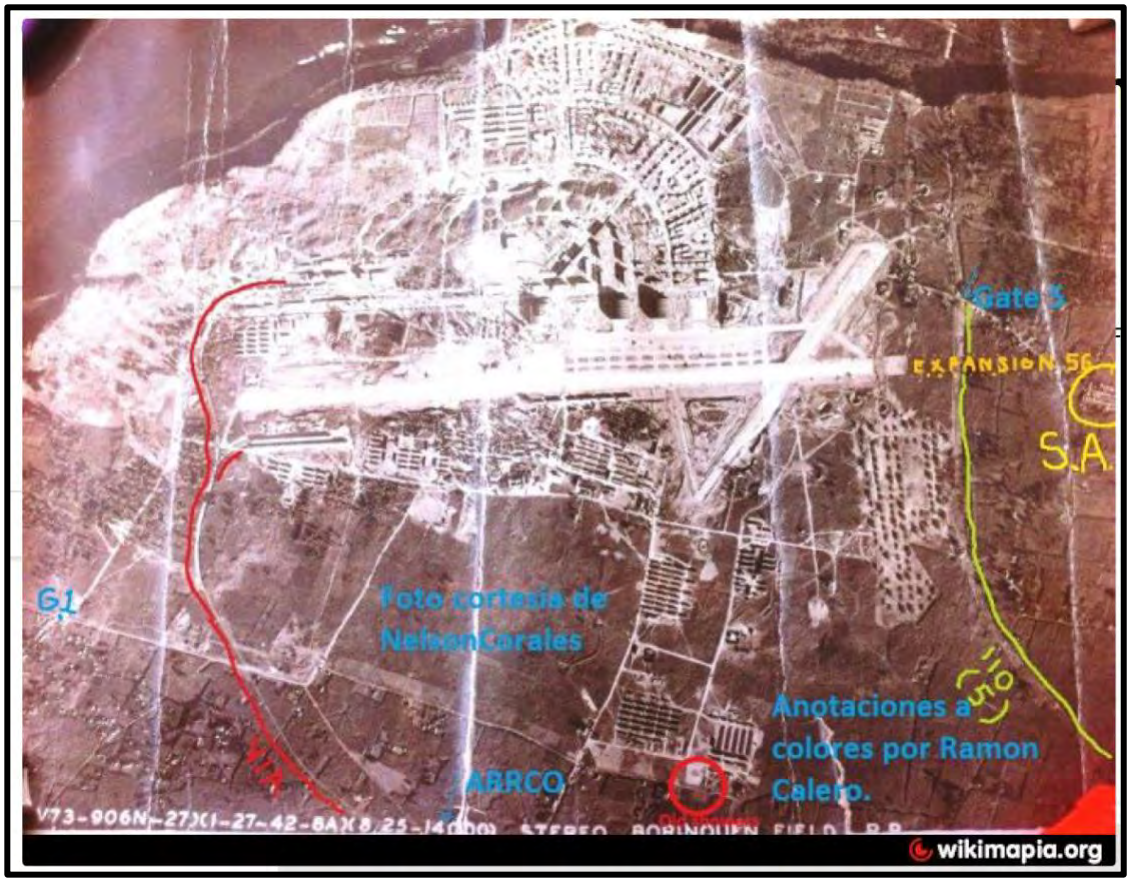


Image No. 3

Image number 3 shows Ramey AFB development at BQN during the 40's and 50's.

Image No. 4

Image No. 5

Images 4 and 5 show how former Ramey AFB looked at the end of the 1950's.

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE PLANIFICACION
SAN JUAN, PUERTO RICO

OFICINA DEL SECRETARIO

COBRO DE DERECHOS

FECHA: 04 DEC 2018

NUM. CONTROL:

A: RECAUDADOR OFICIAL/AUXILIAR
DIVISION DE FINANZAS

DE: LOIDA SOTO
OFICINA DEL SECRETARIO

RECIBIDO
DEC 04 2018
SECRETARIA
JUNTA DE
PLANIFICACION

REPRESENTANTE

NOMBRE: AUTORIDAD DE LOS PUERTOS DE PUERTO RICO

DIRECCION: ENG. ROMEL PEDRAZA
PO BOX 362829
SAN JUAN PR 00936-2829

TRAMITE

NUEVA RADICACION DE CASO

CERTIFICACIÓN ZONA COSTANERA

NUMERO CASO: CZ-2019-1204-043

DESCRIPCION: CERTIFICACION DE ZONA COSTANERA PARA PROYECTO DE RECONSTRUCCION DE LA PISTA 826 DEL AEROPUERTO DE AGUADILLA.
CATASTRO NUM. EXC-TMP-050-00.

COSTO: $0.00

Adelis Caban

From: Romel Pedraza
Sent: Friday, December 28, 2018 3:16 PM
To: Adelis Caban; Ivelisse Lorenzo Torres
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Gracias!

From: Adelis Caban [mailto:acaban@marlinengineering.com]
Sent: Friday, December 28, 2018 1:52 PM
To: Romel Pedraza <RPedraza@prpa.pr.gov>; Ivelisse Lorenzo Torres <ilorenzo@prpa.pr.gov>
Subject: FW: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Saludos,

Me indicó Rose por teléfono que la determinación está aprobada, pero debido al receso de navideño no tienen secretaria para pasarla a final y firmarla. Me aseguró que tendremos la determinación tan pronto regresen del receso de navidad.

En un punto aparte, dialogamos acerca de cómo excluir el aeropuerto de BQN del programa de Zona Costanera. El foro correcto es elevarlo y dirigir una carta a Ernesto Díaz detallando las razones para que consideren la exclusión del aeropuerto del programa, quien a su vez lo tiene que llevar a NOAA.

¡Feliz Año!

Adelís Cabán | P 787.395.7155 | P 787.923.7021 | acaban@marlinengineering.com

---

From: Adelis Caban <acaban@marlinengineering.com>
Sent: Thursday, December 27, 2018 2:21 PM
To: 'Rose Ortíz Diaz' <Ortiz_R@jp.pr.gov>
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Buenos días Rose:

Me llamó el Ing. Romel Pedraza de la Autoridad de Puertos, ellos están inquietos porque necesitan sacar el borrador de la EA para el proyecto de referencia a mediados de enero y respetuosamente me solicitan de seguimiento a la certificación.
¿Existe la posibilidad de que podamos recibir la certificación esta semana?

Cordialmente,
Adelís

Adelís Cabán | P 787.395.7155 | P 787.923.7021 | acaban@marlinengineering.com

---

From: Adelis Caban <acaban@marlinengineering.com>
Sent: Friday, December 21, 2018 1:29 PM
To: 'Rose Ortíz Diaz' <Ortiz_R@jp.pr.gov>
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

¡Que Buena noticia! ¡Gracias!

Adelís Cabán | P 787.395.7155 | P 787.923.7021 | acaban@marlinengineering.com

---

From: Rose Ortíz Diaz <Ortiz_R@jp.pr.gov>
Sent: Friday, December 21, 2018 1:17 PM
To: Adelis Caban <acaban@marlinengineering.com>
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Saludos:

El día de hoy la Junta emitió la Certificación para el proyecto. Ya tengo el borrador listo para firma y procesamiento. Tan pronto salga de Secretaria, te lo envío.

Rose A. Ortíz Díaz
Analista de Planificación V
Unidad de Zona Costanera
Oficina de Geología e Hidrogeología

GOVERNMENT OF PUERTO RICO
Puerto Rico Planning Board

From: Adelis Caban

ortiz_r@jp.pr.gov
787-723-6200 Ext. 16012

PO BOX 41119 | San Juan, P.R. 00940-1119
www.jp.pr.gov
Junta de Planificación de Puerto Rico
@JuntaPlanifica

[mailto:acaban@marlinengineering.com]
Sent: Thursday, December 20, 2018 12:41 PM
To: Rose Ortíz Diaz <Ortiz_R@jp.pr.gov>
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Saludos Rose:

Según conversamos hace unos minutos, adjunto PDF de las Alternativas en 11 X 17.
Las zonas con la capa ("layer") cuadriculada color negra y anaranjada representa el material a ser demolido y dispuesto a sistemas de relleno sanitario (vertederos). La diferencia es que la anaranjada será demolida luego de que se haga la conexión al sur de la pista. Dichas áreas permanecerán como áreas verdes libre de árboles u objetos según regulado por la Administración Federal de Aviación (FAA).

Favor confirmar que lo hayas recibido.

Cordialmente,

Adelís Cabán | P 787.395.7155 | P 787.923.7021 | acaban@marlinengineering.com

From: Rose Ortíz Diaz <Ortiz_R@jp.pr.gov>
Sent: Tuesday, December 18, 2018 10:46 AM
To: Adelis Caban <acaban@marlinengineering.com>
Subject: RE: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Buenos Días:

Ayer acabo de regresar de mis vacaciones y el viaje a una cumbre en California. Ya vi lo que radicaron. Voy a tratar de prepararlo esta semana para presentar el caso en Junta y emitir la Certificación, pues se trata de un Federal Assistance y entiendo que el impacto no será significativo, toda vez que los trabajos propuestos se realizaran en un área previamente impactada. Además, se trata de una infraestructura de importancia regional.

Rose A. Ortíz Díaz
Analista de Planificación V
Unidad de Zona Costanera
Oficina de Geología e Hidrogeología

GOVERNMENT OF PUERTO RICO
Puerto Rico Planning Board

ortiz_r@jp.pr.gov
787-723-6200 Ext. 16012

PO BOX 41119 | San Juan, P.R. 00940-1119
www.jp.pr.gov
Junta de Planificación de Puerto Rico
@JuntaPlanifica

From: Adelis Caban

[mailto:acaban@marlinengineering.com]
Sent: Tuesday, December 18, 2018 10:36 AM
To: Rose Ortíz Diaz <Ortiz_R@jp.pr.gov>
Subject: BQN Runway 8-26 Reconstruction Project (CE-2019-1204-043)

Buenos días Rose:

Espero se encuentre bien. Escribo para dar seguimiento al “Federal Assistance” de referencia. Solo deseamos confirmar la fecha aproximada para recibir la Certificación de Zona Costanera.

¡Les deseo una Feliz Navidad y un Próspero Año 2019!
Sinceramente,

Adelís Cabán, BS.EnvE. | Puerto Rico Office Manager/ Environmental Manager
P 787.395.7155 | M 787.923.7021 | acaban@marlinengineering.com

MARLIN www.marlinengineering.com

GOVERNMENT OF PUERTO RICO
PUERTO RICO PLANNING BOARD

December 21, 2018

CZ-2019-1204-043
Federal Consistency Certificate with the
Puerto Rico Coastal Zone Management Program (PRCZMP)

RESOLUTION

TO NOTIFY PARTIES ABOUT THE PUERTO RICO PLANNING BOARD DETERMINATION OF CONSISTENCY WITH THE PRZCMP POLICIES ACCORDING TO COASTAL ZONE MANAGEMENT ACT FEDERAL CONSISTENCY REGULATIONS AT 15 CFR Part 930

The PR Ports Authority (PRPA) submitted the application at reference in order to obtain a Federal Consistency Certificate to perform improvements at the Rafael Hernández Airport with Federal Assistance of the Federal Aviation Administration (FAA). The project consists in the reconstruction of Runway 8-26 to relocate it 500 feet to the south of its current location and transform the existing runway in a Taxiway. These modifications will occur within the existing operation footprint of the airport.

The proposed project is located within the former Ramey Air Force Base, at Aguadilla, Puerto Rico. The access to the project site is through road PR-107 (Borinquen Avenue) and east through PR-110.

After reviewing the submitted information, the Puerto Rico Planning Board (PRPB) concluded that the proposed reconstruction of runway 8-26 would occur within the existing airport footprint and will not have significant impact in the Puerto Rico Coastal Zone. Therefore, the PRPB in its meeting of December 21, 2018 determined to **concur with the PRPA determination that the proposed "Reconstruction of Runway 8-26 at Rafael Hernández Airport" is consistent with the Puerto Rico Coastal Zone Management Program.**

This Federal Consistency Certification does not exempt the project to comply with other federal or state requirements.

The following parties shall be notified: Eng. Romel Pedraza, PRPA; **Adelis Caban**, Marlin Engineering; **Ernesto Díaz,** Puerto Rico Coastal Zone Management Program, DENR.

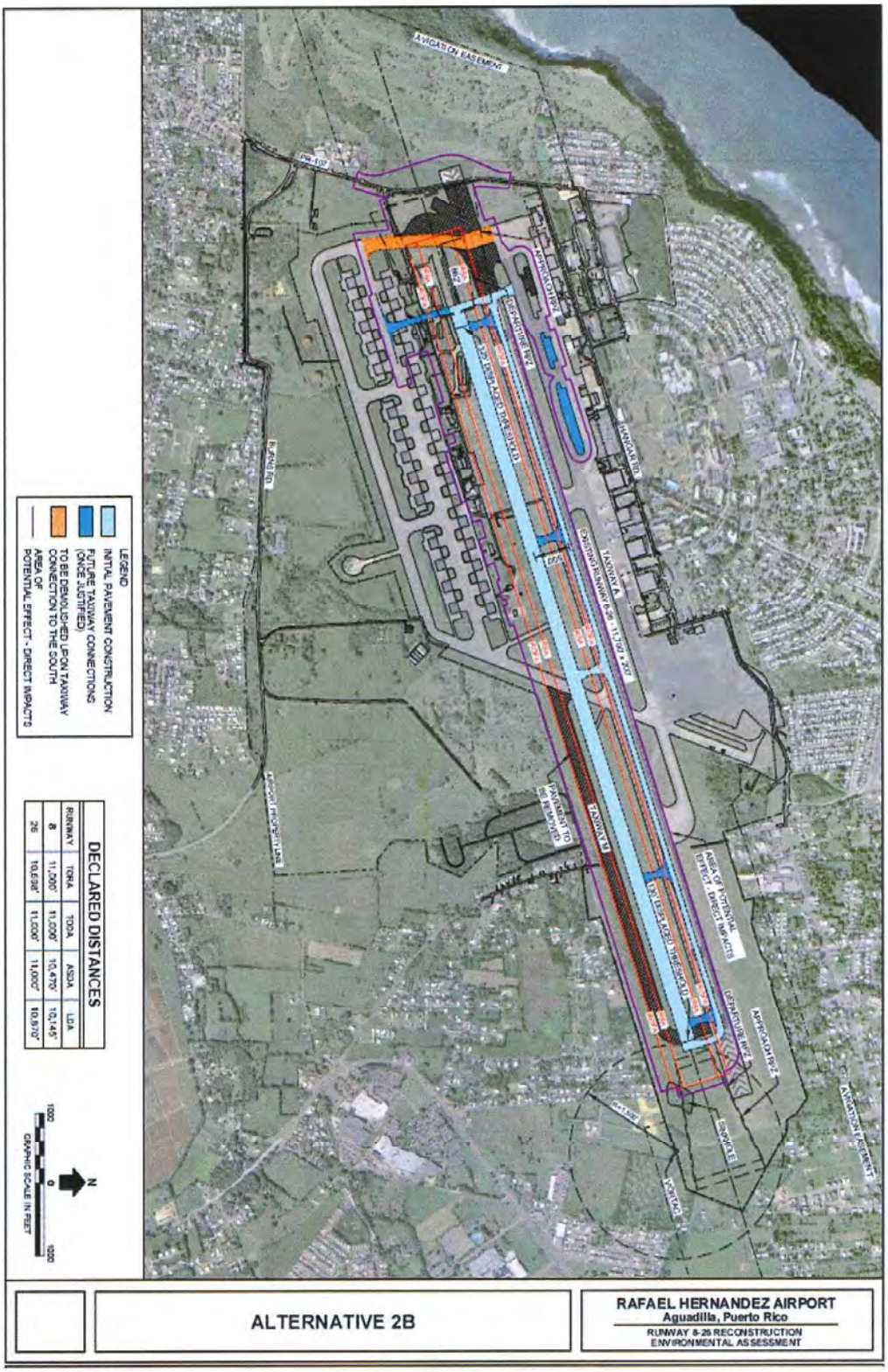
María del C. Gordillo Pérez
President

Certify: That this Resolution is copy of the agreement adopted by Puerto Rico Planning Board (PRPB) in its meeting of **December 21, 2018.** I expedite and notify this copy to the parties under my sign and official stamp of the Puerto Rico Planning Board stamp, for general use and knowledge.

In San Juan, Puerto Rico, today 04 ENE 2019

Loida E. Soto Nogueras
Secretary

GOBIERNO DE PUERTO RICO
JUNTA DE PLANIFICACIÓN



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APPENDIX F

Hazardous Materials

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APPENDIX F.1

Hazardous Materials Database Records Review

(electronic only)

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APPENDIX F.2

Asbestos Containing Materials and Lead Based Paint Survey Report

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LIMITED LEAD-BASED PAINT AND ASBESTOS-CONTAINING MATERIAL SURVEY FOR VACANT STRUCTURES TO BE DEMOLISHED

PUERTO RICO PORTS AUTHORITY (PRPA)
RAFAEL HERNÁNDEZ AIRPORT
AGUADILLA, PR

June, 2018

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

AECOM Caribe, LLP (AECOM) was retained by the Puerto Rico Ports Authority (PRPA) to perform a Limited Asbestos and Lead-Based Paint (LBP) Survey at several vacant and deteriorated buildings scheduled for demolition at Rafael Hernández Airport (BQN Airport) in the municipality of Aguadilla, Puerto Rico. The mentioned buildings are located in a former industrial area at the north side of the old runway 8-26. The subject site comprises a portion of the airport of approximately 40 acres. The mentioned structures will be demolished to provide space for the reconstruction of the old runway 8-26.

The purpose of this survey is to identify the presence of ACM and LBP in the buildings scheduled for demolition. This survey report includes a brief description of the structures, field sampling protocols, analytical methods and limitations, summary of findings, and recommendations.

Sampling activities were conducted during February 13-23, 2018. The sampling points were determined based on field observation of suspect materials, painted areas and in accordance with the protocols recommended for sampling inspections. The structures were evaluated to identify the presence of Suspect Asbestos Containing Materials (SACM) and Lead-Based Paint (LBP) materials. After performing the evaluation, and based upon professional judgment and experience, one hundred fifteen (115) ACM samples were taken due to the presence of Suspect Asbestos-Containing Material (SACM), and three hundred fifteen (315) LBP samples were taken due to the presence of Suspect Lead-Based Paint in the referenced structures. The surveyed structures were identified as Bld. 1000 and a Guardhouse; Bld. 1029 and an Herbicides storage room; Bld. 1070, Bld. 1089 (Airport old Control Tower); Bld. 1071 and related utilities; Bld. 1128 and various utility structures; Bld. 1120 (Former Fuel Storage Station); Bld. 2000, and Bld. 1251. Two other buildings identified as Bld. 1129 and 1132 were evaluated by the subcontractor CMC Environmental Consultants. Copy of the referenced evaluation report is included in Appendix G.

The collected samples and prepared chain of custody sheets were delivered to AES International, Inc. which is a local accredited laboratory for analysis. Samples for asbestos analysis were analyzed by PLM, (EPA Method 600/R-93/116). Paint chip samples were analyzed for detection of lead in paint chips using EPA SW-846 Method 7420 by Flame Atomic Absorption Spectroscopy (AAS). Based on the survey results obtained the following is concluded:

- Lead-Based Paint (LBP) was detected in the following structures: Bld. 1000, Bld. 1029, Bld. 1070, Bld. 1071, Bld. 1089, Bld. 1128, Bld. 1251 and Bld. 2000. No LBP was detected in Bld. 1120.

- Asbestos Containing Materials were detected in the following buildings: Bld. 1000, Bld. 1029, Bld. 1071, Bld. 1128, Bld. 1251, Bld. 2000, and Bld. 1120. No ACM was detected in Bld. 1070 and Bld. 1089.

According to the mentioned findings, LBP and ACM abatement activities are recommended at the evaluated buildings prior to the start any demolition activity in the site.

DISCLAIMER

This report is prepared by AECOM for the express use and benefit of PRPA, its agents and employees. The information in this report or portions thereof may be required to be included in notifications to employees, contractors or other visitors to the Site. This report is not intended to be used as a specification or work plan for any of the work suggested or recommended in this report.

This report is based upon conditions and practices observed at the property the date of site visit and information made available to the surveyor. This report does not intend to identify all hazards or unsafe practices, or to indicate that other hazards or unsafe practices do not exist at the premises.

1.0 INTRODUCTION

AECOM Caribe, LLP (AECOM) was retained by the Puerto Rico Ports Authority (PRPA) to perform a Limited Asbestos-Containing Material (ACM) and Lead-Based Paint (LBP) Survey at several vacant and deteriorated buildings scheduled for demolition at Rafael Hernández Airport (BQN Airport) in the municipality of Aguadilla, Puerto Rico. The mentioned buildings are located in a former industrial area at the north side of the old runway 8-26. The subject site comprises a portion of the airport of approximately 40 acres. The abandoned structures will be demolished to provide space for the reconstruction of the old runway 8-26.

The purpose of this survey is to identify the presence or not of ACM and LBP in the buildings scheduled for demolition (see Figure 1 in **Appendix A** for site location).

Sampling activities of this survey were conducted during February 13-23, 2018. The sampling points were determined based on field observation of suspect materials, painted areas and in accordance with the protocols recommended for sampling inspections. The structures were evaluated to identify the presence of Suspect Asbestos Containing Materials (SACM) and Lead-Based Paint (LBP) materials.

The survey is a working document designed to effectively manage waste disposal and minimize asbestos and lead based paint-related health risks during removal or demolition activities to personnel working on the subject site located in the municipality of Aguadilla, Puerto Rico. This report presents a description of the scope, methods and protocols, results of chemical analyses, conclusions and recommendations.

1.1 REGULATORY BACKGROUND

1.1.1 Asbestos Containing Building Materials

The term asbestos describes six naturally occurring fibrous minerals found in certain types of rock formations. Among that group, the minerals chrysotile, amosite, and crocidolite have been most commonly used in building products such as floor tile, pipe insulation, boiler insulation, and plasters. The minerals anthophyllite, actinolite and tremolite are not frequently found in ACBM. Asbestos can be found in numerous building materials. If maintained intact and undisturbed ACBM do not pose a health risk. They may, however, become a health hazard if they are damaged, disturbed, or deteriorate over time and release fibers into the air.

Asbestos materials can be classified as friable and non-friable. A friable Asbestos-Containing Building Material (ACM) is defined as any material that contains more than 1% asbestos, and that it is friable by hand pressure in its dry state. A Non-Friable ACM is any material that contains more than 1% asbestos and that in its dry state it is

not friable by hand pressure. EPA has further divided Non Friable ACM as Categories I and II.

There are two EPA regulations governing asbestos, the Asbestos Hazard Emergency Response Act (AHERA) and the National Emission Standards for Hazardous Air Pollutants (NESHAP). AHERA (Title 40 CFR Part 763) was enacted by the Congress in 1986, which mandated a regulatory program to address the asbestos hazards in schools. Subsequently, on November 28, 1990 the Congress enacted the Asbestos School Hazard Abatement Reauthorization Act (ASHARA) which expanded the requirements of AHERA to persons who work with asbestos in public and commercial buildings, as well as schools.

As per requirements of the Clean Air Act (CAA) of 1970, EPA promulgated NESHAP (Title 40 CFR Part 61) on April 1973. NESHAP is intended to minimize the release of asbestos fibers during certain activities (i.e., installations, renovations, and demolitions). The NESHAP regulation also requires owners and operators to notify delegated State and local agencies and/or the regional EPA offices before demolition or renovation activities begin. In addition, NESHAP requires the removal of all friable ACBM prior to demolition.

The Occupational Safety and Health Administration (OSHA), and delegated States are responsible for regulating environmental exposure and protecting workers from asbestos exposure. OSHA requires owners of pre-1981 buildings to assume that all suspects ACBM is asbestos-containing until a survey is performed.

1.1.2 Lead-Based Paint

Lead-Based Paint (LBP) is defined as any paint or other surface coatings with a concentration equal or greater than 1.0 milligram per square centimeter of lead, when the analysis is conducted on site with an X-Ray Fluorescence Detector, or 0.5 percent by weight when the analysis is conducted using Atomic Absorption (AA) by an external laboratory. Equivalent units are 5,000 ug/g, 5,000 mg/kg or 5,000 ppm by weight. Surface coatings include paint, shellac, varnish, or any other coating, including wallpaper which covers painted surfaces.

The USEPA has proposed that LBP is a hazard when:

- There are more than 2 square feet of damaged paint at interior surfaces (walls, roofs, floors and doors);
- More than 10 square feet of the same at exterior surfaces; and,

- More than 10% of the surface total of all components with small surface areas such as window sills, window wells, trim, baseboards, etc.

1.2 DISPOSAL OF LEAD-BASED PAINT AND ASBESTOS-CONTAINING MATERIAL

1.2.1 Lead Based Paint Disposal Requirements

The Puerto Rico Environmental Quality Board allows the disposal of lead based paint abated from structures in authorized, Non-Hazardous waste industrial landfills. Likewise, lead-based paint containing debris can be disposed as non-hazardous waste, provided the waste has been tested for non-hazardous characteristics by a certified analytical laboratory.

1.2.2 Asbestos Disposal Requirements

Asbestos waste or debris must be promptly disposed of at an approved disposal site. Disposal of asbestos must follow EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) 40 CFR part 61, subpart M. The EPA's Asbestos Waste Management Guidance offers useful information disposal. The rule requires:

- Methods to contain asbestos waste (wet, double-bagged).
- Procedures for hauling waste. Asbestos must not leak from the containers used to haul it.
- Disposal of asbestos containing material in an authorized landfill. Landfilling is the environmentally preferred method of asbestos disposal because asbestos fibers are immobilized by soil. Asbestos cannot be safely incinerated or chemically treated for disposal.
- Formal record keeping of asbestos waste disposal.

Puerto Rico's Industrial Landfill Facilities are permitted by the Puerto Rico Environmental Quality Board to receive and dispose Asbestos-Containing Materials, as long as these are not mixed with, or contain hazardous constituents as defined by RCRA.

2.0 SURVEY AND SAMPLING PROCEDURES

2.1 SURVEYED SITES

Suspect ACM and LBP samples were collected from all the buildings and related structures scheduled for demolition located within the study area. A brief description of

the surveyed structures is presented below. The date of construction of the buildings was unknown.

a- **Building 1000**: This structure consists of a one-story building of approximately 3,200 square feet and a guardhouse at the south side. It was used as an industrial facility in the past.

b- **Building 1029**: This structure consists of a one-story building of approximately 4,850 square feet and an herbicides storage room (398 square feet) at the northeast side. The building is being used as a mechanical shop by personnel of the Ports Authority.

c- **Building 1070**: This structure consists of a one-story building of approximately 8,600 square feet. It was used as an industrial facility in the past.

d- **Building 1071**: This structure consists of a one-story building of approximately 10,600 square feet and a water storage tank at the south. It was used as an industrial facility in the past.

e- **Building 1089**: This is the old Control Tower of the airport and consists of a two-story building of approximately 400 square feet.

f- **Building 1120**: This structure consists of a one-story building of approximately 300 square feet. It was used as the control/operation room of the former fuel storage facility of the airport.

g- **Building 1128**: This structure consists of a one-story building of approximately 19,800 square feet, a water treatment house, two storage tanks, a fuel storage tank and a control room. It was used as an industrial facility in the past.

h- **Building 1129**: This structure consists of a one-story building of approximately 24,000 square feet which was used as an industrial facility in the past. To the southwest side of this building there is a concrete utilities room of approximately 3,000 square feet. Building 1129 was used as a pharmaceutical facility for several years. This structure was surveyed by the subcontractor Carlos Carrion.

i- **Building 1132**: This structure consists of a one-story building of approximately 18,600 square feet which was used as an industrial facility in the past. This structure was surveyed by the subcontractor Carlos Carrion.

j- **Building 2000**: This structure consists of a one-story building of approximately 17,100 square feet. It was used as an industrial facility in the past.

k- **Building 1251**: This structure consists of a one-story building of approximately 8,100 square feet. It was used as an industrial facility in the past.

Based on the observations made during the site reconnaissance, all the structures were evaluated and sampled as follows:

- Painted components of the evaluated structures were sampled and analyzed to determine the presence or not of lead in paint chips.
- All suspect material observed in the structures scheduled for demolition was sampled to determine the presence or not of asbestos fibers in them.

A photographic log of surveyed structures that were found positive to LBP and ACM is included in **Appendix B.**

2.1.1 Sampling for Asbestos Content Determination

Sampling for ACM was conducted following EPA-recommended applicable guidelines. The procedure used for sampling suspect materials was designed to minimize possible fiber release. Samples of representative suspect materials were collected in accordance with the EPA guidelines and procedures presented in "Guide for Controlling Asbestos Containing Material in Buildings". Once the suspect material was identified, it was sprayed with water.

Then a representative sample of the material was collected and placed in an airtight bag. The bagged sample was properly labeled and stored. If any debris was generated during sampling it was properly cleaned.

A chain of custody form was completed for the bulk samples collected; samples were delivered to the analytical laboratory for analysis using Polarized Light Microscopy (PLM). Chains of Custody and analytical results are included in **Appendix C**.

2.1.2 Sampling for Lead-Based Paint

A standard method for collecting paint chip samples was followed. Several Standards have been provided:

- ASTM E 1729, *Standard Practice for Field Collection of Dried Paint Samples for Lead Determination by Atomic Spectrometry Techniques*.
- The paint chip collection protocol in *Appendix 13.2* of the 1995 HUD Guidelines.

- ASTM E 1645, *Standard Practice for the Preparation of Dried Paint Samples for Subsequent Lead Analysis* by Atomic Spectrometry, is a related standard that may also be consulted regarding the preparation of paint chip samples for laboratory analysis. Paint samples should be selected and collected by a PREQB-Certified Lead Inspector. All layers of paint in the area selected shall be collected, with enough samples to run the anticipated test method.
- The results may be reported in either, percent by weight, milligrams of lead per square centimeter or in micrograms of lead per gram, or both.
- If results are to be reported in milligrams per square centimeter, sample must be taken within a demarcated area of 100 cm^2, and all the paint within that area must be removed for testing.
- Results in milligrams per square centimeter are usually not affected by including any material underneath the paint.

To obtain each paint-chip sample, a minimum area of approximately one square inch was scored using a knife. The collected samples were placed in Zip-Lock Type re-sellable plastic bags, labeled and delivered to the laboratory for analysis. All samples were properly documented using the chain of custody form with the corresponding sample number. Chains of Custody and analytical results are included in **Appendix C**. Samples were analyzed using EPA Method 7420/6010.

2.1.3 Analytical Laboratory

AES International, Inc. was retained by AECOM conduct the Asbestos and Lead-Based Paint analyses. EMSL Accreditation documents are included in **Appendix D**.

3.0 RESULTS

3.1 LEAD BASED PAINT SAMPLING RESULTS

Results indicate that Lead-Based Paint was found in the following sampled structures. Laboratory results are presented in **Table 1-A to 9-A**. The location of the subject structures is illustrated in **Figure 2, Appendix A**.

1- Building 1000 – Eleven (11) of twenty (20) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 1-A of Appendix E**.

2- Building 1029 – Fourteen (14) of forty-three (43) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 2-A of Appendix E**.

3- Building 1070 – Six (6) of thirty-eight (38) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 3-A of Appendix E**.

4- Building 1089 – Five (5) of nine (9) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 4-A of Appendix E**.

5- Building 1071 – Three (3) of forty-five (45) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 5-A of Appendix E**.

6- Building 1128 - One (1) of sixty-two (62) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 6-A of Appendix E**.

7- Building 2000 – Thirteen (13) of fifty-eight (58) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 7-A of Appendix E**.

8- Building 1251 – Seven (7) of thirty-five (35) samples collected from this structure were found with LBP. Laboratory results are presented in **Table 8-A of Appendix E**.

9- Building 1120 - None of five (5) samples collected from building 1120 resulted positive to LBP. Laboratory results are presented in **Table 9-A of Appendix E**.

TABLE A:
LEAD ANALYSIS RESULTS (POSITIVES)

RAFAEL HERNÁNDEZ AIRPORT-AGUADILLA, PR			
#	SAMPLE ID	SAMPLE DESCRIPTION/ LOCATION	LEAD RESULTS (% wt.)
Building 1000			
1	PRPA-1000-LBP-01	Metal door Reddish/Brown paint- Exterior – South	2.86
2	PRPA-1000-LBP-02	Rolling door Reddish/Brown paint- Exterior – South	2.09
3	PRPA-1000-LBP-03	Metal door Baby Yellow paint- Int. –R-1	1.02
4	PRPA-1000-LBP-08	Metal door Gray paint- Int. –R-1	0.640
5	PRPA-1000-LBP-10	Concrete wall bone white paint – Exterior	1.01
6	PRPA-1000-LBP-11	Metal door Reddish/Brown paint- Exterior	5.30
7	PRPA-1000-LBP-12	Concrete wall bone white paint – Exterior	3.90
8	PRPA-1000-LBP-13	Rolling door Reddish/Brown paint – Exterior-North	1.55
9	PRPA-1000-LBP-14	Metal edge Gray/Beige paint-Ext. – North	2.48
10	PRPA-1000-LBP-18	Metal edge roof gutter Red paint – Exterior	1.14
11	PRPA-1000-LBP-19	Guard H. metal door White/Light Gray paint – Exterior	4.58
Building 1029			
12	PRPA-1029-LBP-14	Metal door Gray paint- Ext. West	1.39
13	PRPA-1029-LBP-16	Wall edge (Entrance) Traffic Yellow paint - North	1.52
14	PRPA-1029-LBP-17	Concrete wall Gray/green paint – Interior R-1	3.28
15	PRPA-1029-LBP-18	Concrete wall Gray/green paint – Interior R-1	4.40
16	PRPA-1029-LBP-20	Concrete wall Light gray/green paint – Interior R-2	1.68
17	PRPA-1029-LBP-21	Concrete wall Bone white/green paint – Interior R-3	0.690
18	PRPA-1029-LBP-22	Concrete wall Bone white/green paint – Interior R-1	1.38
19	PRPA-1029-LBP-25	Concrete wall Bone white/green paint – Interior R-5	2.52
20	PRPA-1029-LBP-27	Concrete wall Blue/green paint – Interior R-6	2.34
21	PRPA-1029-LBP-28	Concrete wall Bone white paint – Interior R-8	1.67
22	PRPA-1029-LBP-30	Concrete wall Bone white/green/almond paint – Office Interior R-8	1.15
23	PRPA-1029-LBP-31	Concrete wall Bone white/green paint – Compressor Room R-7	1.64

RAFAEL HERNÁNDEZ AIRPORT-AGUADILLA, PR			
#	SAMPLE ID	SAMPLE DESCRIPTION/ LOCATION	LEAD RESULTS (% wt.)
24	PRPA-1029-LBP-33	Concrete wall Dark gray paint – Interior R-1	3.06
25	PRPA-1029-LBP-34	Concrete wall Dark gray paint – Interior R-1	3.70
Building 1070			
26	PRPA-1070-LBP-04	Traffic Yellow paint – South Parking	4.52
27	PRPA-1070-LBP-24	Concrete wall Almond/terracotta/green paint – Interior R-8	0.820
28	PRPA-1070-LBP-26	Concrete wall Red/almond paint – Interior R-3	1.04
29	PRPA-1070-LBP-31	Concrete wall Red/almond paint – Interior	1.85
30	PRPA-1070-LBP-36	Concrete wall Red paint – Interior	3.09
31	PRPA-1070-LBP-37	Electric Pipe/Telephone panel Orange paint- Interior R-11	5.52
Building 1089			
32	PRPA-1089-LBP-01	Concrete wall Dark gray/red paint – Exterior South wall	12.2
33	PRPA-1089-LBP-02	Concrete wall Light gray/red paint – Exterior West wall	2.76
34	PRPA-1089-LBP-03	Concrete wall Dark gray/dark blue paint – Exterior West wall	8.44
35	PRPA-1089-LBP-04	Concrete wall Light gray/red paint – Exterior	19.0
36	PRPA-1089-LBP-07	Concrete wall Light gray/bone white, red, green paint – Exterior East wall	4.52
Building 1071			
37	PRPA-1071-LBP-31	Electric Pipe Orange paint – Interior Room 15	2.96
38	PRPA-1071-LBP-34	Concrete floor Traffic yellow paint – West entrance	8.72
39	PRPA-1071-LBP-35	Eave of the Building Terracota/brown/ivory paint – West Entrance	0.680
Building 1128			
40	PRPA-1128-LBP-22	Metal Door Gray/brown paint – Interior Room 7	0.780
Building 2000			
41	PRPA-2000-LBP-17	Concrete wall Dark gray paint – Interior Room 1	0.780
42	PRPA-2000-LBP-18	Concrete wall White/light green/terracotta paint – Interior Room 1	4.74
43	PRPA-2000-LBP-20	Concrete wall Dark gray paint – Interior Room 1	1.46
44	PRPA-2000-LBP-49	Concrete wall Light green paint – Exterior	3.46
45	PRPA-2000-LBP-50	Concrete wall Light gray paint – Exterior	1.17
46	PRPA-2000-LBP-51	Concrete wall Light gray paint – Exterior	1.57

RAFAEL HERNÁNDEZ AIRPORT-AGUADILLA, PR			
#	SAMPLE ID	SAMPLE DESCRIPTION/ LOCATION	LEAD RESULTS (% wt.)
47	PRPA-2000-LBP-52	Concrete wall Green paint – Exterior	1.81
48	PRPA-2000-LBP-53	Concrete wall Light pink paint – Exterior	1.57
49	PRPA-2000-LBP-54	Concrete wall Light gray/beige paint – Exterior West	4.74
50	PRPA-2000-LBP-55	Concrete wall Light gray/beige paint – Exterior Northwest	6.12
51	PRPA-2000-LBP-56	Concrete wall Light gray/beige paint – Exterior North	4.80
52	PRPA-2000-LBP-57	Concrete wall Dark green/beige paint – Exterior Northeast	4.56
53	PRPA-2000-LBP-58	Concrete wall Light green paint – Exterior East	1.05
Building 1251			
54	PRPA-1251-LBP-01	Concrete wall Bone white/light green paint – Interior Room 1	1.23
55	PRPA-1251-LBP-02	Concrete wall Bone white paint – Interior Room 1	5.80
56	PRPA-1251-LBP-04	Concrete wall Bone white/light green paint – Interior Room 1	1.26
57	PRPA-1251-LBP-07	Concrete wall Bone white/light green paint – Interior Room 1	2.98
58	PRPA-1251-LBP-16	Concrete wall Bone white/light green paint – Interior Hall	7.90
59	PRPA-1251-LBP-17	Concrete wall Bone white/green paint – Interior Room 6	0.840
60	PRPA-1251-LBP-19	Concrete wall Bone white paint – Interior Hall	1.62

3.2 ASBESTOS CONTAINING MATERIALS SAMPLING RESULTS

Results indicate that asbestos containing materials were found in the following sampled structures. Laboratory results are presented in **Table 1-B to 9-B, Appendix E**. The location of the subject structures is illustrated in **Figure 2, Appendix A**.

1- Building 1000 – Five (5) of ten (10) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 1-B of Appendix E**.

2- Building 1029 – Two (2) of ten (10) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 2-B of Appendix E**.

3- Building 1070 – None of the eighteen (18) samples collected from this structure were found with ACM. Laboratory results are presented in **Table 3-B of Appendix E**.

4- Building 1089 – None of the three (3) samples collected from this structure were found with ACM. Laboratory results are presented in **Table 4-B of Appendix E**.

5- Building 1071 – Twelve (12) of thirty-six (36) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 5-B of Appendix E**.

6- Building 1128 – Two (2) of eighteen (18) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 6-B of Appendix E**.

7- Building 2000 – Eighteen (18) of twenty-nine (29) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 7-B of Appendix E**.

8- Building 1251 – Eight (8) of ten (10) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 8-B of Appendix E**.

9- Building 1120 – Two (2) of three (3) samples collected from the evaluated structure were found with ACM. Laboratory results are presented in **Table 9-B of Appendix E**.

TABLE B:
ASBESTOS ANALYSIS RESULTS (POSITIVES)

RAFAEL HERNÁNDEZ AIRPORT - AGUADILLA, PR			
#	SAMPLE ID	SAMPLE DESCRIPTION/ LOCATION	ACM RESULTS (% ASBESTOS)
Building 1000			
1	PRPA-1000-ACM-02	8" x 8" VFT-green & mastic-Interior Room 1	3 % Chrysotile
2	PRPA-1000-ACM-03	8" x 8" VFT-green & mastic- Interior Room 1	4 % Chrysotile
3	PRPA-1000-ACM-05	8" x 8" VFT-brown & mastic- Interior Room 2	3 % Chrysotile
4	PRPA-1000-ACM-06	8" x 8" VFT-brown & mastic- Interior Room 2	4 % Chrysotile
5	PRPA-1000-ACM-10	White insulation material- Interior room 3	15 % Chrysotile 20 % Amosite
Building 1029			
6	PRPA-1029-ACM-01-B	12" x 12" VFT- Cafeteria	3 % Chrysotile
7	PRPA-1029-ACM-01-C	12" x 12" VFT- Cafeteria	4 % Chrysotile
Building 1071			
8	PRPA-1071-ACM-03-A	12" x 12" Black VFT & mastic- Under carpet-Hall	2 % Chrysotile
9	PRPA-1071-ACM-03-B	12" x 12" Brown VFT & mastic- Under carpet-Hall	2 % Chrysotile
10	PRPA-1071-ACM-07	12" x 12" Cream VFT & mastic- below carpet	3 % Chrysotile
11	PRPA-1071-ACM-11-B	12" x 12" Cream VFT & black mastic- Room 2	2 % Chrysotile
12	PRPA-1071-ACM-14	9" x 9" Green VFT & black mastic- Room 2	4 % Chrysotile
13	PRPA-1071-ACM-15	9" x 9" Ivory VFT & black mastic- Room 2	4 % Chrysotile
14	PRPA-1071-ACM-16	10" x 10" Brown VFT & black mastic-Hall	2 % Chrysotile
15	PRPA-1071-ACM-17-A	9" x 9" Green VFT & black mastic- Room 4	4 % Chrysotile
16	PRPA-1071-ACM-17-B	9" x 9" Dark gray VFT & black mastic- Room 4	4 % Chrysotile
17	PRPA-1071-ACM-22-A	9" x 9" Brown VFT & mastic - Right	3 % Chrysotile
18	PRPA-1071-ACM-22-B	9" x 9" Black VFT & mastic - Right	3 % Chrysotile
19	PRPA-1071-ACM-26	12" x 12" Black VFT & mastic - Interior Room	3 % Chrysotile
Building 1128			
20	PRPA-1128-ACM-10-B	12" x 12" VFT & mastic - Lobby	2 % Chrysotile
21	PRPA-1128-ACM-14-B	12" x 12" VFT & mastic – Main Hall	3 % Chrysotile
Building 2000			
22	PRPA-2000-ACM-01	9" x 9" Ivory VFT & mastic- Bld. 2 Room 1	4 % Chrysotile

RAFAEL HERNÁNDEZ AIRPORT - AGUADILLA, PR			
#	SAMPLE ID	SAMPLE DESCRIPTION/ LOCATION	ACM RESULTS (% ASBESTOS)
23	PRPA-2000-ACM-02	9" x 9" Green VFT & mastic- Bld. 2 Room 1	3 % Chrysotile
24	PRPA-2000-ACM-04	9" x 9" Green VFT & mastic- Bld. 2 Room 3	5 % Chrysotile
25	PRPA-2000-ACM-05	9" x 9" VFT & mastic- Bld. 2 Room 2	3 % Chrysotile
26	PRPA-2000-ACM-06-B	12" x 12" VFT & mastic- Bld. 2 Room	4 % Chrysotile
27	PRPA-2000-ACM-07-B	12" x 12" VFT & black mastic	3 % Chrysotile
28	PRPA-2000-ACM-08-B	12" x 12" VFT & black mastic	2 % Chrysotile
29	PRPA-2000-ACM-13	9" x 9" VFT	4 % Chrysotile
30	PRPA-2000-ACM-14	9" x 9" VFT & mastic	4 % Chrysotile
31	PRPA-2000-ACM-17	Transite panel	15 % Chrysotile
32	PRPA-2000-ACM-18	9" x 9" Brown VFT & mastic	4 % Chrysotile
33	PRPA-2000-ACM-19	9" x 9" Blue VFT & mastic	5 % Chrysotile
34	PRPA-2000-ACM-20	9" x 9" Green VFT & mastic	4 % Chrysotile
35	PRPA-2000-ACM-21	9" x 9" Green VFT & mastic	5 % Chrysotile
36	PRPA-2000-ACM-22	9" x 9" Brown VFT & mastic	5 % Chrysotile
37	PRPA-2000-ACM-23	9" x 9" Green VFT & mastic	4 % Chrysotile
38	PRPA-2000-ACM-24	9" x 9" Brown VFT & mastic	3 % Chrysotile
39	PRPA-2000-ACM-25	Black Pipe Insulation material – North wall	3 % Chrysotile
Building 1251			
40	PRPA-1251-ACM-01-A	9" x 9" Black VFT & mastic – Bld. A Room	3 % Chrysotile
41	PRPA-1251-ACM-01-B	9" x 9" Black VFT & mastic – Bld. A Room	4 % Chrysotile
42	PRPA-1251-ACM-02-A	9" x 9" Brown/Ivory VFT & mastic – Room	3 % Chrysotile
43	PRPA-1251-ACM-02-B	9" x 9" Brown/Ivory VFT & mastic – Room	4 % Chrysotile
44	PRPA-1251-ACM-03	9" x 9" Green VFT & mastic – Room	4 % Chrysotile
45	PRPA-1251-ACM-04	9" x 9" Black VFT & mastic – Room	3 % Chrysotile
46	PRPA-1251-ACM-05	9" x 9" Brown VFT & mastic – Bld. B Room 4	4 % Chrysotile
47	PRPA-1251-ACM-06	9" x 9" Black VFT & mastic – Bld. B Room	4 % Chrysotile
Building 1120			
48	PRPA-1120-ACM-01	9" x 9" Ivory VFT & mastic – Bld. Interior	3 % Chrysotile
49	PRPA-1120-ACM-02	9" x 9" Brown VFT & mastic – Interior Room 1	4 % Chrysotile

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the sampling program the following conclusions are made:

- The survey revealed the presence of lead in Paint above the regulatory threshold standard of 0.5 % by weight in the following structures: Bld. 1000, Bld. 1029, Bld. 1070, Bld. 1071, Bld. 1089, Bld. 1251, and Bld. 2000.

- The survey revealed the presence of Asbestos Containing Materials (1 % or more of asbestos fibers content) in the following structures: Bld. 1000, Bld. 1029, Bld. 1071, Bld. 1251, Bld. 1120, Bld. 1128 and Bld. 2000.

RECOMMENDATIONS:

- LBP Abatement activities are recommended for the removal of the lead-based paint prior to the start of demolition activities. After abatement activities are completed, the debris from the demolition can be disposed as non-hazardous, in an authorized industrial landfill

- ACM Abatement activities are recommended for the removal of the asbestos-containing material prior to the start of demolition activities. After abatement activities are completed, the debris from the demolition can be disposed as non-hazardous, in an authorized industrial landfill.

- A notification shall be submitted to the PR Environmental Quality Board and the PR Office of General Permits (OGPe) in order to apply and obtain a Demolition Permit prior to beginning demolition of structures.

- A copy of this Survey Report must be maintained on site during demolition activities.

5.0 LIMITATIONS

URS Caribe has completed this program using applicable practices and rationale. The testing and sampling documented herein considers general practice's recommended guidelines, as well as those criteria that follows experience and common sense in the field of environmental sampling and site-specific constraints and limitations, as well as safety issues.

Samuel Hernández, EIT
Project Engineer / / Certified LBP & ACM Inspector

Víctor Morales, PE
Project Manager

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APPENDIX G

Cultural Resources Assessment Survey

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Rafael Hernandez Airport
Runway 8-26 Reconstruction
Environmental Assessment

Phase I Cultural Resources Assessment Survey

Prepared for:

Puerto Rico Ports Authority
and
Federal Aviation Administration

Prepared by:

AECOM

March 2020

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ACRONYMS AND ABBREVIATIONS

AC	Advisory Circular
ASGCA	American Society of Golf Course Architects
APE	Area of Potential Effect
BQN	Rafael Hernandez Airport
CFR	Code of Federal Regulations
cmbgs	Centimeters Below Ground Surface
CRAS	Cultural Resources Assessment Survey
DoD	Department of Defense
EA	Environmental Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GSA	General Services Administration
PCC	Portland Cement Concrete
PCI	Pavement Condition Index
PRPA	Puerto Rico Ports Authority
PRSHPO	Puerto Rico State Historic Preservation Office
RAFBHA	Ramey Air Force Base Historical Association
RPZ	Runway Protection Zone
SAC	Strategic Air Command
STP	Shovel Test Pit
US	United States
USCG	US Coast Guard
USGS	US Geological Survey
WWII	World War II

CHAPTER 1 INTRODUCTION

The Puerto Rico Ports Authority (PRPA) and the Federal Aviation Administration (FAA) are preparing an Environmental Assessment (EA) for the reconstruction of Runway 8-26 at Rafael Hernandez Airport, Aguadilla, Puerto Rico (BQN), hereinafter referred to as the Proposed Project. The EA focuses on two primary alternatives for Proposed Project implementation.

This Phase I Cultural Resources Assessment Survey (CRAS) was conducted in support of the EA. Archaeological and historic architectural investigations summarized in this CRAS were conducted pursuant to Section 106 of the National Historic Preservation Act, in compliance with the regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulation (CFR) 800). All work conforms to professional guidelines set forth in the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 CFR 44716, as amended and annotated). The study is also in accordance with Section 10 of Law 112 of July 20, 1988, also known as the Terrestrial Archeology Act of Puerto Rico.

1.1. DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project would construct a new permanent Runway 8-26, 500 feet south of the existing Runway 8-26 centerline, to replace the existing Runway 8-26. The runway would measure 11,000 foot by 200 foot, comprised of Portland Cement Concrete (PCC) with asphalt overlay. The existing Runway 8-26 would be converted to a full length partial parallel taxiway.

The purpose of the Proposed Project to provide an air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN, while maintaining adequate runway length for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and reconstruction.

A 2004 pavement evaluation[1] concluded that the PCC sections on both ends of the existing runway are in good condition with Pavement Condition Index (PCI) values of 88 (i.e., "Good"), but the asphalt concrete overlay sections across the approximate 8,200-foot center portion had PCI values ranging from 0 to 13 (i.e., "Failed"). The two-inch asphalt overlay had totally failed and the underlying asphalt was heavily oxidized. It was also determined that based on PCC modulus values the PCC underlying the asphalt pavement must be removed and replaced.

A pavement condition study was subsequently conducted by the United States (US) Air Force in 2013[2], noting that although approximately 4,000 feet within this section of the runway has been repaired, a 2,000-foot section has a PCI Rating of "Very Poor" (i.e., less than 40) causing a 25-percent reduction in adjusted gross loads for aircraft using the runway. In that same year, an

[1] *Final Pavement Evaluation Report, Runway 8-26, Rafael Hernandez International Airport (BQN), Aguadilla, Puerto Rico*. Prepared by DMJM Aviation, Inc., June 2004.
[2] *Airfield Pavement Summary*. Prepared by US Air Force, February 2013.

airport inspection was conducted by the FAA[3] in accordance with 14 CFR Part 139 and revealed that BQN was not in compliance with 14 CFR Section 139.305(a)(6):

> *"Ponding was observed along the length of Runway 8-26. The runway needs to be crowned and grooved to avoid standing water. Runway grooving is needed to eliminate hydroplaning on the wet runway, resulting in shorter braking distance of aircraft on wet pavement. The pavement condition of the runway is poor and must be addressed. Although Foreign Object Debris was not found on the runway, it needs to be resurfaced. The certificate holder must develop a project to correct the pavement condition [by Dec 16, 2013]. An overlay should be designed to build up the centerline and create a crowned section with a shortened drainage length"*

Subsequent analysis as part of the PRPA Regional Airports Pavement Maintenance and Management Program[4] corroborated previous PCI reports. The Program further forecasted that additional sections of Runway 8-26 would degrade to "Very Poor" rating by 2021.

Recent analysis of runway take-off length requirements for existing and future operations at BQN indicates that the existing runway length of 11,700 feet is sufficient for all passenger and cargo aircraft flying to the continental US to operate at 100 percent load factors. With the exception of the B747-800, long-range international cargo aircraft take-off operations are restricted to no more than 90 percent of maximum payload capacity. Existing available landing lengths on the runway are sufficient for fleet operations even under hottest day/wettest conditions.

The runway length analysis concluded that payload restrictions would begin to occur for domestic passenger aircraft at a length of 9,050 feet Take-Off Run Available, and that at this length long-range international cargo aircraft would operate with load factors between 64 percent and 74 percent, which is considered to be unprofitable to cargo operators. Cargo operators that would experience this level of payload restriction have indicated that a minimum 10,500 feet of useable runway take-off length is required; else these operators may elect to use an alternative airport.

1.2. ALTERNATIVES

To date, the PRPA and FAA have evaluated a variety of Runway 8-26 replacement and reconstruction alternatives which would alleviate the pavement conditions described in **Section 1.1** while maintaining sufficient runway length. The full catchment of alternatives evaluated included temporary and permanent runway replacement options, which are described in **Appendix A**. Ultimately, and as described in further detail within the EA, the PRPA and FAA

[3] Letter of Correction from Charlotte Jones, FAA Southern Region, to Edgar Sierra, Rafael Hernandez Airport, regarding CY 2013 14 CFR Part 139 Compliance Inspection, EIR Number: 2013SO800102, September 10, 2013.
[4] *Regional Airport Pavement Maintenance and Management Program, Rafael Hernandez Airport (BQN)*. Prepared by Kimley-Horn and Associates, Inc., June 2016.

arrived at two principal alternatives which fully meet the established purpose and need, described below:

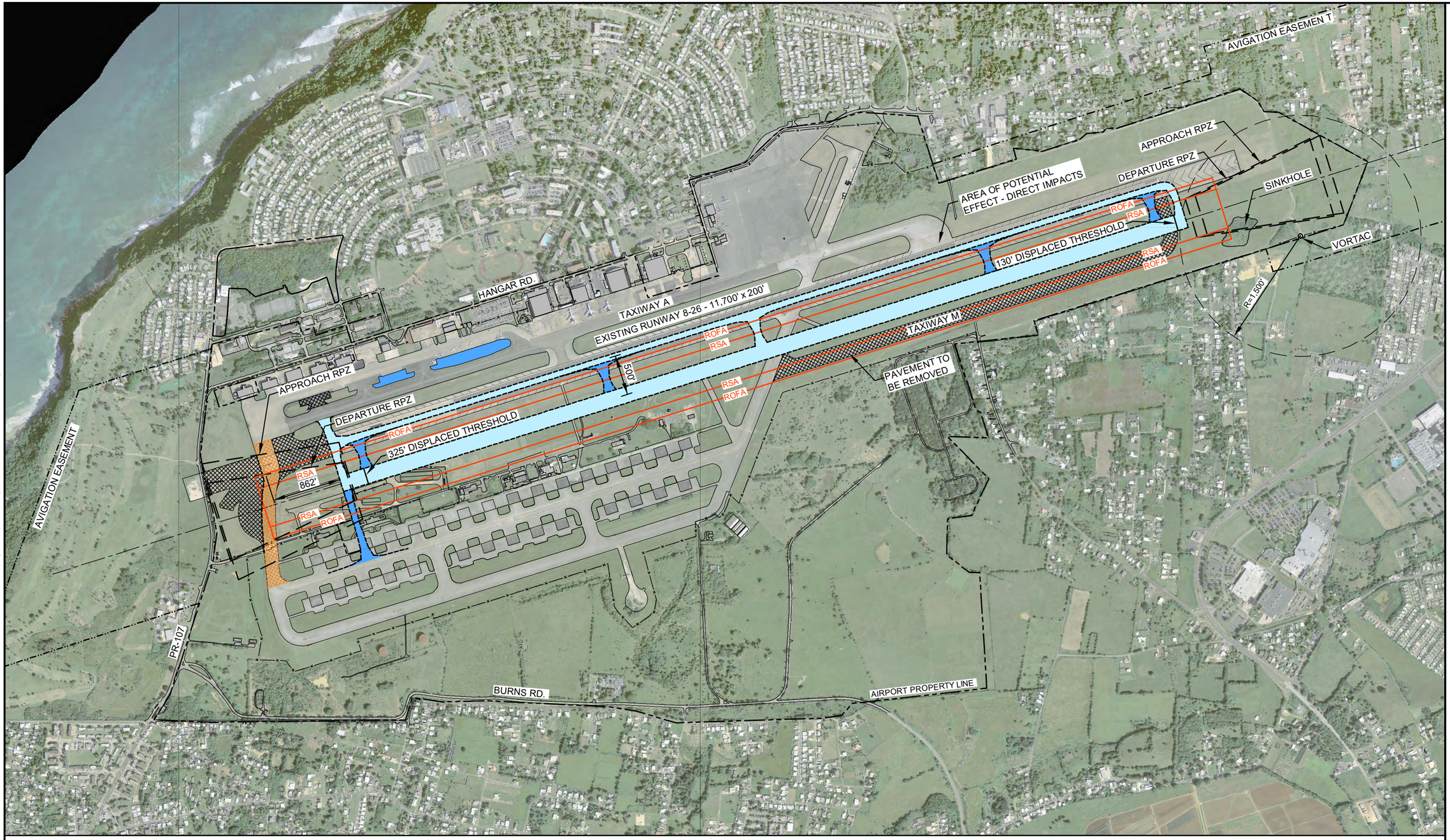
- Alternative 2B (**Figure 1.2-1**): Shifts Runway 8-26 500 feet south and 862 feet east of current alignment. Achieves current FAA design standards and land use compatibility requirements for Runway Protection Zones (RPZ), as directed by FAA Advisory Circular (AC) 150/5300-13A, Change 1, by applying a displaced threshold of 325 feet on Runway 8, 130 feet on Runway 26, and utilizing declared distances. Reduces usable take-off runway length to 10,698 feet on Runway 26. Further reduces useable landing length to 10,870 feet on Runway 26, and 10,145 feet on Runway 8. All RPZ areas would be contained on Airport property.

- Alternative 2D (**Figure 1.2-2**): Shifts Runway 8-26 500 feet south and 1,187 feet east of current alignment. Achieves current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 452 feet on Runway 8 and utilizing declared distances. Reduces usable take-off runway length to 10,675 feet on Runway 8. Further reduces useable landing length to 10,548 feet on Runway 26, and 10,148 feet on Runway 8. All RPZ areas would be contained on Airport property.

Regulations codified at 14 CFR Part 77 are designed to promote the safe and efficient use of navigable airspace, by providing instructions on the determination and disposition of manmade or natural obstructions to air navigation, navigational aids or facilities. Specifically, 14 CFR 77.17(a)(5) prevents the persistence or placement of objects within the surface of a takeoff and/or landing area of an airport, or within any imaginary surface (including, primary, horizontal, conical, approach or transitional surfaces).

So, although Alternatives 2B and 2D both achieve the Proposed Project purpose and need, as well as full compliance with design and safety standards for RPZs and safety areas, both alternatives must also fully comply with Part 77 regulations. As shown on **Figures 1.2-3** and **1.2-4**, buildings 1251, 1245, 3, 1104, 1032, 6, 1071, 1089, 1029, 1031, 2017 are all contained within the primary surface and/or approach surface of the new runway and cannot remain per Part 77.

Further, the remainder of the southern campus buildings are located in the Part 77 7:1 transitional surface of the runway and would be considered obstructions to navigable airspace. Also shown on the figures, the majority of these buildings penetrate the 7:1 surface by a significant amount, with the only exceptions being buildings 9, 15 and 1073. Preliminary airspace analysis has determined that all of these buildings cannot persist in the transitional surface without compromising the operational capabilities of arriving and departing aircraft. Therefore, as determined by FAA regulations, all buildings shown on **Figures 1.2-3** and **1.2-4** must be demolished as part of Alternatives 2B and 2D in order to achieve compliance with Part 77 regulations.



LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

FIGURE 1.2-1

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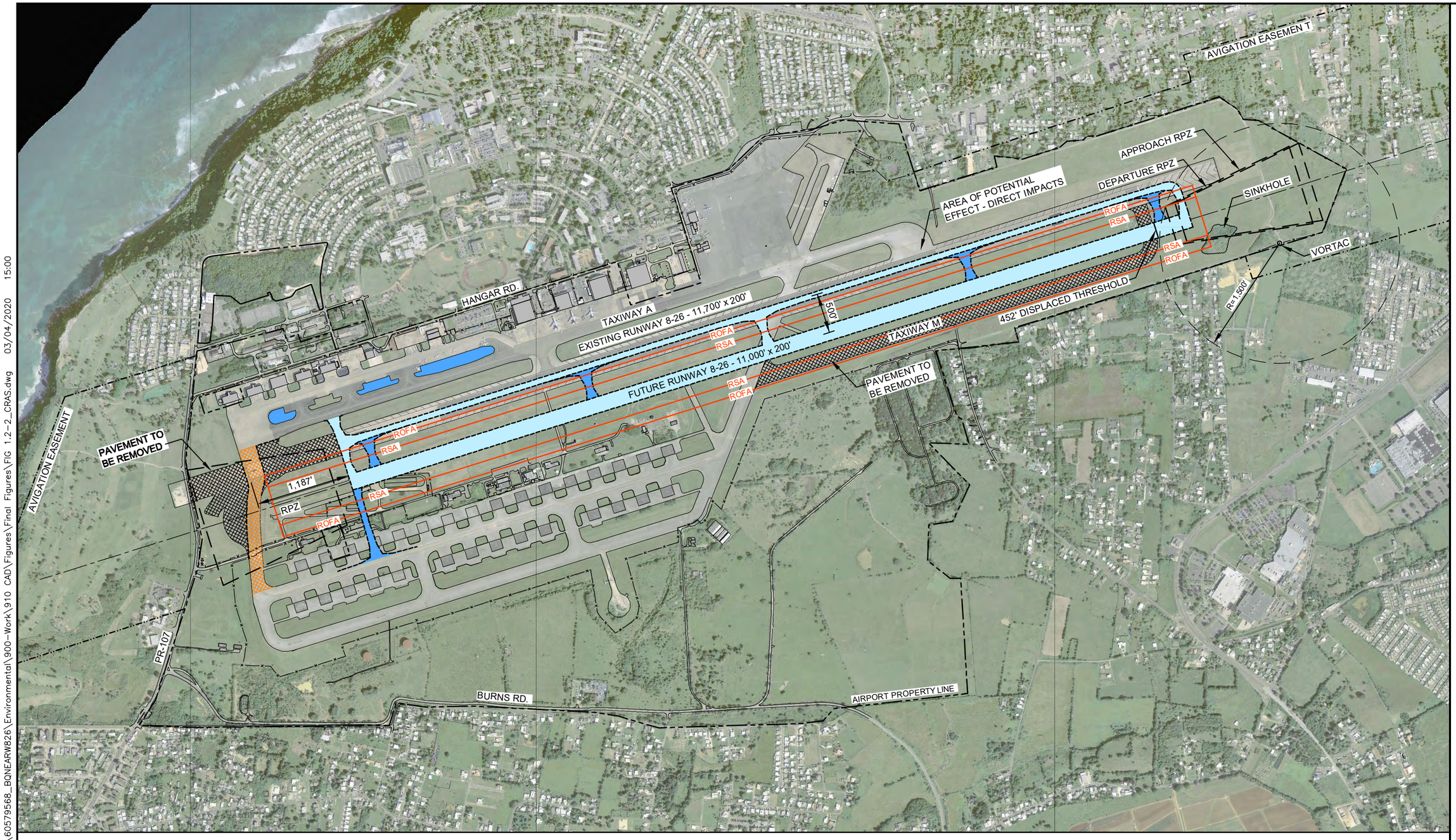

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

FIGURE 1.2-2

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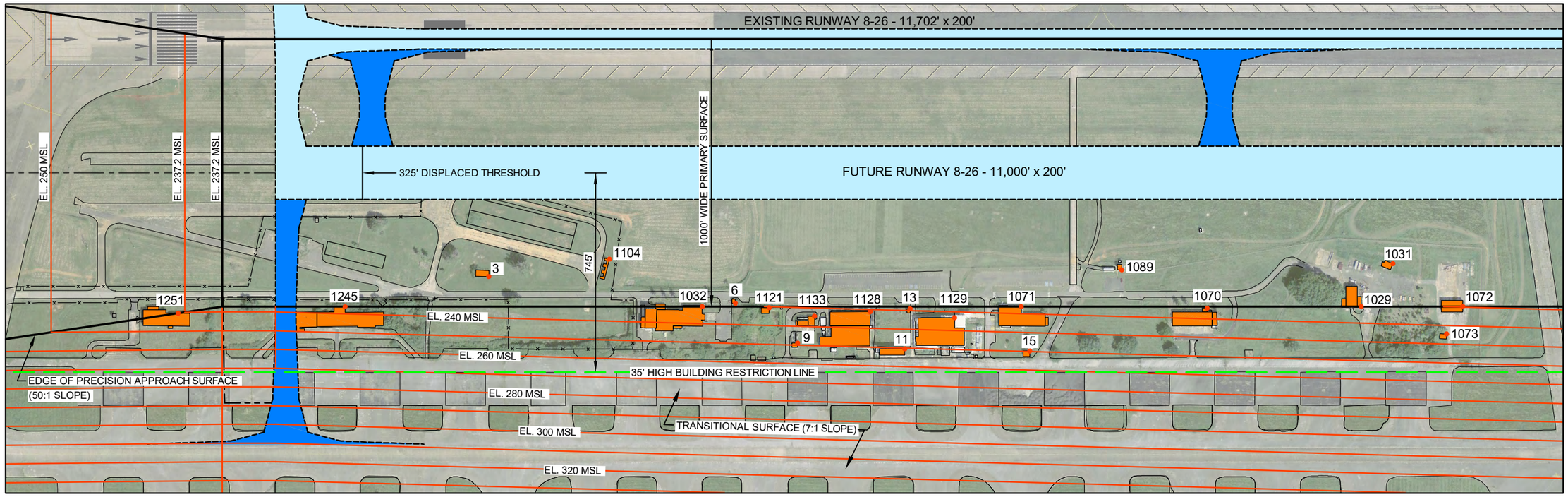

PLAN VIEW

OBSTRUCTION DATA TABLE

NO.	DESCRIPTION	LATITUDE	LONGITUDE	GROUND ELEVATION FEET (MSL)	BUILDING HEIGHT (FEET)	BUILDING ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	SURFACE ELEVATION FEET (MSL)	PENETRATION (FEET)
1251	BUILDING	N 18°29'15.74"	W 067°08'35.79"	245	15	260	RUNWAY 8 APPROACH	240.5	19.5
1245	BUILDING	N 18°29'17.84"	W 067°08'29.67"	238	12	250	PRIMARY	236.2	13.8
3	BUILDING	N 18°29'20.52"	W 067°08'24.70"	242	12	254	PRIMARY	234.1	19.9
1104	BUILDING	N 18°29'22.49"	W 067°08'20.43"	240	12	252	PRIMARY	232.3	19.7
1032	BUILDING	N 18°29'21.85"	W 067°08'16.44"	233	25	258	PRIMARY	230.9	27.1
6	BUILDING	N 18°29'22.33"	W 067°08'15.25"	231	15	246	PRIMARY	230.4	15.6
1121	BUILDING	N 18°29'22.56"	W 067°08'13.94"	231	15	246	7:1 TRANSITIONAL	230.5	15.5
1133	BUILDING	N 18°29'22.77"	W 067°08'12.16"	234	20	254	7:1 TRANSITIONAL	234.3	19.7
9	BUILDING	N 18°29'21.63"	W 067°08'12.47"	234	15	249	7:1 TRANSITIONAL	249.0	0.0
1128	BUILDING	N 18°29'23.55"	W 067°08'10.15"	231	30	261	7:1 TRANSITIONAL	231.2	29.8
11	BUILDING	N 18°29'22.63"	W 067°08'08.43"	232	25	257	7:1 TRANSITIONAL	250.4	6.6
13	BUILDING	N 18°29'24.10"	W 067°08'08.71"	232	15	247	7:1 TRANSITIONAL	229.0	18.0
1129	BUILDING	N 18°29'24.29"	W 067°08'06.95"	232	30	262	7:1 TRANSITIONAL	233.1	28.9
15	BUILDING	N 18°29'23.95"	W 067°08'03.78"	231	12	243	7:1 TRANSITIONAL	249.8	-6.8
1071	BUILDING	N 18°29'25.42"	W 067°08'04.61"	231	15	246	PRIMARY	226.2	19.8
1089	BUILDING	N 18°29'27.85"	W 067°08'01.32"	230	25	255	PRIMARY	224.7	30.3
1070	BUILDING	N 18°29'27.46"	W 067°07'57.70"	228	15	243	7:1 TRANSITIONAL	224.3	18.7
1029	BUILDING	N 18°29'29.24"	W 067°07'52.02"	223	30	253	PRIMARY	221.2	31.8
1031	BUILDING	N 18°29'31.11"	W 067°07'51.34"	226	15	241	PRIMARY	220.7	20.3
1072	BUILDING	N 18°29'30.38"	W 067°07'48.25"	225	20	245	PRIMARY	219.7	25.3
1073	BUILDING	N 18°29'29.23"	W 067°07'48.53"	223	12	235	7:1 TRANSITIONAL	234.5	0.5

LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- AFFECTED BUILDINGS
- 240 MSL — 7:1 TRANSITIONAL SURFACE CONTOUR
- BUILDING RESTRICTION LINE
- 1251 — OBSTRUCTION POINT LOCATION

N

400 0 400

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 1.2-3

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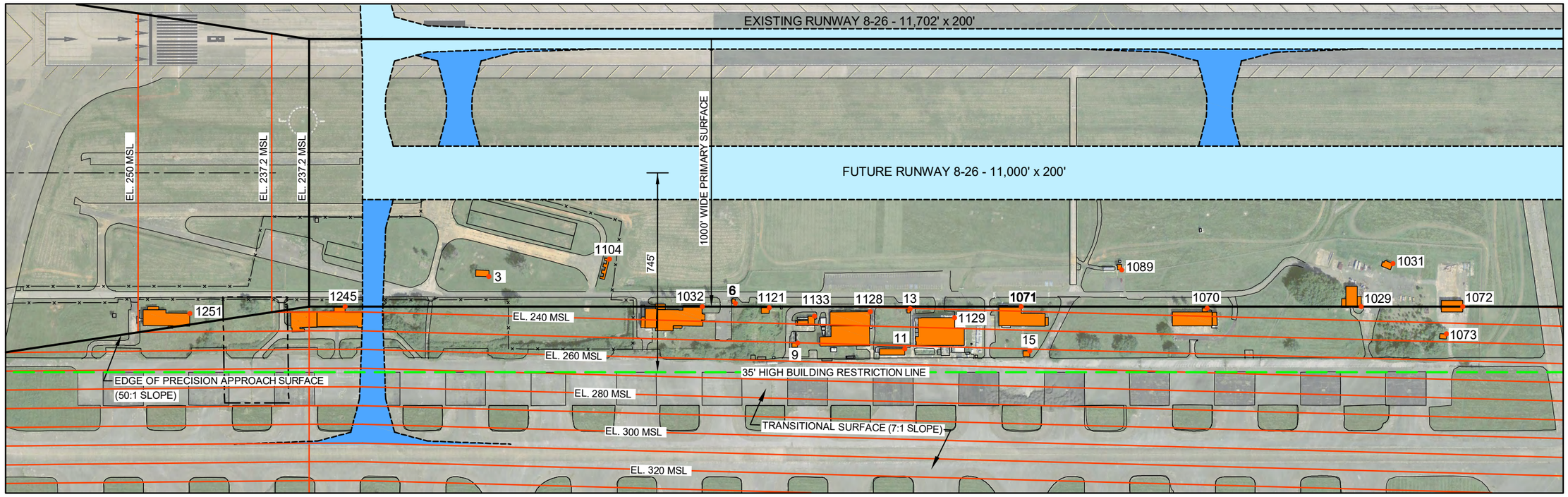

PLAN VIEW

OBSTRUCTION DATA TABLE

NO.	DESCRIPTION	LATITUDE	LONGITUDE	GROUND ELEVATION FEET (MSL)	BUILDING HEIGHT (FEET)	BUILDING ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	SURFACE ELEVATION FEET (MSL)	PENETRATION (FEET)
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1121	BUILDING	N 18°29'22.56"	W 067°08'13.94"	231	15	246	7:1 TRANSITIONAL	231.8	14.2
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9	BUILDING	N 18°29'21.63"	W 067°08'12.47"	234	15	249	7:1 TRANSITIONAL	250.2	-1.2
1128	BUILDING	N 18°29'23.55"	W 067°08'10.15"	231	30	261	7:1 TRANSITIONAL	232.5	28.5
11	BUILDING	N 18°29'22.63"	W 067°08'08.43"	232	25	257	7:1 TRANSITIONAL	251.7	5.3
13	BUILDING	N 18°29'24.10"	W 067°08'08.71"	232	15	247	7:1 TRANSITIONAL	230.3	16.7
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15	BUILDING	N 18°29'23.95"	W 067°08'03.78"	231	12	243	7:1 TRANSITIONAL	251.0	-8.0
1071	BUILDING	N 18°29'25.42"	W 067°08'04.61"	231	15	246	PRIMARY	227.5	18.5
1089	BUILDING	N 18°29'27.85"	W 067°08'01.32"	230	25	255	PRIMARY	226.0	29.0
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1029	BUILDING	N 18°29'29.24"	W 067°07'52.02"	223	30	253	PRIMARY	222.5	30.5
1031	BUILDING	N 18°29'31.11"	W 067°07'51.34"	226	15	241	PRIMARY	222.0	19.0
1072	BUILDING	N 18°29'30.38"	W 067°07'48.25"	225	20	245	PRIMARY	221.0	24.0
1073	BUILDING	N 18°29'29.23"	W 067°07'48.53"	223	12	235	7:1 TRANSITIONAL	235.8	-0.8

LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- AFFECTED BUILDINGS
- 240 MSL — 7:1 TRANSITIONAL SURFACE CONTOUR
- BUILDING RESTRICTION LINE
- 1251 — OBSTRUCTION POINT LOCATION

N

400 0 400

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 1.2-4

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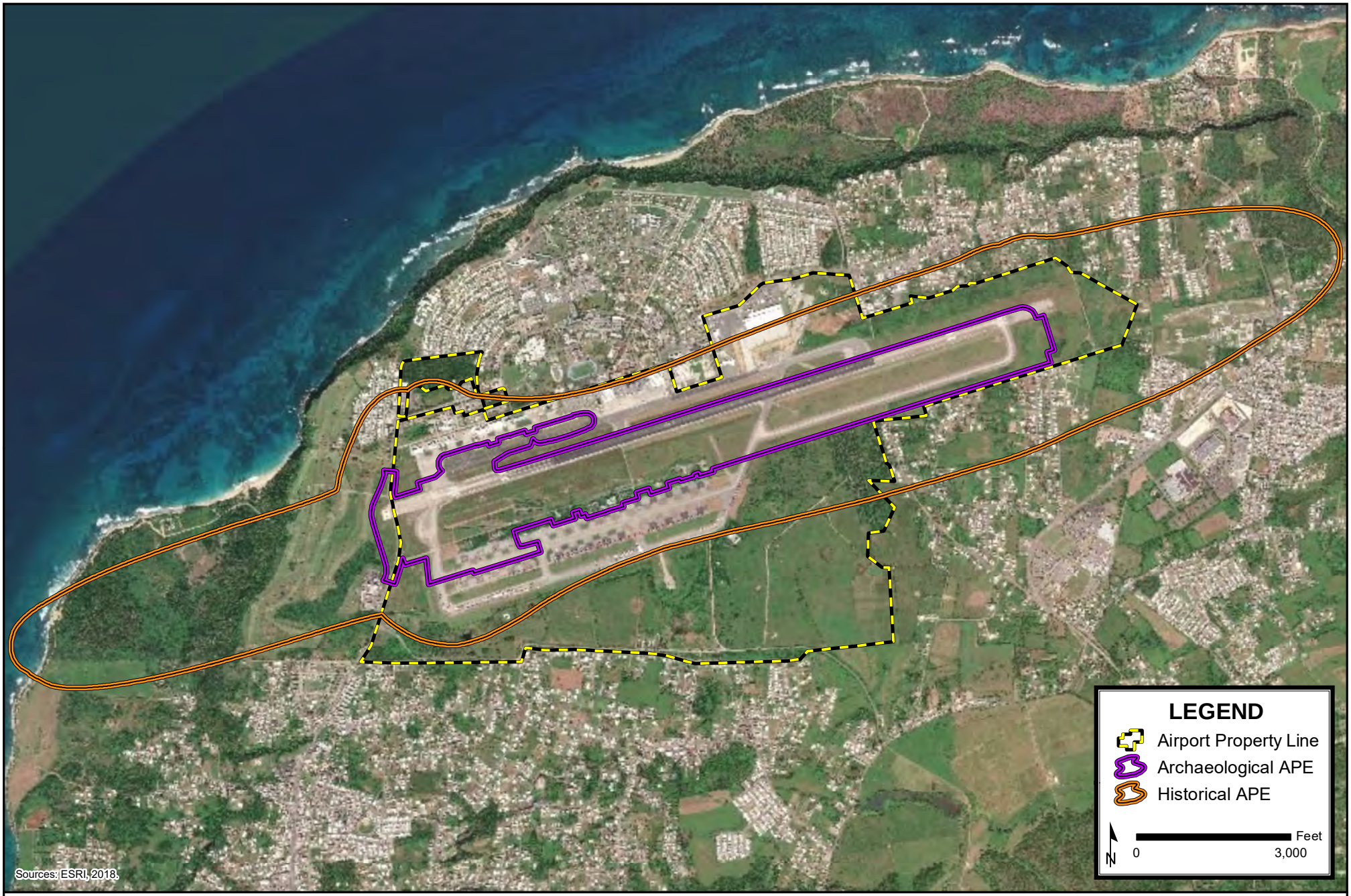
1.3. AREAS OF POTENTIAL EFFECT

Based on the foregoing, Areas of Potential Effect (APE) have been delineated for the assessment of potential impacts of the Proposed Project on archaeological and historic architectural resources.

For archaeological resources potentially impacted by direct construction activities, the archaeological APE corresponds to areas of planned construction and demolition activities for all alternatives evaluated in the EA, including Alternatives 2B and 2D. Refer to **Appendix A** for a depiction of all Alternatives which led to derivation of this composite APE. Additionally, to account for indirect ground disturbance activities that may occur during construction, such as materials and equipment staging, the archaeological APE includes a 100-foot buffer around planned construction areas.

For evaluation of historic architectural resources, a separate APE was also delineated to assess potential impacts not related to the construction footprint of the Proposed Project alternatives, and corresponds to the area within the composite 60 decibel day night average aircraft noise contour of the Proposed Project and retained alternatives. To ensure full evaluation of potentially significant architectural structures, all structures within the airport boundary, even those not contained within the established APE, were also evaluated in this CRAS.

Both the archaeological resources APE, the historic architecture APE, and the airport boundary area that were evaluated within this CRAS are shown on **Figure 1.3-1**.



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RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT

FIGURE
1.3-1

CHAPTER 2 ENVIRONMENTAL OVERVIEW

2.1. PHYSIOGRAPHY AND GEOLOGY

The APE is located within the northwestern portion of Puerto Rico. This physiographic region is characterized by the dissolution of limestone and has resulted in a belt of karst topography 15-23 kilometers (9.3 to 14.3 miles) wide and about 135 kilometers (83.8 miles) long known as the Northern Karst province (Monroe 1980:1). The elevation within the APE generally ranges from 200-250 feet Above Mean Sea Level.

The topography of the immediate APE has not been subjected to specific soil testing due to the presence of the airfield. Therefore, information regarding the soils has been gleaned from data within a one-mile radius surrounding the APE. This area generally consists of limestone outcrops, clay, and sandy loam soil types, described in detail below.

2.2. HYDROLOGY

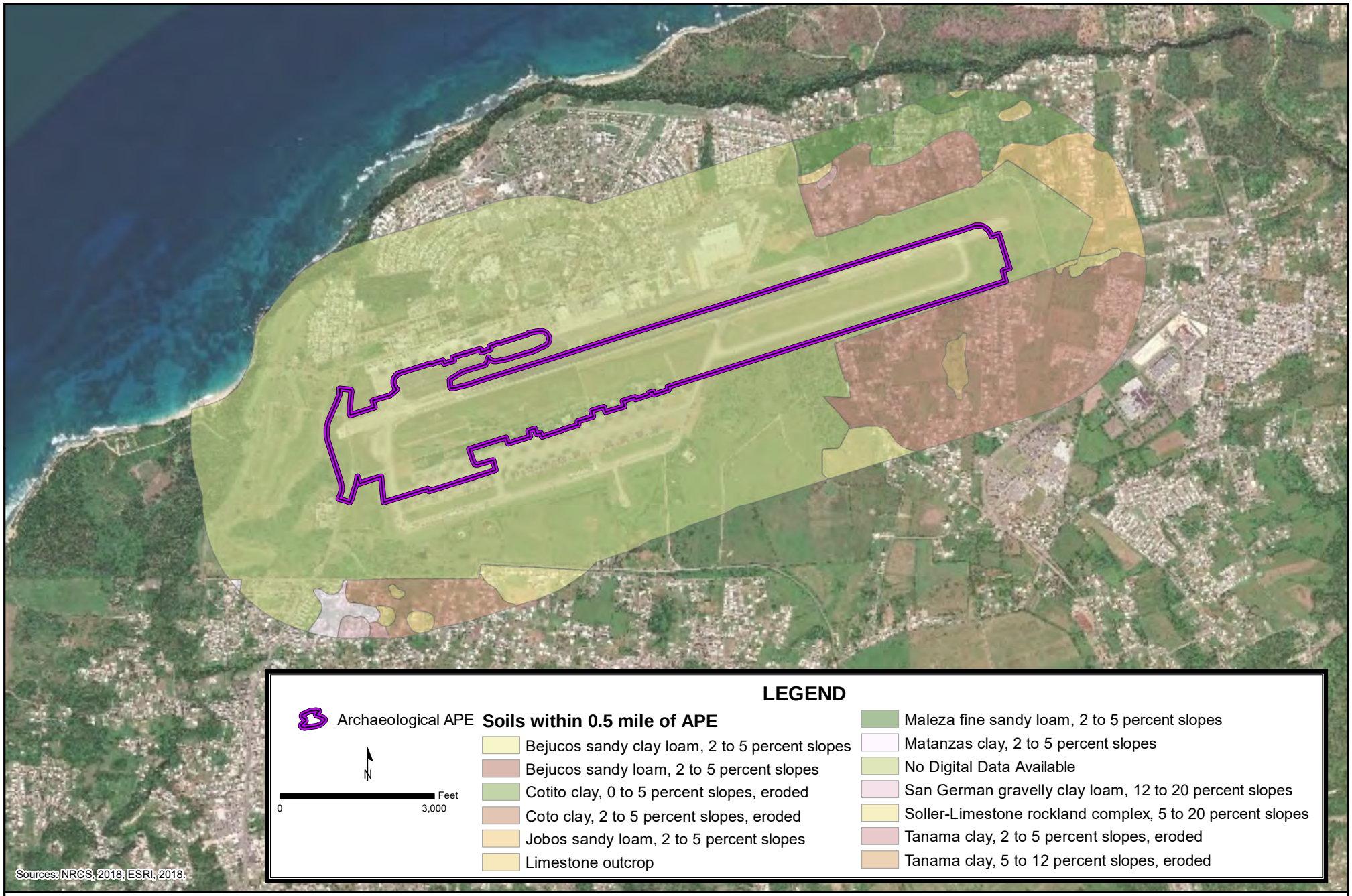
From San Juan continuing west, the karst belt is interrupted only by the relatively wide alluvial valleys of rivers, which have their headwaters in the upland area and which pass through the belt to the Atlantic Ocean. Aside from these through-flowing rivers and some relatively short tributaries, all the rest of the drainage of the karst belt is underground (Monroe 1980:20-21). Approximately 800 meters (0.5 mile) to the south, Canal Aguadilla, a man-made feature, acts as the principal drainage surrounding the APE and drains westerly approximately 2.19 kilometers (1.36 miles) towards Borinquen and then to the Atlantic Ocean near Punta Borinquen (Aguadilla 7.5-minute Quadrangle 2018).

2.3. PROJECT VICINITY SOILS

The US Department of Agriculture Natural Resources Conservation Service Web Soil Survey maps 12 distinct soil types within a 0.5-mile radius of the survey area (**Figure 2.3-1**). Considering soils data was unavailable for entirety of the project APE, soils data from the surrounding 0.5-mile radius will be used to interpret the probability that soils were similar within the APE. The following soil types were identified:

Bejucos sandy clay loam (BcB), 2 to 5 percent slopes / Bejucos sandy loam (BeB), 2 to 5 percent slopes: Bejucos sandy loam soils are situated within interior valleys and toeslopes and all areas are considered prime farmland. These soils are considered to be well drained.

Cotito clay (CtB2), 0 to 5 percent slopes, eroded: Cotito clay soils are situated on alluvial fan geomorphic positions along footslopes and toeslopes. This soil type is considered farmland of statewide importance and is well drained.



RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

SOILS

FIGURE
2.3-1

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Coto clay (CuB2), 2 to 5 percent slopes, eroded: Coto clay soils are situated on alluvial fan geomorphic positions along toeslopes. This soil type is well drained and all areas are considered to be prime farmland.

Jobos sandy loam (JoB), 2 to 5 percent slopes: Jobos sandy loam soils are situated on coastal plains, toeslopes and footslopes. This soil type is not considered prime farmland and is moderately well drained.

Limestone Outcrop (Lo): Limestone Outcrops have limited data and are not considered prime farmland.

Matanzas clay (MsB), 2 to 5 percent slopes: Matanzas clay soils are located within interior valleys at toeslopes and footslopes and all areas are considered prime farmland. These soil types are considered well drained.

Maleza fine sandy loam (MdB), 2 to 5 percent slopes: Maleza fine sandy loam soils are situated on alluvial fan geomorphic positions along toeslopes and footslopes. This soil type is considered prime farmland and is well drained.

San German gravelly clay loam (SaD), 12 to 20 percent slopes: San German gravelly clay loam soils are situated on hillslopes, mountain slopes, and ridges along summits, mountaintops, head slopes, side slopes, and shoulders. This soils is not considered to be prime farmland and is well drained.

Soller-Limestone rockland complex (SrD), 5 to 20 percent slopes: Soller-Limestone rockland complex soils are situated on mogotes, backslopes, shoulders, and summits. Mogotes are a generally isolated steep-sided residual hill composed of either limestone, marble, or dolomite and surrounded by flat alluvial plains. These soil types are not considered prime farmland, but are well drained. Th.

Tanama clay, 2 to 5 percent slopes, eroded(TcB2) / Tanama clay (TcC2), 5 to 12 percent slopes, eroded : Tanama clay soils are situated on mogotes on footslopes and backslopes. This soil type is not considered prime farmland and is well drained.

2.4. FLORA AND FAUNA

Predominant flora within the region consists of African tulip tree, tall albizzia, Guinea grass, zarcilla, cocklebur, morivivi, Oxhorn budica and Madras thorn. Fauna are represented by species such as the Gray Kingbird, Greater Antillean Grackle, Bananaquit, Cattle Egret, Northern Mockingbird, White-winged Dove, and frogs such as the Coqui and lizards (Rodriguez and Rodriguez 2010:7).

2.5. CURRENT CONDITIONS AND LAND USE

The APE is historically agricultural lands reserved for sugarcane plantations, and as such, has been subjected to ground-disturbing activities. In the more recent historic past, the majority of the APE has been subjected to significant grading and other ground-disturbing activities related to the rapid construction of BQN property associated with World War II (WWII) operations. Areas of disturbed soil were consistently encountered within the APE during the current survey efforts.

The APE is located at the confluence of three portions of various US Geological Survey (USGS) quadrangle maps (Aguadilla, Isabela, and Moca). The area immediately west of the APE and outside of the property boundary consists of Borinquen Avenue (Rt. 107) and a golf course on the bluff above Playa La Ruina, or Ruins Beach. North and east of the APE consists of residential and commercial properties labeled on the quadrangle maps as Maleza Baja and Aguacate. South of the APE contains undeveloped parcels associated with BQN.

CHAPTER 3 CULTURAL CONTEXT

3.1. PREHISTORIC CONTEXT

The accepted view of human colonization of the Caribbean has been that maritime settlement of the island chain occurred at various stages through time. The settlement of the Greater Antilles (Cuba, Hispaniola, Puerto Rico) has been thought to have occurred in different ways. In the traditional "Stepping Stone" model cultural groups moved northward up to through the Lesser Antilles island chain to the Greater Antilles. In this model Puerto Rico was the first island of the Greater Antilles to be settled, then Hispaniola and Cuba. Current evidence indicates that these ancient Amerindian groups used single-hulled canoes to make the journey between islands, even though many of the islands were beyond the sight of land (Rouse 1951; Napolitano, et al 2019).

An alternative hypothesis (Bayesian Model) proposes a different theme, one of multiple crossings of the Caribbean Sea that bypassed the Lesser Antilles in favor of more direct route across open water. The Bayesian model postulates that two major crossings were undertaken, with Cuba and Hispaniola being settled by a crossing from Mesoamerica (Napolitano, et al. 2019).

Research leading to the current accepted prehistoric cultural framework in Northwestern Puerto Rico began in the late 19th century beginning with several notable researchers who visited the island, specifically the Northern Puerto Rican coast. These researchers included: Agustin Stahl (1889-90), A.L. Pinart (1893), and J. Walter Fewkes (1902), among others. However, the first stratigraphically controlled archaeological excavations were conducted in the mid-1930s by Froelich G. Rainey who worked with Yale University. Rainey excavated two sites, one at the Coto Ward of Isabela and one in Moserrate, Luquillo. Later that decade Rainey excavated in Southern Puerto Rico at the Canas site in Ponce. Rainey observed at the Canas site that the upper strata contained undecorated pottery with a red slip in association with dense deposits of marine mollusks. A sterile layer was observed, under which were deposits containing elaborate vessel forms and detailed decorations in association with land crab claws (Keegan and Hofman 2017:85). Rainey developed the first two prehistoric cultural definitions based on pottery types, with the older culture designated as Crab and the later culture named Shell (Rodriguez and Rodriguez 2010:13-16).

A program of stratigraphic excavations, deemed the Scientific Survey of Puerto Rico, was conducted by Dr. Irving B. Rouse on the North Coast of Puerto Rico. The excavations took place from 1936-1938 while the investigator excavated on seven sites with potential for defining stratigraphic sequences and establishing correlations with other areas of Puerto Rico. Rouse did not find evidence of preceramic cultures (although he did on future excavations). Rouse excavated at the following sites: Carmona, Coto, Cuevas, Los Indios, Moserrate, Puerta de Tierra, and Santa Elena. Rouse found that four of the seven sites exhibited distinct cultural layers and deposits. Rouses excavation conclusions corresponded with and expanded upon several of Rainey's conclusions. Rouse proposed that Period I is the Coroso or Archaic (3000 BP-2400 BP). The Saladoid culture follows the Archaic and ranged from 2400 BP-1400 BP and is Period II.

Finally, the Ostinoiod culture ranged from 1400 BP-500 BP and encompasses Periods III and IV. The stratigraphical data from Rainey's Coto Ward excavations confirm the periods II, III, and IV (Rouse 1992:52).

3.2. ROUSES CULTURAL SEQUENCES IN NORTHWESTERN PUERTO RICO

The currently accepted cultural framework was developed by Irving Rouse. The following cultural sequences are Rouses adaptations for the Northwestern Puerto Rico area. Rouse and others have identified the region as having fewer prehistoric sites in general than the remainder of the Puerto Rican North Coast. The North Coast is characterized by fertile soils; however Northwestern Puerto Rico displays less fertile terrain. Rouse theorized that the lack of prehistoric settlement in this region was due to strong ocean currents, strong winds, and surf. It was also possible the strong and consistent winds from the Atlantic Ocean along with the presence of few protected bays and inlets made the prehistoric population favor more agreeable parts of Puerto Rico (Rodriguez and Rodriguez 2010:12).

Rouses dates are provided for the main cultural periods listed below (Archaic, Saladoid, Ostinoid) but current research has indicated that populations of Archaic peoples were present until 1800 BP and coexisted with later cultures (Ramos 2019:7).

3.2.1. ARCHAIC (6000 BP – 2400 BP)

The earliest culture to spread across the Greater and Lesser Antilles is often referred to as the Lithic, and there has been some debate as to specific arrival times and origins. The current research indicates that human colonization of the Caribbean Islands began around 7,000 years BP and the earliest sites are located in Cuba and Hispaniola, although this information is not widely disseminated due to language barriers. These earliest sites contained chipped stone tools and this is the dominant lithic technology of the time. There is evidence that flaked stone technology spread from Mesoamerica where this practice is the primary lithic technology. There have been no Lithic age sites recorded in Puerto Rico (Keegan and Hofman 2017: 23; Fitzgerald 2006: 392).

A later wave of settlement from South America has been postulated as bringing ground stone technology to the Island. The early ground stone technology sites are often referred to as the Archaic or preceramic. The oldest recorded sites on Puerto Rico are the Angostura and Maruca sites which date to 6,000 BP. Rouse and Allaire, among others, also have recorded dates in the 6400-6600 BP range but they are not considered firm (Keegan and Hoffman 2017:24-25).

The Archaic culture were the first humans to arrive on the island of Puerto Rico and occupy it continuously. These societies were generally fisherman and hunter gatherers, although there was likely some degree of horticulture present. Numerous paleobotanical studies indicate that manioc, sweet potatoes, and avocado was present during the Archaic period. Marine mollusks were also an important part of their diet (Keegan and Hofman 2017: 85). The archaic culture utilized both groundstone and flaked tools. Early settlements at several sites indicate settlements were situated

in locations with access to mangroves, maritime resources, and riverine areas (Ramos 2019:4-7).

Rock art such as petroglyphs is attributed to the later Archaic culture and may be the result of ground stone technology brought from South America. A ground stone industry was active, with stone spheres, heart-shaped stones, and three-pointed objects being found in middens and in burial contexts. The culture has long been thought to be aceramic, although there is some debate regarding the possible presence at several sites (Ramos 2019:4-7).

3.2.1.1. SALADOID (2400 BP – 1600 BP)

It is widely believed that the Saladoid culture entered Puerto Rico during a migration from the lower Orinoco River in modern day Venezuela. These people were ceramicists, and Another culture, the Huecoid, have fairly similar material culture to the Saladoid. but did not settle in Northwestern Puerto Rico (Laffoon et al. 2014:222). In Western Puerto Rico the Saladoid Series is broken down into two periods. Period IIA has been named Hacienda Grande Period (2400-1600 BP) while Period IIB has been designated the Cuevas Period (1600-1400 BP) (Rouse 1992:52). During both Saladoid Periods larger quantities of terrestrial land crab were found in middens than shell (primarily oyster). The cultural chronology of the Saladoid and Ostinoid Cultures are generally defined by pottery styles.

The Hacienda Grande Period is defined by pottery that is thin and well fired. About a third of the pottery is decorated with polychrome painting, incisions, and zoomorphic lugs and handles. Ceramic griddles for processing manioc root are also found in Hacienda Grande sites and are considered evidence of a subsistence change from the Archaic period (Keegan and Hofman:117).

The Cuevas Period is named for the Cuevas site, which is located many miles upriver on the Rio de Loiza on the Puerto Rican north coast. Cuevas pottery is generally thin, with a finely tempered past and range in color from light brown to ivory. The vessels have been described as plain but ornate (Rouse 1952:336-338). There is often red paint applied to the surface in many designs, including spirals, circles, and semicircles (Keegan and Hofman 2017:87). (Keegan and Hofman 2017:87-88).

3.2.2. OSTINOID (1400 BP – 500 BP)

The Ostiones culture, Spanish for oyster, were a culture known for extensive shell middens (Vega 1990:55). In Western Puerto Rico, the Ostinoid Series is divided into three periods. Period IIIA is referred to as Pure Ostiones Period and ranges from 1400-1100 BP. Period IIIB is named Modified Ostiones and was in place from 1100-800 BP. Finally, the Capa Period (IV) ranged from 800-500 BP (Rouse 1992:52). During the three Ostiones periods larger quantities of oyster shell were found in middens compared to other species, such as land crab.

The Pure Ostiones culture was first identified at the Cabo Rojo site in the vicinity of Punta Ostiones in southwestern Puerto Rico. The pottery of this time period is characterized by thin, hard surfaced wares.

The Modified Ostiones culture appeared later and is predominant on the western half of the island by 1100 BP. The pottery of this time period is primarily red with geometric designs incised into the surface (Keegan and Hofman 2017:88).

The Capa Culture is found in western Puerto Rico. This period is characterized by rapid population growth and the continued settlement in the interior, primarily at the foothills of the limestone mountains. Despite being the latest prehistoric culture, the pottery is widely accepted as the crudest in Puerto Rico. The pottery is heavily sand-tempered and crumbles easily, and the vessel designs are often hard to discern. The surface decoration is typically identified by incised lines beginning and ending with punctations (Keegan and Hoffman:104-105).

3.3. HISTORIC CONTEXT

3.3.1. BORINQUEN FIELD, 1939-1947

In 1936 the US began to consider establishing a military air base on Puerto Rico. With the prospect of war increasing, in early 1939 the War Department investigated numerous potential sites. In mid-April, it decided to locate a major air base at Punta or Point Borinquen. On the island's northwest corner, the site stood 60 miles west of San Juan and six miles north of the small community of Aguadilla. It was occupied by the hamlet of San Antonio and 1,000s of acres of farmland that mostly produced sugar cane, along with cassava, coconuts, cotton, fruits, and sweet potatoes. No historic resources were identified within the project's historic architecture APE that date from prior to establishment of Borinquen Field. The construction of what was to become the US Army's Borinquen Field brought jobs to the area, but at the cost of much dislocation. The military purchased the land and required San Antonio and its residents to move to a new site east of the airbase (Smith and Ramey Air Force Base Historical Association [RAFBHA] 2004; Feliciano Ramos 2011:5-6; Conn et al. 2000:322-325; Reynolds and Gardner 2014:26-30). [5]

Work proceeded quickly. By early September 1939, the Quartermaster Corps had purchased just under 3,800 acres of land for a total of $1,215,000. By the middle of the month, the first forces—Puerto Rican troops from Henry Barracks in Cayey—arrived at the largely sugar cane-covered

[5] The following attempts to present an objective summary of the history of Borinquen Field and its successor, Ramey Air Force Base. Within a colonial environment, however, an objective viewpoint can be difficult to locate. On the one hand, American military histories and other mostly English language accounts dispassionately focus on the War Department's reasons for building the base: protection of the Panama Canal, the Caribbean and, by extension, the US mainland (see, for example, Conn et al. (2000): 322-326 and Smith (2004)). A mainland newspaper article about the construction of Borinquen Field, for example, was headlined ""Flying Maginot Line" Anchored at Puerto Rico to Guard America," and glibly reported that when the Army arrived "Punta Borinquen was a point of land covered with royal palms and Australian pines. Except for the little village of San Antonio, with 500 inhabitants, the region was sparsely settled by "Jibaros" (hill people)" (*Knoxville Journal*, March 31, 1940). Other scholarly accounts, largely written in Spanish, consider the local disruptions caused by the construction of Borinquen and other American military installations (see, for example, Feliciano Ramos (2011) and García Muñiz (1991)). The hard facts of construction—clearing, grading, erecting runways and scores of buildings—remain the same, though.

property. They set up their tents on the future site of Hangar 5, which now houses BQN's passenger terminal (**Photo 3.3-1**). By mid-October workers were constructing administrative buildings, a hospital, and temporary (frame) and permanent (concrete) housing (Smith and RAFBHA 2004; Conn et al. 2000:322-325; Coast Artillery Journal 1941:84). Troops and planes from the mainland arrived in November and December 1939. The first B-18 bomber landed at Borinquen on November 27, 1939. By December 5, 1939, 18 were stationed at the field (Smith and RAFBHA 2004; Conn et al. 2000:322-325) (**Photos 3.3-2 and 3.3-3**).

Photo 3.3-1 "Base housing" in 1939 (source: RAFBHA 2015a).

Photo 3.3-2 Left, first B-18 bombers at Borinquen Field (source: *El Mundo*, December 8, 1939); Photo 3.3-3 right, bombers on future site of Hangar 5, c1939 (source: RAFBHA 2015a).

The nearby presence of a railroad facilitated construction of the base and its many facilities. By 1893 Aguadilla had received its first rail line from Mayagüez to its south. According to Aguadilla historian Haydée E. Reichard de Cancio (2009), in 1907 Aguadillanos were first able to take a direct train to San Juan. Not until as late as 1918-19, however, did the American Railroad Company of Porto Rico connect Aguadilla with Hatillo. This line passed within a few miles of the future base. In late 1939, in all likelihood, the War Department constructed a spur line from the American Railroad directly to the base's construction site (Surillo Luna 2017:87-91, 154-157, 209-212, 253-255; Aponte Pargas 2012; Conn et al. 2000:322-325) (**Photos 3.3-4 and 3.3-5**). Some warehouses constructed at the time (discussed below) remain near the former base. In 1954 the

government eliminated the railroad and neither tracks nor rails remain in place (Reichard de Cancio 2009).

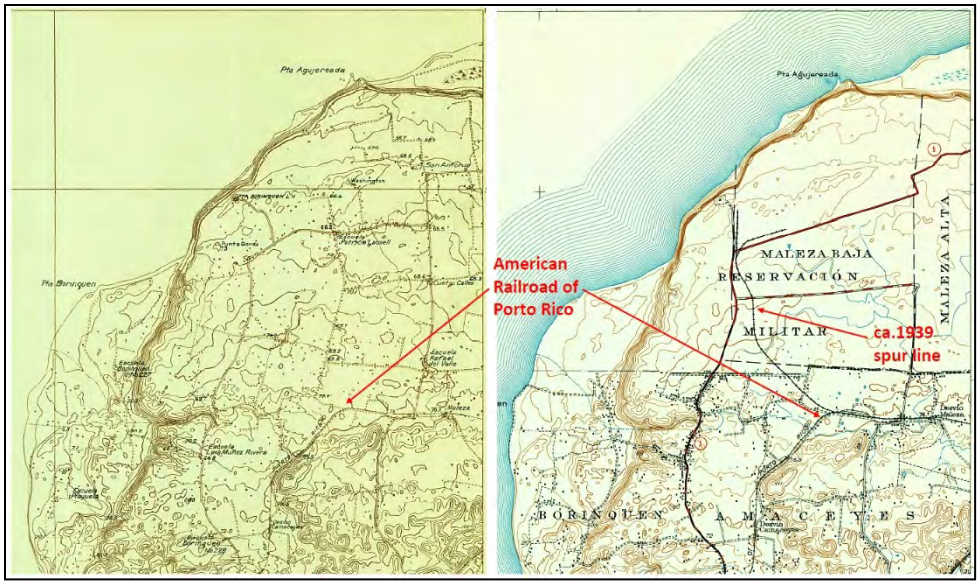

Photo 3.3-4 at left, Annotated sections of USGS, Aguadillo Quadrangle sheets, 1937; Photo 3.3-5 at right, c1949.

From late 1939 through the end of 1940 work continued apace. During this period, according to Dennis Smith and the RAFBHA (2004):

> …much work [was] done on aircraft hangars, runways, barracks, base hospital, officer, NCO and enlisted quarters, instrument repair building, photo laboratory, administrative buildings, post exchange, school house, etc. Work was underway on permanent facilities including an athletic and recreational building, swimming pool, golf course, water filtration plant, power plant, laundry, commissary, service club, officers club, and other needed and desirable facilities.

By the end of October 1939, the runway was "practically completed," according to an account carried in numerous mainland newspapers (*Clarion-Ledger*, October 27, 1939.) A second much-reported account of late March 1940 averred (*Knoxville Journal*, March 31, 1940):

> Three thousand men were put to work clearing 1900 acres at 8 o'clock one morning. At 4 o'clock that afternoon enough space was cut out to land the first plane. Before six months had passed a 4000-foot-long runway had been built parallel to the trade winds track, and temporary Army barracks were complete.

The runway was built of "native rock and asphalt" (*Arizona Daily Star*, May 7, 1940). Work on the entire base proceeded at "breakneck speed" during the year. In October its cost was projected at $8,400,000 (*Dayton Daily News*, August 17, 1940) (**Photo 3.3-6**).

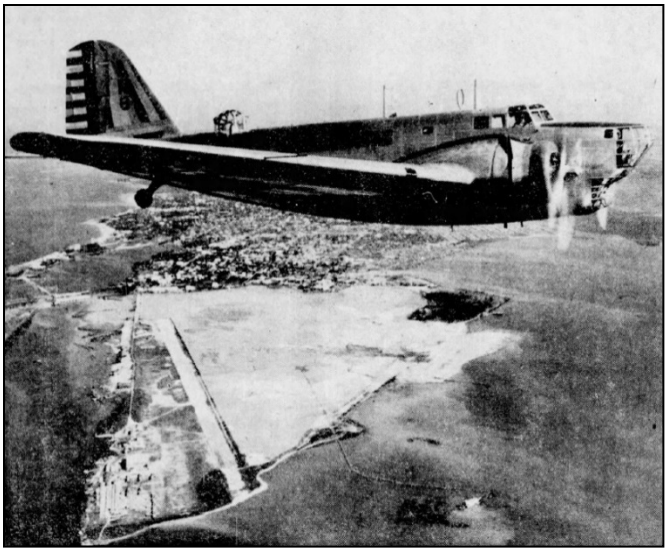

Photo 3.3-6 B-17 Flying Fortress bomber over Borinquen Field, 1940 (source: *Tampa Tribune,* March 31, 1940).

Landscape architects George W. Wickstead, of the Chicago firm of Graham, Anderson, Probst and White, and Edwin A. Farlow wrote of their professional experiences at Borinquen in 1941, another year of extensive work (Baylis et al. 1941:216-217). In April, Wickstead noted that the pay and living conditions were good, although the standard work week exceeded 55 hours. In addition to being competent professionals, he wrote, the project landscape architects "should have some engineering training and experience, as well as being good draftsmen." The "heavy dust," he reported, largely precluded wearing white. Farlow also commented on the hours, which included drafting room work three nights a week and on Saturday afternoons. He further addressed the grading and construction that dirtied the air: "At present [June 5, 1941] the landscape architect's department is concentrating on five grading plans, of which there are many required in very much of a hurry. There is a tremendous amount of construction in progress… [of] buildings, roads, runways, and hangars." In a brief July update (American Society of Landscape Architects 1941:205), Wickstead identified an additional factor that increased the workload, the required "adaptation of former plans to new and more economical ones."

The changes may have resulted from the US Army Corps of Engineers (USACE)assuming responsibility of Borinquen Field from the Quartermaster Corps, in January 1941, and the decision by the USACE to assign major Caribbean construction tasks "from the start" to civilian contractors (Hendricks 1993:22). In late January 1941, more than a year after the start of work, the War Department awarded McCloskey & Co. of Philadelphia a $4,763,750 contract for the construction of the air base at Borinquen. Graham, Anderson, Probst & White was selected as architect and engineers for the project (*Honolulu Star-Bulletin*, January 22, 1941; *Tampa Tribune*, January 23, 1941; *Defense* 1941:3).

Matthew H. McCloskey, Jr. founded McCloskey & Company in 1910 or 1911, at the age of 18. In 1917 he landed his first big construction job at the Philadelphia Naval Yard, "a project that typified the hard-driving McCloskey, whose men built 160,000 square feet of construction in sixty days" (Clark 1973:157). In 1923 his company completed a barracks at the US Military Academy at West

Point. He went on to build more schools in Philadelphia than any other single contractor and erected a number of government buildings in the capital city of Harrisburg. His construction firm was to grow into one of the ten largest in the country (*Evening Press*, April 27, 1973). McCloskey's drive, connections, and political leanings led him into Democratic politics, in fundraising and finance roles, at the state and national level beginning in 1932. (In 1962 he was appointed US ambassador to Ireland.) According to one account, for "six decades McCloskey pursued his business, with a reputation as an intense competitor and a shrewd calculator of contract costs" (Clark 1973:157-158; *New York Times*, April 27, 1973; Philadelphia Architects and Buildings website).

Graham, Anderson, Probst & White grew out of the landmark Chicago architecture firm D.H. Burnham & Company, which Edward Probst joined in 1901 and which by the 1920s had taken on his name. Notable commissions of the firm in the 1920s and 1930s included, in Chicago, the Wrigley Building (1921, 1924); Union Station train station (1924); the Merchandise Mart (1928-1931), the largest building in the world for many years; and the Chicago Main Post Office, the world's largest post office when completed in 1932. Other commissions included Cleveland's Terminal Tower skyscraper (1926-1930) and Philadelphia's Pennsylvania Railroad (30th Street) Station (1929-1933) and Suburban Station (1930) (Slaton and Barton 2014; Chappell 1992). They were perhaps the world's largest architectural firm in the first half of the 20th century and "achieved tremendous recognition…for their finesse in combining sophisticated architectural design with state-of-the-art building technology" (Mintz 1985). Edward Probst's 1942 obituary listed many of the firm's monumental past works but only one on-going project, that at Borinquen (*Chicago Tribune*, January 10, 1942). McCloskey and Graham, Anderson, Probst & White were formidable firms and it is not surprising that they received such a large, complicated, and time-sensitive commission.

Smith and the RAFBHA (2004) address some of the impacts the construction of the base had on local communities. Some were positive, others were not:

> All the construction and activity had significant impact on the surrounding communities, especially Aguadilla. Cash was flowing and business flourished. Puerto Rico had suffered severely from the depression and greatly needed some relief, but although a new excitement was captivating the district, the undesirable elements that always accompany money were indirectly infused into the district. The pace of life was affected, and transformation of cultural patterns accelerated. Cultural patterns usually change slowly, but the acceleration that started in WWII is now more than fifty years into its cycle with no turning point in sight. The Puerto Ricans in the area became more Americanized than in remote locations, and the aftereffects are still apparent in towns like Aguadilla, Aguada, Moca and Isabela.
>
> The military and Puerto Ricans from the surrounding communities generally had good formal relations, but the undercurrent of resentment in many aspects of the relationship was always just below the surface. The Ugly American attitude was far more prevalent in those days than today, and almost all Puerto Ricans have

> stories of abusive treatment or gross discrimination. They were often treated like second class citizens in their own homeland. In fact, many Americans stationed in the area didn't even realize that their fellow Americans were even American citizens. They expected the Puerto Ricans to treat them as if they were their great benefactors, rather than fellow American citizens.

In spite of any tensions, by the opening of 1942, with the US officially at war, many of the first-constructed temporary facilities at Borinquen Field had been replaced by permanent buildings. Large numbers of troops were stationed there, some of whom manned heavy antiaircraft guns emplaced on the cliffs near the base overlooking the sea. Various bombardment squadrons were stationed at Borinquen throughout the war and its "primary mission…gradually became as a landing field, refueling station and aircraft service depot for American aircraft of all types flying to the European and African war theaters" (Smith and RAFBHA 2004). This heavy usage was in part because of the field's location and in part due to its generous runway, which extended more than 11,000 feet.

In 1943, Borinquen processed more than 10,000 aircraft, almost equally split between tactical and cargo/passenger aircraft. These aircraft carried more than 90,000 officers, enlisted men, and civilians. Some construction took place during the year. It included the addition of base buildings, warehouses, and utility systems, as well as the completion of a 150-bed hospital (Smith and RAFBHA 2004). A similar volume of planes serviced (more than 10,000) and passengers (over 100,000) continued in 1944. In late September, a theater with over 800 seats opened. Service members at Borinquen at the end of the year topped 2,000 (Smith and RAFBHA 2004).

Numbers of flights and passengers did not drop until 1945, with the winding down of the war. Due to the airlift of troops coming home from Europe, however, military personnel at Borinquen exceeded 5,000 in July 1945, but dropped below 1,000 by the end of the year. The draw down did not foretell the end of the base or continued growth, however. During the year various new facilities opened, including two swimming pools, a dry cleaning plant, and a new finance building, restaurant, and beer garden. In January 1946, Borinquen extended its runways and raised a 500,000-gallon water storage tank (Smith and RAFBHA 2004).

A newspaper article in 1945 stated that Borinquen was intended to be fully built out as a "permanent field," but was only half completed when the US entered WWII in December 1941. "The swift advent of war," it continued, "forced suspension of permanent construction and Borinquen was rushed into operation as a tactical field with a vast mélange of temporary building to supplement the permanent" (*Oakland Tribune*, August 23, 1945). The planned buildout occurred during the next phase of the base's history.

3.3.2. RAMEY AIR FORCE BASE, 1948-1973

In January 1948, Borinquen Field was re-designated as Ramey Air Force Base. In May 1950, Ramey Air Force Base was transferred from the Caribbean Air Command to the Strategic Air Command (SAC). These actions and the advent of the Korean War in June 1950 led to major

construction activity during much of the decade (Smith and RAFBHA 2004). According to the base historical association: "The character of the base changed at this time from that of a support facility for transient aircraft traffic, to that of an operational base supporting an active program of strategic reconnaissance, charting photography, electronic geodetic mapping and surveying, and related reconnaissance functions for the SAC" (RAFBHA 2015d).

In October 1950, a $6,000,000 contract was awarded to build 575 Wherry Housing units at Ramey (discussed further below). Construction also commenced on a new two-story quarters for nurses. With more housing came more families with children and January 1952 opened with construction of a new $600,000 base school. The Wherry Housing project broke ground in March and in May the base "contracted for construction of airman dormitories, a new mess hall, and administrative buildings at a cost of $1,943,226." The first Wherry units opened at the end of January 1952 and the project was completed and accepted by September. New airmen's barracks were completed in late 1953 and early 1954 (Smith and RAFBHA 2004).

A new base chapel in concrete—the original frame one having burned—was constructed in 1955, as was a new NCO club. In June the Air Force approved 420 additional Wherry Housing units, 252 for airmen and 168 for officers. The Fullana Construction Company of San Juan received the $4,000,000 contract. The following year in March, Banco Popular de Puerto Rico, a new base bank with a drive-up window, opened its doors (Smith and RAFBHA 2004) (**Photos 3.3-7 and 3.3-8**).

Photo 3.3-7 (left) Banco Popular, 1972-1973 (source: www.flickr.com/photos/19191522@N06/3897209403/in/album-72157622217445947/); Photo 3.3-8 (right) bank building in December 2019.

In 1955 the mission of the base's reconnaissance wing and squadrons "officially changed from reconnaissance to bombardment on a global scale." In 1958 B-52 heavy bombers—the Stratofortress—began to arrive at the base. They were accompanied by KC-135 aircraft—the Stratotanker—which fueled the B-52s in the air (RAFBHA 2015d).

In early 1958, the federal government purchased and assumed control of all 995 Wherry Housing units at Ramey at a cost of $10,500,000 (US Congress 1958:56-58). From April 1961 through July 1962, the government "completely renovated" the 995 units (Smith and RAFBHA 2004).

Construction activity at Ramey was limited in the 1960s and early 1970s, particularly when compared to the previous two decades. A few new schools were built—an elementary school (1962); a junior/senior high school (1969-1970) for 1,000 students at a cost of $3.5 million—and utilities and services were improved via new power generators (1961), street lights (1961), and sewer treatment facilities (1969-1970) (Smith and RAFBHA 2004).

The slowdown in construction foreshadowed the closing of Ramey. Throughout 1972 and early 1973, all of the base's units were deactivated. The base formally closed in 1973 (Smith and RAFBHA 2004).

3.3.3. AFTER THE BASES, 1974-2019

In 1974, the General Services Administration (GSA) declared 3,138 of Ramey Air Force Base's 3,139.55 acres as excess. In the following 10 years, much of the property was distributed to a variety of military and other governmental entities. In July 1974, the Air Force transferred 303 acres to the Navy. The Navy subsequently transferred much of holdings, including about 57 acres to the Army and 129 acres to the US Coast Guard (USCG). It still retains title to about 47 acres. In December 1974 the USCG received an additional 21 acres from the Air Force (Smith and RAFBHA 2004).

In 1978 the GSA conveyed about 1,486 acres, and about 309 acres more in easements, to the PRPA for airport purposes. This property is now BQN. Between 1974 and 1978 the former federal Department of Health Education and Welfare conveyed about 71 acres to the Puerto Rico Department of Education and the University of Puerto Rico. In 1980 Puerto Rico received about 643 acres for public park uses. The GSA transferred about 229 acres to Puerto Rico's Department of Housing. This included portions of Ramey's military housing. In turn, the Department of Housing has conveyed portions of this property to private owners (Smith and RAFBHA 2004).

The RAFBHA summarizes the base's status in the early 2000s (RAFBHA 2004):

> Running roughly along the lines of property disposal stated above, the base is presently owned and operated as an airport and industrial park by numerous public and private agencies. Hangar #5 is now the terminal for BQN and the flight line remains intact and quite similar in appearance to what it was 50 years ago. Many air cargo lines use it on a daily basis. Other passenger airlines, including Pan Am and Continental, maintain one daily flight three or more times per week from the mainland at this time (2004). The terminal is in good shape. One is able to select rental cars from Hertz, Avis, etc. and can drop into the terminal café for refreshments. There have been constant rumors that multi-million-dollar investments will be made to improve BQN and transform it into a major international air hub. Work has begun on the terminal and runways. The USCG has a major base in Puerto Rico at Ramey. The Puerto Rico Air National Guard and a sizable number of private aircraft are also housed here, and thus, the runway remains quite active.

> Much of the housing on base has been rehabilitated and, of course, those still included within the rather sizable USCG perimeter, are in excellent shape, and the grounds are absolutely beautiful. A post office is still operated at Ramey Base and the gymnasium and swimming pools continue to be much used. The University of Puerto Rico conducts a branch at Ramey and the secondary school is an absolute thing of beauty. The golf club continues to serve an avid group of enthusiasts and the view from the pro shop deck is second to none.
>
> Many changes have occurred over the years, and changes will continue in the future. But for those who served in the Air Force at Ramey, the major structures are all still intact and the memories of the control tower, B-17s and the giant B-36s are all as visible today as they were "way back then." Time, of course, can never change that.

3.4. LITERATURE SEARCH AND PUERTO RICO SITE FILE REVIEW

Prior to the commencement of fieldwork, a search of the Puerto Rico State Historic Preservation Office (PRSHPO) cultural resource files was made for previously recorded sites within 1 mile (0.8 kilometer) of the survey area. Examination of the PRSHPO indicated that no National Register-listed sites are present within the APE or within a one-mile (0.8 kilometer) radius of the APE. The PRSHPO indicated that there are no archaeological sites recorded within one mile (0.8 kilometer) of the airport property. The closest recorded sites to the APE are located 1.5 meters (2.4 kilometers) to the west-southwest of the study area. These sites are the Borinquen Lighthouse (AL0100001) and Antiguo Faro Espaol (AL0100005). Two cultural resource assessment surveys were conducted on the airport property and are discussed here.

In 2004 MWH Americas, Inc. conducted a Historic and Architectural Resources Survey and Evaluation of the USCG Station Borinquen in Aguadilla, Puerto Rico on behalf of the USCG. The survey identified 201 architectural resources at Air Station Borinquen that were constructed between 1939 and 1990, dating from the time the base was established to the end of the Cold War. This survey excluded a large portion of the former Ramey Air Force Base as it lies outside of the USCG ownership. Building 402 (old Flight Hangar 2) was individually eligible for listing in the National Register of Historic Places based on Criterion A for association with US Military operations in the Caribbean theater, and under Criterion C as an outstanding and unique example of monolithic concrete design (MWH Americas 2004).

In 2014 Armando Marti conducted a Phase IA and IB study at BQN on behalf of Federal Emergency Management Agency (FEMA) in support of an EA for hangar improvements. A hangar (currently Building PR4043) was formerly Building 575. Building 575 was associated with the SAC dispersal program that brought B-52 bombers to Ramey Air Force Base. However, the building had been altered and did not retain integrity. No archaeological resources were identified, and

the author noted that the airport terrain displayed a low probability for encountering archaeological sites (Marti 2014).

CHAPTER 4 RESEARCH DESIGN AND METHODS

4.1. RESEARCH

Prior to the start of the fieldwork, background research was conducted at a variety of institutions to characterize the general history of occupation and land use of the survey areas to identify previously documented archaeological sites and historic structures, and the potential locations of historic structures and occupations. Resources accessed included:

- PRSHPO Research,
- USGS Historical Topographic Map Explorer (http://historicalmaps.arcgis.com/usgs/).

4.2. HISTORIC ARCHITECTURE SURVEY

AECOM conducted an intensive-level field survey on December 16-19, 2020 that included identifying, analyzing and evaluating all properties 50 years old and older, or of exceptional importance, within the historic architecture APE. This survey included review of digital photography of resources, settings, landscape features, and any alterations to resources that might affect their integrity. It also documented the relationship of resources to each other and any potential historic district. The USCG and PRPA assisted in getting access to areas within the Airport that are not open to the public. The only area that was not accessed was the no-longer-occupied site of the former Civilian War Housing (Tropical Acres) southwest of the Airport, which is heavily overgrown and fenced off. It was viewed through the fence line and otherwise viewed and studied through aerial photographs, historic maps, historic photographs, and YouTube videos taken by paintball teams that sneak into the area they refer to as “Las Ruinas Base Ramey” and “Ghost Town Aguadilla.”

4.3. ARCHAEOLOGICAL SURVEY

4.3.1. PREVIOUS RECONNAISSANCE EFFORTS

Previous reconnaissance efforts in support of the Proposed Project have been conducted (AM Group, 2015; AM Group 2019). Between the two investigations completed in 2014 and 2018, a total of 117 trenches parallel to the entire length of existing Runway 8-26 were excavated, thirty meters apart from one another. Each trench measured at a minimum three meters long, 60 centimeters wide and between 50 centimeters and one meter deep. Trench locations are depicted on **Figure 4.3-1 and 1a**, with the Proposed Project Alternatives 2B and 2D overlain on each respectively to show the location of trenches in relation to the proposed runway construction.

Based on the initial reconnaissance, positive recoveries and interpretations were encountered at the following locations. **Appendix B** contains excerpts from the previous survey report that provides more methodological and interpretive information on these findings.

- Trench 29 (2018): east-west water channel at depth of 45-59 centimeters, measuring 25

centimeters wide and twenty centimeters deep.

- Trench 39 (2018): cement block, 74 centimeters wide, at 39-85 centimeters depth.
- Trench 42 (2018): cement block with rod at 74 cm depth.
- Trench 93 (2014, 2018): foundational limestone structures interspersed with cement located in 2014; determined upon reinspection in 2018 to be natural calcareous outcrop.
- Trench 107 (2014, 2018): foundational limestone structures interspersed with cement located in 2014; determined upon reinspection in 2018 to be natural calcareous outcrop.

4.3.2. CURRENT SURVEY

During the current study (December 16-19, 2020), trench locations described in **Section 4.3.1** where positive recoveries were encountered were re-inspected to corroborate the previous findings. The conclusions reported in the 2018 reconnaissance study were corroborated.

To determine the need for survey throughout the remainder of the APE, the property was investigated using a combination of visual surface inspection, photo documentation of existing field conditions, and subsurface shovel testing. The majority of the APE contained large portions of heavily disturbed soils and was subjected to visual surface inspection. Shovel testing was then completed in areas where potential for intact deposits existed.

4.3.2.1. ARCHAEOLOGICAL PROBABILITY MODEL

Prior to the field survey, a probability model was developed to aid in determining the shovel testing intensity to be applied within a particular portion of the Airport property. Due to the absence of mapped soils data, it was difficult to develop a probability model based on environmental conditions. Instead, the 1941-42 topographic maps depicting the project area were consulted as they depict several buildings and roads within the project area (**Figure 4.3-2**). These buildings were related to the communities of Maleza Alta, Maleza Baja, and San Antonio. The building locations were georeferenced with the current aerial maps to display the locations within the project area. Testing in the mapped locations of these structures was planned if soil conditions were not disturbed; however, since visual and subsurface inspection revealed disturbed soils across the airport property, these locations were not subjected to systematic subsurface testing.

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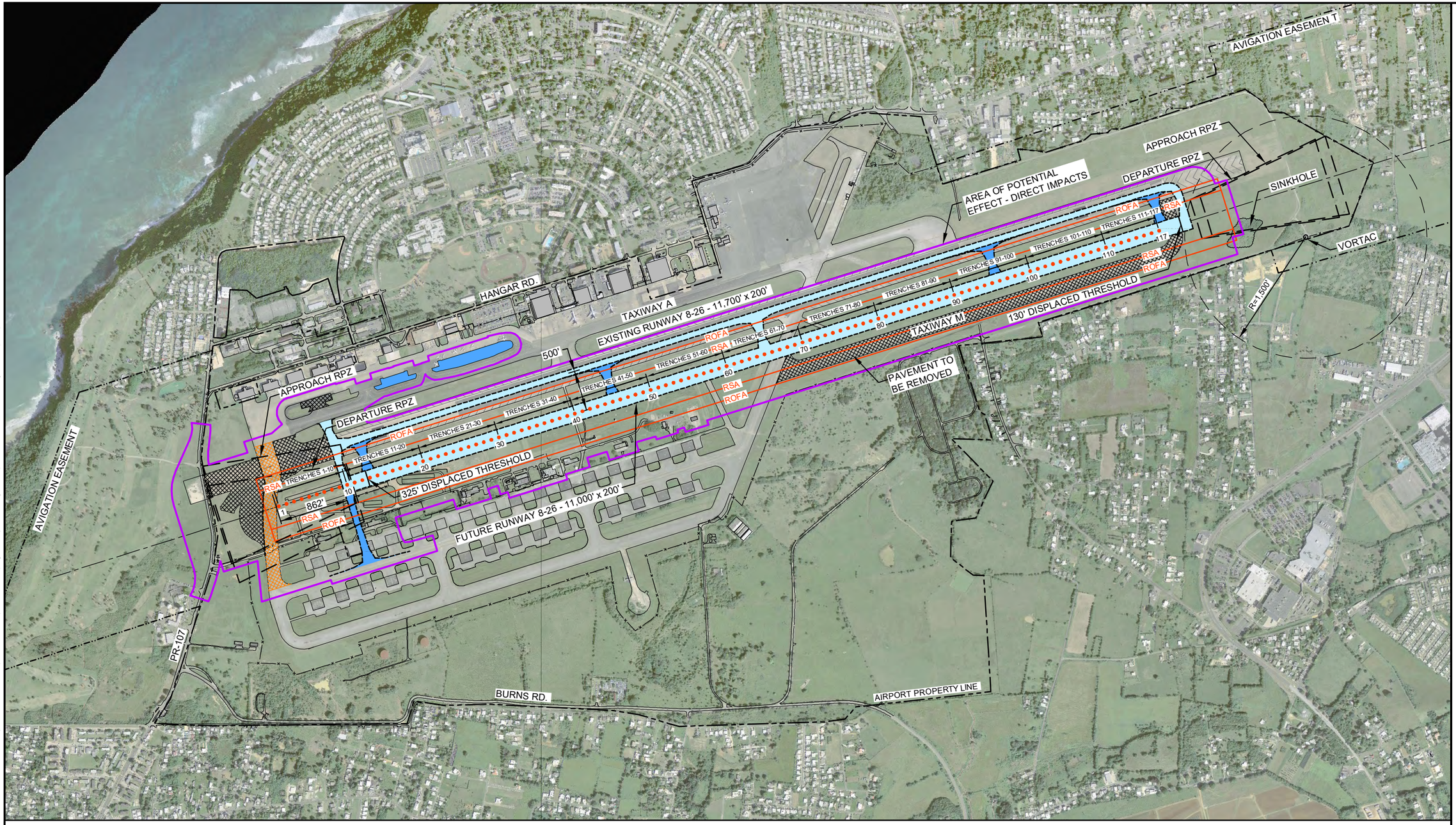

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH
- AREA OF POTENTIAL EFFECT - DIRECT IMPACTS
- ARCHAEOLOGICAL TRENCH LOCATION

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B
PREVIOUS SURVEY TESTING LOCATIONS

FIGURE 4.3-1

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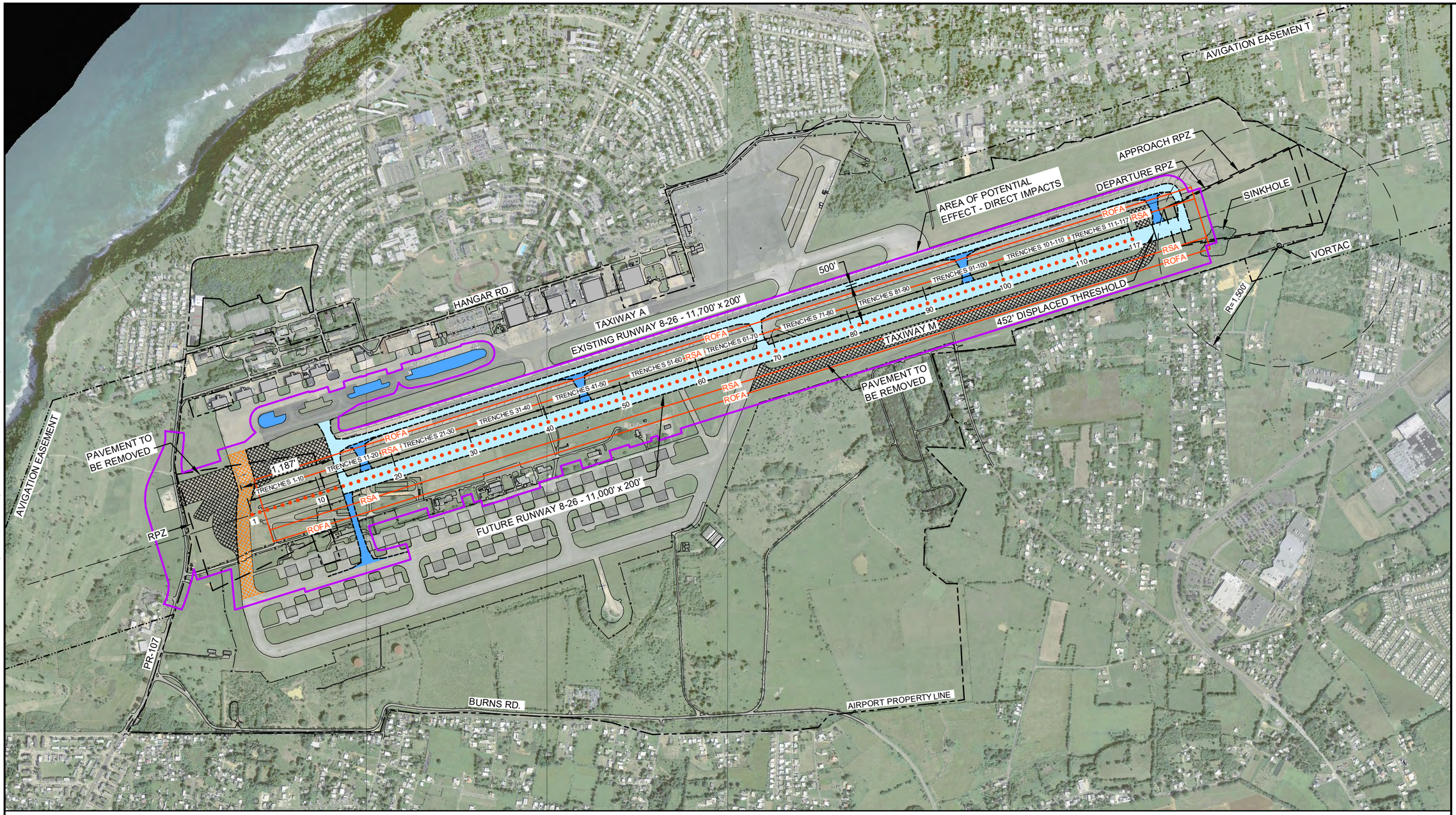

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH
- AREA OF POTENTIAL EFFECT - DIRECT IMPACTS
- ARCHAEOLOGICAL TRENCH LOCATION

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D
PREVIOUS SURVEY TESTING LOCATIONS

FIGURE 4.3-1a

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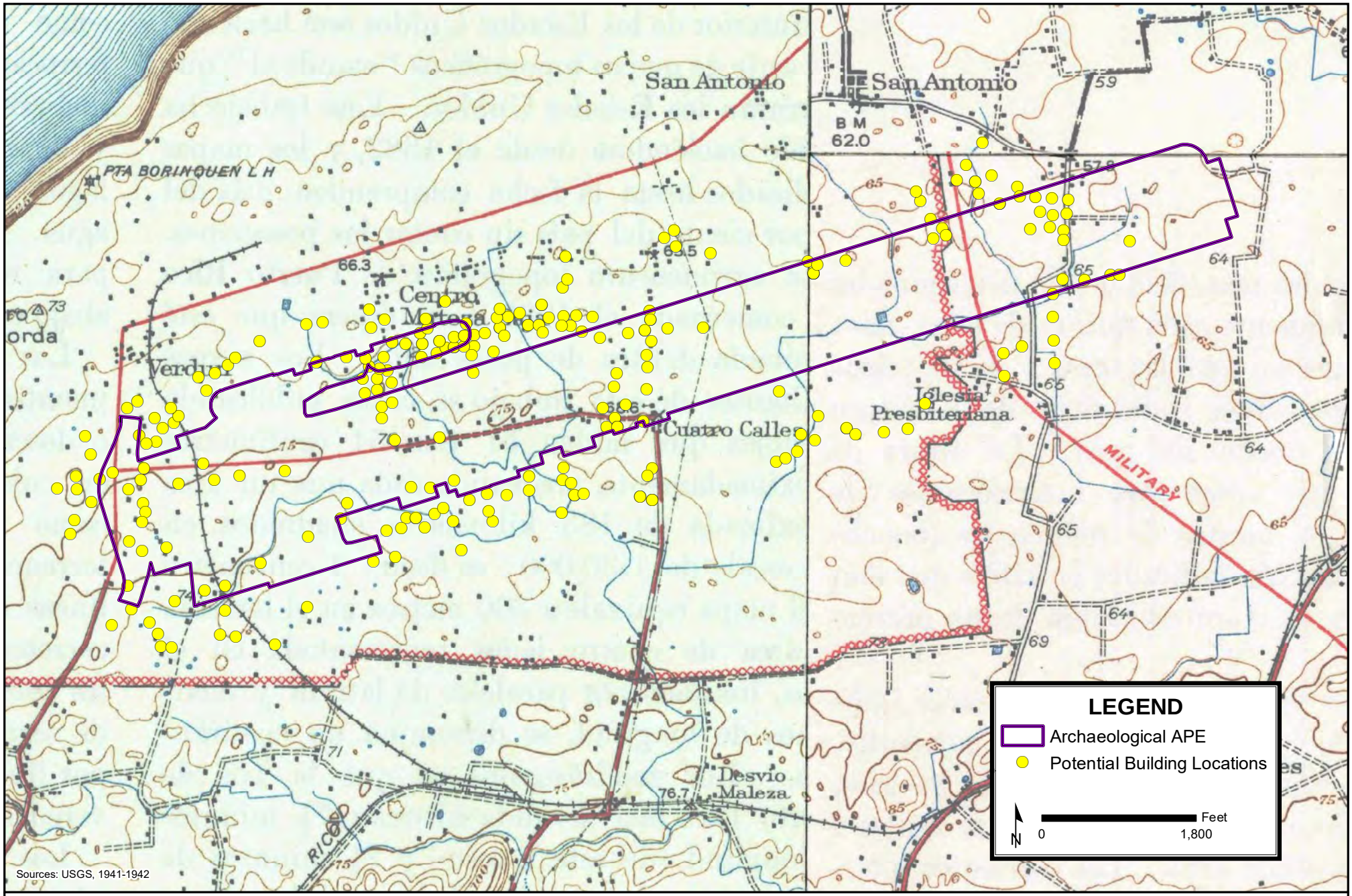


Path: S:\Projects\P\Puerto Rico 2018\60579568_BQNEARW826\Environmental\900-Work\920 GIS\mxd\Cultural\200228_Figure 4.3-2_1941-42 Buildings_rev0.mxd, Date Saved: 3/5/2020 11:58:45 AM

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

POTENTIAL BUILDING LOCATIONS AS DISPLAYED ON 1941-1942 QUADRANGLE MAPS

FIGURE
4.3-2

4.3.2.2. SHOVEL TESTING

Archaeological fieldwork began with systematic pedestrian reconnaissance of the entire APE to evaluate current conditions and identify any archaeological resources visible on the surface. This was followed by systematic shovel test pit (STP) excavation where needed.

Shovel test transects were spaced at 25-meter (75-foot), 50-meter (150-foot), or 100-meter (300-foot) intervals as appropriate, STPs along transects were likewise spaced at 25-meter (75-foot), 50-meter (150-foot), or 100-meter (300-foot) intervals. STPs were round, approximately 50 centimeters (18 inches) in diameter, and excavated by natural stratigraphy into culturally sterile subsoil or to a maximum of one meter in depth. All soils removed from the STP were screened using quarter-inch wire mesh for uniform artifact recovery. Detailed information for each STP was recorded on standardized field forms. The locations of all STPs were recorded in the field using a differentially corrected sub-meter accurate GPS device. All of the STPs were backfilled.

CHAPTER 5 ARCHAEOLOGICAL RESULTS

As previously shown in **Figure 4.3-1 and 4.3-1a** and described in **Section 4.3.1**, previous reconnaissance efforts mechanically excavated 117 trenches parallel to the entire length of existing Runway 8-26, with isolated positive recoveries that were interpreted to be insignificant. During the current 2019 effort, these isolated areas were reinvestigated to corroborate previous findings, and the previous findings were found to be accurate.

Further, the entire study area was subjected to a visual reconnaissance survey where significant disturbances were observed. For ease of data presentation, the archaeological APE was divided into 13 distinct areas labelled A-M (**Figure 5.1-1**). The majority of the archaeological APE exists within or adjacent to runways, associated runway drainage systems, paved and unpaved roads, and in areas with ground hazards (i.e., buildings, downed power lines, 55-gallon drums). Three areas (C, D, and M) were subjected to subsurface shovel testing during this study and all displayed disturbed soils.

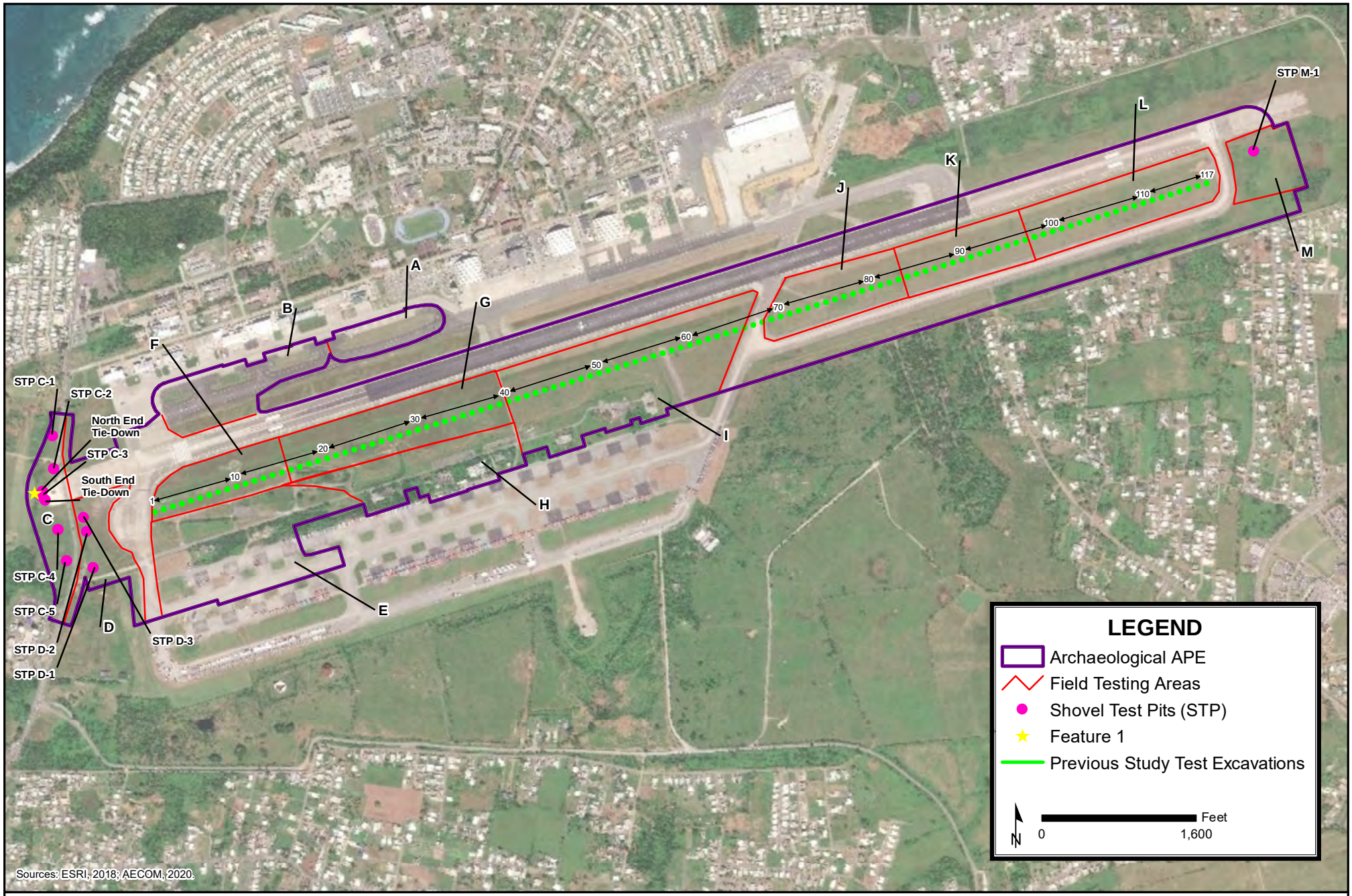
5.1. AREAS A AND B

Area A is an approximately 3.5-acre (1.4-hectare) area and Area B was a roughly 10-acre (6.2-hectare) parcel, for a total 13.5 acres (see **Figure 5.1-1**). The areas consisted of low-lying flat terrain containing airport taxiways, runways, drainage ditches, buried utilities, and manicured lawns bordering airplane taxiways and drainage ditches. Both areas were bordered by a taxiway and airport support structures to the north, the BQN terminal to the east, a paved lot to the west, and taxiways and Runway 8-26 to the south (see **Photo 5.2-1** below). The ground surface was heavily disturbed adjacent to the runways. No subsurface testing was conducted in Areas A or B.

5.2. AREA C

Area C measures 14 acres (5.7 hectares) and is located on the west side of Borinquen Avenue (PR Route 7) and west of Runway 8-26 (see **Figure 5.1-1**). The terrain in this location is low lying and consists of an overgrown field with a gravel parking lot in the center (**Photo 5.2-2**). A linear concrete pad with iron rings was recorded as Feature 1 (**Photo 5.2-3**). This concrete pad measures 0.6 meter (2.0 feet) east-to-west and 6.1 meters (20 feet) north-to-south. It is likely that the concrete pad and iron rings functioned as an aircraft tie-down at some point in the history of the airport.

A transect consisting of five STPs was excavated at 50-meter intervals across the landform and consistently exposed a series of fill episodes (**Photo 5.2-4**). These tests were exemplified in STP C1 (**Figure 5.2-1**). Full stratigraphic summaries of the STPs are provided in **Appendix C**. Stratum I consisted of reddish brown (2.5YR 4/4) sandy clay fill soil to 12 centimeters below ground surface (cmbgs). Stratum II exhibits red sandy clay (2.5YR 5/6) fill soil to 40 cmbgs. Stratum III consisted of reddish brown (2.5YR 4/4) sandy clay fill with gravels to 79 cmbgs. Lastly, Stratum IV consisted of dark reddish brown (2.5YR 3/4) sandy clay to the base of the STP at 94 cmbgs.



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RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

FIELD SURVEY RESULTS

FIGURE 5.1-1

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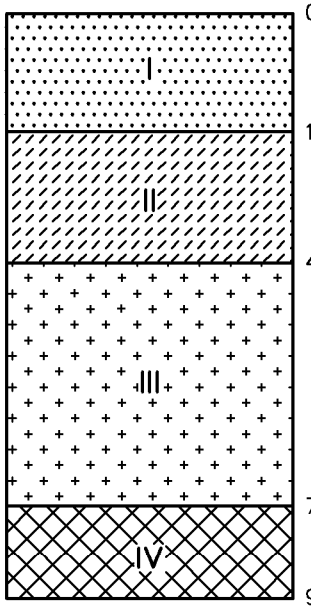
Photo 5.2-1: Area A and Area B ground conditions, facing east.

Photo 5.2-2: Area C Environmental Conditions, facing south.

Photo 5.2-3: Feature 1 in Area C facing south.

Photo 5.2-4: Area C, crew excavating STP C2, facing east.

STP C–1



I – 2.5 YR 4/4
REDDISH BROWN SANDY
CLAY FILL SOIL

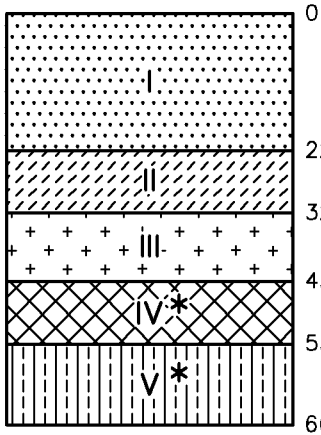
II – 2.5 YR 5/6
RED SANDY
CLAY FILL SOIL

0 40
20 CM

III – 2.5 YR 4/4
REDDISH BROWN SANDY
CLAY FILL SOIL
WITH GRAVEL

IV – 2.5 YR 3/4
DARK REDDISH BROWN
SANDY CLAY

STP D–1



*LIMESTONE ROCKS
INTO STR. IV & V

I – 5 YR 3/4
DARK REDDISH BROWN
SANDY CLAY FILL SOIL

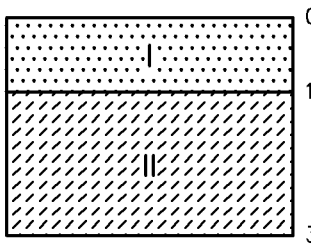
II – 2.5 YR 3/6
DARK RED SANDY
CLAY FILL

III – 2.5 YR 3/6
DARK RED COARSE
SAND SOIL

IV – 2.5 YR 4/4
REDDISH BROWN
SANDY CLAY

V – 2.5 YR 3/3
DARK REDDISH BROWN
SANDY CLAY

STP M–1



I – MOTTLED 10 YR 3/4 DARK YELLOWISH
BROWN SANDY LOAM WITH 10 YR 5/4
YELLOWISH BROWN SANDY LOAM
COMPACT FILL WITH LIMESTONE CHUNKS

II – 10 YR 3/4 DARK YELLOWISH BROWN
SANDY CLAY WITH LIMESTONE CHUNKS

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ENVIRONMENTAL ASSESSMENT

REPRESENTATIVE SOIL PROFILES

FIGURE
5.2-1

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5.3. AREA D

Area D measures 13 acres (5.2 hectares) and is bordered by Borinquen Avenue (PR Route 7) on the west, Runway 8-26 to the north, and access road to the east, and Parallel Road to the south. The terrain in this area is flat and consists of manicured lawn (**Photo 5.2-5**). This location was shovel tested at 50-meter intervals and encountered fill soil overlying clay with limestone inclusions. STP D1 is an example of the stratigraphy in this location (see **Figure 5.2-1**). Stratum I consisted of dark reddish-brown (10YR 3/4) sandy clay fill soil to 22 cmbgs. Stratum II displayed dark red (2.5YR 3/6) sandy clay fill to a depth of 32 cmbgs. Stratum III was characterized by the same soil description as Stratum II but the soil texture consisted of coarse sand fill to 43 cmbgs. Stratum IV consisted of reddish brown (2.5YR 4/4) sandy clay to 53 cmbgs. Stratum V consisted of dark reddish brown (2.5YR 3/3) sandy clay to 66 cmbgs. Both Stratum IV and V contained small limestone rocks and appeared to be natural subsoil.

5.4. AREA E, H AND I

Areas E, H, and I are parcels which border both sides of Parallel Road (see **Figure 5.1-1**). Area E is a roughly 30-acre (12.1-hectare) area which is bordered by an airport access road to the west, Area F to the north, Area H to the east, and paved tarmac to the south. Area H is a 20-acre (8.1-hectare) area which is bisected by Parallel Road. Area G is located to the north of Area H, while Area F is located to the west and Area I is located to the east. The southern edge of Area H is bordered by paved tarmac. Area I is a 56-acre (22.7-hectare) section bordered by Area G and H to the west, paved tarmac to the south, and Parallel Road to the east. Area I is the only parcel in this group which extends north to Runway 8-26 (**Photo 5.2-6**).

The portions of these areas adjacent to both sides of Parallel Road display both dense vegetation and signs of storm damage, likely resulting from Hurricane Maria in 2017. The area consists of hazards such as high voltage transformers (**Photo 5.2-7**). The paved tarmac to the south was not testable. Due to numerous paved areas and potential hazards within the surrounding workspace, subsurface excavation was not conducted in this area.

The portion of Area I adjacent to Runway 8-26 consisted of a graded landscape with numerous buried utilities in the area. Previous testing was performed in 2014 in the vicinity of the runways and revealed heavily disturbed soils (**Figure 5.1-1**).

Photo 5.2-5: Area D Environmental Conditions, facing north.

Photo 5.2-6: Area I, Tarmac present in the grass, facing northeast.

Photo 5.2-7: Overgrown locations with damaged utility risk, facing south.

5.5. AREA F, G, J, K AND L

Areas F, G, J, K, and L are contiguous testing parcels which are bordered by Runway 8-26 to the north (see **Figure 5.1-1**). Area F is an 18-acre (7.3-hectare) area bordered by an access road to the west and Area E to the south. Area G is a 23-acre (9.3-hectare) parcel bordered by Area F to the west, Area I to the east, and Area H to the south. Area J is a 22-acre (8.9-hectare) area bordered by an access road to the east, Parallel road to the south, and Area K to the east. Area L is a 17-acre (6.9-hectare) bordered by Area K to the west and Parallel Road to the east and south. These parcels total 80 acres.

The areas south of Runway 8-26 consisted of a large “v-shaped” drainage ditch system which parallels the entire runway. This drainage system consisted of a graded landscape sloping down to large drainage grates (**Photo 5.2-8**). There are also numerous buried utilities in the area. The northern portion of these areas directly adjacent to Runway 8-26 were tested in 2014 in the vicinity of the runways and revealed heavily disturbed soils (see **Figure 5.1-1**).

5.6. AREA M

Area M is a 13-acre (5.3-hectare) parcel bordered by Runway 8-26 to the north, Parallel Road to the west, and the airport property boundary to the south (see Error! Reference source not found.**.1-1**). This area was not tested during the work in 2014. The borders of this location consist of low-lying areas with high vegetation (**Photo 5.2-9**). One judgmental shovel test was placed in this location and revealed multiple fill episodes and very compact soil. STP M1 displayed two distinct strata (**Figure 5.2-1**; **Photo 5.2-10**). Stratum I consisted of mottled soils, consisting

primarily of dark yellowish brown (10YR 3/4) sandy loam mixed with yellowish brown (10YR 5/4) sandy loam to 12 cmbgs. Stratum II displayed dark yellowish brown (10YR 3/4) sandy clay to a depth of 35 cmbgs. Both strata contained broken limestone rocks in the matrix.

Photo 5.2-8: Graded terrain sloping towards drainage system, facing southwest.

Photo 5.2-9: Area M Environmental Conditions, facing northeast.

Photo 5.2-10: STP M1 wall profile, facing northeast.

CHAPTER 6 ARCHITECTURAL HISTORY RESULTS

6.1. HISTORIC RESOURCE INVENTORY AND ASSESSMENT

6.1.1. GENERAL ARCHITECTURAL CONTEXT

Historic resources within the project's APE were built beginning in late 1939 almost exclusively for the US Army and Air Force, which controlled and funded their appearance and construction. They did not directly spring from traditional Puerto Rican architecture, but nonetheless made use of basic 20th-century materials and styles found throughout the island. Most of the non-residential buildings erected for Borinquen Field and Ramey Air Force Base that are not strictly functional are "watered down" Spanish Revival or, perhaps more accurately, "'Spanish' revival" in style (Ortiz Colom 2003:16). According to mainland newspaper accounts, the "most modern in airports" to be built for the Army at Borinquen Field and the Navy elsewhere on the island:

> …would be models of the latest developments of warfare. In addition to hangars, barracks, and other army and navy necessities, the airports will be model villages complete with theatres, shops and recreational facilities, all in the Spanish Colonial style of architecture (Clarion-Ledger, July 18, 1939).

An account of the now much-altered, early-1940s Building 505 captures the appearance of almost all of the non-residential buildings built by the military at Borinquen Field and Ramey (Louis Berger & Associates 1990:5): "Building 505…employs a design vocabulary widely used by the United States military in Puerto Rico during World War II, in which smooth, unarticulated concrete walls, flat roof with wide eaves, and numerous regularly spaced windows were principal elements." The buildings erected by the Air Force during the Cold War were even more stripped down. They relied on the most basic elements of mid-century-modernism rather than any sort of Spanish Revival.

The single-family and duplex residences also reflect a stripped-down, basic, and cost-conscious use of the mid-century-modern elements that became popular on the island in the 1930s and 1940s. Almost all are built of concrete, which by mid-century had become an extremely popular material in Puerto Rico (Ortiz Colom 2003). They were low, boxy, flat-roofed, and unornamented.

About 200 individual resources and five potential historic districts were inventoried within the APE. These resources are located within an APE that at its longest extends about five miles east to west and one mile north to south. Due to the fact that these resources are almost entirely clustered together by original use and type, and to facilitate their assessment and mapping in this report, they are addressed by group starting at the northwest and finishing at the southeast, as noted in **Table 6.1-1**.

Table 6.1-1 Resource Groups Within the APE

Group of Resources	Individual Resources Assessed	Potential Historical Districts Assessed
Punta Borinquen Golf Course and Clubhouse (W of Borinquen Road)	2	0
Fullana Wherry Housing (NW of Golf Street and Borinquen Avenue)	137	1
Motor Pool and Supply Buildings (NE of Borinquen Avenue and Hangar Road)	15	1
Garages and Support Buildings (NW of Hangar and Wing Roads)	5	1
Borinquen Field Concrete Hangars and Control Tower (SW of Hangar and Wing Roads)	5	1
Cold War-era SAC Bomber Alert Facility (S and N of BQN Runway)	29	1
Material Storage and Fuel Tanks Resources (W and S of Former Taxiway 2)	5	0
Civilian War Housing (SE of Former Taxiway 2 and W of PR 110R)	--	1
Paul Revere Lodge No. 98 (Calle Villa Caribe)	1	0

All but one of these—Paul Revere Lodge No. 98—was directly associated with Borinquen Field or Ramey Air Force Base, or both. The Masonic lodge was started by base personnel and therefore indirectly associated with the military presence. The assessed resources include two neighborhoods built by or under the auspices of the military, the Fullana Wherry Housing and the Civilian War Housing (Tropical Acres). These two, each built in one episode over a period of about a year, are partially in and partially out of the APE. To better assess the potential eligibility of the Fullana Wherry Housing as a historic district, all of its resources were photographed and assessed. The Civilian War Housing was only assessed for its potential as a National Register historic district, as it is inaccessible and in great disrepair. The Punta Borinquen Golf Course, which straddles the APE, was also accessed as single resource within its entire bounds.

6.1.2. PUNTA BORINQUEN GOLF COURSE AND CLUBHOUSE (WEST OF BORINQUEN ROAD)

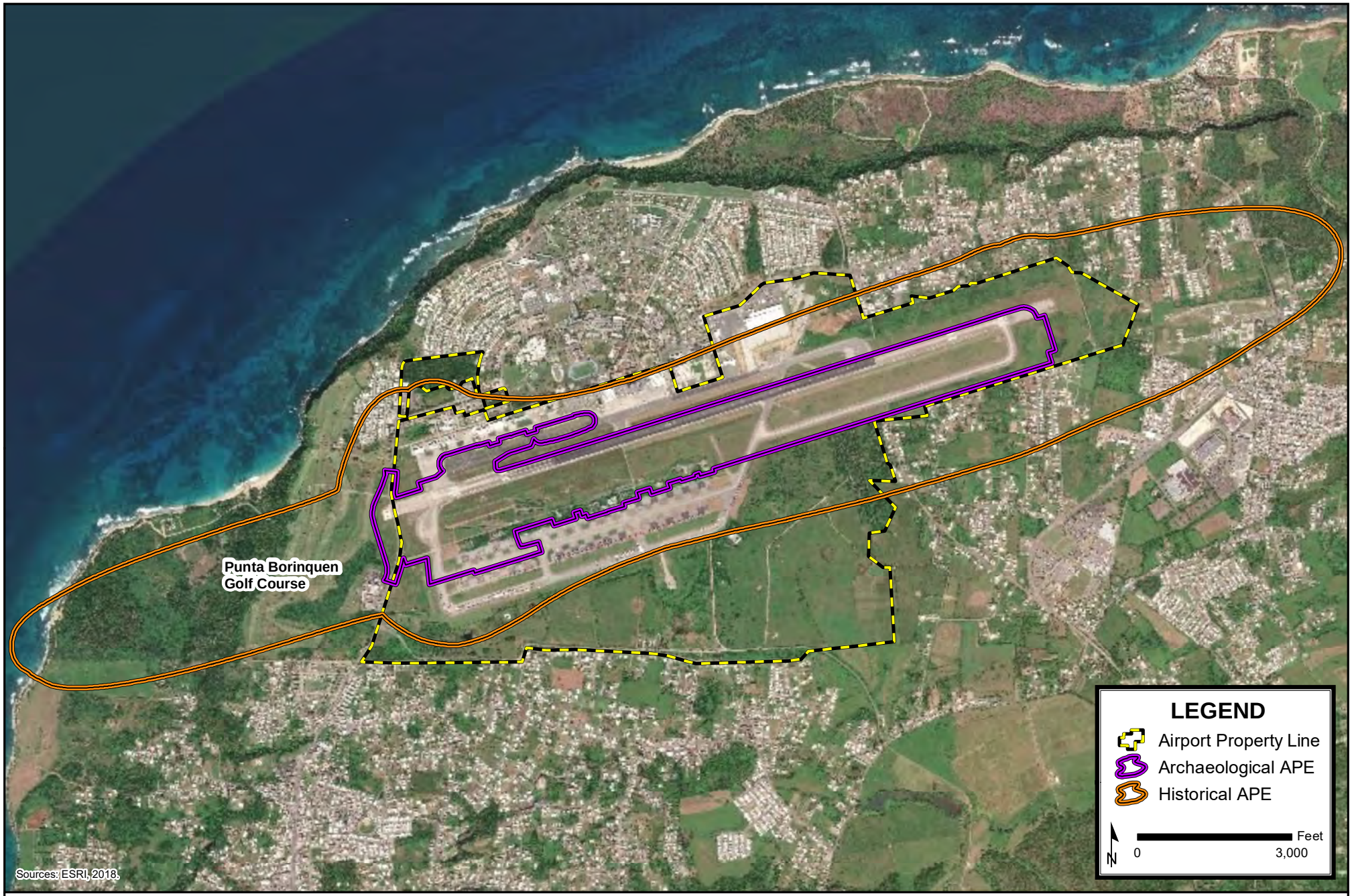
6.1.2.1. PUNTA BORINQUEN GOLF COURSE

The Punta Borinquen Golf Course (formerly Ramey Golf Course) is a single contiguous unit, most of which is located within the project's historic architectural APE (**Figure 6.1-1**). Therefore, the National Register eligibility of the entire course is addressed here. The golf course was planned as an early part of Borinquen Field. Its site is labeled, without the hole layout shown, on a January 1943 map of the field. By May 1944, its 18 holes and clubhouse were identified on a map. They extended west from Borinquen Road to the cliffs overlooking the ocean and south from the 1920 Punta Borinquen lighthouse down past the runway (**Figure 6.1-2**, left). In 1956, the golf course lost its upper section to the Fullana Wherry housing that was erected between the lighthouse and the clubhouse (**Figure 6.1-2**, right). To retain its 18-hole plan, it was extended to the south (Smith and RAFBHA 2004; *Tampa Tribune* 1955b).

The southern extension and redesign of the golf course, which was completed no later than 1960, was the work of golf course architect Ferdinand "Fred" Garbin (1928-2009). Garbin was born in western Pennsylvania in 1928 and educated in agronomy at Penn State University. He designed or redesigned more than 100 courses, almost all in Pennsylvania and Ohio. The American Society of Golf Course Architects (ASGCA) elected him as a member in 1963 and he served as its president in 1968. The ASGCA identifies Garbin's five most notable designs/co-designs as: Sewickley Heights in Sewickley, Crossgates in Millersville, and Meadowlink in Murrysville, all in Pennsylvania; Links at Erie Village in Syracuse, New York, and Coama Springs in San Ildefonso, Puerto Rico. Punta Borinquen and Coama Springs were the only courses he designed outside of the area surrounding Pennsylvania and Ohio (Golf Advisor 2020; ASGCA 2020). The five ASGCA-identified courses are likely notable examples of Garbin's work, but otherwise not necessarily notable designs.

Punta Borinquen is 6,633 yards long from its blue back tees, 6,098 yards from its middle white tees, and 4,900 from its forward red tees. It is a straightforward design of essentially linear holes punctuated by the occasional palm tree and a small number of sand traps (**Photos 6.1-1** through **6.1-6**). Its terrain is gently rolling. The course's most notable feature is its spectacular location, overlooking the confluence of the Caribbean Sea and the Atlantic Ocean.

Punta Borinquen's functional design reflects its military origins, even though it became a private course in 1973. When the base closed, it became Puerto Rico's first public course (Punta Borinquen Golf Club 2020). It does not stand out amidst its numerous contemporaries, military, private, or public. In 1975, the US military maintained about 300 golf courses. In 2014, after further decommissioning, the number likely stood at about 200. According to an account about the remaining courses (Vicens and Wuestewald 2014), "The quality of military golf courses can differ dramatically, ranging from the sprawling 54-hole championship complex outside Andrews Air Force Base in Washington, DC, to a couple of holes plopped in the highlands of Mosul, Iraq."



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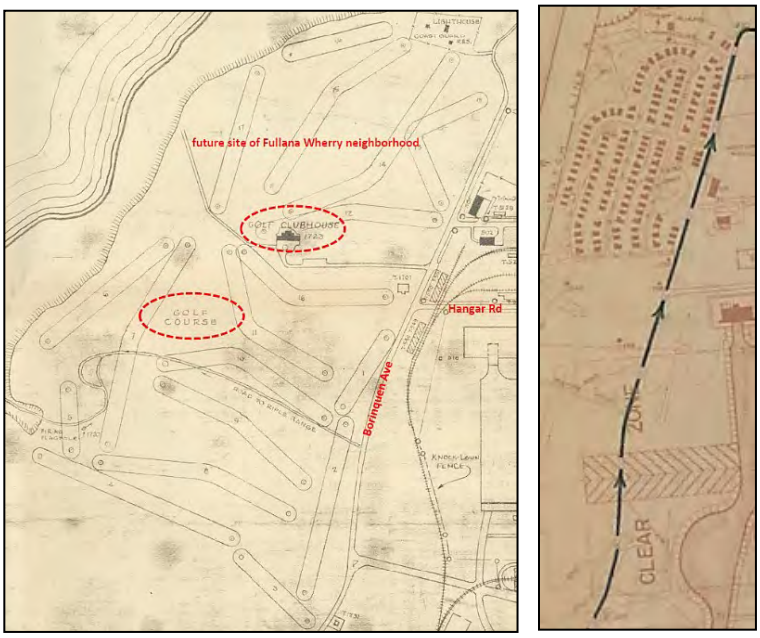
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

PUNTA BORINQUEN GOLF COURSE LOCATION MAP

FIGURE
6.1-1

Figure 6.1-2 Historic Maps of Punta Borinquen Golf Course



Note: Left, map of May 1944 (revised through May 1947); right, map of November 1966 revised through January 1968 with Borinquen Avenue marked by black-arrowed line

Photo 6.1-1, left, Punta Borinquen Golf Course plan (source: Punta Borinquen Golf Club 2020);
Photo 6.1-2, right, holes outlined on aerial photograph (source: Golf Advisor 2020).


Photo 6.2-3, left, looking northwest up Hole 11 with the Atlantic Ocean in the distance;
Photo 6.2-4, right, looking southeast from below the clubhouse.


Photo 6.2-5, left, looking south from blue tees down Hole 1;
Photo 6.2-6, right, looking east from white tees down Hole 13 toward Borinquen Road.

The Punta Borinquen Golf Course is not recommended as individually eligible for National Register listing under any of the Register's Criteria. One of hundreds of golf courses erected by and for the military, it is not notable under Criteria A or B as having made a significant contribution to our history or for association with any persons significant in our past. Its design, similar to that of many of its contemporaries, is not notable: it is not of championship caliber nor is it the work of a master. Fred Garbin was a prolific golf course designer, but not a masterful one, and Punta Borinquen was not among his most highly regarded works. The course is therefore not believed to be significant under Criterion C. As its design is unlikely to yield information important in our history, it is also not significant for its architecture under Criterion D.

It should be noted that two WWII-era Panama mounts remain on the golf course near the cliffs north of the APE (**Photos 6.1-7** through **6.1-9**). As they are outside of the APE and have a history separate from the course, they are not accessed here. It is believed that they should be considered if they fall within the APE of any future project. The 150-milimeter guns that stood upon the mounts beginning about 1941 are gone, but the mounts have been uncovered, cleaned, and remain largely intact and in good condition. A "Panama mount" is a gun mount developed by the US Army

in the 1920s in Panama—hence the name—for fixed coastal artillery. The demountable gun and carriage were set upon the central mount. Arms of the carriage extended out to the toothed steel ring along the outer concrete circle, to assist in shifting the direction of the gun. Panama mounts continued to be used at the outset of WWII, although the system was improved during the war and then supplanted. They were located around the perimeter of the continental US, in defenses newly established in Hawaii, Alaska, Puerto Rico, Newfoundland, and elsewhere (Lewis, *Seacoast Fortifications of the United States*, 1970; Conti and Bailey, 1944; Coast Defense Study Group 2020; Giles 2020).

Photo 6.2-7 Greens of Holes 8 and 9 at bottom and top right, respectively; concrete circles with hubs at lower left and center, north of APE, are Panama Mounts (2018 aerial).

Photos 6.1-8 (left) and 6.1-9 (right) Southernmost Panama mount emplacement (Gerry Giles at far left).

6.1.2.2. PUNTA BORINQUEN CLUBHOUSE (BUILDING 1723)

A clubhouse at Punta Borinquen Golf Course is depicted on the 1944 map of Borinquen Field with a footprint similar to the one it has at present, minus additions. Photographs affixed to columns inside the building, which look to date from the 1950s and early 1960s (they show Presidents Eisenhower and Johnson golfing the course), indicate that the central section of the building is early. It has, however, been substantially altered.

The clubhouse is a long, one-story, concrete building with a flat roof. Early images of the building are difficult to reconcile. It appears to have differing numbers of sets of floor-to-ceiling windows at the center of its front (south-facing) elevation, with upper bands of windows towards either end

(**Photos 6.1-10** and **6.1-11**). Major changes to these openings—replacement doors, closed or shuttered bays, added glass block, the extension of a flat-roofed porte cochere from the entry—conceal the original finish of the facade (**Photos 6.1-12** through **6.1-15**). The building's rear elevation has been heavily altered through the replacement of doors and windows and the addition of a semicircular covered patio. Further, service buildings have been extended to the west side and the east side has been extended or its bays have been altered.

Photo 6.1-10, left, looking northeast at clubhouse from the air, c1950s; Photo 6.1-11, right, front of clubhouse, c1950s from the northwest (or northwest if the image has been reversed) (source: Punta Borinquen Golf Club).

Photo 6.1-12, left, looking southeast at clubhouse rear with later windows, doors, and semicircular patio; Photo 6.1-13, right, façade with altered bays, windows, doors, and service buildings to the west.

Photo 6.1-14, left, looking southeast at façade and later porte cochere; Photo 6.1-15, right, looking out of interior of clubhouse through altered front entry and bays.

The story is the same inside. Wall surfaces, flooring, ceilings, glass, doors—all have been hidden or replaced. One early interior photograph affixed to a post depicts stuccoed walls and plain surrounds and finishes (**Photos 6.1-14** above, and **Photos 6.1-19** and **6.1-20**).

Photo 6.1-19, left, view from near patio doors to front entrance;
Photo 6.1-20, right, clubhouse interior, c1950s (source: Punta Borinquen Golf Club).

6.1.3. FULLAN WHERRY HOUSING (NORTHWEST OF GOLF STREET AND BORINQUEN AVENUE)

Fullan Wherry Neighborhood

The Fullana Wherry Housing addressed here is located north of Golf Street, west of Borinquen Avenue, east of Holes 10, 11, and 12 of the former Ramey golf course, and southeast of the Punta Borinquen lighthouse (**Figure 6.1-3**). The lighthouse and its associated two-story keeper's house stand on the edge of, and can only be reached through, the neighborhood. They were built in 1920 but were never part of the Fullana Wherry plan or housing here and stand outside of the project's APE. They are therefore not addressed here. The Fullana Wherry neighborhood is a single contiguous unit, like the golf course, more than half of which is located within the APE. Therefore, the National Register eligibility of the entire neighborhood is addressed here.

History of Wherry Housing

In response to a severe housing shortage that began at the start of the Depression and grew steadily throughout WWII, the US Congress passed Public Law 211 on August 8, 1949 (US 1998:9, 34). Known commonly as the Wherry Housing Act, the law was designed to "correct the abysmal living conditions available to military families during the early years of the Cold War" (US Army 1998:4, 31). Regarding living conditions at Ramey at this time, the staff director of the US Senate Housing subcommittee summarized what two investigators had determined on a 1955 inspection trip to the base: "They said soldiers are living in hovels there—it is disgraceful" (*Charlotte Observer* August 11, 1955). Although this statement might be an exaggeration, as it was made in the context of political infighting over who would receive a contract to build Wherry houses at the base, it supports the reasoning for establishing the Wherry program and indicates military housing at Ramey was at the least inadequate.

Figure 6.1-3 Fullana Wherry Neighborhood

Note: Fullan Wherry neighborhood outlined in red with APE bound in orange; Punta Borinquen lighthouse and keeper's house are at top center.

Prior to the Cold War, the US Department of Defense (DoD) had provided affordable single-family base housing only to higher-ranking officials (US 1998:14). However, following return from overseas deployment or long-term stateside stationing, military personnel desired local accommodations for their growing families. As a collaborative effort between the DoD, the Federal Housing Administration, and private developers, the Wherry Housing Act was designed to address the lack of housing through a particular process. Developers would sign a long-term land lease (generally 50-75 years) with the federal government on or near military bases and would then build affordable base housing to agreed-upon specifications on the leased lands. In addition to initial construction costs, the developer would shoulder the responsibility of renting and maintaining the homes throughout the duration of the lease. Following the lease's end, the developer was to turn the project over to the government. Incentives for developers included discounted utility rates and anticipated occupancy of 95-97 percent. The program was thought most suitable for junior officers and airmen, and average rents hovered around $60 a month plus

utilities. In order to keep the projects affordable, the act called for a "90 percent mortgage at a fixed rate of four percent, and an $8,100 per unit mortgage limit, thus yielding a $9,000 per unit average construction cost" (US Army 1998:31-38). This limitation proved effective until developers identified loopholes in the law that allowed them to "mortgage out"—complete projects for less cost than the approved mortgage—in order to gain a higher profit margin. A law was eventually put into place to stop this practice; however, following its implementation developers quickly lost interest in Wherry projects (Kuranda et al. 2007:82). By 1955 the program had ended, and the new Capehart Housing Act was passed to replace it the same year.

The first project completed under the Wherry Housing Act was a 250-unit development at Maxwell Air Force Base in Montgomery, Alabama in 1950. By August 1951, the Air Force alone had overseen the construction of 9,050 family units with another 17,788 under contract (Kuranda et al. 2007:72). Although units constructed on Air Force bases consistently average 835 square feet in area, no formal construction manual or design guidelines have been discovered within the archival record. It is unclear whether such guidelines were ever formally created to guide Wherry projects (Kuranda et al. 2007:82, 112). Due to this lack of formalized specifications, Wherry housing varies greatly in its overall stylistic appearance and neighborhoods are heavily influenced by regional styles (Kuranda et al. 2007:123), as seen at the former Ramey Air Force Base.

Despite their diverse regional styles, Wherry neighborhoods prove to have some common characteristics, the first being their location: the neighborhoods were generally placed away from administrative and industrial areas of the base in a designed residential area. Neighborhoods were additionally laid out with many common civilian neighborhood design features of the time including "wide curvilinear streets, large front lawns, long blocks, and three-way intersections." The houses were modest in their design and landscape features were considered luxury items in all neighborhoods as the developer was responsible for the care of the grounds in addition to overall house maintenance (Kuranda et al. 2007:125, 129). Most of the houses were site-constructed and their interiors carefully laid out to maximize usable space in such small footprints. Kitchens were compact and usually located at the rear of the house, with a combined living and dining space located to the front. Hallways were limited to maximize usable space. Almost all units had one to three bedrooms and contained only one bathroom. Due to this later detail, in addition to their overall compact nature, most Wherry houses have undergone renovations and expansions over recent decades (Kuranda et al. 2007:136), as is clearly evidenced at the Wherry neighborhood at Ramey.

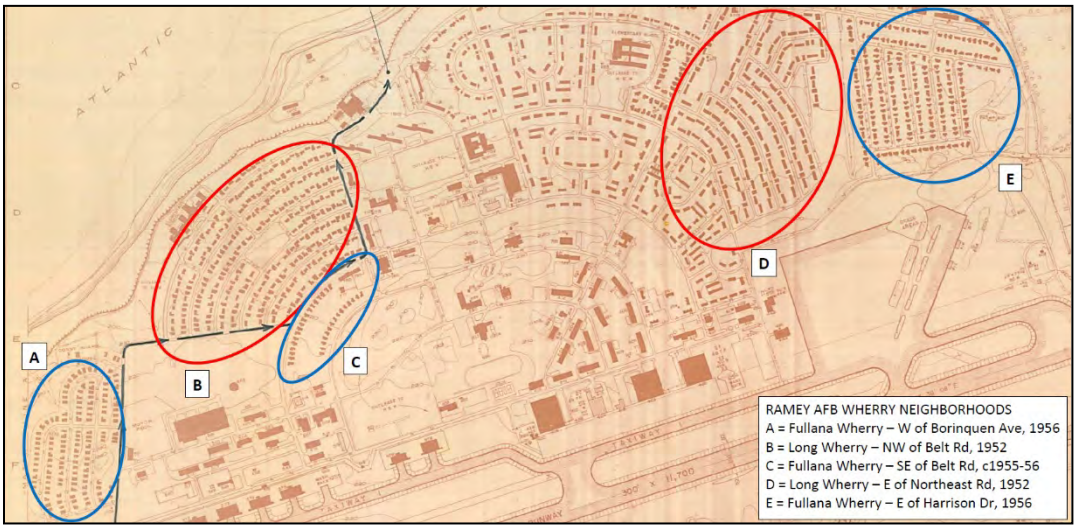
Although the Wherry project had only a limited life, it generated an enormous number of housing units. Funds were appropriated for more than 71,000 units at Air Force, Navy, and Marine bases, of which more than 62,000 were erected. The Air Force accounted for more than 38,000 funded units, all of which were built (Kuranda et al. 2007:D-1).

Wherry Housing at Ramey Air Force Base

Two different construction companies erected Wherry Housing at five different locations within Ramey Air Force Base between 1952 and 1956. In October 1951, the Long Construction

Company of Charleston, South Carolina received a $6,000,000 contract to build 575 Wherry units. The company broke ground on the project in May of the following year and the housing opened in 1953 between January and September. **Figure 6.1-4** depicts the locations of the Fullan Wherry and Fullan Long neighborhoods. One block of Long Wherry housing rose along curved streets northwest of Belt Road (B on Figure 6.1-4); the other, also on curved roads, was built east of Northeast Road (D on Figure 6.1-4). The name of the architect that the Long company engaged is not known. His plans and specifications were used, however, in the next Wherry project at the base (Smith and RAFBHA 2004; *Greenville News* 1955; *Charlotte Observer* 1955). The resemblance of the Long units, in turn, to the Civilian War Housing (discussed below) built in the early 1940s suggests that their architect looked back at earlier plans as well.

Figure 6.1-4 Strategic Air Command "Master Plan" Base 1964 Map



In June 1955, the Air Force approved a $4,000,000 contract for the construction of 420 additional Wherry Housing units for airmen (252 units) and officers (168 units) at the base. The Air Force selected the Fullana Construction Company of San Juan, headed by Francisco Fullana, as the contractor. After the resolution of a Congressional dispute about the nature of the contracting, Fullana began construction (*Oakland Tribune* 1955; *Tampa Tribune* 1955a and 1955b; *Charlotte Observer* 1955; Smith and RAFBHA 2004). Apparently the Fullana firm was already substantial: in 1952, when the Home Builders Association of Puerto Rico was given membership in the US National Association of Home Builders, Francisco Fullana was its president (*Courier-Post* 1952). Further, Fullana had received a contract to build 247 units at Fort Buchanan, San Juan by March 1954. (A successor firm to Fullana Construction—F & R Construction Group, Inc., one of Puerto Rico's largest construction companies—continues to operate in San Juan [F & R Construction Group website]). The company broke ground on the Ramey project in December 1955 and completed it the following year (Smith and RAFBHA 2004; Giles 2019; US Congress 1954:5364). The Fullana Ramey neighborhoods were built west of Borinquen Road, between Belt and Crown roads, and on both sides and east of Harrison Drive (C and E, respectively, on Figure 6.1-4).

In early 1958, the federal government purchased and assumed control of all 995 Wherry Housing units at Ramey, both Long and Fullana. The acquisition cost $10.5 million (US Congress 1958:56-58). From April 1961 through July 1962, the government "completely renovated" the 995 units (Smith and RAFBHA 2004).

Fullana Wherry Neighborhood Architecture

The Fullana Wherry neighborhood west of Borinquen Avenue is a compact development of 137 resources (including both original Wherry houses and a small number of modern infill/commercial development buildings). The neighborhood has four streets, Borinquen Avenue and three that are exclusive to it—Loop Street, Lighthouse Drive, and Park Road. Golf Street runs along its southern edge, but none of its houses have Golf Street addresses and at some point, fences were installed, cutting off access from Golf to the streets.

Houses within the neighborhood display a regionalized design style, as is typical at Wherry neighborhoods (**Photos 6.1-21** through **6.1-28**). The original housing form found within the neighborhood consists of single-story, single-family, concrete homes. These modest residences sit on evenly divided, largely rectangular lots, with a modest setback, featuring a small front yard and driveway. All of the houses appear to have originally featured an L-shaped plan with an attached roofed carport at the front that gave them a rectangular footprint. The carports are found on either the left or right side with no apparent pattern having been set. The residences were originally topped with flat roofs. A single set of paired louvered windows punctuated the building facades and a second set of the same style was typically found on the inside wall of the carport. Original building entrances were housed underneath the carport and unornamented.

Photo 6.1-21, left, Lighthouse Drive north of Loop Street, 1955 (sources: www.facebook.com/photo.php?fbid=10215654143097511&set=pcb.10156368978109313&type=3&theater&ifg=1); Photo 6.1-22, right, Loop Street, late 1960s (source: https://www.facebook.com/photo.php?fbid=10153680825081147&set=g.137328899312&type=1&theater&ifg=1).

Photo 6.1-23 Largely intact houses: 119 Loop Street

Photo 6.1-24, Largely intact houses: 129 Borinquen Avenue

Photo 6.1-25 Largely intact houses: 130 Lighthouse Drive

Photo 6.1-26 Largely intact houses: 125 Loop Street

Photo 6.1-27, left, Largely intact streetscapes: east side of Lighthouse Drive between Golf and Loop Streets; Photo 6.1-28, right, Largely intact streetscapes: east side of Loop Street between Golf Street and Lighthouse Drive.

The neighborhood retains its original residential layout with a few notable exceptions. Borinquen Avenue, a busy thoroughfare, includes a number of new commercial and apartment buildings along its length and where it briefly runs west at the north end of the neighborhood (**Photos 6.1-29** through **6.1-32**). Additionally, a large modern Skate and Splash Park encompasses much of the west side of Borinquen Avenue and the east side of Park Road between Golf and Loop roads. This area, large enough to hold at least a dozen Wherry houses, was not originally developed.

Photo 6.1-29, left, Modern buildings: Aguadilla Skate and Splash Park along Park Road;
Photo 6.1-30, right, Modern buildings: 148 Borinquen Avenue.

Photo 6.1-31, left, Modern buildings: 149 Borinquen Avenue;
Photo 6.1-32, right, Modern buildings: Vistas de Aguamar at 127 Borinquen Avenue (source: Google Earth, 2016).

These modern intrusions are limited, but nonetheless diminish the neighborhood's character. Beyond them, the residences largely retain their original lot sizes, setbacks, and front yards, and the streets remain quiet and meandering, with sidewalks located on only one side, as is typical of most Wherry neighborhoods. More intrusive than the modern buildings, though, are the numerous alterations to the houses (**Photos 6.1-33** through **Photos 6.1-40**). All feature some level of alteration and none are individually distinguished. Just over one-third of the neighborhood's resources appear to retain a high enough degree of integrity of materials, design, and workmanship to merit recommendation as contributing to a potential historic district. The remaining two-thirds appear to have lost their integrity of materials, design, and workmanship. Common alterations found throughout the neighborhood include the addition of walls and fencing at the perimeter of the lots, which disrupts the original street rhythm; substantial additions; enclosure of original carports and additions of others; arcades constructed across and beyond front elevations; reconfiguration of roof lines; the redesign of fenestration patterns, including the replacement of louvered windows; and the use of modern cladding and design motifs on exteriors, breaking with the original uniform, if severe, feel of the neighborhood.

Photo 6.1-33, left, typical alterations: 142 Lighthouse Drive;

Photo 6.1-34, right, typical alterations: 124 Loop Street.

Photo 6.1-35 typical alterations: 133 Loop Street

Photo 6.1-36 typical alterations: 103 Park Road

Photo 6.1-37 typical alterations: 135 Park Road

Photo 6.1-38 typical alterations: 137 Borinquen Avenue

Photo 6.1-39 left, typical altered streetscapes: east side of Lighthouse Drive between Loop Street and Borinquen Avenue;
Photo 6.1-40, right, typical altered streetscapes: west side of Park Road between Loop Street and Borinquen Avenue.

Table 6.1-2 is followed by a map of the neighborhood marked with addresses and individual photographs of each building in the neighborhood (**Photos 6.1-41** through **6.1-175**). It follows each of the neighborhood's four streets in alphabetical order, from south to north. Unless otherwise noted, each house is assigned a 1956 date of construction. Basic descriptions and alterations are given for each building. In order to best address the integrity of the neighborhood, all buildings were photographed and described. The fifth column identifies whether a building is within the APE or not. The final column contains a recommendation of whether or not a building would contribute to a potential historic district. NC identifies the recommendation as noncontributing; C identifies it as contributing.

1 **Table 6.1-2 Fullan Wherry Neighborhood Addresses**

Address	Date	Original Appearance	Alterations	In APE?	C/NC
101 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Multiple additions to footprint; replacement windows; alterations to roofline; addition of wall/fence to property	Yes	NC
103 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Addition of fence to property; appears to retain original footprint and some window openings/louvers	Yes	C
105 Borinquen	c2008	New construction; 2-story, concrete building with multiple bays; possible apartments	On site of demolished original house	Yes	NC
Between 105 & 123 Borinquen	c2007	Aguadilla Skate and Splash Park: new construction; 2-story, multi-bay commercial building with parking lot; concrete water and skateboarding pools	On site of demolished original house(s)	No	NC
123 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Enclosure of carport; replacement windows and doors; new entry; conversion into commercial building	Yes	NC
125 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains original footprint; façade retains some original openings and louvers; later-added windows; addition of fence to property	Yes	C
127 Borinquen	2013	Vistas de Aguamar: new apartment construction; 2-story, concrete building with multiple bays	On site of demolished original house	Yes	NC
129 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows; small additions to footprint; addition of concrete fence to property	Yes	C
131 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows; small additions to footprint; addition of fence to property	Yes	C
133 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows; alteration to roofline (addition of parapet); re-stuccoed exterior; partial enclosure of carport; addition of concrete wall	Yes	NC
135 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows; addition to footprint; addition of fence to property	No	NC

137 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows; addition to footprint; addition of garage w/steep shed roof; addition of fence at front of property	No	NC
139 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Large alterations to footprint; alteration of window placements; alteration to roofline; building now has Spanish Colonial Revival details	No	NC
141 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Large alterations to footprint; alteration of window placements; parapet added to roofline; addition of fence	No	NC
143 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Large alterations to footprint; alteration of windows and bays; parapet added to roofline; fence added	No	NC
147 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Enclosure of carport; replacement windows and doors; alterations to footprint; parapet added to roofline	No	NC
148 Borinquen	2014	Large, stuccoed, concrete, 2-story house with hipped pantile roofs	On site of demolished original house (or completely transformed original house survives within)	No	NC
149 Borinquen	2016	Tropical Borinquen Apartments: new apartment construction; 2-and 3-story concrete building with multiple bays and stepped-back elevation at north	On site of demolished original house	No	NC
150 Borinquen	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Large alterations to footprint including new construction of 2nd-story at rear; separate 2-car addition; replacement windows; reconfiguration of window and door openings	No	NC
152 Borinquen	2000s	New construction; 2-story concrete residence with multiple bays; fence added to property	Demolition of original house	No	NC
101 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfigured window and door openings; alteration to roofline	Yes	NC
102 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Addition of tilted row of red pantiles atop roof; alteration to window	Yes	NC

			openings; alterations to footprint; fence/wall added to property		
103 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfiguration of window and door openings; peaked gables alter roofline	Yes	NC
104 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfiguration of window and door openings; tall parapet added to roofline	Yes	NC
105 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Addition of secondary carport; addition of concrete wall/fence to property; replacement windows	Yes	NC
106 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Minor alteration to footprint; replacement windows	Yes	C
107 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfiguration of window and door openings	Yes	C
108 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Minor alteration to footprint; replacement windows; addition of concrete fence to property	Yes	C
109 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfigured window and door openings; addition of concrete fence to property	Yes	C
110 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; addition of concrete fence; retains footprint	Yes	C
111 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfigured window and door openings; addition of concrete wall/fence; shed roof and parapet added at roof	Yes	NC
112 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; addition of concrete fence/wall; retains footprint	Yes	C
113 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; reconfigured window and door openings; columned porch extended across front and side; addition of concrete wall/fence added	Yes	NC

114 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations raise roofline on angle; alteration to window openings and footprint; fence added	Yes	NC
115 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; addition of concrete wall/fence	Yes	C
116 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alteration to roofline and adding of columns; alteration to window openings and footprint; concrete fence/wall added at front	Yes	NC
117 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; addition to building footprint; pantiles tilted across roofline	Yes	NC
118 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Pantiles tilted across roofline; alteration to window openings; significant alterations to footprint	Yes	NC
119 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alteration to window openings; replacement windows/doors; enclosure of carport; footprint extended	Yes	NC
120 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; second carport added to side	Yes	NC
121 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; large arches added across front; replacement windows; addition of fence	Yes	NC
122 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alteration to roofline and added columns; alteration to window openings; alterations to footprint through carport additions	Yes	NC
123 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement windows and doors and altered roofline; addition of fence to property	No	NC
124 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers and footprint; minimally altered	Yes	C
125 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; alteration to	No	NC

			roofline; addition of fence to property		
126 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Altered roofline; alteration to window openings; extension to footprint; addition of fence	Yes	NC
127 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; alteration to roofline	No	NC
128 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; addition of concrete fence/wall; retains footprint	Yes	C
129 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; added side arch; replacement windows and doors; pantile now angles over roofline; addition of fence	No	NC
130 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers and footprint; addition of concrete wall; little altered	No	C
131 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers, fenestration pattern, and footprint; little altered	No	C
132 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint through addition; replacement windows and doors; alteration to roofline; portico added at porch	No	NC
133 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; alteration to roofline; entry portico added; later concrete wall/fence	No	NC
134 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; roofline altered with shed extension and pantiles; concrete wall/fence added	No	NC
135 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Building is significantly overgrown, but appears to be retain footprint, carport, and at least some louvers	No	C
136 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Arched opening added to side; some replacement windows and doors; fence added across front	No	C

137 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Extension of house to front notably alters footprint; replacement windows and doors; gabled rooflines added	No	NC
138 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; retains some louvers; second-story addition	No	NC
139 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Significant alterations to footprint; replacement windows and doors; alterations to roofline by addition of deck and upper story; fence added	No	NC
140 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Some louvers remain; some replacement windows and doors; largely intact	No	C
141 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Significant alterations to footprint through adding of second story and replacement of windows and doors; fence added	No	NC
142 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Significant alterations to house through addition of second story and deck supported by extended columns	No	NC
143 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers, fenestration pattern, and footprint; added concrete wall/fence; largely intact	No	C
144 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Significant alterations to building footprint; readily apparent replacement windows and doors and enclosure of carport; fence added	No	NC
145 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers and building footprint; partial enclosure of carport	No	C
147 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement windows and doors; pantiles added to roof; wall surfaces altered	No	NC
149 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; carport extension; prominent replacement windows and doors; built-up roofline	No	NC

151 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Replacement of louvers with louvered windows; retains footprint; little altered	No	C
153 Lighthouse	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers and building footprint; little altered	No	C
102 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement doors and windows, including bay window; garage added; built-up roofline	Yes	NC
104 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; notable replacement of windows and doors; added garage doors and tiled wall surfaces; central built-up roof and partial second story added; fence added	Yes	NC
106 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint include two-bay carport extended forward; replacement windows and doors; built-up roofline; fence added	Yes	NC
108 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; carport enclosed; replacement windows and doors; roofline extended up	Yes	NC
110 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers and building footprint; addition of fence; little altered	Yes	C
111 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; retains some louvers; changes to windows and doors include much-altered entry; second story addition	Yes	NC
112 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Addition to footprint, most notable at walling-in of part of carport; retention of openings, but replaced windows and doors	Yes	NC
113 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of footprint; replacement windows and doors; addition of fence; largely intact	No	C
114 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers; some altered windows and doors; intact footprint	Yes	C

115 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Addition to building footprint through extension; replacement windows and doors; roofline altered by extension and addition of shed	No	NC
116 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of some louvers, footprint, and carport; limited changes to doors	Yes	C
117 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Built-up roofline and extended parapet; replacement windows and doors; major changes to wall surfaces	No	NC
118 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint by doubling of carport and addition of garage doors; deep porch extended across front; replaced windows and doors	Yes	NC
119 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers; some window bays expanded	No	C
120 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers; some window bays expanded	Yes	C
121 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers; conspicuous alteration to principal front window	No	C
122 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Gable and shed roofs added; portico placed across much-altered entry; carport enclosed as garage; windows and doors changed	Yes	NC
123 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retention of footprint, louvers, and carport	No	C
124 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint; extended new carport and enclosure of original; window bays greatly expanded; portico added; heavily built-up roof	Yes	NC
125 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers; little altered	No	C

126 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint through side extension; replaced windows and doors and widened bays; parapets added at roofline	No	NC
127 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint, including partial enclosure of carport as porch; replacement windows and doors; pantiles alter roofline and tiles some wall surfaces	No	NC
128 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Footprint appears intact, but roofline and window and door surrounds altered; replaced windows and doors	No	NC
129 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Much altered through enclosure of carport, extension and building-up of roof, expansion of bays, addition of portico, and tiling or other panelling of some wall surfaces	No	NC
130 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers	No	C
131 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint; replacement windows and doors; built-up roofline	No	NC
133 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Shed-roof and built-up extensions to roof; second-story added; carport gated; window openings altered; entry replaced and portico added to front	No	NC
135 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Porch with wide flat piers, four arches, and tilted pantile roof added to front encompasses original and added carport; concrete wall/fence built at front of lot	No	NC
137 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Heavily built-up roof line, carport enclosed as garage; bays and doors altered	No	NC
139 Loop	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Carport enclosed as garage; roof built-up and deck added; bays altered; entry changed and shaded	No	NC

			by modern portico; projecting bays added		
Loop between 130 Loop and 131 Lighthouse	c1970s	Concrete utility building	Appears intact	No	NC
101 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Retains footprint, carport, openings, and some louvers	Yes	C
102 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, openings, and some louvers; little altered	Yes	C
103 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Additions of arcades, porch with barley-sugar columns and caryatids, turned-post balustrade, red pantiles, multiple carports, expanded bays, and concrete wall/fence	Yes	NC
104 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, openings, and some louvers; little altered	Yes	C
105 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Enclosure of carport as garage; extended flat-roofed arcades at either side; flat-roofed portico added across altered entry; built-up roof edges and added upper deck and partial second story; concrete wall/fence added across front of lot	Yes	NC
106 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, openings, and some louvers; built-up roof line	Yes	C
107 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	Yes	C
108 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	Yes	C
109 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Arcaded porch extended across front of carport, entry, and south side of house edged by red pantiles; at altered entry includes turned-post balustrade	Yes	NC

111 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Deep arcaded porch with overhanging roof extended across front and south side elevations; carport, bays, and entry altered	Yes	NC
113 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Original house almost entirely engulfed by addition of second story, Corinthian-columned porches at front and south sides, altered openings, and wide overhanging roof	Yes	NC
115 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint; replacement windows and doors; alteration to roofline through build-up of parapet	Yes	NC
117 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; carport fenced in	Yes	C
119 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Arcade with red pantiled roof extended across front and to south side; entry altered and shaded by added porch with balustrade	Yes	NC
121 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Much altered by shed roof with brick-tiled front, and pantile edge added across carport and tile-framed altered adjacent bay; modern entry with pantile roof supported by large columns; concrete wall/fence added	Yes	NC
123 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Roofline extended up; carport altered; bays and windows enlarged; concrete wall/fence added	Yes	NC
124 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; concrete wall/fence added	Yes	NC
125 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Roofline extended up; carport altered; bays and windows enlarged	Yes	NC
126 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; concrete wall/fence added; modern	Yes	C

			tile across front elevation, but still fairly intact		
127 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint; replacement windows and doors	No	NC
128 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to building footprint; replacement windows and doors; heavily built-up parapet roof	Yes	NC
129 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	No	C
130 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	No	C
131 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	No	C
132 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	No	C
133 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Much altered roofline with parapets, shed roofs, and conical pantiled tower; tile-walled bay to side expands footprint; portico added in front of entry; altered bays	No	NC
134 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; carport fenced in	No	C
135 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Altered roofline with parapets and shed roofs; columned portico across altered entry; altered bays; tile added to much of front elevation; carport enclosed as garage; concrete wall/fence across front of lot	No	NC
136 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; fence across front of lot	No	C

137 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Built-up parapet and shed roofline; room added to once-open side of carport; some bays intact; concrete wall/fence across front of lot	No	NC
138 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays; concrete wall/fence across front of lot	No	C
139 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Front bay blocked over; carport and adjacent bay fenced in; footprint altered	No	NC
140 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Seven-bay arcade with swooping roof that encompasses carport added across front; arcaded windows added behind; prominent concrete wall/fence edges front of lot	No	NC
141 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Intact footprint, carport, and some openings and louvered bays	No	C
142 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Alterations to footprint; replacement doors and windows	No	NC
143 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Carport enclosed by vertical-board-like, blank concrete wall, altering footprint; bays altered	No	NC
144 Park	1956	1-story, single-family residence w/ L-shaped living space and attached carport; stuccoed concrete walls and flat roof; louvered windows	Built-up projecting roof dominates house; carport and adjacent bay enclosed by ornate gates; altered bays; prominent concrete wall added	No	NC

1 Note: NC = Noncontributing to potential historic district; C = Contributing to potential historic district.

Figure 6.1-5 Fullan Wherry Neighborhood Addresses

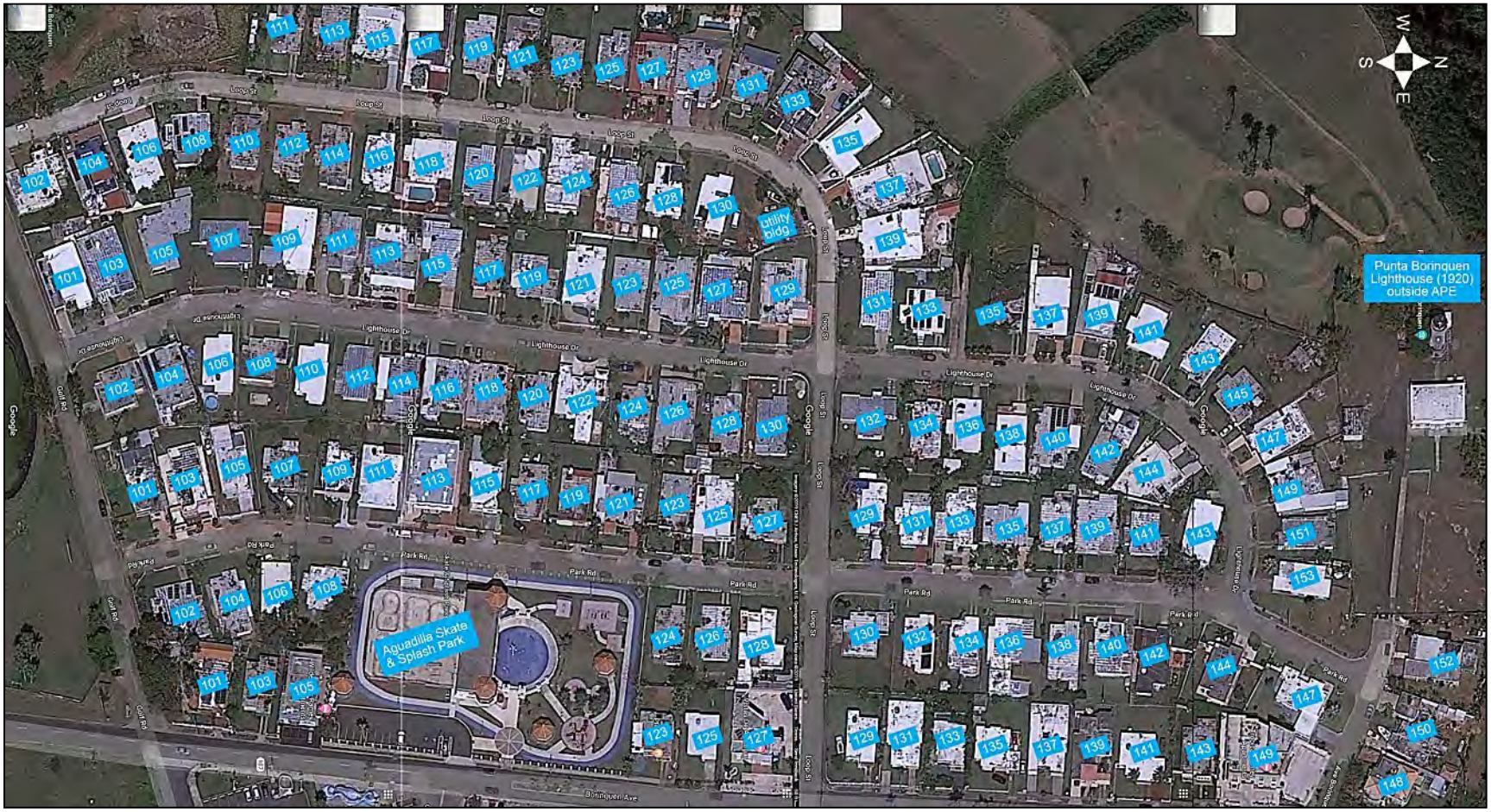


Photo 6.1-41 101 Borinquen Avenue

Photo 6.1-42 103 Borinquen Avenue

Photo 6.1-43 105 Borinquen Avenue

Photo 6.1-44 Aguadilla Splash and Skate Park between 105 and 123 Borinquen Avenue

Photo 6.1-45 123 Borinquen Avenue

Photo 6.1-46 125 Borinquen Avenue

1 Photo 6.1-47 Vistas de Aguamar, 127 Borinquen Avenue

Photo 6.1-48 129 Borinquen Avenue

2 Photo 6.1-49 131 Borinquen Avenue

Photo 6.1-50 133 Borinquen Avenue

3 Photo 6.1-51 135 Borinquen Avenue

Photo 6.1-52 137 Borinquen Avenue

1 Photo 6.1-53 139 Borinquen Avenue

Photo 6.1-54 141 Borinquen Avenue

2 Photo 6.1-55 143 Borinquen Avenue

Photo 6.1-56 147 Borinquen Avenue

3 Photo 6.1-57 148 Borinquen Avenue

Photo 6.1-58 149 Borinquen Avenue

1 Photo 6.1-59 150 Borinquen Avenue

Photo 6.1-60 151 Borinquen Avenue

2 Photo 6.1-61 101 Lighthouse Drive

Photo 6.1-62 102 Lighthouse Drive

3 Photo 6.1-63 103 Lighthouse Drive

Photo 6.1-64 104 Lighthouse Drive

1 Photo 6.1-65 105 Lighthouse Drive

Photo 6.1-66 106 Lighthouse Drive

2 Photo 6.1-67 107 Lighthouse Drive

Photo 6.1-68 109 Lighthouse Drive

3 Photo 6.1-69 109 Lighthouse Drive

Photo 6.1-70 110 Lighthouse Drive

1 Photo 6.1-71 111 Lighthouse Drive

Photo 6.1-72 112 Lighthouse Drive

2 Photo 6.1-73 113 Lighthouse Drive

Photo 6.1-74 114 Lighthouse Drive

3 Photo 6.1-75 115 Lighthouse Drive

Photo 6.1-76 116 Lighthouse Drive

1 Photo 6.1-77 117 Lighthouse Drive

Photo 6.1-78 118 Lighthouse Drive

2 Photo 6.1-79 119 Lighthouse Drive

Photo 6.1-80 120 Lighthouse Drive

3 Photo 6.1-81 121 Lighthouse Drive

Photo 6.1-82 122 Lighthouse Drive

1 Photo 6.1-83 123 Lighthouse Drive

Photo 6.1-84 124 Lighthouse Drive

2 Photo 6.1-85 125 Lighthouse Drive

Photo 6.1-86 126 Lighthouse Drive

3 Photo 6.1-87 127 Lighthouse Drive

Photo 6.1-88 128 Lighthouse Drive

1 Photo 6.1-89 129 Lighthouse Drive

Photo 6.1-90 130 Lighthouse Drive

2 Photo 6.1-91 131 Lighthouse Drive

Photo 6.1-92 132 Lighthouse Drive

3 Photo 6.1-93 133 Lighthouse Drive

Photo 6.1-94 134 Lighthouse Drive

1 Photo 6.1-95 135 Lighthouse Drive

Photo 6.1-96 136 Lighthouse Drive

2 Photo 6.1-97 137 Lighthouse Drive

Photo 6.1-98 138 Lighthouse Drive

3 Photo 6.1-99 139 Lighthouse Drive

Photo 6.1-100 140 Lighthouse Drive

1 Photo 6.1-101 141 Lighthouse Drive

Photo 6.1-102 142 Lighthouse Drive

2 Photo 6.1-103 143 Lighthouse Drive

Photo 6.1-104 144 Lighthouse Drive

3 Photo 6.1-105 145 Lighthouse Drive

Photo 6.1-106 146 Lighthouse Drive

Photo 6.1-107 149 Lighthouse Drive

Photo 6.1-108 151 Lighthouse Drive

Photo 6.1-109 153 Lighthouse Drive

Photo 6.1-110 102 Loop Street

Photo 6.1-111 104 Loop Street

1 Photo 6.1-112 106 Loop Street

Photo 6.1-113 108 Loop Street

2 Photo 6.1-114 110 Loop Street

Photo 6.1-115 111 Loop Street

3

4 Photo 6.1-116 112 Loop Street

Photo 6.1-117 113 Loop Street

1 Photo 6.1-118 114 Loop Street

Photo 6.1-119 115 Loop Street

2 Photo 6.1-120 116 Loop Street

Photo 6.1-121 117 Loop Street

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4 Photo 6.1-122 118 Loop Street

Photo 6.1-123 119 Loop Street

1 Photo 6.1-124 120 Loop Street

Photo 6.1-125 121 Loop Street

2 Photo 6.1-126 122 Loop Street

Photo 6.1-127 123 Loop Street

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4 Photo 6.1-128 124 Loop Street

Photo 6.1-129 125 Loop Street

Photo 6.1-130 126 Loop Street

Photo 6.1-131 127 Loop Street

Photo 6.1-132 128 Loop Street

Photo 6.1-133 129 Loop Street

Photo 6.1-134 130 Loop Street

Photo 6.1-135 131 Loop Street

Photo 6.1-136 133 Loop Street

Photo 6.1-137 135 Loop Street

Photo 6.1-138 137 Loop Street

Photo 6.1-139 139 Loop Street

Photo 6.1-140 Utility building on lot between 130 Loop Street and 131 Lighthouse Drive

1 Photo 6.1-141 101 Park Road

Photo 6.1-142 102 Park Road

2 Photo 6.1-143 103 Park Road

Photo 6.1-144 104 Park Road

3 Photo 6.1-145 105 Park Road

Photo 6.1-146 106 Park Road

1 Photo 6.1-147 107 Park Road

Photo 6.1-148 108 Park Road

2 Photo 6.1-149 109 Park Road

Photo 6.1-150 111 Park Road

3 Photo 6.1-151 113 Park Road

Photo 6.1-152 115 Park Road

1 Photo 6.1-153 117 Park Road

Photo 6.1-154 119 Park Road

2 Photo 6.1-155 121 Park Road

Photo 6.1-156 123 Park Road

3 Photo 6.1-157 126 Park Road

Photo 6.1-158 127 Park Road

1 Photo 6.1-159 128 Park Road

Photo 6.1-160 129 Park Road

2 Photo 6.1-161 130 Park Road

Photo 6.1-162 131 Park Road

3 Photo 6.1-163 132 Park Road

Photo 6.1-164 133 Park Road

1 3.1Photo 6.1-165 134 Park Road

Photo 6.1-166 135 Park Road

2 Photo 6.1-167 136 Park Road

Photo 6.1-168 137 Park Road

3 Photo 6.1-169 138 Park Road

Photo 6.1-170 139 Park Road

1 Photo 6.1-171 140 Park Road

Photo 6.1-172 141 Park Road

2 Photo 6.1-173 142 Park Road

Photo 6.1-174 143 Park Road

3 Photo 6.1-175 144 Park Road

National Register Eligibility Assessment

Goodwin & Associates (Kuranda et al. 2007) historic context of Wherry and Capehart-era housing provides a detailed history of Wherry housing and suggestions about how to assess the National Register eligibility of such resources. The context for the many thousands of individual Wherry houses, and many scores of Wherry neighborhoods, is largely the same, so the report emphasizes the high degree of integrity required to support significance (Kuranda et al. 2007:152):

> The ability of a historic resource to convey its significance lies in its integrity. When constructed, the buildings and neighborhoods reflected their era of construction through such character-defining features as windows and doors, exterior materials, roof form and sheathing, landscaping, and amenities including carports or garages. Many Wherry and Capehart neighborhoods have experienced considerable change since constructed in the 1950s and 1960s. Renovations undertaken as part of the Wherry acquisition program of the Capehart era, modernization of kitchens and baths, upgrades in finishes to reflect personal expectations of the occupants, energy efficiency programs, privatization, and demolition affect the individual and collective integrity of Wherry and Capehart housing and neighborhoods.

The Fullana Wherry neighborhood has experienced many alterations, including landscape changed by walls and fences, addition of rooms and occasional upper stories, numerous and varied alterations of bays, loss of original louvers and doors, enclosure or addition of carports, various alterations to rooflines, construction of arcades and porches, modern resurfacing of facades, and even the addition of some modern buildings on vacant lots or the sites of original houses. The neighborhood retains its location, but is believed to lack sufficient integrity of design, setting, materials, workmanship, feeling, and association to support National Register listing under any of the Register's Criteria. None of its houses are believed to have the combination of integrity and significance to merit individual eligibility.

Among the close to 1,000 surviving Wherry houses at the former Ramey base, the neighborhood and its individual houses do not stand out in particular. The other two Fullana Wherry and Long Wherry neighborhoods and individual houses were briefly viewed as part of this assessment. They have lost few buildings, but also exhibit many changes. One other group of Fullana Wherry houses, on the northwest side of Crown Road between Fourth Street and Arch Road

(neighborhood B on **Figure 6.1-3**), appears to include a large number of fairly intact houses (**Photos 6.1-176** through **6.1-179**).

Photo 6.1-176, left, and Photo 6.1-177, right: Individual houses within a Fullana Wherry neighborhood on Crown Road between Fourth Street and Arch Road.

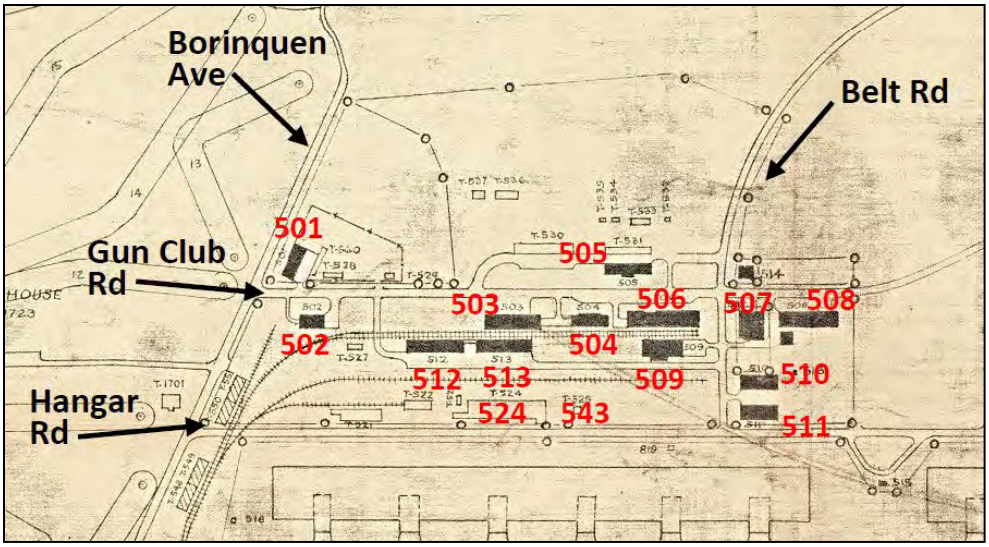
Photo 6.1-178, left, and Photo 6.1-179, right: Groups of houses within a Fullana Wherry neighborhood on Crown Road between Fourth Street and Arch Road.

In sum, within both their national and local context, the neighborhood off of Borinquen assessed here, and its individual intact houses, does not appear to be notably intact or significant, and neither it nor any of its houses are recommended as National Register-eligible.

6.1.4. MOTOR POOL AND SUPPLY BUILDINGS (NE OF BORINQUEN AVENUE AND HANGAR ROAD)

This group of maintenance, supply, and support buildings clustered together at the northern edge of the APE is identified on the 1944 base map as the motor pool and supply area. It was built in the early 1940s along with Borinquen Field to hold the buildings its functions describe. The group of buildings are set along Borinquen Avenue and Gun Club, Hangar, and Belt roads (**Figure 6.1-6**). Note: the potential for these buildings to be part of a historic is addressed separately below.

Figure 6.1-6 1944 "Reservation Layout" Map, annotated



6.1.4.1. BUILDING 501 (MOTOR TRANSPORTATION AND REPAIR)

Building 501, built in the early 1940s, is identified as a motor transportation and repair building on the 1944 base map. The 1964 and 1968 maps associated it with a fenced-in motor pool to its north and east. It apparently functioned as a military vehicle repair shop from its construction in the early 1940s until its transfer from military hands in the early 1970s. Following its sale, it was divided into commercial space. Its six garage bays were enclosed and reconfigured into small shops that sold clothing, coffee, food, and the like. In December 2020, its storefronts were in disrepair and all of its shops were vacant. Located on busy Borinquen Avenue, it has modern buildings to its north and south and, west across Borinquen, it looks at a modern waterpark.

The building retains its one-story, flat-roofed, concrete, rectangular form and the five plain pilasters, front and rear, that helped divide it into six garage bays (**Photos 6.1-180** through **6.1-182**). The pilasters and concrete walls lend the building a barely apparent Spanish Colonial Revival-style appearance. The same pilaster treatment is found at other functional early-1940s buildings at the former air field and other contemporary military installations in Puerto Rico (Berger 1990:5). It has been heavily altered through the enclosing of its front (west-facing) garage bays with a variety of walls, windows, and doors. Building 501 stands at its original location, but due to its many physical changes and changes to its surroundings, it otherwise appears to have lost its integrity of design, setting, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 501 (Motor Transportation and Repair): Photo 6.1-180, left, north side and west front elevations; Photo 6.1-181, right, west front and south side elevations.

Photo 6.1-182 Building 501 (Motor Transportation and Repair): east near and north side elevations.

6.1.4.2. BUILDING 502 (ORDNANCE REPAIR SHOP)

The 1944 base map identifies this early-1940s building as the ordnance repair shop. By 1966 it provided ground power to the base. After leaving military hands it held a water works shop (RAFB 1966; RAFBHA 1970 and 1999). It stands with other WWII-era military buildings on Gun Club Road, but Borinquen Avenue to its west has been largely modernized.

The building is construction of concrete and topped by flat roofs extended by overhanging eaves. These elements lend it a minimal Spanish Colonial Revival-style (**Photos 6.1-183** through **6.1-186**). At its center it rises to two stories or a double-height single story that functions as a clerestory. One-story-tall blocks cross its front and rear elevations. It is now vacant, with door and some window bays closely sealed. Many of its multi-light, metal casement windows have broken panes; some are tilted open exposing the interior to the elements.

Building 502 stands at its original location and retains much of its setting, but due to its many physical alterations and changes to its surroundings, it appears to have lost some of its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere

during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 502 (Ordnance Repair Shop): Photo 6.1-183, left, west side and north front elevations; Photo 6.1-184, right, north front elevation (source: Google Earth, dated May 2016).


Building 502 (Ordnance Repair Shop): Photo 6.1-185, left, west side and north front elevations; Photo 6.1-186, right, east side elevation.

6.1.4.3. BUILDING 503 (QUARTERMASTER WAREHOUSE)

The 1944 base map labels this early-1940s building as a quartermaster warehouse. It later served as the Base Equipment Management Office or BEMO. For at least two decades, it has provided Head Start services to the community (RAFB 1966; RAFBHA 1970 and 1999). It stands with other WWII-era military buildings on Gun Club Road.

Similar to Building 501 and others, it retains its one-story, flat-roofed, concrete, rectangular form punctuated, front and rear, by plain, evenly spaced pilasters (**Photos 6.187** through **6.1-190**). It also retains some louvers beneath its eaves that would have improved airflow over its stored goods. Its window bays and entries have been altered through the addition of glass blocks infill and modern doors.

Building 503 stands at its original location and retains much of its setting largely intact. It has few notable alterations and therefore appears to retain its integrity of design, materials, workmanship, feeling, and association. However, it has no known associational significance and is unlikely to yield important historic information. It is also not believed to be historically or architecturally

significant. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 503 (Quartermaster Warehouse): Photo 6.1-187, left, east side and north front elevation; Photo 6.1-188, right, north front and west side elevations.


Building 503 (Quartermaster Warehouse): Photo 6.1-189, left, west side and south rear elevations; Photo 6.1-190, right, south rear and east elevations.

6.1.4.4. BUILDING 504 (BAKERY)

The number of personnel at Ramey Field is suggested by the size of early-1940s Building 504, which was the base bakery according to the 1944 map. It was still a bakery in 1966, but by 1983 the Puerto Rican National Guard was using it for storage. It has since become the Guard's armory (Greenleaf/Telesca 1983:4-74; RAFB 1966). It stands with other WWII-era military buildings on Gun Club Road.

The building retains its basic two-story, flat-roofed, concrete, rectangular form (**Photos 6.1-191** through **6.1-194**). It has been heavily altered, though, by changes to its windows and entries, enclosure of a porte cochere, and the modern addition of crenellations.

Building 504 stands at its original location and retains much of its setting, but due to its many physical changes and changes to its surroundings, it appears to have otherwise lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity

to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 504 (Bakery): Photo 6.1-191, left, east side and north front elevations; Photo 6.1-192, right, east and north elevations with original open porte cochere, 1972-1973 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/).

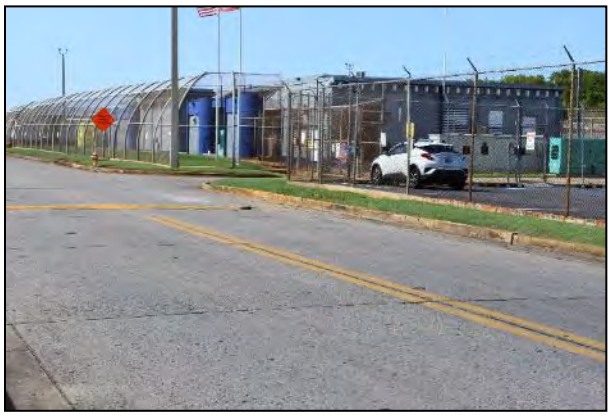
Building 504 (Bakery): Photo 6.1-193, left, north front and west side elevations: Photo 6.1-194, right, west side and south rear elevations.

6.1.4.5. BUILDING 505 (UTILITY SHOP)

Building 505, built in the early 1940s, is identified as a utility shop on the 1944 map. By 1966 it served as the civil engineering office. In 1983 it was in the hands of the Puerto Rican National Guard, but by about 1999 it housed the Immigration and Natural Service (INS). The USCustoms and Border Patrol, successor to the INS, now occupies it. (RAFB 1966; Greenleaf/Telesca 1983:4-74). Its remains on Gun Club Road with other contemporary buildings but is framed by additions and resources later built on its site.

Comparisons of footprint on early maps and aerial views suggest that the concrete core of the one-story, flat-roofed building remains in place (**Photos 6.1-195** through **6.1-196**). Its original appearance is largely obscured, however, by additions, the enclosure of bays, and heavy security fencing.

The building stands at its original location and retains some of its setting. Due to its many physical changes, it appears to have otherwise lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria. The same conclusion was reached in a previous inventory of the building (Berger 1990:5).



Building 505 (Utility Shop): Photo 6.1-195, left, south front and east side elevations; Photo 6.1-196, right, aerial view depicting same elevations (source: Google Earth dated May 2016).

6.1.4.6. BUILDING 506 (COMMISSARY AND QUARTERMASTER WAREHOUSE)

Building 506 was built in the early 1940s, according to the 1944 map, as a commissary and quartermaster warehouse. By 1966, nearing the end of its military life, it served solely as a commissary. By 1983 it was the headquarters of the 20th battalion of the Puerto Rican National Guard. In ca. 1999 it remained in Guard hands. It is currently vacant (RAFB 1966; RAFBHA 1970 and 1999; Greenleaf/Telesca 1983:4-74). Near it on Gun Club Road, many contemporary buildings still stand.

This flat-roofed, concrete-block building is larger than most of its neighbors (**Photos 6.1-197** through **6.1-201**). Its two-story core is extended at its north front, west side and, particularly, east side elevation. Its expression of the Spanish Colonial Revival-style is less minimal than its surrounding contemporaries. It includes a projecting unadorned frieze beneath the eaves of both its one- and two-story sections, along with a projecting course at its foundation. Additionally, its front (north-facing) elevation is crossed by a porch supported by unarticulated square columns and pilasters. It retains many of its early or original, steel casement windows intact.

Building 506 stands at its original location and retains much of its setting. It is largely intact with few notable alterations and therefore appears to retain its integrity of design, materials, workmanship, feeling, and association. However, it has no known associational significance and is unlikely to yield important historic information. It is also not believed to be historically or architecturally significant. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is

therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 506 (commissary): Photo 6.1-197, left, north front and west side elevations; Photo 6.1-198, right, north front elevation.

Photo 6.1-199, Building 506 (Commissary): south rear and east side elevations.

Building 506 (Commissary): Photos 6.1-200-201, north front elevation, 1972-1973 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/).

6.1.4.7. BUILDING 507 (POWER PLANT)

Built in the early 1940s, Building 507 was a power plant for the base into the 1970s. By about 1999 it was vacant and remains so at present (RAFB 1966; RAFBHA 1970 and 1999). Near it stand other WWII-era base buildings.

The former power plant appears to be a tall, one-story, flat-roofed, concrete rectangle (**Photos 6.1-202** through **6.1-205**). It is so heavily overgrown that it is not possible to view most of it. It appears to be plainly finished with a beltcourse beneath narrow windows tucked below its overhanging roof. Some bays are filled in, empty, or have had their windows altered.

Building 507 is at its original location and retains much of its setting. Due to changes to its bays, it appears to have lost some of its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 507 (Power Plant): Photo 6.1-202, left, north front elevation; Photo 6.1-203, right, north front and west side elevations (source: Google Earth, dated May 2016).


Building 507 (Power Plant): Photo 6.1-204, left, west side and south rear elevations; Photo 6.1-205, right, south rear and east side elevations (source: Google Earth, dated May 2016).

6.1.4.8. BUILDING 508 (LAUNDRY)

Building 508 was built in the early 1940s, according to the 1944 map, as a laundry, a function it still maintained around 1970 near the end of its military life. By c1999 it was abandoned and remains vacant to the present (RAFB 1966; RAFBHA 1970 and 1999). It stands with other contemporary WWII-era buildings.

The concrete, one-story laundry building was always plainly finished, with flat wall surfaces, long casement windows mostly underpinned by louvered openings, and a flat roof (**Photos 6.1-206** through **6.1-209**). A minimal Spanish Colonial Revival-style appearance is lent to the building by a narrow beltcourse above its foundation and a front (north-facing) portico supported by plain square columns.

Building 508 is at its original location and retains much of its setting. It is largely intact with few notable alterations and therefore appears to retain its integrity of design, materials, workmanship, feeling, and association. However, it has no known associational significance and is unlikely to yield important historic information. It is also not believed to be historically or architecturally significant. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 508 (Laundry): Photo 6.1-206, left, east side and north front elevations; Photo 6.1-207, right, south rear elevation.

6.1.4.9. BUILDING 509 (COLD STORAGE PLANT)

Building 509, built as a cold storage plant, was standing by 1944. By 1966 it had the same or similar function, although it was called the ice plant. The US Navy had leased it to the National Guard by 1983 and it remained in the Guard's hands in c1999. It now appears to be vacant (RAFB 1966; RAFBHA 1970 and 1999; Greenleaf/Telesca 1983:4-74). Near it on Gun Club Road, many contemporary buildings still stand.

The former cold storage building is a one-story, plainly finished, concrete rectangle crowned by a flat roof edged by parapet walls (**Photos 6.1-208** through **6.1-210**). Its entry and window bays have largely been covered over and sealed shut.

The building stands at its original location and retains some of its setting. Due to its physical changes, it otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout

the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 509 (Cold Storage Plant): Photo 6.1-208, left, north front and east side elevations; Photo 6.1-209, right, east side and south rear elevations (source: Google Earth, dated May 2016).

Photo 6.1-210, Building 509 (Cold Storage Plant): northeast corner of building at far left with rear of Building 508 in front.

6.1.4.10. BUILDING 510 (AIR CORPS GARAGE)

Built in the early 1940s, Building 510 is labeled on the 1944 map as an Air Corps garage. By the late 1990s the US Army Reserve occupied it. It now part of the National Guard armory (RAFB 1966; RAFBHA 1970 and 1999).

The former garage has flush-surfaced concrete walls and a flat roof with overhanging eaves (**Photos 6.1-211** through **6.1-212**). One-story tall, it has regularly spaced, plainly finished pilasters similar to those of other nearby military-built buildings. Some of its windows and entries have been filled in or otherwise altered. It appears that some of its former garage bays have been walled in. A corner (southwest) covered entryway is a modern addition.

The building is at its original location and retains some of its setting but appears to have lost much of its integrity of design, materials, workmanship, feeling, and association due to changes to its bays. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the

continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 510 (Air Corps Garage): Photo 6.1-211, left, west side and south front; Photo 6.1-212, right, west and south rear elevations with companion Building 511 in foreground.

6.1.4.11. BUILDING 511 (AIR CORPS GARAGE)

Like matching Building 510 on its north, Building 511 was erected in the early 1940s and labeled on the 1944 map as an Air Corps garage. By the late 1990s the US Army Reserve occupied it and it is now part of the National Guard armory (RAFB 1966; RAFBHA 1970 and 1999).

The former garage, like its neighbor to the north, has flush-surfaced concrete walls and a flat roof with overhanging eaves (**Photos 6.1-213** through **6.1-215**). One-story tall, it has regularly spaced, plainly finished pilasters similar to those of other nearby military-built buildings. Some of its windows and entries have been filled in or otherwise altered. It appears that some of its former garage bays have been walled in.

Building 511 is at its original location and retains some of its setting but appears to have lost much of its integrity of design, materials, workmanship, feeling, and association due to changes to its bays. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 511 (Air Corps Garage): Photo 6.1-213, left, south rear and east side elevations; Photo 6.1-214, right, west side and south rear elevations.

Photo 6.1-215, Building 511 (Air Corps Garage): north front and west side elevations with matching Building 510 at far left.

6.1.4.12. BUILDING 512 (QUARTERMASTER WAREHOUSE)

Building 512 was erected for Ramey Field in the early 1940s on the north side of a former railroad spur line. With its companion just to the east, it is identified on the 1944 map as a quartermaster warehouse. It may have continued to serve as a warehouse after the rail line closed but appears to have been vacant for decades (RAFB 1966; RAFBHA 1970 and 1999). It is located in close proximity to other WWII-era base buildings.

Building 512 is a long, one-story, concrete rectangle topped by a gabled roof (**Photos 6.1-216** through **6.1-218**). It retains early or original sliding doors at it service bays. Its roof, which has been resurfaced, continues to be supported by wooden trusses. A later-added ceiling suspended beneath the trusses is gone. It remains a basic, functional warehouse building.

The building is at its original location and retains some of its setting. It appears to have lost much of its integrity of design, materials, workmanship, feeling, and association due to the replacement of its roof and some changes to its sliding doors, as well as the loss of the railroad tracks that were the reason for its existence at this site. Additionally, it has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.


Building 512 (Quartermaster Warehouse): Photo 6.1-216, left, north track-facing and west side elevations; Photo 6.1-217, right, south road-facing elevation.

Photo 6.1-218, Building 512 (Quartermaster Warehouse): interior wooden roof framing.

6.1.4.13. BUILDING 513 (QUARTERMASTER WAREHOUSE)

Building 513 (like neighboring Building 512) was erected for Ramey Field in the early 1940s on the north side of a former railroad spur line. They were identified on the 1944 map as quartermaster warehouses. It may have continued to serve as a warehouse after the rail line closed but appears to have been vacant for decades (RAFB 1966; RAFBHA 1970 and 1999). It is located in close proximity to other WWII-era base buildings.

The building is a long, one-story, concrete rectangle that was once topped by a gabled roof (**Photos 6.1-219 – 6.1-220**). Its roof and the sliding doors that served its bays are gone. It is in ruinous condition.

The building stands at its original location and retains some of its setting. Due to its many physical changes, it appears to have otherwise lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout

the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 513 (Quartermaster Warehouse): Photo 6.1-219, left, west side and south tract-facing elevations; Photo 6.1-220, right, north road-facing elevation with Building 512 at right.

6.1.4.14. BUILDING 524 (PAVEMENT AND GROUNDS)

On the 1944 map, this early-1940s building is identified as housing Borinquen Field's pavement and grounds office. In 1966 it retained this function. By about 1999, however, it was home to a private school. The portion of the building that still stands is now incorporated into the successor Friedrich Froebel Bilingual School decades (RAFB 1966; RAFBHA 1970 and 1999). It has many later-added resources on its grounds, and buildings to its west and across Hangar Road on the south have been removed, rebuilt, or altered.

Building 524 is one-story tall and flat-roofed (**Photos 6.1-221** through **6.1-224**). Most of its visible original bays have replacement windows or doors or have been sealed. Its roof is largely hidden by solar panels and portions of its elevations cannot be viewed, as they are covered by additions.

Building 524 is at its original location and retains some of its original setting. Due to its many physical changes, it otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 524 (Paving and Grounds): Photo 6.1-221, left, south front and east side elevations; Photo 6.1-222, right, east side and north rear elevations.


Building 524 (Paving and Grounds): Photo 6.1-223, left, modern additions with north rear and west side elevations beyond; Photo 6.1-224, right, modern aerial view of school complex with Hangar Road at bottom and older aqua-colored portions at right.

6.1.4.15. BUILDING 543 (VETERINARY OFFICE)

On the 1944 map, a temporary frame building stood on this site. When Building 508 was built and what its original function was is not known, although its appearance suggests it was erected in the early/mid-1950s along with numerous other buildings as part of Ramey Air Force Base. The first legible map it can be located on identifies it as a veterinary office. It is labeled as such on the 1966 map and continued to serve that function at least through 1972-73, when an airman snapped a photograph of it. It is currently home to activities of the US Customs and Border Patrol (RAFB 1966; RAFBHA 1970 and 1999). Many of the buildings around it have been removed, rebuilt, or altered.

Building 543 is concrete with a flat roof and plain wall surfaces (**Photos 6.1-225** through **6.1-228**). It is one-story tall and rectangular. A comparison of the building with a photograph from the early 1970s indicates that its main entrance and vents above have been removed. Additionally, its window louvers have been replaced.

The former veterinary office is at its original location and retains some of its original setting. Due to its many physical changes, it appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Ramey Air Force

Base and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 543 (Veterinary Office): Photo 6.1-225, left north front elevation in 1972-1973 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/); Photo 6.1-226, right, east side and north front elevations.


Building 543 (Veterinary Office): Photo 6.1-227, left, north front and west side elevations; Photo 6.1-228, right, east side and south rear elevations view.

6.1.4.16. POTENTIAL MOTOR POOL AND SUPPLY BUILDINGS HISTORIC DISTRICT

None of the motor pool and supply buildings are recommended as individually eligible for National Register listing due to their workmanlike designs and many alterations. They are also not recommended as National Register-eligible as part of a discrete historic district or a potential larger one that encompasses more of former Borinquen Field and Ramey Air Force Base. They retain their location, along with the other resources at the former military base. Due to modern infill and many alterations, they are not believed to retain sufficient integrity of design, setting, materials, workmanship, feeling, and association to support listing under Criterion A in the area of military significance, Criterion C in the area of architectural significance, or any other Criterion.

6.1.5. GARAGES AND SUPPORT BUILDINGS (NW OF HANGAR AND WING ROADS)

This group of garages and support buildings is clustered together at the northern edge of the APE north of the central section of the runway, adjacent to an area historically used for airplane parking. It was built in the early 1940s along with Borinquen Field to support nearby air operations. The five buildings are on the eastern end of Hangar Road (**Photos 6.1-229** and **6.1-230**). Note: the potential for these buildings to be part of a historic is addressed separately below.

Photo 6.1-229, left, 1944 map, annotated; Photo 6.1-230, right, modern Google Earth aerial with red dots at building locations.

6.1.5.1. BUILDING 406 (FIRE STATION)

On the 1944 map, this early-1940s building is identified as the fire station. By 1966 it housed base communications and also served as a confinement center. This conformed neatly with its use in 1972-73 as the home of base security and law enforcement and also as the base telephone exchange (RAFB 1966; RAFBHA 1970 and 1999). It currently holds USCG offices. It stands among other WWII-era military buildings along Hangar Road.

This long, one- and two-story building, like its WWII-era contemporaries, is constructed of concrete and topped by a flat roof with a wide overhang (**Photos 6.1-231** through **6.1-236**). It is plainly finished, with a long one-story block extended from its west side elevation. Four bays on its north elevation facing Hangar Road are edged by unadorned pilasters like those found elsewhere at the base's early buildings. These likely provided access for fire engine. Only one remains unenclosed. Other changes to the building include replacement of windows and doors; the enclosing or shortening of some window bays; the addition of long metal plates beneath most of the window bays; and the adding of an upper door and metal stairs at the east side elevation.

The building is at its original location and retains much of its setting but appears to have lost much of its integrity of design, materials, workmanship, feeling, and association due to numerous changes to its bays, including those that served its fire engines. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere

during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 406 (Fire Station): Photo 6.1-231, left, south front and west side elevations; Photo 6.1-232, right, west side and north rear elevations.

Building 406 (Fire Station): Photo 6.1-233, left, north rear elevation; Photo 6.1-234, right, east side elevation.

Building 406 (Fire Station): Photo 6.1-235, left, south front elevation in 1972-1973 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/); Photo 6.1-236, right, similar but broader view of south elevation.

6.1.5.2. BUILDING 407 (PAINT, OIL, AND DOPE HOUSE)

Building 407, erected in the early 1940s, is labeled as the paint, oil, and dope house on the 1944 map. Perhaps because of its modest size and use, it is absent from later legible maps. It is now used by the USCG. It stands with other WWII-era base buildings along Hangar Road.

This building is a plainly finished, one-story, concrete rectangle topped by a flat roof with widely overhanging eaves (**Photos 6.1-237** through **6.1-239**). It has been altered in a number of ways: ghosts of filled-in window bays are visible on its north side elevation; the surviving window bays at its south side elevation have had their sash changed; the front (west-facing) garage door is not original; and a long sheet-metal ell has been extended from its rear (east) elevation. Additionally, a small entry block near the rear of its south elevation is a later addition or has had its door replaced.

Building 407 is at its original location and retains much of its setting but appears to have lost much of its integrity of design, materials, workmanship, feeling, and association through the alteration or enclosure of most of its original bays and the extension of an ell to its rear. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 407 (Paint, Oil, and Dope House): Photo 6.1-237, left, west front and south side elevations with Building 409 at far left; Photo 6.1-238, right, north side and west front elevations.

Photo 6.1-239, Building 407 (Paint, Oil, and Dope House): west front with Building 408 at left.

6.1.5.3. BUILDING 408 (PHOTOGRAPHIC LABORATORY)

Building 408 was built in the early 1940s as, according to the 1944 map, a photographic laboratory. By 1966 it served as the "IAU Library" (unidentified acronym). In 1970 it housed the

OSI or Office of Special Investigations (RAFB 1966; RAFBHA 1970 and 1999). It currently holds USCG offices. The building stands with other WWII-era base buildings along Hangar Road.

The former photographic laboratory is one-story tall and concrete (**Photos 6.1-240** through **6.1-243**). A widely overhanging flat roof covers its square form, which is extended at the rear (east) by a small original wing that holds an entry foyer. The building is more decoratively, if still simply, finished than most of its contemporaries. It has a tall raised foundation mirrored by a shallower plain frieze. Its front (west-facing) entry is set in a central projection that steps back toward the doorway. Alterations to the building include the enclosure of some window bays, the reduction in size by half of other windows, and the replacement of sash.

Building 408 is at its original location and retains much of its setting. It appears to have lost its integrity of design, materials, workmanship, feeling, and association through changes to its window bays. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen field and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 408 (Photographic Laboratory): Photo 6.1-240, left, north side and west front elevations; Photo 6.1-241, right, west front and south side elevations.

Building 408 (Photographic Laboratory): Photo 6.1-242, left, south side and east rear elevations; Photo 6.1-243, right, east rear and north side elevations.

6.1.5.4. BUILDING 409 (AIR CORPS GARAGE)

Erected in the early 1940s, Building 409 is identified on the 1944 map as an Air Corps garage. The 1966 map identifies it as a communications center. By 1999 it still functioned as a communications center, but for the USCG rather than the Air Force. The USCG appears to continue to use it in part for that function (RAFB 1966; RAFBHA 1970 and 1999). A second, once-identical, former garage (Building 410) stands to its north. Buildings 409 and 410 are nearly identical to, but longer than, Building 501, erected contemporaneously on Borinquen Avenue to the west. WWII-era base buildings stand to its west, but the resources to its east were erected in recent years.

Building 409 is a rectangular, flat-roofed, one-story, concrete building (**Photos 6.1-244** through **6.1-247**). It has a flat surface finish that is divided into seven bays by rectilinear pilasters and edged below ventilators at the eaves by two incised parallel lines. How many garage bays the building originally held is not known. A 1955 photograph depicting its front (south) elevation, as well as evident infill, indicates that many of its original windows, entries, eave-level ventilators, and garage bays have been enclosed or otherwise replaced or altered (RAFBHA 2015c).

Building 409 is at its original location and some of its setting is intact, but appears to have lost its integrity of design, materials, workmanship, feeling, and association due to numerous changes to its ventilator, window, garage, and entry bays. Further, it has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Army erected many such support buildings during WWII at Borinquen and other bases throughout the continental US, the Caribbean, and elsewhere. Therefore, the building is not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Building 409 (Air Corps Garage): Photo 6.1-244, left, west side and south front elevations; Photo 6.1-245, right, south front and east side elevations.

Building 409 (Air Corps Garage): Photo 6.1-246, left, north rear and east side elevations with Building 410 at right; Photo 6.1-247, right, annotated 1955 aerial (source (RAFBHA 2015c).

6.1.5.5. BUILDING 409 (AIR CORPS GARAGE)

Like its mate to the north (Building 409), this building was erected in the early 1940s as an Air Corps garage. By 1966 it had been converted to a flight simulator building 1966 map identifies it as a communications center. By 1999 it still functioned as a flight simulator building, but for the USCG rather than the Air Force. Still in USCG hands, it appears to have at least in part reverted to its early function as a garage and shop (RAFB 1966; RAFBHA 1970 and 1999). WWII-era base buildings stand to its west, but the resources to its east are recently built.

Again, like its neighbor, this building is a rectangular, flat-roofed, one-story, concrete garage (**Photos 6.1-248** through **6.1-250**). It has a flat surface finish that is divided into seven bays by rectilinear pilasters and edged below ventilators at the eaves by two incised parallel lines. Its original number of garage bays is not known, but a 1955 aerial depicting its rear (south) elevation, as well as evident infill, indicates that many of its original windows, entries, eave-level ventilators, and garage bays have been enclosed or otherwise replaced or altered.

Building 410 is at its original location and some of its setting is intact, but it appears to have lost its integrity of design, materials, workmanship, feeling, and association due to numerous changes to its ventilator, window, garage, and entry bays. Further, it has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Army erected many such support buildings during WWII at Borinquen and other bases throughout the

continental US, the Caribbean, and elsewhere. Therefore, the building is not recommended as individually eligible for National Register listing under any of the Register's Criteria.


Building 410 (Air Corps Garage): Photo 6.1-248, left, east side and north front elevations; Photo 6.1-249, right, south rear and east side elevations.

Building 410 (Air Corps Garage): Photo 6.1-250, west side and south rear elevations with Building 409 at far left.

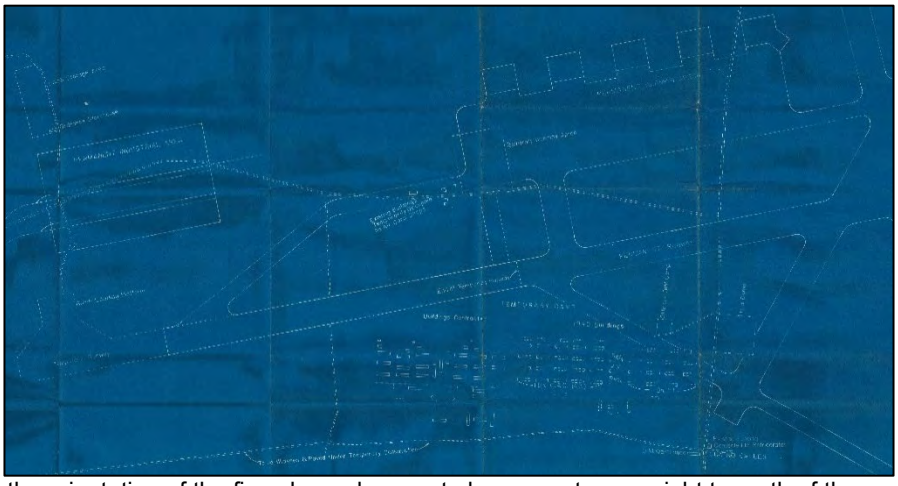
6.1.6. RAFAEL HERNANDEZ AIRPORT RUNWAY 8/26

Borinquen Field was erected beginning in September 1939 on about 3,800 acres of farmland that mostly produced sugar cane, along with cassava, coconuts, cotton, fruits, and sweet potatoes (Smith and RAFBHA 2004; Feliciano Ramos 2011:5-6; Conn et al. 2000:322-325; Reynolds and Gardner 2014:26-30). By the end of October, the Borinquen Field runway—now Rafael Hernandez Airport Runway 8/26—was "practically completed," according to numerous mainland newspaper accounts (Clarion-Ledger, October 27, 1939.) (**Figure 6.1-7**) According to a follow-up account of late March 1940, also much-reported (Knoxville Journal, March 31, 1940):

> Three thousand men were put to work clearing 1900 acres at 8 o'clock one morning. At 4 o'clock that afternoon enough space was cut out to land the first plane. Before six months had passed a 4000-foot-long runway had been built parallel to the trade winds track, and temporary Army barracks were complete.

Another 1940 news story stated the runway was built of "native rock and asphalt" (Arizona Daily Star, May 7, 1940).

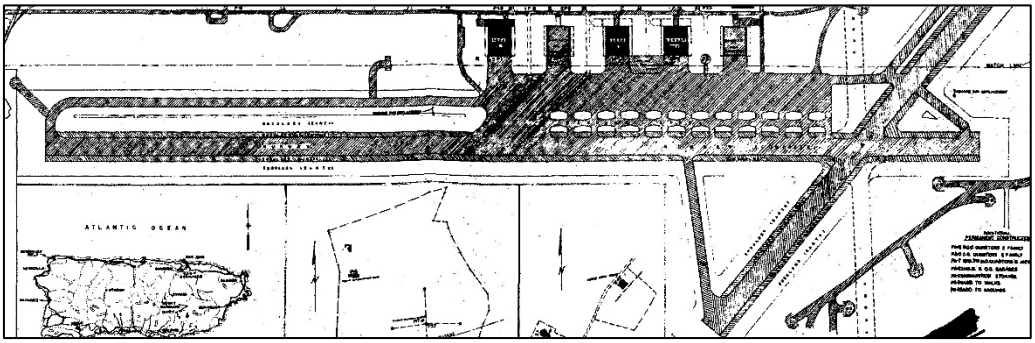
Figure 6.1-7 Temporary Construction, Borinquen Field, December 1939



Note the orientation of the five planned concrete hangars at upper right to north of the runway.

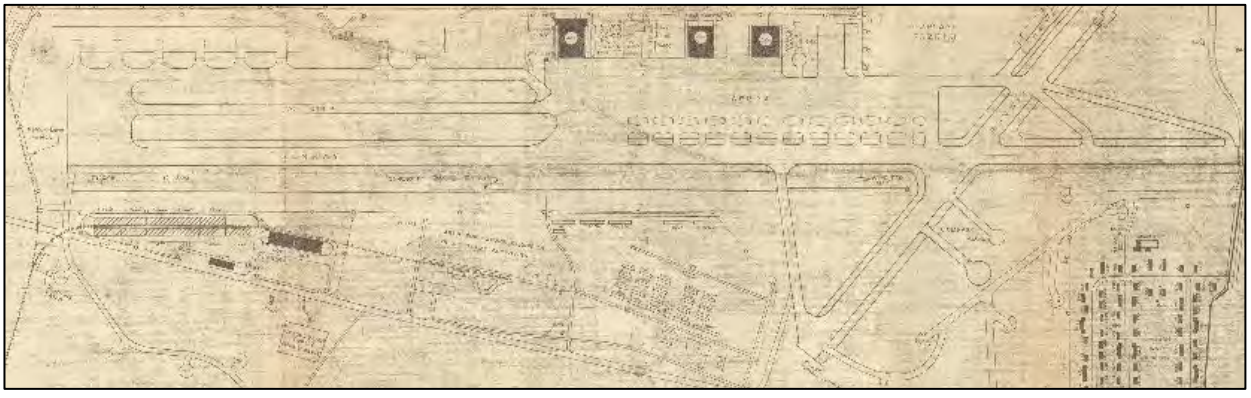
The runway was used extensively during WWII. Various bombardment squadrons were stationed at Borinquen and its "primary mission…gradually became as a landing field, refueling station and aircraft service depot for American aircraft of all types flying to the European and African war theaters." In 1943 the runway and base processed more than 10,000 aircraft, both tactical and cargo/passenger. This heavy usage is reflected in the runway's multiple extensions during the war (Smith and RAFBHA 2004) (**Figures 6.1-8** and **6.1-9**, **Photo 6.1-251**).

Figure 6.1-8 US Engineer Office, January 1943 Progress Plan



Note long extension to west.

Figure 6.1-9 Reservation Layout Plan, May 1944

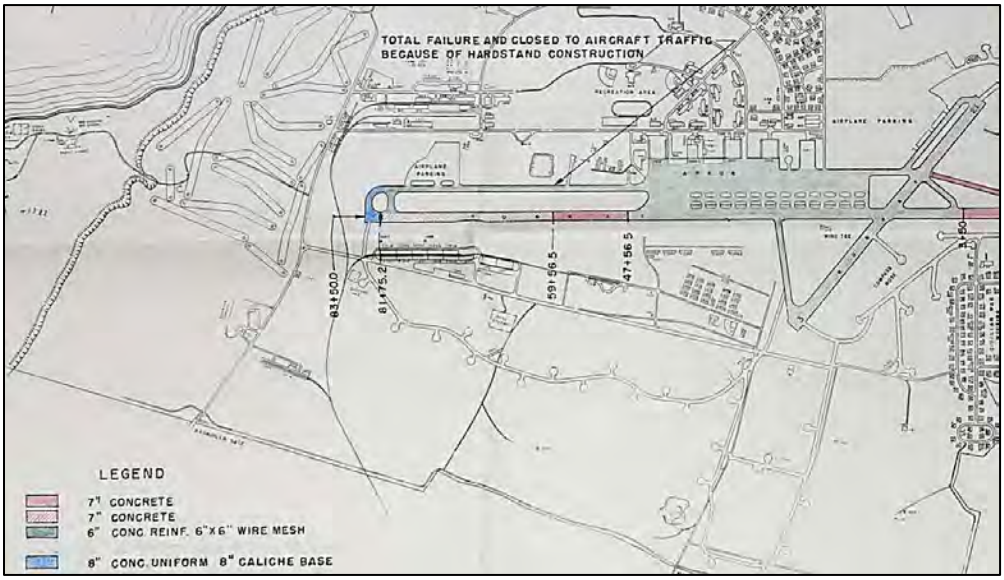


Note extension to east.

Photo 6.1-251 Runway to south of concrete hangars, 1943 (or 1945) (source: RAFBHA 2015b).

The close of the war did not end the heavy use of the runway and base. Borinquen extended its runway yet again in January 1946 (Smith and RAFBHA 2004). A May 1948 plan indicates that various construction materials had been used at the runway over time or were planned to be added: 7” concrete, 6” reinforced concrete, 8” concrete with an 8” caliche (nitrate-bearing gravel or rock) base. At least one taxiway of hardstand (compacted gravel) construction had failed and been closed to aircraft traffic (**Figure 6.1-10**). How much of the runway was reconstructed at this time is not known.

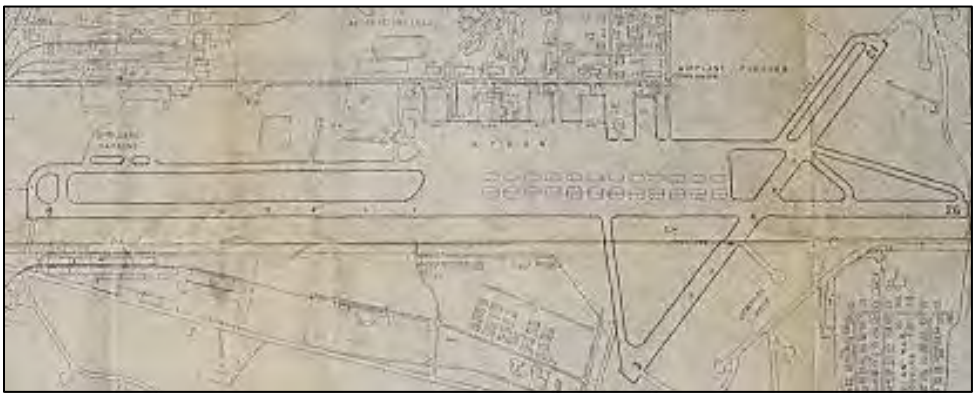
Figure 6.1-10 Air Installation Office Reservation Layout Plan, May 1948



By 1951 the runway had been extended to east and west again to 11,700’, its current length (SAC 1951) (**Figures 6.1-11** and **Photo 6.1-252**). It has undergone additional changes, however, since

1951. In the mid-/late-1950s, SAC added Taxiway 2 and its checkerboard apron to the south, along with connecters to the runway. These were erected with money provided to SAC in 1955 for construction of various facilities at Ramey Air Force Base, including airfield pavement (*Congressional Record* 1955:8667). Due to the heavy weight of the B-52s that SAC used at the base, the main runway may well have been repaved or otherwise strengthened at this time. The runway currently looks essentially the same as it did in the mid-1960s (SAC 1964 and 1966) (**Figure 6.1-12**).

Figure 6.1-11 Strategic Air Command Grass Cutting Areas, August 1951



Note that runway has been extended to east and west to current length.

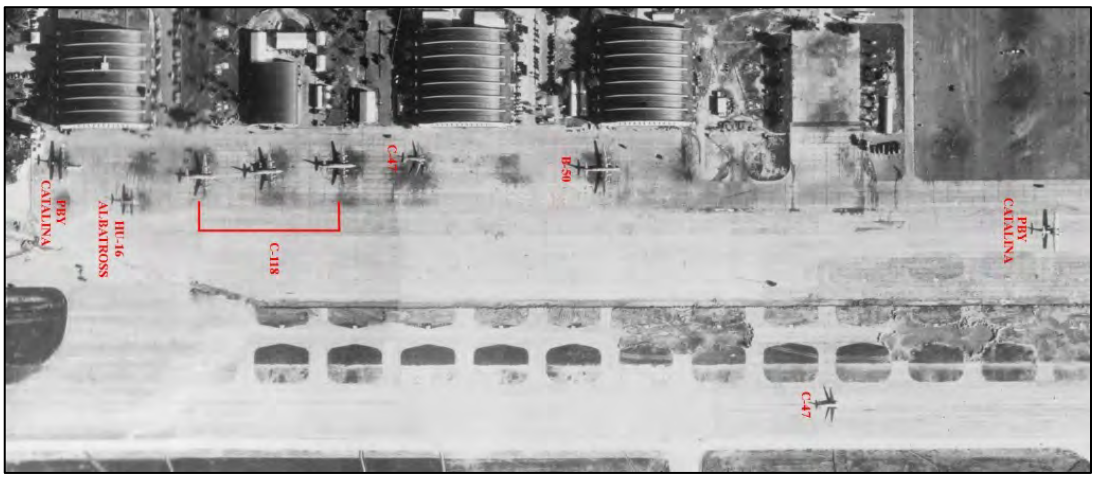


Photo 6.1-252 Various aircraft at taxiway and runway south of concrete hangars (source: RAFBHA 2015c).

Figure 6.1-12 Strategic Air Command Master Plan, November 1966

Note change to taxiway in front of three central concrete hangars and addition of Taxiway 2 and connectors at south.

BQN Runway 8/26 is at its original location and retains much of its setting, framed by buildings erected by the Army and Air Force during WWII and the Cold War. However, it appears to have lost much its integrity of design, materials, workmanship, feeling, and association due to numerous extensions, rebuilding, and other changes to it. It is not believed to possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army, Air Force, and SAC erected runways at all of the many air bases they built throughout the continental US, the Caribbean, and elsewhere during the WWII and the Cold War. The runway is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

6.1.7. BORINQUEN FIELD CONCRETE HANGARS AND CONTROL TOWER (SOUTHWEST OF HANGAR AND WING ROADS)

History

Not long after the tents went up at Borinquen Field in September 1939, construction work began on numerous temporary and permanent buildings, a permanent runway, and other resources (Smith and RAFBHA 2004). From the outset, the field's most prominent and central resources were the runway and, on its north, Hangar 2 (Building 402), Hangar 3 (Building 403), Hangar 5 (Building 405), and the Control Tower (Building 400). By the end of October, a rudimentary runway was "practically completed" and by March 1940 a 4,000-foot-long permanent runway was in operation (*Clarion-Ledger*, October 27, 1939; *Knoxville Journal*, March 31, 1940). Work on the massive hangars and the tower took much longer. Indeed, it is not clear whether construction of the hangars, and perhaps the tower as well, began until 1941. In January of that year the US Army Corps of Engineers took over responsibility for construction of Borinquen from the Quartermaster Corps and saw to it that "civilian contractors undertook the major Caribbean construction tasks from the start" (Hendricks 1993:22). The four buildings may not have been

finished until 1942, when "major construction at Borinquen Field" was completed (Bykofsky and Larson 1957:22) (**Photos 6.1-253** and **6.1-254**).

Photo 6.1-253, left, Hangar 5 under construction, 1941; Photo 6.1-254, right, construction of runway and Hangars 3 and 2 (left to right), 1941 (source: RAFBHA 2015a).

The three hangars were among a small early group of advanced, thin-shell, reinforced-concrete hangars and warehouses erected in the United States in the early 1940s (**Photos 6.1-255** and **6.1-256**). According to Weitze (1999a:26) in her context for Cold War infrastructure, they were designed by Anton Tedesko of the Chicago engineering firm Roberts & Schaefer:

> From 1939 through World War II, and continuing with the two prototype B-36 hangars for SAC in 1947, Tedesko designed key thin-shell reinforced concrete structures for the US military, running field tests on many to ascertain their structural performance once formwork was removed….Tedesko's earliest hangars included three for the Army Air Corps at Borinquen Field, Puerto Rico (project cost: $1,100,000); 16 (seaplane, maintenance, electronics testing, radar and flight testing) for the Navy at North Island, San Diego (two: $1,000,000), Philadelphia (one: $1,000,000), Patuxent, Maryland (12: $5,250,000), and Richmond, Virginia; six for the Army Signal Corps and the Army Air Forces at Wright Field, Dayton, Ohio ($1,125,000); and two for the Army Air Forces at Andrews Field, Maryland ($400,000). Especially spectacular were groupings of Navy and Army warehouses, each warehouse 182 feet wide and 1,562 feet long, side by side, in Richmond and Norfolk, Columbus and Dayton, and Bayonne, New Jersey, 1940-1943. In all, by July 1946, Roberts & Schaefer—through the work of Anton Tedesko—claimed "28 concrete hangars and six million square feet of concrete warehouses and shops for the Navy, Air Corps and Quartermaster Corps…all in 'Z-D' [thin-shell reinforced concrete] type construction."

The Chicago firm Graham, Anderson, Probst & White had been selected in January 1941 as Borinquen's architects and engineers (*Honolulu Star-Bulletin*, January 22, 1941; *Tampa Tribune*, January 23, 1941; *Defense* 1941:3), but apparently was required to use the designs of Tedesko and their Chicago competitors. Roberts & Schaefer averred at the end of the war that their work on the design in the United States had advanced since the early 1930s "from a theory based on

mathematical calculations to a complete method of practical concrete construction" (Weitze 1990a:26). Although the form was to become relatively common in the late 1940s, 1950s, and 1960s, the 28 hangars built for the military with Tedesko's designs were unusual monumental buildings, particularly in the early 1940s when the Borinquen hangars were built.

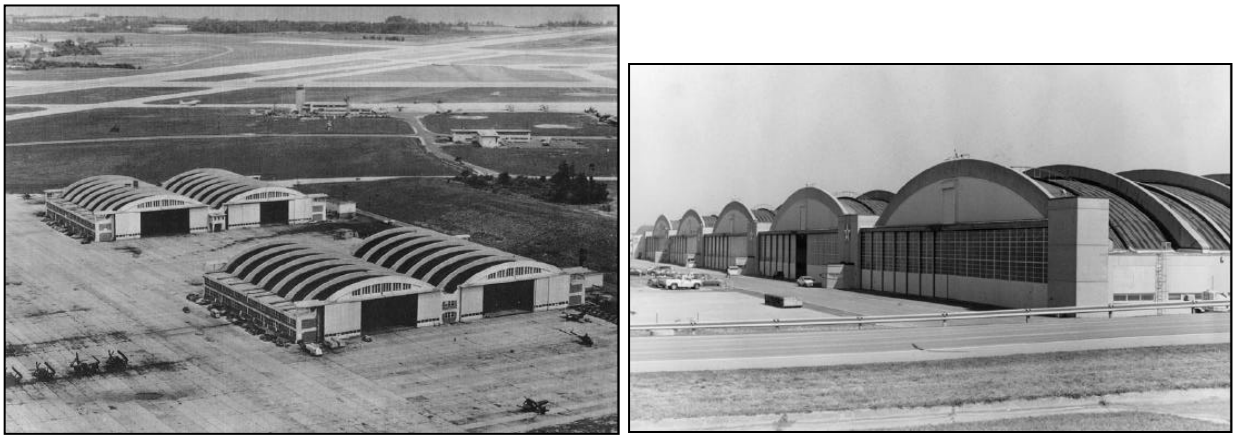


Photo 6.1-255, left, US Naval Air Station Patuxent River hangars, 1942; Photo 6.1-256, right, Army Air Forces Wright Field hangars, 1943-45; all designed by Anton Tedesko and Roberts & Schaefer (source of both: Weitze 1999a:27; photographer of Wright Field hangars: Karen J. Weitze)

In the 1920s, the German engineering firm Dyckerhoff and Widmann and engineer Walter Bauerfeld created the first thin-shell, reinforced-concrete structure for a planetarium dome. In 1932 Dr. Anton Tedesko (1903-1994) of the firm emigrated to the United States under a joint agreement it set up with Roberts & Schaefer to promote its thin-shell patents. He designed a small dome in 1934 for New York's Hayden Planetarium and, in 1936, the country's first long-span, thin-shell, reinforced-concrete building, the Hershey Arena in Pennsylvania (Hines and Billington 2004; Weitze 2019a:24-25; Viest 1966; Evans 2007) (**Photos 6.1-257** and **6.1-258**).

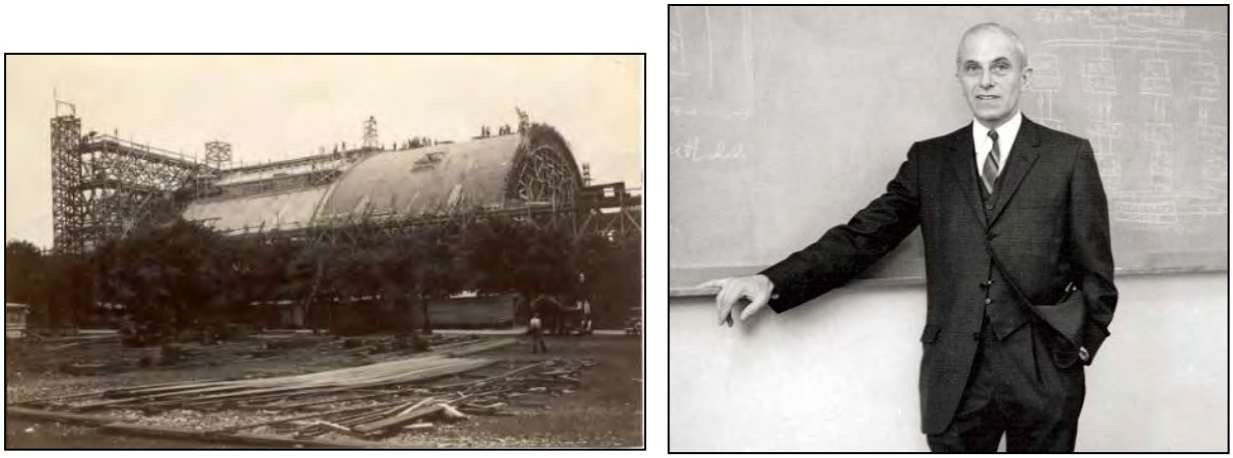


Photo 6.1-257, left, Hershey Arena under construction;
Photo 6.1-258, right, Anton Tedesko (source of both: Clark 2009)

The three Borinquen hangars were initially planned to be five. A mid-1942 base plan shows Hangars 2, 3, and 5 (Buildings 402, 403, and 405, respectively) completed, along with the control tower just to their west. It also includes the footprints of what would have been Hangar 1, east of

2, and Hangar 4 between 3 and 5 (US Engineer Office 1942). The "Reservation Layout" plan of May 1944 no longer includes footprints for the two unbuilt hangars. According to Gerry Giles of the RAFBHA (2019), the materials for Hangar 1 may have been lost at sea, helping to scuttle its construction. Some footings for the heavy concrete anchors that would have edged the east side of the hangar were erected and still remain in place (**Photos 6.1-259 – 6.1-261**).

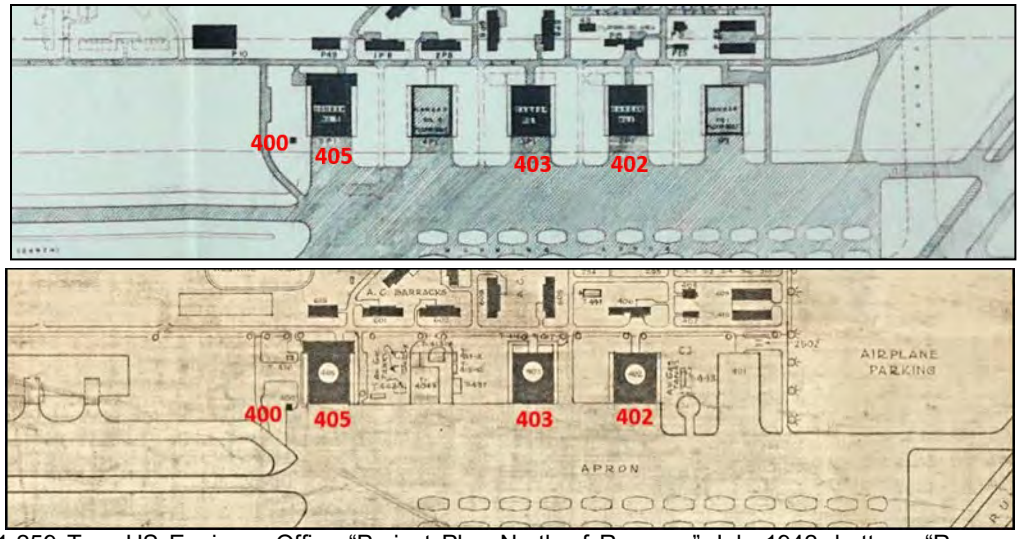


Photo 6.1-259 Top, US Engineer Office "Project Plan North of Runway," July 1942; bottom, "Reservation Layout, Ramey Air Force Base" plan, May 1944.

Photo 6.1-260 Left, looking north with Hangar 2 at far left and footings for never-built Hangar 1 at far right; right, zoomed image of footings (source: Google Earth imagery, 2016).

Photo 6.1-261 Locations of Control Tower and three hangars between runway on south and Hangar Road on north.

6.1.7.1. HANGAR 2 (BUILDING 402)

Hangar 2 is the easternmost of the three hangars. Like the other two, it was designed by Anton Tedesko and erected c.1941 as a long-span, thin-shell, reinforced-concrete building. It is nearly square, about 265' across and 255' deep. Its large open hangar area encompasses more than an acre. The building's concrete arch is supported by 15 regularly spaced ribs. Seven tall ribs, which extend well above its roof, arch over it from its south runway-facing elevation to an eighth shorter rib that doubles as a parapet for the north Hangar Road-facing elevation. Between the seven tall ribs and the north parapet rib are seven shorter ribs that only rise a short distance above the roof. The seven tall ribs curve down to anchorages in substantial concrete buttresses on the ground.

The south elevation is dominated by two sets of original telescoping doors that slide, overlap, and open up access to the entire hangar space—minus that set aside at either side for offices and other use—when fully pushed to either side (**Photos 6.1-262** through **6.1-267**). The metal and glass hangar doors appear to be original and can be seen in a 1955 image. A contemporary metal sign affixed to a wall inside the doors reads "HANGAR C-130 TAILDOOR SOUTHSIDE 4 FEET WIDE X 41 FEET HIGH TOTAL HORIZONTAL SPAN 178 FEET." Regularly spaced projecting ribs extend from above the doors to the bottom of the tall rib curving crossing the elevation. The original name of the building remains impressed across the top of the curve, "FLIGHT HANGAR NO. 2."

Hangar 2: Photo 6.1-262, left, west side and south runway elevations; Photo 6.1-263, right, south runway and east side elevations.

Hangar 2: Photo 6.1-264, left, south runway elevation in 1955, note doors (source: Teleview Productions); Photo 6.1-265, right, south runway and east side elevations with same doors.

Hangar 2: Photo 6.1-266, left, south runway elevation, not ribs, inset "Flight Hangar No. 2" name and tailfin opening; Photo 6.1-267, right, south runway elevation, note doors.

The north elevation facing Hangar Road retains its two original, metal-and-glass, hangar doors at its center (**Photos 6.1-268** through **6.1-271**). A sign at the runway-side doors describes each as "HANGAR FRONT MAIN DOOR SOUTHSIDE MAX. VERTICAL HEIGHT 37 FEET." Regularly spaced projecting ribs that read like pilasters rise from the ground to either side of the doors, and from the door lintels, up to the curved arch of the roof. Windows are paired between the ribs to either side of the doors; window bays above are covered with sheet metal. At the east and west side elevations the roof flattens and juts out in wide overhangs, shading the two stories of office and other non-hangar-floor space on either side. These elevations also have paired windows and some doors at the first story between the anchoring concrete buttresses. Paired windows cross the elevations above, serving the second-story rooms. Most of the windows on the side elevations are in place, although it not clear if they are original. (Whether the hangar retains any original windows was not determined.) A few bays have been filled by concrete or concrete block and some are closed by sheet metal.

Hangar 2: Photo 6.1-268, left, east side and north street-side elevations; Photo 6.1-269, right, north street-side elevation, note ribs and original hangar doors.


Hangar 2: Photo 6.1-270, left, north street-side and west side elevations; Photo 6.1-271, right, anchor buttresses on west side elevation, looking north.

Inside the hangar the sweeping concrete ceiling is exposed (**Photos 6.1-272** through **6.1-275**). It is essentially a smooth surface, although wires that serve hanging light fixtures extend across it. Rectangular concrete panels divided by ribs mark the north elevation. Concrete and horizontal ribs cover the much shallower exposed wall at the south elevation. Across the east and west side elevations doors enter into office and other space beyond the hangar floor. A walkway serves doors into the rooms above. Two levels of rooms at the north elevation between the north hangar doors have either been modernized or are not original.


Photos 6.1-272 and 6.1-273, Hangar 2: looking northwest in hangar at roof and wall.

Hangar 2: Photo 6.1-274, left, looking southwest in hangar toward runway-side doors;


Photo 6.1-275, right, looking northeast toward roof and levels of subsidiary space along east side

USCG Air Station Borinquen currently occupies the building, which houses USCG planes, helicopters, maintenance equipment, and offices. In 1971 Air Station San Juan, the station's predecessor, relocated from Isla Grande Naval Station to Ramey Air Force Base and for a time took on the name Air Station Puerto Rico. The USCG took over occupancy of the hangar from the United States Navy in July 1976. (Between the base closing in 1973 and 1976, the facility was in the hands of the Commonwealth of Puerto Rico and the Navy; the latter occupied the hangar during that time.) The USCG carefully maintains the building, although damage to the roof in 2017 by Hurricane Maria appears to have led to some water damage.

Individual Eligibility to the National Register

Hangar 2 is remarkably intact. Alterations are minor, limited largely to window bays. It retains its form and design and even its two sets of hangar doors. It is believed to retain its integrity of location, design, setting, materials, and workmanship, and therefore to also retain its integrity of feeling and association. It still stands along an airstrip within a former military facility, in the company of other contemporary buildings, most notably hangars 3 and 5 and Borinquen Field's original control tower. The hangar is believed to be historically significant under National Register Criterion A in the area of engineering for its early and important, long-span, thin-shell, reinforced-concrete design. It is also believed to be historically significant under Criterion A for the important role it played in the military during WWII and the Cold War. It clearly fits within the definition of the military area of significance, for it was built for "defending the territory and sovereignty of a people." The hangar is further believed to be significant in the areas of significance of architecture and engineering under Criterion C as embodying the distinctive characteristics of its type, period, and method of construction. And it is believed to be eligible under Criterion C as representing the work of a master, pioneering engineer Anton Tedesko. (In 2004 MWH Americas also recommended the hangar as National Register-eligible under Criteria A and C). The hangar is not believed to be National Register eligible under Criterion B, for it has no known important association with the lives of persons significant in our past. It is also believed to be unlikely to yield information important in history that could not be collected from other sources and to therefore not be eligible under Criterion D. Due to its significance in the identified areas, and its retention of the integrity necessary to support that significance, Hangar 2 is recommended as individually eligible for National Register listing under Criteria A and C. The recommended National Register boundaries for Hangar 2 are pictured below in **Figure 6.1-13**. They take in the immediate area around the hangar, including a section of apron to its south. This area was historically associated with the hangar.

Eligibility to the National Register as Part of a Historic District

Hangar 2 is also believed to be National Register eligible as a contributing building to the Borinquen Field Concrete Hangars and Control Tower Historic District. This proposed historic district is discussed separately below.

6.1.7.2. HANGAR 3 (BUILDING 403)

Hangar 3 is located between Hangars 2 and 5. Like the other two, it was designed by Anton Tedesko and erected c.1941 as a long-span, thin-shell, reinforced-concrete building. It is nearly

square, about 265 feet across and 255 feet deep (**Photos 6.1-276** through **6.1-281**). Its large open hangar area covers more than an acre. Its concrete arch is supported by 15 regularly spaced ribs. Seven tall ribs extending well above its roof arch over it from its south runway-facing elevation to an eighth shorter rib that doubles as a parapet for the north street-side elevation. Between the seven tall ribs and the north parapet rib are seven shorter ribs that only rise a short distance above the roof. The seven tall ribs curve down to anchorages in substantial concrete buttresses on the ground.

Like Hangar 2, its south elevation is dominated by two sets of original telescoping doors that slide, overlap, and open up access to the entire hangar space—minus that set aside at either side for offices and other use—when fully pushed to either side. The metal and glass hangar doors are original. Regularly spaced projecting ribs extend from above the doors to the bottom of the tall rib curving crossing the elevation. The original name of the building remains set into the southern concrete rib at the top of its curve, “FLIGHT HANGAR NO. 3.”

Hangar 3: Photo 6.1-276, left, south runway and east side elevations; Photo 6.1-277, south runway elevation.

Photos 6.1-278 and 6.1-279, Hangar 3: detail views of west set of south runway-facing hangar doors.

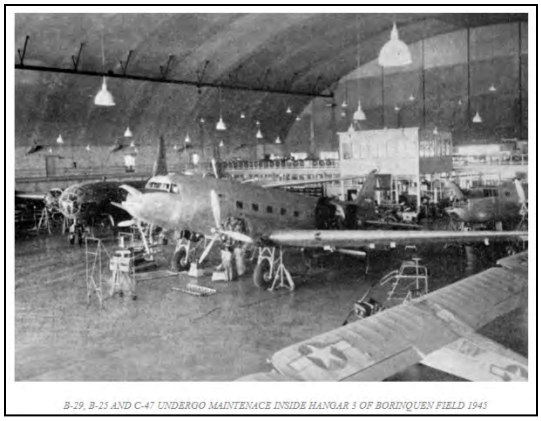

Hangar 3: Photo 6.1-280, left, west side and south runway elevations; Photo 6.1-281, right, west side elevation buttresses.

On the north Hangar Road elevation, the building no longer retains its original hangar doors (**Photos 6.1-282** through **6.1-285**). Where they stood, later solid walls with doors for foot traffic are now in place. Regularly spaced, pilaster-like, projecting ribs climb from the ground to either side of the current central panels, and from the lintels above them, to the curved arch of the roof. Windows once paired between the ribs to either side of the doors have largely been filled in or otherwise altered; horizontal window bays above remain in place. At the east and west side elevations the roof flattens and juts out in wide overhangs, shading the two stories of office and other non-hangar-floor space on either side. These elevations retain original window bays and doorways at the first story and window bays above set between the anchoring concrete buttresses. (Whether the hangar retains any original windows was not determined.) Some of the bays have enclosed.


Hangar 3: Photo 6.1-282, left, north street-side elevation; Photo 6.1-283, right, north street-side elevations, note ribs and infill of original hangar doors.


Hangar 3: Photo 6.1-284, left, north street-side and W side elevations; Photo 6.1-285, right, north street-side and west side elevations, note intact bays at side elevation.

Inside the hangar the sweeping concrete ceiling is largely hidden by a screen of plastic mesh (**Photos 6.1-286** through **6.1-289**). Hurricane Maria damaged the roof and water infiltration has loosened bits of the ceiling; the mesh protects those working below from fragments of falling debris. The ceiling is in place and visible through the mesh, although it is hard to capture in photographs. It is essentially a smooth surface, although wires that serve hanging light fixtures extend across it. Behind the mesh, rectangular concrete panels divided by ribs mark the north elevation, and concrete and horizontal ribs cover the much shallower exposed wall at the south elevation. Across the east and west side elevations doors enter into office and other space beyond the hangar floor. A walkway serves doors into the rooms above. Two levels of rooms at the north elevation remain in place but are partially hidden by metal screens at the first floor and wallboard and FedEx signage at the second.



Hangar 3: Photo 6.1-286, left, looking northwest at hangar interior in 1945 (source: RAFBHA 2015b); Photo 6.1-287, right, looking northwest at north wall and roof; note that wall, roof, and hanging light supports beneath mesh continue to look those in the 1945 image.

Hangar 3: Photo 6.1-288, left, looking southeast toward east flank of rooms and runway-side elevation; Photo 6.1-289, right, looking southwest toward west flank of rooms and runway-side elevation.

Since the early 2000s, FedEx has operated out of the BQN. Historically, their primary business at the airport has been processing flowers shipped from South America. They occupy Hangar 3 and also the 1980s-era hangar immediately to the west.

Individual Eligibility to the National Register

Hangar 3 is extremely intact. Alterations are relatively minor, limited largely to window bays and the removal of the street-side set of hangar doors. It retains its form and design and its runway-side of hangar doors. It is believed to retain its integrity of location, design, setting, materials, and workmanship, and therefore to also retain its integrity of feeling and association. It still stands along an airstrip within a former military facility, in the company of other contemporary buildings, most notably hangars 2 and 5 and Borinquen Field's original control tower. The hangar is believed to be historically significant under National Register Criterion A in the areas of engineering and architecture for its early and important, long-span, thin-shell, reinforced-concrete design. It is also believed to be historically significant under Criterion A for the important role it played in the military during WWII and the Cold War. It clearly fits within the definition of the military area of significance, for it was built for "defending the territory and sovereignty of a people." The hangar is further believed to be significant in the areas of significance of architecture and engineering under Criterion C as embodying the distinctive characteristics of its type, period, and method of construction. And it is believed to be eligible under Criterion C as representing the work of a master, pioneering engineer Anton Tedesko. The hangar is not believed to be National Register eligible under Criterion B, for it has no known important association with the lives of persons significant in our past. It is also believed to be unlikely to yield information important in history that could not be collected from other sources and to therefore not be eligible under Criterion D. Due to its significance in the identified areas, and its retention of the integrity necessary to support that significance, Hangar 3 is recommended as individually eligible for National Register listing under Criteria A and C. The recommended National Register boundaries for Hangar 3 are pictured below in **Figure 6.1-13**. They take in the immediate area around the hangar, including a section of apron to its south. This area was historically associated with the hangar.

Eligibility to the National Register as Part of a Historic District

Hangar 3 is also believed to be National Register eligible as a contributing building to the Borinquen Field Concrete Hangars and Control Tower Historic District. This proposed historic district is discussed separately below.

6.1.7.3. HANGAR 5 (BUILDING 405)

Hangar 5 is the easternmost of the three hangars. Off its southwest corner stands the Control Tower. Like the other two, it was designed by Anton Tedesko and erected c.1941 as a long-span, thin-shell, reinforced-concrete building. Its original block is nearly square, about 265' across and 255' deep (**Photos 6.1-290** through **6.1-293**). Its former hangar area encompasses more than an acre. The building's concrete arch is supported by 15 regularly spaced ribs. Seven tall ribs, which extend well above its roof, arch over it from its south runway-facing elevation to an eighth shorter rib that doubles as a parapet for the north Hangar Road-facing elevation. Between the seven tall ribs and the north parapet rib are seven shorter ribs that only rise a short distance above the roof. The seven tall ribs curve down to anchorages, now hidden, in substantial concrete buttresses on the ground.

At the hangar's south runway-side elevation, regularly spaced projecting ribs extend from above the site of its doors to the bottom of the tall rib curving across the top of the elevation. The original name of the building remains set into the southern concrete rib, "ALTITUDE 212 BASE HANGAR NO. 5. While the top part of the elevation remains intact, the area below that once contained massive sets of sliding hangar doors has been enclosed. It is now crossed by ground-level doors and numerous window bays above.

Hangar 5: Photo 6.1-290, left, south runway and east side elevations with control tower at left; Photo 6.1-291, right, south runway elevation with control tower at left, 1954 (source: RAFBHA 2015c).

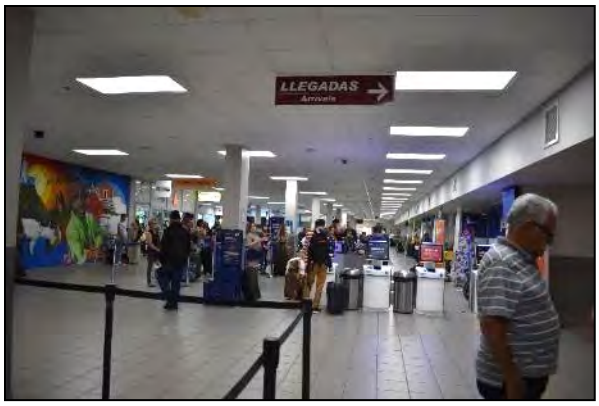

Hangar 5: Photo 6.1-292, left, west side and south runway-facing elevation with control tower at left; Photo 6.1-293, right, north street-facing and east side elevations.

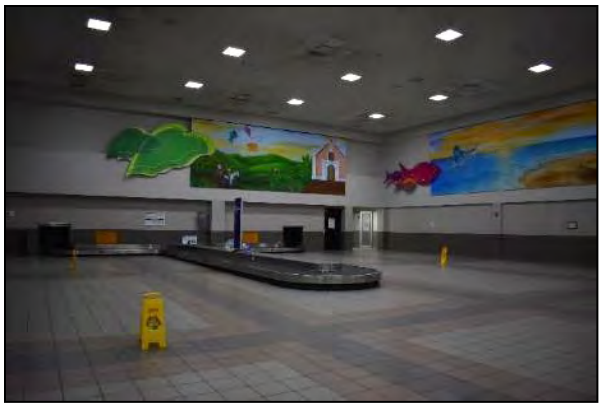
In the late 1970s, the airport began commercial operations as BQN. The terminal at that time was located at the vacant squadron operations building (Building 1071), at the SAC alert facility to the south (discussed below), which was altered to serve that function (Giles 2019). In the 1980s the airport began to receive increased traffic as an alternative to San Juan's Luis Muñoz Marín International Airport. The heavier passenger load led the PRPA to convert Hangar 5 into the airport's terminal in the mid-2000s. This in turn led to the removal of the hangar doors on the north and south elevations and other changes to the building. The hangar's north street-side elevation retains exposed ribs within the curve of its arch, as do the other two hangars (**Photos 6.1-294** through **6.1-296**). Below, though, the original hangar doors have been removed and a modern, flat-roofed, one-story addition juts forward at the right and left; at the center the modern entry doors to the terminal are shaded by a deep canopy. The bays that crossed the elevation have been replaced by ones within the projecting additions. The east and west side elevations are similarly altered, as the front additions continue along them to the south. The original bays on these elevations are gone, replaced by those in the additions.


Hangar 5: Photo 6.1-294, left, north street-facing and east side elevations; Photo 6.1-295, right, north street-side elevation.

Photo 6.1-296 Hangar 5: E side and N street-side elevations.

The interior is also heavily altered (**Photos 6.1-297** through **6.1-302**). The northern and central parts of the building include coffee shops and restaurants, a large waiting area and ticket counters, and a baggage claim area. Closer inspection, though, reveals that the building's roof and at least its northern wall, on the inside as well as the outside, remain intact. The passenger and baggage claim areas are contained within walls and ceilings erected independently within the original spacious footprint of the hangar floor.





Hangar 5: Photo 6.1-297, left, ticket counters with north street-side entries at far left; Photo 6.1-298, right, baggage claim area to south of ticket counters.

Hangar 5: Photo 6.1-299, left, looking northeast at interior of north street-side arch wall and ceiling; Photo 6.1-300, right, detail of ribbing concrete ribbing at interior of north street-side arch wall.

Hangar 5: Photo 6.1-301, left, looking south at ceiling with body of passenger and baggage claim area visible freestanding on hangar floor independent of roof; Photo 6.1-302, right, another view of freestanding construction within original body of hangar.

Individual Eligibility to the National Register

Hangar 5 retains its primary and most important feature, its long-span, thin-shell, reinforced-concrete design. It also retains the concrete ribs and walls in its north and south-facing arches. The remainder of the building, however, is much altered through the removal of all hangar doors and original bays; the addition of new wings across the east, north, and west elevations; and the construction of modern passenger and baggage areas within its original shell. Due to these alterations, the building is not believed to retain sufficient integrity of design, materials, and workmanship to support individual eligibility for National Register listing. However, due to the retention of its thin-shell roof, concrete arched ribs, finish within its arches at its north and south elevations, and overall design—as well as its continued location in a line with the contemporary tower and hangars 2 and 3—it is believed to retain sufficient integrity to be a contributing building within the Borinquen Field Concrete Hangars and Control Tower Historic District. This proposed historic district is discussed separately below.

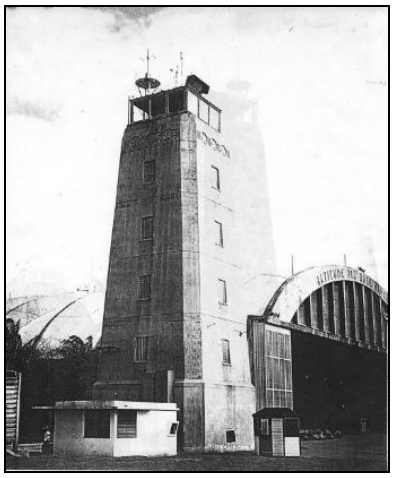
6.1.7.4. CONTROL TOWER (BUILDING 400)

As it was not a Tedesko design, the Borinquen Field (now Rafael Hernandez Airport) Control Tower was likely built in 1941 under the direction of Graham, Anderson, Probst & White, Borinquen's architects and engineers (*Honolulu Star-Bulletin*, January 22, 1941; *Tampa Tribune*, January 23, 1941; *Defense* 1941:3). Less complicated to construct and perhaps even more important than the hangars, it was probably completed before them. It was standing by 1942, when a photograph of its cabin or cab was taken (**Photos 6.1-303** through **6.1-307**).

The Control Tower is a six-story, reinforced-concrete, truncated obelisk. It has four sides that taper in toward the top and chamfers at each corner, giving it a nominal octagonal footprint. Narrow incised bands in the concrete separate the floors. The first floor is additionally set off by a wider plinth-like footprint. The bottom bays originally held a centered entry on its north elevation and bays centered on two or three of the other elevations originally filled with metal grilles or louvers. Centered above at each side and story was a single bay also filled with grilles or louvers.

All of these upper bays are evident, although some have been closed in. Atop the fifth-story bays are four incised lines divided by three regularly spaced, five-pointed stars—the symbol of the US Army—rising within incised circles. An incised band rings the tower above these insignias.

A metal-and-glass flight control cab tops the tower. It was originally square, with three floor-to-ceiling windows on each side placed perpendicular to the ground. The centermost of each set, at least, swung open from the bottom for ventilation. By 1974 the cab had been replaced by an octagon with 12 full-height windows set in an angled-out metal frame. This cab also included a walkway around its windows and rails atop its roof. It too has been replaced.



Control Tower: Photo 6.1-303, left, note square cab and Hangar 5 to right, 1948; Photo 6.1-304, right, note octagonal shape of cab, 1974 (source of both: www.facebook.com/photo.php?fbid=10216325381198044&set=pcb.10156600523744313&type=3&theater).

Photo 6.1-305 Control Tower: view from cab, 1942 (source: http://rameyafb.net/war-years/).


Control Tower: Photo 6.1-306 views looking northwest; Photo 6.1-307 looking southwest

According to Warren Graff of the RAFBHA, after the base closed, the control tower "became non-operational until commercial jet service rose to the level that the airport…decided to bring the tower back to life around 2007." In 2015 it was renovated to add an elevator and new tower cab (www.facebook.com/photo.php?fbid=10216325381198044&set=pcb.10156600523744313&type=3&theater&ifg=1). The renovation was completed in 2015 when the new cab was hoisted to the building's top and the freestanding, concrete, elevator shaft—connected by a roofed glass walkway on the fifth story—was brought into service (**Photos 6.1-308** through **6.1-313**). The addition of an elevator was required for the tower to be brought back into service. The elevator supplanted the winding metal stair, still in place, that previously provided access to the cab.



Control Tower: Photo 6.1-308 (left) and Photo 6.1-309 (center), new elevator shaft and cab just after hoisting into place, 2015 (source: http://rameyafb.net/category/blog/page/11/); Photo 6.1-310, right, circular stair in 2009 (source: https://www.facebook.com/photo.php?fbid=1108193270675&set=g.137328899312&type=1&theater&ifg=1).

Photos 6.1-311 – 6.1-313, Control Tower: views looking S at tower, with concrete walls, form and insignia intact and 2015-added cab, elevator tower, and connector.

Individual Eligibility to the National Register

WWII-era hangars are apparently extremely rare. An extensive online search identified only a few that are relatively intact (if they still stand) in the continental United States (**Photos 6.1-314** through **6.1-317**). Two built in the early 1940s—one at the former Hendricks Air Force Base in Sebring, Florida; the other at the former Wendover Air Force Base in Utah—look like cabs set atop fire lookout towers. A substantial tower at the former Hutchinson Naval Air Station is the only remaining WWII control tower in Kansas (Ford 2012). A wide, three-story, masonry box topped by a cab, the Hutchinson tower is solid, but looks little like the Borinquen control tower. (Although the online search unearthed only three towers, presumably others still survive.)

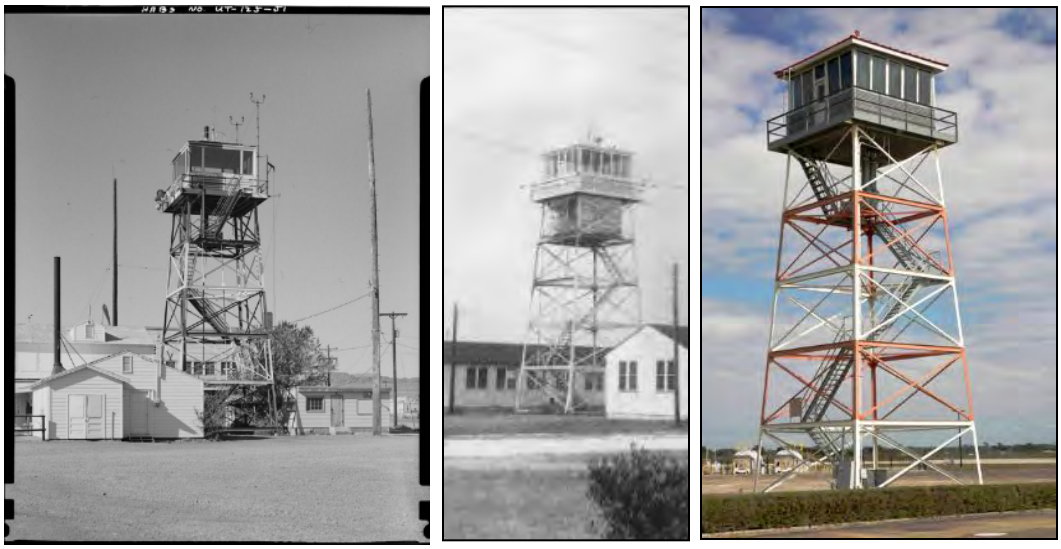


Photo 6.1-314, left, former Wendover Air Force Base Control Tower, c1989 (source: https://www.loc.gov/resource/hhh.ut0435.photos/?sp=1); Photo 6.1-315, center, and Photo 3.1-316, right, former Hendricks Air Force Base control tower in Sebring, Florida, c1955 (source: www.allenaltvater.org/chapter-6---hendricks-field-after-the-war.html) and c2014 (source: https://travelforaircraft.wordpress.com/2013/02/22/sebrings-ww-ii-atc-tower-blast-from-the-past-write/).

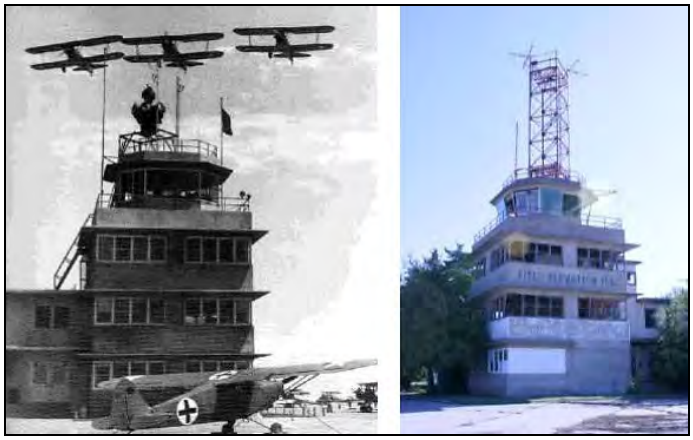


Photo 6.1-317, left, Hutchinson NAS control tower, c1950; right, control tower in 2008 (source: Ford 2012; photographer of 2008 image: Susan Jezak Ford)).

The National Register multiple property form for WW-II era aviation facilities in Kansas, which identifies and discusses the Hutchinson Tower, recommends significance and registration requirements:

> Control towers facilitated the takeoff and landing of aircraft and are one of the key distinguishable features of World War II-era Kansas airbases. These resources are primary resources—significant to the operation of the base during the war—and have the potential to be individually eligible for the National Register.
>
> Integrity of design, location, association, and setting are particularly important for control towers. The loss of some original materials is not as important a factor, particularly given the rarity of extant examples of this property type. These resources are individually eligible and can contribute to a historic district.
>
> The following registration requirements apply to control towers in addition to the general significance and registration requirements noted above:
>
> Control towers are significant under Criterion A in the area of military for their direct association with the federal government's wartime aviation operations from 1939 through 1945. To be eligible, the control tower must be located on a World War II-era airbase in Kansas and have been used as part of the government's wartime aviation operations.
>
> Control towers also may be eligible under Criterion C in the area of architecture and/or engineering. This Criterion is likely best justified by discussing the architectural style exhibited on the building, the tower's materials, and how its appearance was impacted by the design of the surrounding base features. To be eligible, the control tower must retain integrity of key character-defining elements in order to convey design. Integrity of materials is not as important as retaining massing and form. Additions should not overwhelm the original structure or obscure key elements.

These recommendations are not set in stone but do apply a rational standard for judging the National Register eligibility of WWII-era control towers. They have been taken into consideration in assessing the Borinquen Tower.

The design, body, and detailing of the Control Tower is intact, although some of its bays have been filled. The cab has been replaced, twice, which is not unusual for older towers. It additionally now has a modern subsidiary elevator tower, attached by a walkway, standing to its west. It has lost some materials and some of its setting through its alterations and adjacent elevator tower addition. It is believed that its design nonetheless remains largely intact and that it retains its integrity of location, workmanship, feeling, and association. The tower still stands along an airstrip within a former military facility, in the company of other contemporary buildings, most notably hangars 2, 3, and 5. It is believed to be historically significant under National Register Criterion A for the important role it played in the military during WWII and the Cold War. It clearly fits within the definition of the military area of significance, for it was built for "defending the territory and sovereignty of a people." The tower is further believed to be significant in the areas of significance of architecture and engineering under Criterion C as embodying the distinctive characteristics of its type, period, and method of construction. The hangar is not believed to be National Register eligible under Criterion B, for it has no known important association with the lives of persons significant in our past. It is also believed to be unlikely to yield information important in history that could not be collected from other sources and to therefore not be eligible under Criterion D. Due to its significance in the identified areas, and its retention of the integrity necessary to support that significance, the Control Tower is recommended as individually eligible for National Register listing under Criteria A and C. The recommended National Register boundaries for the tower are pictured below in **Figure 6.1-13**. They take in the immediate area around the it, including a section of apron. This area was historically associated with the tower.

Eligibility to the National Register as Part of a Historic District

The Control Tower is also believed to be National Register eligible as a contributing building to the Borinquen Field Concrete Hangars and Control Tower Historic District. This proposed historic district is discussed separately below.

6.1.7.5. BORINQUEN FIELD CONCRETE HANGARS AND CONTROL TOWER HISTORIC DISTRICT

The proposed Borinquen Field Concrete Hangars and Control Tower Historic District contains five buildings, Hangar 2, Hangar 3, a modern FedEx hangar, Hangar 5, and the Control Tower. Hangars 2, 3, and 5 are believed to be contributing buildings to the historic district. Hangars 2 and 3 and the Control Tower retain a substantial amount of integrity and are additionally recommended as individually eligible for Register listing (**Figure 6.1-13**). Hangar 5 is not believed to retain sufficient integrity to support individual listing but—due to its retention of its long-span, thin-shell, reinforced-concrete design—it is believed to have the integrity necessary to be a contributing building to the historic district. The fifth building within the district is a 1980s-era FedEx hangar (**Photos 6.1-318** through **6.1-320**). It occupies the site of a small building (Building

404x) erected between 1944 and 1947 (according to updates to the 1944 map) to support the three hangars. It is less than 50 years old and is not associated with Borinquen Field, Ramey Air Force Base, or the designs of Anton Tedesko. It is therefore believed to be a noncontributing building to the proposed historic district. Located between Hangar 3 and Hangar 5, it is included so that the historic district is not bifurcated and can encompass its four principal and contributing buildings.

Figure 6.1-13 Proposed National Register Boundaries of the Borinquen Field Concrete Hangars and Control Tower

Notes: Hangars and Control Tower Historic District outlined in yellow; Proposed individual boundaries for Hangars 2 and 3 outlined in red.

Noncontributing modern FedEx hangar: Photo 6.1-318, left, east side and north street-side elevations; Photo 6.1-319, right, north street-side elevation with Hangar 3 at center and Hangar 2 at far left.

Photo 6.1-320 Noncontributing modern FedEx hangar: east side and south runway-side.

Even with the modern hangar included, the other four buildings retain the same close physical relationship that they have had with each other since their construction (**Photos 6.1-321** through **6.1-330**). The inclusion of the modern hangar allows this relationship to be contained within the district, which is only minimally affected by the hangar's presence.

Photo 6.1-321 Borinquen Field, February 1944: (Left to right) Control Tower, Hangar 5, no-longer-extant building, Hangar 3, and Hangar 2 (source: United States Army Air Forces, DZ Europe 1946:20).

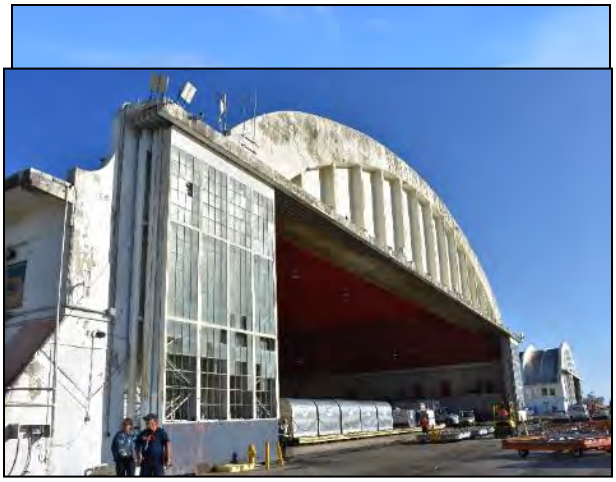


Photo 6.1-322, left, Views looking northeast; Photo 6.1-323, right, views looking northwest, (from left to right) Control Tower, Hangar 5, modern FedEx hangar, Hangar 3, and Hangar 2.

Photo 6.1-324, left Control Tower, Hangar 5, modern FedEx hangar, Hangar 3, and Hangar 2 (left to right); Photo 6.1-325, right, Hangar 3 with Hangar to at far right.

Photo 6.1-326, Left, Hangar 2 at left, Hangar 3 at center, and Hangar 5 at far right;
Photo 6.1-327, right, Control Tower at right, Hangar 5 at center, and Hangar 3 and Hangar 2 at far left.

Photo 6.1-328 Hangar 5 and Control Tower

Photo 6.1-329 Borinquen Field with Control Tower and Hangar 5 at far left, Building 404x and Hangar 3 at center, and Hangar 2 at far right in 1943.

Photo 6.1-330 Borinquen Field with Control Tower and Hangar 5 at far left, modern FedEx hangar and Hangar 3 at center, and Hangar 2 at far right in 1943;

The proposed Borinquen Field Concrete Hangars and Control Tower Historic District is believed to be historically significant under National Register Criterion A in the area of engineering for the early and important, long-span, thin-shell, reinforced-concrete design of Hangars 2, 3, and 5. It is also believed to be historically significant under Criterion A for the important role it played in the military during WWII and the Cold War. It clearly fits within the definition of the military area of

significance, for it was built for "defending the territory and sovereignty of a people." The concrete hangars and Control Tower are further believed to be significant in the areas of significance of architecture and engineering under Criterion C as embodying the distinctive characteristics of their type, period, and method of construction. And the district it is believed to be eligible under Criterion C as representing the work of a master, pioneering engineer Anton Tedesko. The district is not believed to be National Register eligible under Criterion B, for it has no known important association with the lives of persons significant in our past. It is also believed to be unlikely to yield information important in history that could not be collected from other sources and to therefore not be eligible under Criterion D. Due to its significance in the identified areas, and its retention of the integrity necessary to support that significance, the Borinquen Field Concrete Hangars and Control Tower Historic District is recommended as National Register under Criteria A and C. The recommended National Register boundaries for the district are pictured above at **Figure 6.1-7**. They take in the immediate areas around the buildings, including a section of apron to their south. This area was historically associated with all four contributing buildings.

6.1.8. COLD WAR-ERA SAC BOMBER MISSION ALERT FACILITY (SOUTH AND NORTH OF BQN RUNWAY)

In 1955 the US House of Representatives authorized $9,739,00 for SAC construction at Ramey. The money was to be used for "Airfield pavements, fuel dispensing facilities, aircraft maintenance facilities, operational facilities, utilities, land acquisition, personnel facilities, and harbor facilities" (*Congressional Record* 1955:8667). The money was used in large part to construct the alert facility buildings and associated taxiway 2, along with five nose dock hangars to the north of the facility.

Between 1957 and 1960, SAC began to reconfigure its aprons and support buildings in order to speed crews, planes, and nuclear weapons into the air. From one hour from notice to takeoff, which was a great leap from the earlier six-hour window, SAC worked on alert facility designs that would allow a plane to be in the air just 15 minutes after the sounding of an alert. This required reconfiguring aprons to eliminate sharp turns from the taxiway to the runway and putting necessary facilities, including crew quarters, next to the planes. Speed was necessary to thwart Soviet nuclear Intercontinental Ballistic Missiles. When the alert apron program was finished, most aprons were Christmas trees types (with taxiways angled at 45 degrees, which allowed easy runway access), a few were angled toward angled taxiways, and a few retained 90-degree angles.

In 1959 and 1960, SAC erected one of three types of standardized flight crew quarters—known as readiness crew or alert facilities or buildings—at 64 of its 65 bases. They were designed to hold 70, 100, or 150 men. Due to their uniform below-ground features, they became known as moleholes (Weitz 1999a:120):

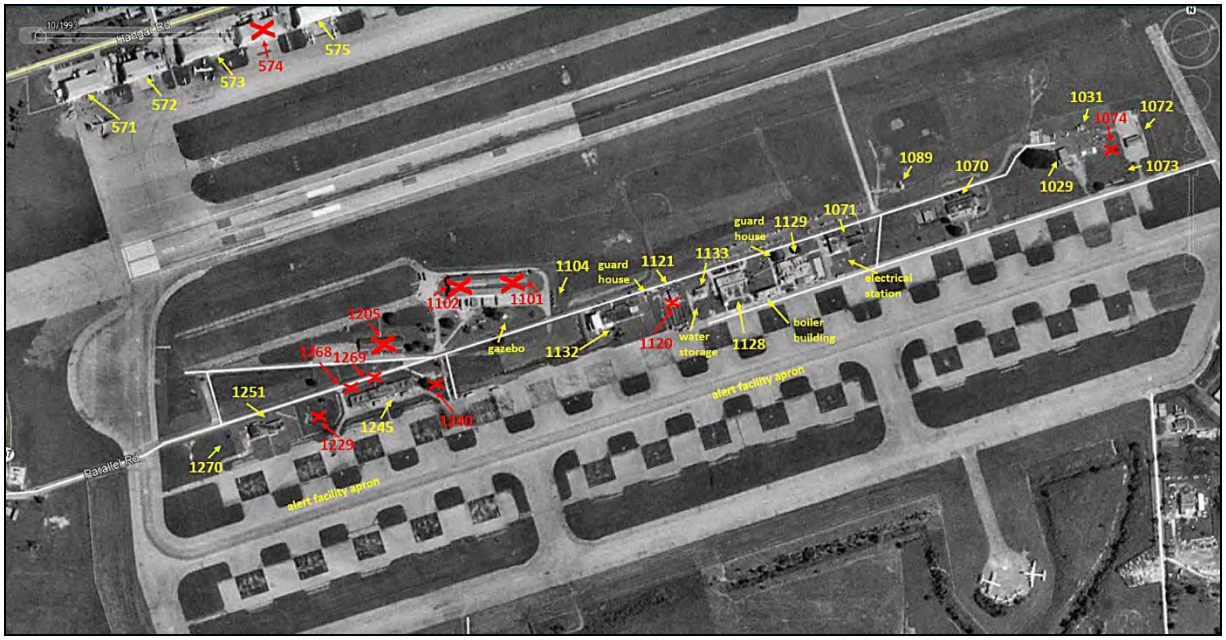
> Of reinforced concrete and concrete-block construction, moleholes were of two-story height, with one story below ground. These windowless alert quarters were identical everywhere, with tunnel-like egress covered in corrugated steel. In

selected cases, due to ground water table conditions, the moleholes were built fully aboveground, with the lower story earthen bermed for semi-hardening.

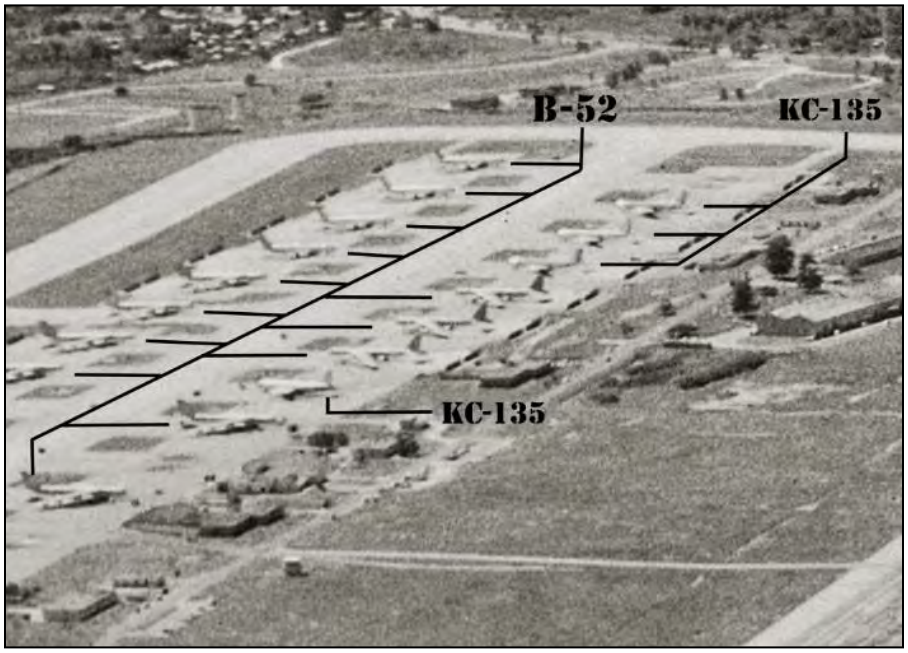
The single base that did not receive one of the standardized moleholes was Ramey. A historic assessment of SAC facilities and their buildings could not confirm, from documentary sources, whether the standardize facility planned for Ramey was erected. The readiness crew building at Ramey, which is not two stories and has no in-ground portion, confirms that it was not (Weitz 1999a:122).

Further, Ramey never received a Christmas tree type apron, but rather had its bombers berthed perpendicular to the alert apron. This required the plane to make three 90-degree turns before it reached the runway for takeoff. The main indicator of the alert apron's SAC function was its placement near one end of the runway. In its taxiway and readiness building, Ramey was an anomaly.

The alert facility has lost some original buildings, particularly along its long apron and taxiway. It retains others, some largely intact, some heavily altered. The 29 surviving resources of the alter facility are addressed individually below. Following that assessment, a potential alert facility historic district is evaluated (**Photos 6.1-331 – 6.1-332**).



1 Photo 6.1-331 Alert Facility in 1993 with extant and no-longer-extant resources mapped (Google Earth base map)



2 Photo 6.1-332 Alert Facility, early 1960 (RAFBHA 2015c)

3 6.1.8.1. BUILDING 1270 (STORAGE)

4 Documents do not identify the use of this building. Its rough appearance, lack of windows, and
5 single entry suggest it was used for storage (**Photos 6.1-333** through **6.1-335**). The building's
6 vents, louvers, and small size suggest it stored mechanical equipment. It was erected between
7 about 1956 and 1959 along with the other early resources at the alert facility. It has stood vacant
8 since at least 1999 (Giles 2019; RAFBHA 1999 and 2015c).

The building is small, rectangular, and contains a single room. Its concrete-block construction was left exposed. Its roof is flat with overhanging eaves. Ventilators holes cross the top of its west side elevation. At its south front elevation, louvers top its single entryway, which has lost its door.

The building stands at its original location and retains some of its setting. Due to its physical changes, it appears to have lost much of its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1270 (Storage): Photo 6.1-333, left, W side and S front elevations; Photo 6.1-334, right, north rear and W side elevations; bottom, south front elevation.

Photo 6.1-335 Building 1270 (Storage): S front elevation.

6.1.8.2. BUILDING 1251 (TARGET INTELLIGENCE)

A target intelligence or combat building or facility—the names are interchangeable—was required to train aircrew members in the techniques of identifying targets identification and developing proper bombing procedures. Such buildings were generally erected with crew study rooms, classrooms, a large room for specialized instruction and briefings, a library, and administrative and instruction offices. This target intelligence building was erected between about 1956 and 1959. Modern aerials indicate that it was at least partially in use or maintained from the early

1990s up to about 2010 (Department of the Air Force 1971:7-4; Giles 2019; RAFBHA 1999 and 2015c). According to Pat Allen, a navigator at Ramey from 1967 to 1970, his six-man, B-52 crew would receive mission assignments in the building. They would study the mission's details and be tested on their understanding of it. After they flew test missions, they would be debriefed at the facility (Allen 2011).

The building is essentially two one-story rectangles of different depths that form a flush elevation on the front (south-facing) facade (**Photos 6.1-336** through **6.1-339**). The section on the west is deeper than the one on the east. Stuccoed concrete block topped by a flat roof with overhanging eaves forms the building. Plain concrete pilasters are regularly spaced along the elevations. They are divided by a narrower, horizontal, beltcourse-like projection. The windows of the building's western section have been walled in, but for small glass-block-filled bays set above the beltcourse. These window openings were originally wider, but not deeper. The windows in the eastern section, also small and filled with glass block, appear to have been even wider before they too were walled in. A projecting covered entry bay to the building's front is an early or original feature. A longer one to the rear (north) may have been added after the military left. Once divided into multiple rooms, the interior is now essentially a large open space containing numerous heavy-duty, floor-to-ceiling, storage racks. There is also evidence of some later subdivision of space. This suggests that after 1999 it was used as a storage building by a non-military enterprise.

Building 1251 is at its original location and retains some of its original setting but appears to have lost its integrity through the blocking up of large portions of its windows and the gutting of its interior. All the original functions it was built to perform are no longer apparent due to its interior changes. Due to its many physical changes, it has otherwise lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The SAC and Air Force erected many target intelligence buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1251 (Target Intelligence): Photo 6.1-336, left, west side and south front elevations; Photo 6.1-337, right, south front elevation.


Building 1251 (Target Intelligence): Photo 6.1-338, left, south front elevation; Photo 6.1-339, right, interior

6.1.8.3. BUILDING 1245 (READINESS CREW FACILITY)

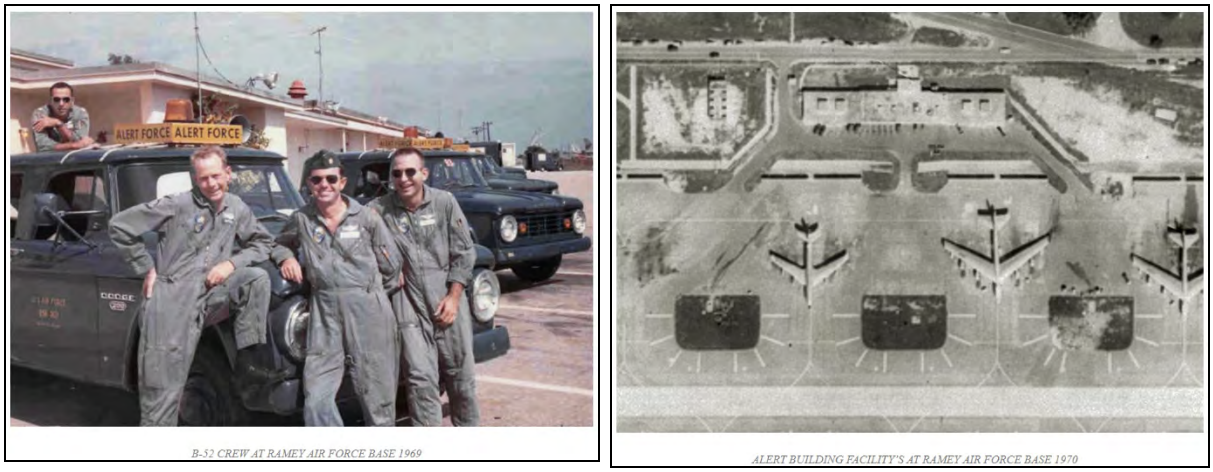
Also known as the alert facility or building, Building 1245 was built in the late 1950s but did not conform, as described above, to the standardized design of SAC readiness crew facilities. Modern aerials indicate that it was at least partially in use or maintained from the early 1990s through about 2010 (Giles 2019; RAFBHA 1999 and 2015c). The removal of numerous interior walls, however, suggest that it may have been used for storage at a later date.

According to navigator Pat Allen, in the late 1960s his six-man, B-52 crew (along with other crews) was on alert for 24 hours for a full seven days at a time. They then received four days off. During the week of alert, they slept, ate, and did just about everything else in the readiness crew building. The building included sleeping quarters for each six-man crew. Additionally, it held a dining room, a briefing room that doubled as a movie room, and pool, ping pong, and card tables. Eight bombers were on alert at all times, according to Allen, so the building would always be occupied by eight crews (Allen 2011).

The readiness crew facility is a long, one-story, rectangular, concrete-block building (**Photos 6.1-340** through **6.1-349**). Regularly spaced, concrete pilasters cross the front (north-facing) central third (or perhaps 40 percent) of the building. In front of them are slender columns forming a portico that supports a flat porch roof set a bit lower than the building's principal, flat, concrete roof. This central section of the facade had long window bays that were walled in, perhaps early in the building's life. The eastern and western thirds (or a bit less) of the facade appears to have always lacked windows. Vestibules with side doors project from the centers of the eastern and western sections and lead into them.

Inside, the central section appears to have always been a large open space with exposed structural columns running down its center. This space likely held the common areas for briefings, movies, and activities mentioned by Pat Allen. The eastern and western sections were broken up into small rooms for the crews. The south-facing vestibules at each section opened into a central corridor. To either side of each corridor were six or eight small rooms. One of these rooms was a bathroom with showers, urinals, and toilets; the others provided sleeping and other space for the eight six-man crews that the building held at all times. The western and eastern sections of the

building were windowless. Half-story extensions, however, projected above each of the four bathrooms. These apparently housed air conditioning units, along with now-windowless openings that would have added additional ventilation as well as some natural light. Walls have been removed from both sections: the eastern one retains perhaps three-quarters of its partition walls, the western one only about one-quarter. The surviving bathrooms retain some gray-green tile walls, which are likely original.



Building 1251 (Target Intelligence): Photo 6.1-340, left, south front elevation, 1969; Photo 6.1-341, right, building at top center, 1969 (source: RAFBHA 2015c).

Building 1245 (Alert Facility): Photo 6.1-342, left, west side and south front elevations; Photo 6.1-343, right, south front elevation.

Building 1245 (Alert Facility): Photo 6.1-344, left, south front and east side elevations;

Photo 6.1-345, right, north rear elevation.

Building 1245 (Alert Facility): Photo 6.1-346, left, interior of eastern crew section; Photo 6.1-347, right, interior of central common section.

Building 1245 (Alert Facility): Photo 6.1-348, left; Photo 6.1-349, right, interior of western crew section.

Building 1245 is at its original location and retains some of its original setting, but otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association through the blocking up of its windows and the removal of most of its interior walls. These changes make it difficult to understand the building's original functions—central to its appearance and construction—from surviving architectural evidence. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. SAC erected many readiness crew facilities at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. Such facilities survive at former SAC bases that are more intact and that much better represent the standardized form of the building. These include Building 679 at Forbes Field in Topeka, Kansas that was recommended as National Register-eligible under Criterion A and C in 2008 (Kansas Air National Guard 2008:4-15 to 4-18, 5-5 to 5-6) (**Photos 6.1-350** and **6.1-351**). Building 1245 does not represent the character-defining features for its type identified in Karen Weitze's account of SAC

bomber bases (Weitze 1999a:107-124, 155-157). It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Photos 6.1-350 and 6.1-351 Readiness Crew Building 679 at Forbes Field, Topeka, KS, 1960; note tubular entries leading to belowground level (source: Kansas Air National Guard 2008:4-15)

6.1.8.4. GAZEBO

The heavily overgrown remains of what may have been a gazebo or picnic shelter stand in a roughly rectangular area of ground that 1964 and 1968 base maps identify as the "alert force picnic area." The area, located a short distance northeast of the readiness crew building, may have near the parking lot where on-alert SAC flight crews could visit with their families (Allen 2011). The structure is not visible in aerial photographs and not noted on maps, likely because of its modest appearance and function. It may date from the 1960s, however.

The former structure retains portions of ten concrete-block posts spaced to form a rectangle. Its concrete floor slab remains in place, but its roof is gone (**Photos 6.1-352** through **6.1-354**).

The gazebo is at its original location and retains some of its setting, but its integrity appears to have been lost through the loss its roof and damage to its posts. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Gazebo: Photo 6.1-352, left, concrete-block post; Photo 6.1-353, right, navigator Pat Allen with daughter in parking lot just outside of fence, likely near picnic area, late 1960s (source: Allen 2011).

Photo 6.1-354 Gazebo: concrete-block posts

6.1.8.5. BUILDING 1104 (STORAGE AND SUPPLY)

Building 1104 was built in the late 1950s as a storage structure. Modern aerials indicate that it was at least partially maintained from the early 1990s through about 2010 By 1999 it stood vacant (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

This building is one-story tall and built of concrete block (**Photos 6.1-355** through **6.1-357**). It is shaped like a comb with four widely spaced teeth. Its long east rear and shorter south and east side elevations are of solid concrete block, but for groups of tripled ventilation holes beneath its flat, overhanging, concrete roof. At its front (west-facing) elevation, it has four protruding sections finished on their west like the other elevations. They embrace three U-shaped recesses that are lined with concrete shelves. The shelving is exposed, but remains of wooden frames suggest they were originally enclosed by wooden doors.

Building 1104 is at its original location and retains some of its original setting. It has lost the many wooden doors that once protected the contents of its storage shelves. Due to their absence, it appears to have lost much of its integrity of design, materials, workmanship, feeling, and association has been lost. Further, the Air Force erected many such support buildings at Ramey

and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1104 (Storage and Supply): Photo 6.1-355, left, east rear and north side elevations; Photo 6.1-356, right, west front elevation

Photo 6.1-357 Building 1104 (Storage and Supply): west front elevation

6.1.8.6. BUILDING 1132 (SQUADRON OPERATIONS)

Building 1132 was built in the late 1950s to house squadron operations. At some point after it left military hands in the early 1970s, it was leased or acquired by American V. Mueller or American Critical Care, manufacturers, respectively, of surgical equipment and pharmaceuticals. Both were divisions of the American Hospital Supply Corporation of Chicago. American Critical Care had operations in Puerto Rico by 1980. The company dramatically altered the building to suit their production needs. Modern aerials indicate that it was in use or at least maintained from the early 1990s through about 2010 (*Chicago Tribune,* September 14, 1980; Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

The building is long and rectangular with extensions at each of its elevations (**Photos 6.1-358** through **6.1-361**). It is built of plastered concrete blocks and topped by a flat concrete roof. It retains a few long window bays; the others have been blocked in. Extended from its west side elevation is a round-edged addition of one story with an apparent second story that is actually parapet walls without an upper roof. The walls hid large generators from view. The building has

been extended by flat-roofed, one-story additions on the north (rear) and south (front) elevations. A loading dock has also been added to its east. These changes were made by the pharmaceutical company that took it over as a manufacturing facility. The company extensively reworked the interior adding multiple partition walls along with dropped ceilings.

Building 1132 is at its original location and retains some of its original setting, but appears to have lost its integrity of design, materials, workmanship, feeling, and association through the enclosure of most of its windows, the construction of extensions on all four of its elevations, and the near complete reworking and partitioning of its interior. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1132 (Squadron Operations): Photo 6.1-358, left, west side and south front elevations; Photo 6.1-359, right, south front and east side elevations.


Building 1132 (Squadron Operations): Photo 6.1-360, left, north rear and west side elevations; Photo 6.1-361, right, post-military-period partition walls and dropped ceiling.

6.1.8.7. GUARD HOUSE

This guard house stands just north of Building 1132. It was built following the closure of Ramey Air Force Base. Its finish, color scheme, awnings, and location indicate that the pharmaceutical

company that took over Building 1132 erected it, likely in the mid-1970s. Modern aerials indicate that it was in use or at least maintained from the early 1990s until about 2010.

Built of concrete and topped by a widely overhanging flat roof, the guard house has a guard room on the north facing a former road with windows looking north, east, and west (**Photos 6.1-362** and **6.1-363**). A bathroom is contained in its southeastern corner.

This building is less than 50 years old and not of exceptional importance. It is therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.


Guard House: Photo 6.1-362, left, west side and south front elevations; Photo 6.1-363, right, south front and east side elevations

6.1.8.8. BUILDING 1121 (ELECTRICAL STATION)

The former electrical station was erected in the late 1950s. Modern aerials indicate that it was in use or at least maintained from the early 1990s until about 2010 (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c). It is heavily overgrown, has wires down on it from utility poles, and could not be carefully viewed or approached.

The AM Group in 2018 described it as a small, rectangular, concrete-block building with concrete beams and a concrete slab roof (**Photos 6.1-364** through **6.1-365**). Its south rear and east and west side elevations are described as having windows. These are glass on the south elevation and "contemporary, Miami style, aluminum louvered windows" on the south (AM Group 2018:56-57). The front (north-facing) elevation, which could be partially viewed as part of the current survey, has a single metal door and no windows.

Building 1121 is at its original location and retains some of its original setting. However, it appears to have lost much of its integrity of design, materials, workmanship, feeling, and association through the replacement of windows and likely the north entry door as well. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and

elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1121 (Electrical Station):Photo 6.1-364, left, north front elevation; Photo 6.1-365, right, north front and west side elevation (source: AM Group 2018:94).

Photo 6.1-366 Building 1121 (Electrical Station): interior (source: AM Group 2018:94)

6.1.8.9. BUILDING 1133 (CAPTIVE WATER SUPPLY TANK BUILDING)

The former captive water supply tank building was erected in the late 1950s. The area around it was maintained, according to aerials, until the early 2010s. It was probably used by Arnar-Stone Laboratories in its pharmaceutical production beginning around 1975 (see entry for Building 1129, below) (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c). Like Building 1120 just to its west, it is vacant and heavily overgrown, has wires down on it from utility poles, and could not be carefully viewed or approached along its north elevation.

The AM Group in 2018 described it as a small, rectangular, concrete-block building with concrete beams and a concrete slab roof, similar to Building 1120 just to its west (**Photos 6.1-367** through **6.1-370**). The north elevation, they write is open, overlooking a 12-foot diameter tank as long as the building. The west elevation has "Miami aluminum louver style" windows that are not original. The east elevation has no windows (AM Group 2018:57).

Building 1133 is at its original location and retains some of its original setting. It appears to have some of its integrity of design, materials, workmanship, feeling, and association through the replacement of two windows. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1133 (Captive Water Supply Tank Building): Photo 6.1-367, left, north rear elevation with gray water tank; Photo 6.1-368, right, west side and south front elevations (source: AM Group 2018:98).


Building 1133 (Captive Water Supply Tank Building): Photo 6.1-369, left, south front and east side elevations; Photo 6.1-370, right, interior looking northwest with large tank on right (source: AM Group 2018:98).

6.1.8.10. WATER STORAGE BUILDING

Just east of the captive water building is the water storage building. It was built after Ramey Air Force Base closed and does not appear on the 1964 or 1968 maps (Giles 2019; RAFBHA 1999 and 2015c). According to aerial imagery, it was built between 1993 and 2002, probably by Arnar-Stone Laboratories to support its pharmaceutical production (see entry for Building 1129, below).

The resource consists of a small concrete-block building topped by a flat concrete roof with overhanging eaves (**Photos 6.1-371** through **6.1-373**). It is surrounded by a concrete-block wall

and chain-link or cyclone fencing that extends to the north, encompassing two fiberglass water tanks that are exposed to the elements. Metal pipe railings extend over the tanks.

This building is less than 50 years and not of exceptional importance. It is therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Water Storage Building: Photo 6.1-371, left, north elevation; west side and south front elevations; Photo 6.1-372, right, north elevation framed by chain-link fencing.

Photo 6.1-373 Water Storage Building: November 2006 aerial showing Building 1131 at top (north) and water storage building below (to the south)

6.1.8.11. BUILDING 1128 (ARMAMENTS AND AVIONICS SHOP)

The northern third of this building was erected in the late 1950s as the armaments and avionics shop. After Ramey Air Force Base closed in the early 1970s, and no later than 1993 according to a Google aerial image, a large addition was added to the south that almost tripled the size of the building's size. (As discussed at the following entry for Building 1129, the changes were probably made in 1975.) It was likely connected with the operations of Arnar-Stone Laboratories, which took over and greatly altered neighboring Building 1129 in 1975. The building currently stands

vacant and greatly deteriorated (*Chicago Tribune*, April 14, 1976; Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

The original rectangular rear block is one-story tall (**Photos 6.1-374** through **6.1-377**). Like the other contemporary alert facility resources, it is built of concrete block with concrete columns and topped by a flat overhanging concrete roof. The rear block was apparently once lit by long windows, many of which have been filled in. The later southern two-thirds of the building has concrete-block walls with no windows. Unlike the other alert facility resources, steel I-beams form the building's structural body. Two wide entryways with shielding eaves face south. A rectangular, one-story, flat-roofed, concrete addition—also post-military—projects to the building's west. The building is heavily overgrown and was deemed unsafe to enter, so it is unclear how extensively the interior of its original block was altered. Arnar-Stone Laboratories probably altered its interior to suit its industrial needs.

This building has been added to and heavily altered. Approximately two-thirds of it was built less than 50 years and is not of exceptional importance. It remains in its original location and retains some of its setting, but otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1128 (Armaments and Avionics Shop): Photo 6.1-374, left, western third of S front elevation; Photo 6.1-375, right, central third of S front elevation

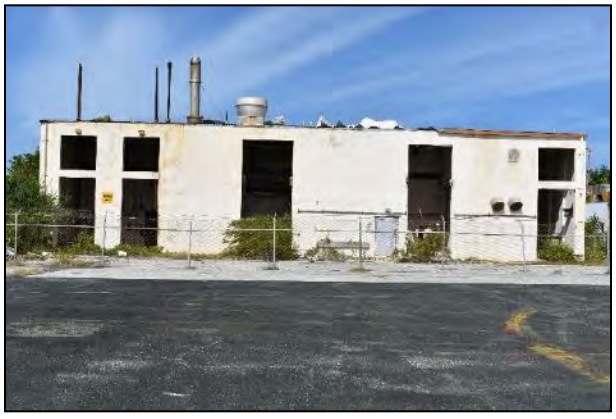

Building 1128 (Armaments and Avionics Shop): Photo 6.1-376, left, south front and east side elevations; right, south front elevation.

6.1.8.12. BOILER BUILDING

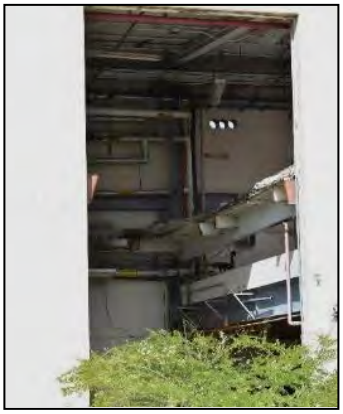
This building does not appear on base maps of 1964 and 1968 and was not built by the Air Force. It was standing at the taking of a1993 aerial but was likely built in the late 1970s to support Arnar-Stone's pharmaceutical manufacturing just to the east in Building 1129. Aerial images suggest it has been vacant for at least ten years.

The long tall building was apparently built to hold boilers and other heavy equipment, all of which have been removed (**Photos 6.1-378** through **6.1-381**). It is of concrete construction with additional I-beam support. Unlike other buildings at Ramey, it is topped by a corrugated-metal shed roof, which slopes to the south. Five nearly full-height opening cross its front (south) elevation. Three are divided about two-thirds of the way up by cross beams; these were once present at the two central bays but have been cut away. Indeed, portions of the floor of a second or mezzanine level have been cut away to facilitate the removal of the boilers and other equipment. Only a few doors and windows pierce the east and west side and north rear elevations. Various pipes and other equipment-related openings mark the rear elevation and, particularly, the roof.

This building is less than 50 years and not of exceptional importance. It is therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Boiler Room: Photo 6.1-378, left, west side and south front elevations; Photo 6.1-379, right, south front elevation



Boiler Room: Photo 6.1-380, left, east side and north rear elevations; Photo 6.1-381, right, view into center front bay showing cutaway floor.

6.1.8.13. GUARD HOUSE

A tiny guardhouse identified as “13 Traffic and Access Control Guard Station” by AM Group in 2018 was not recorded. It was likely completely engulfed by overgrowth and not seen during this survey. AM Group (2018:61) described it as follows (**Photos 6.1-382** and **6.1-383**):

> This is a small concrete building close to and northwest of 1129. It is made of concrete with a concrete roof slab. It has a square configuration with its southeast corner chamfered. It has an entrance and a window on its east facade. Other windows are in the south and west facades. It is covered with vegetation and is not accessible due to a locked gate blocking its entrance. This building, however does not display the older buildings' construction methods. It is a contemporary auxiliary building made to serve the later usage these buildings had.

The guard house is not included on the 1964 or 1968 maps of the base. It would not have been built by the military, as it would not have had a function on the base; the buildings to either side of it did not require a separate guard. In all likelihood it was erected by Arnar-Stone Laboratories around 1975 to limit access to their manufacturing facilities. It is less than 50 years and not of

exceptional importance. It is therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Guard House: Photo 6.1-382, left, south side and east front elevations; Photo 6.1-383, right, east front elevation (source of both: AM Group 2018:118).

6.1.8.14. BUILDING 1129 (ARMAMENTS AND ELECTRICAL SHOP)

Building 1129, which housed armaments and electrical shops, was erected between about 1956 and 1959 (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c). Arnar-Stone Laboratories, based in the Chicago area, opened a pharmaceutical production facility here in 1975. Modern aerials indicate the building was at least partially used or maintained up until about 2010. It is currently vacant and heavily overgrown *(Chicago Tribune,* April 14, 1976; *Miami Herald*, November 6, 1977).

Most of the core first story of this long building is original, if heavily altered, construction (**Photos 6.1-384** through **6.1-388**). It appears to be built of concrete block, but much of its original wall surface is hidden by 1975 extensions along its west side and front (south-facing) elevations and at its northwest corner. The additions, likely of concrete block, are fitted out with modern, single-light windows. Even more dramatic was the addition of a partial second story on the south—some of the bays of which are empty or filled in—and the construction of a metal platform over the body of the remaining part of the building. This platform supports a complex web of oversized pipes, ducts, and machinery that were central to the manufacture of pharmaceuticals. The building was not entered during this survey but AM Group looked at a portion of its interior: "Its interior is full of industrial wastes, which include a large number of vials full of unknown chemicals. Building materials dangles everywhere. Most rooms have no windows and signs reveal the possibility of that hazardous materials were handled when last in use" (AM Group 2018:61).

Arnar-Stone had a profound effect on this central section of the former alert facility, heavily altering or in some cases erecting, Building 1133, the Water Storage Building, Building 1128, the Boiler Building, the Guard House, this building, and the Electrical Station with water tank to its east. Like the others that Arnar-Stone took over, this building has been heavily, indeed almost unrecognizably, altered. Although it remains at its original location and some of its setting in intact, it appears to have lost its integrity of design, materials, workmanship, feeling, and association

through its many additions and reworkings, which obscure its original appearance and functions. Additionally, the building has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1129 (Armaments and Electrical Shop): Photo 6.1-384, left, west side and south front elevations; Photo 6.1-385, right, south front front elevation.


Building 1129 (Armaments and Electrical Shop): Photo 6.1-386, left, addition at southeast corner; Photo 6.1-387, right, addition along west side elevation.

Building 1129 (Armaments and Electrical Shop): Photo 6.1-388, south front elevation with Boiler Building at left.

6.1.8.15. ELECTRICAL STATION

Aerial photographs indicate that the electrical station and the large water tank to its rear (south) were erected in 2004 or 2005. Later aerials indicate that it was vacant, unmaintained, and heavily overgrown by 2015.

The building is small and rectangular (**Photos 6.1-389** and **6.1-390**). A flat concrete roof with a wide overhang tops its concrete-block walls. The south elevation retains glass windows. Window bays on the east and west side elevations contain louvers. The large aboveground water storage tank to the rear (north) is built of metal, rusting at the seams, and topped by a low conical roof. A metal cage frames a ladder that still climbs its west-facing section.

This building and the tank are less than 50 years and not of exceptional importance. They are therefore not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Electrical Station: Photo 6.1-389, left, east and south elevations with water tank looming to rear; Photo 6.1-390, right, east and south elevations

6.1.8.16. BUILDING 1071 (SQUADRON OPERATIONS)

The squadron operations building was erected between about 1956 and 1959. It is almost rectangular with a projection at its southwest that gives an L-shaped footprint. Like the other contemporary buildings in the alert area, it was likely built at one time. Its L-shape appears on the 1964 and 1968 base maps. Modern aerials indicate that it was at least partially in use or maintained from the early 1990s up to about 2010. It is now vacant and heavily overgrown (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c). The building looks much like a 1972-73 photograph of the 53rd Weather Reconnaissance Squadron building (**Photo 6.1-391**). (The 53rd began operating at the base in 1956 (RAFBHA 2015c).) That building, though, has paired as well as tripled windows, unlike Building 1071. Additionally, other buildings at the base had similar facades and window treatments. The presence of the former weather observation tower a short distance to the northeast, though, leaves the question of whether this was the Weather

Reconnaissance building open to question. The building's use in the late 1970s is known for sure. At that time, it was converted to serve as the terminal for BQN (Giles 2019).

Photo 6.1-391 53rd Weather Reconnaissance Squadron building, 1972-73 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/).

The building is one-story tall with concrete-block walls, concrete piers that project forward as pilasters, and a flat concrete roof (**Photos 6.1-392** through **6.1-396**). Many if not all of its windows appear to have been modernized. This likely happened in the late 1970s when it was converted to terminal use. (Some window bays may retain their original aluminum frames or were replaced by similar frames.) An extension at the building's eastern end was likely made when the terminal took over the building. Its north face, looking toward the runway, contains an entry set in floor-to-ceiling glass that resembles, as AM Group (2018:62) notes, an all-glass store front. Another alteration is the open concrete-block wall on the western end of the north elevation that appears to have been built to screen a loading area, perhaps for luggage and cargo. The interior was not viewed, but a photograph by AM Group suggests that it has been altered, which would have been required in the transition to terminal use.

Building 1071 is at its original location and retains some of its setting. It appears to have lost its integrity of design, materials, workmanship, feeling, and association through the replacement of windows, changes to bays, an addition, and reconfiguring for use as the airport's terminal. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore

recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1071 (Squadron Operations): Photo 6.1-392, left, west side and north rear elevations; Photo 6.1-393, right, north rear elevation


Building 1071 (Squadron Operations): Photo 6.1-394, left, N rear elevation with top of water tank at electrical station to rear; Photo 6.1-395, right, E side and N rear elevations

Photo 6.1-396 Building 1071 (Squadron Operations): left, N elevation of E wing with modern entry and windows; right, interior with partition wall alterations (source: AM Group 2018:122)

6.1.8.17. BUILDING 1089 (WEATHER OBSERVATION TOWER)

Building 1089 was erected by Ramey as a weather observation tower between about 1956 and 1959 (**Photos 6.1-397** through **6.1-399**). (It appears on an aerial taken in 1959-60.) When the base left military hands completely in 1974, its control tower was closed. Until that tower was

renovated and brought back into operation in 2007, BQN operated as a "non-towered" or "uncontrolled" airport. During this period, the weather observation tower was used, as best as possible, as the airport's control tower (Giles 2019; RAFBHA 1999 and 2015c; FAA 2018).

Photos 6.1-397 through 6.1-399, Building 1089 (Weather Observation Tower) in 1966 (sources, left to right: facebook.com/photo.php?fbid=10216498930176660&set=gm.10156654112324313&type=3&theater&ifg=1; facebook.com/photo.php?fbid=4571727230190&set=g.137328899312&type=1&theater&ifg=1; facebook.com/photo.php?fbid=620456868004822&set=g.137328899312&type=1&theater&ifg=1)

The building consists of a one-story base with a glass-filled cab above (**Photos 6.1-400** through **6.1-403**). The nearly square base is built of concrete blocks with concrete corner posts. Its south elevation holds a boarded-up bay that has lost its original window glass. The east elevation has no bays. The north once held a window bay, evidenced by a plain projecting concrete sill, that has been blocked in. On the west is an off-center door that has been replaced. A metal stair climbs in a single run to a landing above that door. Pipe railings at the stair have been altered at least where they attach at the landing. The landing continues around the north, east, and west sides of the cab as a narrow pipe-railed balcony. From the landing, a glass door leads into the cab, which has nearly floor-to-ceiling glass windows. All four elevations slant outward and each elevation has a central window with two lights, a large light at the top and a narrower one at the bottom that apparently once opened for ventilation. Flanking the two-part windows are windows with a single full-height light and the glass entry. Aluminum frames all of the windows and the entry. The interior, which has been stripped of its equipment, retains some desks and cabinets that are not original to the building. A flat roof tops the cab.

The former weather observation tower is at its original location and retains some of its setting. It appears to have lost some of integrity of design, materials, workmanship, feeling, and association through the blocking in of a window, replacement of a door, and some alteration to its stair railings. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the

continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1089 (Weather Observation Tower): Photo 6.1-400, left, west and south elevations; Photo 6.1-401, right, north and west elevations.


Building 1089 (Weather Observation Tower): Photo 6.1-402, left, south and east elevations; Photo 6.1-403, right, interior of cab with equipment removed, looking toward runway and early hangars.

6.1.8.18. BUILDING 1070 (AIRCRAFT MAINTENANCE ORGANIZATIONAL SHOP)

Building 1070, a former aircraft maintenance organizational shop, was erected between about 1956 and 1959. Modern aerials indicate that it was at least partially in use or maintained from the early 1990s up into the 2010s. It is now vacant (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

The design and appearance of the building conforms with the others built at the alert facility in the late 1950s (**Photos 6.1-404** through **6.1-407**). It is one-story tall and built of concrete blocks covered in plaster. Concrete pilasters that are also beams are spaced regularly across its elevations. A flat overhanging concrete roof covers it. It was once lit by long window bays, but all the original windows are gone, their bays either completely blocked or reduced to relatively small, glass-block-filled openings tucked beneath the eaves. The surviving metal doors are not original. A doorway on the north elevation has been blocked in. A one-bay addition extends along the length of the building's east side elevation.

Building 1070 is its original location and retains some of integrity of setting. However, it appears to have lost its integrity of design, materials, workmanship, feeling, and association through the blocking in, or almost complete blocking in, of all of its windows bays, the loss of its original windows and doors, and the addition of an ell on its east side. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1070 (Aircraft Maintenance Organizational Shop): Photo 6.1-404, left, south front elevation, central door; Photo 6.1-405, right, south front elevation.

Building 1070 (Aircraft Maintenance Organizational Shop): Photo 6.1-406, left, east side and south front elevations; Photo 6.1-407, right, west side and north rear elevations (source: AM Group 2018:134).

6.1.8.19. BUILDING 1029 (GROUND SUPPORT EQUIPMENT SHOP)

A former ground support equipment shop, Building 1029 was erected between about 1956 and 1959. Modern aerials indicate that it was at least partially in use or maintained from the early 1990s up to, perhaps, the present. It appears to still be utilized at times as a repair shop or for equipment storage (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

The rectangular core of this building is one-story tall and built of concrete block that has been plastered (**Photos 6.1-408** through **6.1-411**). Concrete beams project as pilasters along its

elevations. It has three slightly recessed panels across its north and south elevations and five recesses along its longer east and west side elevations. A concrete-block band level with the pilasters rings the building. Tall sets of louvers in the right and left panels at the north elevation—the central panel holds a garage door—and in the three northern panels on the side elevations provide ventilation and light to the interior. They are underpinned with a projecting concrete band or beltcourse and topped by an additional row of narrow, concrete-block-filled recessed panels that appear to be original. At the south elevation, this subsidiary set of panels is lacking. The central panel holds a garage door and the panels to either side have a band of three narrow louvered openings that extend out into another set of three louvers on low wings that project to the side. The south louvers are shaded by wide overhanging eaves, which mark both wings. The fluid connection of the wings with the main block suggest the entire building was erected at the same time. Building 1029's appearance is unique on the alert facility flight line. It is the only clearly mid-century-modern building, if in a limited and functional way. The interior of the main block is a straightforward utilitarian space with exposed metal trusses and concrete block. The interiors of the wings were not accessible.

Building 1029 is at its original location and retains much of its setting. It has been little altered and therefore appears to retain much of its integrity of design, materials, workmanship, feeling, and association. However, the building was a functional airbase shop and has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. Accordingly, it is recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1029 (Ground Support Equipment Shop): Photo 6.1-408, left, south front and east side elevation, central door; Photo 6.1-409, right, east side and north rear elevations.


Building 1029 (Ground Support Equipment Shop): Photo 6.1-410, left, north rear and west side elevations; Photo 6.1-411, right, interior looking north through rear louvers.

6.1.8.20. BUILDING 1031 (ELECTRIC POWER STATION)

Building 1031, a former electric power station, was erected in the late 1950s. Modern aerials indicate that it was in use or at least maintained from the early 1990s until close to the present (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c). It appears to no longer be used.

The building is nearly square and one-story tall (**Photos 6.1-412** through **6.1-414**). A flat roof tops its concrete-block walls. The front (south-facing) elevation holds a replacement door and an eight-light casement window that may be original. Two large bays at the east have been blocked over, but for some large later louvers added at their tops. A smaller bay on the north has been fully enclosed by concrete block. The west elevation, largely screened by a shed of sheet metal and chain-link fencing, has no openings. Inside, two concrete pads likely once held generators or other equipment.

Building 1031 is at its original location and retains some of its original setting. It appears to have lost its integrity of design, materials, workmanship, feeling, and association, though, through the enclosure of most of its bays, the addition of louvers, and the replacement of a door. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the

Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1120 (Electrical Station): Photo 6.1-412, left, west side and south front elevations; Photo 6.1-413, right, south front and east side elevations.

Photo 6.1-414 Building 1120 (Electrical Station): east side and north rear elevations with Building 1029 in background.

6.1.8.21. BUILDING 1031 (ELECTRIC POWER STATION)

A former weapons and base systems shop, Building 1072 was erected between about 1956 and 1959. Modern aerials indicate that it was at least partially in use or maintained from the early 1990s up to about 2010. It is currently vacant, uncared for, and in poor condition (Giles 2019; Quitclaim deed 1979; RAFBHA 1999 and 2015c).

The tall, one-story, concrete-block building has a nearly flat roof with no overhangs (**Photos 6.1-415** through **6.1-418**). Three large garage bays, only one with a door, open from its south-facing front elevation. The space that could have held a fourth bay, but apparently never did, has three smaller entry bays with topped by a single empty window bay. The north elevation only has two garage bays, which appears to have always been the case; both retain their doors. One partially intact casement window is set high near its western edge. Two metal doors and two upper casement windows, painted over, mark the west side elevation; similar windows bays, but no doors, at the east elevation have largely lost their casement windows. The building's interior has functional exposed concrete-block walls; the spaces that could be viewed are littered with old computer and mechanical equipment, plastic pipes, bricks, and other odds and ends.

Building 1072 is at its original location, but appears to have lost its integrity of design, materials, workmanship, feeling, and association through alterations to and/or loss of garage doors, windows, and doors. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1072 (Weapons and Base Systems Shop): Photo 6.1-415, left, west side and south front elevations; Photo 6.1-416, right, south front and east side elevations.


Building 1072 (Weapons and Base Systems Shop): Photo 6.1-417, left, east side and north rear elevations; Photo 6.1-418, right, north rear and west side elevations.

6.1.8.22. BUILDING 1073 (TRAFFIC CHECK HOUSE)

This building once served as a traffic check house. It was built along with the other buildings at the alert facility between about 1956 and 1959. Modern aerials suggest it has been vacant and overgrown since about 2002. Currently it is almost entirely engulfed by overgrowth and could not be entered.

The small nearly square building is built of concrete block with a widely overhanging flat concrete roof (**Photos 6.1-419** through **6.1-421**). Its south front and north rear elevations each hold one door and one window. Single window bays pierce the side elevations. The aluminum frames of the casement windows suggest that they might be original. The inside is a single open space.

Building 1073 is at its original location and retains some of its original setting. Although the glass in its window bays and the tops of its doors is broken, it appears to retain its integrity of design, materials, workmanship, feeling, and association. However—a basic guard house—it has no historic, associational, or architectural significance and is unlikely to yield important historic information. The Air Force and SAC erected many such support buildings at Ramey and other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is not recommended as individually eligible for National Register listing under any of the Register's Criteria.

Building 1073 (Traffic Check House): Photo 6.1-419, left, south front and east side elevations; right, east side and north rear elevations.

Photo 6.1-421 Building 1073 (Traffic Check House): interior (source: AM Group 2018:150)

Taxiway 2 and Alert Facility Apron

The US House of Representatives authorized just under $10,000,000 for SAC construction at Ramey in 1955. The money was to be used for various facilities, including airfield pavement (*Congressional Record* 1955:8667). Presumably one of the first resources constructed was Taxiway 2 and the Alert Facility Apron, to the north of which the facility buildings were erected. A 1966 photograph depicts the taxiway and its distinctive checkerboard apron (**Photos 6.1-422** through **6.1-427**). The checkerboards still remain clearly visible from the air—less so from ground level—although they have faded over the years. It consists of squares painted black upon which aircraft parked and rectangles of turf, angle at the edges facing the taxiway, which helped with drainage. The squares that have faded the most are those at the west near Building 1245

(Readiness Crew Facility), which suggests that they got more use than those farther east. Concrete remnants of blast deflector fences remain to the north of the northern squares and the south of the southern ones. They too are in better shape to the east, again suggesting use patterns.

Photo 6.1-422 Taxiway 2 and Alert Facility Apron: looking west at taxiway and apron at left, alert facility buildings to their right, and main runway at center with nose dock hangars at upper right and concrete hangars at lower right, 1966 (source: http://rameyafb.net/ramey-air-force-base-1966/).

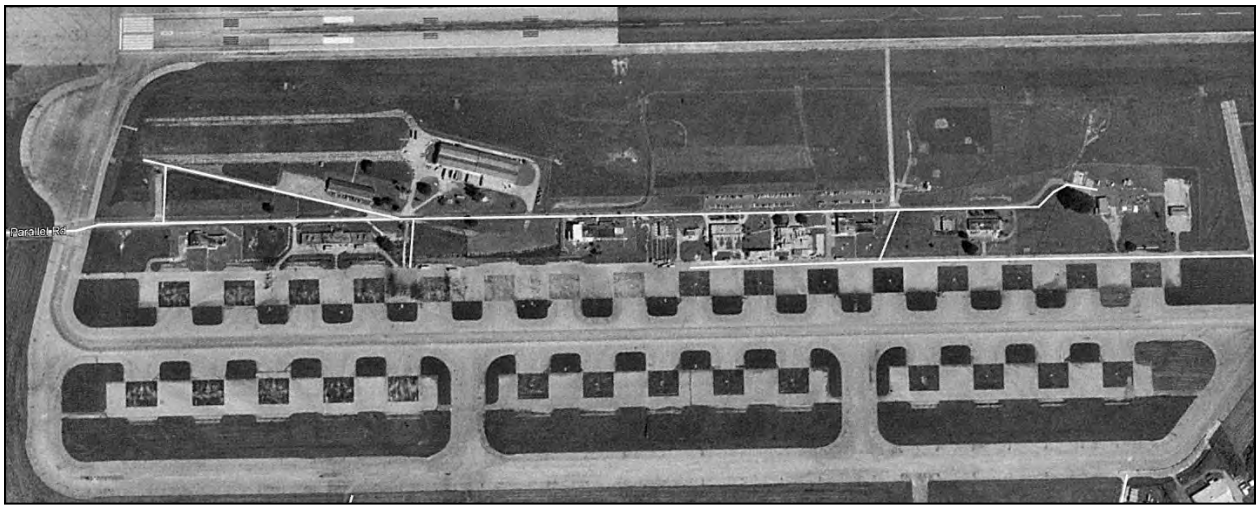


Photo 6.1-423 Taxiway 2 and Alert Facility apron, aerial view, 1993.

Photo 6.1-424 Taxiway 2 and Alert Facility apron, aerial view, 2019.

Taxiway 2 and Alert Facility Apron: Photo 6.1-425, left, ground-level views looking west from western end of apron; Photo 6.1-426, right, ground-level views looking east from eastern end of apron.

Photo 6.1-427 Taxiway 2 and Alert Facility Apron: concrete remains of blast on south side of apron.

In her context for SAC Cold War-era bomber bases, Weitze (1999a) does not mention the coloration of any aprons. Rather, she focuses on configuration, either straightforward right-angled, as is Ramey; “individual stubs at 90-degree angles to a 45-degree alert taxiway”; or the last designed and preferred herringbone or “Christmas tree” alert aprons (**Photos 6.1-428** and **6.1-249**).

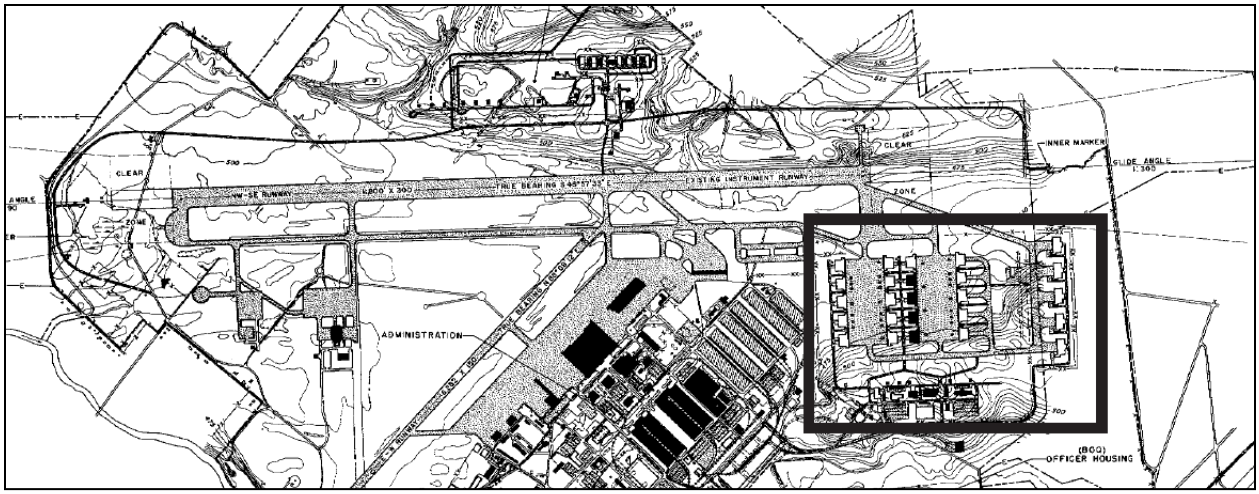


Photo 6.1-428 SAC rectangular stubbed parking aprons and angled taxiway at Griffiss Air Force Base outlined in black, from October 1957 master plan (source: Weitze 1999a:110).

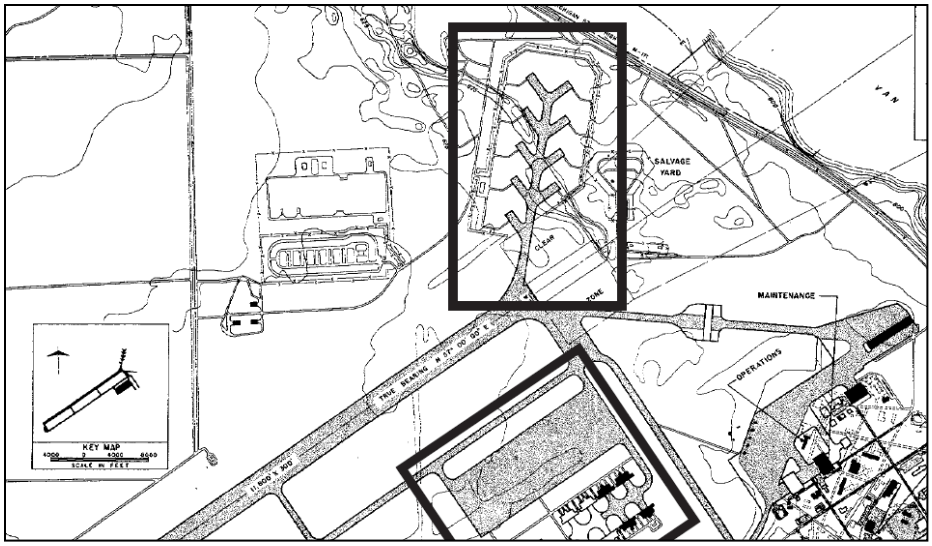


Photo 6.1-429 Christmas tree alert apron at Wurtsmith Air Force Base outlined in black rectangle, from October 1957 master plan (source: Weitze 1999a:110).

Weitze (1999a:155) combines the character-defining features of the SAC alert apron configurations and crew quarters (moleholes). She writes:

> Not surprisingly, SAC undertook construction for its alert aprons first—and, again not surprisingly, design changed literally while aprons were in buildout. Resultant from this situation, two key alert apron patterns exist, supplemented by particular instances where a pre-existing rectangular apron was called into service [as at Ramey]; a new rectangular apron and taxiway were built due to land limitations and topography; or, a former hot cargo area was reconfigured for alert service. SAC also built alert aprons in different sizes—similar to its treatment of the double-cantilever hangar. Accompanying the alert aprons, and erected during 1958-1960, the moleholes also came in small, medium, and large sizes—and, like the alert aprons, occasionally were built in a non-standard manner. Nonetheless, all SAC alert facilities had an alert apron and an alert crew quarters, the latter always basically designed as a molehole [unlike at Ramey].

Key character-defining features include:

- an alert apron configured for between four and 10 bombers (B-47s, B-58s, and B-52s);
- a taxiway angled at 45 degrees from the end of the primary (longest) runway; and
- a molehole of 18,000, 22,500, or 31,000 square feet.

In addition, the molehole had its own character-defining features, including:

- two-story height, with the lower story either fully below ground, or bermed aboveground;

- egress tunnels from the underground story sheathed in corrugated metal with single-pane, wood frame windows per tunnel and blast-framed doors;

- and, simple 1950s design detailing, including a nearly flat gable roof and windowless walls.

In other words, the alert apron and associated taxiway are not assessed independently, but together. As the Ramey alert quarters does not conform with the design of the other SAC bases, and as the alert area is a remnant form that did not meet later SAC design standards—and as together they do not have the features that define them—the Alert Apron with Taxiway 2 is not recommended as individually eligible for National Register listing.

Nose Dock Hangars at the SAC Bomber Mission Alert Facility

The shape, roof lines, and side-by-side placement of the nose dock hangars at Ramey strongly suggest that they were designed by Luria Engineering of New York, which had manufactured mobilization buildings for the Army during WWII and continued to produce hangars during the Cold War (Weitze 1999a:83). It is not clear whether Luria's designs for hangars intended largely for B-52s or those for multi-purpose wing hangars were used. Both designs dated from the mid-/late 1950s and included modifications (**Photos 6.1-430** through **6.1-433**).

Plate 74. Luria Engineering. Multi-purpose wing hangars at the former Forbes Air Force Base. Front oblique view, July 1999. Photograph, K.J. Weitze.

Plate 71. Luria Engineering. Multi-purpose wing hangar at the former Lincoln Air Force Base. Front view, July 1999. Photograph, K.J. Weitze.

Photos 6.1-430 (left) and 6.1-431 (right) Luria Engineering multi-purpose wing and B-52 wing hangars at the former Forbes and Lincoln AFBs, dates of construction not determined (source: Weitze 1999a:81-84).

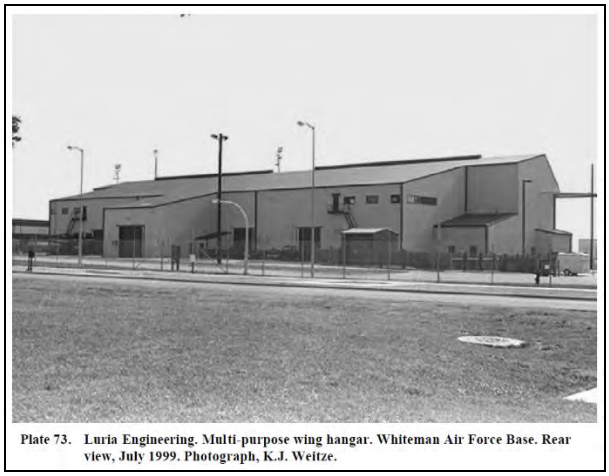


Plate 73. Luria Engineering. Multi-purpose wing hangar. Whiteman Air Force Base. Rear view, July 1999. Photograph, K.J. Weitze.

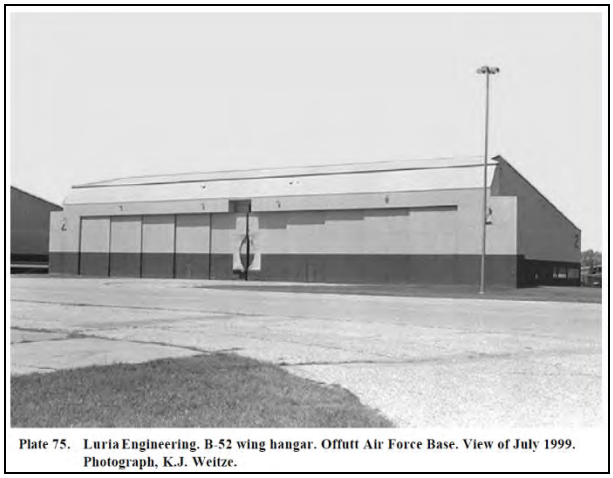
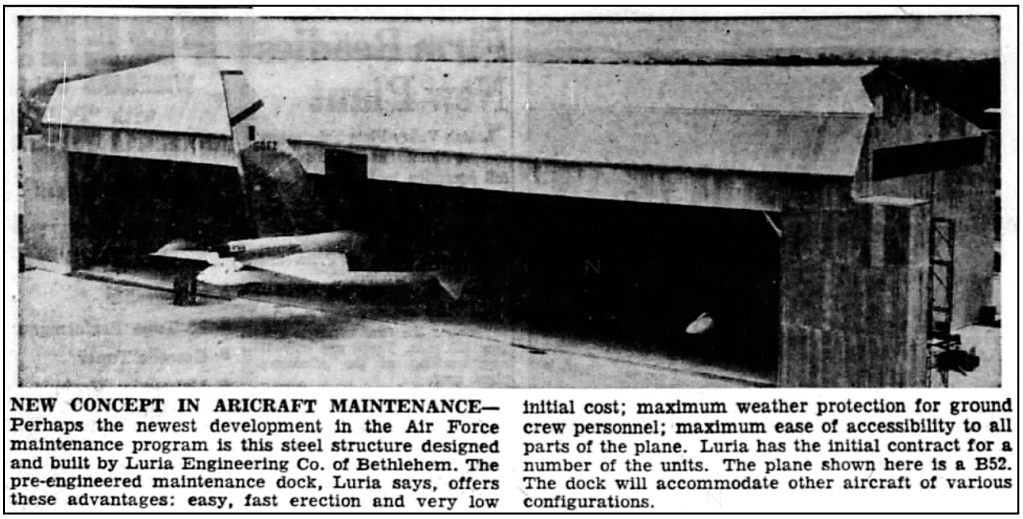


Plate 75. Luria Engineering. B-52 wing hangar. Offutt Air Force Base. View of July 1999. Photograph, K.J. Weitze.

Photos 6.1-432 (left) and 6.1-433 (right) Luria Engineering multi-purpose wing and B-52 wing hangars at Whiteman and AFBs, dates of construction not determined (source: Weitze 1999a:81-84).

Nose dock hangars similar to those built at Ramey were erected at numerous Air Force bases from the mid-1950s into the early 1960s. The Air Force erected them at its 65 SAC bases on the mainland, in Canada, and in Puerto Rico at Ramey. According to Weitze (1999a:72) in her study of SAC bomber mission bases, SAC erected 405 nose dock and wing hangars from about the late 1940s through the early 1960s for B-29, B-36, B-47, B-52, and other large aircraft. These included 129 “Multi-purpose Luria” types and 79 “Late 1950s Generic (B-52)” types. If the surviving nose dock hangars at Ramey were built by Luria, they likely were part of the two contracts that Luria received in 1956, which totaled $14,916,000, to produce “new-type, all-weather hangars to shelter intercontinental B-52 bombers and newly-designed aircraft maintenance docks” (*Indianapolis Star* 1956) (**Photo 6.1-434**). According to one source, large general maintenance hangars with distinctive offset gables, such as those at Ramey, were erected as part of the SAC dispersal program between 1958 and 1960. This program called for dispersing bomber wings over three times as many bases as the previous practice. One of those dispersal bases was Ramey (Pedrotty, Webster, and Chmiel 1999:5-8.).

Regardless of their precise dates of construction or the exact origin of their designs, the surviving nose dock hangars at Ramey are associated with SAC bomber mission and alert facility. They are, however, located north of the facility, along Hangar Road and the principal runway of Ramey Air Force Base.



NEW CONCEPT IN ARICRAFT MAINTENANCE— Perhaps the newest development in the Air Force maintenance program is this steel structure designed and built by Luria Engineering Co. of Bethlehem. The pre-engineered maintenance dock, Luria says, offers these advantages: easy, fast erection and very low initial cost; maximum weather protection for ground crew personnel; maximum ease of accessibility to all parts of the plane. Luria has the initial contract for a number of the units. The plane shown here is a B52. The dock will accommodate other aircraft of various configurations.

Photo 6.1-434 Luria Engineering "pre-engineered maintenance dock," with B-52, 1957 (source: *Morning Call* (Allentown, PA), 1957).

6.1.8.23. BUILDING 571 (NOSE DOCK HANGAR)

Building 571 is absent from base maps of 1951 and earlier. It was likely erected between 1956 and 1959 along with the other SAC buildings at the alert facility to the south across the runway. It is pictured on the 1964 base map. By 1983 it was no longer servicing aircraft but was "used by the [Puerto Rico] Department of Education for band exercises and folkloric dances" (Greenleaf/Telesca 1983:4-74). It is currently largely vacant.

The building is a nose dock hangar (**Photos 6.1-435** through **6.1-440**). As its name suggests, a nose dock (or nose pocket) hangar holds the body of an airplane within its walls and, through an extension of the wall facing away from the runway, the nose of the plane. This provides shelter for mechanics working on all of the plane but the tail, which, depending on the aircraft's length, sticks out from the notched opening above the center of the doors opening on the runway and the upper part of the closed hangar doors. The building is approximately 200' wide and 90' deep, with an approximately 30'-deep nose dock—large enough to accommodate the front end of a B-52's fuselage—extending at the center of the north rear elevation. A B-52 has a wingspan of approximately 185' and a length of approximately 160'. Therefore, the hangar provided a bit of extra room at either side for wingspan and required the tail of a B-52 to remain outdoors when the plane was being maintained. To allow entry for the B-52 (or another smaller plane), the doors on the north (runway) side telescope the full width of the hangar. Door pockets extend the hangar at east and west to hold the telescoping doors and allow access to its entire width.

The nose dock hangars may also have serviced the KC-135 aircraft that fueled the B-52s in the air. Due to weight, the B-52 could not take off with a full load of fuel but had to be fueled after takeoff. According to Allen (2011), who flew on B-52s at Ramey in the late 1960s, the amount of fuel the B-52 took on following takeoff was about equal to the plane's entire weight absent fuel. The KC-135 would have fit more easily in the hangar, as its wingspan was about 130' and its length about 136'. Both the B-52 and the KC-135 stood about 42' high.

According to the typology for military aircraft hangars established by Pedrotty, Webster, and Chmiel (1999:6-15), this hangar and the other nose dock hangars to its east are steel truss with offset gable roof types. The truss work appears to remain in place. However, the hangar's corrugated metal walls, doors, and roof appear to have been reclad on multiple occasions and secondary doors, windows, and other bays have been altered or replaced. To adapt the building as a storage space after the military left, two large truck bays served by below-level ramps were added to either side of the nose dock.


Building 571 (Hangar): Photo 6.1-435, left, south front elevation; Photo 6.1-436, right, north rear elevation.


Photos 6.1-437 (left) and 6.1-438 (right) Building 571 (Hangar): north rear and west side elevations.


Building 571 (Hangar): Photo 6.1-439, left, east side elevation; Photo 6.1-440, right, east side and north rear elevations.

Building 571 is at its original location and retains some of its setting but appears to have lost much its integrity of design, materials, workmanship, feeling, and association due to numerous changes to its wall and roof cladding and the addition of truck bays with loading docks. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many nose dock hangars at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

6.1.8.24. BUILDING 572 (NOSE DOCK HANGAR)

Building 572 was likely erected between 1956 and 1959 along with the buildings at the alert facility to the south across the runway and other nose dock hangars to its east and west. It is pictured on the 1964 base map. In 2017 the building was the Western Aviation Service Corp. hangar, which housed the Borinquen Field-Ramey Air Force Base Museum. Hurricane Maria heavily damaged the building and the museum. It is currently vacant with most of the same gaping holes and damage it sustained in September 2017 (*View From the Tower*, October 1, 2017).

Like the other nose dock hangars, the building is approximately 200' wide and 90' deep, with an approximately 30'-deep nose dock extending at the center of its the north rear elevation (**Photos 6.1-441** through **6.1-449**). Its south (runway) elevation retains a central notch for a B-52 tail and door pockets to hold full-width telescoping doors. This hangar and the others are steel truss with offset gable roof types (Pedrotty, Webster, and Chmiel 1999:6-15. The truss work appears to remain largely in place, but the hangar's corrugated metal walls, doors, and roof appear to have been reclad on multiple occasions and secondary doors, windows, and other bays have been altered or replaced. Section of its walls and roof pulled away by Hurricane Maria remain unrepaired.

Building 572 is at its original location and retains some of its setting but appears to have lost much its integrity of design, materials, workmanship, feeling, and association through numerous changes to, and some loss of, its wall and roof cladding. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected nose dock hangars at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 572 (Hangar): Photo 6.1-441, left, south front and east side elevations of Buildings 571 and 572 (left to right), 1972-73 (source: https://rameyafb.wordpress.com/2010/11/13/pictures-of-ramey-afb-puerto-rico/); Photo 6.1-442, right, south front elevations of Buildings 571, 572, and 573 (left to right).


Building 572 (Hangar): Photo 6.1-443, left, west side and north rear elevations; Photo 6.1-444, right, east side and north rear elevations


Building 572 (Hangar): Photo 6.1-446, left, damage and interior at bay to east of nose bay; Photo 6.1-447, right, damage at and to east of nose bay.


Building 572 (Hangar): Photo 6.1-448, left, damage an interior at bay west of nose bay; Photo 6.1-449, right, September 2017 view, post-Hurricane Maria (source: *View From the Tower*, October 1, 2017).

6.1.8.25. BUILDING 573 (NOSE DOCK HANGAR)

Building 573, with the buildings at the alert facility to its south and the nose dock hangars to its sides, was likely erected between 1956 and 1959. It is included on the 1964 base map. It is home to Vortex Aviation which "provides contracted aircraft maintenance related services to aircraft owners and operators in Puerto Rico" (Vortex Aviation website).

The hangar is approximately 200-foot wide and 90-foot deep (**Photos 6.1-450** through **6.1-454**). Its approximately 30-foot deep nose dock has been enclosed at its front with concrete block. It is also closed off from the body of the hangar inside. Its runway-facing north elevation retains a central notch and door pockets to hold its telescoping doors. This hangar and the others are steel truss with offset gable roof types (Pedrotty, Webster, and Chmiel 1999:6-15). The truss work appears to remain largely in place, but the hangar's corrugated metal walls, doors, and roof appear to have been reclad on multiple occasions and secondary doors, windows, and other bays have been altered or replaced. In addition to the notable changes to the nose dock, the building has been extended across its south elevation by a flat-roofed addition that extends forward to the same plane as the end of the nose dock.

Building 573 is at its original location and retains some of its setting. However, it appears to have lost much its integrity of design, materials, workmanship, feeling, and association through numerous changes to its wall and roof cladding, the enclosure of its nose dock, and the addition of a full-width extension across its north elevation. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected nose dock hangars at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Photo 6.1-450 Building 573 (Nose Dock Hangar): south elevation and interior depicting retention of central notch for B-52 tail, enclosure of nose dock, and addition of window bands at side elevations (source: Vortex Aviation website).

Building 573 (Hangar): Photo 6.1-451, left, south front elevation; Photo 6.1-452, right, north rear and west side elevations.

Building 573 (Hangar): Photo 6.1-453, left, east side and north rear elevations; Photo 6.1-454, right, north rear elevation

6.1.8.26. BUILDING 574 (NOSE DOCK HANGAR) - DEMOLISHED

Building 574 was a nose dock hangar built between about 1956 and 1959 that was apparently identical to those to either side of it. Aerial photographs indicate it was demolished between 2009 and 2012 (**Photos 6.1-455** through **6.1-457**). Its footprint, however, remains visible through a ghost mark on the concrete pad on which it was built. Long vacant, it was described not long before its demolition as an “abandoned [and] dangerous eyesore” (RAFBHA 2015e).

Building 574 (Nose Dock Hangar): Photo 6.1-455, left, aerial view in 2009; Photo 6.1-456, right, aerial view of footprint in 2018

Photo 6.1-457, Building 574 (Nose Dock Hangar): hangar demolition (source: RAFBHA 2015e).

6.1.8.27. BUILDING 575 (HANGAR)

Along with the buildings at the alert facility to the south across the runway and other nose dock hangars to its east and west, Building 572 was likely erected between 1956 and 1959. The 1964 base map includes it. It is currently home to the Department of Homeland Security, Customs and Border Protection (CBP), Caribbean Air Marine Branch.

In 2013, the CBP determined that Building 575 was not eligible for National Register-listing. Its report noted the building's potential significance under Criterion A for its associations with the SAC dispersal program that brought B-52 bombers to Ramey and under Criterion C, as a typical example of the late-1950s/early-1960s nose dock maintenance hangars built at SAC installations using standardized plans. The report further identified the hangar as "by far the most altered" of Ramey's four nose dock hangars. Alterations at that time included a large addition on the northeast corner, infilling of ribbon windows on the side elevation, and the infilling of the nose pocket in the interior space (**Photos 6.1-458** through **6.1-462**). They identified these alterations as having impacted the integrity of materials, design, workmanship and, to a lesser extent, the integrity of setting, feeling, and association. They determined that the hangar was not individually eligible for National Register listing due to lack of integrity and also determined that it was also not a contributing resource to a larger historic district. In 2018, in summarizing their 2013 determination, the CBP further noted that SHPO concurrence was pending (US Customs and

Border Protection 2015:18). The CBP opened a new 30,000-square-foot hangar immediately east of Building 575 in 2016. At that time, they further altered and upgraded Building 575 (US Customs and Border Protection 2016).

Building 575 is at its original location and retains some of its setting. However, it appears to have lost its integrity of design, materials, workmanship, feeling, and association through numerous changes to its wall and roof cladding, the infilling of its nose dock, and the additions across its east side elevation that partially wraparound its front and rear elevations. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Air Force and SAC erected many nose dock hangars at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Photo 6.1-458 Building 575 (Nose Dock Hangar): Google Earth aerial of Building 575 at right and new associated hangar at left, 2019.

Photo 6.1-459 Building 575 (Nose Dock Hangar): Google Earth aerial of north front and west side elevations of Building 575 at right and new associated hangar at left, 2019.

Building 575 (Hangar): Photo 6.1-460, left, west side and south front elevations; Photo 6.1-461, right, west side elevation

Photo 6.1-462 Building 575 (Hangar): north rear and west side elevations

Potential Ramey Air Force Base SAC Bomber Mission Alert Facility Historic District

None of the resources—the buildings, the taxiway, the apron—are recommended as individually eligible for National Register listing, as described above. They are also not recommended as National Register-eligible as part of a potential discrete Ramey SAC Bomber Mission Alert Facility Historic District or a potential larger one that encompasses more of former Borinquen Field and Ramey Air Force Base. They retain their location, along with the other resources at the former military base. However, as summarized in **Table 6.1-3** below, 25 of the 28 resources within the potential district are believed to be noncontributing. Of the 25 noncontributing resources, 19 are believed to have lost their integrity, three are less than 50 years, and one has been demolished. The resources are not unusual or rare survivors, for the Air Force and SAC erected many such resources at other bases throughout the continental US, the Caribbean, and elsewhere during the Cold War. The resources therefore require a relatively high degree of integrity of design, materials, and workmanship to contribute to the district which, as described at their individual entries, the large majority lack.

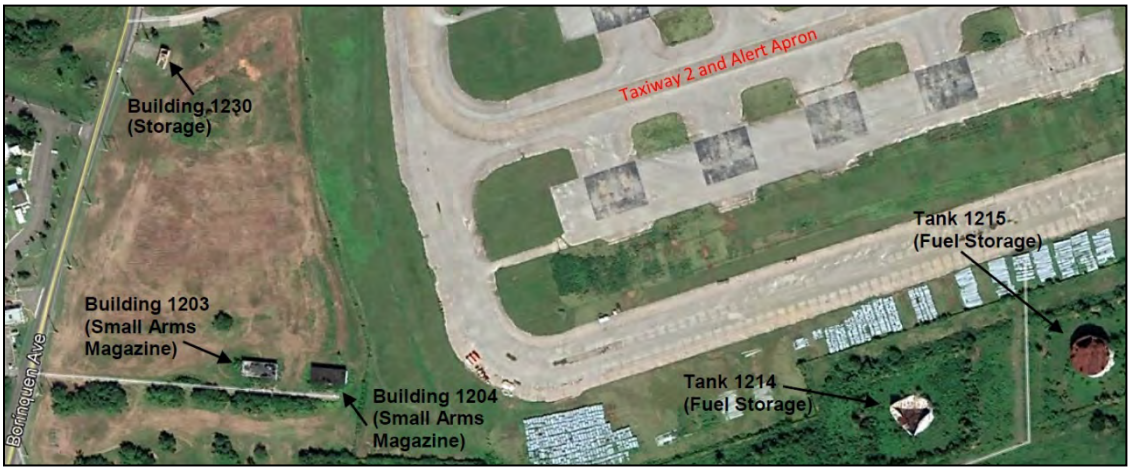
Table 6.1-3 Resources within Potential Ramey Air Force Base SAC Bomber Mission Alert Facility Historic District

Building Number and Name	C/NC Recommendation
Building 1270 (Storage)	NC—loss of integrity
Building 1251 (Target Intelligence)	NC—loss of integrity
Building 1245 (Readiness Crew Facility)	NC—loss of integrity
Gazebo	NC—loss of integrity
Building 1104 (Storage and Supply)	NC—loss of integrity
Building 1132 (Squadron Operations)	NC—loss of integrity
Guard House	NC—less than 50 years old
Building 1121 (Electrical Station)	NC—loss of integrity
Building 1133 (Captive Water Supply Tank Building)	NC—loss of integrity
Water Storage Building	NC—less than 50 years old
Building 1128 (Armaments and Avionics Shop)	NC—loss of integrity
Boiler Building	NC—less than 50 years old
Guard House	NC—less than 50 years old
Building 1129 (Armaments and Electrical Shop)	NC—loss of integrity
Electrical Station	NC—less than 50 years old
Building 1071 (Squadron Operations)	NC—loss of integrity
Building 1089 (Weather Observation Tower)	C—retains integrity
Building 1070 (Aircraft Maintenance Organizational Shop)	NC—loss of integrity
Building 1029 (Ground Support Equipment Shop)	C—retains integrity
Building 1031 (Electric Power Station)	NC—loss of integrity
Building 1072 (Weapons and Base Systems Shop)	NC—loss of integrity
Building 1073 (Traffic Check House)	C—retains integrity
Taxiway 2 and Alert Facility Apron	NC—loss of integrity
Building 571 (Nose Dock Hangar)	NC—loss of integrity
Building 572 (Nose Dock Hangar)	NC—loss of integrity
Building 573 (Nose Dock Hangar)	NC—loss of integrity
Building 574 (Nose Dock Hangar)	NC—demolished
Building 575 (Nose Dock Hangar)	NC—loss of integrity

NC = Noncontributing to potential historic district; C = Contributing to potential historic district

6.1.9. MATERIAL STORAGE AND FUEL TANKS RESOURCES (WEST AND SOUTH OF FORMER TAXIWAY 2)

Figure 6.1-14 Material Storage and Fuel Tanks Resources Locator Map



6.1.9.1. BUILDING 1230 (STORAGE)

Building 1230 is not included on the 1944 map, so it was erected after the 1947 update. However, its solid, boxy, concrete construction and surviving concrete louvers suggest it was erected by the late 1940s. It is included on the 1964 base map as a permanent building, carrying number 1230, but its function is not identified.

The building has a concrete loading dock along most of its front (west-facing) elevation, which is served by three wide, nearly full-height doors that once opened into three storage rooms (**Photos 6.1-463** through **6.1-466**). These spaces are divided by fire walls and shelves. Along with the building's relatively remote location, this suggests that it held combustible material. Due to the spacing of the shelves, it has been posited that it held pressurized tanks (Giles 2019).

Building 1230 is at its original location. Its setting, west of the alert facility, remains relatively intact. Its changes are few and it therefore appears to retain its integrity of design, materials, workmanship, feeling, and association. However, it appears to lack any historic, associational, or architectural significance, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.


Building 1230 (Storage): Photo 6.1-463, left, west front and south side elevations; Photo 6.1-464, right, north side and west front elevations.


Building 1230 (Storage): Photo 6.1-465, left, south side and east rear elevations; Photo 6.1-466, right, east rear elevation concrete louvers

6.1.9.2. BUILDING 1203 (SMALL ARMS MAGAZINE)

Building 1203 and matching Building 1204 to its east, erected in the early 1940s, are included on the 1944 map. Each is identified as a small arms magazine. They originally had access to boxcars and trucks: their loading docks face south to the site of a former American Railroad spur line, and a former roadway to their north extended a short distance west to Borinquen Avenue. Both appear to have long been vacant and they are heavily overgrown on their rail-facing south elevations.

Building 1203 is a concrete rectangle topped by a flat, overhanging roof (**Photos 6.1-467** through **6.1-470**). Its south elevation retains a concrete loading dock and apparently—overgrowth obscures much of the elevation—loading doors. The other elevations are marked by square gaping openings that may have been shuttered and upper ventilators that retain, at least in part, metal louvers.

This former small arms magazine is at its original location. Its setting, south of the alert facility, remains relatively intact. Due to alterations to its bays, it appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have, and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen

and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1203 (Small Arms Magazine): Photo 6.1-467, left, buildings on railroad spur, 1944; Photo 6.1-468, right, north rear and west side elevations with Building 1204 at far left.

Building 1203 (Small Arms Magazine): Photo 6.1-469, left, east side and north rear elevations; Photo 6.1-470, right, west side and south front elevations.

6.1.9.3. BUILDING 1204 (SMALL ARMS MAGAZINE)

Building 1204 was erected in the early 1940s, as was Building 1203, as a small arms magazine. It was oriented on the south to a former railroad spur line and on the north to a road that extended out to Borinquen Avenue. Like its neighbor, it has long been vacant and is heavily overgrown on its south elevation.

The former small arms magazine Building 1203 features a flat roof overhanging its concrete rectangular body (**Photos 6.1-471** through **6.1-473**). Its south elevation retains a concrete loading dock and, apparently, loading doors. The other elevations are marked by square gaping openings that may have been shuttered and upper ventilators that retain, in part, metal louvers.

Like its neighbor, this former small arms magazine is at its original location in a setting, south of the alert facility, that remains relatively intact. Due to alterations to its bays, it appears to have lost its integrity of design, materials, workmanship, feeling, and association. It does not possess sufficient integrity to support any historic, associational, or architectural significance it might have,

and it is unlikely to yield important historic information. The Army erected many such support buildings at Borinquen and other bases throughout the continental US, the Caribbean, and elsewhere during WWII. It is therefore recommended as not individually eligible for National Register listing under any of the Register's Criteria.

Building 1204 (Small Arms Magazine): Photo 6.1-471, left, east side and north rear elevations with Building 1203 at right; Photo 6.1-472, right, west side and south front elevations.

Photo 6.1-473 Building 1204 (Small Arms Magazine): south front and east side elevations

6.1.9.4. TANK 1214 (FUEL STORAGE)

Fuel storage tanks 1214 and 1215 do not appear on maps from the 1940s or a barely legible 1951 map. They are, however, located in an area that was established for fuel storage. By 1964 they were in place.

This tank was a large, round, metal structure set within barriers to contain any fuel spills (**Photos 6.1-474** and **6.1-475**). Its roof has collapsed along with most of its walls.

Tank 1214 is at its original location but has collapsed and thereby lost its integrity. It has no historic, associational, or architectural significance and is unlikely to yield important historic information: many such support structures were erected at army bases throughout the continental US, the Caribbean, and elsewhere during the Cold War era. Therefore, it is not recommended as individually eligible for National Register listing under any of the Register's criteria.

Tank 1214 (Fuel Storage Tank): Photo 6.1-474, left, looking southeast at Tanks 1215 and 1214, left to right; Photo 6.1-475, right, looking south at Tank 1214.

6.1.9.5. TANK 1215 (FUEL STORAGE)

As with its neighbor to the west, fuel storage tank 1215 does not appear on maps from the 1940s or a barely legible 1951 map. Located within an area established for fuel storage, it is depicted on the 1964 map.

This tank was a large, round, metal structure set within fuel-spill containment barriers (**Photos 6.1-476** and **6.1-477**). Its walls still stand but its roof has partially collapsed.

Tank 1215 is at its original location but has partially collapsed and thereby lost its integrity. It has no historic, associational, or architectural significance and is unlikely to yield important historic information. Many such support structures were erected at army bases throughout the continental US, the Caribbean, and elsewhere during the Cold War era. Therefore, it is not recommended as individually eligible for National Register listing under any of the Register's criteria.

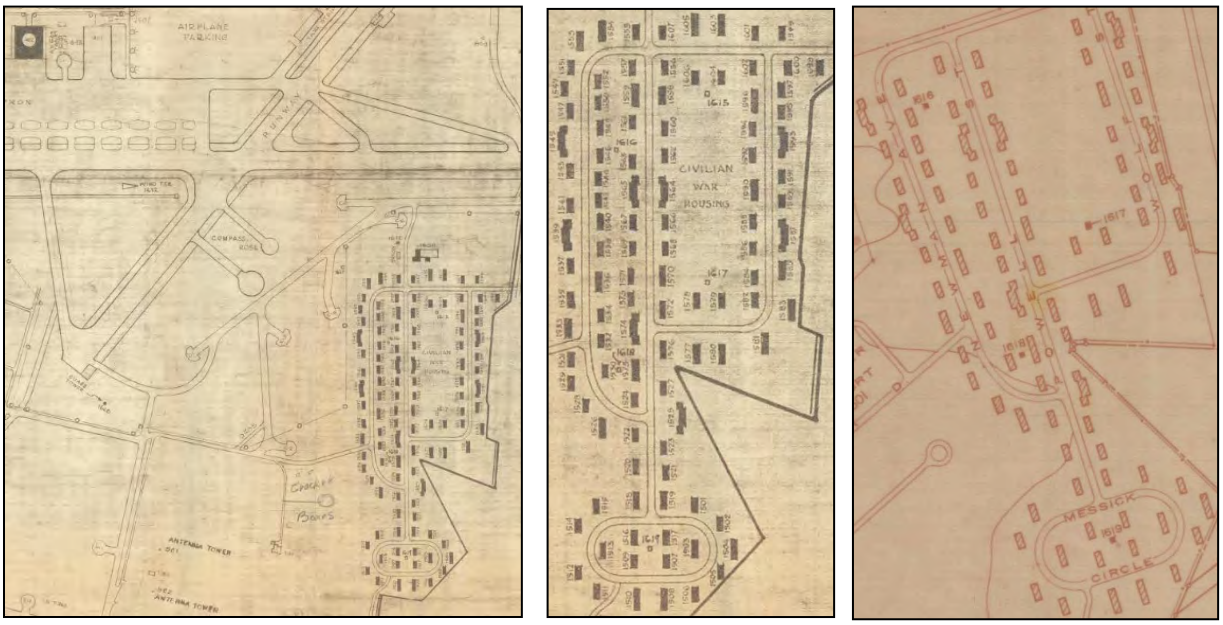
Tank 1215 (Fuel Storage Tank): Photo 6.1-476, left, looking south at tank, left to right; Photo 6.1-477, right, looking southeast at tank.

6.1.10. CIVILIAN WAR HOUSING (SOUTHEAST OF FORMER TAXIWAY 2 AND WEST OF PR 110R)

Borinquen Field's 1944 "Reservation Layout" map identifies buildings 1501 to 1607 as "Civilian War Housing" of "permanent construction" (**Photos 6.1-478** through **6.1-480**). The neighborhood has the same footprint and name on the 1948 "Reservation Layout" map, when it held about 110 residential buildings. By 1964, according to SAC's "Basic Mission Plan" map, about 25 residences had been removed from the neighborhood's northern end; its northern road had accordingly been shifted south. The change was apparently prompted by runway alterations. This map identifies the neighborhood not as Civilian War Housing, but as "Airmen Family Housing Lanham Act ". This indicates that funding from the Defense Housing and Community Facilities and Services Act of October 1940—commonly known as the Lanham Act—paid for the neighborhood's construction.

Under the Lanham Act, the federal government erected emergency housing for defense workers and military families in the build-up to and during World War II. As the first workers at Borinquen Field lived in tents (**Photo 3.3-1**), and as the northwest corner Puerto Rico where the field was built lacked sufficient housing and the ability to build it, the Lanham Act was the perfect vehicle to house base workers. As the neighborhood's name attests, it was erected for civilian workers at Borinquen. Between 1940 and 1945 nearly a million units were built under the act (Kuranda et al. 2007:63; Giles 2019).

SAC's 1968 "Base Plan" depicts the same group of houses. It does not assign a name to the neighborhood but does include street names. At the neighborhood's southern end was Messick Circle. Powell Street ran north from the circle to the unnamed northern boundary street. Two streets—Wolf Street on the east and Powell Avenue on the west—flanked and curved into it.



Civilian War Housing: Photo 6.1-478, left, housing in relation to runway and Hangar 2 at upper left on 1944 base map; Photo 6.1-479, center, enlarged view; Photo 6.1-480, right, neighborhood on 1968 base map.

In March 1966 the base began rehabilitating its "236 Lanham Act housing units" (RAFBHA 2015d). (The number apparently separately counts multiple units within buildings.) By 1967 the neighborhood had been renamed "Tropical Acres." A photograph of a freshly painted sign with the new name appeared in the base newspaper, *Ramey Tropicair*, on January 13, 1967. In 1969-70, the electrical system was repaired. Three years later the military left and, according to Gerry Giles of the RAFBHA in 2019: "Sadly, Tropical Acres was not turned over to locals for renovation/habitation after the base closed and has remained overgrown with vegetation" (www.facebook.com/photo.php?fbid=10217500104485392&set=gm.10156978500899313&type=3&theater&ifg=1). Old photographs depict a neighborhood of one- and some two-story residences (**Photos 6.1-481** through **6.1-486**). They are essentially straightforward, concrete or concrete-block, rectangular buildings with no adornment, flat widely overhanging roofs, numerous long louvered window bays, and multiple doors.

Photo 6.1-481, left, Newman Avenue, no date; Photo 6.1-482, right, Suarezes in 1967 (source of both: www.facebook.com/photo.php?fbid=10208201039494579&set=g.137328899312&type=1&theater&ifg=1)

Photos 6.1-483 and 6.1-484 Early 1970s (source of both: www.facebook.com/photo.php?fbid=10216019167164607&set=oa.10157076401284313&type=3&theater&ifg=1)

Photo 6.1-485, Left, Tropical Acres home in April 1972 (source: www.flickr.com/photos/19191522@N06/3911500962); Photo 6.1-486, right, Wolf Street image taken after entering through fence and "chop[ing] way in with a machete," 2001 (source: facebook.com/photo.php?fbid=10208201039494579&set=g.137328899312&type=1&theater&ifg=1).

Access to the neighborhood was not possible, as chain link fencing topped by barbed wire rings it. Current aerials, though, depict overgrowth so heavy that houses are barely visible from the air (**Photos 6.1-487** through **6.1-492**). YouTube videos from the past 10 years indicate that exterior walls and roofs of at least some houses are intact, but they have lost their doors, windows, and all interior finish. (https://www.youtube.com/watch?v=vBTeJnzWkcM (2010)). Also, holes have been knocked into some of the interior walls (https://www.youtube.com/watch?v=htFMdtIn4NA (2013)).

Google Aerials from (left to right) 1993 (Photo 6.1-487), 2002 (Photo 6.1-488), and 2019 (Photo 6.1-489); aerial at right depicts areas within (north of) and outside of the APE and the approximate boundary of the neighborhood.

Photos 6.1-490 (left) and 6.1-491 (right) Civilian War Housing: YouTube video, 2010.

Photo 6.1-492 Civilian War Housing: YouTube video, 2013.

Views in December 2019 of some of the houses from PR 110R just to the east—likely of Wolf Street—confirm that some stand with walls intact, but doors and windows removed (**Photos 6.1-493** through **6.1-496**).

Photos 6.1-493 (left) and 6.1-494 (right) Current photographs looking west from PR 110R.

Photos 6.1-495 (left) and 6.1-496 (right) Civilian War Housing: current photographs looking northwest from PR 110R.

It is believed—on the basis of old, recent, and current photographs, aerials, and videos—that the Civilian War Housing or Tropical Acres neighborhood retains many of its original residences, but that these essentially consist of walls, roofs, and partitions without windows, doors, or interior finishes. Further, though the buildings remain at their original location, their setting has been compromised by unchecked growth of trees and understory that almost engulf them. Therefore, the neighborhood is not believed to retain the integrity of design, setting, materials, workmanship, feeling, or association necessary to support significance under any of the National Register Criteria. The Civilian War Housing neighborhood is recommended as not eligible for National Register listing as a historic district.

6.1.11. PAUL REVERE LODGE NO. 98 (CALLE VILLA CARIBE)

Paul Revere Lodge No. 98—a Masonic lodge—is located in a residential neighborhood on the east side of Calle Villa Caribe, less than a quarter-mile north and east of the former Ramey Air Force Base and its runway (**Photos 6.1-497** through **6.1-498**). Although the lodge is not located on the base, it was founded in 1954, according to historian W.B. Victor Ortiz, by “military brethren from the States” stationed at Ramey (https://allevents.in/aguadilla/the-history-of-paul-revere-lodge-98open-only-to-master-masons/20003006681317).

Paul Revere Lodge No. 98: Photo 6.1-497, left, location of lodge and proximity to former Ramey Air Force Base runway; Photo 6.1-498, right, aerial view exposing plain parapet-front nature of building (source of both: Google Earth 2019 imagery).

The building is essentially a plain, one-story, concrete-block rectangle with a flat roof that steps up at it center (**Photos 6.1-499** through **6.1-504**). The front (west-facing) elevation has a concrete false or parapet front with a smooth plaster surface that looks to have taken some design inspiration from colonial Spanish architecture, particularly mainland US missions of the southwest. The parapet's side walls, which extend beyond the body of the building, are battered. They step up with similarly angled edges to the center of the facade. The centered entry is covered by a roll-up metal door and shaded by a flat-roofed porch supported by two plain columns set on concrete piers. Two pairs of window bays flank the entry. They are doubled next to the door, single towards the side elevations, and filled with metal louvers. A metal shield centered above the entry says, "Paul Revere Lodge No. 98 F. & A. M. Aguadilla PR 1954." It was installed in 2018 or 2019 to replace an earlier square sign (Paul Revere Lodge Facebook page). The side elevations are marked by plain pilasters and multiple louvered bays. They are roughly finished with exposed concrete block, as it the rear elevation. Interior access was not gained, but recent photographs from the lodge's website depict a large open space with a checkerboard linoleum or vinyl floor, an elevated platform, and a dropped ceiling (**Photos 6.1-505** and **6.1-506**).


Photos 6.1-499 (left) and Photo 6.1-500 (right) Paul Revere Lodge No. 98: W front elevation.


Paul Revere Lodge No. 98: Photo 6.1-501, left, north side and west front elevations showing edges of parapet front; Photo 6.1-502, right, west front elevation with shield added after Hurricane Maria.


Paul Revere Lodge No. 98: Photo 6.1-503, left, east rear and north side elevations; Photo 6.1-504, right, corner of west front and south side elevations.

Photo 6.1-505 and 6.1-506 Paul Revere Lodge No. 98: interior in 2017 (source: https://www.facebook.com/pg/paulreverelodge98/photos/)

Freemasonry originally came to Puerto Rico in the early 19th century but was largely suppressed by the Spanish government off and on until the close of the century, when the island fell under the control of the United States. In December 2019 the Grand Lodge—or Gran Logia Soberana—of Puerto Rico, located in Santurce, counted 70 lodges under its jurisdiction with more than 2,700 brothers (George Washington Masonic National Memorial 2019). Two additional Masonic orders are active on the island, the Grand National Orient of Puerto Rico and the Mixed Grand Lodge of Puerto Rico. The traditional male orders are also joined on the island by the Julia de Burgos Respectable Women's Lodge (Planell 2017).

The Paul Revere Lodge retains its integrity of location and setting on the first residential street northeast of the former Ramey Air Force Base's undeveloped land and almost within sight of its runway. A plain concrete-block building but for its false front, it also appears to retain its integrity of design, materials, and workmanship and, by extension, of feeling and association. However, there are over 70 Masonic lodges in Puerto Rico, including at least one grand building, the Gran Logia Soberana Lodge (**Photos 6.1-507** and **6.1-508**). The Paul Revere Lodge is not believed to have any particular historical or associational significance and is not likely to yield important historic information not available from other sources. Its architecture is workmanlike and unremarkable. It is therefore not believed to be National Register eligible under any of the Register's Criteria.

Gran Logia Soberano: Photo 6.1-507, left, exterior in 2017; Photo 6.1-508, right, interior in 2019 (source of both: https://www.google.com/maps/; photographer of both: Hugo Alberto Guzman).

6.2. CONCLUSIONS

AECOM conducted a Phase I Cultural Resources Survey of planned improvements at BQN in Aguadilla, Puerto Rico. These efforts included background research and both archaeological and historic architectural field surveys. Background research identified no National Register-listed cultural resources within the APE.

Architectural historic fieldwork was performed within the Proposed Project's APE December 16-19, 2019 by Marvin Brown of AECOM, who meets the Secretary of Interior's standards for architectural historic and historic investigations as required by Section 106. This report recommends that three buildings within the historic architecture APE are individually eligible for National Register listing: Hangar 2 (Building 402), Hangar 3 (Building 403), and the Control Tower (Building 400). One group of resources is recommended as National Register-eligible as the Borinquen Field Concrete Hangars and Control Tower, which contains five buildings: Hangar 2 (Building 402), Hangar 3 (Building 404), a modern FedEx hangar, Hangar 5 (Building 405), and the Control Tower (Building 400). All of these but the modern hangar are recommending as contributing to the historic district. No other individual resources or groups of resources are recommended as National Register eligible.

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APPENDIX A: ALTERNATIVES CONSIDERED

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Alternative	Description
1A	Construct temporary Runway 8-26, rehabilitate existing runway, and restore operations to newly reconstructed existing runway. To implement, convert Taxiway M to a temporary 11,000-foot by 150-foot AC runway, 70 feet north of its existing centerline. Correct crown section on Taxiway M to correct longitudinal grade. Reconstruct Runway 8-26 to 11,000 feet by 150 feet of PCC with crown section and runway grooving.
1B	As with Alternative 1A, with the following variations. Shift temporary Runway 8-26 243 feet east of current alignment. Demolish airfield buildings and structures to accommodate ROFA of temporary runway. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 915 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,085 feet TORA on Runway 26, and 10,950 feet Landing Distance Available (LDA) on Runway 8. All RPZ areas would be contained on Airport property
1C	As with Alternative 1A, with the following variations. Shift temporary Runway 8-26 478 feet east of current alignment. Demolish airfield buildings and structures to accommodate ROFA of temporary runway. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 400 feet on Runway 8, a displaced threshold of 245 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,600 feet TORA on Runway 26, 10,715 feet TORA on Runway 8. Reduce LDA on Runway 8 to 10,715 feet on Runway on Runway 8 and 10,755 on Runway 26. Realign approximately 2,060 lineal feet of Borinquen Avenue (Route 107) to avoid placement in RPZ
2A	Construct new permanent Runway 8-26 to replace the existing Runway 8-26. To implement, construct 11,000 feet by 200 feet AC runway, 500 feet south of existing Runway 8-26 centerline. Convert existing Runway 8-26 to full length-parallel taxiway.
2B	Shift Runway 8-26 862 feet east and 500 feet south of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 325 feet on Runway 8, 130 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,698 feet TORA on Runway 26, 10,870 feet LDA on Runway 26, and 10,145 feet LDA on Runway 8. All RPZ areas would be contained on Airport property. RSA and ROFA would partially overlap documented sinkhole
2C	Shift Runway 8-26 862 feet east and 500 feet south of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 325 feet on Runway 8, 130 feet on Runway 26 utilizing declared distances and realigning 2,060 lineal feet of Borinquen Avenue (Route 107). Reduce usable runway length to 10,145 feet LDA on Runway 8 and 10,870 feet LDA on Runway 26.. RSA and ROFA would partially overlap documented sinkhole
2D	Shift Runway 8-26 1,187 feet east and 500 feet south of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 452 feet on Runway 8, and utilizing declared distances. Reduce usable runway length to 10,148 feet LDA on Runway 8, 10,548 feet LDA on Runway 26, and 10,675 TORA on Runway 8. RSA and ROFA would partially overlap documented sinkhole
No-Action	For comparative purposes under NEPA, impacts of each project Alternative described above will be assessed against the option of taking no action (i.e., not implementing or constructing the project).

1

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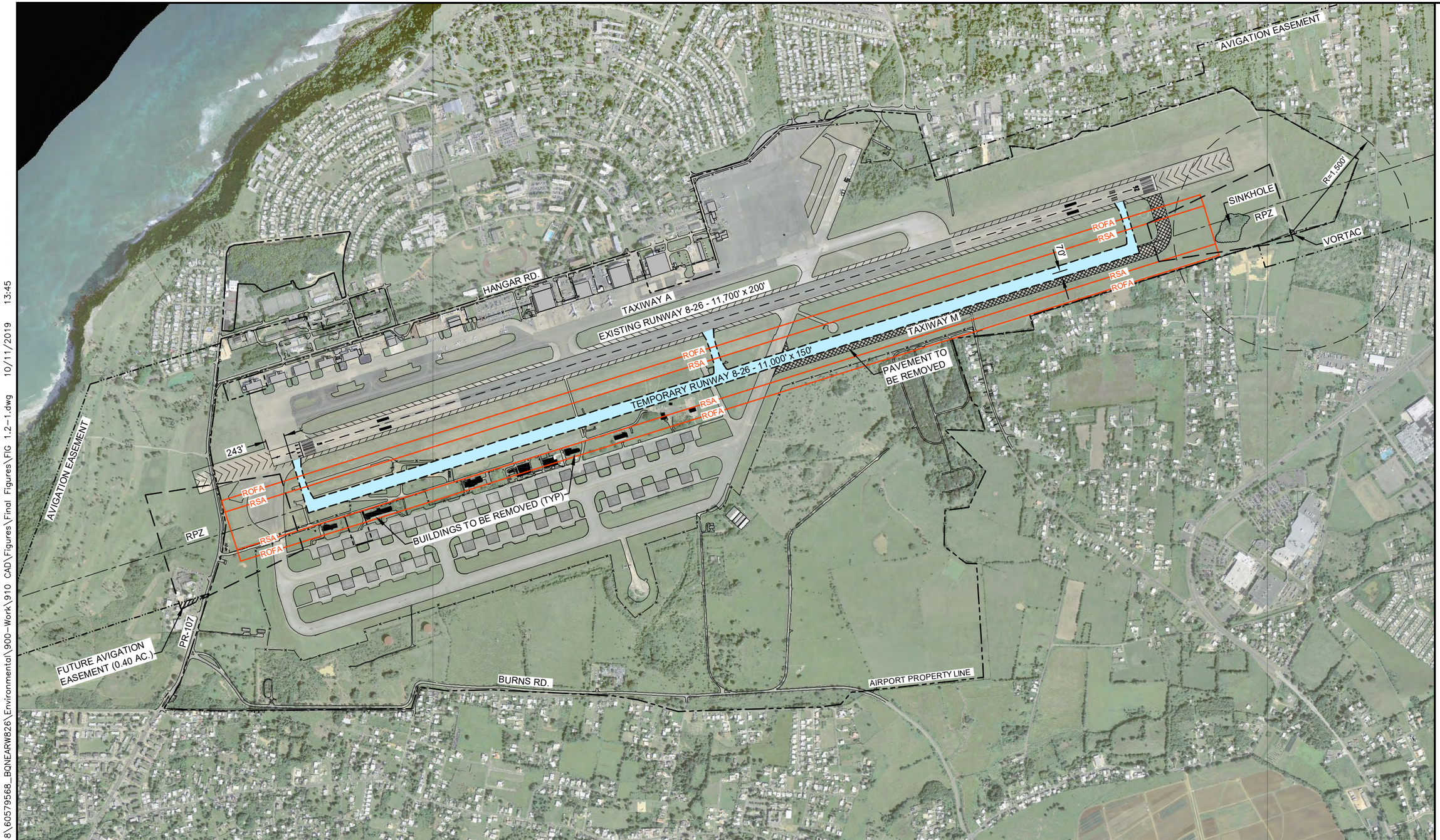

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,950'	10,950'
26	11,000'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1A

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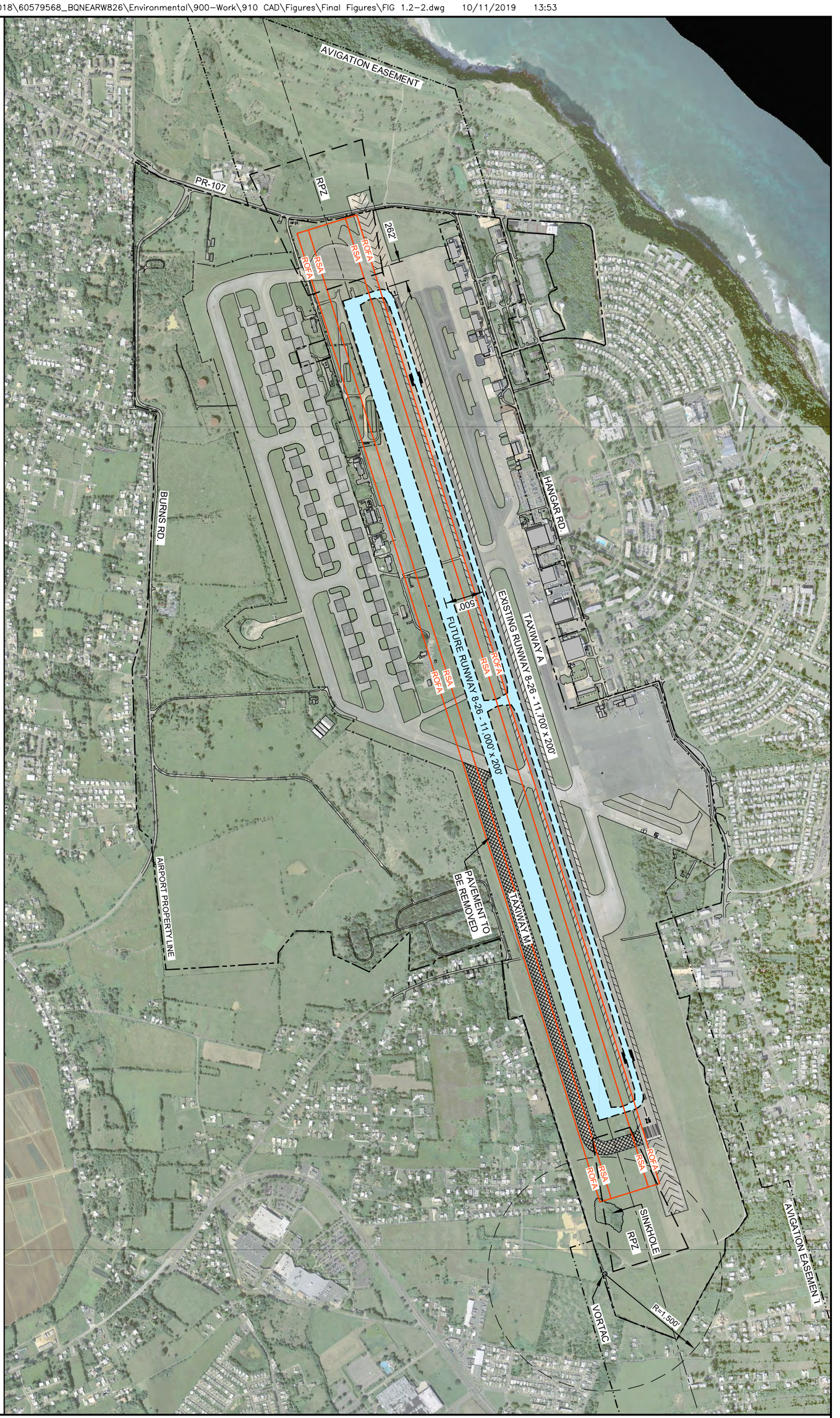

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GRAPHIC SCALE IN FEET
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ALTERNATIVE 2A

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AVIGATION EASEMEN T
AREA OF POTENTIAL EFFECT - DIRECT IMPACTS
SINKHOLE
RPZ
R=1,500'
VORTAC
ROFA
RSA
70'
HANGAR RD.
TAXIWAY A
EXISTING RUNWAY 8-26 - 11,700' x 200'
TAXIWAY M
TEMPORARY RUNWAY 8-26 - 11,000' x 150'
PAVEMENT TO BE REMOVED
APPROACH RPZ
DEPARTURE RPZ
915' DISPLACED THRESHOLD
243'
BUILDINGS TO BE REMOVED (TYP)
AVIGATION EASEMENT
PR-107
BURNS RD.
AIRPORT PROPERTY LINE

LEGEND
TEMPORARY PAVEMENT CONSTRUCTION
TO BE REMOVED

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,950'	10,035'
26	10,085'	11,000'	11,000'	11,000'

N

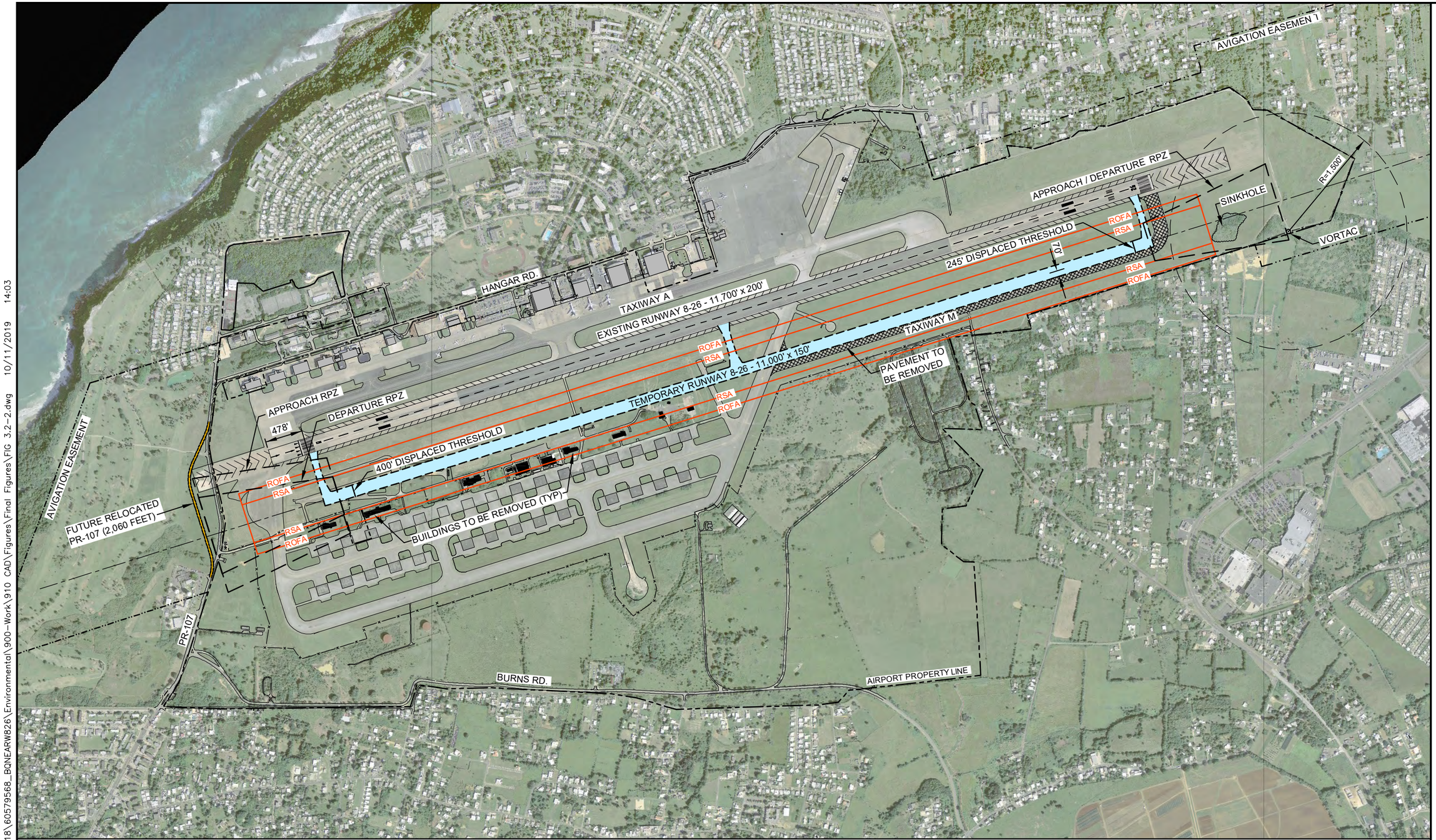
1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1B

S:\Projects\P\Puerto Rico 2018\60579568_BQNEARW826\Environmental\900-Work\910 CAD\Figures\Final Figures\FIG 3.2-1.dwg 10/11/2019 13:57



DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,715'	11,000'	10,715'	10,715'
26	10,600'	11,000'	11,000'	10,755'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1C

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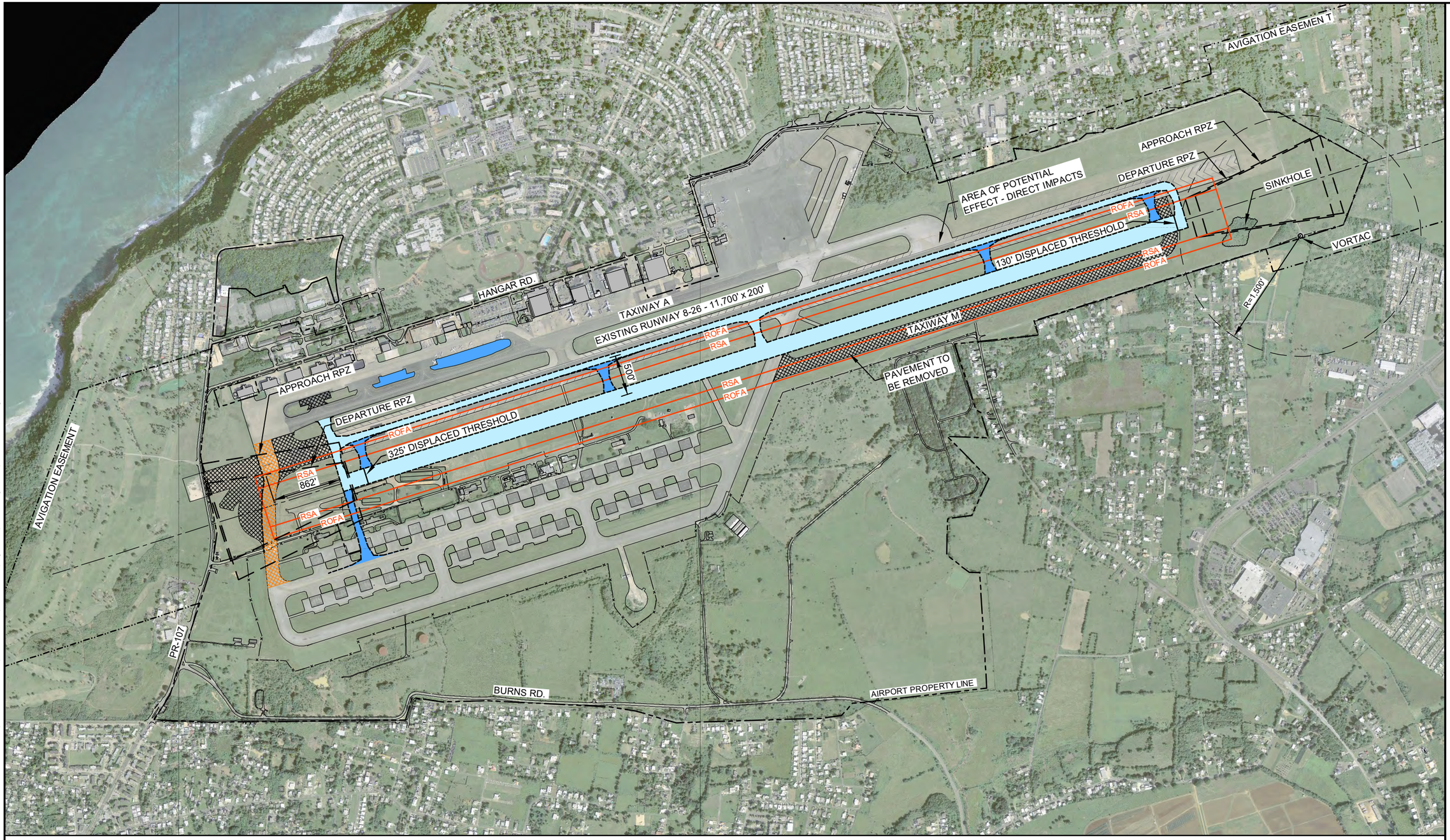

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

S:\Projects\P\Puerto Rico 2018\60579568_BQNEARW826\Environmental\900-Work\910 CAD\Figures\Final Figures\FIG 3.2-3.dwg 10/11/2019 14:07

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2C

AVIGATION EASEMENT T
APPROACH RPZ
DEPARTURE RPZ
AREA OF POTENTIAL EFFECT - DIRECT IMPACTS
SINKHOLE
VORTAC
R=1,500'
ROFA
RSA
130' DISPLACED THRESHOLD
HANGAR RD.
TAXIWAY A
EXISTING RUNWAY 8-26 - 11,700' x 200'
TAXIWAY M
FUTURE RUNWAY 8-26 - 11,000' x 200'
500'
PAVEMENT TO BE REMOVED
DEPARTURE RPZ
APPROACH RPZ
325' DISPLACED THRESHOLD
862'
AVIGATION EASEMENT
FUTURE RELOCATED PR-107 (2,060 FEET)
PR-107
BURNS RD.
AIRPORT PROPERTY LINE

LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	11,000'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

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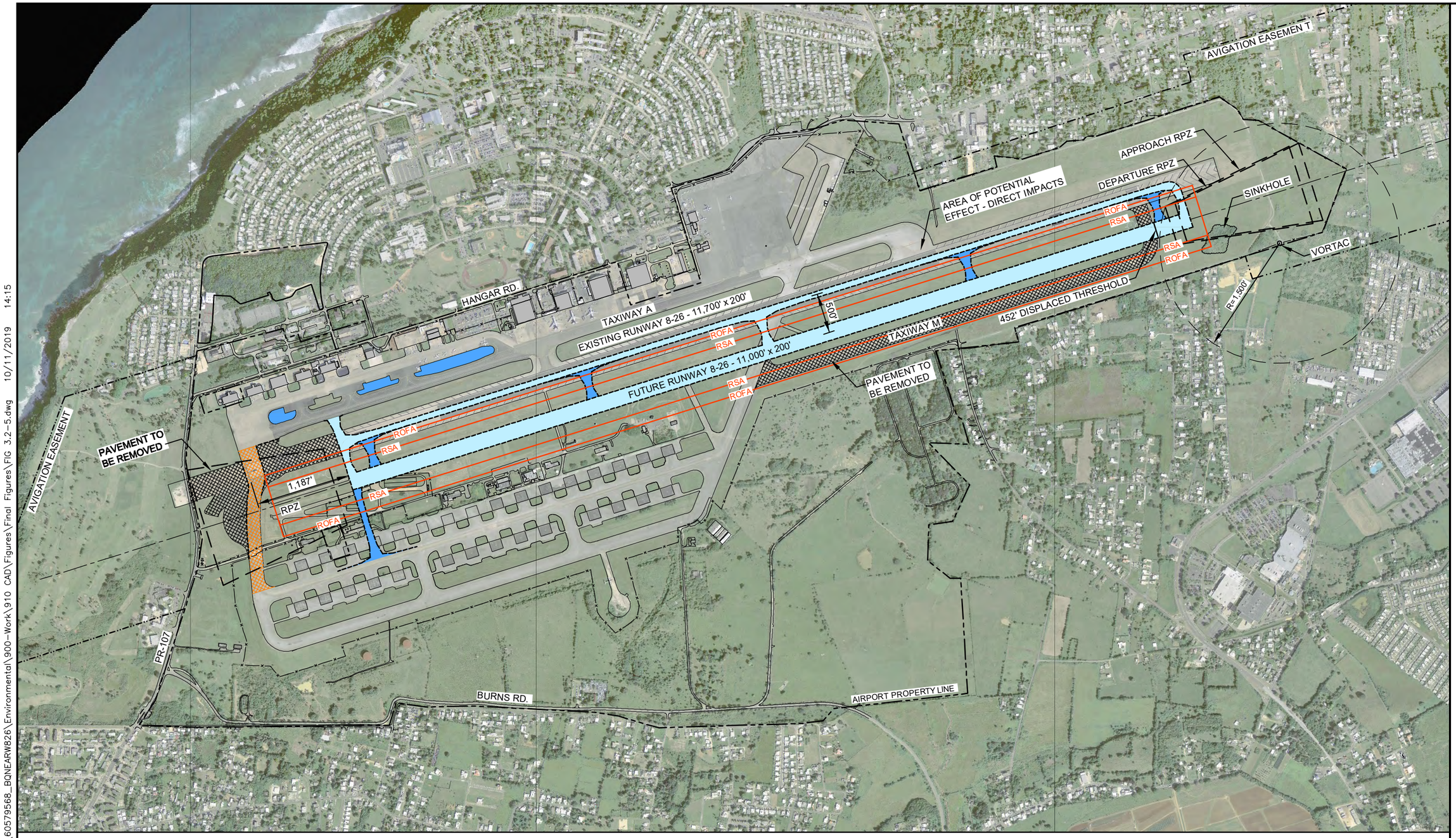

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

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APPENDIX B: EXCERPT FROM PREVIOUS RECONNAISSANCE STUDY

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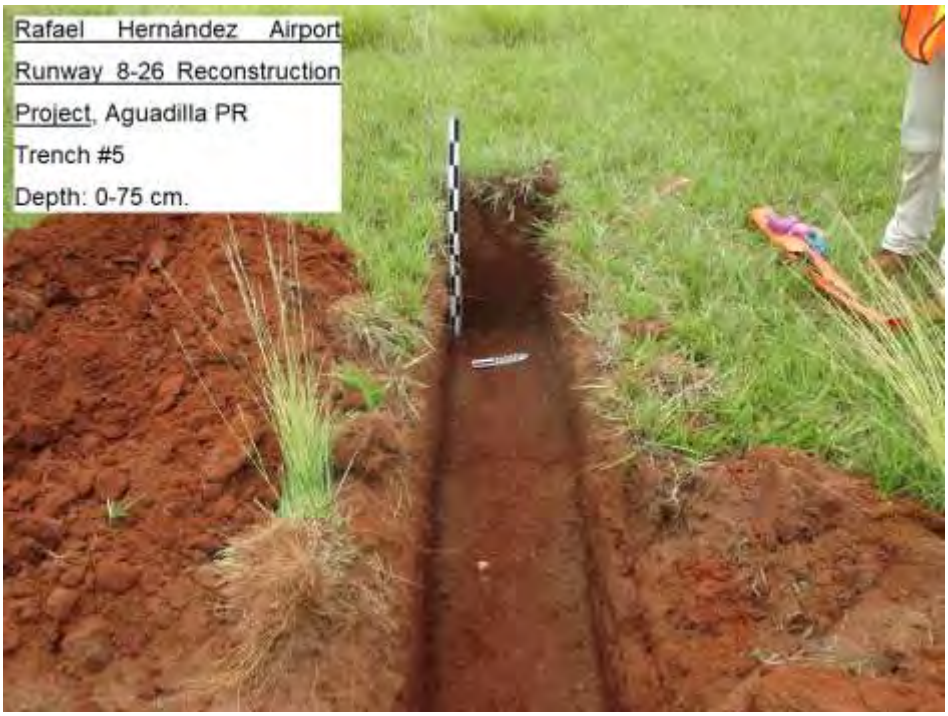
Table #3 Results of the Trenches

Test	Depth	Results	Composition	Munsell
T1	0-27 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	27-61 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(July, 2018)

T2	0-09 cm.	Negative	Clay. Yellowish Brown, weed	10YR 5/6
	09-43 cm	Negative	Clay, Limestone Rock	10YR 8/6
	43-56 cm.	Negative	Clay. Limestone Rock	7.5YR 3/4
	56-63 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T3	0-32 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	32-72 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T4	0-28 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	28-63 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T5	0-35 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	35-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6



(July, 2018)

T6	0-27 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	27-67 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(July, 2018)

T7	0-31 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4

	31-62 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T8	0-36 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	36-64 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T9	0-07 cm.	Negative	Clay. Yellowish Brown, weed	10YR 5/6
	07-34 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	34-85 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T10	0-31 cm.	Negative	Clay. Yellowish Brown, weed	10YR 5/6
	31-44 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	44-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(July, 2018)

T11	0-26 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	26-68 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T12	0-18 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	18-69 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T13	0-21 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	21-72 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(July, 2018)

T14	0-14 cm.	Negative	Clay. Yellowish Brown, weed	10YR 4/3
	14-22 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	22-53 cm.	Negative	Clay. Limestone Rock	10YR 7/6
	53-62 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T15	0-13 cm.	Negative	Clay. Yellowish Brown, weed	10YR 5/6
	13-23 cm	Negative	Clay, Limestone Rock	10YR 8/6
	23-35 cm.	Negative	Clay. Limestone Rock	7.5YR 3/4
	35-64 cm	Negative	Clay, Veined Limestone Rock	7.5YR 3/6
T16	0-21 cm.	Negative	Clay. Yellowish Brown, weed	10YR 4/3
	21-51 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	51-71 cm.	Negative	Clay. Limestone Rock	7.5YR 4/6
T17	0-12 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	12-68 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T18	0-25 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	25-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T19	0-32 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	32-67 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T20	0-28 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	28-72 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T21	0-51 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	51-77 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T22	0-43 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	43-64 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T23	0-24 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4

	24-54 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	54-66 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T24	0-34 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	34-59 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	59-64 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T25	0-26 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	26-51 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	51-66 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T26	0-24 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	24-54 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	54-66 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T27	0-43 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	43-64 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T28	0-58 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	58-87 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T29	0-13 cm.	Negative	Asphalt, weed	Gley 2.5/N
	13-48 cm	Negative	Clay, Limestone Rock	10YR 8/6
	48-59 cm.	**Positive**	Clay. Limestone Rock Water channel	7.5YR 3/4

59-66 cm **Positive** Clay, Limestone Rock Water channel 7.5YR 3/6

This water channel has 8cm width from 58cm-66cm. Has 20cm depth

View of the Channel's Top (August, 2018)

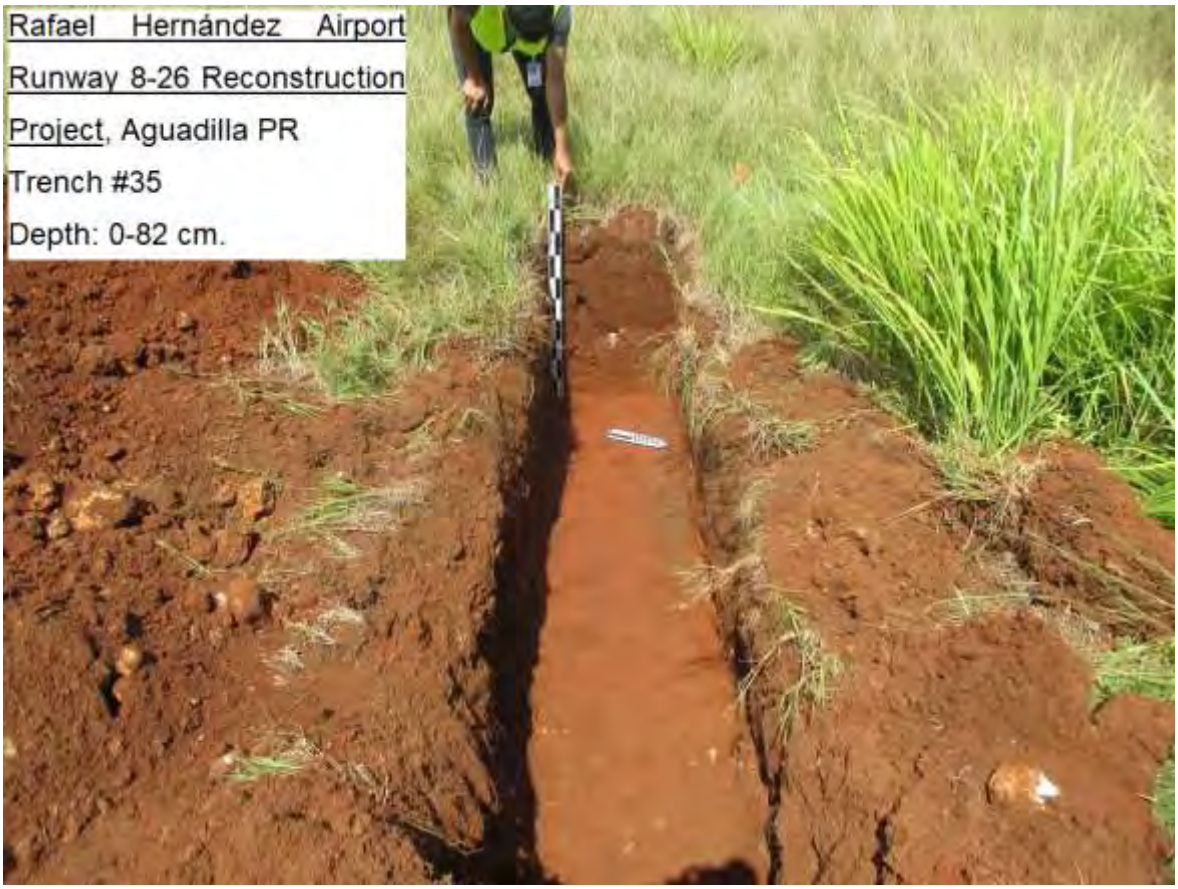
View of the Channel's Top (August, 2018)

View of the Channel (August, 2018)

View of the Channel (August, 2018)

T30	0-43 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	43-71 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T31	0-39 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	39-74 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T32	0-47 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	47-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T33	0-29 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	29-62 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T34	0-38 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	39-74 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T35	0-53 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	53-82 cm	Negative	Clay, Limestone Rock	7.5YR 3/6



(August, 2018)

T36	0-22 cm.	Negative	Clay. Yellowish Brown, weed	2.5YR 4/6
	22-47 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	47-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T37	0-34 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	34-71 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T38	0-42 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	42-82 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T39	0-39 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	39-85 cm	**Positive**	Clay, Limestone Rock, Cement Block	7.5YR 3/6

At Northwest we found a Cement Block. Has 74cm width

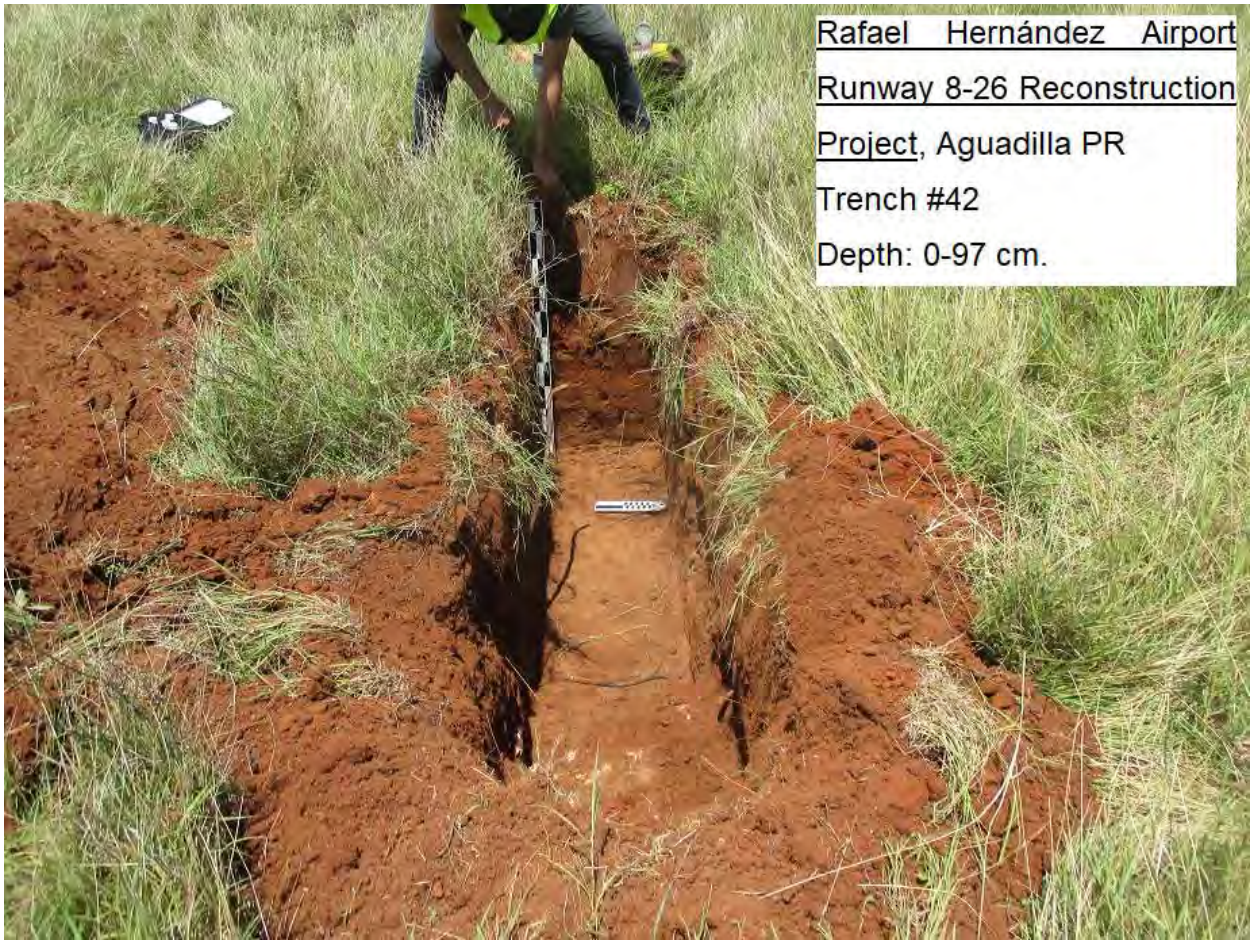
(August, 2018)

Cement Block (August, 2018)

Cement Block (August, 2018)

T40	0-37 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	37-68 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T41	0-50 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	50-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T42	0-67 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	67-97 cm	**Positive**	Clay, Limestone Rock Cement Block	7.5YR 3/6

Cement block with a rod at 74cm depth



Cement Block with a Rod (August, 2018)

Cement Block with a Rod (August, 2018)

Cement Block with a Rod (August, 2018)

T43	0-35 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	35-77 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T44	0-46 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	46-85 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T45	0-42 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	42-67 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T46	0-49 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	49-60 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
	60-82 cm	Negative	Clay, Limestone Rock	2.5YR 4/6
T47	0-49 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	49-60 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
	60-82 cm	Negative	Clay, Limestone Rock	2.5YR 4/6
T48	0-51 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	51-85 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T49	0-46 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	46-71 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T50	0-47 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	47-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T51	0-29 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	29-62 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T52	0-38 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	39-74 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T53	0-53 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	53-82 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T54	0-25 cm.	Negative	Clay. Yellowish Brown, weed	2.5YR 4/6
	25-51 cm	Negative	Clay, Limestone Rock	7.5YR 3/4
	5184 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T55	0-33 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	33-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T56	0-35 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	35-82 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T57			This trench doesn't do it. Road	
T58	0-34 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	34-80 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T59	0-30 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	30-83 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T60	0-22 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	22-70 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T61	0-36 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	36-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T62	0-30 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	30-70 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T63	0-36 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	36-81 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T64	0-29 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	29-81 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T65	0-38 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	38-79 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T66	Taxiway Area (security section)			
T67	Taxiway Area			
T68	Taxiway Area			
T69	0-32 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	32-61 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
	61-71 cm	Negative	Clay, Limestone Rock	2.5YR 4/6

(August, 2018)

T70	0-41 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	41-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T71	0-28 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	28-72 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T72	0-36 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	36-81 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T73	0-23 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	23-69 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T74 Can't do it. Cement on top


(August, 2018)

T75	0-37 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	37-80 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T76	0-29 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	29-68 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T77	0-75 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	75-82 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(August, 2018)

T78	0-21 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	21-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T79	0-63 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	63-76 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T80	0-72 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/6
T81	0-76 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/6
T82	0-27 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	27-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

T83	0-44 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	44-74 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T84	0-21 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	21-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T85	0-76 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/6
T86	0-29 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	29-72 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(September, 2018)

T87	0-87 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/6
T88	0-19 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	19-84 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T89	0-14 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	14-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T90	0-27 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	27-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

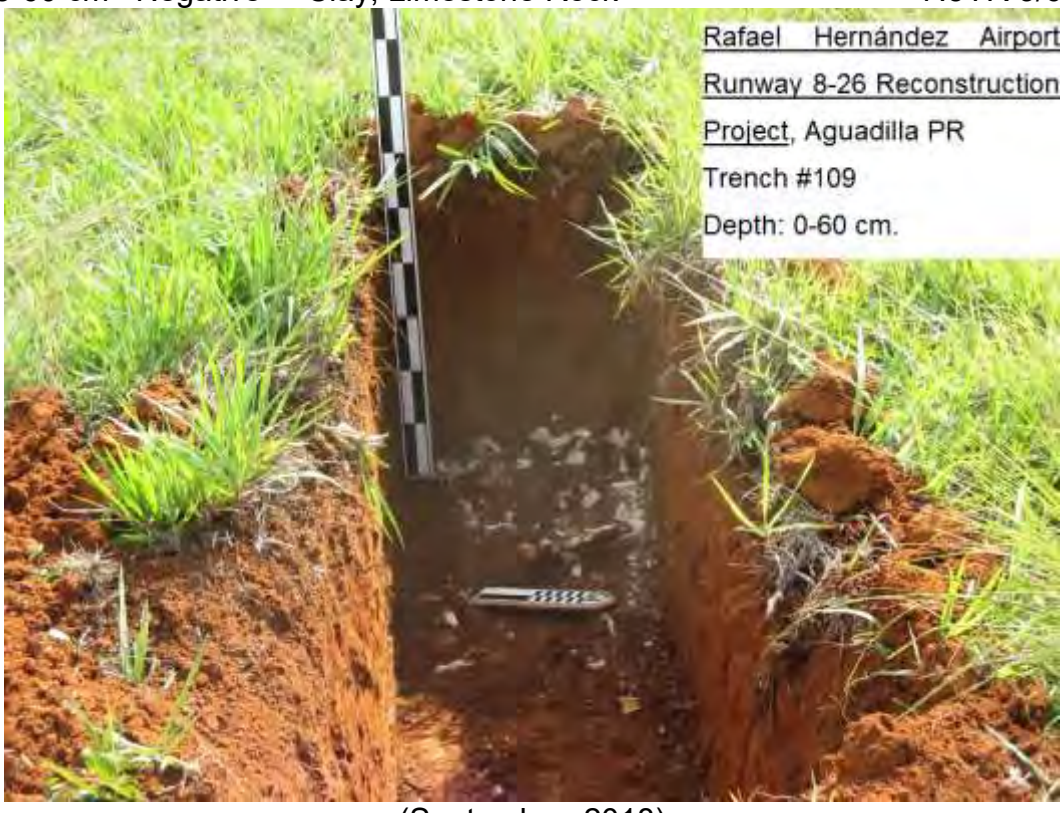
(September, 2018)

T91	0-15 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	15-81 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T92	0-67 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	67-86 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T93	0-13 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	13-79 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T94	0-10 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	10-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T95	0-13 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	13-77 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

(September, 2018)

T96	0-09 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	09-64 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T97	0-31 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	31-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T98	0-15 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	15-69 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T99	0-19 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	19-81 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T100	0-26 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	26-92 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T101	0-31 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	31-74 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T102	0-20 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	20-41 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	41-84 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T103	0-26 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	26-43 cm	Negative	Clay, Limestone Rock	2.5YR 3/6

43-96 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T104 0-14 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
14-55 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
51-83 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T105 0-17 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
17-75 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T106 0-81 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/6
T107 0-09 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
09-87 cm	Negative	Clay, Limestone Rock	7.5YR 2/6
51-83 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T108 0-17 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
17-86 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T109 0-18 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
18-60 cm	Negative	Clay, Limestone Rock	7.5YR 3/6



(September, 2018)

T110 0-22 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
22-89 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T111 0-30 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4

	30-92 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T112	0-25 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	25-73 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T113	0-22 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	22-79 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T114	0-30 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	30-86 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T115	0-33 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	33-80 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T116	0-25 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	25-89 cm	Negative	Clay, Limestone Rock	7.5YR 3/6
T117	0-22 cm.	Negative	Clay. Yellowish Brown, weed	7.5YR 3/4
	22-60 cm	Negative	Clay, Limestone Rock	2.5YR 3/6
	60-88 cm	Negative	Clay, Limestone Rock	7.5YR 3/6

Trenches Results

In the Rafael Hernández Airport Runway 8-26 Reconstruction Project a total of one hundred seventeen (117) trenches were planned, all located between Alpha Runway and taxiway Charlie. During the excavation process the majority of the trench's locations were performed. The site has a compacted soil, composed of clay, surface vegetation and some scattered stones. The trenches were established and performed in the direction from west to east along where the new runway was performed according the Alternative 2. The excavation process was carried out by performing the trenches with a set distance of thirty (30) meters apart.

In most boreholes a compact clay surface of dark brown color was found (7.5 YR 3/4), while in the subsoil an extremely compact reddish-brown layer, (7.5YR 3/6). While performing these trenches in the survey a lot of limestones rocks were visible and finding during the excavations.

During the excavation progress, some trenches found remains of human impact. The trench #29, were found a little water channel that cross the excavation from west to east. This water channel, has twenty-five centimeters wide and a depth of twenty

centimeters. The length is indefinite because continues along the extension of the trench. This element it's the most important evidenced in this survey.

Other elements were a wall fabricated in cement found in the trench #35 and a cement block with a rod in the trench #42.

Regarding to the cement block evidenced in the trench # 35, this could be a base to hold a tensioner. Bearing in mind that in the upper part of this base there is a hook.

All trenches ended with a depth ranging between fifty-four (54) centimeter and ninety-six (96) centimeters.

One of the most important things in this study was the identification of the old elements discovered in 2015 in trenches # 93 and # 107. However, during the field work, the archaeologist Eduardo Questell and myself excavated deeper than in the previous stage. Evidence that the elements identified, were in fact natural calcareous outcrops.

Under these outcrops, was found compact clay identical to those evidenced in the adjoining trenches.

We want to stipulate, that the elements discovered in the excavation stage in 2015, are not elements that had human intervention, therefore, they are not historical resources, as had been stipulated in the previous study.

Although we determined, that in the project area, historical resources could be evidenced, due to the location of this project, the construction of the naval base and the old location of the San Antonio community.

Criteria for Evaluation at National Register of Historic Places

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of significant persons in our past; or

APPENDIX C: SHOVEL TEST PIT STRATIGRAPHIC SECTIONS

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STP #	Strat	Depth (cm)	Munsell #	Munsell Color	Texture	Artifacts	Comments
C1	I	0-18	2.5YR 4/4	Reddish Brown	Sandy Clay/ Loam	none	Fill Soil
	II	18-40	2.5YR 5/6	Red	Sandy Clay/ Loam	none	Fill Soil
	III	40-79	2.5YR 4/4	Reddish Brown	Sandy Clay/ Loam	none	Fill Soil
	IV	79-94	7.5YR 4/1	Dark Gray	Sandy Clay	none	Disturbed with gravel
C2	I	0-24	2.5YR 5/6	Reddish Brown	Sandy Loam	none	Fill Soil
		24-35	2.5YR 5/8	Red	Sandy Clay	none	Clay impasse
C3	I	0-34	7.5YR 4/4	Reddish Brown	Sandy Clay/ Loam	none	Fill- end of runway
	II	34-44	7.5YR 3/4	Dark Reddish Brown	Sandy Clay	none	Rocky impasse
C4	I	0-28	7.5YR 4/4	Reddish Brown	Sandy Clay/Loam	none	Fill Soil
	II	28-38	2.5 YR 5/4	Reddish Brown	Sandy Clay	none	Fill Soil
C5	I	0-34	7.5YR 4/4	Reddish Brown	Sandy Clay/ Loam	none	Fill Soil
	II	34-48	7.5YR 4/3	Reddish Brown	Sandy Loam	none	Fill Soil
	III	48-68	2.5YR 4/5	Red	Sandy Clay	none	Clay impasse
D1	I	0-22	5YR 3/4	Dark Reddish Brown	SA CL/LO	none	Fill Soil
	II	22-32	2.5YR 3/6	Dark Red	SA CL/LO	none	Fill Soil
	III	32-43	2.5YR 3/6	Dark Red	SA CL	none	Fill Soil
	IV	43-53	7.5YR 4/1	Dark Gray	SA CL	none	Clay increasing
	V	53-66			SA CL	none	Imp. Clay
D2	I	0-23	2.5YR 4/4	Reddish Brown	Sandy Clay	none	Fill with limestone rubble
	II	23-40	2.5YR 3/4	Dark Reddish Brown	Sandy Clay	none	Rocky impasse
D3	I	0-18	2.5YR 4/4	Reddish Brown	Sandy Clay	none	Fill with limestone rubble
	II	18-35	2.5YR 3/4	Dark Reddish Brown	Sandy Clay	none	Rocky impasse
M1	I	0-12	10YR 3/4; 10YR 5/4	Darky Yellowish Brown; Yellowish Brown	Silty Sandy Loam	none	Compact, mottled fill with limestone rock
	II	Dec-35	10YR 3/4	Yellowish Brown	Silty Sandy Loam	none	Rocky impasse

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APPENDIX D: QUALIFICATIONS OF INVESTIGATORS

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Daniel Cassedy, PhD, is a Registered Professional Archaeologist who has over 35 years of experience as a supervisory archaeologist specializing in cultural resource management in eastern North America. He provides project management and technical direction on projects conducted in compliance with Section 106 of the National Historic Preservation Act. Dr. Cassedy is a Principal Archaeologist based in the Morrisville, NC office. He has extensive experience in all phases of archaeological surveys and excavations nationwide, and specializes in regulatory agency coordination, public outreach, and cultural resource management studies. He has been employed by AECOM for over 16 years. Notable projects include the Evaluation and Documentation of Navy Atlantic Fleet Photographic Laboratory at NAS Jacksonville; Environmental and Functional Program Reviews at Multiple NASA centers; Archaeological and Historical Services for Robbins Air Force Base, Warner Robbins, Georgia; and Phase II Archaeological Investigations for the US Army Redstone Arsenal, Huntsville, Alabama.

Mark Martinkovic, M.A., is a Registered Professional Archaeologist with over 15 years of experience in the Cultural Resource Management (CRM) industry and exceeds the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61). Mr. Martinkovic is a Senior Archaeologist based in the Tallahassee, FL office. He has experience in the design, management, and technical execution of historic and archaeological investigations throughout the eastern US, primarily on the Gulf Coast. Since June 2006 he has been employed by AECOM and worked on Department of Transportation and private sector energy projects and also as a Historic Preservation Specialist (archaeologist) for FEMA in various roles on the Gulf Coast. Most recently he has successfully completed the Phase I investigation of 30 miles of proposed pipeline in South Carolina according to state and FERC guidelines. Mr. Martinkovic has also participated in surveys and studies of proposed energy corridors in Florida, primarily assessments of transmission line corridors and power station sites. He also has extensive experience in monitoring and overseeing the excavation of large-scale utility projects, including the installation of a sewer system on the Beauvoir Plantation in Biloxi, MS (2010) and the installation of a combined sewer and natural gas system in historic downtown Pensacola (2000).

Marvin Brown, M.A., has over 35 years of experience in historic and architectural studies, environmental compliance procedures, and project management. This experience includes performing historic architectural surveys in support of state and federal projects in compliance with Section 106 and other statutes and regulations; determination of effects and development of mitigation measures, including Memoranda of Agreement, Programmatic Agreements, Historic Preservation Plans, HABS/HAER-level recordation, and Section 4(f) documentation; environmental documentation including Environmental Impact Statements, Environmental Assessments, and Categorical Exclusions for airport, highway, and other projects; recordation of historic bridges; emergency and long-term response for FEMA projects; and drafting Multiple Property Documentation forms and National Register nominations for individual properties and historic districts. He has completed numerous projects in Florida associated with airports and other resources.

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APPENDIX H

Noise Analysis Technical Report

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Rafael Hernandez Airport
Runway 8-26 Reconstruction
Environmental Assessment

Noise Technical Report

Prepared for:

Puerto Rico Port Authority
and
Federal Aviation Administration

Prepared by:

AECOM

November 2019

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ACRONYMS AND ABBREVIATIONS

AEDT	Aviation Environmental Design Tool
AEM	Area Equivalent Method
ATCT	Air Traffic Control Tower
BQN	Rafael Hernandez Airport
CFR	Code of Federal Regulation
dB	Decibel
dBA	A-Weighted Decibel
DNL	Day-Night Average Sound Level
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
GA	General Aviation
HUD	Department of Housing and Urban Development
Hz	Hertz
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
SEL	Sound Exposure Level
SPL	Sound Pressure Level

CHAPTER 1 INTRODUCTION

This *Noise Technical Report* details the assessment scope, calculation methodology, input data and other technical information used in the analysis of noise impacts associated with the proposed Runway 8-26 Reconstruction at the Rafael Hernandez Airport (i.e., BQN, or the Airport), hereinafter referred to as the Proposed Project.

1.1. AIRCRAFT NOISE DESCRIPTORS

A variety of noise metrics are used to assess airport noise impacts in different ways. Noise metrics are used to describe individual noise events (such as a single operation of an aircraft taking off overhead) or groups of events (such as the cumulative effect of numerous aircraft operations, the collection of which creates a general noise environment or overall exposure level). Both types of descriptors are helpful in explaining how people tend to respond to a given noise condition. Descriptions of these metrics are provided below.

Decibel, dB – Sound is a complex physical phenomenon consisting of complex minute vibrations traveling through a medium, such as air. These vibrations are sensed by the human ear as sound pressure. Because of the vast range of sound pressure or intensity detectable by the human ear, sound pressure level (SPL) is represented on a logarithmic scale known as decibels (dB). A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet (laboratory-type) listening conditions. A SPL of 120 dB begins to be felt inside the ear as discomfort and pain at approximately 140 dB. Most environmental sounds have SPLs ranging from 30 to 100 dB.

Because dB are logarithmic, they cannot be added or subtracted directly like other (linear) numbers. For example, if two sound sources each produce 100 dB, when they are operated together they will produce 103 dB, not 200 dB. Four 100 dB sources operating together again double the sound energy, resulting in a total SPL of 106 dB, and so on. In addition, if one source is much louder than another, the two sources operating together will produce the same SPL as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source masks the quieter one.

Two useful rules to remember when comparing SPLs are: (1) most people perceive a 6 to 10 dB increase in SPL between two noise events to be about a doubling of loudness, and (2) changes in SPL of less than about 3 dB between two events are not easily detected outside of a laboratory.

A-Weighted Decibel, dBA – Frequency, or pitch, is a basic physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 15,000 Hz. Because the human ear is more sensitive to middle and high frequencies (i.e., 1000 to 4000 Hz), a frequency weighting called “A” weighting is applied to the measurement of sound. The internationally standardized "A" filter approximates the sensitivity of the human ear and helps in assessing the perceived loudness of various sounds.

In this document all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Figure 1.1-1 charts common indoor and outdoor sound levels. A quiet rural area at nighttime may be 30 A-weighted decibels (dBA) or lower while the operator of a typical gas lawn mower may experience a level of 90 dBA. Similarly, the level in a library may be 30 dBA or lower while the listener at a rock band concert may experience levels near 110 dBA.

Maximum A-Weighted Noise Level, L_{max} – Sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the ambient or background as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a particular noise "event" by its highest or maximum sound level (L_{max}). Note L_{max} describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{max} may produce very different total exposures. One may be of very short duration, while the other may be much longer.

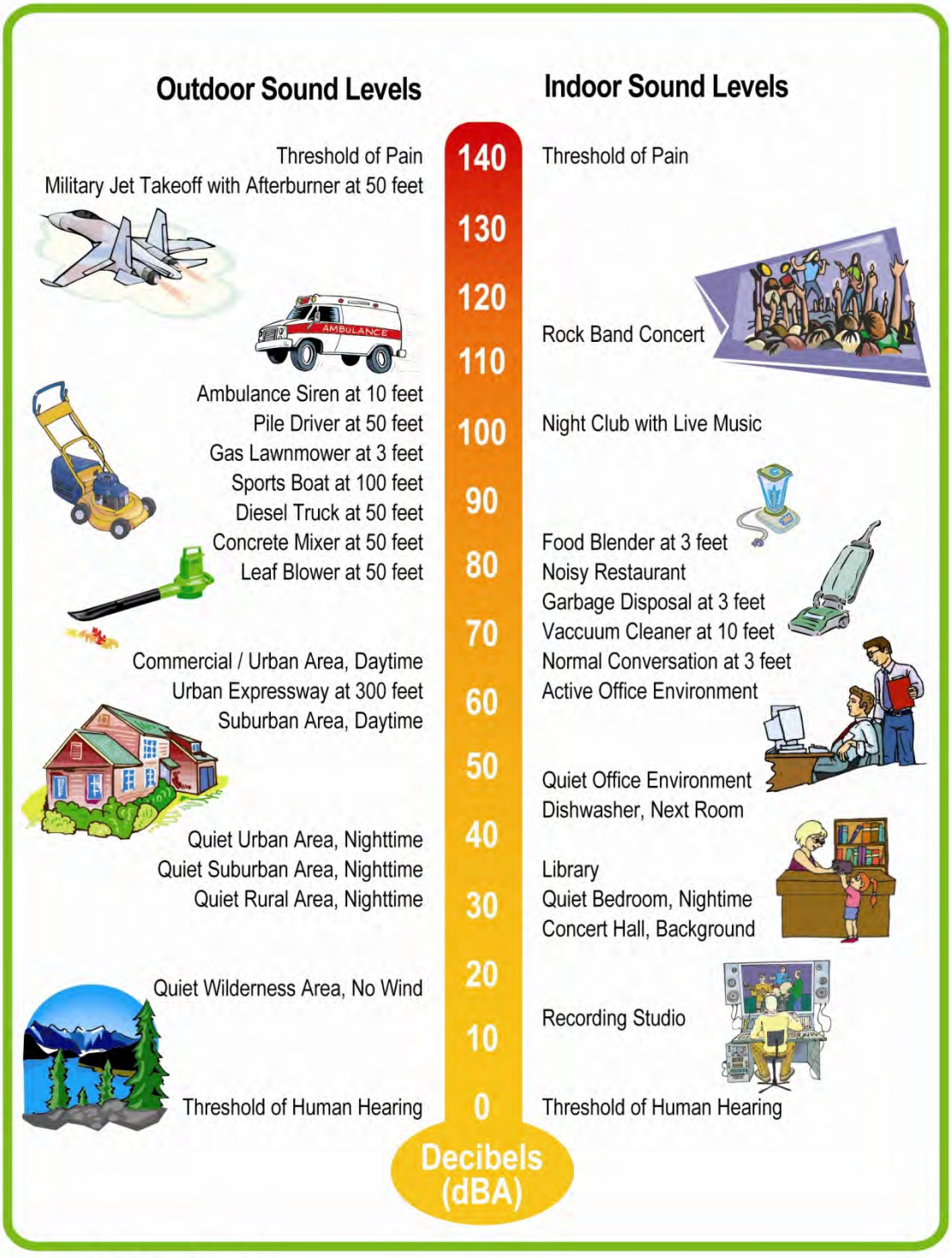
Sound Exposure Level, SEL – The most common measure of noise exposure for a single aircraft flyover is the sound exposure level (SEL). SEL is a summation of the A-weighted sound energy at a particular location over the true duration of a noise event normalized to a fictional duration of one second. The true duration is defined as the amount of time the noise event exceeds background levels. For events lasting more than one second, SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event.

The normalization to the fictional duration of one second enables the comparison of noise events with differing true duration and/or maximum level. Because the SEL is normalized to one second, it will almost always be larger in magnitude than the L_{max} for the event. In fact, for most aircraft events, the SEL is about 7 to 12 dB higher than the L_{max}. Additionally, since it is a cumulative measure, a higher SEL can result from either a louder or longer event, or some combination.

As SEL combines an event's overall sound level along with its duration, SEL provides a comprehensive way to describe noise events for use in modeling and comparing noise environments. Computer noise models, such as the one employed for this document, base their computations on these SELs.

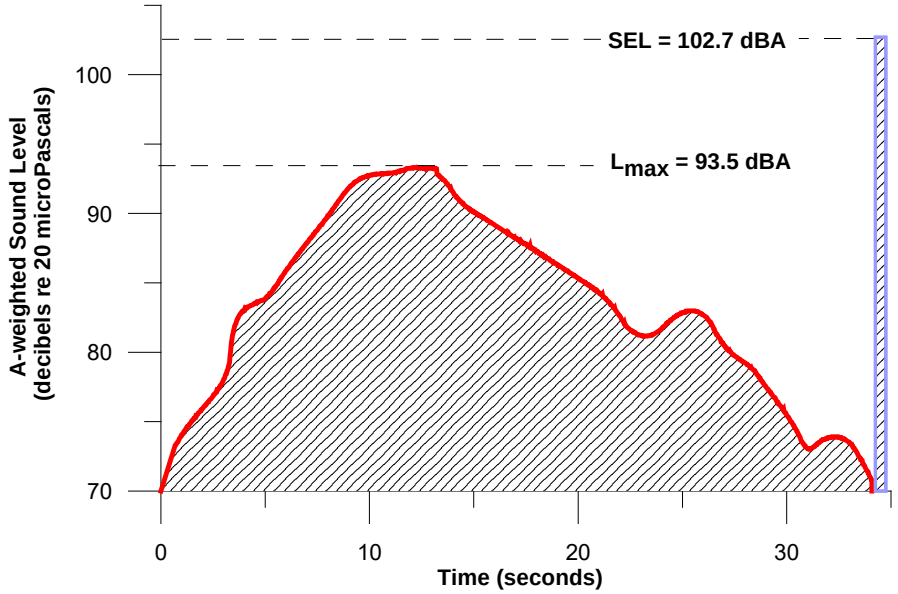
Figure 1.1-2 shows an event's "time history," the variation of sound level with time. For typical sound events experienced by a fixed listener, like a person experiencing an aircraft flying by, the sound level rises as the source (or aircraft) approaches the listener, peaks and then diminishes as the aircraft flies away from the listener. The area under the time history curve represents the overall sound energy of the noise event. The L_{max} for the event shown in the figure was 93.5 dBA. Compressing the event's total sound energy into one second to compute its SEL yields 102.7 dBA.

Figure 1.1-1 Common Outdoor and Indoor Sound Levels



Source: URS Corporation, 2008

Figure 1.1-2 Comparison of Maximum Sound Level (L_{MAX}) and Sound Exposure Level (SEL)



Source: URS Corporation, 2007.

Equivalent Sound Level, L_{eq} – Equivalent sound level (L_{eq}) is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest (e.g., an hour, an 8-hour school day, nighttime, or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal "peaks" and "dips." In the context of noise from typical aircraft flight events and as noted earlier for SEL, L_{eq} does not represent the sound level heard at any particular time, but rather represents the total sound exposure for the period of interest. Also, it should be noted that the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged," sound level. Thus, loud events tend to dominate the noise environment described by the L_{eq} metric.

Day-Night Average Sound Level, DNL - Time-averaged sound levels are measurements of sound levels averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period. For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (DNL). This metrics are similar to the Leq except that it compensates for the widely assumed increase in people's sensitivity to noise during nighttime hours. Each aircraft operation occurring between 10:00 p.m. and 7:00 a.m. is treated as if it were 10 operations. Logarithmically, this multiplier is the equivalent of adding 10 dB to the noise level of each nighttime operation. These noise level penalties are intended to correspond to the drop in background noise level which studies have

found takes place from daytime to nighttime in a typical community. The nighttime decrease in ambient sound levels—from both outdoor and indoor sources—is commonly considered to be the principal explanation for people's heightened sensitivity to noises during these periods.

DNL is the primary noise descriptor of this study. DNL is a 24-hour time-weighted-average noise metric expressed in dBA which accounts for the noise levels (in terms of SEL) of all individual aircraft events, the number of times those events occur, and the time of day at which they occur. Values of DNL can be measured with standard monitoring equipment or predicted with computer models. This document utilizes estimates of DNL with a Federal Aviation Administration (FAA)-approved computer-based noise model.

Typical DNL values for a variety of noise environments are shown in **Figure 1.1-3**. DNL values can be approximately 85 dBA outdoors under a flight path within a mile of a major airport and 40 dBA or less outdoors in a rural residential area.

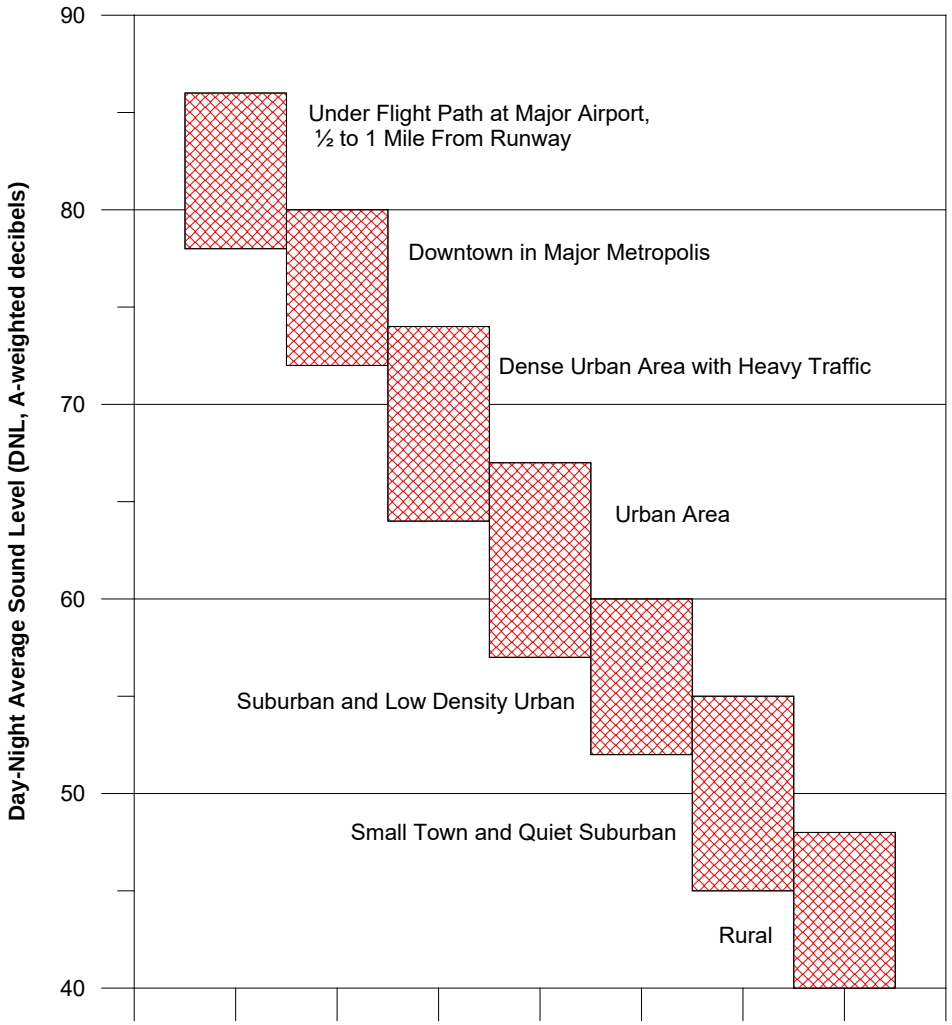
Due to the DNL descriptor's close correlation with the degree of community annoyance from aircraft noise, DNL have been formally adopted by most Federal agencies for measuring and evaluating aircraft noise for land use planning and noise impact assessment. Federal committees such as the Federal Interagency Committee on Urban Noise (FICUN) and the Federal Interagency Committee on Noise (FICON) which include the Environmental Protection Agency (EPA), FAA, Department of Defense, Department of Housing and Urban Development (HUD), and Veterans Administration, found DNL to be the best metric for land use planning. They also found no new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL. Other cumulative metrics could be used only to supplement, not replace DNL. Furthermore, FAA Order 1050.1F for environmental impact studies, requires DNL be used in describing cumulative noise exposure and in identifying aircraft noise/land use compatibility issues (EPA, 1974; FICUN, 1980; FICON, 1992; 14 CFR part 150, 2007; FAA, 2006).

1.2. EFFECTS OF AIRCRAFT NOISE ON PEOPLE

This section addresses three ways humans can be affected by aircraft noise: annoyance, speech interference and sleep disturbance.

Annoyance – The primary potential effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (EPA, 1974). Scientific studies and a large number of social/attitudinal surveys have been conducted to appraise people's annoyance to all types of environmental noise, especially aircraft events. These studies and surveys have found the DNL to be the best measure of this annoyance (EPA, 1974; FICUN, 1980; FICON, 1992; ANSI, 2007; ANSI, 2003; Schultz, 1978; Fidell, et. al., 1991).

Figure 1.1-3 Typical Range of Outdoor Community Day-Night Average Sound Levels



Source: FICON, 1992

The relationship between annoyance and DNL determined by the scientific community and endorsed by many Federal agencies, including the FAA, is shown in **Figure 1.2-1**. For a DNL of 65 dBA, approximately 13 percent of the exposed population would be highly-annoyed. The figure also shows at very low values of DNL, such as 45 dB or less, one percent or less of the exposed population would be highly annoyed. At very high values of DNL, such as 90 dBA, more than 80 percent of the exposed population would be highly annoyed.

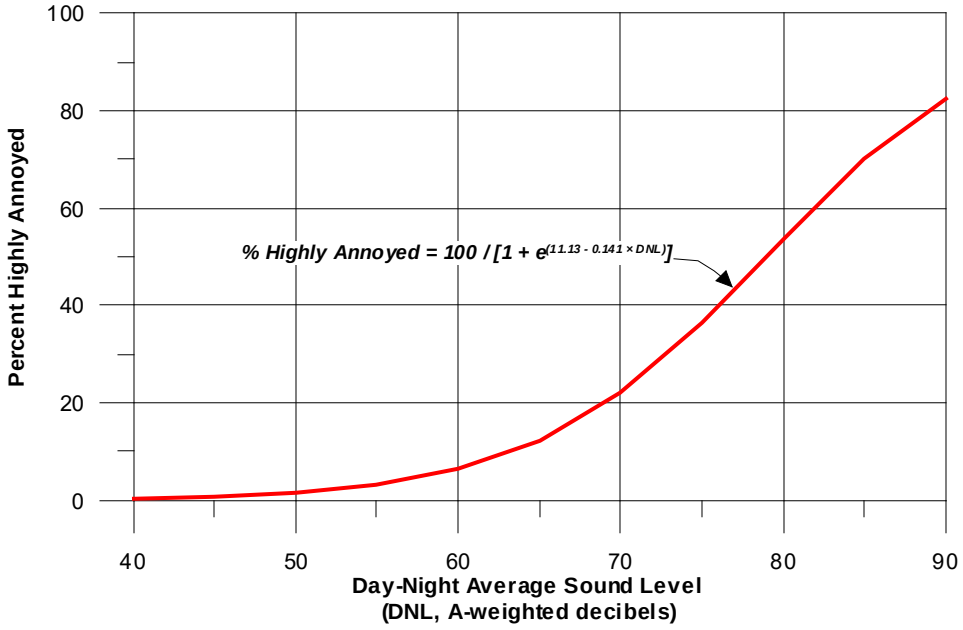
It is often suggested a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for FAA environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

- Provides a valid basis for comparing and assessing community noise effects.
- Represents a noise exposure level normally dominated by aircraft noise and not other

community or nearby highway noise sources.

- Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.
- HUD also established a DNL standard of 65 dBA for eligibility for Federally-guaranteed home loans.

Figure 1.2-1 Relationship between Annoyance and Day-Night Average Sound Level



Source: FICON, 1992

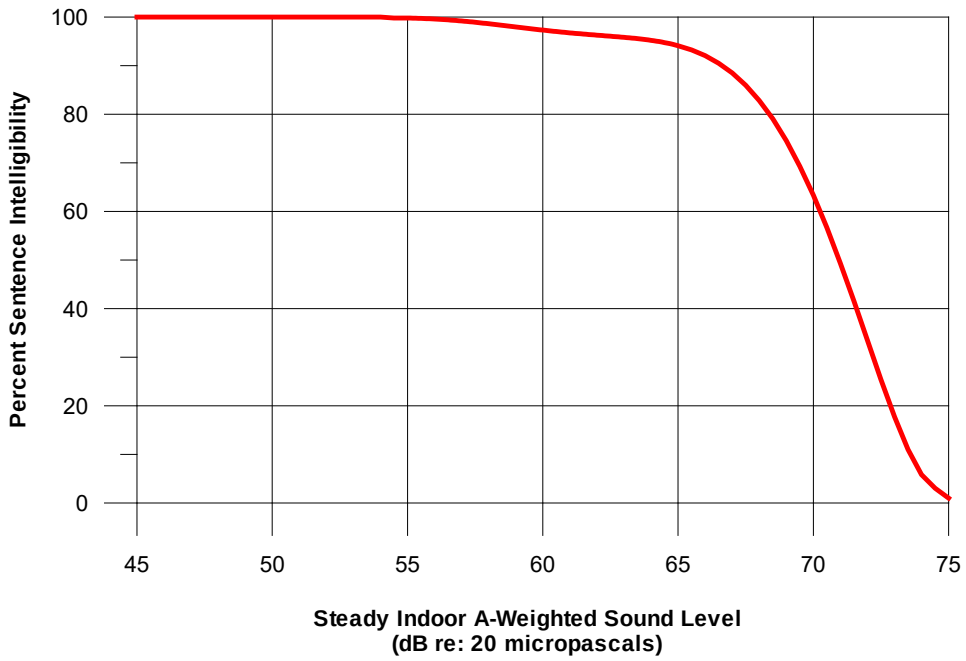
Speech Interference – A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation. As an aircraft approaches and its sound level increases, speech becomes harder to hear. As the ambient level increases, the talker must raise his/her voice, or the individuals must get closer together to continue talking.

For typical communication distances of three or four feet (one to 1.5 meters), acceptable outdoor conversations can be carried on in a normal voice as long as the ambient noise outdoors is less than about 65 dBA (FICON, 1992). If the noise exceeds this level, intelligibility would be lost unless vocal effort was increased or communication distance was decreased.

Indoor speech interference can be expressed as a percentage of sentence intelligibility between two average adults with normal hearing speaking fluently in relaxed conversation approximately one meter apart in a typical living room or bedroom (EPA, 1974). As shown in **Figure 1.2-2**, the percentage of sentence intelligibility is a non-linear function of the (steady) indoor ambient or background sound level (24-hour energy-average $L_{eq(24)}$). Steady ambient indoor sound levels of up to 45 dBA $L_{eq(24)}$ are expected to allow 100 percent intelligibility of sentences. The curve shows 99 percent sentence intelligibility for $L_{eq(24)}$ at or below 54 dBA and less than 10 percent

intelligibility for $L_{eq(24)}$ greater than 73 dBA. In the same document from which **Figure 1.2-2** was taken, the EPA established an indoor criterion of 45 dBA DNL as requisite to protect against speech interference indoors (EPA, 1974).

Figure 1.2-2 Percent Sentence Intelligibility for Indoor Speech



Source: EPA, 1974

1.3. NOISE ANALYSIS

1.3.1. EXISTING CONDITION NOISE MODELING ASSUMPTIONS

Airport Environmental Design Tool (AEDT)

The FAA has required the use of the Aviation Environmental Design Tool (AEDT) since May 29, 2015 for determining the predicted noise impact in the vicinity of airports. Statutory requirements for AEDT use are defined in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures; Order 5050.4B, NEPA Implementing Instructions for Airport Actions; and Title 14 Code of Federal Regulations (CFR) part 150, Airport Noise Compatibility Planning. AEDT Version 2D, released September 27, 2017, was the version used for this document (https://aedt.faa.gov/2d_information.aspx).

The AEDT incorporates the number of annual average daily daytime and nighttime flight and run-up operations, flight paths, and flight profiles of the aircraft along with its extensive internal database of aircraft noise and performance information, to calculate the DNL at many points on the ground around an airport. From a grid of points, the AEDT contouring program draws contours of equal DNL to be superimposed onto land use maps. For this document, DNL contours of 65, 70, and 75 dBA were developed. DNL contours are a graphical representation of how the noise

from the airport's average annual daily aircraft operations is distributed over the surrounding area. The AEDT can calculate sound levels at any specified point so that noise exposure at representative locations around an airport can be obtained.

The results of the AEDT analysis provide a relative measure of noise levels around airfield facilities. When the calculations are made in a consistent manner, the AEDT is most accurate for comparing before and after noise effects resulting from forecast changes or alternative noise control actions. It allows noise levels to be predicted for such Proposed Projects without the actual implementation and noise monitoring of those actions.

Title 14 CFR part 150, Appendix A, provides Federal compatible land use guidelines for several land uses as a function of DNL values. Compatible or non-compatible land use is determined by comparing the predicted or measured DNL values at a site to the established thresholds.

Examples of detailed local acoustical variables include:

- Temperature profiles;
- Wind gradients;
- Humidity effects;
- Ground absorption;
- Individual aircraft directivity patterns; and
- Sound diffraction caused by terrain, buildings, barriers, etc.

The results of the AEDT analysis provide a relative measure of noise levels around airfield facilities. When the calculations are made in a consistent manner, the AEDT is most accurate for comparing before and after noise effects resulting from forecast changes or alternative noise control actions. It allows noise levels to be predicted for such proposed projects without the actual implementation and noise monitoring of those actions.

Modeled Aircraft Operations

This section describes in detail the sources and derivation of the AEDT input data for the existing conditions including airport layout, weather, flight operations, runway use, flight tracks, track use, and flight profiles.

Airport Layout

There is one runway at BQN. Runway 8-26 is 11,700 feet long by 200 feet wide with 50-foot shoulders. The center section of the runway between 2,000 feet and 8,000 feet is comprised of six to eight inches of Portland Cement Concrete (PCC), with Asphalt Concrete (AC) overlay with thicknesses varying between three and six inches. The runway is serviced primarily by two partial parallel taxiways, Taxiway A and Taxiway M, as well as a traverse diagonal Taxiway C, which ties in with Taxiways E and G providing access to the southwestern apron area. Parking aprons include a commercial apron, cargo apron, business/GA apron, a government/municipal apron, and an "other/no-use" apron.

Flight Operations

As shown in **Table 1.3-1**, AEDT-modeled annual operations for the Existing Conditions totaled 40,451 operations, an average of approximately 111 daily operations Nighttime operations accounted for approximately 16% percent of the total operations at BQN.

Table 1.3-1 Existing Condition Average Annual Daily Aircraft Operations

ANP ID	Operations		
	Day	Night	Total
7478	0.211482	0.098104	0.309586
737400	0.002691	-	0.002691
737700	-	0.052096	0.052096
737800	0.017913	1.721775	1.739688
747200	0.001944	0.003549	0.005493
747400	0.677598	0.179848	0.857446
767300	0.001342	0.001349	0.002691
767JT9	0.013693	-	0.013693
A300-622R	0.002748	0.002749	0.005497
A310-304	0.023812	0.22547	0.249282
A319-131	0.053696	0.11339	0.167086
A320-232	3.33262	4.776948	8.109568
B429	0.02347	0.006622	0.030092
BEC58P	1.460358	0.005431	1.465789
C130E	2.188287	0.617202	2.805489
CIT3	0.024692	-	0.024692
CL600	0.150692	-	0.150692
CNA172	5.363998	0.189402	5.5534
CNA182	1.194489	-	1.194489
CNA206	2.314213	0.154276	2.468489
CNA208	5.525708	0.230478	5.756186
CNA441	0.344435	0.006258	0.350693
CNA500	0.073992	-	0.073992

ANP ID	Operations		
	Day	Night	Total
CNA510	0.057496	-	0.057496
CNA560XL	0.032896	-	0.032896
CNA680	0.021894	-	0.021894
CNA750	0.013693	-	0.013693
CVR580	1.659521	0.03905	1.698571
DC1010	1.249549	0.314818	1.564367
DC3	0.038386	-	0.038386
DHC6	4.339783	0.021808	4.361591
DHC8	0.002691	-	0.002691
DO328	1.476461	0.003034	1.479495
ECLIPSE500	0.005497	-	0.005497
EMB120	2.421325	0.006064	2.427389
EMB145	0.021893	-	0.021893
EMB190	0.008191	-	0.008191
F10062	0.005463	0.010932	0.016395
FAL20	0.024694	-	0.024694
GASEPF	1.804174	0.047912	1.852086
GASEPV	18.472441	1.272748	19.74519
GIV	0.066743	0.004447	0.07119
GV	0.005497	-	0.005497
HS748A	0.005497	-	0.005497
IA1125	0.015994	0.003196	0.01919
LEAR35	0.473668	0.003025	0.476693
MD11GE	2.596481	0.98708	3.583561
MD83	0.005497	-	0.005497
MU3001	0.119873	0.008918	0.128791
PA28	3.904095	-	3.904095
PA30	0.493193	-	0.493193
PA31	0.164397	-	0.164397
PA42	0.008191	-	0.008191
R44	0.072694	0.020496	0.09319
SA365N	24.457834	6.898358	31.35619
SD330	4.63116	0.018126	4.649286
SF340	0.927382	0.171201	1.098583
Grand Total	**92.608117**	**18.21616**	**110.8243**

Notes: ANP = Aircraft Noise Profile
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Numbers may not add due to rounding.
Sources: AEDT 2D; AECOM, 2019.

Runway Use

A summary of the modeled annual average daily utilization of BQN's runways is presented in **Tables 1.3-2** and **1.3-3** for arrivals and departures respectively. This data was provided by the FAA Air Traffic Control Tower (ATCT).

Table 1.3-2 Existing Condition Arrival Operations Runway Utilization

Runway	% of Total
8	69%
26	4%
H08	26%
H26	2%
Total	100%

Source: FAA ATCT 2018.

Table 1.3-3 Existing Condition Departure Operations Runway Utilization

Runway	% of Total
8	67%
26	4%
H08	27%
H26	2%
Total	100%

Source: FAA ATCT 2018.

Flight Tracks

Flight tracks are the aircraft's actual path through the air projected vertically onto the ground. Modeled flight tracks reflect a reasonable representation of the actual flight track recognizing that pilot technique and weather conditions will affect the actual track of individual flights. **Figure 1.3-1** depict modeled arrival and departure tracks.

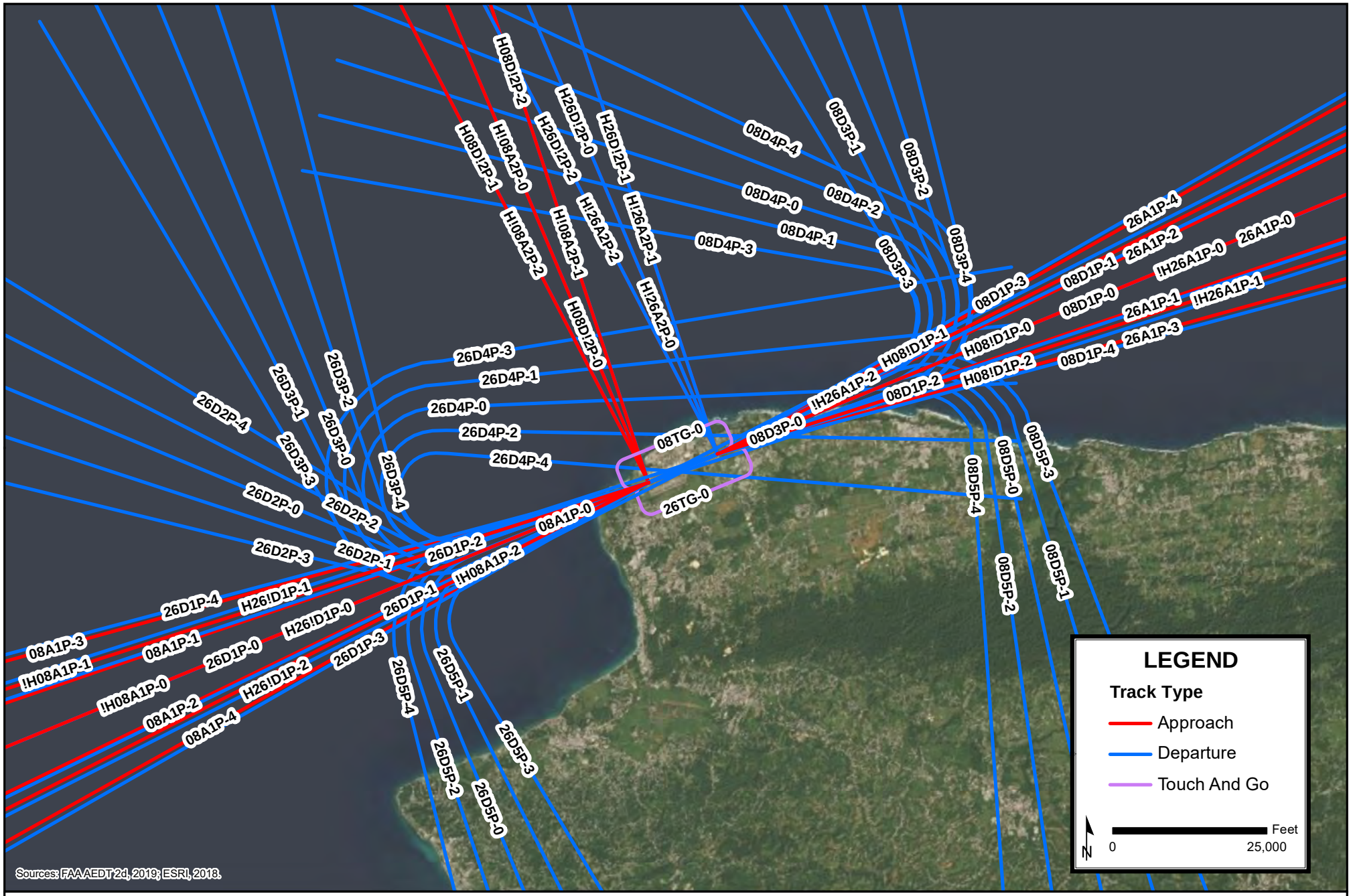
Track Use

Utilization percentages of the flight tracks and flight subtracks are tabulated in **Table 1.3-4** for arrivals and departures.

Table 1.3-4 Existing Condition Percent of Total Operations by Runway and Flight Track

Arrivals		Percent of Total Operations By Subtrack					
Runway	**Track Name**	**Subtrack 0**	**Subtrack 1**	**Subtrack 2**	**Subtrack 3**	**Subtrack 4**	**Total**
8	08A1P	12.5%	7.9%	7.9%	2.0%	2.0%	32.4%
	08TG	3.1%	0.0%	0.0%	0.0%	0.0%	3.1%
26	26A1P	0.7%	0.4%	0.4%	0.1%	0.1%	1.7%
	26TG	0.3%	0.0%	0.0%	0.0%	0.0%	0.3%
H08	!H08A1P	5.4%	1.2%	1.2%	0.0%	0.0%	7.9%
	H!08A2P	3.7%	0.9%	0.9%	0.0%	0.0%	5.4%
H26	!H26A1P	0.3%	0.1%	0.1%	0.0%	0.0%	0.4%
	H!26A2P	0.4%	0.1%	0.1%	0.0%	0.0%	0.5%
						Total	51.7%
Departures		**Percent of Total Operations By Subtrack**					
Runway	**Track Name**	**Subtrack 0**	**Subtrack 1**	**Subtrack 2**	**Subtrack 3**	**Subtrack 4**	**Total**
8	08D1P	5.2%	3.3%	3.3%	0.9%	0.9%	13.5%
	08D3P	3.9%	2.5%	2.5%	0.6%	0.6%	10.1%
	08D4P	2.7%	1.7%	1.7%	0.4%	0.4%	6.9%
	08D5P	0.7%	0.5%	0.5%	0.1%	0.1%	1.9%
26	26D1P	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%
	26D2P	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%
	26D3P	0.2%	0.1%	0.1%	0.0%	0.0%	0.5%
	26D4P	0.2%	0.1%	0.1%	0.0%	0.0%	0.6%
	26D5P	0.1%	0.1%	0.1%	0.0%	0.0%	0.2%
H08	H08!D1P	5.4%	1.2%	1.2%	0.0%	0.0%	7.9%
	H08D!2P	3.7%	0.9%	0.9%	0.0%	0.0%	5.4%
H26	H26!D1P	0.3%	0.1%	0.1%	0.0%	0.0%	0.4%
	H26D!2P	0.4%	0.1%	0.1%	0.0%	0.0%	0.5%
						Total	48.3%

Source: FAA ATCT 2018.



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RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

FLIGHT TRACKS

FIGURE
1.3-1

Flight Profiles

Flight profiles model the vertical paths of aircraft during departure and arrival to determine the altitude, speed, and engine thrust or power of an aircraft at any point along a flight track. AEDT uses this information to calculate noise exposure on the ground. Profiles are unique to each aircraft type and vary with temperature, barometric pressure, headwind, and aircraft weight. Standard AEDT default profiles were used for all aircraft operations.

FAA Part 150 Compatible Land Use Criteria

Title 14 CFR part 150, Appendix A, Table 1 (Title 14 CFR part 150, 2007), provides Federal compatible land use guidelines for several land uses as a function of DNL values. Compatible or non-compatible land use is determined by comparing the predicted or measured values at a site to the values listed in **Table 1.3-5**.

Table 1.3-5 Land Use Compatibility with Yearly Day-Night Average Sound Levels

	Yearly Day-Night Average Sound Level (DNL)					
	Below 65 Decibels	**65-70 Decibels**	**70-75 Decibels**	**75-80 Decibels**	**80-85 Decibels**	**Over 85 Decibels**
Residential						
Residential (Other than mobile homes & transient lodges)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communications	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, General	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
Recreational						

Outdoor Sports Arenas, Spectator Sports	Y	Y[5]	Y[5]	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

NOTE: The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

Y (Yes) Land Use and related structures are compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

NLR Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.

25, 30, or 35 Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

[1] Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

[2] Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[3] Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[4] Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[5] Land use compatibility provided special sound reinforcement systems are installed.

[6] Residential buildings require an NLR of 25 dB.

[7] Residential buildings require an NLR of 30 dB.

[8] Residential buildings not permitted.

Noncompatible land use

Source: Title 14 CFR part 150, 2007.

1.3.2. FUTURE CONDITIONS NOISE MODELING

Proposed Action Alternative 2B consists of shifting Runway 8-26 862 feet east of current alignment, applying a displaced threshold of 325 feet on Runway 8 and 130 feet on Runway 26, and utilizing declared distances. Proposed Action Alternative 2D consists of shifting Runway 8-26 1,187 feet east of current alignment, applying a displaced threshold of 452 feet on Runway 8, and utilizing declared distances. Because of the change in runway orientation and endpoint locations, both action alternatives would be expected to change the location of the DNL 65 dB noise contour on and surrounding BQN compared to the No-Action Alternative. Additionally, AEDT noise modeling demonstrates that the locations of noise contours would differ between Alternatives 2B and 2D. These differences are attributed to a difference in the location of the proposed runway endpoints and thresholds and declared distances between these two alternatives.

Flight Operations

The Proposed Project would not result in an increase in aircraft operations or a change in aircraft fleet mix at BQN. Total aircraft operations are forecast to increase in future years relative to

existing conditions irrespective of implementing any of the Proposed Project alternatives. **Tables 1.3-6 and 1.3-7** show the anticipated average annual day and night operations for CY 2024 and 2029, respectively, which would be identical under Alternative 2B, Alternative 2D, and the No-Action Alternative

Table 1.3-6 2024 Average Annual Daily Aircraft Operations

ANP ID	2024 Operations		
	Day	Night	Total
7478	0.235810	0.109390	0.345200
737400	0.002700	-	0.002700
737700	-	0.057500	0.057500
737800	0.019972	1.919728	1.939700
747200	0.001946	0.003554	0.005500
747400	0.755638	0.200562	0.956200
767300	0.001346	0.001354	0.002700
767JT9	0.013700	-	0.013700
A300-622R	0.002749	0.002751	0.005500
A310-304	0.026698	0.252802	0.279500
A319-131	0.059871	0.126429	0.186300
A320-232	3.715432	5.325668	9.041100
B429	0.027766	0.007834	0.035600
BEC58P	1.626850	0.006050	1.632900
C130E	2.438286	0.687714	3.126000
CIT3	0.027400	-	0.027400
CL600	0.167100	-	0.167100
CNA172	5.980625	0.211175	6.191800
CNA182	1.331500	-	1.331500
CNA206	2.578786	0.171914	2.750700
CNA208	6.159487	0.256913	6.416400
CNA441	0.384808	0.006992	0.391800
CNA500	0.082200	-	0.082200
CNA510	0.063000	-	0.063000
CNA560XL	0.038400	-	0.038400
CNA680	0.021900	-	0.021900
CNA750	0.013700	-	0.013700
CVR580	1.849675	0.043525	1.893200
DC1010	1.391834	0.350666	1.742500
DC3	0.043800	-	0.043800
DHC6	4.835998	0.024302	4.860300
DHC8	0.002700	-	0.002700
DO328	1.645918	0.003382	1.649300
ECLIPSE500	0.005500	-	0.005500
EMB120	2.697345	0.006755	2.704100

ANP ID	2024 Operations		
	Day	Night	Total
EMB145	0.021900	-	0.021900
EMB190	0.008200	-	0.008200
F10062	0.005465	0.010935	0.016400
FAL20	0.030100	-	0.030100
GASEPF	2.012359	0.053441	2.065800
GASEPV	20.589581	1.418619	22.008200
GIV	0.074534	0.004966	0.079500
GV	0.005500	-	0.005500
HS748A	0.005500	-	0.005500
IA1125	0.016002	0.003198	0.019200
LEAR35	0.528127	0.003373	0.531500
MD11GE	2.892272	1.099528	3.991800
MD83	0.005500	-	0.005500
MU3001	0.132633	0.009867	0.142500
PA28	4.353400	-	4.353400
PA30	0.550700	-	0.550700
PA31	0.183600	-	0.183600
PA42	0.008200	-	0.008200
R44	0.081204	0.022896	0.104100
SA365N	27.261551	7.689149	34.950700
SD330	5.160602	0.020198	5.180800
SF340	1.036124	0.191276	1.227400
Grand Total	**103.213499**	**20.304401**	**123.517900**

Notes: ANP = Aircraft Noise Profile
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Numbers may not add due to rounding.
Sources: AEDT 2D; AECOM, 2019.

Table 1.3-7 2029 Average Annual Daily Aircraft Operations

ANP ID	2029 Operations		
	Day	Night	Total
7478	0.245377	0.113827	0.359204
737400	0.002810	-	0.002810
737700	-	0.059833	0.059833
737800	0.020783	1.997607	2.018390
747200	0.002025	0.003698	0.005723
747400	0.786293	0.208698	0.994991
767300	0.001401	0.001408	0.002810
767JT9	0.014256	-	0.014256
A300-622R	0.002861	0.002862	0.005723
A310-304	0.027782	0.263057	0.290839
A319-131	0.062300	0.131558	0.193858

ANP ID	2029 Operations		
	Day	Night	Total
A320-232	3.866160	5.541719	9.407879
B429	0.028892	0.008152	0.037044
BEC58P	1.692848	0.006296	1.699143
C130E	2.537202	0.715613	3.252815
CIT3	0.028512	-	0.028512
CL600	0.173879	-	0.173879
CNA172	6.223247	0.219742	6.442989
CNA182	1.385516	-	1.385516
CNA206	2.683402	0.178888	2.862290
CNA208	6.409365	0.267335	6.676700
CNA441	0.400419	0.007275	0.407695
CNA500	0.085535	-	0.085535
CNA510	0.065556	-	0.065556
CNA560XL	0.039958	-	0.039958
CNA680	0.022788	-	0.022788
CNA750	0.014256	-	0.014256
CVR580	1.924713	0.045290	1.970003
DC1010	1.448298	0.364892	1.813190
DC3	0.045577	-	0.045577
DHC6	5.032185	0.025287	5.057472
DHC8	0.002810	-	0.002810
DO328	1.712689	0.003519	1.716209
ECLIPSE500	0.005723	-	0.005723
EMB120	2.806770	0.007029	2.813800
EMB145	0.022788	-	0.022788
EMB190	0.008533	-	0.008533
F10062	0.005686	0.011379	0.017065
FAL20	0.031321	-	0.031321
GASEPF	2.093997	0.055609	2.149605
GASEPV	21.424858	1.476169	22.901027
GIV	0.077558	0.005168	0.082725
GV	0.005723	-	0.005723
HS748A	0.005723	-	0.005723
IA1125	0.016652	0.003327	0.019979
LEAR35	0.549552	0.003510	0.553062
MD11GE	3.009605	1.144134	4.153739
MD83	0.005723	-	0.005723
MU3001	0.138013	0.010268	0.148281
PA28	4.530008	-	4.530008
PA30	0.573041	-	0.573041
PA31	0.191048	-	0.191048

ANP ID	2029 Operations		
	Day	Night	Total
PA42	0.008533	-	0.008533
R44	0.084499	0.023824	0.108323
SA365N	28.367496	8.001082	36.368578
SD330	5.369957	0.021018	5.390974
SF340	1.078158	0.199035	1.277193
Grand Total	**107.400659**	**21.128108**	**128.528767**

Notes: ANP = Aircraft Noise Profile
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Numbers may not add due to rounding.
Sources: AEDT 2D; AECOM, 2019.

Runway Use

Runway utilization for the Proposed Project Alternatives would remain unchanged from the existing condition, as depicted in **Tables 1.3-2 and 1.3-3**.

Flight Tracks

Flight tracks for the Proposed Project Alternatives would remain unchanged from the existing condition.

Track Use

Flight track and subtrack utilization for the Proposed Project Alternatives would remain unchanged from the existing condition, as depicted in **Table 1.3-4**.

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APPENDIX I

Traffic Analysis Technical Report

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APPENDIX I.1

2019 Traffic Analysis Technical Report

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Rafael Hernandez Airport
Runway 8-26 Reconstruction
Environmental Assessment

Construction Traffic Impacts Analysis
Technical Report

Prepared for:

Puerto Rico Port Authority
and
Federal Aviation Administration

Prepared by:

AECOM

November 2019

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ACRONYMS AND ABBREVIATIONS

BQN	Rafael Hernandez Airport
LOS	Level of Service
mph	miles per hour
TMC	Turning Movement Counts

CHAPTER 1 INTRODUCTION

This *Construction Traffic Impacts Analysis Technical Report* details the assessment scope, calculation methodology, and other technical information used in the analysis of construction-related traffic impacts associated with the proposed Runway 8-26 Reconstruction at the Rafael Hernandez Airport (i.e., BQN, or the Airport), hereinafter referred to as the Proposed Project.

1.1. ANAYSIS METHODOLOGY

1.1.1. EXISTING TRAFFIC CONDITIONS

A July 2018 study, conducted by Marlin Engineering (included in this appendix), analyzed existing traffic conditions on roadways surrounding BQN. Twelve-Hour Turning Movement Counts (TMC) from 6 AM to 6 PM, on a typical weekday (Tuesday, Wednesday, or Thursday) were collected at ten study intersections. The analysis was conducted by identifying the maximum one-hour (peak-hour) traffic volume from the collected TMC for the entire set of ten intersections, rather than for individual intersections. The volumes indicate that the AM peak-hour for the surrounding roadway network was from 7:15 AM to 8:15 AM, and the PM peak-hour was from 2:15 PM to 3:15 PM.

The existing operation conditions of studied intersections for the AM and PM peak-hour were evaluated using Synchro 9, which utilizes analysis methodologies contained in the 2010 Highway Capacity Manual[1]. Existing peak hour turning movement volumes, existing traffic signal timings, and generic intersection geometries were utilized in the analyses to estimate existing delay and level of service (LOS) for each of the study's intersections (one signalized and nine unsignalized).

LOS is a qualitative measure used to describe the quality of motor vehicle traffic service. LOS is used to analyze roadways and intersections by categorizing traffic flow and assigning quality levels of traffic based on performance measures such as vehicle speed, density, congestion, and other factors. LOS for intersections is determined differently for signalized and unsignalized approaches.

As stated in the 2010 Highway Capacity Manual:

> *"Signalized intersection LOS is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour).*

[1] Transportation Research Board, 2010. *2010 Highway Capacity Manual* (HCM2010), Fifth Edition. Transportation Research Board, National Academies of Sciences, Engineering, and Medicine.

Unsignalized intersection LOS criteria can be further reduced into three intersection types: all-way stop, two-way stop, and roundabout control. All-way stop and roundabout control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach.

Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements." (Transportation Research Board, 2010)

Tables 1.1-1 and **1.1-2** detail LOS criteria for signalized and unsignalized intersections, respectively.

Table 1.1-1 Level of Service Criteria for Signalized Intersections

LOS	Average Intersection Delay	General Description
A	Less than or equal to 10 seconds	Free flow
B	Greater than 10 to 20 seconds	Stable flow (slight delays)
C	Greater than 20 to 35 seconds	Stable flow (acceptable delays)
D	Greater than 35 to 55 seconds	Approaching unstable flow (tolerable delays)
E	Greater than 55 to 80 seconds	Unstable flow (intolerable delays)
F	Greater than 80 seconds	Forced flow (congested; queues failing to clear)

Source: Transportation Research Board, 2010

Table 1.1-2 Level of Service Criteria for Unsignalized Intersections

LOS	Average Control Delay
A	Less than or equal to 10 seconds
B	Greater than 10 to 15 seconds
C	Greater than 15 to 25 seconds
D	Greater than 25 to 35 seconds
E	Greater than 35 to 50 seconds
F	Greater than 50 seconds

Source: Transportation Research Board, 2010

A subsequent traffic analysis was performed by AECOM in 2019 to establish more detailed existing roadway network traffic conditions. For this analysis, Synchro 9 was used as previously discussed, with the addition of intersection-specific geometry and connecting roadway link properties. The resulting network analysis established existing peak-hour travel speeds and travel times using different intersection approaches (clockwise and counter-clockwise) between the studied intersections, considering the specific intersection geometries and intersection approaches. Speed and travel time between intersections are a function of open roadway speed, segment length, and notably of the level of congestion for each specific intersection approach. Existing conditions for the studied segments are shown in **Tables 1.1-3** and **1.1-4**.

Table 1.1-3 Existing Peak-Hour Conditions for Clockwise Approaches

Intersection			Volume (Total Vehicles)	Speed (mph)	Link Distance (feet)	Time (seconds)
From	To	Approach				
PR 107 at PR 4467 (signalized)	PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	Northbound	1,317	20	5,500	188
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Eastbound	527	25	3,934	107
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Eastbound	536	22	164	5
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Guard Road at Crown Road	Eastbound	342	18	1,572	60
Guard Road at Crown Road	PR 110 at Wing Road	Eastbound	412	13	1,683	88
PR 110 at Wing Road	PR 110 at PR 4466	Eastbound	468	33	11,995	248
PR 110 at PR 4466	PR 110 at PR 459 Interchange-north of PR 110 overpass	Southbound	2	32	10,535	224
PR 110 at PR 459 Interchange-north of PR 110 overpass	PR 110 at PR 459 Interchange-south of PR 110 overpass	Westbound	597	22	198	6
PR 110 at PR 459 Interchange-south of PR 110 overpass	PR 467 at PR 459	Westbound	801	29	7,076	166
PR 467 at PR 459	PR 107 at PR 4467 (signalized)	Westbound	285	22	11,102	344

Note: mph = miles per hour
Source: AECOM, 2019

Table 1.1-4 Existing Peak Hour Conditions for Counter-Clockwise Approaches

Intersection			Volume (Total Vehicles)	Speed (mph)	Link Distance (feet)	Time (seconds)
From	To	Approach				
PR 107 at PR 4467 (signalized)	PR 467 at PR 459	Eastbound	348	2	11,102	3,785
PR 467 at PR 459	PR 110 at PR 459 Interchange-south of PR 110 overpass	Eastbound	670	32	7,076	151
PR 110 at PR 459 Interchange-south of PR 110 overpass	PR 110 at PR 459 Interchange-north of PR 110 overpass	Eastbound	667	10	198	14
PR 110 at PR 459 Interchange-north of PR 110 overpass	PR 110 at PR 4466	Northbound	696	36	10,535	200
PR 110 at PR 4466	PR 110 at Wing Road	Westbound	987	21	11,995	389
PR 110 at Wing Road	Guard Road at Crown Road	Westbound	410	12	1,683	96
Guard Road at Crown Road	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Westbound	337	27	1,572	40
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Westbound	343	23	164	5
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	PR 107 at Engineer Orlando Alarcon Ave./Hangar Road	Westbound	224	9	3,934	298
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	PR 107 at PR 4467 (signalized)	Southbound	745	29	5,500	129

Source: AECOM, 2019

1.1.2. CONSTRUCTION PHASE TRAFFIC CONDITIONS

In 2018, Marlin Engineering conducted a future conditions analysis to assess traffic conditions during the year of construction, using the same process discussed in **Section 1.1.2** above and detailed in their study report included in this appendix. Construction contractors were interviewed regarding expected construction traffic volumes for the Proposed Project. The contractor's representative indicated that approximately six construction trucks (used for activities such as material delivery or debris hauling) would enter or leave the site each hour. Additionally, a

maximum of 150 construction employees would be traveling to the site and impacting local traffic daily. Many of the employee commute trips would be expected to occur either before the AM peak-hour or after the PM peak-hour.

AECOM conducted an additional construction year traffic analysis with Synchro 9, again using intersection-specific geometry and connecting roadway link data to develop two future scenarios for the roadway network adjacent to BQN. A “build” scenario was developed for the construction activity year, which included the addition of construction-related traffic, and a “no-build” scenario with the construction-related traffic removed.

Construction-related traffic impacts to vehicle delay at the study area intersections was determined by subtracting the future year “no-build” scenario delay time (seconds per vehicle) from the future year “build” scenario delay time for each intersection directional approach. This difference in delay time represents the additional time an average vehicle would be expected to wait at a given intersection approach during the construction phase of the Proposed Project. The resulting LOS was determined by adding the construction-related delay for each intersection to the future year delay time developed by Marlin Engineering, and then applying the LOS criteria depicted in **Tables 1.1-1** and **1.1-2**. In many cases, intersection approaches analyzed in Marlin Engineering’s study have multiple controlled lanes for multiple direction-of-travel options. The change in average delay time developed by AECOM was applied to each of the controlled lanes and movement options at such intersection approaches. “No-build” and “build” scenario delay times for each studied intersection approach are shown in **Tables 1.1-5** and **1.1-6**.

Table 1.1-5 Construction Year Peak-Hour Intersection Delays for Clockwise Approaches

Intersection			Average Road Segment Travel Time (seconds/vehicle)		Construction Traffic Delay (Seconds/ Vehicle)
From	To	Approach	No-Build Scenario	Build Scenario	
PR 107 at PR 4467 (signalized)	PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	Northbound	187	197	10
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Eastbound	107	107	--
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Eastbound	5	5	--
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Guard Road at Crown Road	Eastbound	60	60	--
Guard Road at Crown Road	PR 110 at Wing Road	Eastbound	88	88	--
PR 110 at Wing Road	PR 110 at PR 4466	Eastbound	248	248	--
PR 110 at PR 4466	PR 110 at PR 459 Interchange-north of PR 110 overpass	Southbound	232	232	--
PR 110 at PR 459 Interchange-north of PR 110 overpass	PR 110 at PR 459 Interchange-south of PR 110 overpass	Westbound	6	6	--
PR 110 at PR 459 Interchange-south of PR 110 overpass	PR 467 at PR 459	Westbound	172	172	--
PR 467 at PR 459	PR 107 at PR 4467 (signalized)	Westbound	360	360	--

Source: AECOM, 2019

Table 1.1-6 Construction Year Peak Hour Intersection Delays for Counter-Clockwise Approaches

Intersection			Average Delay (seconds/vehicle)		Construction Traffic Delay (Seconds/ Vehicle)
From	To	Approach	No-Build Scenario	Build Scenario	
PR 107 at PR 4467 (signalized)	PR 467 at PR 459	Eastbound	3,785	3,785	--
PR 467 at PR 459	PR 110 at PR 459 Interchange-south of PR 110 overpass	Eastbound	151	151	--
PR 110 at PR 459 Interchange-south of PR 110 overpass	PR 110 at PR 459 Interchange-north of PR 110 overpass	Eastbound	11	12	1
PR 110 at PR 459 Interchange-north of PR 110 overpass	PR 110 at PR 4466	Northbound	200	200	--
PR 110 at PR 4466	PR 110 at Wing Road	Westbound	389	389	--
PR 110 at Wing Road	Guard Road at Crown Road	Westbound	96	105	9
Guard Road at Crown Road	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Westbound	40	40	--
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	Westbound	5	5	--
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit	PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	Westbound	298	298	--
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road	PR 107 at PR 4467 (signalized)	Southbound	129	129	--

Source: AECOM, 2019

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APPENDIX I.2

2018 Puerto Rico Airport Construction Traffic Study

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CONSTRUCTION TRAFFIC IMPACT ON SURROUNDING ROADWAYS STUDY

RAFAEL HERNANDEZ AIRPORT (BQN)
RUNWAY RECONSTRUCTION PROJECT

AGUADILLA, PUERTO RICO

JULY 2018 | DRAFT

PREPARED BY

MARLIN Engineering, Inc.
1700 NW 66th Avenue | Suite 106
Plantation, FL 33313

P: 305.477.7575
www.marlinengineering.com

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EXECUTIVE SUMMARY

Marlin Engineering, Inc (MEI) has been retained to conduct a traffic impact analysis of construction traffic impacts on the roadway network surrounding Rafael Hernandez Airport, at Aguadilla, Puerto Rico during a proposed runway reconstruction project. The project entails the total reconstruction of Runway 8-26, along with reconfiguring a taxiway which parallels the runway to serve as a temporary runway while Runway 8-26 is being reconstructed. The anticipated start time of the project is February 2020, with completion anticipated by December 2020. The proposed reconstruction may have some potential constraints and impacts to the local commute which can impact the quality of life of the communities surrounding the airport.

During the AM and PM peak hours, both in the existing conditions and during the construction project (if nothing was done to improve operational conditions at these intersections between the writing of this study in July 2018 and the start of the runway construction project in February 2020), the following approaches on the surrounding roadway network have a LOS of F and excessive delays:

AM Peak Hour:

- **PR 467 at PR 459** — **Eastbound STOP-controlled approach**
- **PR 110 at PR 459 North** — **Eastbound to northbound left-turn**
- PR 110 at PR 459 North — Westbound to southbound left-turn
- **PR 110 at PR 4466** — **Westbound STOP-controlled approach**
- PR 107 at Engineer Alarcon — Westbound STOP-controlled approach

PM Peak Hour:

- **PR 467 at PR 459** — **Eastbound STOP-controlled approach**
- PR 110 at PR 459 North — Eastbound to northbound left-turn
- PR 110 at PR 4466 — Westbound STOP-controlled approach
- PR 107 at Engineer Alarcon — Westbound STOP-controlled approach

It is recommended that the Puerto Rico Department of Transportation and Public Works (DTOP), which maintains "PR" routes of which all of these intersections are a part of, verify operational conditions (perform qualitative analysis) of these intersections on-site during peak periods. The DTOP should consider analyzing whether operations at these intersections could be improved by converting them to all-way STOP-control, or whether traffic signals are warranted.

If no operational improvements are made at the intersections listed above before the start of runway reconstruction, anticipated in February 2020:

When the contractor is hauling materials to/from the airport construction site to/from the locations of the bituminous concrete plant, landfill, and borrow site during the AM and PM peaks:

Contractor should use PR-107 south, then turn east onto PR-2, then follow PR-2 to PR-110 north to travel from the airport construction site to the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport.

Contractor should use PR-110 south, the turn west onto PR-2, then follow PR-2 to PR-107 north to travel from the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport to the airport construction site.

Finally, it should be noted that the contractor must be responsible for any damage caused by the construction vehicles on the roadways during the construction period.

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Appendix

1.0 INTRODUCTION

Marlin Engineering, Inc (MEI) has been retained to conduct a traffic impact analysis of construction traffic impacts on the roadway network surrounding Rafael Hernandez Airport, at Aguadilla, Puerto Rico during a proposed runway reconstruction project. The project entails the total reconstruction of Runway 8-26, along with reconfiguring a taxiway which parallels the runway to serve as a temporary runway while Runway 8-26 is being reconstructed. The anticipated start time of the project is February 2020, with completion anticipated by December 2020. The proposed reconstruction may have some potential constraints and impacts to the local commute which can impact the quality of life of the communities surrounding the airport.

During this period, there will be a minimal increase in traffic volumes around the vicinity of the BQN airport consisting of construction vehicles and employees going in and out to the construction site. Thus, to evaluate the overall impact of the reconstruction on the adjacent roadway network, a traffic impact analysis report was conducted.

The airport is located at the very northwest corner of the island of Puerto Rico. The airport is a joint civil-military airport and is the second largest international airport on the island. The airport has only one (1) runway. The proposed project will reconstruct the runway, in part to accommodate expansion of a nearby Federal Express (FedEx) cargo facility.

Figure 1 is a location map of the airport, which also shows the surrounding roadway network.

2.0 CONSTRUCTION ACCESS

The contractor's representative, Victor Morales, PE, Project Manager, AECOM, was contacted and the following information was provided:

- The earthwork borrow site and nearest landfill is located on PR-110, approximately eight (8) to ten (10) miles away from the site.
- There will be approximately six (6) trips per hour (in and out) for construction vehicles such as dump trucks or cement trucks with maximum construction traffic occurring during 7AM to 9AM in the morning and 4PM to 6PM in the evening.
- The bituminous concrete (asphalt) plant is expected to be located approximately four (4) miles away from the site, and the Portland cement concrete (PCC) plant is anticipated to be located not less than two (2) miles away from the site, or located in the south area of the airport property.

- Also, it is also expected to have as many as 150 employees working on the construction site from 6AM to 5PM on a typical workday.

Access to the proposed reconstruction site is proposed via one of the two pre-determined access points shown in **Figure 2**. The access point 1 is marked as the best preferred point of access to the site and is located on the west side of BQN airport on PR-107. Access point 2 is marked as the second-best point of access and it is located on the south side of BQN airport.

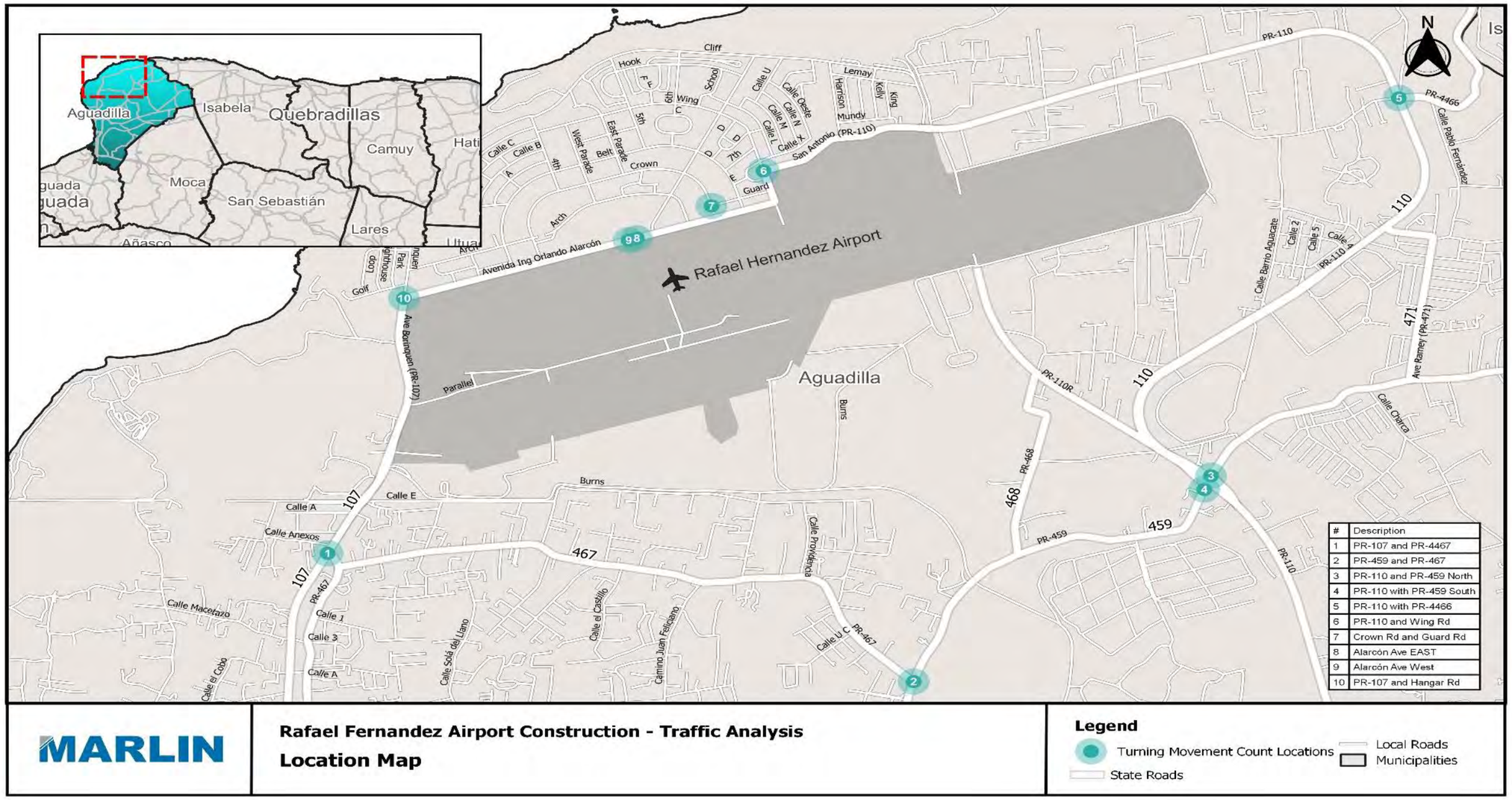

Figure 1. Study Location Map

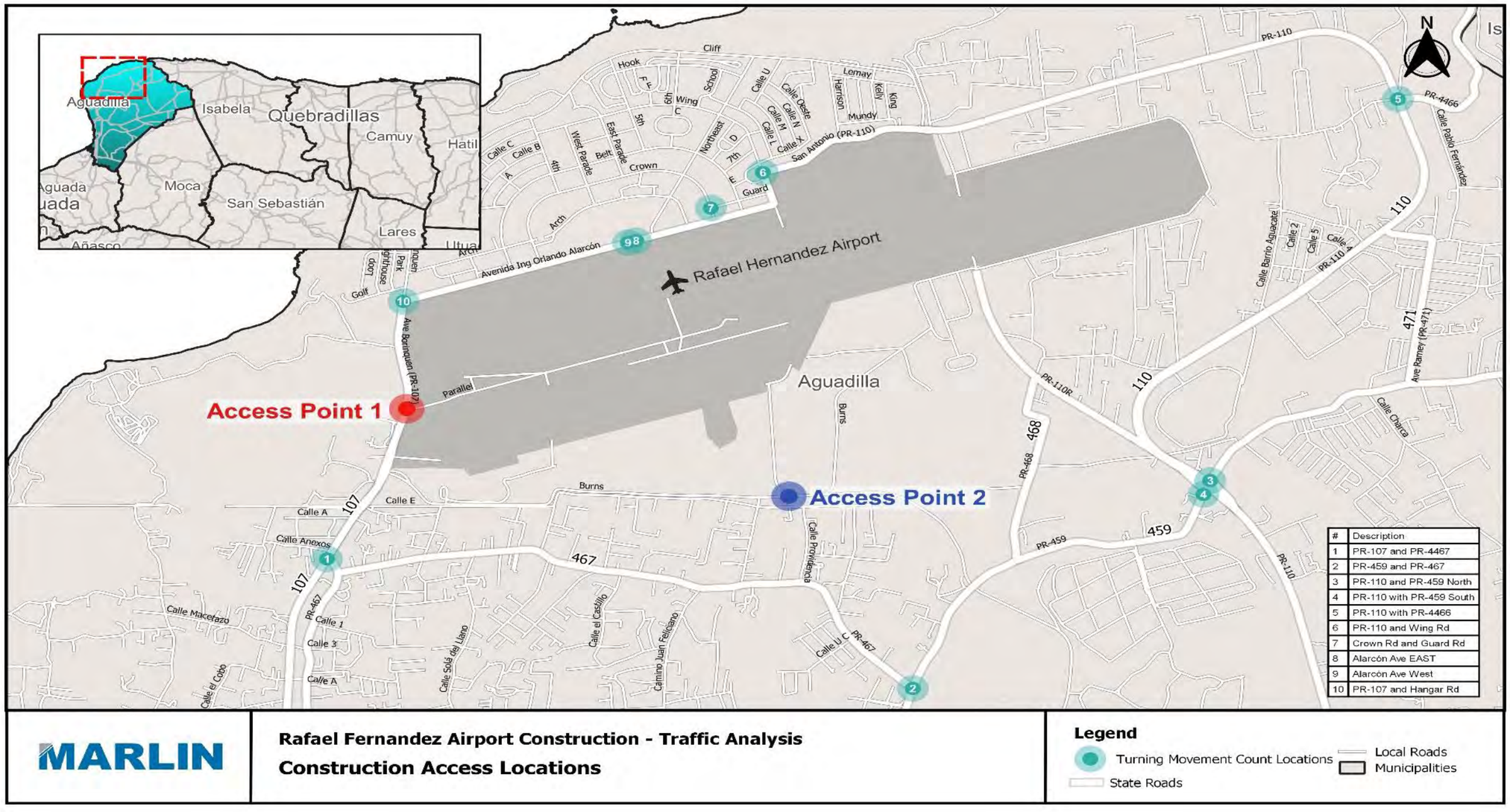

Figure 2. Construction Access Locations

3.0 STUDY AREA

The study area was determined based on engineering judgement in selecting the ten (10) heaviest utilized roadway intersections on the roadways surrounding the airport for analysis. Of the ten (10) intersections selected, one (1) is controlled by traffic signals, and the remaining nine (9) are unsignalized intersections controlled by STOP-signs. The study intersections are as follows:

- 1) PR 107 at PR 4467 (signalized)
- 2) PR 467 at PR 459
- 3) PR 110 at PR 459 Interchange- PR 459 ramp terminal intersection north of PR 110 overpass
- 4) PR 110 at PR 459 Interchange- PR 459 ramp terminal intersection south of PR 110 overpass
- 5) PR 110 at PR 4466
- 6) PR 110 at Wing Road
- 7) Guard Road at Crown Road
- 8) Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of airport terminal)
- 9) Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit (approximately 145 feet west of airport terminal)
- 10) PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road

These intersections are shown in the location map illustrated in **Figure 1.**

4.0 EXISTING CONDITIONS

For purposes of this study, 12-Hour Turning Movement Counts (TMC) from 6am-6pm, on a typical weekday (Tuesday, Wednesday, or Thursday) were collected at the ten (10) study intersections. The analysis was conducted by identifying the maximum one-hour (peak-hour) traffic volume from the collected TMC for the entire set of ten (10) intersections (not individually). Thus, the volumes indicate that AM peak-hour for the surrounding roadway network was from 7:15am to 8:15am, and the PM peak-hour was from 2:15pm to 3:15pm. **Figure 3** summarizes the existing AM and PM peak-hour turning movement counts volumes at the study intersections. Printouts of the turning movement counts are provided in the **Appendix**.

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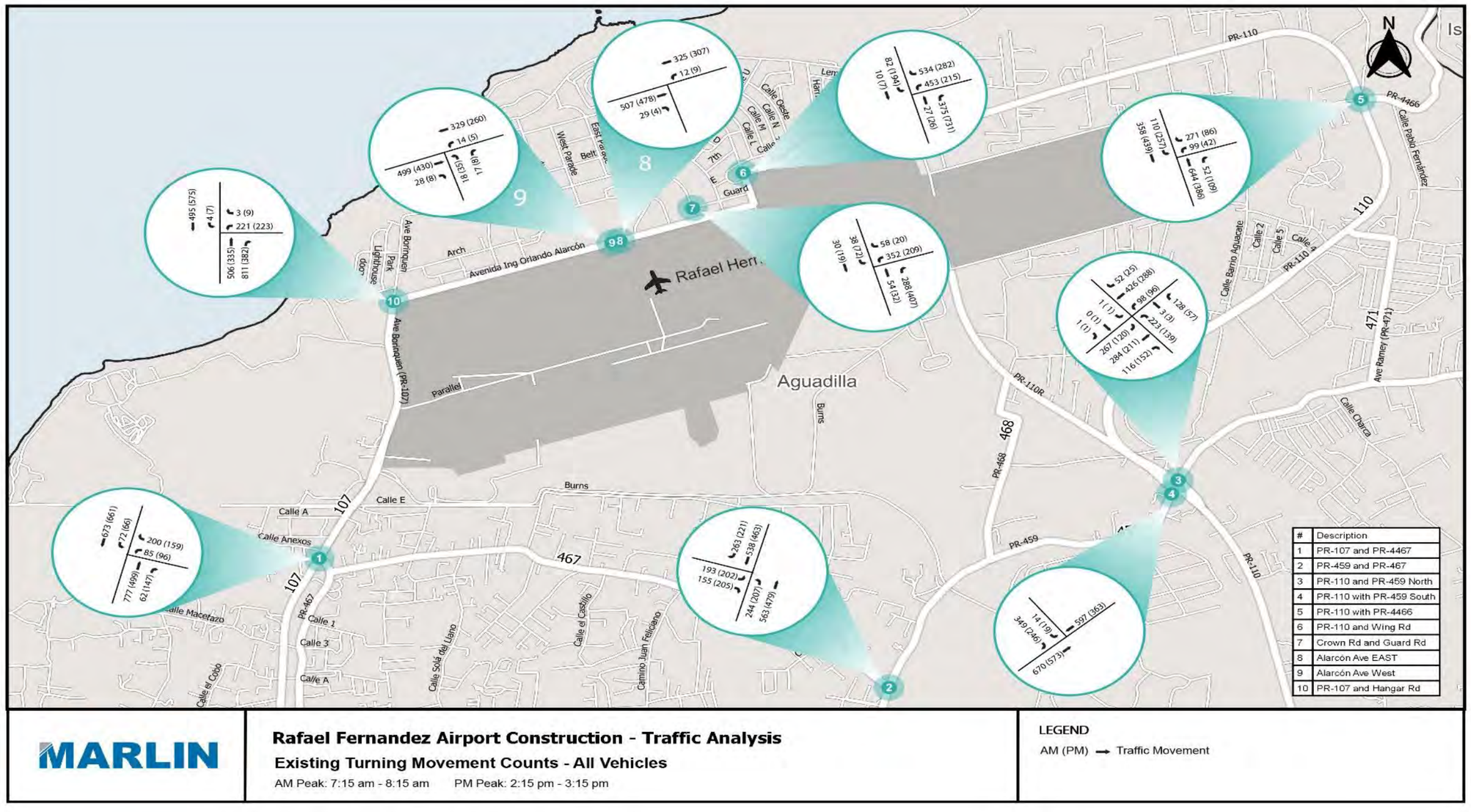

Figure 3. Existing Turning Movement Counts

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Level of service, or LOS, is a qualitative measure used to relate the quality of motor vehicle traffic service. LOS is used to analyze roadways and intersections by categorizing traffic flow and assigning quality levels of traffic based on performance measure like vehicle speed, density, congestion, and other factors.

As per the *Highway Capacity Manual 2010* (Transporation Research Board, 2010):

"Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour).

Level of Service Criteria for Signalized Intersections

LOS	Average Intersection Delay	General Description
A	Less than or equal to 10 seconds	Free flow
B	Greater than 10 to 20 seconds	Stable flow (slight delays)
C	Greater than 20 to 35 seconds	Stable flow (acceptable delays)
D	Greater than 35 to 55 seconds	Approaching unstable flow (tolerable delays)
E	Greater than 55 to 80 seconds	Unstable flow (intolerable delays)
F	Greater than 80 seconds	Forced flow (congested; queues failing to clear)

Unsignalized intersection LOS criteria can be further reduced into three intersection types: all-way stop, two-way stop, and roundabout control. All-way stop and roundabout control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements.

Level of Service Criteria for Unsignalized Intersections

LOS	Average Control Delay
A	Less than or equal to 10 seconds
B	Greater than 10 to 15 seconds
C	Greater than 15 to 25 seconds
D	Greater than 25 to 35 seconds
E	Greater than 35 to 50 seconds
F	Greater than 50 seconds"

Note that the delays per LOS "grade" are lower for unsignalized intersections than signalized intersections. This is due to motorist expectation- when at a signalized intersection, motorists instinctively understand that they are at an intersection with supposedly higher traffic volumes which would justify it being signalized and they are conditioned to expect delays to be higher than they would expect to encounter at an usually smaller unsignalized intersection.

For purposes of this study, control delays of LOS F on individual approaches at the unsignalized intersections were determined to indicate unacceptable/failing conditions.

The AM & PM peak-hour existing operating conditions of the study area intersections were evaluated using Synchro 9, which utilizes analysis methodologies contained in the 2010 Highway Capacity Manual. Existing peak hour turning movement volumes, existing roadway geometry, and traffic signal timings (signal optimization using Synchro 9), were utilized in the analyses. Based on the Synchro analyses, the existing overall level of service (LOS) and average delay for the study's one (1) signalized and nine (9) unsignalized intersections are as follows. The signalized intersection delay is shown as the average delay for all of the approaches of the intersection combined. The delays for the unsignalized intersections are shown as control delay per approach. Synchro printouts for the existing conditions are included in **Appendix A.**

Table 1. Existing traffic conditions at the study intersections during AM peak-hour (7:15am to 8:15am)

Intersection (Signalized)	Overall LOS	Intersection Delay (sec/veh)
PR 107 at PR 4467	B	12.4
Intersection (Unsignalized)	**Approach LOS**	**Control Delay (sec/veh)**
PR 467 at PR 459 (STOP-control for PR 467)	NB Left- B	12.0
	EB Left- F	1489.5
	EB Right- C	18.8
	SB Through- free-flow	-
	SB Right- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 459 North (STOP-control for PR 110)	NB Left- A	9.7
	EB Left- F	1907.1
	WB Left- F	55.8
	SB Left- A	8.5
	SB Through- free-flow	-
	SB Right- free-flow	-

	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at PR 459 South (STOP-control for PR 110)	EB Left- E	38.6
	SB Through- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 4466 (STOP-control for PR 4466)	WB Left- F	354.4
	SB Left- A	9.9
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at Wing Road (STOP-control for PR 110)	WB Left- C	19.6
	WB Right- B	12.6
	SB Left- A	7.4
	SB Through- free-flow	-
	NB Through- free-flow	-
Guard Road at Crown Road (STOP-control for Guard Road)	WB Left- C	20.8
	SB Left- A	8.1
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal)	WB- A	0.4
	EB- free-flow	-
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit (approx. 145 feet west of terminal) (STOP-control for airport exit)	WB Left- A	8.6
	NB Left- C	16.0
	WB Through- free-flow	-
	EB Through- free-flow	-
	EB Right- free-flow	-
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road (STOP-control for Hangar Road)	WB Left- F	107.5
	SB Left- A	8.5
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-

Table 2. Existing traffic conditions at the study intersections during PM peak-hour (2:15pm to 3:15pm)

Intersection (Signalized)	Overall LOS	Intersection Delay (sec/veh)
PR 107 at PR 4467	B	10.8

Intersection (Unsignalized)	Approach LOS	Control Delay (sec/veh)
PR 467 at PR 459 (STOP-control for PR 467)	NB Left- B	10.6
	EB Left- F	794.8
	EB Right- C	18.6
	SB Through- free-flow	-
	SB Right- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 459 North (STOP-control for PR 110)	NB Left- A	8.3
	EB Left- F	115.0
	WB Left- C	23.9
	SB Left- A	8.4
	SB Through- free-flow	-
	SB Right- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at PR 459 South (STOP-control for PR 110)	EB Left- B	13.5
	SB Through- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 4466 (STOP-control for PR 4466)	WB Left- F	60.1
	SB Left- A	9.7
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at Wing Road (STOP-control for PR 110)	WB Left- C	19.0
	WB Right- A	9.8
	SB Left- A	7.6
	SB Through- free-flow	-
	NB Through- free-flow	-
Guard Road at Crown Road (STOP-control for Guard Road)	WB Left- C	16.7
	SB Left- A	8.6
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-

Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal)	WB- A EB- free-flow	0.3 -
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit (approx. 145 feet west of terminal)	WB Left- A NB Left- C WB Through- free-flow EB Through- free-flow EB Right- free-flow	8.3 15.2 - - -
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road (STOP-control for Hangar Road)	WB Left- F SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	77.0 8.0 - - -

The existing conditions analysis indicates that the signalized intersection at PR 107 and PR 4467 operates acceptably during both the AM and PM peak hours. All of the unsignalized intersections operate acceptably during the AM and PM peak hours, except for the particular approaches on them listed below:

AM Peak Hour:

- **PR 467 at PR 459** **Eastbound STOP-controlled approach**
- **PR 110 at PR 459 North** **Eastbound to northbound left-turn**
- PR 110 at PR 459 North Westbound to southbound left-turn
- **PR 110 at PR 4466** **Westbound STOP-controlled approach**
- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

PM Peak Hour:

- **PR 467 at PR 459** **Eastbound STOP-controlled approach**
- PR 110 at PR 459 North Eastbound to northbound left-turn
- PR 110 at PR 4466 Westbound STOP-controlled approach
- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

The approaches which are bolded were shown in Synchro to be experiencing extremely excessive delays. **It is recommended that the Puerto Rico Department of Transportation and Public Works (DTOP), which maintains "PR" routes of which all of these intersections are a part of, verify operational conditions (perform qualitative analysis) of these intersections on-site during peak periods. The DTOP should consider analyzing whether operations at these intersections could be improved by converting them to all-way STOP-control, or whether traffic signals are warranted.**

5.0 FUTURE BACKGROUND TRAFFIC DURING CONSTRUCTION PROJECT

Future background traffic is the non-project-related traffic projected to utilize the study intersections. For the purposes of this analysis, the future background traffic was anticipated to be calculated by factoring an annual growth rate to the existing AM & PM peak-hour volumes to factor the volumes up to year 2020, the year the reconstruction is proposed to take place. The annual growth rates were based on historical trends obtained from the survey taken by World Bank. The trends indicate a continuous decrease in the growth rate from year 2006 to 2016. Thus, for this analysis, no growth rate was used to factor the existing traffic volumes in obtaining the future background traffic volume and existing volumes were used for analysis.

6.0 TRIP DISTRIBUTION

To avoid construction traffic (such as dump trucks, cement mixer trucks, etc.) worsening operational conditions any at the approaches of the unsignalized study intersections which have a LOS of F with excessive delays while the runway reconstruction project is taking place, MEI recommends the following:

When the contractor is hauling materials to/from the airport construction site to/from the locations of the bituminous concrete plant, landfill, and borrow site during the AM and PM peaks:

Contractor should use PR-107 south, then turn east onto PR-2, then follow PR-2 to PR-110 north to travel from the airport construction site to the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport.

Contractor should use PR-110 south, the turn west onto PR-2, then follow PR-2 to PR-107 north to travel from the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport to the airport construction site.

This route is shown in **Figure 4.** PR-2 is a major, east-west four (4)-lane divided roadway. While this route increases travel distances, it avoids the critical approaches with LOS of F and excessive delays described in Section 4. Contractor truck traffic trying to navigate these approaches would worsen operational conditions, and would cause delays to the Contractor in time and wasted fuel.

Based on the information provided by the contractor's representative, the construction traffic (such as dump trucks, cement mixer trucks, etc.) vehicles were distributed such that six (6) trips were considered in each direction to and from the work site in the AM and PM peak-hour based on the point of access to the construction site. From the existing traffic conditions, the critical intersections or the intersections having LOS F were not assigned any new trips generated by the construction vehicles during AM and PM peak-hours in order to avoid more congestion. The critical approaches during the

AM and PM peak hours were at the same intersections and these intersections were PR 467 at PR 459, PR 110 at PR 459 North, PR 110 at PR 4466, and PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road respectively.

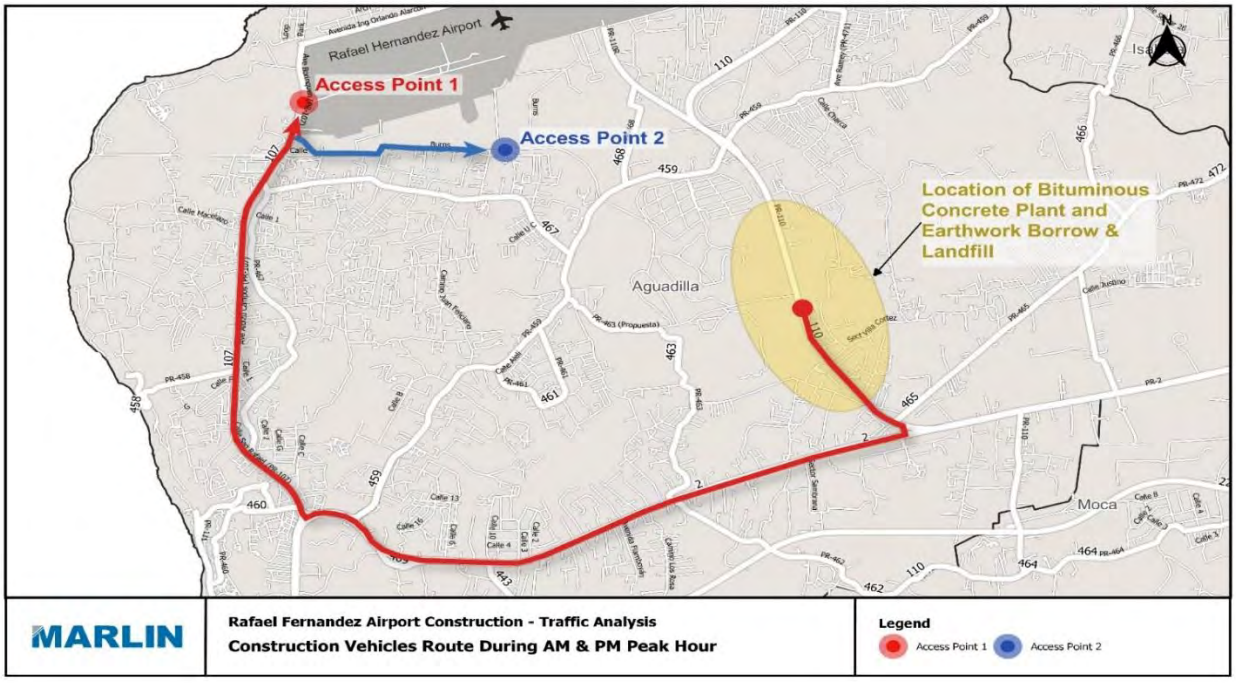

Figure 4. Recommended Construction Vehicles Route During AM & PM Peak-Hour

Further, only 25% trips generated from the employees working at the construction site during the reconstruction period were included in the analysis as it was assumed that most of the employees will arrive the construction site before the AM peak hour, or leave after the PM peak-hour. Thus, 75% of the trips generated by the employees were not used during the analysis, and only 25% were distributed onto the roadway network during the AM and PM peak-hour assuming that they will access the construction site from access point 1, which is the best preferred point of access to the site.

Lastly, the number of trips generated by heavy construction vehicles such as dump trucks, cement truck, etc. and trips from the employees were added to sum up the total number of additional trips generated during the construction period and it is shown in **Figure 5.** These trips were then added to the existing traffic volume at the study area intersections to arrive at the 2020 traffic volume during the construction period at those study area intersections and it is shown in **Figure 6.**

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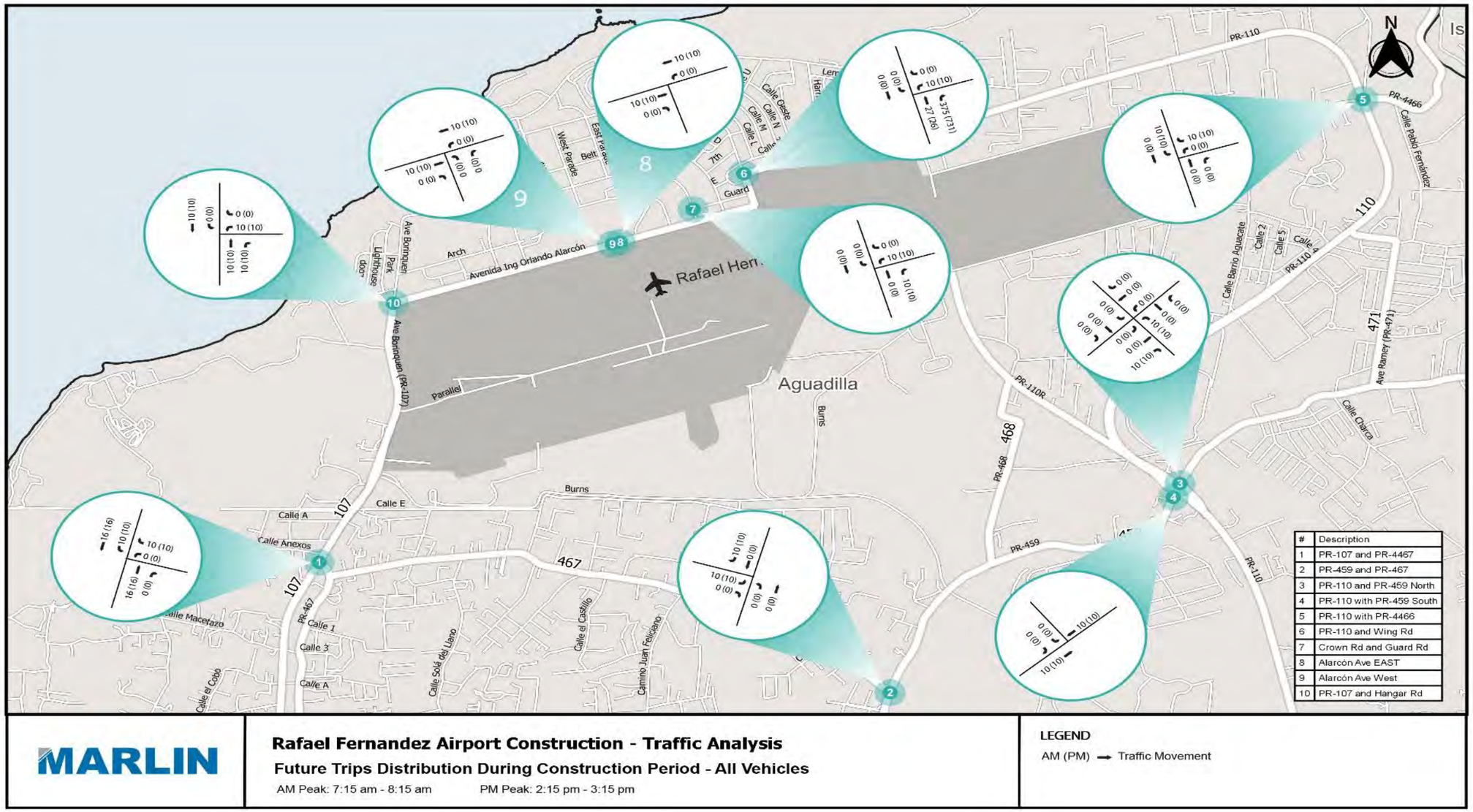

Figure 5. Future Trips Distribution During Construction Period

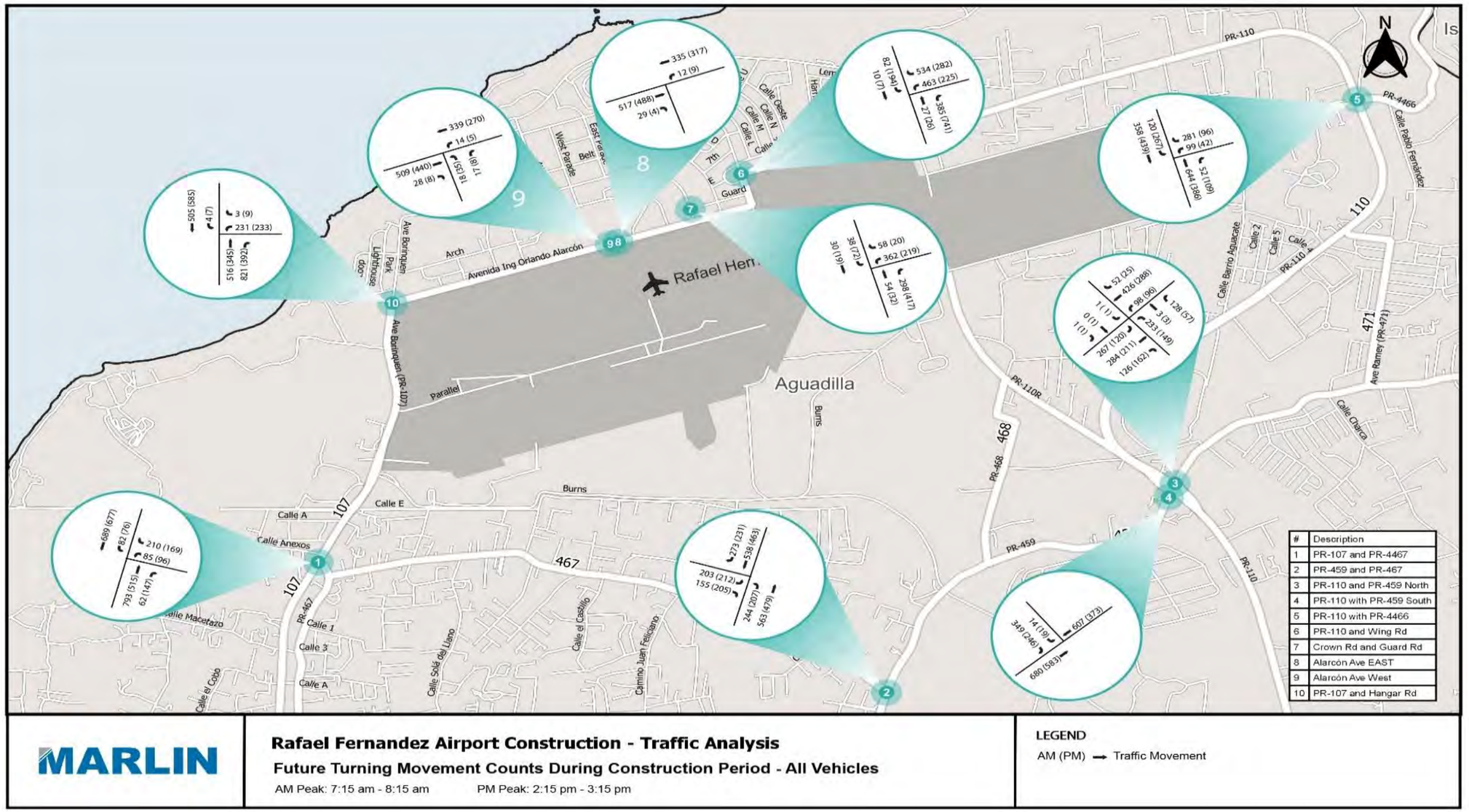

Figure 6. Future Turning Movement Counts During Construction Period

7.0 FUTURE CONDITIONS ANALYSIS DURING CONSTRUCTION

The AM & PM peak-hours operating condition for the study area intersections were analyzed in Synchro using the projected turning movements for year 2020, the year the reconstruction is proposed to take place. Based on the Synchro analyses, the projected overall level of service (LOS) and delay for the study's one (1) signalized and nine (9) unsignalized intersections are as follows:

Table 3. Future traffic conditions at the study intersections during AM peak-hour (7:15am to 8:15am)

Intersection (Signalized)	Overall LOS	Intersection Delay (sec/veh)
PR 107 at PR 4467	B	13.1

Intersection (Unsignalized)	Approach LOS	Control Delay (sec/veh)
PR 467 at PR 459	NB Left- B	12.1
(STOP-control for PR 467)	EB Left- F	1619.3
	EB Right- C	19.0
	SB Through- free-flow	-
	SB Right- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 459 North	NB Left- A	9.7
(STOP-control for PR 110)	EB Left- F	2067.8
	WB Left- F	57.3
	SB Left- A	8.5
	SB Through- free-flow	-
	SB Right- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at PR 459 South	EB Left- E	40.5
(STOP-control for PR 110)	SB Through- free-flow	-
	NB Through- free-flow	-
PR 110 at PR 4466	WB Left- F	386.9
(STOP-control for PR 4466)	SB Left- A	10.0
	SB Through- free-flow	-
	NB Through- free-flow	-
	NB Right- free-flow	-
PR 110 at Wing Road	WB Left- C	21.6
(STOP-control for PR 110)	WB Right- B	12.6
	SB Left- A	7.4
	SB Through- free-flow	-
	NB Through- free-flow	-

Guard Road at Crown Road (STOP-control for Guard Road)	WB Left- C SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	24.9 8.1 - - -
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal)	WB- A EB- free-flow	0.4 -
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit (approx. 145 feet west of terminal)	WB Left- A NB Left- C WB Through- free-flow EB Through- free-flow EB Right- free-flow	8.7 16.4 - - -
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road (STOP-control for Hangar Road)	WB Left- F SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	132.3 8.5 - - -

Table 4. Future traffic conditions at the study intersections during PM peak-hour (2:15pm to 3:15pm)

Intersection (Signalized)	Overall LOS	Intersection Delay (sec/veh)
PR 107 at PR 4467	B	15.4

Intersection (Unsignalized)	Approach LOS	Control Delay (sec/veh)
PR 467 at PR 459 (STOP-control for PR 467)	NB Left- B EB Left- F EB Right- C SB Through- free-flow SB Right- free-flow NB Through- free-flow	10.7 864.4 18.8 - - -
PR 110 at PR 459 North (STOP-control for PR 110)	NB Left- A EB Left- F WB Left- C SB Left- A SB Through- free-flow SB Right- free-flow NB Through- free-flow NB Right- free-flow	8.3 149.9 24.2 8.4 - - - -

PR 110 at PR 459 South (STOP-control for PR 110)	EB Left- B SB Through- free-flow NB Through- free-flow	13.7 - -
PR 110 at PR 4466 (STOP-control for PR 4466)	WB Left- F SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	65.2 9.8 - - -
PR 110 at Wing Road (STOP-control for PR 110)	WB Left- C WB Right- A SB Left- A SB Through- free-flow NB Through- free-flow	19.6 9.8 7.6 - -
Guard Road at Crown Road (STOP-control for Guard Road)	WB Left- C SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	17.2 8.6 - - -
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal)	WB- A EB- free-flow	0.3 -
Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance/Exit (approx. 145 feet west of terminal)	WB Left- A NB Left- C WB Through- free-flow EB Through- free-flow EB Right- free-flow	8.3 15.5 - - -
PR 107 at Engineer Orlando Alarcon Avenue/Hangar Road (STOP-control for Hangar Road)	WB Left- F SB Left- A SB Through- free-flow NB Through- free-flow NB Right- free-flow	94.8 8.0 - - -

The analysis indicates that the signalized intersection at PR 107 and PR 4467 operates acceptably during both the AM and PM peak hours while the construction is taking place. All of the unsignalized intersections operate acceptably during the AM and PM peak hours, except for the particular approaches on them listed below:

AM Peak Hour:

- **PR 467 at PR 459** **Eastbound STOP-controlled approach**
- **PR 110 at PR 459 North** **Eastbound to northbound left-turn**
- PR 110 at PR 459 North Westbound to southbound left-turn
- **PR 110 at PR 4466** **Westbound STOP-controlled approach**

- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

PM Peak Hour:

- **PR 467 at PR 459 Eastbound STOP-controlled approach**
- PR 110 at PR 459 North Eastbound to northbound left-turn
- PR 110 at PR 4466 Westbound STOP-controlled approach
- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

These are the same intersections and critical approaches listed in the existing conditions section. The construction traffic itself will not appreciably worsen operational conditions simply due to the volumes being light overall. This project will not generate appreciable amounts of construction traffic being that it is a reconstruction of a single airport runway.

8.0 CONCLUSIONS

Marlin Engineering, Inc (MEI) has been retained to conduct a traffic impact analysis of construction traffic impacts on the roadway network surrounding Rafael Hernandez Airport, at Aguadilla, Puerto Rico during a proposed runway reconstruction project. The project entails the total reconstruction of Runway 8-26, along with reconfiguring a taxiway which parallels the runway to serve as a temporary runway while Runway 8-26 is being reconstructed. The anticipated start time of the project is February 2020, with completion anticipated by December 2020. The proposed reconstruction may have some potential constraints and impacts to the local commute which can impact the quality of life of the communities surrounding the airport.

During this period, there will be a minimal increase in traffic volumes around the vicinity of the BQN airport consisting of construction vehicles and employees going in and out to the construction site. Thus, to evaluate the overall impact of the reconstruction on the adjacent roadway network, a traffic impact analysis report was conducted.

The contractor's representative stated that they expect only six (6) construction trucks, such as dump trucks, cement mixer trucks, etc. to enter and exit the airport runway reconstruction site per hour at the times of highest construction activity. This is equivalent to a truck entering or leaving the site every five (5) minutes. This volume is not enough to affect operational conditions on the surrounding roadway network.

In addition, the contractor's representative stated that there would be a maximum of 150 employees at the work site. However, it is anticipated that approximately 75% of the employees would arrive to the work site before the AM peak hour of the surrounding roadway network, and leave the work site after the PM peak hour of the surrounding roadway network. Thus, impact of employees driving to/from the work site will be of little affect onto the surrounding roadway network during peak periods as well. Also, the employees would naturally determine through trial and error, or local knowledge, the best way to access the work site from whatever direction they are coming from when they head to the work site, or heading home after the work day.

During the AM and PM peak hours, both in the existing conditions and during the construction project (if nothing was done to improve conditions between the writing of this study in July 2018 and the start of the runway construction project in February 2020), the following approaches on the surrounding roadway network have a LOS of F and excessive delays:

AM Peak Hour:

- **PR 467 at PR 459** **Eastbound STOP-controlled approach**
- **PR 110 at PR 459 North** **Eastbound to northbound left-turn**
- PR 110 at PR 459 North Westbound to southbound left-turn
- **PR 110 at PR 4466** **Westbound STOP-controlled approach**
- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

PM Peak Hour:

- **PR 467 at PR 459** **Eastbound STOP-controlled approach**
- PR 110 at PR 459 North Eastbound to northbound left-turn
- PR 110 at PR 4466 Westbound STOP-controlled approach
- PR 107 at Engineer Alarcon Westbound STOP-controlled approach

It is recommended that the Puerto Rico Department of Transportation and Public Works (DTOP), which maintains "PR" routes of which all of these intersections are a part of, verify operational conditions (perform qualitative analysis) of these intersections on-site during peak periods. The DTOP should consider analyzing whether operations at these intersections could be improved by converting them to all-way STOP-control, or whether traffic signals are warranted.

If no operational improvements are made at the intersections listed above before the start of runway reconstruction, anticipated in February 2020:

When the contractor is hauling materials to/from the airport construction site to/from the locations of the bituminous concrete plant, landfill, and borrow site during the AM and PM peaks:

Contractor should use PR-107 south, then turn east onto PR-2, then follow PR-2 to PR-110 north to travel from the airport construction site to the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport.

Contractor should use PR-110 south, the turn west onto PR-2, then follow PR-2 to PR-107 north to travel from the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport to the airport construction site.

Finally, it should be noted that the contractor must be responsible for any damage caused by the construction vehicles on the roadways during the construction period.

Appendix

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Appendix A. Existing Turning Movement Counts

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File Name:	PR-107 at PR-4467 – All vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	Frontage Road				PR-107																	
	SB				SB				WB					NB					EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Frontage Rd Right	PR-107 Right	Thru	Left	Peds	Right	Frontage Rd Thru	PR-107 Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	2	56	4	1	0	8	3	8	1	5	0	40	1	0	4	1	0	0
06:15	0	0	0	0	0	41	3	0	0	16	0	1	0	8	0	77	0	3	3	0	0	0
06:30	0	2	0	0	0	71	6	0	4	16	0	11	1	13	0	135	0	0	3	1	0	0
06:45	0	3	0	0	0	81	9	0	3	19	0	12	0	10	0	178	2	0	6	3	0	5
07:00	0	0	2	0	0	102	10	0	3	34	2	10	0	8	0	191	1	0	5	4	0	1
07:15	0	3	4	0	0	125	11	1	7	37	1	15	1	10	0	219	3	0	6	4	0	2
07:30	0	3	5	0	0	179	26	0	10	53	6	26	0	14	0	186	1	0	19	11	0	8
07:45	0	1	5	0	0	215	20	1	9	39	4	23	0	22	1	216	6	1	11	15	0	2
08:00	0	5	9	0	0	154	15	0	13	32	8	21	0	14	1	156	7	0	13	10	0	0
08:15	1	2	2	0	0	153	19	0	18	31	5	25	4	18	0	193	4	0	9	4	0	5
08:30	0	1	1	0	0	121	14	0	13	33	7	16	1	13	0	188	7	0	5	1	0	1
08:45	0	1	1	0	0	142	11	0	3	25	2	19	4	17	1	172	4	1	9	1	0	0
09:00	0	0	0	0	0	140	9	0	4	20	1	12	2	15	1	161	3	0	5	1	0	0
09:15	1	0	1	0	0	131	12	0	5	15	2	16	3	16	0	170	2	0	6	2	0	0
09:30	0	1	0	0	1	133	14	0	6	16	1	13	1	14	0	152	0	0	7	1	0	1
09:45	0	0	1	0	0	125	10	0	2	10	2	14	1	20	0	144	1	1	10	3	0	0
10:00	0	2	1	0	0	158	11	0	1	17	1	15	0	15	1	135	2	0	9	2	0	0
10:15	1	2	0	0	1	164	18	0	0	21	2	11	1	14	1	130	4	0	10	2	0	1
10:30	1	0	0	0	0	161	13	1	0	22	3	12	1	11	0	130	3	0	5	4	0	0
10:45	0	1	0	0	0	166	10	0	1	14	4	9	0	9	0	120	2	0	6	1	0	0
11:00	1	3	4	0	0	168	17	0	1	18	2	17	1	15	0	131	5	1	9	3	0	1
11:15	0	0	8	0	1	159	14	1	0	18	5	14	0	20	2	148	5	0	7	2	0	1
11:30	1	4	2	0	0	160	20	1	0	33	4	17	0	16	2	163	5	0	15	5	0	2
11:45	0	0	4	0	0	183	19	0	1	25	5	28	0	19	0	176	3	0	11	4	0	1
12:00	1	1	3	0	0	182	19	0	1	33	7	17	4	17	0	186	6	0	9	8	0	2
12:15	1	1	9	0	0	154	13	0	0	33	11	25	0	15	1	166	6	0	11	5	0	0
12:30	1	0	7	0	0	147	15	0	2	33	9	21	0	14	0	167	5	1	9	6	0	0
12:45	0	5	9	0	0	155	24	0	0	41	5	16	1	16	0	178	1	0	15	9	0	1
13:00	0	0	0	0	0	151	22	0	0	38	3	13	0	13	1	125	1	0	9	4	0	0
13:15	1	0	3	0	0	142	21	0	0	36	4	10	1	14	0	174	2	0	10	3	0	1

13:30	1	3	2	0	0	146	20	1	2	25	6	11	1	12	0	169	5	0	5	2	0	0
13:45	0	2	0	0	0	164	30	1	2	29	5	20	2	10	0	166	6	0	7	2	0	0
14:00	0	0	2	0	1	160	28	0	3	30	3	21	0	28	2	110	1	1	4	1	0	0
14:15	1	2	0	0	0	170	14	0	0	31	8	25	2	31	0	106	2	0	5	1	0	2
14:30	0	1	2	0	0	171	16	1	4	35	10	24	2	33	0	121	7	1	3	0	0	2
14:45	1	1	2	0	0	152	17	2	1	41	7	22	0	39	1	134	4	0	4	1	0	0
15:00	0	4	6	0	0	168	19	0	10	37	6	25	2	44	1	136	12	0	8	1	0	3
15:15	1	3	3	0	0	175	18	0	3	27	11	16	1	18	0	145	4	1	6	8	0	0
15:30	0	1	1	0	0	181	24	1	8	38	6	17	2	19	0	124	10	0	10	6	0	0
15:45	0	1	2	0	0	189	17	0	5	15	0	17	4	25	0	115	9	0	13	6	0	0
16:00	0	1	0	0	0	152	23	1	5	20	4	8	0	16	0	137	7	0	10	6	0	0
16:15	0	3	3	0	0	142	17	0	3	11	2	16	0	32	0	140	8	0	5	2	0	0
16:30	1	1	6	0	0	165	15	0	7	24	2	19	0	27	0	112	2	0	5	3	0	0
16:45	1	2	5	0	0	152	21	0	2	27	2	20	0	23	1	123	9	0	4	2	0	0
17:00	1	1	1	0	0	145	23	0	2	16	5	18	0	22	0	124	9	0	19	3	0	0
17:15	0	0	1	0	0	159	10	0	3	23	7	12	0	26	0	136	11	0	9	5	0	0
17:30	0	0	0	0	0	174	22	0	7	24	2	20	0	30	0	133	4	0	13	6	0	0
17:45	0	4	4	0	0	130	14	0	7	21	4	17	0	17	0	142	4	0	6	0	0	6

File Name:	PR-107 at PR-4467 – Heavy vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	Frontage Road				PR-107																	
	SB				SB				WB					NB				EB				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Frontage Rd Right	PR-107 Right	Thru	Left	Peds	Right	Frontage Rd Thru	PR-107 Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
06:45	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
07:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
07:30	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0

07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0
08:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
11:15	0	0	0	0	0	2	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12:15	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0
12:30	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
12:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
15:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
16:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name:	PR-459 at PR-467 – All Vehicles	
Start Date:	5/8/2018	
Start Time:	6:00:00 AM	
Site Code:	00000123	

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	8	29	0	0	0	0	0	0	0	27	1	0	7	0	9	0
06:15	10	49	0	0	0	0	0	0	0	59	9	1	16	0	10	1
06:30	19	58	0	0	0	0	0	0	0	57	12	0	24	0	17	0
06:45	27	81	0	0	0	0	0	0	0	87	15	1	14	0	20	0
07:00	48	82	0	0	0	0	0	0	0	105	27	0	29	0	41	0
07:15	56	143	0	0	0	0	0	0	0	148	55	0	27	0	46	0
07:30	82	122	0	0	0	0	0	0	0	143	67	0	47	0	31	0
07:45	68	127	0	0	0	0	0	0	0	148	77	0	46	0	60	0
08:00	57	146	0	0	0	0	0	0	0	124	45	0	35	0	56	0
08:15	26	108	0	0	0	0	0	0	0	114	23	0	56	0	78	0
08:30	32	129	0	0	0	0	0	0	0	109	19	0	32	0	27	0
08:45	30	119	0	0	0	0	0	0	0	105	32	0	37	0	46	0
09:00	28	109	0	0	0	0	0	0	0	95	28	0	33	0	33	1
09:15	25	110	0	0	0	0	0	0	0	101	26	0	30	0	31	0
09:30	30	95	0	0	0	0	0	0	0	120	25	0	31	0	30	0
09:45	27	98	0	0	0	0	0	0	0	101	22	0	40	0	28	0
10:00	24	89	0	0	0	0	0	0	0	95	20	0	25	0	29	0
10:15	19	81	0	0	0	0	0	0	0	87	31	0	26	0	27	0
10:30	18	79	0	0	0	0	0	0	0	88	36	0	18	0	22	1
10:45	22	96	0	0	0	0	0	0	0	70	27	0	16	0	21	0
11:00	26	100	0	0	0	0	0	0	0	76	33	0	24	0	26	0
11:15	25	99	0	0	0	0	0	0	0	102	32	0	24	0	33	0
11:30	28	87	0	0	0	0	0	0	0	113	24	0	29	0	29	0
11:45	27	90	0	0	0	0	0	0	0	127	32	0	36	0	37	0
12:00	40	110	0	0	0	0	0	0	0	132	49	0	24	0	29	0
12:15	33	130	0	0	0	0	0	0	0	113	32	0	18	0	35	0
12:30	30	116	0	0	0	0	0	0	0	129	30	0	33	0	24	1
12:45	37	119	0	0	0	0	0	0	0	107	46	0	30	0	41	0
13:00	30	104	0	0	0	0	0	0	0	100	40	0	25	0	35	0
13:15	31	109	0	0	0	0	0	0	0	96	36	0	22	0	36	1
13:30	32	111	0	0	0	0	0	0	0	99	39	0	41	0	41	0
13:45	58	125	0	0	0	0	0	0	0	101	41	0	45	0	45	0
14:00	51	121	0	0	0	0	0	0	0	110	45	0	36	0	44	0
14:15	49	130	0	0	0	0	0	0	0	120	50	0	37	0	50	1

14:30	46	98	0	0	0	0	0	0	0	114	55	0	54	0	52	0
14:45	61	99	0	0	0	0	0	0	0	129	52	0	55	0	51	0
15:00	65	136	0	0	0	0	0	0	0	116	50	0	59	0	49	0
15:15	57	100	0	0	0	0	0	1	0	121	46	0	45	0	50	0
15:30	40	130	0	0	0	0	0	0	0	142	26	0	36	0	41	0
15:45	35	129	0	0	0	0	0	0	0	113	29	0	48	0	43	0
16:00	32	105	0	0	0	0	0	0	0	109	36	0	24	0	41	0
16:15	41	112	0	0	0	0	0	0	0	116	35	0	30	0	25	0
16:30	40	114	0	0	0	0	0	0	0	104	30	0	28	0	35	0
16:45	58	127	0	0	0	0	0	0	0	117	26	0	37	0	42	0
17:00	54	126	0	0	0	0	0	0	0	136	49	0	27	0	31	0
17:15	33	140	0	0	0	0	0	0	0	111	32	0	34	0	37	0
17:30	40	147	0	0	0	0	0	0	0	104	38	0	31	0	36	0
17:45	35	87	0	0	0	0	0	0	0	136	37	0	27	0	25	0

File Name:	PR-459 at PR-467 – Heavy Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	0	1	2	0	2	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	3	0	0	0	0	0	0	0	2	0	0	2	0	1	0
06:45	1	3	0	0	0	0	0	0	0	2	0	0	1	0	1	0
07:00	1	1	0	0	0	0	0	0	0	4	0	0	0	0	1	0
07:15	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
07:45	0	2	0	0	0	0	0	0	0	3	1	0	0	0	1	0
08:00	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0
08:15	0	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0
08:30	1	0	0	0	0	0	0	0	0	4	1	0	1	0	1	0

08:45	0	3	0	0	0	0	0	0	0	3	2	0	1	0	2	0
09:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
09:15	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
09:30	1	2	0	0	0	0	0	0	0	2	1	0	1	0	0	0
09:45	0	0	0	0	0	0	0	0	0	1	1	0	1	0	2	0
10:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
10:15	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
10:30	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
10:45	0	2	0	0	0	0	0	0	0	3	1	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0
11:15	1	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0
11:30	0	2	0	0	0	0	0	0	0	7	1	0	1	0	1	0
11:45	1	2	0	0	0	0	0	0	0	5	0	0	0	0	2	0
12:00	0	2	0	0	0	0	0	0	0	6	0	0	0	0	0	0
12:15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
12:30	0	2	0	0	0	0	0	0	0	3	0	0	1	0	0	0
12:45	0	5	0	0	0	0	0	0	0	3	1	0	0	0	2	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	1	2	0	0	0	0	0	0	0	4	1	0	1	0	0	0
13:45	0	1	0	0	0	0	0	0	0	2	2	0	1	0	2	0
14:00	1	0	0	0	0	0	0	0	0	3	1	0	0	0	2	0
14:15	0	4	0	0	0	0	0	0	0	1	1	0	1	0	1	0
14:30	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0
14:45	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	0
15:00	1	1	0	0	0	0	0	0	0	2	1	0	3	0	0	0
15:15	0	2	0	0	0	0	0	0	0	4	1	0	0	0	0	0
15:30	0	6	0	0	0	0	0	0	0	2	1	0	1	0	1	0
15:45	0	2	0	0	0	0	0	0	0	5	1	0	1	0	0	0
16:00	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:30	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0
16:45	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
17:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:15	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
17:30	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17:45	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0

File Name:	PR-110 at PR-459 North – All Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	11	2	0	1	0	3	2	6	9	10	0	1	0	0	1
06:15	4	24	5	0	4	0	13	0	14	16	31	0	0	0	0	0
06:30	6	32	9	0	6	0	21	0	13	20	39	0	0	0	0	0
06:45	8	45	9	0	16	0	34	0	19	30	41	0	0	0	0	0
07:00	6	50	3	0	17	0	43	0	25	38	38	0	0	0	0	0
07:15	3	87	17	0	14	0	58	0	27	55	56	1	0	0	1	0
07:30	23	118	20	0	32	2	61	0	30	83	57	1	1	0	0	0
07:45	15	113	29	0	64	1	67	1	23	69	68	0	0	0	0	0
08:00	11	108	32	0	18	0	37	0	36	77	86	0	0	0	0	1
08:15	13	54	16	0	13	1	21	0	50	62	85	0	0	1	1	0
08:30	12	63	18	0	15	0	26	0	34	46	99	0	1	0	0	0
08:45	14	36	15	0	16	1	30	0	29	37	53	0	2	0	0	0
09:00	12	30	11	0	10	0	20	0	20	32	50	0	0	0	0	0
09:15	10	29	10	0	11	1	21	1	25	30	51	1	0	1	0	0
09:30	8	26	9	0	18	1	16	1	21	28	52	0	0	0	0	0
09:45	9	40	10	0	16	0	19	0	19	25	28	0	0	0	0	0
10:00	7	41	12	0	17	0	14	0	30	40	36	0	0	0	0	0
10:15	10	35	16	0	16	1	20	1	31	41	34	0	1	0	1	0
10:30	11	33	8	0	9	0	11	0	28	36	33	0	0	1	0	0
10:45	4	45	9	0	10	1	13	1	36	32	20	0	0	0	0	0
11:00	3	49	9	1	17	0	13	0	33	42	28	1	0	0	0	0
11:15	11	40	9	0	11	0	18	0	29	44	47	0	0	0	0	0
11:30	8	28	10	0	20	0	25	0	27	46	44	0	0	0	0	0
11:45	11	45	20	0	29	1	20	0	42	70	56	0	1	0	0	0
12:00	13	70	26	0	12	0	17	0	34	79	37	0	0	0	1	0
12:15	11	65	15	0	16	0	28	0	29	70	54	0	0	0	0	0
12:30	6	50	19	0	16	1	20	0	27	57	48	0	0	1	0	0
12:45	5	48	13	0	11	3	32	0	34	61	47	1	0	0	0	0
13:00	3	42	12	0	12	0	30	0	29	50	44	0	0	0	0	0
13:15	5	43	10	0	16	2	25	0	25	55	46	0	0	0	0	0
13:30	7	57	20	0	17	2	27	0	21	46	30	0	0	0	0	0
13:45	9	64	21	0	15	1	34	0	33	61	39	1	1	0	0	0
14:00	5	66	30	0	14	1	33	2	30	60	34	0	0	1	0	0
14:15	6	70	25	0	16	1	41	0	40	70	33	1	0	0	0	0
14:30	4	28	17	0	18	0	28	1	42	39	29	0	0	1	1	0
14:45	6	84	19	0	10	1	30	0	33	33	20	0	0	0	0	0
15:00	9	106	35	0	13	1	40	1	37	69	38	0	1	0	0	0

15:15	6	54	13	0	16	2	29	1	66	73	59	0	0	0	1	0
15:30	8	38	16	0	17	0	35	0	51	88	47	1	0	0	0	0
15:45	11	47	13	0	18	0	32	0	54	72	41	0	0	1	0	0
16:00	4	38	15	0	12	0	31	0	55	50	49	0	0	0	0	0
16:15	5	43	19	0	9	1	31	0	42	63	39	0	0	0	0	0
16:30	8	25	12	0	14	0	32	0	35	58	42	0	0	0	0	0
16:45	11	23	14	0	14	1	39	0	51	68	39	0	0	0	0	0
17:00	11	42	7	0	10	0	34	0	39	58	43	0	0	0	0	0
17:15	3	36	8	0	20	0	35	0	53	59	59	0	0	0	1	0
17:30	5	37	12	0	20	0	34	0	46	63	50	0	0	0	0	0
17:45	8	34	16	0	12	1	28	0	34	58	50	0	0	0	0	0

File Name:	PR-110 at PR-459 North – Heavy Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
06:15	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	1	0	0	2	2	0	0	0	0	0
06:45	0	3	0	0	1	0	0	0	0	0	1	0	0	0	0	0
07:00	0	2	0	0	1	0	2	0	2	2	1	0	0	0	0	0
07:15	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
07:30	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
07:45	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0
08:00	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0
08:30	0	1	0	0	1	0	1	0	0	2	0	0	0	0	0	0
08:45	0	1	1	0	0	0	1	0	1	2	3	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

09:15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:30	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
09:45	1	1	0	0	0	0	1	0	1	0	2	0	0	0	0	0
10:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:15	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0
10:30	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	1	0	2	0	1	0	2	0	1	0	0	0	0	0
11:15	0	0	0	0	1	0	1	0	1	1	2	0	0	0	0	0
11:30	0	1	0	0	0	0	1	0	0	2	3	0	0	0	0	0
11:45	1	1	1	0	2	0	0	0	1	0	1	0	0	0	0	0
12:00	1	0	0	0	0	0	1	0	5	1	4	0	0	0	0	0
12:15	0	1	0	0	0	0	0	0	1	0	3	0	0	0	0	0
12:30	1	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0
12:45	0	1	0	0	0	0	0	0	2	0	1	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	1	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0
13:30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	1	0	1	0	1	0	2	0	1	0	0	0	0	0
14:00	2	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0
14:15	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0
14:45	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0
15:15	0	0	1	0	0	0	1	0	1	2	2	0	0	0	0	0
15:30	1	1	0	0	1	0	0	0	0	1	3	0	0	0	0	0
15:45	1	1	1	0	0	0	1	0	0	1	1	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
16:15	0	0	0	0	0	0	1	0	4	0	1	0	0	0	0	0
16:30	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
17:45	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0

File Name:	PR-110 at PR-459 South – All Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	9	0	1	0	0	0	0	0	23	0	0	10	0	1	0
06:15	0	38	0	0	0	0	0	0	0	59	0	0	24	0	0	0
06:30	0	50	0	0	0	0	0	0	0	66	0	0	39	0	1	0
06:45	0	76	0	0	0	0	0	0	0	94	0	0	45	0	2	0
07:00	0	101	0	0	0	0	0	0	0	103	0	0	68	0	0	0
07:15	0	142	0	0	0	0	0	0	0	148	0	0	97	0	3	0
07:30	0	160	0	0	0	0	0	0	0	186	0	0	97	0	7	1
07:45	0	175	0	0	0	0	0	0	0	149	0	0	96	0	2	0
08:00	0	120	0	0	0	0	0	0	0	187	0	0	59	0	2	0
08:15	0	76	0	0	0	0	0	0	0	206	0	0	52	0	6	0
08:30	0	92	0	0	0	0	0	0	0	162	1	1	76	0	7	0
08:45	0	69	0	0	0	0	0	0	0	118	0	0	64	0	5	1
09:00	0	55	0	0	0	0	0	0	0	110	0	0	55	0	3	0
09:15	0	60	0	0	0	0	0	0	0	101	0	0	50	0	2	0
09:30	0	61	0	0	0	0	0	0	0	102	0	0	47	0	1	0
09:45	0	59	0	0	0	0	0	0	0	99	0	1	41	0	4	0
10:00	0	57	0	0	0	0	0	0	0	96	0	0	39	0	3	1
10:15	0	52	0	0	0	0	0	0	0	97	0	0	63	0	2	0
10:30	0	45	0	0	0	0	0	0	0	104	0	0	46	0	1	0
10:45	0	49	0	0	0	0	0	0	0	110	0	0	44	0	2	0
11:00	0	57	0	0	0	0	0	0	0	103	0	0	51	0	3	1
11:15	0	58	0	1	0	0	0	0	3	120	0	0	60	0	5	0
11:30	0	51	0	0	0	0	0	0	0	125	0	0	53	0	3	1
11:45	1	67	0	0	0	0	0	0	0	159	0	0	72	0	11	0
12:00	0	90	0	0	0	0	0	0	0	137	0	0	77	0	14	0
12:15	0	94	0	0	0	0	0	0	0	141	0	0	57	0	7	1
12:30	0	64	0	0	0	0	0	0	0	127	0	0	67	0	6	0
12:45	0	74	0	0	0	0	0	0	0	160	0	0	68	0	7	1
13:00	0	69	0	0	0	0	0	0	0	135	0	0	58	0	5	0
13:15	0	72	0	0	0	0	0	0	0	152	0	0	51	0	4	0
13:30	0	75	0	0	0	0	0	0	0	156	0	1	45	0	2	0
13:45	0	95	0	0	0	0	0	0	0	141	0	0	42	0	3	0
14:00	0	80	0	0	0	0	0	0	0	142	0	0	66	0	5	1
14:15	0	66	0	0	0	0	0	0	0	132	0	1	61	0	7	0

14:30	0	65	0	0	0	0	0	0	0	139	0	0	55	0	4	0
14:45	0	85	0	0	0	0	0	0	0	152	0	0	57	0	2	1
15:00	0	147	0	0	0	0	0	0	0	150	0	0	73	0	6	0
15:15	0	82	0	0	0	0	0	0	0	196	0	0	57	0	5	0
15:30	0	74	0	0	0	0	0	0	0	177	0	0	70	0	7	0
15:45	0	81	0	0	0	0	0	0	0	163	0	0	65	0	7	0
16:00	0	75	0	0	0	0	0	0	0	145	0	0	86	0	7	0
16:15	0	70	0	0	0	0	0	0	0	145	0	0	79	0	3	0
16:30	0	46	0	0	0	0	0	0	0	142	0	0	110	0	6	0
16:45	0	58	0	0	0	0	0	0	0	163	0	0	113	0	6	0
17:00	0	76	0	0	0	0	0	0	0	138	0	0	113	0	7	0
17:15	0	81	0	0	0	0	0	0	0	161	0	0	109	0	9	0
17:30	0	57	0	0	0	0	0	0	0	145	0	0	76	0	8	0
17:45	0	54	0	0	0	0	0	0	0	122	0	0	62	0	11	0

File Name:	PR-110 at PR-459 South – Heavy Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	1	0	0	0	0	0	0	0	1	0	0	2	0	0	0
06:30	0	1	0	0	0	0	0	0	0	3	0	0	2	0	1	0
06:45	0	3	0	0	0	0	0	0	0	1	0	0	1	0	0	0
07:00	0	4	0	0	0	0	0	0	0	5	0	0	0	0	0	0
07:15	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
07:30	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
07:45	0	1	0	0	0	0	0	0	0	2	0	0	1	0	1	0
08:00	0	2	0	0	0	0	0	0	0	1	0	0	1	0	1	0
08:15	0	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0
08:30	0	2	0	0	0	0	0	0	0	4	0	0	1	0	0	0

08:45	0	2	0	0	0	0	0	0	0	6	0	0	1	0	1	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	2	0	0	1	0	1	0
09:45	0	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0
10:00	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:15	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:30	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0
10:45	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
11:00	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
11:15	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0
11:30	0	2	0	0	0	0	0	0	0	5	0	0	2	0	0	0
11:45	0	1	0	0	0	0	0	0	0	3	0	0	1	0	1	0
12:00	0	1	0	0	0	0	0	0	0	10	0	0	2	0	0	0
12:15	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12:30	0	1	0	0	0	0	0	0	0	2	0	0	2	0	0	0
12:45	0	2	0	0	0	0	0	0	0	4	0	0	2	0	1	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
13:30	0	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0
13:45	0	1	0	0	0	0	0	0	0	3	0	0	2	0	1	0
14:00	0	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0
14:15	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
14:30	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0
14:45	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
15:00	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
15:15	0	1	0	0	0	0	0	0	0	5	0	0	2	0	0	0
15:30	0	1	0	0	0	0	0	0	0	4	0	0	1	0	0	0
15:45	0	3	0	0	0	0	0	0	0	4	0	0	1	0	0	0
16:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:15	0	1	0	0	0	0	0	0	0	6	0	0	0	0	0	0
16:30	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
17:00	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
17:45	0	3	0	0	0	0	0	0	0	2	0	0	2	0	0	0

File Name:	PR-110 at PR-4466 – All Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	22	6	0	12	1	14	0	5	20	0	0	0	0	1	0
06:15	1	19	10	0	23	0	9	0	5	40	2	0	1	0	2	0
06:30	0	25	8	0	42	0	10	0	9	87	3	0	4	0	0	0
06:45	1	48	10	0	56	2	23	0	8	136	2	0	2	0	0	0
07:00	0	49	8	0	66	4	16	0	6	106	3	0	3	1	0	0
07:15	1	66	17	0	70	1	20	0	7	159	1	0	5	0	0	0
07:30	0	88	35	0	75	0	28	0	14	179	5	0	4	2	0	0
07:45	0	96	26	0	82	0	24	0	14	180	1	0	5	0	1	0
08:00	2	108	32	0	44	0	27	0	17	126	3	0	1	1	0	0
08:15	0	94	24	0	43	0	31	0	18	110	1	0	5	0	0	0
08:30	0	111	21	0	40	0	27	0	14	109	2	1	0	1	1	0
08:45	2	79	20	0	50	2	24	0	15	113	3	0	6	0	0	0
09:00	1	65	18	0	45	0	20	0	11	102	0	0	1	1	0	0
09:15	1	59	19	0	42	0	19	0	12	103	1	0	0	0	0	0
09:30	2	64	21	0	20	1	16	0	14	110	0	0	2	1	1	0
09:45	0	44	36	0	22	0	10	0	10	98	0	0	0	1	0	0
10:00	0	84	33	0	21	2	11	0	9	95	2	0	3	0	2	0
10:15	1	81	30	0	19	1	9	0	8	80	1	0	2	0	0	0
10:30	1	90	24	0	16	0	4	0	7	86	0	0	0	0	0	0
10:45	0	77	25	0	27	1	8	0	14	77	0	0	0	1	1	0
11:00	1	94	37	0	21	0	13	0	18	87	1	0	1	0	0	0
11:15	1	72	33	0	26	0	8	0	16	88	2	0	1	0	1	0
11:30	3	105	31	0	29	1	9	0	13	100	3	0	4	0	0	0
11:45	5	121	33	0	27	1	16	0	21	104	5	0	3	1	1	0
12:00	4	123	46	0	27	0	14	0	15	108	6	0	3	1	2	0
12:15	0	101	27	0	27	1	3	0	20	81	1	0	3	2	1	0
12:30	1	105	27	0	24	1	17	0	15	113	3	0	3	0	3	0
12:45	1	96	31	0	42	0	18	0	22	100	3	0	7	0	1	0
13:00	1	90	30	0	32	0	9	0	20	95	0	0	2	0	0	0
13:15	1	85	25	0	33	0	10	0	21	96	2	0	1	2	0	0
13:30	0	68	21	0	35	0	8	0	25	101	2	0	2	1	0	0
13:45	0	101	54	0	20	1	14	0	26	78	0	0	0	0	2	0
14:00	1	100	55	0	21	0	12	0	30	87	0	0	0	0	0	0
14:15	0	96	60	0	19	1	8	0	28	88	2	0	2	2	1	0
14:30	0	98	61	0	20	2	9	0	21	85	3	0	3	0	1	0
14:45	1	121	70	0	24	0	7	0	29	101	0	0	4	0	1	0

15:00	2	124	66	0	23	0	18	0	31	112	1	0	2	0	1	0
15:15	0	129	71	0	25	1	21	0	20	82	2	0	2	1	0	0
15:30	0	139	84	0	26	0	18	0	36	70	1	0	1	2	1	0
15:45	0	102	66	0	14	0	10	0	33	73	2	0	2	0	0	0
16:00	0	122	56	0	25	1	15	0	27	83	4	0	1	0	1	0
16:15	1	115	62	0	31	0	14	0	26	86	1	0	1	4	0	0
16:30	0	132	61	0	34	2	17	0	32	64	1	0	1	2	1	0
16:45	1	122	68	0	28	0	12	0	26	97	0	0	0	1	0	0
17:00	0	113	65	0	24	0	11	0	43	113	2	0	0	1	0	0
17:15	3	107	50	2	26	1	17	0	35	91	3	0	2	0	1	0
17:30	4	90	45	0	30	0	14	0	24	77	2	2	1	0	0	0
17:45	1	77	48	0	33	0	14	0	31	81	2	0	2	0	0	0

File Name:	PR-110 at PR-4466 – Heavy Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
06:15	0	0	0	0	1	0	1	0	0	2	0	0	0	0	0	0
06:30	0	1	0	0	0	0	1	0	0	2	0	0	0	0	0	0
06:45	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
07:00	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0
07:15	0	2	0	0	0	0	1	0	0	3	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
08:00	0	2	2	0	1	0	0	0	0	2	0	0	0	0	0	0
08:15	0	4	1	0	0	0	1	0	1	5	0	0	0	0	0	0
08:30	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0
08:45	0	1	1	0	0	0	1	0	1	2	1	0	0	0	0	0
09:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:15	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0

09:45	0	3	0	0	0	0	0	0	0	1	1	0	0	0	0	0
10:00	0	2	1	0	0	0	1	0	1	0	0	0	0	0	0	0
10:15	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:30	0	4	0	0	0	0	0	0	0	2	1	0	0	0	0	0
10:45	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	2	0	0	0	0	0	0	1	4	0	0	1	0	0	0
11:15	0	1	0	0	1	0	1	0	0	4	0	0	0	0	0	0
11:30	1	5	0	0	1	0	0	0	0	3	1	0	0	0	0	0
11:45	0	4	0	0	0	0	0	0	1	3	0	0	2	0	0	0
12:00	0	5	1	0	0	0	0	0	0	2	0	0	0	0	0	0
12:15	0	5	0	0	0	0	0	0	2	2	0	0	0	0	0	0
12:30	0	2	2	0	2	0	1	0	0	2	0	0	0	0	0	0
12:45	0	4	1	0	1	0	0	0	0	4	0	0	0	0	0	0
13:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
13:30	0	2	1	0	0	0	1	0	0	2	0	0	0	0	0	0
13:45	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0
14:00	0	1	1	0	1	0	1	0	1	2	2	0	0	0	0	0
14:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
14:45	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	2	1	0	1	0	2	0	2	2	1	0	0	0	0	0
15:15	0	3	1	0	0	0	0	0	1	2	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
15:45	0	2	1	0	1	0	1	0	1	1	0	0	0	0	0	0
16:00	0	2	0	0	0	0	0	0	2	4	0	0	0	0	0	0
16:15	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:30	0	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17:15	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
17:45	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0

File Name:	PR-110 at Wing Rd – All Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	1	0	24	0	0	0	0	0	0	0
06:15	0	6	5	0	21	0	47	0	33	0	0	0	0	0	0	0
06:30	0	6	3	0	58	0	49	0	53	0	0	0	0	0	0	0
06:45	1	10	17	0	83	0	69	0	75	3	3	0	0	0	2	0
07:00	1	8	19	1	88	1	85	0	68	9	2	0	1	0	1	0
07:15	1	3	8	0	121	2	106	0	64	4	3	0	1	1	1	0
07:30	3	4	26	0	142	2	129	0	86	6	1	0	4	3	1	0
07:45	0	3	16	0	133	4	130	0	107	10	0	0	1	0	1	0
08:00	2	0	32	0	138	1	88	0	118	7	2	0	0	0	0	0
08:15	0	1	22	0	94	2	81	0	88	6	3	0	1	3	1	1
08:30	1	4	27	0	93	3	61	0	102	4	2	1	1	1	1	0
08:45	0	4	18	0	142	1	47	0	75	6	3	1	2	1	4	0
09:00	1	1	10	0	90	1	35	0	70	2	2	0	0	0	0	0
09:15	0	2	9	0	91	2	32	0	85	3	1	1	1	2	2	0
09:30	1	3	10	1	98	0	30	0	86	4	2	0	0	2	1	0
09:45	0	0	9	0	85	1	55	0	95	2	3	0	0	0	3	0
10:00	0	2	8	0	78	1	51	0	90	2	4	1	1	1	0	0
10:15	1	1	20	0	77	1	45	0	99	3	1	0	1	1	0	0
10:30	0	1	21	0	69	2	49	0	101	1	2	0	2	1	1	1
10:45	0	1	25	0	60	2	51	0	78	3	1	0	0	0	1	0
11:00	0	4	33	0	57	0	57	0	83	4	1	1	2	1	0	0
11:15	0	3	20	0	70	1	53	0	100	5	2	1	1	1	1	0
11:30	0	3	21	0	87	0	50	0	116	4	1	0	1	0	1	0
11:45	1	3	33	0	90	1	65	0	126	4	1	0	1	2	1	0
12:00	0	1	41	0	74	1	69	0	121	3	2	1	0	1	0	0
12:15	1	4	25	0	60	1	59	0	111	4	0	0	0	0	0	0
12:30	0	2	35	0	79	0	57	0	119	5	0	0	1	1	0	0
12:45	0	5	27	0	115	3	59	0	112	7	0	0	0	0	2	2
13:00	0	0	22	0	95	2	52	0	110	5	1	1	0	0	1	0
13:15	1	2	28	0	92	2	55	0	101	4	1	0	0	2	1	0
13:30	0	2	30	0	49	1	60	0	152	3	0	1	1	2	3	0
13:45	1	3	26	0	58	1	61	0	164	5	1	0	1	0	2	0
14:00	1	2	21	1	61	1	64	0	151	9	2	0	2	0	0	0
14:15	1	1	45	1	75	0	70	0	180	5	1	2	0	1	1	1
14:30	0	1	44	0	72	1	36	0	191	7	1	1	0	1	1	1
14:45	0	1	51	0	66	1	44	0	151	8	0	0	0	3	0	0

15:00	1	4	54	0	69	1	65	0	209	6	2	0	0	0	0	0
15:15	0	6	47	0	55	2	50	0	163	10	1	0	0	0	1	0
15:30	1	1	34	0	60	0	54	0	156	4	1	3	0	3	0	0
15:45	1	1	27	0	58	2	55	0	124	5	0	0	1	0	1	0
16:00	0	2	30	0	75	3	49	0	178	7	2	0	1	1	0	0
16:15	1	3	31	0	68	1	68	0	144	8	0	0	0	0	0	0
16:30	0	2	56	0	53	0	52	0	167	9	1	0	0	0	0	0
16:45	0	4	30	1	92	1	57	0	119	5	1	0	0	0	0	0
17:00	0	3	26	0	89	2	58	0	156	4	0	0	1	1	0	0
17:15	0	4	28	0	45	1	54	0	98	3	3	0	1	0	0	0
17:30	0	1	19	0	53	0	39	0	95	8	0	7	0	0	0	1
17:45	0	3	16	0	45	1	54	0	119	4	1	0	0	0	0	0

File Name:	PR-110 at Wing Rd – Heavy Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	2	0	1	0	2	0	0	0	0	0	0	0
07:30	1	0	0	0	1	0	3	0	1	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	1	0	2	0	1	0	3	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
09:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

09:30	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
09:45	0	1	1	0	0	0	2	0	1	0	0	0	0	0	0	0
10:00	0	0	0	0	2	0	3	0	2	0	0	0	0	0	0	0
10:15	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
11:00	0	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
11:30	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0
11:45	1	0	0	0	0	0	2	0	5	0	0	0	0	0	0	0
12:00	0	1	1	0	1	0	0	0	2	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	1	0	6	0	0	0	0	0	0	0
12:45	0	0	1	0	1	0	5	0	1	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	1	0	1	0	4	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0
13:45	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0
14:00	0	0	1	0	2	0	3	0	2	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:30	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0
14:45	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
15:00	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
15:30	0	0	1	0	0	0	3	0	2	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:30	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0

File Name:	Crown Rd at Guard Rd – All Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	2	1	0	3	0	25	2	21	0	0	0	0	0	0	1
06:15	0	0	2	0	6	0	25	2	28	2	0	0	0	0	0	0
06:30	0	1	1	0	9	0	37	1	44	5	0	0	0	0	0	0
06:45	0	2	3	0	17	0	50	0	75	17	0	0	0	0	0	0
07:00	0	5	8	0	16	0	71	0	46	8	0	1	0	0	0	1
07:15	0	6	10	0	10	0	96	0	60	7	0	0	0	0	0	1
07:30	0	9	6	0	15	0	113	1	62	16	0	0	0	0	0	0
07:45	0	10	13	0	22	0	80	0	74	21	0	0	0	0	0	2
08:00	0	5	9	0	11	0	63	0	92	10	0	0	0	0	0	0
08:15	0	6	3	0	9	0	59	0	67	2	0	0	0	0	0	2
08:30	0	2	3	0	3	0	48	0	60	10	0	0	0	0	0	0
08:45	0	6	10	0	12	0	35	0	44	3	0	0	0	0	0	0
09:00	0	5	5	0	4	0	30	0	40	4	0	0	0	0	0	0
09:15	0	4	6	0	9	0	31	0	38	2	0	0	0	0	0	0
09:30	0	3	8	0	10	0	28	0	39	6	0	0	0	0	0	0
09:45	0	5	7	0	8	0	25	0	58	5	0	0	0	0	0	0
10:00	0	5	6	0	7	0	30	0	51	4	0	0	0	0	0	0
10:15	0	4	9	0	5	0	45	0	55	3	0	0	0	0	0	0
10:30	0	3	10	0	2	0	44	0	60	5	0	0	0	0	0	0
10:45	0	6	11	0	3	0	52	0	61	7	0	0	0	0	0	0
11:00	0	4	10	0	3	0	56	0	60	10	0	0	0	0	0	0
11:15	0	5	7	0	2	0	48	0	63	4	0	0	0	0	0	0
11:30	0	8	10	0	3	0	50	2	61	8	0	0	0	0	0	0
11:45	0	3	13	0	6	0	61	0	69	4	0	0	0	0	0	0
12:00	0	6	18	0	7	0	61	0	68	5	0	0	0	0	0	0
12:15	0	6	11	0	8	0	52	0	68	3	0	0	0	0	0	0
12:30	0	6	13	0	6	0	42	0	66	6	0	0	0	0	0	1
12:45	0	5	16	0	7	0	58	0	72	5	0	0	0	0	0	0
13:00	0	5	12	0	4	0	52	0	77	4	0	0	0	0	0	0
13:15	0	4	13	0	5	0	51	0	58	5	0	0	0	0	0	0
13:30	0	6	10	0	6	0	60	0	54	8	0	0	0	0	0	0
13:45	0	2	8	0	10	0	62	0	49	7	0	0	0	0	0	0
14:00	0	3	9	0	4	0	59	0	95	10	0	0	0	0	0	0
14:15	0	4	10	0	6	0	47	0	101	6	0	0	0	0	0	0

14:30	0	5	18	0	5	0	44	0	88	9	0	0	0	0	0	0
14:45	0	4	20	0	3	0	56	0	102	8	0	0	0	0	0	0
15:00	0	6	24	0	6	0	62	0	116	9	0	0	0	0	0	0
15:15	0	1	18	0	1	0	55	0	117	6	0	0	0	0	0	0
15:30	0	12	28	0	4	0	54	0	89	3	0	0	0	0	0	3
15:45	0	1	11	0	4	0	44	0	76	0	0	0	0	0	0	0
16:00	0	1	28	0	1	0	55	0	86	1	0	0	0	0	0	0
16:15	0	2	20	0	3	0	67	0	90	0	0	1	0	0	0	0
16:30	0	1	25	0	1	0	55	0	77	0	0	0	0	0	0	1
16:45	0	1	7	0	3	0	58	0	88	0	0	0	0	0	0	0
17:00	0	1	12	0	2	0	65	2	88	4	0	0	0	0	0	0
17:15	0	1	6	0	3	0	55	1	60	1	0	0	0	0	0	1
17:30	0	0	10	0	2	0	44	2	72	2	0	0	0	0	0	10
17:45	0	1	8	0	1	0	59	0	75	1	0	3	0	0	0	0

File Name:	Crown Rd at Guard Rd – Heavy Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

09:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
15:00	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	1	1	0	0	0	1	0	2	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name:	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal) – All Vehicles	
Start Date:	5/9/2018	
Start Time:	5:45:00 AM	
Site Code:	00000123	

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
05:45	0	0	0	0	0	22	0	1	0	0	0	0	1	36	0	1
06:00	0	0	0	0	0	33	0	2	0	0	0	0	2	43	0	2
06:15	0	0	0	0	0	45	2	0	0	0	0	0	5	66	0	1
06:30	0	0	0	0	0	46	1	2	0	0	0	0	1	131	0	1
06:45	0	0	0	1	0	75	0	1	0	0	0	0	5	93	0	1
07:00	0	0	0	0	0	90	1	2	0	0	0	0	5	105	0	0
07:15	0	0	0	0	0	104	7	1	0	0	0	0	5	105	1	2
07:30	0	0	0	0	0	91	3	0	0	0	0	0	4	135	0	2
07:45	0	0	0	0	0	61	0	14	0	0	0	2	7	156	0	4
08:00	0	0	0	0	0	69	2	7	0	0	0	3	13	111	0	1
08:15	0	0	0	0	0	54	4	12	0	0	0	3	10	90	0	0
08:30	0	0	0	4	0	42	2	6	0	0	0	5	13	103	1	2
08:45	0	0	0	0	0	36	2	4	0	0	0	1	7	95	0	2
09:00	0	0	0	0	0	42	1	2	0	0	0	2	8	96	0	1
09:15	0	0	0	0	0	41	2	1	0	0	0	3	10	87	0	1
09:30	0	0	0	0	0	57	3	2	0	0	0	1	9	80	0	0
09:45	0	0	0	0	0	55	4	3	0	0	0	2	4	77	0	2
10:00	0	0	0	0	0	60	2	1	0	0	0	2	2	69	0	3
10:15	0	0	0	0	0	61	1	2	0	0	0	3	3	90	0	2
10:30	0	0	0	0	0	73	2	2	0	0	0	2	5	81	0	1
10:45	0	0	0	0	0	75	2	3	0	0	0	1	2	86	0	1
11:00	0	0	0	6	0	66	0	0	0	0	0	1	4	76	0	1
11:15	0	0	0	0	0	76	2	0	0	0	0	8	1	78	0	2
11:30	0	0	0	0	0	81	2	0	0	0	0	0	2	99	0	2
11:45	0	0	0	0	0	89	4	3	0	0	0	3	2	86	1	2
12:00	0	0	0	0	0	61	6	0	0	0	0	2	4	95	0	2
12:15	0	0	0	0	0	56	6	3	0	0	0	0	2	88	0	1
12:30	0	0	0	0	0	69	3	2	0	0	0	2	3	79	0	1
12:45	0	0	0	0	0	66	1	2	0	0	0	1	2	88	0	0
13:00	0	0	0	0	0	61	2	1	0	0	0	2	3	70	0	0
13:15	0	0	0	0	0	62	1	2	0	0	0	1	4	74	0	0
13:30	0	0	0	0	0	63	3	2	0	0	0	1	5	67	0	2
13:45	0	0	0	0	0	70	2	0	0	0	0	2	1	69	0	3
14:00	0	0	0	0	0	72	2	1	0	0	0	0	0	96	0	0

14:15	0	0	0	0	0	71	3	1	0	0	0	1	2	102	0	0
14:30	0	0	0	0	0	73	1	2	0	0	0	2	1	110	0	0
14:45	0	0	0	0	0	79	3	3	0	0	0	0	0	138	0	1
15:00	0	0	0	0	0	84	2	3	0	0	0	0	1	128	0	1
15:15	0	0	0	0	0	76	1	1	0	0	0	3	0	93	0	2
15:30	0	0	0	0	0	52	1	2	0	0	0	0	0	88	0	0
15:45	0	0	0	0	0	85	1	0	0	0	0	1	1	85	0	0
16:00	0	0	0	0	0	91	1	1	0	0	0	0	0	99	0	0
16:15	0	0	0	0	0	65	0	4	0	0	0	0	1	94	0	0
16:30	0	0	0	1	0	72	2	4	0	0	0	2	0	107	0	0
16:45	0	0	0	1	0	81	0	3	0	0	0	0	4	94	0	0
17:00	0	0	0	1	0	68	0	1	0	0	0	0	0	78	0	3
17:15	0	0	0	6	0	64	2	3	0	0	0	0	0	86	0	0
17:30	0	0	0	1	0	73	0	2	0	0	0	0	0	86	0	0
17:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

File Name:	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (immediately west of terminal) – Heavy Vehicles															
Start Date:	5/9/2018															
Start Time:	5:45:00 AM															
Site Code:	00000123															
	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
05:45	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
06:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
06:15	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
06:45	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0
07:00	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
07:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
07:30	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0
07:45	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
08:00	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0
08:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
08:30	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0
08:45	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0

09:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
09:15	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
09:30	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
09:45	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
10:00	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0
10:15	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0
10:30	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
10:45	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
11:15	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
11:30	0	0	0	0	0	8	0	0	0	0	0	0	0	2	0	0
11:45	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0
12:15	0	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0
12:30	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0	0
12:45	0	0	0	0	0	4	0	0	0	0	0	0	0	5	0	0
13:00	0	0	0	0	0	5	0	0	0	0	0	0	0	4	0	0
13:15	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0
13:30	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0
13:45	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
14:00	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
14:15	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0
14:30	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
14:45	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
15:15	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
16:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
16:30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
17:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
17:30	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name:	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (approx. 145 feet west of terminal) – All Vehicles
Start Date:	5/9/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	24	1	1	9	0	6	0	2	29	0	1
06:15	0	0	0	0	0	34	0	2	1	0	3	0	4	43	0	2
06:30	0	0	0	0	0	44	0	0	4	0	9	0	0	69	0	1
06:45	0	0	0	0	0	45	4	1	2	0	2	0	2	130	0	1
07:00	0	0	0	0	0	72	7	1	4	0	5	0	2	84	0	1
07:15	0	0	0	0	0	87	2	2	5	0	6	0	9	102	0	0
07:30	0	0	0	0	0	99	4	1	2	0	2	0	8	111	0	3
07:45	0	0	0	0	0	85	4	0	5	0	9	0	8	132	0	3
08:00	0	0	0	0	0	58	4	1	5	0	1	0	3	154	1	5
08:15	0	0	0	0	0	68	4	7	15	0	6	0	3	111	0	2
08:30	0	0	0	0	3	53	1	4	2	0	10	0	2	101	0	2
08:45	0	0	0	0	0	42	1	2	6	0	17	0	8	116	0	1
09:00	0	0	0	0	0	40	2	3	2	0	8	0	2	11	0	2
09:15	0	0	0	0	0	38	1	1	3	0	9	0	3	111	0	1
09:30	0	0	0	0	0	39	2	1	2	0	10	0	2	95	0	0
09:45	0	0	0	0	0	65	3	1	3	0	11	0	1	93	0	0
10:00	0	0	0	0	0	57	1	1	4	0	8	0	4	100	0	2
10:15	0	0	0	0	0	51	1	0	2	0	5	0	2	88	0	0
10:30	0	0	0	0	0	44	2	2	4	0	6	0	2	75	0	0
10:45	0	0	0	0	0	70	2	3	2	0	2	0	3	74	0	1
11:00	0	0	0	0	0	73	1	4	8	0	3	0	1	80	0	1
11:15	0	0	0	0	0	64	2	1	9	0	6	0	2	70	0	1
11:30	0	0	0	0	0	68	1	10	1	0	8	0	3	84	0	0
11:45	0	0	0	0	0	80	3	0	5	0	6	0	8	95	0	0
12:00	0	0	0	0	0	78	1	2	6	0	6	1	2	86	0	2
12:15	0	0	0	0	0	61	3	2	6	0	5	0	4	89	0	1
12:30	0	0	0	0	0	50	4	0	3	0	2	0	6	87	0	0
12:45	0	0	0	0	0	66	2	1	6	0	3	0	5	82	0	0
13:00	0	0	0	0	0	62	2	1	5	0	2	0	4	74	0	2
13:15	0	0	0	0	0	60	1	1	4	0	3	0	3	69	0	1
13:30	0	0	0	0	0	58	0	0	6	0	4	0	2	62	0	2
13:45	0	0	0	0	0	51	3	0	2	0	9	0	2	58	0	1
14:00	0	0	0	0	0	64	2	1	3	0	4	0	1	101	0	0
14:15	0	0	0	0	0	59	3	2	1	0	7	0	0	106	0	1

14:30	0	0	0	0	0	48	1	0	2	0	6	0	2	95	0	1
14:45	0	0	0	0	0	82	0	0	0	0	10	0	3	99	0	0
15:00	0	0	0	0	0	71	1	2	5	0	12	0	3	130	1	2
15:15	0	0	0	0	0	86	0	2	0	0	4	0	0	127	0	2
15:30	0	0	0	0	0	75	1	3	1	0	4	0	1	93	0	0
15:45	0	0	0	0	0	56	0	1	2	0	0	0	2	86	0	2
16:00	0	0	0	0	0	80	1	0	9	0	13	0	1	83	0	0
16:15	0	0	0	0	0	83	1	1	5	0	1	0	0	95	0	0
16:30	0	0	0	0	0	65	2	2	4	0	0	0	0	94	0	0
16:45	0	0	0	0	0	68	0	4	3	0	2	0	0	99	0	1
17:00	0	0	0	0	0	78	0	3	2	0	1	0	1	102	0	1
17:15	0	0	0	0	0	68	3	1	1	0	0	0	0	78	0	4
17:30	0	0	0	0	0	63	0	3	1	0	0	0	0	85	0	6
17:45	0	0	0	0	0	67	1	2	0	0	0	0	1	91	0	1

File Name:	Engineer Orlando Alarcon Avenue/Hangar Road at Airport Entrance (approx. 145 feet west of terminal) – Heavy Vehicles	
Start Date:	5/9/2018	
Start Time:	6:00:00 AM	
Site Code:	00000123	

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0
06:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
06:30	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0
06:45	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0
07:00	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0
07:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
07:30	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
07:45	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0
08:00	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0	0
08:15	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0
08:30	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
08:45	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0
09:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0

09:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
09:45	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
10:00	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0
10:15	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0
10:30	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0
10:45	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
11:00	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0
11:30	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0
11:45	0	0	0	0	0	7	0	0	0	0	0	0	0	2	0	0
12:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0	0
12:30	0	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0
12:45	0	0	0	0	0	5	0	0	0	0	0	0	0	4	0	0
13:00	0	0	0	0	0	3	0	0	0	0	0	0	0	5	0	0
13:15	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0
13:30	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
13:45	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
14:00	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
14:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
14:30	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0
14:45	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0
15:00	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
15:30	0	0	0	0	0	4	0	0	0	0	0	0	0	2	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
16:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
16:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
16:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
17:30	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0
17:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

File Name:	PR-107 at Engineer Orlando Alarcon Avenue/Hangar Road – All Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	19	2	0	0	0	42	0	47	16	0	0	0	0	0	0
06:15	0	20	1	0	0	0	21	4	71	30	0	0	0	0	0	0
06:30	0	42	1	0	1	0	21	1	115	49	0	0	0	0	0	0
06:45	0	41	2	0	1	0	33	0	160	74	0	0	0	0	0	0
07:00	0	71	1	0	1	0	34	0	162	89	0	0	0	0	0	0
07:15	0	98	1	0	1	0	47	3	234	120	0	0	0	0	0	0
07:30	0	128	1	0	1	0	65	0	209	125	0	1	0	0	0	0
07:45	0	147	1	0	1	0	47	3	202	146	0	0	0	0	0	0
08:00	0	122	1	0	0	0	62	2	166	115	0	0	0	0	0	0
08:15	0	63	2	0	4	0	39	3	141	92	0	2	0	0	0	0
08:30	0	84	4	0	3	0	38	2	139	110	0	0	0	0	0	0
08:45	0	86	1	0	2	0	40	1	120	100	0	0	0	0	0	1
09:00	0	80	2	0	1	0	30	2	110	99	0	0	0	0	0	0
09:15	0	77	3	0	2	0	33	3	109	98	0	1	0	0	0	0
09:30	0	96	2	0	1	0	41	1	111	104	0	1	0	0	0	0
09:45	0	99	2	0	2	0	45	1	99	78	0	0	0	0	0	0
10:00	0	120	4	0	3	0	28	1	95	77	0	0	0	0	0	0
10:15	0	114	3	0	2	0	34	0	84	74	0	0	0	0	0	0
10:30	0	130	2	0	1	0	35	0	75	69	0	0	0	0	0	0
10:45	0	121	2	0	1	0	75	1	78	93	0	1	0	0	0	0
11:00	0	135	3	0	3	0	80	2	82	76	0	2	0	0	0	0
11:15	0	118	4	0	0	0	74	0	115	70	0	0	0	0	0	0
11:30	0	127	1	0	2	0	73	0	101	95	0	0	0	0	0	0
11:45	0	148	5	0	0	0	63	0	120	107	0	0	0	0	0	0
12:00	0	170	2	0	1	0	75	1	118	93	0	1	0	0	0	0
12:15	0	103	4	0	2	0	79	0	139	101	0	0	0	0	0	0
12:30	0	114	2	2	4	0	68	0	117	95	0	0	0	0	0	2
12:45	0	111	2	0	3	0	53	0	114	77	0	1	0	0	0	0
13:00	0	102	1	0	2	0	51	0	100	69	0	1	0	0	0	0
13:15	0	105	2	0	3	0	46	0	95	66	0	0	0	0	0	0
13:30	0	123	1	0	2	0	44	1	96	58	0	0	0	0	0	0
13:45	0	120	2	0	2	0	39	2	101	49	0	0	0	0	0	0
14:00	0	166	1	0	1	0	51	0	110	67	0	1	0	0	0	0
14:15	0	146	1	0	1	0	50	0	85	91	0	1	0	0	0	0
14:30	0	121	2	0	2	0	60	0	88	85	0	0	0	0	0	0
14:45	0	122	3	0	3	0	47	1	101	84	0	0	0	0	0	0

15:00	0	186	1	0	3	0	66	1	108	75	0	0	0	0	0	0
15:15	0	157	1	0	0	0	52	0	124	71	0	0	0	0	0	0
15:30	0	203	1	0	1	0	76	0	101	59	0	1	0	0	0	0
15:45	0	127	2	0	3	0	65	2	89	55	0	0	0	0	0	0
16:00	0	122	0	0	1	0	65	4	86	72	0	0	0	0	0	0
16:15	0	113	1	0	2	0	42	1	94	50	0	0	0	0	0	0
16:30	0	175	1	0	1	0	59	0	88	54	0	0	0	0	0	0
16:45	0	126	3	0	2	0	73	0	102	54	0	0	0	0	0	0
17:00	0	121	2	0	1	0	62	0	99	49	0	0	0	0	0	0
17:15	0	101	1	0	0	0	68	2	96	59	0	0	0	0	0	0
17:30	0	68	1	0	2	0	82	0	111	60	0	0	0	0	0	0
17:45	0	57	1	0	1	0	41	4	95	53	0	1	0	0	0	0

File Name:	PR-107 at Engineer Orlando Alarcon Avenue/Hangar Road – Heavy Vehicles
Start Date:	5/8/2018
Start Time:	6:00:00 AM
Site Code:	00000123

	SB				WB				NB				EB			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0
07:00	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0
08:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
09:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

09:30	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0
09:45	0	2	0	0	1	0	0	0	1	1	0	0	0	0	0	0
10:00	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:15	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0
10:30	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0
10:45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	1	0	0	0	0	2	0	2	2	0	0	0	0	0	0
11:15	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
11:30	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
12:00	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
12:30	0	1	0	0	0	0	2	0	2	0	0	0	0	0	0	0
12:45	0	1	0	0	1	0	3	0	0	1	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0
13:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
14:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0
14:30	0	1	0	0	1	0	0	0	1	2	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
15:00	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15:15	0	1	1	0	0	0	2	0	1	0	0	0	0	0	0	0
15:30	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0
15:45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
17:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B. Synchro Printouts for Existing Traffic Conditions

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PR-107 at PR-4467
AM peak-hour (7:15am to 8:15am)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	85	0	200	0	777	62	72	673	0
Future Volume (vph)	0	0	0	85	0	200	0	777	62	72	673	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.905			0.989				
Flt Protected					0.985					0.950		
Satd. Flow (prot)	0	0	0	0	1694	0	1837	1816	0	1745	1837	0
Flt Permitted					0.985					0.205		
Satd. Flow (perm)	0	0	0	0	1694	0	1837	1816	0	377	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					163			11				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		291			621			411			497	
Travel Time (s)		7.9			16.9			8.0			9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	92	0	217	0	845	67	78	732	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	309	0	0	912	0	78	732	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2		1	2	
Detector Template				Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)				20	100		20	100		20	100	
Trailing Detector (ft)				0	0		0	0		0	0	
Detector 1 Position(ft)				0	0		0	0		0	0	
Detector 1 Size(ft)				20	6		20	6		20	6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA		Perm	NA	

PR-107 at PR-4467
AM peak-hour (7:15am to 8:15am)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Detector Phase				8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)				22.5	22.5		47.5	47.5		47.5	47.5	
Total Split (%)				32.1%	32.1%		67.9%	67.9%		67.9%	67.9%	
Maximum Green (s)				18.0	18.0		43.0	43.0		43.0	43.0	
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)					0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)					4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)					11.3			43.7		43.7	43.7	
Actuated g/C Ratio					0.18			0.68		0.68	0.68	
v/c Ratio					0.72			0.73		0.30	0.58	
Control Delay					21.3			12.6		9.5	8.8	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					21.3			12.6		9.5	8.8	
LOS					C			B		A	A	
Approach Delay					21.3			12.6			8.8	
Approach LOS					C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 64			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			
Description: PR-107 at PR-4467 (AM peak-hour)			

Splits and Phases: 3:

PR-107 at PR-4467
PM peak-hour (2:15pm to 3:15pm)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	96	0	159	0	499	147	66	661	0
Future Volume (vph)	0	0	0	96	0	159	0	499	147	66	661	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.916			0.966				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	0	0	0	1703	0	1837	1761	0	1745	1837	0
Flt Permitted					0.982					0.320		
Satd. Flow (perm)	0	0	0	0	1703	0	1837	1761	0	588	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					115			39				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		291			621			411			497	
Travel Time (s)		7.9			16.9			8.0			9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	1%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	104	0	173	0	542	160	72	718	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	277	0	0	702	0	72	718	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2		1	2	
Detector Template				Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)				20	100		20	100		20	100	
Trailing Detector (ft)				0	0		0	0		0	0	
Detector 1 Position(ft)				0	0		0	0		0	0	
Detector 1 Size(ft)				20	6		20	6		20	6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Detector Phase				8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)				22.5	22.5		47.5	47.5		47.5	47.5	
Total Split (%)				32.1%	32.1%		67.9%	67.9%		67.9%	67.9%	
Maximum Green (s)				18.0	18.0		43.0	43.0		43.0	43.0	
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)					0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)					4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)					11.6			44.2		44.2	44.2	
Actuated g/C Ratio					0.18			0.68		0.68	0.68	
v/c Ratio					0.69			0.58		0.18	0.57	
Control Delay					23.4			8.4		6.3	8.7	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					23.4			8.4		6.3	8.7	
LOS					C			A		A	A	
Approach Delay					23.4			8.4			8.4	
Approach LOS					C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 64.9			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 10.8		Intersection LOS: B	
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			
Description: PR-107 at PR-4467 (PM peak-hour)			

Splits and Phases: 3:

PR-467 at PR-459
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	149.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	193	155	244	563	538	263
Future Vol, veh/h	193	155	244	563	538	263
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	1	1	1	0
Mvmt Flow	210	168	265	612	585	286

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1870	728	871	0	-	0
Stage 1	728	-	-	-	-	-
Stage 2	1142	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	~ 80	427	778	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 53	427	778	-	-	-
Mov Cap-2 Maneuver	~ 53	-	-	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	~ 202	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 834.4	3.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	778	-	53	427	-	-
HCM Lane V/C Ratio	0.341	-	3.958	0.395	-	-
HCM Control Delay (s)	12	-	$ 1489.5	18.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1.5	-	23	1.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	93.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	202	0	205	0	0	0	207	479	0	0	463	221
Future Vol, veh/h	202	0	205	0	0	0	207	479	0	0	463	221
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	50	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	0	3	2	2	2	1	1	0	0	1	0
Mvmt Flow	220	0	223	0	0	0	225	521	0	0	503	240

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1594	-	623	743	0	-	-	-	0
Stage 1	623	-	-	-	-	-	-	-	-
Stage 2	971	-	-	-	-	-	-	-	-
Critical Hdwy	6.41	-	6.23	4.11	-	-	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.327	2.209	-	-	-	-	-
Pot Cap-1 Maneuver	~ 118	0	484	869	-	0	0	-	-
Stage 1	537	0	-	-	-	0	0	-	-
Stage 2	369	0	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 87	0	484	869	-	-	-	-	-
Mov Cap-2 Maneuver	~ 87	0	-	-	-	-	-	-	-
Stage 1	537	0	-	-	-	-	-	-	-
Stage 2	273	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 403.8	3.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	869	-	87	484	-	-
HCM Lane V/C Ratio	0.259	-	2.524	0.46	-	-
HCM Control Delay (s)	10.6	-	$ 794.8	18.6	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1	-	20.6	2.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	424.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	1	223	3	128	267	284	116	98	426	52
Future Vol, veh/h	1	0	1	223	3	128	267	284	116	98	426	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	1	1	1	0	0	1	4
Mvmt Flow	1	0	1	242	3	139	290	309	126	107	463	57

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1658	1719	491	1657	1685	372	520	0	0	435	0	0
Stage 1	704	704	-	952	952	-	-	-	-	-	-	-
Stage 2	954	1015	-	705	733	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.21	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.309	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	79	91	582	~ 79	95	676	1051	-	-	1135	-	-
Stage 1	431	443	-	314	341	-	-	-	-	-	-	-
Stage 2	313	318	-	430	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	39	50	582	~ 51	52	676	1051	-	-	1135	-	-
Mov Cap-2 Maneuver	39	50	-	~ 51	52	-	-	-	-	-	-	-
Stage 1	271	384	-	~ 198	214	-	-	-	-	-	-	-
Stage 2	154	200	-	372	372	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	55.8	$ 1907.1	3.9	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1051	-	-	77	73	1135	-	-
HCM Lane V/C Ratio	0.276	-	-	4.997	0.03	0.094	-	-
HCM Control Delay (s)	9.7	0	$ 1907.1	55.8	8.5	0	-	
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	1.1	-	-	41.9	0.1	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	22.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	1	1	139	3	57	120	211	152	96	288	25
Future Vol, veh/h	1	1	1	139	3	57	120	211	152	96	288	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	2	1	1	2	1	0	8
Mvmt Flow	1	1	1	151	3	62	130	229	165	104	313	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1109	1190	327	1109	1122	312	340	0	0	395	0	0
Stage 1	535	535	-	573	573	-	-	-	-	-	-	-
Stage 2	574	655	-	536	549	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.5	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	189	189	719	188	208	728	1225	-	-	1169	-	-
Stage 1	533	527	-	506	507	-	-	-	-	-	-	-
Stage 2	507	466	-	530	520	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	140	145	719	153	159	728	1225	-	-	1169	-	-
Mov Cap-2 Maneuver	140	145	-	153	159	-	-	-	-	-	-	-
Stage 1	459	469	-	436	437	-	-	-	-	-	-	-
Stage 2	396	401	-	470	463	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	23.9	115	2.1	2
HCM LOS	C	F		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1225	-	-	212	194	1169	-	-
HCM Lane V/C Ratio	0.106	-	-	1.02	0.017	0.089	-	-
HCM Control Delay (s)	8.3	0	-	115	23.9	8.4	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	9.3	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	349	0	0	0	0	670	0	0	597	0
Future Vol, veh/h	14	0	349	0	0	0	0	670	0	0	597	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	14	0	1	2	2	2	0	1	0	0	1	0
Mvmt Flow	15	0	379	0	0	0	0	728	0	0	649	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1377	1377	649	-	0	-	-	-	0
Stage 1	649	649	-	-	-	-	-	-	-
Stage 2	728	728	-	-	-	-	-	-	-
Critical Hdwy	6.54	6.5	6.21	-	-	-	-	-	-
Critical Hdwy Stg 1	5.54	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.54	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4	3.309	-	-	-	-	-	-
Pot Cap-1 Maneuver	150	146	472	0	-	0	0	-	0
Stage 1	498	469	-	0	-	0	0	-	0
Stage 2	457	432	-	0	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	150	0	472	-	-	-	-	-	-
Mov Cap-2 Maneuver	150	0	-	-	-	-	-	-	-
Stage 1	498	0	-	-	-	-	-	-	-
Stage 2	457	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	38.6	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	480	-
HCM Lane V/C Ratio	-	0.822	-
HCM Control Delay (s)	-	38.6	-
HCM Lane LOS	-	E	-
HCM 95th %tile Q(veh)	-	7.9	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	0	246	0	0	0	0	573	0	0	363	0
Future Vol, veh/h	19	0	246	0	0	0	0	573	0	0	363	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	2	2	2	0	1	0	0	1	0
Mvmt Flow	21	0	267	0	0	0	0	623	0	0	395	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1018	1018	395	-	0	-	-	-	0
Stage 1	395	395	-	-	-	-	-	-	-
Stage 2	623	623	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.21	-	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.309	-	-	-	-	-	-
Pot Cap-1 Maneuver	265	239	656	0	-	0	0	-	0
Stage 1	685	608	-	0	-	0	0	-	0
Stage 2	539	481	-	0	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	265	0	656	-	-	-	-	-	-
Mov Cap-2 Maneuver	265	0	-	-	-	-	-	-	-
Stage 1	685	0	-	-	-	-	-	-	-
Stage 2	539	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	707	-
HCM Lane V/C Ratio	-	0.407	-
HCM Control Delay (s)	-	13.5	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	2	-

PR-110 at PR-4466
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	86.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	99	0	271	0	644	52	110	358	0
Future Vol, veh/h	0	0	0	99	0	271	0	644	52	110	358	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	0	0	1	4	2	1	0
Mvmt Flow	0	0	0	108	0	295	0	700	57	120	389	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1356	1356	728	-	0	0	757	0	0
Stage 1	728	728	-	-	-	-	-	-	-
Stage 2	628	628	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.2	-	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	127	151	427	0	-	-	854	-	0
Stage 1	416	432	-	0	-	-	-	-	0
Stage 2	472	479	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	110	124	427	-	-	-	854	-	-
Mov Cap-2 Maneuver	110	124	-	-	-	-	-	-	-
Stage 1	416	432	-	-	-	-	-	-	-
Stage 2	388	393	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 354.4	0	2.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	241	854	-
HCM Lane V/C Ratio	-	-	1.669	0.14	-
HCM Control Delay (s)	-	-	$ 354.4	9.9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	26	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	42	0	86	0	386	109	257	439	0
Future Vol, veh/h	0	0	0	42	0	86	0	386	109	257	439	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	5	0	1	0	1	2	0	2	0
Mvmt Flow	0	0	0	46	0	93	0	420	118	279	477	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1515	1515	479	-	0	0	538	0	0
Stage 1	479	479	-	-	-	-	-	-	-
Stage 2	1036	1036	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.21	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.309	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	129	121	589	0	-	-	1040	-	0
Stage 1	617	558	-	0	-	-	-	-	0
Stage 2	338	311	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	82	0	589	-	-	-	1040	-	-
Mov Cap-2 Maneuver	82	0	-	-	-	-	-	-	-
Stage 1	617	0	-	-	-	-	-	-	-
Stage 2	215	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	60.1	0	3.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	1040	-
HCM Lane V/C Ratio	-	-	0.717	0.269	-
HCM Control Delay (s)	-	-	60.1	9.7	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	4.6	1.1	-

PR-110 at Wing Road
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	14.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	453	0	534	0	27	375	82	10	0
Future Vol, veh/h	0	0	0	453	0	534	0	27	375	82	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	0	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	1	0	0	1	0	0	0
Mvmt Flow	0	0	0	492	0	580	0	29	408	89	11	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	218	-	29	-	0	-	29	0	0
Stage 1	29	-	-	-	-	-	-	-	-
Stage 2	189	-	-	-	-	-	-	-	-
Critical Hdwy	6.41	-	6.21	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.309	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	772	0	1049	0	-	0	1597	-	0
Stage 1	996	0	-	0	-	0	-	-	0
Stage 2	846	0	-	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	729	0	1049	-	-	-	1597	-	-
Mov Cap-2 Maneuver	729	0	-	-	-	-	-	-	-
Stage 1	996	0	-	-	-	-	-	-	-
Stage 2	799	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	6.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	729	1049	1597	-
HCM Lane V/C Ratio	-	0.675	0.553	0.056	-
HCM Control Delay (s)	-	19.6	12.6	7.4	0
HCM Lane LOS	-	C	B	A	A
HCM 95th %tile Q(veh)	-	5.3	3.5	0.2	-

Intersection	
Int Delay, s/veh	11.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	215	0	282	0	26	731	194	7	0
Future Vol, veh/h	0	0	0	215	0	282	0	26	731	194	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	0	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	1	0	0	0	1	14	0
Mvmt Flow	0	0	0	234	0	307	0	28	795	211	8	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	457	-	28	-	0	-	28	0	0
Stage 1	28	-	-	-	-	-	-	-	-
Stage 2	429	-	-	-	-	-	-	-	-
Critical Hdwy	6.41	-	6.21	-	-	-	4.11	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.309	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	563	0	1050	0	-	0	1592	-	0
Stage 1	997	0	-	0	-	0	-	-	0
Stage 2	659	0	-	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	488	0	1050	-	-	-	1592	-	-
Mov Cap-2 Maneuver	488	0	-	-	-	-	-	-	-
Stage 1	997	0	-	-	-	-	-	-	-
Stage 2	571	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	7.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	488	1050	1592	-
HCM Lane V/C Ratio	-	0.479	0.292	0.132	-
HCM Control Delay (s)	-	19	9.8	7.6	0
HCM Lane LOS	-	C	A	A	A
HCM 95th %tile Q(veh)	-	2.6	1.2	0.5	-

Intersection	
Int Delay, s/veh	10.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	352	0	58	0	54	288	38	30	0
Future Vol, veh/h	0	0	0	352	0	58	0	54	288	38	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	0	0	0	0	2	0	0	0
Mvmt Flow	0	0	0	383	0	63	0	59	313	41	33	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	330	330	215	-	0	0	372	0	0
Stage 1	215	215	-	-	-	-	-	-	-
Stage 2	115	115	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.42	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	665	592	830	0	-	-	1198	-	0
Stage 1	821	729	-	0	-	-	-	-	0
Stage 2	910	804	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	642	0	830	-	-	-	1198	-	-
Mov Cap-2 Maneuver	642	0	-	-	-	-	-	-	-
Stage 1	821	0	-	-	-	-	-	-	-
Stage 2	878	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8	0	4.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	663	1198	-
HCM Lane V/C Ratio	-	-	0.672	0.034	-
HCM Control Delay (s)	-	-	20.8	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	5.2	0.1	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	209	0	20	0	32	407	72	19	0
Future Vol, veh/h	0	0	0	209	0	20	0	32	407	72	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	1	0	0	0	0	1	1	5	0
Mvmt Flow	0	0	0	227	0	22	0	35	442	78	21	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	433	433	256	-	0	0	477	0	0
Stage 1	256	256	-	-	-	-	-	-	-
Stage 2	177	177	-	-	-	-	-	-	-
Critical Hdwy	6.41	6.5	6.2	-	-	-	4.11	-	-
Critical Hdwy Stg 1	5.41	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	582	519	788	0	-	-	1090	-	0
Stage 1	789	699	-	0	-	-	-	-	0
Stage 2	856	756	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	540	0	788	-	-	-	1090	-	-
Mov Cap-2 Maneuver	540	0	-	-	-	-	-	-	-
Stage 1	789	0	-	-	-	-	-	-	-
Stage 2	794	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	6.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	555	1090	-
HCM Lane V/C Ratio	-	-	0.448	0.072	-
HCM Control Delay (s)	-	-	16.7	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.3	0.2	-

Engineer Orlando Alarcon Avenue at Airport Entrance
AM peak-hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	507	29	12	325	0	0
Future Volume (Veh/h)	507	29	12	325	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	551	32	13	353	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			583		946	567
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			583		946	567
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1001		286	523

Direction, Lane #	EB 1	WB 1
Volume Total	583	366
Volume Left	0	13
Volume Right	32	0
cSH	1700	1001
Volume to Capacity	0.34	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.4
Lane LOS		A
Approach Delay (s)	0.0	0.4
Approach LOS		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Engineer Orlando Alarcon Avenue/Hanger Road at Airport Entrance (immediately west of terminal)			

Engineer Orlando Alarcon Avenue at Airport Entrance
PM peak-hour (2:15pm to 3:15pm)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	478	4	9	307	0	0
Future Volume (Veh/h)	478	4	9	307	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	520	4	10	334	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			524		876	522
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			524		876	522
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1053		316	555

Direction, Lane #	EB 1	WB 1
Volume Total	524	344
Volume Left	0	10
Volume Right	4	0
cSH	1700	1053
Volume to Capacity	0.31	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Engineer Orlando Alarcon Avenue at Airport Entrance			

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	499	28	14	329	18	17
Future Vol, veh/h	499	28	14	329	18	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	6	0
Mvmt Flow	542	30	15	358	20	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	573	0	946	558
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.1	-	6.46	6.2
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.2	-	3.554	3.3
Pot Cap-1 Maneuver	-	-	1010	-	285	533
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	677	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1010	-	280	533
Mov Cap-2 Maneuver	-	-	-	-	280	-
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	664	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	364	-	-	1010	-
HCM Lane V/C Ratio	0.105	-	-	0.015	-
HCM Control Delay (s)	16	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	8	5	260	35	8
Future Vol, veh/h	430	8	5	260	35	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	3	0	0
Mvmt Flow	467	9	5	283	38	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	476	0	765	472
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	293	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1097	-	374	596
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1097	-	372	596
Mov Cap-2 Maneuver	-	-	-	-	372	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	400	-	-	1097	-
HCM Lane V/C Ratio	0.117	-	-	0.005	-
HCM Control Delay (s)	15.2	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

PR 107 at Hanger Road
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	11.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	221	0	3	0	506	811	4	495	0
Future Vol, veh/h	0	0	0	221	0	3	0	506	811	4	495	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	0	0	33	0	0	0	0	0	0
Mvmt Flow	0	0	0	240	0	3	0	550	882	4	538	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1097	1097	550	-	0	0	550	0	0
Stage 1	550	550	-	-	-	-	-	-	-
Stage 2	547	547	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.53	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 238	215	480	0	-	-	1030	-	0
Stage 1	582	519	-	0	-	-	-	-	0
Stage 2	584	521	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 237	0	480	-	-	-	1030	-	-
Mov Cap-2 Maneuver	~ 237	0	-	-	-	-	-	-	-
Stage 1	582	0	-	-	-	-	-	-	-
Stage 2	580	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	107.5	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	239	1030	-
HCM Lane V/C Ratio	-	-	1.019	0.004	-
HCM Control Delay (s)	-	-	107.5	8.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	9.8	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	223	0	9	0	335	382	7	575	0
Future Vol, veh/h	0	0	0	223	0	9	0	335	382	7	575	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	0	0	11	0	1	1	0	1	0
Mvmt Flow	0	0	0	242	0	10	0	364	415	8	625	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1004	1004	364	-	0	0	364	0	0
Stage 1	364	364	-	-	-	-	-	-	-
Stage 2	640	640	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.31	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.399	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	270	244	661	0	-	-	1206	-	0
Stage 1	707	627	-	0	-	-	-	-	0
Stage 2	529	473	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	267	0	661	-	-	-	1206	-	-
Mov Cap-2 Maneuver	267	0	-	-	-	-	-	-	-
Stage 1	707	0	-	-	-	-	-	-	-
Stage 2	524	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	77	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	273	1206	-
HCM Lane V/C Ratio	-	-	0.924	0.006	-
HCM Control Delay (s)	-	-	77	8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	8.5	0	-

Appendix C. Synchro Printouts for Future Traffic Conditions

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PR-107 at PR-4467
AM peak-hour (7:15am to 8:15am)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	85	0	210	0	793	62	82	689	0
Future Volume (vph)	0	0	0	85	0	210	0	793	62	82	689	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.904			0.989				
Flt Protected					0.986					0.950		
Satd. Flow (prot)	0	0	0	0	1694	0	1837	1800	0	1745	1818	0
Flt Permitted					0.986					0.195		
Satd. Flow (perm)	0	0	0	0	1694	0	1837	1800	0	358	1818	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					172			10				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		291			621			411			497	
Travel Time (s)		7.9			16.9			8.0			9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	92	0	228	0	862	67	89	749	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	320	0	0	929	0	89	749	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2		1	2	
Detector Template				Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)				20	100		20	100		20	100	
Trailing Detector (ft)				0	0		0	0		0	0	
Detector 1 Position(ft)				0	0		0	0		0	0	
Detector 1 Size(ft)				20	6		20	6		20	6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Detector Phase				8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)				22.5	22.5		47.5	47.5		47.5	47.5	
Total Split (%)				32.1%	32.1%		67.9%	67.9%		67.9%	67.9%	
Maximum Green (s)				18.0	18.0		43.0	43.0		43.0	43.0	
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)					0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)					4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)					11.3			43.5		43.5	43.5	
Actuated g/C Ratio					0.18			0.68		0.68	0.68	
v/c Ratio					0.73			0.76		0.37	0.61	
Control Delay					21.4			13.5		11.3	9.2	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					21.4			13.5		11.3	9.2	
LOS					C			B		B	A	
Approach Delay					21.4			13.5			9.4	
Approach LOS					C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 63.9			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			
Description: PR-107 at PR-4467 (AM peak-hour)			

Splits and Phases: 3:

PR-107 at PR-4467
PM peak-hour (2:15pm to 3:15pm)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	169	0	159	0	515	147	76	677	0
Future Volume (vph)	0	0	0	169	0	159	0	515	147	76	677	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.935			0.967				
Flt Protected					0.975					0.950		
Satd. Flow (prot)	0	0	0	0	1723	0	1837	1762	0	1745	1818	0
Flt Permitted					0.975					0.284		
Satd. Flow (perm)	0	0	0	0	1723	0	1837	1762	0	522	1818	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					65			38				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		291			621			411			497	
Travel Time (s)		7.9			16.9			8.0			9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	1%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	184	0	173	0	560	160	83	736	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	357	0	0	720	0	83	736	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2		1	2	
Detector Template				Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)				20	100		20	100		20	100	
Trailing Detector (ft)				0	0		0	0		0	0	
Detector 1 Position(ft)				0	0		0	0		0	0	
Detector 1 Size(ft)				20	6		20	6		20	6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA		Perm	NA	

PR-107 at PR-4467
PM peak-hour (2:15pm to 3:15pm)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Detector Phase				8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)				22.5	22.5		47.5	47.5		47.5	47.5	
Total Split (%)				32.1%	32.1%		67.9%	67.9%		67.9%	67.9%	
Maximum Green (s)				18.0	18.0		43.0	43.0		43.0	43.0	
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)					0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)					4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)					15.5			43.1		43.1	43.1	
Actuated g/C Ratio					0.23			0.64		0.64	0.64	
v/c Ratio					0.80			0.63		0.25	0.64	
Control Delay					35.1			10.7		8.5	11.2	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					35.1			10.7		8.5	11.2	
LOS					D			B		A	B	
Approach Delay					35.1			10.7			11.0	
Approach LOS					D			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 67.6			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			
Description: PR-107 at PR-4467 (PM peak-hour)			

Splits and Phases: 3:

PR-467 at PR-459
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	169.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	203	155	244	563	538	273
Future Vol, veh/h	203	155	244	563	538	273
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	1	1	1	0
Mvmt Flow	221	168	265	612	585	297

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1875	733	882	0	-	0
Stage 1	733	-	-	-	-	-
Stage 2	1142	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	~ 79	424	771	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 52	424	771	-	-	-
Mov Cap-2 Maneuver	~ 52	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	~ 201	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 926.4	3.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	771	-	52	424	-	-
HCM Lane V/C Ratio	0.344	-	4.243	0.397	-	-
HCM Control Delay (s)	12.1	-	$ 1619.3	19	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1.5	-	24.5	1.9	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

PR-467 at PR-459
PM peak-hour (2:15pm to 3:15pm)

Intersection	
Int Delay, s/veh	105.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	212	0	205	0	0	0	207	479	0	0	463	231
Future Vol, veh/h	212	0	205	0	0	0	207	479	0	0	463	231
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	50	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	0	3	2	2	2	1	1	0	0	1	0
Mvmt Flow	230	0	223	0	0	0	225	521	0	0	503	251

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1600	-	629	754	0	-	-	-	0
Stage 1	629	-	-	-	-	-	-	-	-
Stage 2	971	-	-	-	-	-	-	-	-
Critical Hdwy	6.41	-	6.23	4.11	-	-	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.327	2.209	-	-	-	-	-
Pot Cap-1 Maneuver	~ 117	0	480	861	-	0	0	-	-
Stage 1	533	0	-	-	-	0	0	-	-
Stage 2	369	0	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 86	0	480	861	-	-	-	-	-
Mov Cap-2 Maneuver	~ 86	0	-	-	-	-	-	-	-
Stage 1	533	0	-	-	-	-	-	-	-
Stage 2	273	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 448.7	3.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	861	-	86	480	-	-
HCM Lane V/C Ratio	0.261	-	2.679	0.464	-	-
HCM Control Delay (s)	10.7	-	$ 864.4	18.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1	-	22	2.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

PR-110 at PR-459 North
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	467.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	1	233	3	128	267	284	126	98	426	52
Future Vol, veh/h	1	0	1	233	3	128	267	284	126	98	426	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	1	1	1	0	0	1	4
Mvmt Flow	1	0	1	253	3	139	290	309	137	107	463	57

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1663	1730	491	1663	1691	377	520	0	0	446	0	0
Stage 1	704	704	-	958	958	-	-	-	-	-	-	-
Stage 2	959	1026	-	705	733	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.21	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.309	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	78	89	582	~ 78	94	672	1051	-	-	1125	-	-
Stage 1	431	443	-	312	338	-	-	-	-	-	-	-
Stage 2	311	315	-	430	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	48	582	~ 50	51	672	1051	-	-	1125	-	-
Mov Cap-2 Maneuver	38	48	-	~ 50	51	-	-	-	-	-	-	-
Stage 1	270	383	-	~ 195	212	-	-	-	-	-	-	-
Stage 2	152	197	-	371	371	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	57.3	$ 2067.8	3.8	1.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1051	-	-	74	71	1125	-	-
HCM Lane V/C Ratio	0.276	-	-	5.347	0.031	0.095	-	-
HCM Control Delay (s)	9.7	0	$ 2067.8	57.3	8.5	0	-	
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	1.1	-	-	43.6	0.1	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

PR 110 at PR 459 North
PM peak-hour (2:15pm to 3:15pm)

Intersection	
Int Delay, s/veh	29.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	1	1	149	3	57	120	211	162	96	288	25
Future Vol, veh/h	1	1	1	149	3	57	120	211	162	96	288	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	2	1	1	2	1	0	8
Mvmt Flow	1	1	1	162	3	62	130	229	176	104	313	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1115	1201	327	1114	1127	317	340	0	0	405	0	0
Stage 1	535	535	-	578	578	-	-	-	-	-	-	-
Stage 2	580	666	-	536	549	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.5	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	187	186	719	186	206	724	1225	-	-	1159	-	-
Stage 1	533	527	-	503	504	-	-	-	-	-	-	-
Stage 2	504	460	-	530	520	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	138	142	719	~ 151	157	724	1225	-	-	1159	-	-
Mov Cap-2 Maneuver	138	142	-	~ 151	157	-	-	-	-	-	-	-
Stage 1	458	469	-	432	433	-	-	-	-	-	-	-
Stage 2	393	395	-	469	462	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	24.2	149.9	2	2
HCM LOS	C	F		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1225	-	-	202	191	1159	-	-
HCM Lane V/C Ratio	0.106	-	-	1.125	0.017	0.09	-	-
HCM Control Delay (s)	8.3	0	-	149.9	24.2	8.4	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	10.9	0.1	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	349	0	0	0	0	680	0	0	607	0
Future Vol, veh/h	14	0	349	0	0	0	0	680	0	0	607	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	14	0	1	2	2	2	0	1	0	0	1	0
Mvmt Flow	15	0	379	0	0	0	0	739	0	0	660	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1399	1399	660	-	0	-	-	-	0
Stage 1	660	660	-	-	-	-	-	-	-
Stage 2	739	739	-	-	-	-	-	-	-
Critical Hdwy	6.54	6.5	6.21	-	-	-	-	-	-
Critical Hdwy Stg 1	5.54	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.54	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4	3.309	-	-	-	-	-	-
Pot Cap-1 Maneuver	146	142	465	0	-	0	0	-	0
Stage 1	492	463	-	0	-	0	0	-	0
Stage 2	451	427	-	0	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	146	0	465	-	-	-	-	-	-
Mov Cap-2 Maneuver	146	0	-	-	-	-	-	-	-
Stage 1	492	0	-	-	-	-	-	-	-
Stage 2	451	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.5	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	473	-
HCM Lane V/C Ratio	-	0.834	-
HCM Control Delay (s)	-	40.5	-
HCM Lane LOS	-	E	-
HCM 95th %tile Q(veh)	-	8.2	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	0	246	0	0	0	0	583	0	0	373	0
Future Vol, veh/h	19	0	246	0	0	0	0	583	0	0	373	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	2	2	2	0	1	0	0	1	0
Mvmt Flow	21	0	267	0	0	0	0	634	0	0	405	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1039	1039	405	-	0	-	-	-	0
Stage 1	405	405	-	-	-	-	-	-	-
Stage 2	634	634	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.21	-	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.309	-	-	-	-	-	-
Pot Cap-1 Maneuver	258	232	648	0	-	0	0	-	0
Stage 1	678	602	-	0	-	0	0	-	0
Stage 2	532	476	-	0	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	258	0	648	-	-	-	-	-	-
Mov Cap-2 Maneuver	258	0	-	-	-	-	-	-	-
Stage 1	678	0	-	-	-	-	-	-	-
Stage 2	532	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	698	-
HCM Lane V/C Ratio	-	0.413	-
HCM Control Delay (s)	-	13.7	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	2	-

PR-110 at PR-4466
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	95.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	99	0	281	0	644	52	120	358	0
Future Vol, veh/h	0	0	0	99	0	281	0	644	52	120	358	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	0	0	1	4	2	1	0
Mvmt Flow	0	0	0	108	0	305	0	700	57	130	389	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1378	1378	728	-	0	0	757	0	0
Stage 1	728	728	-	-	-	-	-	-	-
Stage 2	650	650	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.2	-	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	123	146	427	0	-	-	854	-	0
Stage 1	416	432	-	0	-	-	-	-	0
Stage 2	460	468	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 105	118	427	-	-	-	854	-	-
Mov Cap-2 Maneuver	~ 105	118	-	-	-	-	-	-	-
Stage 1	416	432	-	-	-	-	-	-	-
Stage 2	371	377	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 386.9	0	2.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	237	854	-
HCM Lane V/C Ratio	-	-	1.743	0.153	-
HCM Control Delay (s)	-	-	$ 386.9	10	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	27.6	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	42	0	96	0	386	109	267	439	0
Future Vol, veh/h	0	0	0	42	0	96	0	386	109	267	439	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	5	0	1	0	1	2	0	2	0
Mvmt Flow	0	0	0	46	0	104	0	420	118	290	477	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1537	1537	479	-	0	0	538	0	0
Stage 1	479	479	-	-	-	-	-	-	-
Stage 2	1058	1058	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.21	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.309	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	126	117	589	0	-	-	1040	-	0
Stage 1	617	558	-	0	-	-	-	-	0
Stage 2	329	304	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	78	0	589	-	-	-	1040	-	-
Mov Cap-2 Maneuver	78	0	-	-	-	-	-	-	-
Stage 1	617	0	-	-	-	-	-	-	-
Stage 2	204	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	65.2	0	3.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	197	1040	-
HCM Lane V/C Ratio	-	-	0.761	0.279	-
HCM Control Delay (s)	-	-	65.2	9.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	5.1	1.1	-

PR-110 at Wing Road
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	15.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	463	0	534	0	27	385	82	10	0
Future Vol, veh/h	0	0	0	463	0	534	0	27	385	82	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	0	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	1	0	0	1	0	0	0
Mvmt Flow	0	0	0	503	0	580	0	29	418	89	11	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	218	-	29	-	0	-	29	0	0
Stage 1	29	-	-	-	-	-	-	-	-
Stage 2	189	-	-	-	-	-	-	-	-
Critical Hdwy	7.11	-	6.21	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.309	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	740	0	1049	0	-	0	1597	-	0
Stage 1	991	0	-	0	-	0	-	-	0
Stage 2	815	0	-	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	708	-	1049	-	-	-	1597	-	-
Mov Cap-2 Maneuver	708	-	-	-	-	-	-	-	-
Stage 1	991	-	-	-	-	-	-	-	-
Stage 2	769	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	6.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	708	1049	1597	-
HCM Lane V/C Ratio	-	0.711	0.553	0.056	-
HCM Control Delay (s)	-	21.6	12.6	7.4	0
HCM Lane LOS	-	C	B	A	A
HCM 95th %tile Q(veh)	-	6	3.5	0.2	-

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	225	0	282	0	26	741	194	7	0
Future Vol, veh/h	0	0	0	225	0	282	0	26	741	194	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	0	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	1	0	0	0	1	14	0
Mvmt Flow	0	0	0	245	0	307	0	28	805	211	8	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	457	-	28	-	0	-	28	0	0
Stage 1	28	-	-	-	-	-	-	-	-
Stage 2	429	-	-	-	-	-	-	-	-
Critical Hdwy	6.41	-	6.21	-	-	-	4.11	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	-	3.309	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	563	0	1050	0	-	0	1592	-	0
Stage 1	997	0	-	0	-	0	-	-	0
Stage 2	659	0	-	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	488	0	1050	-	-	-	1592	-	-
Mov Cap-2 Maneuver	488	0	-	-	-	-	-	-	-
Stage 1	997	0	-	-	-	-	-	-	-
Stage 2	571	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	7.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	488	1050	1592	-
HCM Lane V/C Ratio	-	0.501	0.292	0.132	-
HCM Control Delay (s)	-	19.6	9.8	7.6	0
HCM Lane LOS	-	C	A	A	A
HCM 95th %tile Q(veh)	-	2.8	1.2	0.5	-

Guard Road at Crown Road
AM peak-hour (7:15am to 8:15am)

Intersection	
Int Delay, s/veh	12.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	362	0	58	0	54	298	38	30	0
Future Vol, veh/h	0	0	0	362	0	58	0	54	298	38	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	0	0	0	0	2	0	0	0
Mvmt Flow	0	0	0	393	0	63	0	59	324	41	33	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	336	336	221	-	0	0	383	0	0
Stage 1	221	221	-	-	-	-	-	-	-
Stage 2	115	115	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	618	588	824	0	-	-	1187	-	0
Stage 1	781	724	-	0	-	-	-	-	0
Stage 2	890	804	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	601	567	824	-	-	-	1187	-	-
Mov Cap-2 Maneuver	601	567	-	-	-	-	-	-	-
Stage 1	781	724	-	-	-	-	-	-	-
Stage 2	859	776	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.9	0	4.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	624	1187	-
HCM Lane V/C Ratio	-	-	0.732	0.035	-
HCM Control Delay (s)	-	-	24.9	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	6.3	0.1	-

Guard Road at Crown Road
PM peak-hour (2:15pm to 3:15pm)

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	219	0	20	0	32	417	72	19	0
Future Vol, veh/h	0	0	0	219	0	20	0	32	417	72	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	1	0	0	0	0	1	1	5	0
Mvmt Flow	0	0	0	238	0	22	0	35	453	78	21	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	438	438	261	-	0	0	488	0	0
Stage 1	261	261	-	-	-	-	-	-	-
Stage 2	177	177	-	-	-	-	-	-	-
Critical Hdwy	6.41	6.5	6.2	-	-	-	4.11	-	-
Critical Hdwy Stg 1	5.41	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	578	515	783	0	-	-	1080	-	0
Stage 1	785	696	-	0	-	-	-	-	0
Stage 2	856	756	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	536	0	783	-	-	-	1080	-	-
Mov Cap-2 Maneuver	536	0	-	-	-	-	-	-	-
Stage 1	785	0	-	-	-	-	-	-	-
Stage 2	794	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	6.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	551	1080	-
HCM Lane V/C Ratio	-	-	0.471	0.072	-
HCM Control Delay (s)	-	-	17.2	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.5	0.2	-

Engineer Orlando Alarcon Avenue at Airport Entrance
AM peak-hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	517	29	12	335	0	0
Future Volume (Veh/h)	517	29	12	335	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	562	32	13	364	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			594		968	578
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			594		968	578
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			992		278	516

Direction, Lane #	EB 1	WB 1
Volume Total	594	377
Volume Left	0	13
Volume Right	32	0
cSH	1700	992
Volume to Capacity	0.35	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.4
Lane LOS		A
Approach Delay (s)	0.0	0.4
Approach LOS		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Engineer Orlando Alarcon Avenue/Hanger Road at Airport Entrance (immediately west of terminal)			

Engineer Orlando Alarcon Avenue at Airport Entrance
PM peak-hour (2:15pm to 3:15pm)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	488	4	9	317	0	0
Future Volume (Veh/h)	488	4	9	317	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	530	4	10	345	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			534		897	532
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			534		897	532
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1044		307	547

Direction, Lane #	EB 1	WB 1
Volume Total	534	355
Volume Left	0	10
Volume Right	4	0
cSH	1700	1044
Volume to Capacity	0.31	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Engineer Orlando Alarcon Avenue at Airport Entrance			

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	509	28	14	339	18	17
Future Vol, veh/h	509	28	14	339	18	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	6	0
Mvmt Flow	553	30	15	368	20	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	584	0	967	568
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	399	-
Critical Hdwy	-	-	4.1	-	6.46	6.2
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.2	-	3.554	3.3
Pot Cap-1 Maneuver	-	-	1001	-	277	526
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1001	-	272	526
Mov Cap-2 Maneuver	-	-	-	-	272	-
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	656	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	355	-	-	1001	-
HCM Lane V/C Ratio	0.107	-	-	0.015	-
HCM Control Delay (s)	16.4	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	440	8	5	270	35	8
Future Vol, veh/h	440	8	5	270	35	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	3	0	0
Mvmt Flow	478	9	5	293	38	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	487	0	787	483
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1086	-	363	588
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	753	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1086	-	361	588
Mov Cap-2 Maneuver	-	-	-	-	361	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	389	-	-	1086	-
HCM Lane V/C Ratio	0.12	-	-	0.005	-
HCM Control Delay (s)	15.5	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	14.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	231	0	3	0	516	821	4	505	0
Future Vol, veh/h	0	0	0	231	0	3	0	516	821	4	505	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	0	0	33	0	0	0	0	0	0
Mvmt Flow	0	0	0	251	0	3	0	561	892	4	549	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1119	1119	561	-	0	0	561	0	0
Stage 1	561	561	-	-	-	-	-	-	-
Stage 2	558	558	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.53	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.597	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 231	209	473	0	-	-	1020	-	0
Stage 1	575	513	-	0	-	-	-	-	0
Stage 2	577	515	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 230	0	473	-	-	-	1020	-	-
Mov Cap-2 Maneuver	~ 230	0	-	-	-	-	-	-	-
Stage 1	575	0	-	-	-	-	-	-	-
Stage 2	574	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	132.3	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	232	1020	-
HCM Lane V/C Ratio	-	-	1.096	0.004	-
HCM Control Delay (s)	-	-	132.3	8.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	11.3	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	14.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	233	0	9	0	345	392	7	585	0
Future Vol, veh/h	0	0	0	233	0	9	0	345	392	7	585	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	0	0	11	0	1	1	0	1	0
Mvmt Flow	0	0	0	253	0	10	0	375	426	8	636	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1026	1026	375	-	0	0	375	0	0
Stage 1	375	375	-	-	-	-	-	-	-
Stage 2	651	651	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.31	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.399	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	237	652	0	-	-	1195	-	0
Stage 1	699	621	-	0	-	-	-	-	0
Stage 2	523	468	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	259	0	652	-	-	-	1195	-	-
Mov Cap-2 Maneuver	259	0	-	-	-	-	-	-	-
Stage 1	699	0	-	-	-	-	-	-	-
Stage 2	518	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	94.8	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	1195	-
HCM Lane V/C Ratio	-	-	0.993	0.006	-
HCM Control Delay (s)	-	-	94.8	8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	9.8	0	-

APPENDIX J

Draft EA Public Involvement

(to be provided at Preliminary Final EA)

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APPENDIX J.1

Notice of Availability of Draft EA and Notice of Combined Public Hearing/Public Information Workshop

(to be provided at Preliminary Final EA)

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APPENDIX J.2

Draft EA Agency Transmittal Letters and Distribution List

(To be provided at Preliminary Final EA)

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APPENDIX K

DOT Section 4(f) Evaluation

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Department of Transportation Act Section 4(f) Evaluation

Rafael Hernandez Airport
Runway 8-26 Reconstruction

Prepared for:

Puerto Rico Port Authority
and
Federal Aviation Administration

Prepared by:

AECOM

July 2020

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ACRONYMS AND ABBREVIATIONS

AC	Advisory Circular
AC	Asphalt Concrete
ADG	Aircraft Design Group
AEDT	Aviation Environmental Design Tool
AFB	Air Force Base
BQN	Rafael Hernandez Airport
CFR	Code of Federal Regulations
DNL	Day-Night Average Noise Level
DOT	U.S. Department of Transportation
DSA	Direct Study Area
EA	Environmental Assessment
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FHWA	U.S. Federal Highway Administration
GSA	General Services Administration
ISA	Indirect Study Area
LDA	Landing Distance Available
MOA	Memorandum of Agreement
MOS	Modification of Design Standard
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OFA	Object Free Area
PCC	Portland Cement Concrete
PEQB	Puerto Rico Environmental Quality Board
PRPB	Puerto Rico Planning Board
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
SHPO	State Historic Preservation Office
TORA	Take-off Run Available
US	United States
USC	United States Code

1.1. INTRODUCTION

The Puerto Rico Port Authority (PRPA) has prepared an Environmental Assessment (EA) in accordance with the provisions of the National Environmental Policy Act of 1969 (NEPA), to assess the potential environmental impacts of a proposed reconstruction of Runway 8-26 and associated improvements at Rafael Hernandez Airport (BQN), hereinafter referred to as the Proposed Project.

The Proposed Project has the potential to directly or indirectly impact properties protected by U.S. Department of Transportation (DOT) Act Section 4(f), codified at 23 United States Code (USC) Part 138 and 49 USC 303. Section 4(f) affords protection for publicly owned parks, recreational areas, wildlife/waterfowl refuges, and significant historic sites that may be affected by projects approved or funded by the DOT or any of its operating administrations, including the Federal Aviation Administration (FAA).

This Draft Evaluation evaluates and documents the Proposed Project in terms of its compliance with the requirements of Section 4(f). The FAA is the lead federal agency for both NEPA and Section 4(f) compliance.

1.1.1. REGULATORY CONTEXT

Per 49 USC 303(c), a federal agency such as the FAA may approve a transportation program or project requiring the use of a publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national , state or local significance, or land of an historic site of national, state, or local significance, only if: (1) there is no prudent or feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use. Regulatory requirements for implementing Section 4(f) that are applicable to the Proposed Project are further described in the following sections.

1.1.1.1. SECTION 4(F) USE

Use of a Section 4(f) property by a project occurs in any of the following circumstances (23 Code of Federal Regulations [CFR] 774.17):

- Land from the Section 4(f) property is permanently incorporated into a transportation facility;
- There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose, as determined by the criteria in 23 CFR 774.13(d) (i.e., when all or part of the Section 4(f) property is required for project construction-related activities); or
- There is a constructive use of the Section 4(f) property, which is defined at 23 CFR 774.15(a) as a use which occurs when the transportation project does not incorporate land from the Section 4(f) property, but the project's proximity impacts are so severe that

the protected activities, features or attributes that qualify the property for protection under Section 4(f) are substantially impaired.

- A Proposed Project's indirect effects in the following areas is necessary to ascertain whether a constructive use of any Section 4(f) resources in the proximity of the project would occur: air quality, light emissions and visual impacts, and noise.

1.1.1.2. DE MINIMIS IMPACTS

Section 4(f) regulations at 23 CFR Part 774 et seq. establishes procedures for determining whether or not the use of a Section 4(f) property, as described in **Section 1.1.1.1** above, has a *de minimis* impact on the property. A *de minimis* impact on a publicly owned park, recreational area, or fish/wildlife refuge is an impact that does not "adversely affect the activities, features and attributes of the Section 4(f) property (23 CFR 774.17). In addition, *de minimis* impacts on any applicable historic sites are those where a "no effect" or "no adverse effect" determination has been made and concurred with by the State Historic Preservation Office (SHPO).

Accordingly, in implementing these regulations for projects where the FAA has jurisdiction, FAA Order 1050.1F, *Environmental Impacts, Policies and Procedures Desk Reference* allows the FAA to "make a *de minimis* impact determination with respect to the physical use of a Section 4(f) property if, after taking into account any measures to minimize harm, the result is either: 1) a determination that the project would not adversely affect the activities, features or attributes qualifying a park…for protection under Section 4(f); or 2) a Section 106 finding of no adverse effect or no historic properties affected".

Procedural requirements for Section 4(f) compliance are codified at DOT Order 5610.1C. Albeit not binding, per Order 1050.1F, U.S. Federal Highway Administration (FHWA) regulations at 23 CFR 774 *et seq*., and FHWA implementing guidance for these regulations, can be used by the FAA in determining compliance of aviation projects with Section 4(f).

Per the FHWA Section 4(f) Policy Paper, a *de minimis* impact determination constitutes a finding under the Act, "is not an evaluation of alternatives, and no avoidance or feasible and prudent avoidance alternatives analysis is required". A *de minimis* impact determination does not require consideration of all possible planning to minimize harm because avoidance, mitigation, minimization or enhancement of any foregone characteristics afforded protection under the Act are included as part of the determination (23 CFR 774.17).

1.1.1.3. EXCEPTIONS AND EXEMPTIONS

Section 4(f) regulations contain exceptions to the requirement for Section 4(f) approval, such as restoration, rehabilitation or maintenance of transportation facilities that are on or eligible to be listed to the NRHP when adverse effects would not occur; archaeological sites that are on or eligible to be listed to the NRHP when the resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place; and temporary occupancies of land that are minimal enough to not constitute a use within the definitions of

Section 4(f). Section 4(f) exemptions typically apply to the use of railroad or transit lines historically used for the transportation of goods or passengers.

1.1.1.4. ALTERNATIVES EVALUATION

If a Section 4(f) property would be used for a transportation project, the FAA must demonstrate that there is no feasible and prudent alternative to the use of the Section 4(f) property, and that the project includes all measures to minimize harm to the property. If there is no feasible prudent avoidance alternative and the use of the Section 4(f) property is not a *de minimis* impact, the FAA may approve only the alterative that causes the least overall harm in light of Section 4(f) protections.

1.1.2. DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project involves reconstruction of Runway 8-26. The runway is 11,700 feet long by 200 feet wide with 50-foot shoulders. The center section of the runway between 2,000 feet and 8,000 feet is comprised of six to eight inches of Portland Cement Concrete (PCC), with Asphalt Concrete (AC) overlay with thicknesses varying between three and six inches. A 2004 pavement evaluation[1] concluded that the PCC sections on both ends of the runway are in good condition with Pavement Condition Index (PCI) values of 88 (i.e., "Good"), but the AC overlay sections across the approximate 8,200-foot center portion had PCI values ranging from 0 to 13 (i.e., "Failed"). The two-inch asphalt overlay had totally failed and the underlying asphalt was heavily oxidized. It was also determined that based on PCC modulus values the PCC underlying the asphalt pavement must be removed and replaced.

A pavement condition study was subsequently conducted by the United States (US) Air Force in 2013[2], noting that although approximately 4,000 feet within this section of the runway has been repaired, a 2,000-foot section has a PCI Rating of "Very Poor" (i.e., less than 40) causing a 25% reduction in adjusted gross loads for aircraft using the runway. In that same year, an airport inspection was conducted by the FAA[3] in accordance with 14 CFR Part 139 and revealed that BQN was not in compliance with 14 CFR Section (§) 139.305(a)(6):

> *"Ponding was observed along the length of Runway 8-26. The runway needs to be crowned and grooved to avoid standing water. Runway grooving is needed to eliminate hydroplaning on the wet runway, resulting in shorter braking distance of aircraft on wet pavement. The pavement condition of the runway is poor and must be addressed. Although Foreign Object Debris was not found on the runway, it needs to be resurfaced. The certificate holder must develop a project to correct the pavement*

[1] *Final Pavement Evaluation Report, Runway 8-26, Rafael Hernandez International Airport (BQN), Aguadilla, Puerto Rico*. Prepared by DMJM Aviation, Inc., June 2004.
[2] *Airfield Pavement Summary*. Prepared by U.S. Air Force, February 2013.
[3] *Letter of Correction from Charlotte Jones, FAA Southern Region, to Edgar Sierra, Rafael Hernandez Airport, regarding CY 2013 14 CFR Part 139 Compliance Inspection*, EIR Number: 2013SO800102, September 10, 2013.

condition [by Dec 16, 2013]. An overlay should be designed to build up the centerline and create a crowned section with a shortened drainage length"

Subsequent analysis as part of the PRPA Regional Airports Pavement Maintenance and Management Program[4] corroborated previous PCI reports. Runway 8-26 requires reconstruction to comply with 14 CFR Section (§) 139.305(a)(6).

The purpose of the proposed runway and associated airfield improvements is twofold: 1) provide an air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN; and 2) maintain adequate runway length (i.e., a minimum of 10.500 feet take-off distance) for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and reconstruction.

The Proposed Project and associated airfield improvements would provide an air carrier runway of sufficient strength and adequate length to accommodate existing and future operations of the existing and projected future aircraft fleet at BQN. Once completed, the runway would comply with all current FAA design and safety standards. The Proposed Project would also provide an air carrier runway of sufficient strength and adequate length to accommodate existing and future operations of the existing and projected future aircraft fleet at BQN during rehabilitation and reconstruction activities. Large portions of the existing runway show signs of pavement deterioration and ponding is present along the length of the runway. As a result of this condition, BQN is not in compliance with 14 Code of Federal Regulations (CFR) Section (§) 139.305(a)(6).

Based on planning information generated to date, Runway 8-26 reconstruction can feasibly be accomplished in two principal ways:

- Construct temporary Runway 8-26, rehabilitate existing runway, and restore operations to newly reconstructed existing runway. To implement, convert Taxiway M to a temporary 11,000-foot by 150-foot AC runway, 70 feet north of its existing centerline. Correct crown section on Taxiway M to correct longitudinal grade. Reconstruct Runway 8-26 to 11,000 feet by 150 feet of PCC with crown section and runway grooving. Demolish buildings to the south of the runway that would be included in the runway's object free areas and safety areas.

- Construct new permanent Runway 8-26 to replace the existing Runway 8-26. To implement, construct 11,000 feet by 200 feet AC runway, 500 feet south of existing Runway 8-26 centerline. Convert existing Runway 8-26 to full length-parallel taxiway. Demolish buildings to the south of the runway that would be included in the runway's object free areas and safety areas.

[4] *Regional Airport Pavement Maintenance and Management Program, Rafael Hernandez Airport (BQN)*. Prepared by Kimley-Horn and Associates, Inc., June 2016.

1.1.3. ALTERNATIVES EVALUATED

Five Action Alternatives for runway reconstruction were developed for the EA, and each was evaluated for its ability to satisfy the purpose and need of the Proposed Project and for its feasibility in terms of construction and operations. A No-Action Alternative (i.e., not implementing or constructing the project) was also included for comparative purposes. Two Action Alternatives, Alternative 2B and Alternative 2D (hereafter collectively referred to as the "Action Alternatives"), were found to satisfy the purpose and need and constructability and operations requirements. The potential environmental impacts of Alternatives 2B and 2D were evaluated in the EA.

Section 4(f) prohibits the use of a Section 4(f) property if there is a feasible and prudent avoidance alternative; if any such alternatives exist, one of these must be selected. Per 23 CFR 774.17, an alternative is not feasible if it cannot be built as a matter of sound engineering judgment. The regulation also states that an alternative is not prudent under the following conditions:

1. It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
2. It results in unacceptable safety or operational problems;
3. After reasonable mitigation, it still causes severe social, economic or environmental impacts; severe disruption to established communities; severe disproportionate impacts to minority or low income populations; and/or severe impacts to environmental resources protected under other Federal statutes;
4. It results in additional construction, maintenance or operational costs of extraordinary magnitude;
5. It causes other unique problems or unusual factors;
6. It involves multiple factors as above that while are individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

The FAA has performed all possible planning to confirm that there are no feasible and prudent avoidance alternatives to the Proposed Project's impacts on Section 4(f) properties. An alternative is not considered feasible if it cannot be built as a matter of sound engineering judgment (23 CFR 774.17). Further, an alternative is not considered prudent if it compromises the project to a degree that it is unreasonable to proceed in light of its purpose and need, results in unacceptable safety or operational problems, causes significant or disproportionate social, economic or environmental impacts after mitigation, or results in additional costs of extraordinary magnitude.

Table 1.1-1 summarizes the alternatives developed for the EA and considered by FAA, among others specifically added within the context of Section 4(f), along with a determination of whether they are feasible or prudent. Of the feasible prudent alternatives, Alternatives 2B and 2D would not avoid the Section 4(f) resources, and on balance, both of these alternatives present the same level of harm to the Section 4(f) resources in question. Therefore, either Alternative 2B or 2D could constitute the "least overall harm" alternative under Section 4(f).

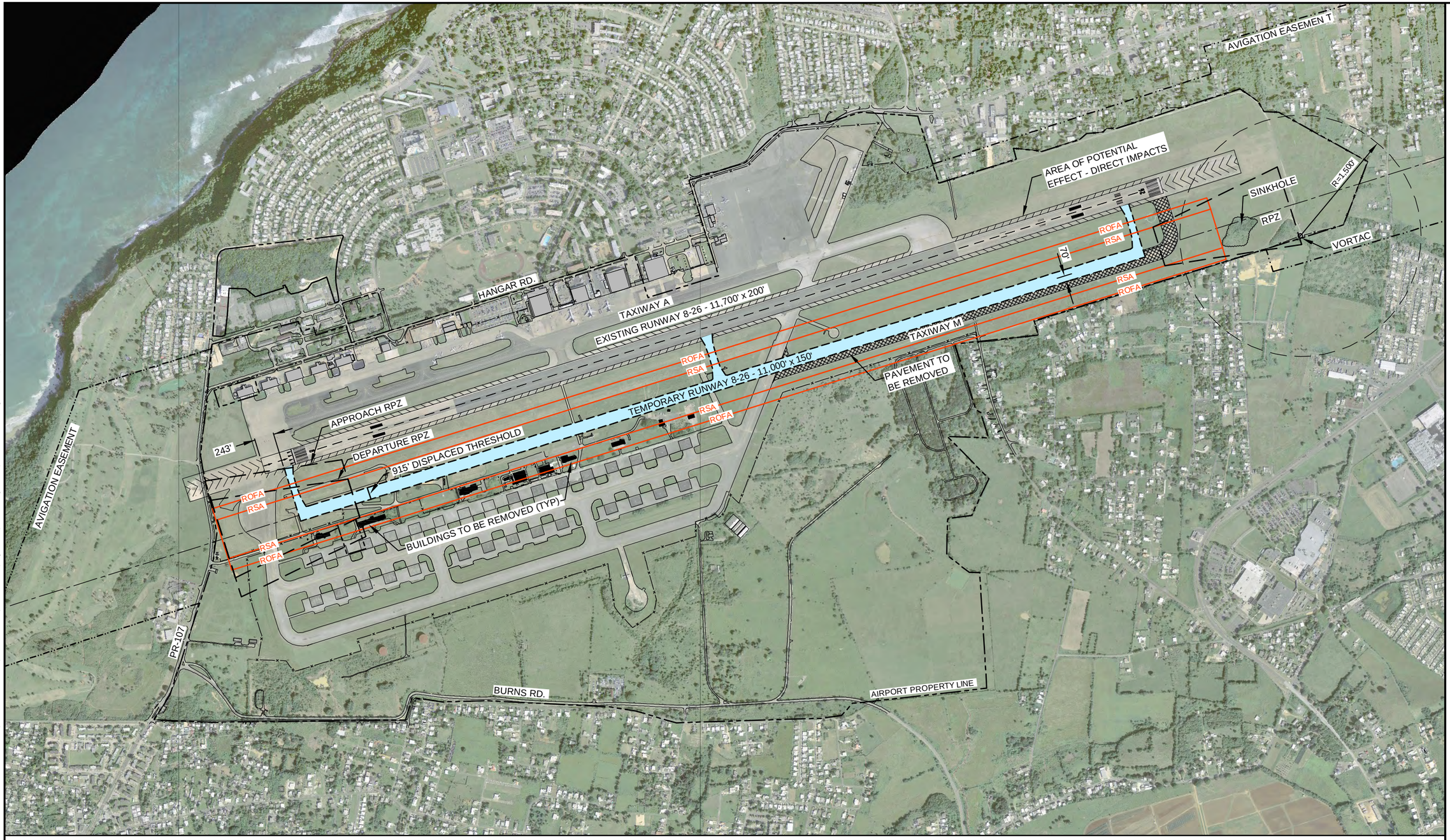
Table 1.1-1 Alternatives Summary

Alternative	Description	Avoids 4(f) Properties?	Determination
1B	Reconstruct Runway 8-26 in place, 243 feet east of current alignment. Demolish airfield buildings and structures to the south of the project area to accommodate object-free areas of temporary runway. Reduce usable runway take-off length to 10,085 feet on Runway 26, and 10,950 feet landing distance on Runway 8. All runway protection zone areas would be contained on Airport property (**Figure 1.1-1**).	No. Impacts Runway 8-26 and southern buildings which qualify as Section 4(f) resources.	Feasible, but not prudent: Does not provide requisite minimum take-off length of 10,500 feet, as stated in purpose and need, which would cause safety/operational problems for cargo air carrier fleet.
1C	Reconstruct Runway 8-26 in place, 478 feet east of current alignment. Demolish airfield buildings and structures to the south of the project area to accommodate object-free areas of temporary runway. Reduce usable runway length to 10,600 feet of take-off length on Runway 26, 10,715 feet on Runway 8. Reduce landing distance on Runway 8 to 10,715 feet and 10,755 on Runway 26. Realign approximately 2,060 lineal feet of Borinquen Avenue (Route 107) to avoid placement in runway protection zone (**Figure 1.1-2**).	No. Impacts Runway 8-26 and southern buildings which qualify as Section 4(f) resources.	Feasible, but not prudent: Meets minimum take-off length requirements but impacts Route 107 which would increase social, economic and environmental impact associated with project.
2B	Reconstruct a new Runway 8-26 500 feet south and 862 feet east of current alignment. Demolish airfield buildings and structures to the south of the project area to accommodate object-free areas of permanent runway. Reduce usable runway length to 10,698 feet take-off distance on Runway 26, 10,870 feet landing distance on Runway 26,	No. Impacts Runway 8-26 and southern buildings which qualify as Section 4(f) resources.	Feasible and Prudent: Provides requisite minimum take-off length of 10,500 feet, as stated in purpose and need. All construction activities would be contained entirely on airport property.

Alternative	Description	Avoids 4(f) Properties?	Determination
	and 10,145 feet landing distance on Runway 8. All runway protection zone areas would be contained on Airport property (**Figure 1.1-3**).		
2C	Reconstruct a new Runway 8-26 500 feet south and 862 feet east of current alignment. Demolish airfield buildings and structures to the south of the project area to accommodate object-free areas of permanent runway. Realign 2,060 lineal feet of Borinquen Avenue (Route 107) to avoid runway protection zone. Reduce usable runway length to 10,145 feet landing distance on Runway 8 and 10,870 feet landing distance on Runway 26 (**Figure 1.1-4**).	No. Impacts Runway 8-26 and southern buildings which qualify as Section 4(f) resources.	Feasible, but not prudent: Meets minimum take-off length requirements but impacts Route 107 which would increase social, economic and environmental impact associated with project.
2D	Reconstruct a new Runway 8-26 500 feet south and 1,187 feet east of current alignment. Demolish airfield buildings and structures to the south of the project area to accommodate object-free areas of permanent runway. Reduce usable runway length to 10,148 feet landing distance on Runway 8, 10,548 feet landing distance on Runway 26, and 10,675 take-off distance on Runway 8 (**Figure 1.1-5**)	No. Impacts Runway 8-26 and southern buildings which qualify as Section 4(f) resources.	Feasible and Prudent: Provides requisite minimum take-off length of 10,500 feet, as stated in purpose and need. All construction activities would be contained entirely on airport property.
No-Action	For comparative purposes under NEPA, impacts of each project Alternative described above will be assessed against the option of taking no action (i.e., not implementing or constructing the project).	Yes	Feasible, but not prudent: Does not meet the stated purpose and need of the Proposed Project. The runway would continue to deteriorate, causing unsafe operational conditions at BQN.

Alternative	Description	Avoids 4(f) Properties?	Determination
Rehabilitate Runway in Place and Close Airport During Construction	Perform pavement reconstruction on Runway 8-26 in place. No buildings to the south of the project would be impacted. BQN would be closed to flight traffic for the duration of the construction period.	No. Buildings to the south of the Runway, which qualify as Section 4(f) resources, would be avoided. However, Runway 8-26 itself would still be impacted.	Feasible, but not prudent: Meets purpose and need by repairing Runway condition and providing minimum operational runway lengths. Temporary loss of operational capability at BQN would impact its role in international air carrier service and disaster relief operations in Puerto Rico, and revenue loss would negatively impact local/regional economy.
Rehabilitate Runway in Place and Move Aircraft Operations to Luis Munoz Marin International Airport (SJU) During Construction	Perform pavement reconstruction on Runway 8-26 in place. No buildings to the south of the project would be impacted. BQN air traffic would be moved to SJU for the duration of the construction period.	No. Buildings to the south of the Runway, which qualify as Section 4(f) resources, would be avoided. However, Runway 8-26 itself would still be impacted.	Feasible, but not prudent: Meets purpose and need by repairing Runway condition and providing minimum operational runway lengths. However, SJU's largest runway is only 10,400 feet long, which is below the minimum requirement of the project, and therefore relocated air traffic would incur operational penalties. Temporary loss of operational capability at BQN would impact its role in international air carrier service and disaster relief operations in Puerto Rico. Increased air traffic at SJU would negatively impact the social and natural environment in San Juan by inducing additional noise, air quality and land use impacts to the areas surrounding SJU.

Source: AECOM, 2017.



LEGEND

TEMPORARY PAVEMENT CONSTRUCTION

TO BE REMOVED

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,950'	10,035'
26	10,085'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1B

FIGURE 1.1-1

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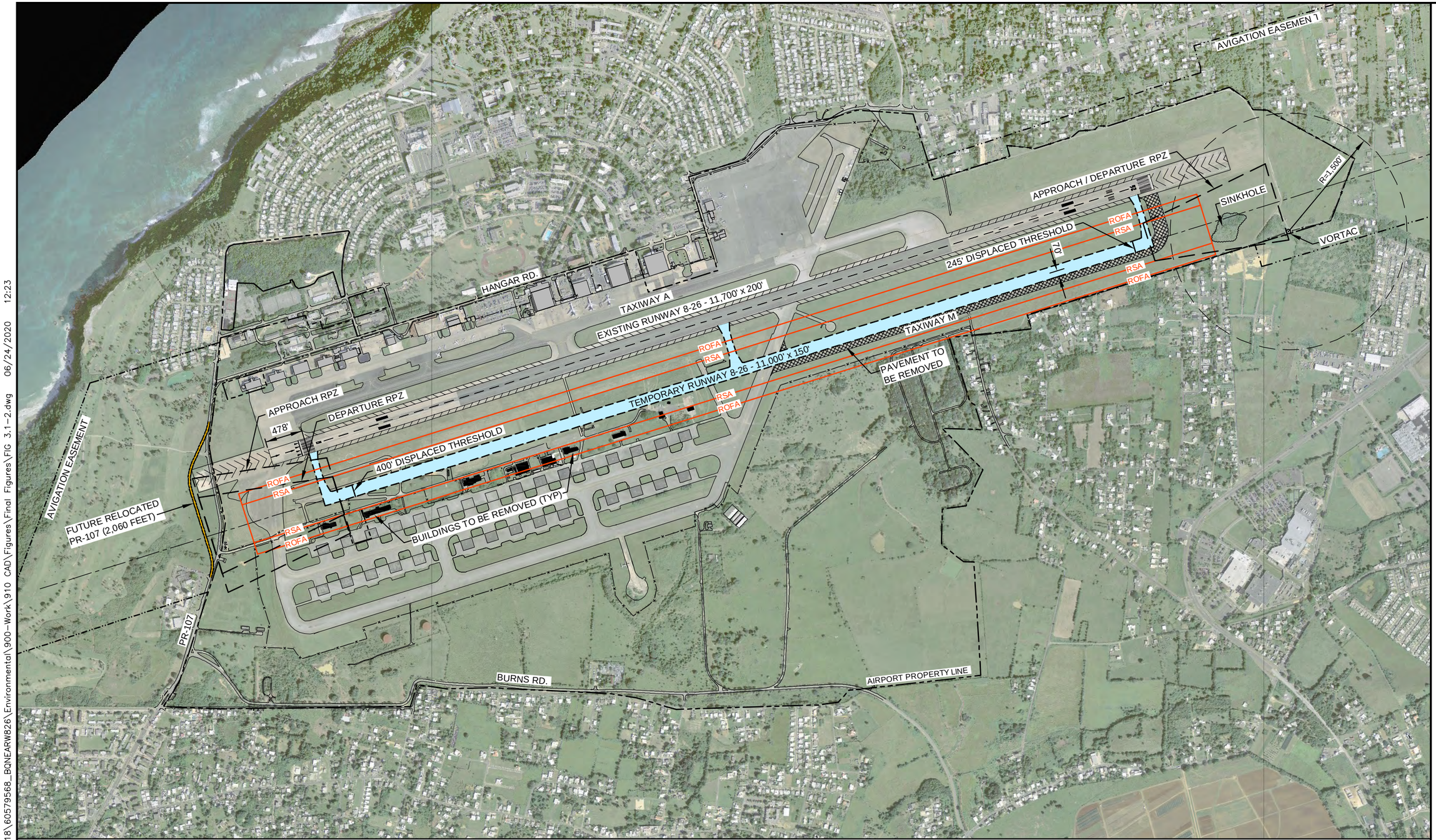

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,715'	11,000'	10,715'	10,715'
26	10,600'	11,000'	11,000'	10,755'

N

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GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1C

FIGURE
1.1-2

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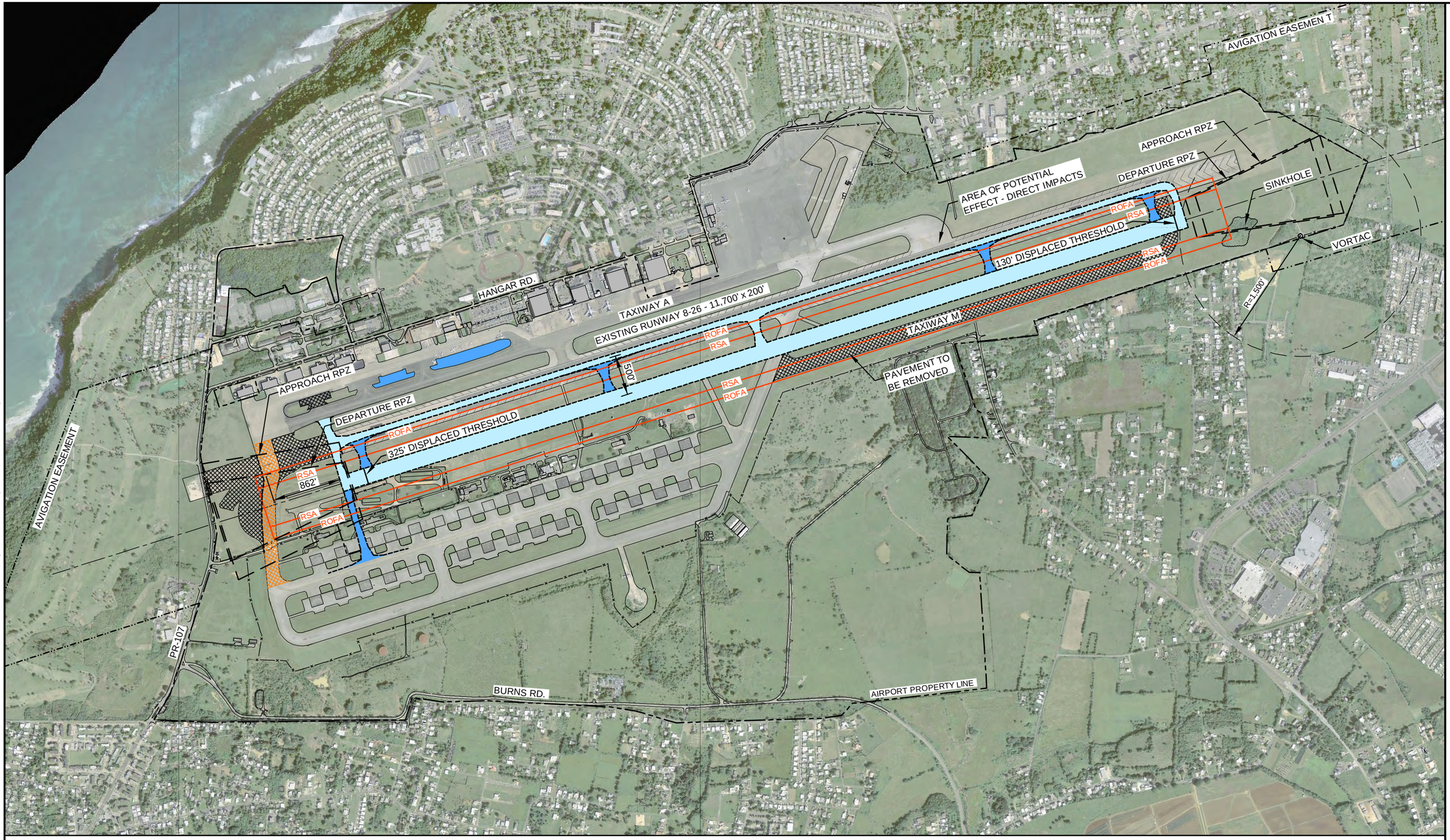

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

FIGURE 1.1-3

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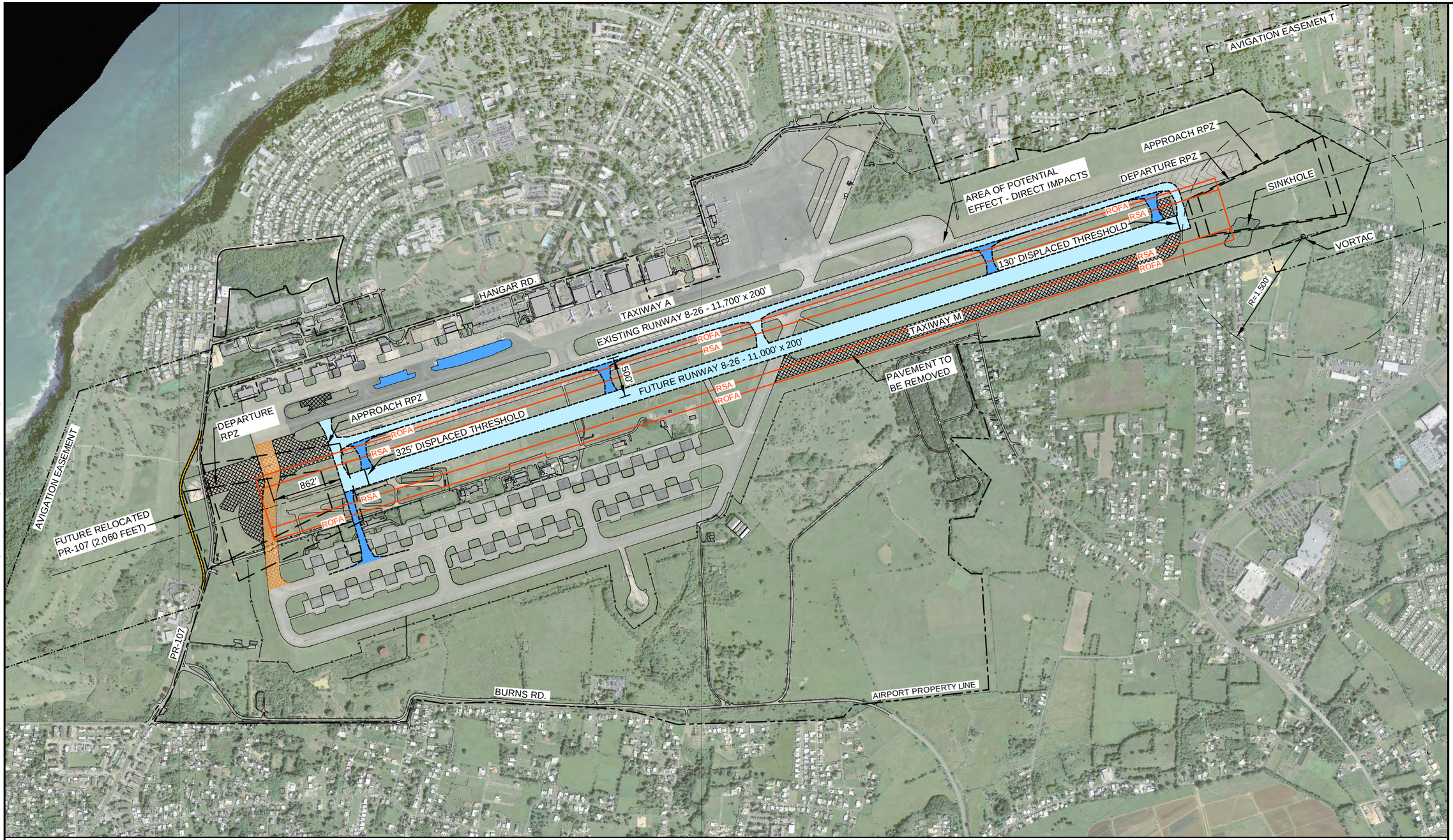

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	11,000'	11,000'	11,000'	10,870'

N

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GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2C

FIGURE 1.1-4

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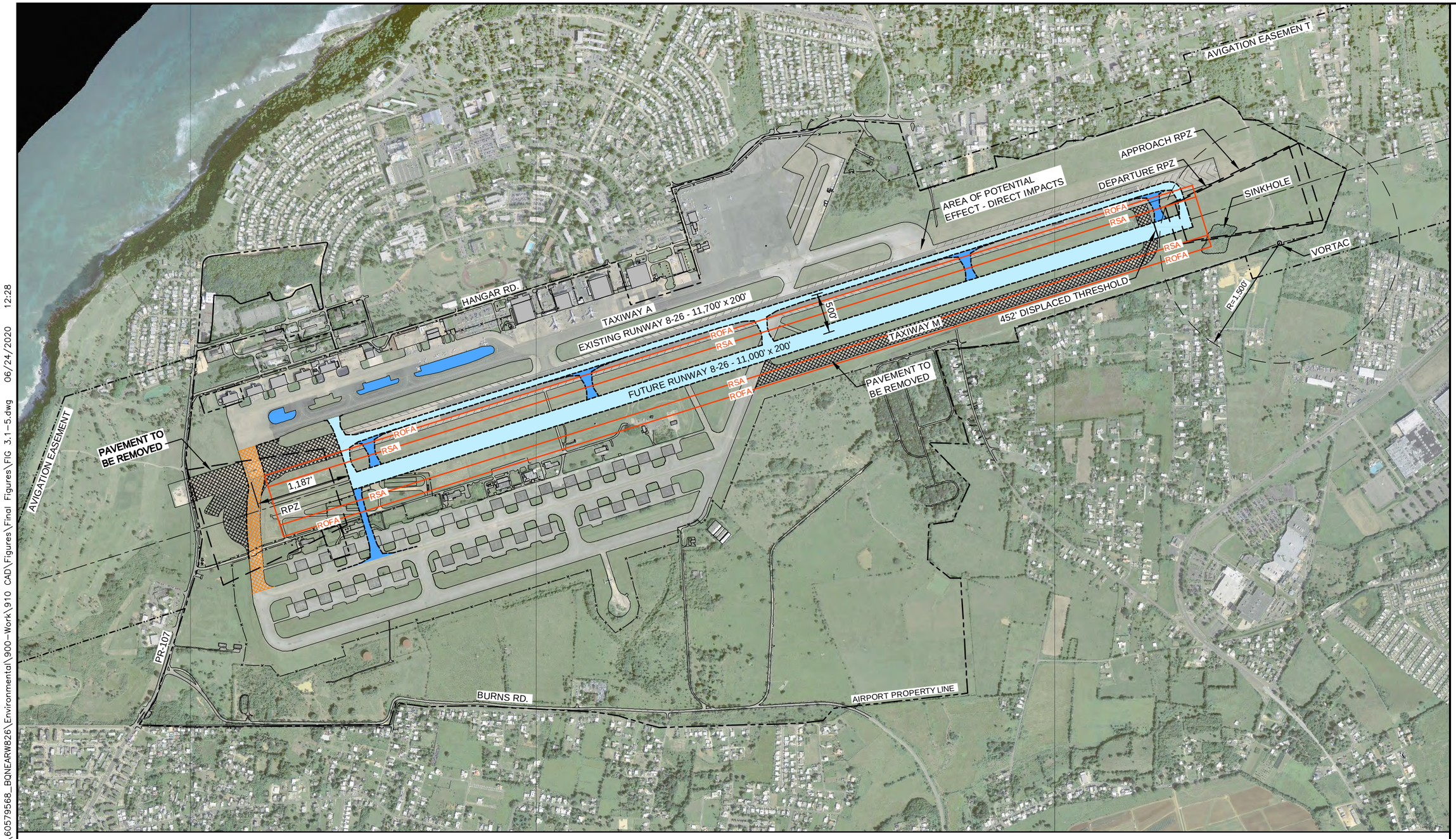

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

FIGURE 1.1-5

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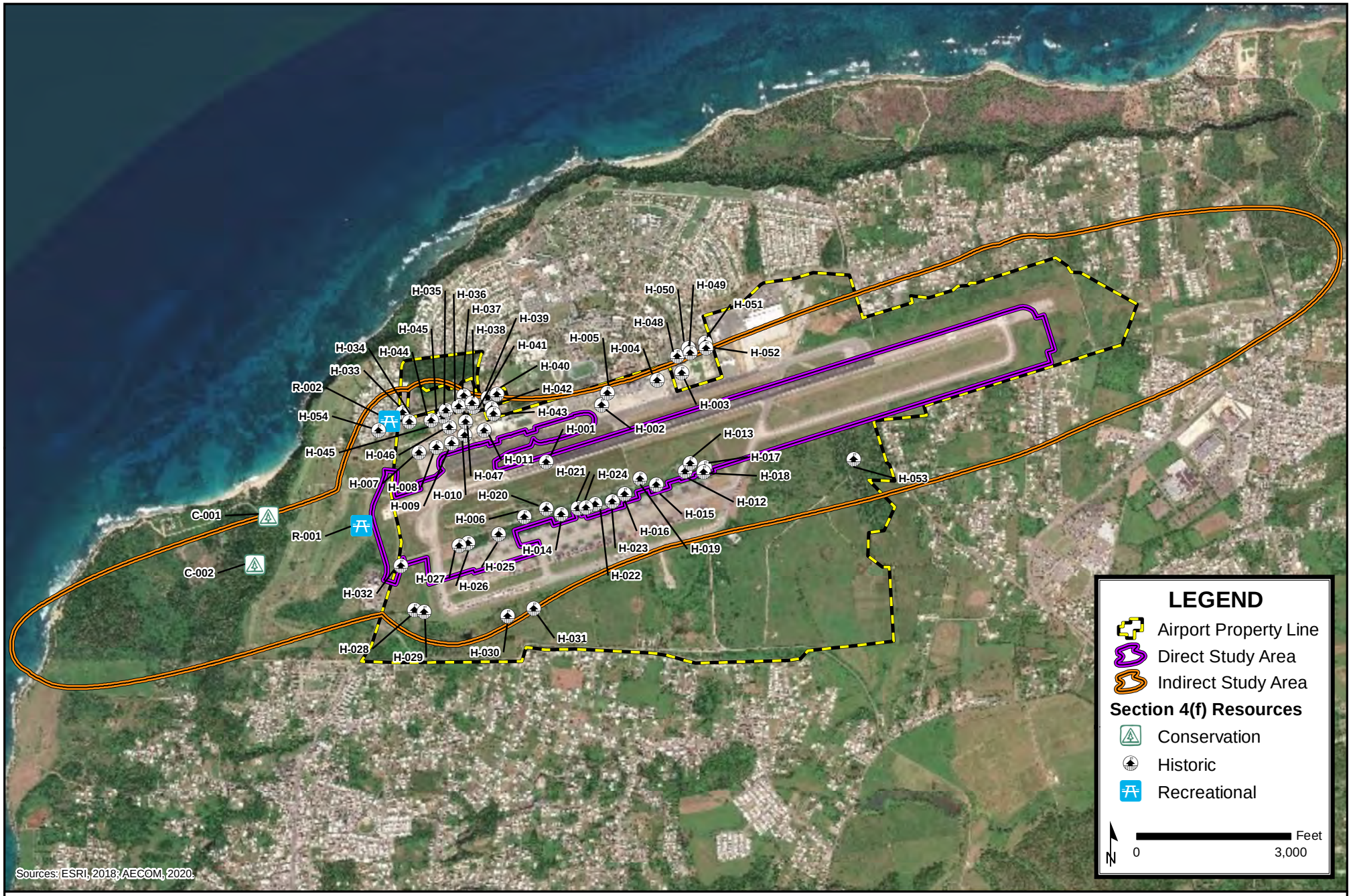
1.2. DESCRIPTION OF SECTION 4(F) RESOURCES

This section includes a summary appraisal of Section 4(f) resources that could be potentially directly or constructively used by the Proposed Project, including a description of amenities and any stakeholders involved in the operation, maintenance or administration of the resource.

A Direct Study Area (DSA) was delineated within which direct physical impacts of the Proposed Project alternatives (i.e., construction footprint) have been characterized and disclosed. To account for indirect ground disturbance activities that may occur during construction, such as materials and equipment staging, the DSA includes a 100-foot buffer. Section 4(f) resources within the DSA were evaluated for potential physical use and constructive use by the Proposed Project. An Indirect Study Area (ISA) was also delineated to assess potential secondary impacts not related to the construction footprint of the Proposed Project alternatives, and corresponds to the area within the composite DNL 60 dB of the Proposed Project and retained alternatives. buffer. Section 4(f) resources within the DSA were evaluated for potential constructive use by the Proposed Project.

A comprehensive list of Section 4(f) resources within the DSA and ISA was developed to assess potential impacts resulting from the Proposed Project. Numerous Section 4(f) resources included in this evaluation are associated with the airport's history as a military base dating to World War II and the Cold War. BQN was initially conceived and constructed as the US military air base Borinquen Field, with construction beginning in 1939. The base was re-designated as Ramey Air Force Base (AFB) in 1948 and was considered an important strategic military asset during the first half of the Cold War. In 1974 virtually all of Ramey AFB was deemed to be in excess by the US General Services Administration (GSA) and subsequently distributed to a variety of military and other government entities. In 1978 the GSA conveyed approximately 1,486 acres, and 309 acres more in easements, to PRPA for airport purposes. This property is now BQN. During t consultation by the FAA on March 24, 2020, the Puerto Rico SHPO indicated that it considers BQN to be a historic district eligible for listing to the NRHP due to its historic association with Ramey AFB, and that all structures associated with the former Borinquen Field and Ramey AFB (described below) individually contribute to the historic district. Historic properties are considered to be Section 4(f) resources, therefore structures associated with BQN's military history are afforded protection under Section 4(f) regulations. An additional search of Aguadilla Municipio parcel data was performed to identify other potential Section 4(f) resources (such as public parks and conservation areas) within the DSA and ISA.

Figure 1.2-1 depicts the locations of Section 4(f) resources identified as potentially affected by the Proposed Project. Historic Section 4(f) resources and other identified Section 4(f) resources are discussed in the following sections. Each Section 4(f) resource is identified on the Figure using a unique ID. Resources are differentiated based on category (e.g., recreational areas, historic resources). **Table 1.2-1** describes each resource that is individually identified on **Figure 1.2-1**.



RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

DOT SECTION 4(F) RESOURCES

FIGURE
1.2-1

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Table 1.2-1 Section 4(f) Resources within the DSA and ISA

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
Historic Structure	H-001	Runway 8-26	Circa-1939	The current Runway 8-26 is 11,700 feet long by 200 feet wide with 50-foot shoulders. The center section of the runway between 2,000 feet and 8,000 feet is comprised of six to eight inches of PCC, with AC overlay with thicknesses varying between three and six inches. Runway construction at Borinquen field began immediately upon breaking ground at the airfield in 1939. Runway 8-26 was lengthened from 1941 to 1946. From 1957 to 1959 it was extended and widened, in order to accommodate the B-52 heavy bomber aircraft. A partial length 1.5-inch asphalt overlay was applied in 1971 before Ramey Air Force Base was closed in 1972 . Since initial construction and widening, relatively small portions of the runway have undergone various repairs and rehabilitations. According to a 2017 Pavement Maintenance and Management Program (PMMP) report, roughly 66% of the runway (approximately 6,188,971 square feet of the of the 9,348,881 total square feet) has not undergone any pavement repair or maintenance in 50 or more years . This indicates that at least two-thirds of the runway are comprised of materials that date back at least to Ramey AFB. The Puerto Rico SHPO has determined that the runway is potentially eligible for NRHP listing.
Historic Structure	H-002	Building 400 - Control Tower	Circa-1941	Six-story, reinforced-concrete, truncated obelisk. Narrow incised bands in the concrete separate the floors. A 2015 metal-and-glass octagonal flight control cab tops the tower, with an external walkway. The tower was non-operational from the time of Ramey AFB closure, and was re-commissioned in 2007 to server as the BQN control tower. An winding metal stair previously provided cab access and still stands, but a freestanding concrete elevator shaft and connecting walkway were added in 2015. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
Historic Structure	H-003	Building 402 - Hangar 2	Circa-1941	Building is nearly square, about 265' across and 255' deep with a concrete arch roof supported by 15 ribs. Large open hangar area encompasses more than an acre, with interior space set aside for office space. Structure has been regularly maintained and updated since construction and is presently in good condition. The US Coast Guard currently occupies the hangar. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-004	Building 403 - Hangar 3	Circa-1941	Building is nearly square, about 265' across and 255' deep with a concrete arch roof supported by 15 ribs. Roof continues as flat overhangs on the east and west faces. Large open hangar area encompasses more than an acre, with interior space set aside for office space. Hurricane Maria damaged the roof in 2017 and water infiltration has loosened bits of the ceiling; a mesh protects those working below from fragments of falling debris. Structure has been regularly maintained and updated since construction and is presently in generally good condition, hurricane damage notwithstanding. FedEx currently occupies the hangar. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-005	Building 405 - Hangar 5	Circa-1941	Original building is nearly square, about 265' across and 255' deep with a concrete arch roof supported by 15 ribs. The structure has been modified numerous times to accommodate various functions, including serving as the BQN terminal during the mid-2000s. The interior has been extensively modified and modernized, including addition of airport terminal amenities such as a baggage claim area and gift shop. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-006	Building 3 - Gazebo	1960s	Original use appears to have been a picnic area for the military alert crews that occupied building 1245 in rotating shifts. Structure

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				consists of heavily overgrown remains of what may have been a gazebo or picnic shelter stand in a roughly rectangular area of ground. Former structure retains portions of ten concrete-block posts spaced to form a rectangle. Its concrete floor slab remains in place, but its roof is gone. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-007	Building 571 - Nose Dock Hangar	Between 1956 and 1959	Originally used as a nose dock hangar, which supports the body of an aircraft within its walls, while the nose projects out through an extension of the wall. Approximately 200' wide and 90' deep, with an approximately 30'-deep nose dock extending at the center of its the north rear elevation. Steel truss building with offset gable roof. Known aircraft historically using the hangar include B-52 and KC-135. After base closure, may have been used to service aircraft until 1983, after which time it has been used by the Puerto Rico Department of Education for band exercises and folkloric dances. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-008	Building 572 - Nose Dock Hangar	Between 1956 and 1959	Originally used as a nose dock hangar, which supports the body of an aircraft within its walls, while the nose projects out through an extension of the wall. Approximately 200' wide and 90' deep, with an approximately 30'-deep nose dock extending at the center of its the north rear elevation. Steel truss building with offset gable roof. Known aircraft historically using the hangar include B-52 and KC-135. Until 2017 the building was the Western Aviation Service Corp. hangar, which housed the Borinquen Field-Ramey Air Force Base Museum. Hurricane Maria heavily damaged the building and the museum. It is currently vacant with most of the same gaping holes and damage it sustained in September 2017. Per consultation with SHPO, this structure has integrity under NRHP

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-009	Building 573 - Nose Dock Hangar	Between 1956 and 1959	Originally used as a nose dock hangar, which supports the body of an aircraft within its walls, while the nose projects out through an extension of the wall. Approximately 200' wide and 90' deep, with an approximately 30'-deep nose dock extending at the center of its the north rear elevation. Steel truss building with offset gable roof. Known aircraft historically using the hangar include B-52 and KC-135. Building currently houses Vortex Aviation, a provider of contracted aircraft maintenance related services to aircraft owners and operators. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-010	Building 574 - Nose Dock Hangar	Between 1956 and 1959	Building is believed to have been constructed and used in identical fashion to Buildings 571, 572, and 573, based on historic aerial photographs. Building was demolished between 2009 and 2012 due to its dilapidated and dangerous condition, and only the concrete pad remains. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-011	Building 575 - Hangar	Between 1956 and 1959	Building had a historic structure and purpose similar to Buildings 571, 572, and 573. Building has been dramatically altered from its original condition. Currently houses Department of Homeland Security, Customs and Border Protection, Caribbean Air Marine Branch. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-012	Building 1029 - Ground Support Equipment Shop	Between 1956 and 1959	Original constructed to house a military ground support equipment shop. Between the base closure and the present, it appears to have been used intermittently for airport equipment storage and at times a repair shop. Rectangular core of building is one-story tall and built of plaster-covered concrete block. A concrete-block band rings the building. Interior of the main block is a straightforward

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				utilitarian space with exposed metal trusses and concrete block. The interiors of the wings are not accessible. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-013	Building 1031 - Electric Power Station	Late 1950s	Originally constructed as a power station for Ramey AFB. Was at least partially used or maintained from the 1990s until present. Building is nearly square and one-story tall with concrete block walls and a flat roof. Inside, two concrete pads likely once held generators or other equipment. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-014	1132 - Squadron Operations	Late 1950s	Historically used to house military squadron operations. Building interior was substantially altered by subsequent private occupants -- a medical equipment manufacturer and a pharmaceuticals manufacturer, beginning in the 1970s. Building is long and rectangular with extensions at each of its elevations. Built of plastered concrete blocks and topped by a flat concrete roof. Building maintenance appears to have ceased by 2010. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-015	Building 1070 - Aircraft Maintenance Organizational Shop	Between 1956 and 1959	Initially constructed as a military aircraft organizational shop. Subsequent to base closure, it may have been partially used by unknown occupants until 2010. One-story tall and built of concrete blocks covered in plaster with a flat overhanging concrete roof. Currently vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-016	Building 1071 - Squadron Operations	Between 1956 and 1959	Historically used for Ramey AFB squadron operations, however the specific squadron is unknown. At times was used as a civilian airport terminal. May have been partially in use by non-military

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				occupants after the closure of Ramey AFB until 2010, however the later occupants are unknown. One-story tall with concrete-block walls, concrete piers that project forward as pilasters, and a flat concrete roof. An extension at the building's eastern end likely made when building was converted to civilian terminal. The interior appears to have been altered to accommodate terminal use. Currently vacant and overgrown with vegetation. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-017	Building 1072 - Weapons and Base Systems Shop	Between 1956 and 1959	Originally constructed to house a weapons and base systems shop for Ramey AFB. Tall, one-story, concrete-block building with a nearly flat roof with no overhangs. Building's interior has functional exposed concrete-block walls and is littered with old computer and mechanical equipment, plastic pipes, bricks, and other odds and ends. Possibly partially used and maintained until 2010, but currently vacant, unmaintained, and greatly dilapidated. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-018	Building 1073 - Traffic Check House	Between 1956 and 1959	Constructed as a traffic check house for Ramey AFB. Small nearly square building built of concrete block with a widely overhanging flat concrete roof. The inside is a single open space. Appears to have been vacant and overgrown by 2002. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-019	Building 1089 - Weather Observation Tower	Between 1956 and 1959	Originally erected to serve as a weather observation tower for Ramey AFB. When the base closed its control tower was closed and from 1974 to 2007, the civilian airport operated as a "non-towered" airport. During this time Building 1089 was used as a makeshift control tower. Building consists of a one-story concrete block base with concrete corner posts and a glass-filled cab with a

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				flat roof above. Building is currently vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-020	Building 1104 - Storage and Supply	Late 1950s	Originally constructed to serve as a storage building. One-story tall and built of concrete block, shaped like a comb with four widely spaced teeth. Building was vacated by 1999. Building maintenance appears to have ceased by 2010. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-021	Building 1121 - Electrical Station	Late 1950s	Originally constructed as an Air Force base electrical station. Small, rectangular, concrete-block building with concrete beams and a concrete slab roof. Vacant and heavily overgrown, with wires down on it from utility poles, and cannot not be carefully viewed or approached. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-022	Building 1128 - Armaments and Avionics Shop	Late 1950s (northern third). 1970-1980s (southern two-thirds)	Originally constructed to house a military armaments and avionics shop. Former pharmaceutical company tenant likely altered building interior to suit its industrial needs. Original rectangular rear block is one-story tall. Built of concrete block with concrete columns and topped by a flat overhanging concrete roof. A rectangular, one-story, flat-roofed, concrete addition—also post-1970s—projects to the building's west. The building is vacant, significantly deteriorated, heavily overgrown, and unsafe to enter. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-023	Building 1129 - Armaments and Electrical Shop	Between 1956 and 1959	Originally constructed to house armaments and electrical shops for Ramey AFB, and was later occupied and expanded by a private laboratory company. Most of the core first story of this long building is original, if heavily altered, construction appears to be built of

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				concrete block, but much of its original wall surface is hidden by circa-1975 extensions along its west side and south-facing elevations and at its northwest corner. The later additions appear to be of concrete block. The building was not entered during current resource survey due to industrial hazards, but previous investigations report: "Its interior is full of industrial wastes, which include a large number of vials full of unknown chemicals. Building materials dangle everywhere. Most rooms have no windows and signs reveal the possibility of that hazardous materials were handled when last in use." Building may have been in use and partially maintained until circa-2010. Currently vacant and heavily overgrown with vegetation. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-024	Building 1133 - Captive Water Supply Tank Building	Late 1950s	Constructed as a captive water supply tank building and tank for Ramey AFB. Subsequently occupied by a private laboratory company beginning around 1975. Small, rectangular, concrete-block building with concrete beams and a concrete slab roof and an exterior 12'-diameter tank as long as the building. Vacant and heavily overgrown, with wires down on it from utility poles, and cannot be carefully viewed or approached along its north elevation. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-025	Building 1245 - Readiness Crew Facility	Late 1950s	Historically used to house on-alert B-52 bomber crews. Appears to have been internally converted and used for non-military storage beginning in the 1990s. Long, one-story, rectangular, concrete-block building. Maintenance on the building appears to have ceased circa 2010. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.

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Historic Structure	H-026	Building 1251 - Target Intelligence	Between 1956 and 1959	Historically a target intelligence or combat building or facility used to train military aircrew members in the techniques of identifying targets identification and developing proper bombing procedures. Possibly later used for storage by a non-military enterprise. Building consists of two one-story rectangles of different depths that form a flush elevation on the south-facing facade. Stuccoed concrete block topped by a flat roof. Currently abandoned. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-027	Building 1270 - Storage	Between 1956 and 1959	Original use unknown. Appears to have been used by the military for small mechanical equipment storage. Small, rectangular, concrete block building with a single room. Currently abandoned and overgrown with vegetation. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-028	Building 1203 - Small Arms Magazine	Early 1940s	Historically a small arms magazine with former access to boxcars and trucks via a former American Railroad spur line, and a former roadway extended a short distance west to Borinquen Avenue. Rectangular concrete building with a flat, overhanging roof. A concrete loading dock extends along its south elevation. The bays have been altered from their original construction. Appears to be long vacant and portions of the building are overgrown with vegetation and exhibit gaping holes in the walls. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-029	Building 1204 - Small Arms Magazine	Early 1940s	Historically a small arms magazine with former access to boxcars and trucks via a former American Railroad spur line, and a former roadway extended a short distance west to Borinquen Avenue. Rectangular concrete building with a flat, overhanging roof. A concrete loading dock extends along its south elevation. The bays

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				have been altered from their original construction. Appears to be long vacant and portions of the building are overgrown with vegetation. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-030	Building 1214 - Fuel Storage Tank	Between 1951 and 1964	Large, round metal tank set within barriers to contain any fuel spills. Its roof has collapsed along with most of its walls. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-031	Building 1215 - Fuel Storage Tank	Between 1951 and 1964	Large, round metal tank set within barriers to contain any fuel spills. It walls still stand and are heavily rusted. The roof has partially collapsed. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-032	Building 1230 - Storage	Late 1940s	Rectangular concrete building with a flat roof, with a concrete loading dock along most of its west-facing elevation. Firewalls and shelving inside the building suggest that it historically housed flammable, pressurized, or other hazardous materials. The building is currently in relatively good condition. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-033	Building 501 - Motor Transportation and Repair)	Early 1940s	Functioned as a military vehicle repair shop from the early 1940s until the early 1970s when it was sold to a private concern and reconfigured into retail shops. One story rectangular concrete building with pilasters and a flat roof. The building has undergone many structural and superficial modifications. As of 2020, its storefronts were in disrepair and all of its shops were vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.

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Historic Structure	H-034	Building 502 - Ordnance Repair Shop	Early 1940s	Originally an ordnance repair shop. By 1966 it provided ground power to Ramey AFB. After the closure of Ramey AFB it was transitioned from military control and held a water works shop. Two-story, two-tier rectangular concrete structure with a flat roof with overhanging eaves. The original building has been physically altered on numerous occasions. Currently vacant, with broken window panes and closely sealed doors. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-035	Building 503 - Quartermaster Warehouse	Early 1940s	Initially used as a quartermaster warehouse for Borinquen Field and later served as the Base Equipment Management Officed for Ramey AFB. Flat-roofed rectangular concrete building with evenly spaced pilasters. Structure is currently in generally good condition and has been occupied by Head Start services for at least 20 years. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-036	Building 504 – Bakery	Early 1940s	Originally served as the base bakery. It was still a bakery in 1966, but by 1983 the Puerto Rican National Guard was using it for storage. A basic two-story, flat-roofed, concrete, rectangular building. It has been heavily altered, though, by changes to its windows and entries, enclosure of a porte cochere, and the modern addition of crenellations. Currently used for storage by the National Guard. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-037	Building 505 - Utility Shop	Early 1940s	Constructed as a utility shop for Borinquen Field and later used as the civil engineering office for Ramey AFB. Later housed offices for the Puerto Rican National Guard, then the US Immigration and Naturalization Service, and is now occupied by US Customs and Border Patrol. The original one-story concrete core building remains in place, but has been enclosed in other later building

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				additions. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-038	Building 506 - Commissary and Quartermaster Warehouse	Early 1940s	Used as a commissary and quartermaster warehouse for Borinquen Field and Ramey AFB. After base closure, the building served as headquarters of the 20th battalion of the Puerto Rican National Guard. Two-story, L-shaped concrete block building with a flat roof. Original structure is largely intact. Building is currently vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-039	Building 507 - Power Plant	Early 1940s	Served as a powerplant for both Borinquen Field and Ramey AFB. Tall, one-story concrete rectangle with a flat roof and narrow windows. Building is in disrepair, is heavily overgrown with vegetation, and has been vacant since 1999. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-040	Building 508 - Laundry	Early 1940s	Constructed as a military laundry facility and was used as such until the closure of Ramey AFB. Plainly finished one-story rectangular concrete building with a flat roof. Building is largely intact with few physical alterations, but was abandoned by 1999 and currently remains vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-041	Building 509 - Cold Storage Plant	Early 1940s	Built as a cold storage plant for Borinquen Field. Under Ramey AFB it served a similar function but was called the "ice plant." Transferred to US Navy control after base closure, and leased to the National Guard from 1983 until at least 1999. Original building is a plainly covered one-story concrete structure with a flat roof edged by parapet walls. It has undergone numerous physical alterations. Appears to be vacant at the present time. Per

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				consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-042	Building 510 - Air Corps Garage	Early 1940s	Initially constructed as a vehicle garage for Borinquen Field Air Corps. Later occupied by the US Army Reserve and National Guard. One-story concrete building with pilasters and a flat roof with overhanging eaves. Structure was later modified by enclosing some windows, doors, and garage bays and several additions. Currently part of the National Guard Armory. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structures	H-043	Building 511 - Air Corps Garage	Early 1940s	Initially constructed as a vehicle garage for Borinquen Field Air Corps. Later occupied by the US Army Reserve and National Guard. One-story concrete building with pilasters and a flat roof with overhanging eaves. Structure was later modified by enclosing some windows, doors, and garage bays and several additions and other modifications. Currently part of the National Guard Armory. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-044	Building 512 - Quartermaster Warehouse	Early 1940s	Served as a quartermaster warehouse on the north side of a former railroad spur line. Possibly continued to serve as a warehouse after the railroad closure, but appears to have been vacant for decades at this time. Long, one-story concrete rectangle with a gabled roof supported by wooden trusses. Remains a basic functional warehouse building, although it remains vacant. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-045	Building 513 - Quartermaster Warehouse	Early 1940s	Served as a quartermaster warehouse on the north side of a former railroad spur line. Possibly continued to serve as a warehouse after the railroad closure, but appears to have been

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				vacant for decades at this time. Long, one-story concrete rectangle with a gabled roofs. Currently vacant and in ruinous condition. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-046	Building 524 - Pavement and Grounds	Early 1940s	Constructed to house Borinquen Field's pavement and grounds office, and continued to serve this function for Ramey AFB. By 1999 it housed a private school. One-story building with a flat roof which is now covered by solar panels. Structure has undergone numerous alterations to its original design, including sealing off of windows and doors and numerous structural additions. Currently occupied by Friedrich Froebel Bilingual School. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-047	Building 543 - Veterinary Office	Early to Mid-1950s	Original purpose is unknown, but served as a veterinary clinic for Ramey AFB from the mid-1950s until base closure. One-story rectangular plain concrete building with a flat roof. The original structure has been extensively physically altered from its original construction. Currently occupied by US Customs and Border Patrol. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-048	Building 406 - Fire Station	Early 1940s	Originally constructed and used as a fire station for Borinquen field and later Ramey AFB. By 1966 was used as a communication center and confinement center. In 1972 and 1973 it served as an office for base security and law enforcement and a telephone center. A long, rectangular two-story plain concrete building with a flat roof with a wide overhang, and a one-story concrete extension on its west elevation. Three of the four original bays have been enclosed. Exterior stairs have been added on the west side and numerous other alterations to the structure have occurred. The building currently houses US Coast Guard personnel. Per

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-049	Building 407 - Paint, Oil, and Dope House	Early 1940s	Storage building for paints, oils, lubricants, and related materials for Borinquen Field and possible Ramey AFB. Plainly finished one-story concrete rectangle with a flat roof with widely overhanging eaves. Minor mostly cosmetic alterations have been made to the building, as well as an addition of a small entry block on the south elevation. Currently occupied by the US Coast Guard. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-050	Building 408 - Photographic Laboratory	Early 1940s	Originally constructed and used as a photographic laboratory and possibly later as another unknown type of laboratory. In 1970 is housed the Office of Special Investigations for Ramey AFB. Small, one-story concrete building with a widely overhanging flat roof. Somewhat more elaborately decorated than other nearby contemporary buildings, with a tall raised foundation and a west facing entry set in a central projection that steps back toward the doorway. Building has undergone minor physical alterations. Currently occupied by the US Coast Guard. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-051	Building 409 - Air Corps Garage	Early 1940s	First constructed and used as a garage for the Borinquen Field Air Corps. During the Cold War it was used as a communications center for Ramey AFB. After base closure, the US Coast Guard continued to use it as a communications center. A rectangular flat roofed one-story concrete building currently with seven bays, although the original number of bays in unknown. Some bays and windows have been enclosed. Currently occupied by the US Coast Guard. Per consultation with SHPO, this structure has integrity

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Structure	H-052	Building 410 - Air Corps Garage	Early 1940s	Original construction and use were identical to Building 409. By 1966 it had been converted to a flight simulation building and communications center for Ramey AFB. After base closure, the US Coast Guard continued to use it as a flight simulation building. A rectangular, flat-roofed, one story concrete garage with a flat finish currently divided into seven bays. The original number of bays is unknown, due to later alterations. Currently occupied by the US Coast Guard. Per consultation with SHPO, this structure has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Area	H-053	Civilian War Housing	Early 1940s	Former civilian neighborhood located directly south of Runway 8-26 and constructed in the early years of Borinquen Field to house civilian workers involved in base construction, who had lived in tents on the base at the onset of construction. Development was funded by the 1940 Defense Housing and Community Facilities and Services Act. The development originally included approximately 110 individual buildings, however by 1964 approximately 25 units had been removed from the neighborhood's northern end as the northern access road had been shifted south, apparently to accommodate runway alterations. The southern portion of the neighborhood is located outside of the ISA. In 1966 Ramey AFB began rehabilitation activities on the structures. In 1967 the neighborhood was renamed "Tropical Acres" and rehabilitation work continued, including repairs and upgrades to the electrical system. Upon closure of Ramey Air Force Base, the neighborhood was fenced off and became completely overgrown with vegetation. It remains inaccessible (due to a barbed wire topped chain link fence) and overgrown. The neighborhood initially consisted of one- and two-story concrete block buildings with no adornment, flat widely overhanging roofs, numerous long louvered window bays,

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				and multiple doors. Many of the original residences are believed to exist currently. Some of the house walls and roofs are believed to be still intact, with windows and doors removed and degraded interiors. Per consultation with SHPO, this area as a whole has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Historic Area	H-054	Fullana Neighborhood (Partial)	Between 1952 and 1956	Located north of Golf Street, west of Borinquen Avenue, and southeast of the Punta Borinquen lighthouse and includes 137 individual resources within the ISA. The neighborhood was constructed under the Wherry Housing Act of 1949, which intended to correct poor living conditions for US military families at US military bases. The Fullana neighborhood (like all Wherry Housing) was constructed by private developers through a long-term lease with the federal government. However, in early 1958, the federal government purchased and assumed control of all Wherry Housing units at Ramey Air Force Base, including those outside of the ISA. Wherry neighborhoods, regardless of location and regional style have several common characteristics exhibited in this neighborhood: wide curvilinear streets, large front lawns, long blocks, three-way intersections, and modest house designs. The original construction of the Fullana neighborhood featured modest single-story, single-family concrete homes on evenly divided, largely rectangular lots with a modest setback, with a small front yard and driveway. All of the houses appear to have originally featured an L-shaped floor plan with an attached roofed carport at the front that gave them a rectangular footprint. The residences were originally topped with flat roofs. A single set of paired louvered windows punctuated the building facades and a second set of the same style was typically found on the inside wall of the carport. Original building entrances were housed underneath the carport and unornamented. As is the case with most Wherry Act residences, most of the houses have been partially to extensively

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				altered. Many have received a variety of extensions and additions over the years. Roughly one-third of the houses retain enough of their original features to be recognizable. Some original housing resources and initially undeveloped parcels within the neighborhood have been lost to modern development, including modern commercial and apartment buildings and a large modern Skate and Splash Park (Resource R-002). Additional changes to features such as landscaping, walls, and fences, and construction of modern housing on formerly vacant lots within the neighborhood have significantly altered the character of the neighborhood as compared to its original layout and character. Per consultation with SHPO, this area as a whole has integrity under NRHP criteria that makes it a contributing resource to a historic district comprising Ramey Air Force Base.
Recreational Area	R-001	Punta Borinquen Golf Course and Club House	1943-1944	The 18-hole course is 6,633 yards long from its blue back tees, 6,098 yards from its middle white tees, and 4,900 from its forward red tees. It is a straightforward design of essentially linear holes punctuated by the occasional palm tree and a small number of sand traps Its terrain is gently rolling. The course's most notable feature is its location, overlooking the confluence of the Caribbean Sea and the Atlantic Ocean. In 1973 it became a private golf course. When Ramey AFB closed, Punta Borinquen became Puerto Rico's first public golf course . The central portion of the Punta Borinquen Golf Course clubhouse was part of the original construction in 1944. Numerous later additions at unknown dates have followed. The original central portion of the clubhouse has been significantly altered from its initial design and construction, both inside and outside. The clubhouse is a long, one-story, concrete building with a flat roof. Later additions include an extension to the structure on at least one side; the addition of a flat-roofed porte cochere from the entry area, which conceals the original façade; and a semicircular patio. Most of the original windows and doors and the entire interior have been

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				altered. In spite of numerous alterations, the original core of the building remains largely intact, and the clubhouse is currently in use for its original intended purpose. Because the golf course and its clubhouse are publicly owned and accessible this property is eligible for protection under Section 4(f).
Recreation Area	R-002	Aguadilla (Ramey) Skate and Splash Park	--	Located approximately 1500 feet northwest of the western end of the current Runway 8-26 at BQN. The park has three main areas: a water playground zone, a non-wet playground area, and an expansive skateboarding park with various skating pools . The date of construction is relatively new, although the specific year of construction is unknown. It is a privately owned recreational facility that is open to the public for a fee. As a publicly-accessible recreation facility, this property is eligible for protection under Section 4(f)
Conservation Area	C-001	Conservation Area (Unnamed)	--	Apparently unnamed conservation area adjacent to Resource C-002. A large wooded open space located approximately 2200 feet east of the east end of the current Runway 8-26. Bounded on its east side by Punta Borinquen Golf Course, on its northwest by Borinquen Beach, and on its south by the Villa del Golf road, which separates this area from Resource C-002 to the south. Because the conservation area is publicly owned and accessible this property is eligible for protection under Section 4(f).
Conservation Area	C-002	Conservation Area (Unnamed)	--	Apparently unnamed conservation area adjacent to Resource C-001. A large wooded open space located approximately 2200 feet east of the east end of the current Runway 8-26. Bounded on its east side by Punta Borinquen Golf Course, by Wilderness Road to the south, and the Villa del Golf makes up the preserve's northern border and separates it from Resource C-001 to the north. On the north end, along Villa del Golf is a listing for the Hoyo 8 Mountain Bike Park, which appears to feature technical single track mountain bike trails, some of which penetrate the preserve . Google Maps also highlights the Ruinas de el Faro trail within the

Resource Category	Map ID (Figure 1.2-1)	Name	Year or Timeframe of Construction (for Historic Properties)	Description
				preserve, although information about the trail seems to be unavailable. Because the conservation area is publicly owned and accessible this property is eligible for protection under Section 4(f).

Sources: *Final Pavement Evaluation Report, Runway 8-26, Rafael Hernandez International Airport (BQN), Aguadilla, Puerto Rico*. DMJM Aviation, Inc. June 4, 2004;
Regional Airports Pavement Maintenance and Management Program, Rafael Hernández International Airport (BQN). Kimley Horn Puerto Rico, LLC. 2017.
Phase I Cultural Resources Survey: Architectural History, Rafael Hernandez International Airport, Aguadilla, Puerto Rico. Prepared by AECOM, Inc., March 2020;
Discover Puerto Rico Website: https://www.discoverpuertorico.com/profile/rameys-skate-splash-park/7701;
Trail Forks Website: https://www.trailforks.com/trails/hoyo-8-trail-track/

1.3. IMPACTS ON SECTION 4(F) RESOURCES

In accordance with Section 4(f) use definitions summarized in **Section 1.1.1.1** of this Evaluation, the following sections evaluate potential impacts of the Proposed Project on the Section 4(f) resources described in **Section 1.2**.

1.3.1. PHYSICAL USE OF SECTION 4(F) RESOURCES

Section 4(f) resources located within the DSA were evaluated for physical use by the Proposed Project under Section 4(f) regulations. As previously discussed, physical use would occur if the Proposed Project either permanently incorporates a Section 4(f) property into a transportation facility; or the Proposed Project results in a temporary occupancy of land that is adverse in terms of the statute's preservation purpose, as determined by the criteria in 23 CFR 774.13(d) (i.e., when all or part of the Section 4(f) property is required for project construction-related activities).

Both Proposed Action Alternatives include reconstructing Runway 8-26 500 feet to the south of its present location, as well as shifting the runway 862 feet east under Alternative 2B or 1,187 east under Alternative 2D. Both Action Alternatives would require demolition of 21 buildings south of the reconstructed/relocated Runway 8-26 to achieve compliance with 14 CFR 77.17(a)(5), which prevents the persistence or placement of objects within the surface of a takeoff and/or landing area of an airport, or within any imaginary surface (including, primary, horizontal, conical, approach or transitional surfaces). Alternative 2B and Alternative 2D would each result in physical use of 17 total Section 4(f) resources: demolition of 16 buildings south of proposed runway reconstruction location, and alteration of the existing Runway 8-26 to serve as a parallel taxiway. **Table 1.3-1** provides a summary the Proposed Project's physical use of Section 4(f) resources within the DSA.

Table 1.3-1 Summary of Physical use Impacts to Section 4(f) Resources

Resource Category	Map ID (Figure 1.3-1)	Name	Evaluation
Historic Structure	H-001	Runway 8-26	Conversion of runway to parallel taxiway will require removal and replacement of historic pavement materials. *Physical use.*
Historic Structure	H-006	Building 3 - Gazebo	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-012	Building 1029 - Ground Support Equipment Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-013	Building 1031 - Electric Power Station	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*

Resource Category	Map ID (Figure 1.3-1)	Name	Evaluation
Historic Structure	H-014	Building 1132 - Squadron Operations	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-015	Building 1070 - Aircraft Maintenance Organizational Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-016	Building 1071 - Squadron Operations	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-017	Building 1072 - Weapons and Base Systems Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-018	Building 1073 - Traffic Check House	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-019	Building 1089 - Weather Observation Tower	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-020	Building 1104 - Storage and Supply	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-021	Building 1121 - Electrical Station	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-022	Building 1128 - Armaments and Avionics Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-023	Building 1129 - Armaments and Electrical Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-024	Building 1133 - Captive Water Supply Tank Building	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*
Historic Structure	H-025	Building 1245 - Readiness Crew Facility	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*

Resource Category	Map ID (Figure 1.3-1)	Name	Evaluation
Historic Structure	H-026	Building 1251 - Target Intelligence	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5). *Physical use.*

Source: AECOM, 2020.

1.3.2. CONSTRUCTIVE USE OF SECTION 4(F) RESOURCES

The potential for constructive use under Section 4(f) was evaluated for the Section 4(f) resources within the DSA that would not experience physical use, and for all Section 4(f) resources located within the ISA. Constructive use would occur if the proximity of the Proposed Project results in air quality impacts, light and visual emissions impacts, or noise impacts so severe that the protected activities, features or attributes that qualify the property for protection under Section 4(f) are substantially impaired.

As discussed in detail in the EA, the Proposed Project would not result in an increase in airport capacity or a change in the types of aircraft using BQN, and long-term operational air quality impacts would not occur. A minor short-term increase in air pollutant emissions would result from construction-related vehicles and equipment, but these increases would be limited to the construction period. Aguadilla Municipio is considered in attainment/unclassifiable for all National Ambient Air Quality Standards (NAAQS). Therefore, implementation of the Proposed Project would not substantially impair the features of any Section 4(f) resources and constructive use would not occur on this basis.

The relocated runway would require airfield lighting changes that would result in an increase in light and visual emissions associated with the relocated runway, while decreasing light and visual emissions in the area currently occupied by Runway 8-26. These increased emissions associated with the reconstructed runway would mostly affect areas on the airfield and would not impair any of the unique features or functionality of any Section 4(f) resources. Constructive use would not occur on this basis.

The relocation of Runway 8-26 would shift noise contours (an estimate of noise exposure at given locations) associated with landing, takeoff, approach, climb-out, and taxiing of aircraft roughly 500 feet to the south, relative to current airport noise exposure conditions. Section 4(f) resources in the northern portions of the ISA would consequently experience a decrease in noise exposure with implementation of either Action Alternative.

Table 1.3-2 displays land use compatibility with DNL designations. A specific point analysis was prepared using FAA's Aviation Environmental Design Tool (AEDT) for each Section 4(f) resource located within the DSA and ISA to determine whether the DNL resulting from each Proposed Project alternative would result in constructive use for each resource. **Table 1.3-3** depicts the results of the point analysis. The most notable increases at grid points would occur at the former locations of buildings that would be demolished as a result of the Proposed Project, and therefore

would not constitute constructive use. The remaining Section 4(f) resources would either experience a decreased DNL as a result of the Proposed Project, or the resulting increased DNL would remain land use compatible. Therefore, the Proposed Project would not result in constructive use of any Section 4(f) properties as a result of noise impacts.

Table 1.3-2 Land Use Compatibility with Yearly Day-Night Average Sound Levels

	Yearly DNL					
	Below 65 dB	**65-70 dB**	**70-75 dB**	**75-80 dB**	**80-85 dB**	**Over 85 dB**
Residential						
Residential (Other than mobile homes & transient lodges)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communications	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, General	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y[5]	Y[5]	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

Source: Title 14 CFR part 150, Appendix A, Table 1, January 1998.
NOTE:
The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute

federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE:

SLUCM Standard Land Use Coding Manual.

Y (Yes) Land Use and related structures are compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

NLR Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.

25,30, or 35 Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

[1] Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

[2] Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[3] Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[4] Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[5] Land use compatible provided special sound reinforcement systems are installed.

[6] Residential buildings require an NLR of 25 dB.

[7] Residential buildings require an NLR of 30 dB.

[8] Residential buildings not permitted.

Noncompatible land use denoted in red highlighting.

Table 1.3-3 Predicted Sound Level Changes at Section 4(f) Properties

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
Conservation Area	C-001	Conservation Area (Unnamed)	60.8	56.6	56.6	-4.2	-4.2	No constructive use: sound level decreases	No constructive use: sound level decreases
	C-002	Conservation Area (Unnamed)	63.8	62.7	62.6	-1.1	-1.1	No constructive use: sound level decreases	No constructive use: sound level decreases
Historic Structure	H-001	Runway 8-26	87.1	68.9	69.8	-18.2	-17.3	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-002	Building 400 - Control Tower	63.4	59.0	59.3	-4.4	-4.1	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-003	Building 402 - Hangar 2	62.6	57.9	57.8	-4.7	-4.9	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-004	Building 403 - Hangar 3	62.3	57.6	57.6	-4.7	-4.7	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-005	Building 405 - Hangar 5	61.4	57.5	57.7	-3.9	-3.7	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-006	Building 3 - Gazebo	63.9	74.3	75.8	10.4	11.9	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-007	Building 571 - Nose Dock Hangar	69.5	62.8	61.1	-6.8	-8.5	No constructive use: sound level decreases	No constructive use: sound level decreases

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
	H-008	Building 572 - Nose Dock Hangar	67.8	64.3	63.0	-3.5	-4.7	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-009	Building 573 - Nose Dock Hangar	66.3	63.9	64.3	-2.4	-2.0	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-010	Building 574 - Nose Dock Hangar	64.5	62.3	63.5	-2.2	-1.0	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-011	Building 575 - Hangar	63.7	61.5	62.3	-2.2	-1.4	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-012	Building 1029 - Ground Support Equipment Shop	61.6	67.6	67.6	6.0	5.9	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-013	Building 1031 - Electric Power Station	62.9	70.2	70.0	7.4	7.1	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-014	Building 1132 - Squadron Operations	61.3	68.9	69.6	7.6	8.3	No constructive use; sound levels increase but building slated for	No constructive use; sound levels increase but building slated for

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
								demolition (see Physical Use impacts discussion)	demolition (see Physical Use impacts discussion)
	H-015	Building 1070 - Aircraft Maintenance Organizational Shop	60.5	66.5	66.4	6.0	5.9	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-016	Building 1071 - Squadron Operations	60.4	67.2	67.6	6.8	7.1	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-017	Building 1072 - Weapons and Base Systems Shop	61.5	67.3	66.9	5.8	5.3	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-018	Building 1073 - Traffic Check House	60.7	65.9	65.5	5.2	4.8	No constructive use; sound levels increase but building	No constructive use; sound levels increase but building

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
								slated for demolition (see Physical Use impacts discussion)	slated for demolition (see Physical Use impacts discussion)
	H-019	Building 1089 - Weather Observation Tower	62.3	70.3	70.6	8.0	8.3	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-020	Building 1104 -Storage and Supply	63.6	73.2	74.0	9.6	10.4	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-021	Building 1121 -Electrical Station	61.1	68.7	69.1	7.6	8.0	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-022	Building 1128 - Armaments and Avionics Shop	60.6	67.8	68.2	7.2	7.6	No constructive use; sound levels increase	No constructive use; sound levels increase

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
								but building slated for demolition (see Physical Use impacts discussion)	but building slated for demolition (see Physical Use impacts discussion)
	H-023	Building 1129 - Armaments and Electrical Shop	60.0	66.7	66.8	6.7	6.8	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-024	Building 1133 -Captive Water Supply Tank Building	60.6	67.8	68.2	7.3	7.7	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-025	Building 1245 - Readiness Crew Facility	63.4	74.1	75.5	10.7	12.1	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)	No constructive use; sound levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-026	Building 1251 - Target Intelligence	65.4	72.7	67.9	7.3	2.5	No constructive use; sound	No constructive use; sound

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
								levels increase but building slated for demolition (see Physical Use impacts discussion)	levels increase but building slated for demolition (see Physical Use impacts discussion)
	H-027	Building 1270 - Storage	66.1	70.0	65.3	3.9	-0.7	No constructive use; sound levels increase but land use remains noise-compatible.	No constructive use: sound level decreases
	H-028	Building 1203 - Small Arms Magazine	56.8	56.3	55.2	-0.5	-1.6	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-029	Building 1204 - Small Arms Magazine	56.7	56.6	55.4	-0.1	-1.3	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-030	Building 1214 - Fuel Storage Tank	53.1	56.9	56.7	3.8	3.7	No constructive use; sound levels increase but land use remains noise-compatible.	No constructive use; sound levels increase but land use remains noise-compatible.
	H-031	Building 1215 - Fuel Storage Tank	52.4	56.2	56.5	3.8	4.1	No constructive use; sound levels increase but land use remains noise-compatible.	No constructive use; sound levels increase but land use remains noise-compatible.
	H-032	Building 1230 - Storage	62.4	61.2	60.8	-1.3	-1.6	No constructive use: sound level decreases	No constructive use: sound level decreases

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
	H-033	Building 501 - Motor Transportation and Repair)	62.6	58.7	57.3	-4.0	-5.3	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-034	Building 502 - Ordnance Repair Shop	64.0	59.7	58.4	-4.2	-5.6	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-035	Building 503 - Quartermaster Warehouse	60.8	60.2	60.9	-0.6	0.1	No constructive use: sound level decreases	No constructive use; sound levels increase but land use remains noise-compatible.
	H-036	Building 504 - Bakery	59.9	59.1	60.4	-0.8	0.5	No constructive use: sound level decreases	No constructive use; sound levels increase but land use remains noise-compatible.
	H-037	Building 505 - Utility Shop	58.4	57.8	59.0	-0.6	0.6	No constructive use: sound level decreases	No constructive use; sound levels increase but land use remains noise-compatible.
	H-038	Building 506 - Commissary and Quartermaster Warehouse	59.1	58.2	59.2	-1.0	0.1	No constructive use: sound level decreases	No constructive use; sound levels increase but land use remains noise-compatible.
	H-039	Building 507 - Power Plant	58.4	57.3	58.1	-1.1	-0.2	No constructive use: sound level decreases	No constructive use: sound level decreases

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
	H-040	Building 508 - Laundry	58.0	56.7	57.5	-1.3	-0.4	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-041	Building 509 - Cold Storage Plant	59.7	58.6	59.6	-1.1	-0.1	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-042	Building 510 - Air Corps Garage	59.8	58.4	59.2	-1.5	-0.6	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-043	Building 511 - Air Corps Garage	60.7	59.0	59.9	-1.7	-0.9	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-044	Building 512 - Quartermaster Warehouse	62.9	61.3	60.7	-1.6	-2.2	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-045	Building 513 - Quartermaster Warehouse	61.7	60.9	61.3	-0.8	-0.5	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-046	Building 524 - Pavement and Grounds	63.2	61.8	62.5	-1.4	-0.7	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-047	Building 543 - Veterinary Office	62.1	60.5	61.7	-1.5	-0.3	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-048	Building 406 - Fire Station	59.8	55.8	55.7	-4.0	-4.1	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-049	Building 407 - Paint, Oil, and Dope House	60.1	56.1	55.9	-4.0	-4.2	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-050	Building 408 - Photographic Laboratory	59.3	55.5	55.4	-3.8	-4.0	No constructive use: sound level decreases	No constructive use: sound level decreases

Category	ID	Description	2029 Predicted Sound Level (DNL dB)			Change From No-Action (DNL dB)		Conclusion	
			No-Action	Alt 2B	Alt 2D	Alt 2B	Alt 2D	Alt 2B	Alt 2D
	H-051	Building 409 - Air Corps Garage	59.5	55.7	55.5	-3.8	-4.0	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-052	Building 410 - Air Corps Garage	60.3	56.3	56.1	-4.0	-4.2	No constructive use: sound level decreases	No constructive use: sound level decreases
	H-053	Civilian War Housing	58.3	60.8	60.6	2.5	2.4	No constructive use; sound levels increase but land use remains noise-compatible.	No constructive use; sound levels increase but land use remains noise-compatible.
	H-054	Fullana Neighborhood (Partial)	61.3	56.9	55.7	-4.5	-5.6	No constructive use: sound level decreases	No constructive use: sound level decreases
Recreational Area	R-001	Punta Borinquen Golf Course and Club House	68.0	63.2	63.1	-4.7	-4.9	No constructive use: sound level decreases	No constructive use: sound level decreases
	R-002	Aguadilla (Ramey) Skate and Splash Park	62.0	57.6	56.3	-4.4	-5.7	No constructive use: sound level decreases	No constructive use: sound level decreases

Source: AEDT, 2020.

In summary, the Proposed Project would not result in impacts to air quality, light and visual emissions, or increased noise impacts that would significantly impair any Section 4(f) resources. No constructive use of Section 4(f) resources would result from the Proposed Project.

1.3.3. MEASURES TO MINIMIZE HARM

In summary, both Runway 8-26 and 16 of the 21 buildings to be demolished as a result of both Alternatives 2B and 2D are considered Section 4(f) properties with significant direct, physical use as defined at 23 CFR 774.17. No constructive use impacts have been identified. The direct physical use of these properties is significant because they are each individually considered to be contributing resources to a historic district as determined in consultation with the SHPO as required by Section 106 of the National Historic Preservation Act (NHPA). The use is not *de minimis* in nature because alterations to the affected Section 4(f) properties constitute an adverse effect to historic resources per 36 CFR 800.

Because these alternatives unavoidably impact Section 4(f) resources, mitigation is required to minimize the harm incurred. Each impacted Section 4(f) resource individually contributes to the NRHP-eligible Ramey Air Force Base historic district. Mitigations proposed for adverse effects under Section 106 and ratified with a Memorandum of Agreement (MOA) between FAA and SHPO constitute the mitigation measures under Section 4(f). By adhering to the MOA stipulations discussed in **Section 4.7.2.1** of the EA for cultural resources and included in **Appendix C** of the EA, the FAA will mitigate significant Section 4(f) impacts associated with the Proposed Project.

1.4. AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The Puerto Rico Planning Board (PRPB), Puerto Rico Environmental Quality Board (PEQB), and other Commonwealth and local agencies received scoping information as part of the EA early agency coordination process, and provided comments on potential impacts to the Section 4(f) resources. With respect to potential archaeological and historic resources in the vicinity of the Proposed Project, the Puerto Rico SHPO received and reviewed a Cultural Resources Assessment Survey for the Proposed Project through NHPA Section 106 consultation with FAA, and subsequently concluded that all structures associated with the Former Ramey AFB individually contribute to a historic district that is eligible for inclusion to the NRHP, and therefore are considered Section 4(f) resources.

In accordance with 23 CFR 774.5(b)(2), the public and agencies with jurisdiction over the Section 4(f) resources affected or potentially affected by the Proposed Project will be afforded the opportunity to review and comment on the effects of the Proposed Project on the resources during the Draft EA comment period.

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