



**SAN DIEGO COUNTY  
REGIONAL AIRPORT AUTHORITY  
STAFF REPORT**

**Item No.  
14**

Meeting Date: **NOVEMBER 1, 2012**

**Subject:**

**Presentation On Green Build Ramp Control Facility (RCF)**

**Recommendation:**

Receive the presentation and take possible action.

**Background/Justification:**

The Green Build Construction Project at San Diego International Airport (SAN) will provide additional terminal and airfield infrastructure on the west side of existing Terminal 2 West. The new airfield infrastructure includes ten aircraft parking gates, ten off-gate parking spaces for overnight aircraft, and a new taxi lane. (Attachment 1)

The Federal Aviation Administration (FAA) Air Traffic Control Tower (the Tower) at SAN is responsible for providing control of aircraft movements on runways and taxiways – these pavements are classified by the FAA as movement areas. The Tower is not responsible for providing advisories for aircraft movements at gates, ramps, taxi lanes or remote parking locations – these pavements are classified by the FAA as non-movement areas. FAA Tower Managers at each airport can accept or decline responsibility for providing advisories to aircraft on the non-movement areas. The SAN Tower has previously agreed to provide advisories for SAN aircraft movements into and out of the existing 41 parking gates and twenty remote (off-gate) overnight aircraft parking spaces. The FAA has provided aircraft movement advisories at SAN for more than 20 years. However, the FAA can stop providing advisories at any time at their discretion.

The new Green Build aircraft gates and adjacent pavements are non-movement areas and they are not visible from the FAA Tower. The view from the Tower is obstructed by the existing Terminal 2 West concourse roof and north rotunda.

**FAA Decision Regarding the Green Build Airfield Infrastructure**

In a letter dated December 7, 2009, the FAA advised the Airport Authority that it would not accept the responsibility for issuing advisories for aircraft movements on the new Green Build airfield infrastructure. (Attachment 2)

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Airport Authority and FAA Tower staffs conducted several meetings to discuss alternatives for controlling aircraft movements on the Green Build airside pavements. The Authority offered to install video cameras and place the monitors in the Tower, but the FAA was not willing to accept the video control option due to the: 1) size of the area involved; 2) volume of projected aircraft movements; and, 3) lack of existing FAA procedures for using video to control aircraft ground movements.

### **Options for Managing the Green Build Airfield Pavements**

When it became apparent that the FAA was not going to provide control of aircraft movements within the Green Build airfield infrastructure, Authority Staff considered the following alternatives: 1) control aircraft movements using only video cameras and monitors at a remote location; 2) provide control from a location with a partial view of the gates, taxi lane and overnight parking; 3) control aircraft movements from the ground using personnel and escort vehicles; 4) control aircraft with personnel in a ramp control facility (RCF) with a full view of the new gates, parking spaces and taxi lane, as well as the adjacent taxiway B that is controlled by the FAA Tower. After discussing these four options with the FAA and the airlines, Authority Staff decided to build a RCF with a full view of the new Green Build airfield infrastructure.

### **Authority Staff Decision to Operate a RCF at SAN**

Every airport has unique design and operational features. SAN has a number of unique design features that present operational challenges:

1. Single runway
2. Single full-length parallel taxiway
  - a. Regular inbound and outbound aircraft taxi conflicts
  - b. Arriving cargo and general aviation aircraft using taxiway B
  - c. Increased arriving aircraft runway occupancy when taxiway B is congested
3. One-at-a-time aircraft taxi into and out of gates between concourses
4. Runway 09 arrival/departure operations
  - a. Opposite direction movements on Taxiway B (runway 09 arrivals/ runway 27 departures)
  - b. Runway 09 departure aircraft queue on taxiway B
5. FAA Control Tower providing advisories to all aircraft moving into and out of the existing 41 aircraft parking gates.

The analysis of options for controlling aircraft movements on the Green Build pavements led to a very important conclusion. The new Green Build taxi lane, if managed properly, will reduce aircraft congestion on taxiway B, thus reducing congestion into and out of all parking gates at Terminal 2 East and Terminal 2 West. This can only be accomplished through continuous positive control of the new taxi lane, in combination with continuous communication/coordination with the FAA Tower and airline pilots and operations. This was the key consideration for the decision to build and operate a RCF with a full view of the Green Build pavements and Taxiway B.

The RCF will also ensure safe, orderly and timely control of aircraft movements into and out of the Green Build gates and overnight parking spaces. The total cost for the Green Build Airside expansion is \$50,000,000. In order to maximize this capital expenditure, this infrastructure should be managed in a way that takes full advantage of all of the benefits that it can provide for SAN operations. The RCF will play a key role in maximizing the use of these benefits.

The plan to build the RCF was shared with the SAN Airlines during two regularly scheduled Airline Airport Affairs Committee (AAAC) meetings. It is also part of the Green Build Project that was approved by the Airlines. The structure is located on top of the Terminal 2 West concourse. The RCF, when completed, will provide a full view of the Green Build aircraft parking gates, overnight aircraft parking spots, the new taxi lane, as well as Taxiway B and aircraft parking gates on the west side of Terminal 2 East. The total cost of RCF construction is projected to be \$2 million. The RCF is scheduled to be completed and commissioned for operations on April 1, 2013.

### **RCF Staffing and Operations**

There are three models for performing ramp control at U. S. Airports: 1) airline staff, 2) airport staff; and, 3) private companies.

Attachment 3 provides a partial list of U. S. Airports that currently have non-FAA ramp control facilities and operations. The SAN Airside Operations staff visited four of these airports to gain a better understanding about operating procedures, staffing models, facilities, equipment, technology, training programs, as well as operations and maintenance costs. Three of the four airports started using ramp control as of a result of an FAA decision to stop providing aircraft movement control in ramp and gate areas at their airports.

The four airports visited were Los Angeles International Airport, McCarran (Las Vegas) International Airport, Denver International Airport and Seattle-Tacoma International Airport.

LOS ANGELES INTERNATIONAL AIRPORT (LAX) - AIRLINE RCF STAFF

There are several airlines at LAX that perform ramp control operations. The visit focused on Alaska and United Airlines/SkyWest ramp control.

Alaska Airlines

Facility	Small Operations office with a limited view of gates and ramp
Number of Gates	9
Operating Hours	6:00 a.m. until 10:30 p.m. daily
Staff Qualifications/ Experience	Airline staff is provided between three days and one week of training. No previous air traffic controller experience required
Equipment	2 video cameras with view of the ramp, radios, gate assignment computer, touch screen voice switch control system, and digital voice recorder
Costs	Not provided

United/SkyWest Airlines

Facility	Old FAA Tower
Number of Gates	9
Operating Hours	4:00 a.m. until 2:00 a.m. daily
Staff Qualifications/ Experience	One week of training and no air traffic controller experience required
Equipment	Video camera with view of the ramp, digital voice recorder, radios and gate management computer
Costs	Not provided

The Airline staffing model works at LAX. It is important to note: 1) ramp control is done in three facilities; 2) they do not control remote (RON) aircraft parking; and, 3) there is a minimal amount of coordination and communication with the FAA Control Tower.

MCCARRAN (LAS VEGAS) INTERNATIONAL AIRPORT (LAS) - AIRPORT RCF STAFF

Facility	Two Stand-Alone Towers
Number of Gates	130 and several aircraft holding pads
Operating Hours	5:30 a.m. until 1:00 a.m. daily
Staff Qualifications/ Experience	The training is very structured and closely mirrors that of the FAA/Military. They require a minimum of two weeks / 80 hours of classroom training followed by a maximum of 200 hours to reach qualification for staff with previous air traffic controller experience, and 300 hours for those without controller experience. Most staff qualifies within two to three months.
Equipment	Radios with wireless headsets, seven video cameras with views of ramps and holding pads, radar display, gate assignment computer and voice recorders

Costs FY2012 Budget \$3,156,252

LAS ramp control is a very large operation. They have a robust program with detailed procedures and strong management oversight. The RCF staff are former air traffic controllers (military and FAA). It is important to note that their ramp control staff perform a number of duties that are unique when compared to the other ramp control facilities surveyed.

DENVER INTERNATIONAL AIRPORT (DIA) – AIRPORT AND AIRLINE RCF STAFF

Facility	One Tower Located On Top of Terminal Concourse
Number of Gates	70 (Airport Staff) - 23 controllers and 6 supervisors (Airline Staff) – 10 controllers and 3 supervisors
Operating Hours	(Airport Staff) – 24 hours daily (Airline Staff) – 10 hours daily
Staff Qualifications/ Experience)	DIA has a very detailed training curriculum that consists of both classroom and on-the-job training. The staff is comprised of some personnel with an ATC background; however the majority of the controllers do not have prior any ATC experience.
Equipment	Multiple cameras with views of the ramps; FIDS/BIDS display, gate management computer, flight scheduling program, radio headsets, PASSUR, weather display monitor and voice recorders.
Costs	\$675,264 Annually

DIA ramp control operations are split between the Airport and United Airlines ramp control staff operating in the same facility. The Airport staff provides service to and from concourses A and C as well as to the south cargo ramp. United Airlines provides ramp control services to and from concourse B.

SEATTLE-TACOMA INTERNATIONAL AIRPORT (SEA) – PRIVATE COMPANY RCF STAFF

Facility	One Tower Located on Top of Terminal Building
Number of Gates	72
Operating hours	24 hours daily
Staff Qualifications/ Experience	All controllers are former FAA or military controllers
Equipment	Multiple cameras with views of the ramps; FIDS/BIDS display, computer, flight scheduling program, radio headsets, weather display monitor and voice recorders.
Costs	The Port of Seattle hired Robinson Aviation, Inc. (RVA) to staff the RCF. The total cost of the three-year contract is an amount not-to-exceed \$2,827,293. The SEA ramp control facility is staffed 24 hours daily with two controllers on duty for more than 16 hours daily.

It is important to note that the SEA Airport RCF is staffed 24 hours daily and that there are two controllers on duty for 16 hours daily. The RCF staff is responsible for controlling aircraft movements into and out of 72 gates. Robinson Aviation Inc. (RVA) provides air traffic control at over 90 airports.

### **SAN RCF Staffing**

After considering all three staffing options: 1) airline staff; 2) Authority staff; and, 3) private company, Staff decided to move forward with a private company to operate the SAN RCF. The private company option will: provide the most qualified staff (service provider must have previous air traffic control experience); reduce Authority risk and liability by requiring that the private company carry a \$100 million insurance policy and name the Airport Authority as an additional insured; and, allow for competitive bids from service providers. There are a number of companies that provide this type of service at airports throughout the United States. The FY2013 budget for RCF staffing is \$245,600 (March 1, 2012 through June 30, 2013), and \$668,968 for the entire FY2014. Staff issued an RFP on October 2, 2012, with proposals due on October 31, 2012. Interviews are scheduled for November 8, 2012. Staff will present a recommendation to execute a contract with a RCF service provider at the December 6, 2012, Board Meeting. The RCF will be staffed seven (7) days/week and eighteen (18) hours/day from 6 a.m. until midnight. The plan for staffing the RCF has been shared with the Lindbergh Airline Manager's Council.

### **RCF FY2013 AND 2014 RCF TOTAL COSTS ESTIMATE**

	<b>2013</b>	<b>2014</b>
<b>Personnel</b>	\$245,600	\$668,968
<b>Training</b>	\$15,000	0
<b>Equipment</b>	\$300,000	\$20,000 (maintenance)
<b>Licenses</b>	\$72,000	0
<b>Materials &amp; Supplies</b>	\$5,000	\$5,000
<b>Totals</b>	\$637,600	\$693,968

RCF IMPLEMENTATION SCHEDULE

October 2012	RFP or Hiring controllers (if necessary) Purchase RCF equipment and furniture
December 2012	Present to the Board a Recommendation and proposed Resolution for the RCF Staff Contract
December 2012	Acquire license for an FAA radio frequency in RCF
December 2012	Finalize RCF training manual Finalize RCF contingency plans
January 2013	Revise Airport Layout Plan, Charts, drawings, Airport Facility Directory, Emergency Plans Coordinate RCF equipment installation with Green Build
February 2013	Conduct tenant, aircraft pilot and FAA Controller briefings
March 2013	Complete on-site RCF training Complete airfield signs and markings installation Test all RCF equipment
April 1, 2013	Assume control of the RCF from the Green Build Joint Venture
April 15, 2013	First day of RCF operations for gates 42-47, taxi lane and overnight aircraft parking (gates 38-41 closed until August 13, 2013)
August 13, 2013	First day of RCF operations for gates 48-51 (gates 38-41 reopen)

**Future RCF Staff Responsibilities**

It is anticipated that, in the future, the FAA will stop providing advisories for aircraft movements into and out of fourteen (14) additional gates at Terminal 2 East and Terminal 2 West. The RCF will assume responsibility for these gates as well.

The Authority has acquired a computerized Gate Management System (GMS) and plans to use this system for planning and day-to-day common use operations. It is anticipated that the RCF will have a key role in using the GMS to maximize the benefits of common use gates during irregular operations, aircraft delays, equipment malfunctions, routine jet bridge maintenance, etc.

The southwest side of the new taxi lane is a good location to hard-stand (ground board) charter aircraft and irregular operations aircraft. The RCF will be able to facilitate the use of this pavement while ensuring smooth and safe aircraft movements in this area.

The RCF can also serve as a backup FAA Control Tower if needed.

**Fiscal Impact:**

Adequate funds are available for the FY2013 costs within both the Green Build capital budget and Airside Operations department operating budget (in the Services-Other line item). Adequate funds are also available for the FY2014 costs within the Airside Operations department operating budget in the Services-Other line item.

**Authority Strategies:**

This item supports one or more of the Authority Strategies, as follows:

- Community Strategy     Customer Strategy     Employee Strategy     Financial Strategy     Operations Strategy

**Environmental Review:**

- A. This Board presentation is not a project that would have a significant effect on the environment as defined by the California Environmental Quality Act (CEQA), as amended. 14 Cal. Code Regs. §15378. This Board presentation is not a "project" subject to CEQA, Cal. Pub. Res. Code §21065.
- B. This Board presentation is not a "development" as defined by the California Coastal Act. Cal. Pub. Res. Code §30106.

**Equal Opportunity Program:**

Not applicable.

**Prepared by:**

GEORGE CONDON  
DIRECTOR, AVIATION OPERATIONS & PUBLIC SAFETY DEPARTMENT

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

December 7, 2009

San Diego County Regional Airport Authority  
P.O. Box 82776  
San Diego, Ca 92138-2776

ATTN:  
George Condon  
Director, of Airside Operations

Mr. Condon,

Your office provided airport improvement plans for the control tower review that will add 10 new gates and a taxi-lane west of Terminal 2 West. You asked if the control tower would accept control responsibility for the proposed addition to the airport.

The control tower accepts responsibility for the control of aircraft, vehicles, equipment and personnel on the controlled movement areas of the airport. FAA grants the tower manager authority to designate portions of the airport surface which are not visible from the tower as non-movement areas. The new gates and taxi-lane are not visible from the tower and will be designated as a non-movement area. The control tower cannot accept control responsibility of the new gates or the new taxi-lane.

At select times the new taxi-lane and new over flow parking areas could provide an improvement to airport operations and possibly reduce delays. Reduced delay time would depend on airport volume and direction of traffic.

The airport should create a ramp tower / control facility to control this area. Many other airports have ramp control facilities that manage non-movement areas. This type of facility located on the new terminal would have line of sight visibility of the new ramp area, could manage the gates, the over flow parking spots, and control aircraft taxiing on the new taxi-lane.

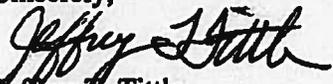
SAN Airport has very limited concrete. With coordination the control tower could work with a ramp control facility to utilize the new taxi-lane. The taxi-lane and ramp could provide an area for an arrival to hold clear of the movement area waiting for a gate, and an area to hold a departure aircraft with an extended departure delay (i.e. MSP ORD snow delay).

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The taxi-lane could also be used as an extension beyond taxiway Bravo during Runway 9 operations. Moving select Runway 9 departures into the taxi-lane would move the departure sequence forward and allow an arrival access to a gate sooner. The taxi-lane could also provide an area to help the tower with departure fix staging that could accelerate the Runway 9 departure line-up. There are days now when these suggestions would save several minutes' inbound delay for an arrival.

The control tower cannot take control of the new ramp. The tower is interested in working with a ramp control facility to develop procedures that would provide improvement to SAN airport operations.

Sincerely,

  
Jeffrey T. Tittle  
Acting Air Traffic Manager  
San Diego Lindbergh ATCT  
San Diego, Ca. 92101

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**LIST OF U.S. AIRPORTS WITH NON-FAA RAMP CONTROL FACILITIES AND OPERATIONS**

**Operated by Third Party Company and Airlines**

Airport Name	FAA Identifier	Ramp Control	Airline	3 <sup>rd</sup> Party Company	Facilities	Staffing	Hours of Operation	Number of Gates
Atlanta Hartsfield	ATL	Yes	DAL	TBI	3 towers, TBI runs 1 of the towers and DAL runs the other	3 per shift	24/7	30
Chicago O'Hare	ORD	Yes	UAL	Signature Flight Support	Tower	4 UAL personnel/signature flight support personnel for RJ's	T1 - 24/7 T2 - 10PM	52
San Francisco	SFO	Yes	UAL	Total Airport Services	2 facilities - A Terminal and G Terminal	UAL staffs Terminal G. Total Airport Services staff 9 people.	24/7	SFO - 24 gates and 6 RONs/ UAL - 20+ gates

**Operated by Third Party Company**

Airport Name	FAA Identifier	Ramp Control	Airline	3 <sup>rd</sup> Party Company	Facilities	Staffing	Hours of Operation	Number of Gates
Minneapolis - St. Paul International	MSP	Yes		Regional Lead Aviation Services/DAL	Building on top of the concourse	2 per shift	24/7	Bet. A and B Concourse for all DAL regional flights
Seattle International	SEA	Yes		RVA	Old ATCT	2 per shift except mid (0000-0600)	24/7	77

# LIST OF U.S. AIRPORTS WITH NON-FAA RAMP CONTROL FACILITIES AND OPERATIONS

## Operated by Airline and Airport

Airport Name	FAA Identifier	Ramp Control	Airline	Airport	Facilities	Staffing	Hours of Operation	Number of Gates
Dallas Ft. Worth International	DFW	Yes	AAL	DFW International	AAL - 11 story Tower, heavy use of cameras at gates where there is not line-of-sight. DFW - small building that sits on the roof of the International gates. Single Tower	AA - AAL employees DFW employees, crew of 10 people	AAL - 24/7 DFW - 0615-2200	AAL - A & C Terminals; D18-D40 DFW - 9 gates
Denver International	DEN	Yes	UAL	DIA	Single Tower	UA gates UA Non-UA airport staff	24/7	124
Detroit-Wayne County International	DET	Yes	DAL	DTW	DAL - Building on roof of terminal; DTW North side terminal	DAL - 5 people on shift DTW Unknown	24/7	70 gates to include domestic/International
Newark/NJ	EWR	Yes	UAL	EWR Airport Ops	EWR - Office with cameras COA - Tower at Terminal C	EWR - Airside Ops staff the ramp control; COA - COA employees	24/7	EWR - 15 gates, International Terminal B COA - Terminals C & A
Phoenix Sky Harbor	PHX	Yes	USA	PHX Airport Ops	PHX & USA - Co-located facility	PHX - On-duty Sup, USA employees	0600-Mid	PHX - 4 International USA - all of their flights
Miami International	MIA	Yes	AAL	MIA	3 towers	MIA - Controls everything except for AAL flights	24/7	50 gates not to include AAL gates
Boston Logan International	BOS	Yes	JBU/DAL/ UAL	BOS	Lower floor of the ATCT	Massport employees	0630-2200	Carriers handle their own. Massport controls 10 International gates only.

**LIST OF U.S. AIRPORTS WITH NON-FAA RAMP CONTROL FACILITIES AND OPERATIONS**

**Operated by Airport**

Airport Name	FAA Identifier	Ramp Control	Airport	Facilities	Staffing	Hours of operation	Number of Gates
Las Vegas McCarran	LAS	Yes	Airport	2 towers	2 per shift in each tower	0600-0200 daily	98
Orlando International	MCO	Yes/gate control	MCO	Office	MCO employees	24/7	11 International gates, 10 common-use gates. Coordination only.
Washington Dulles International	IAD	Yes	IAD	Building on top of the concourse	IAD Airport Ops	24/7	All gates

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**LIST OF U.S. AIRPORTS WITH NON-FAA RAMP CONTROL FACILITIES AND OPERATIONS**

**Operated by Airline**

Airport Name	FAA Identifier	Ramp Control	Airline	Facilities	Staffing	Hours of Operation	Number of Gates
Los Angeles International	LAX	Yes (3)	UAL/DAL/AA	Old ATC-UA - AA & DL have ramp control towers above their terminal	2 per shift	24/7	40
John F. Kennedy International	JFK	Yes	AAL/UAL/JBU/DAL	Line of sight and cameras	Airline employees	24/7	All gates
Houston Bush International	IAH	Yes	UAL	2 towers - north and south	UAL employees	0500-2200	Controls all gates including other carriers
New York - La Guardia	LGA	Yes	UAL/DAL	2 cabs on top of the terminals	UAL/DAL employees	24/7	Each carrier controls their own flights
Philadelphia International	PHL	Yes	USA	Physical tower located near the terminal building	USA employees	24/7	Ramp control all carriers
Honolulu International	HNL	Yes	HNL	1 tower in the "old" FAA Control Tower	State HI employees, staff of 14 people	24/7	All gates including the cargo area
Cincinnati/ North Kentucky	CVG	Yes	DAL	1 tower located on top of building	2 per shift	24/7	All gates
Charlotte/Douglas International	CLT	Yes	USA	Building located on the 2 <sup>nd</sup> floor of main terminal	USA employees	24/7	Ramp Control all traffic
Salt Lake City International	SLC	Yes	DAL	1 tower located in the "old" ATCT	DAL employees	24/7	All the SKY & DAL gates

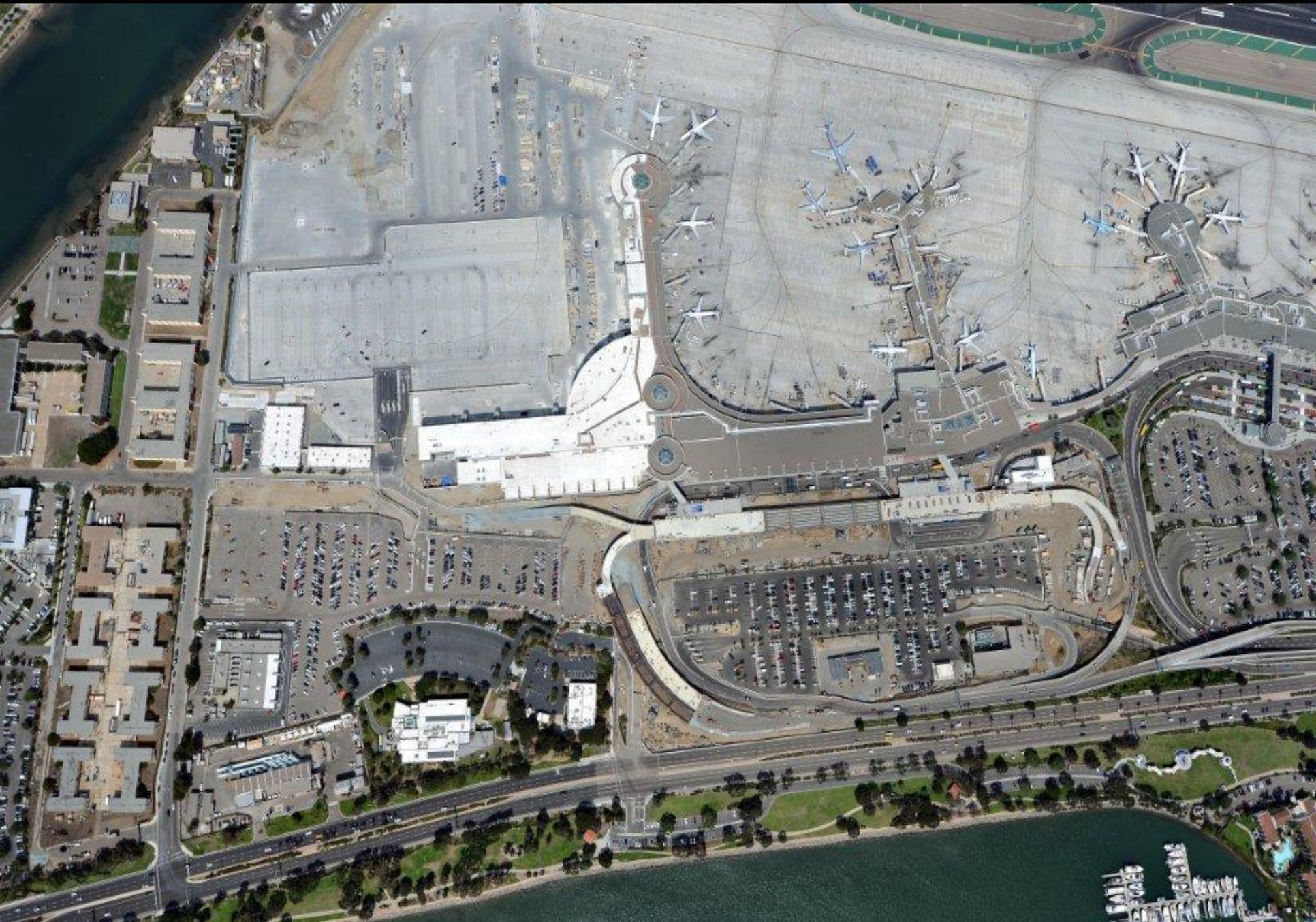
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Item 14

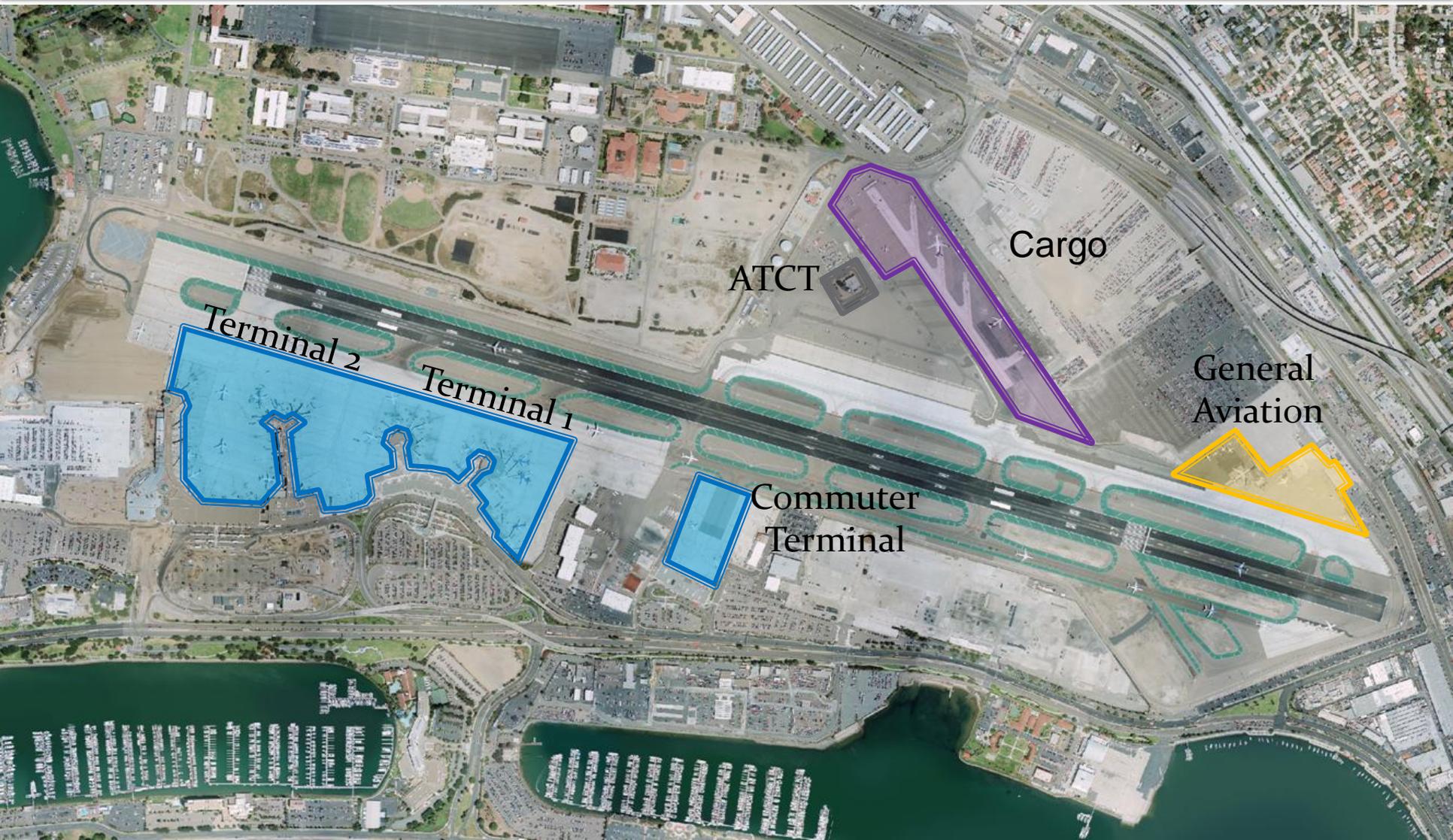
# Ramp Control Facility







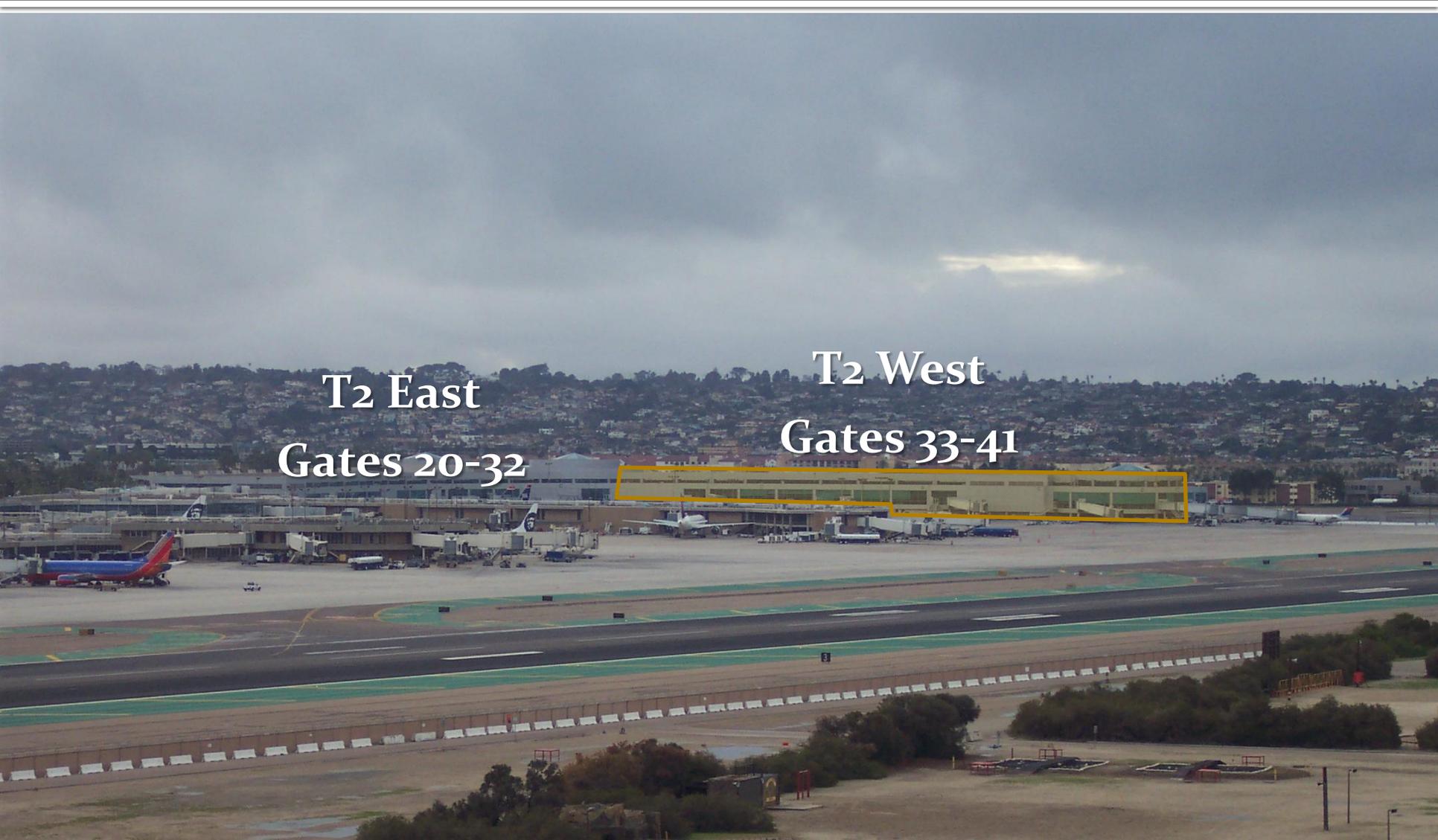
# Key Operational Activity Locations



# Obstructed ATCT View



# ATCT View from Terminal 2



T2 East  
Gates 20-32

T2 West  
Gates 33-41

# FAA Decision & Alternatives

- December 2009 FAA Letter
- Alternatives for Managing Aircraft Movements on the Green Build Airfield Infrastructure

# Objective

- Safe, orderly and timely movement of aircraft into and out of the Green Build airside infrastructure.
- 10 new gates
- 10 off-gate overnight aircraft parking spaces

# Design Considerations

## LEGEND

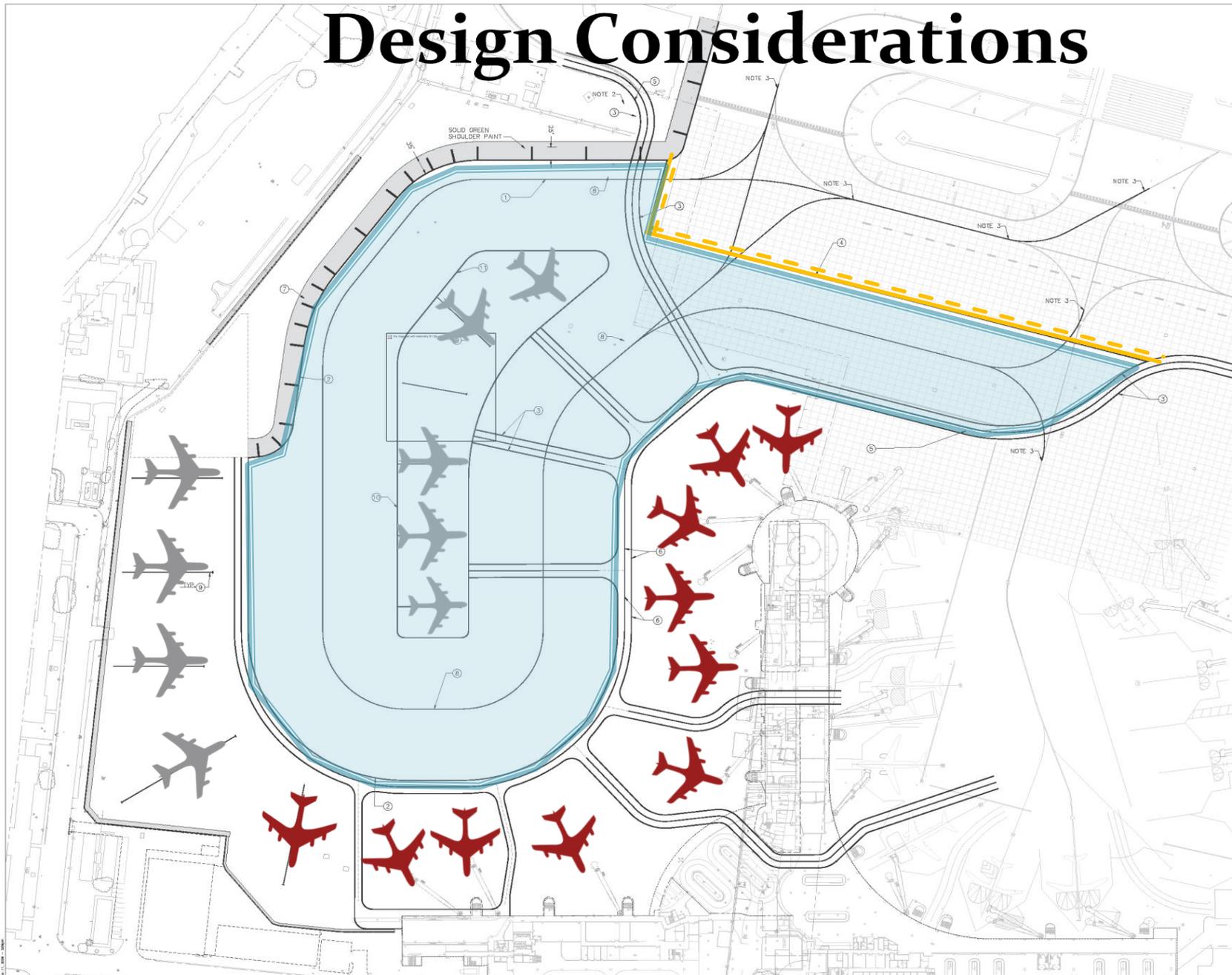
- TAIWAY EDGE MARKING
- APRON LIMIT LINE MARKING
- EXISTING FEATURES
- TAIWAY CENTERLINE
- NON-MOVEMENT BOUNDARY AREA
- PROPERTY LINE

## NOTES

1. ALL MARKINGS SHALL MEET FAA ADVISORY CIRCULAR (AC) 15015340-11. MARKINGS NOT ADDRESSED IN AC ARE NOTED BELOW.
2. FOR STOP SIGN, REFER TO AIRFIELD LIGHTING PLAN, SHEET 75.
3. MATCH IN TO EXISTING PAVEMENT MARKINGS

## KEY NOTES

- ① TAIWAY CENTERLINE, 12" YELLOW, SEE DETAIL 4, SHEET 54.
- ② TAIWAY EDGE MARKING, SEE DETAIL 5, SHEET 54.
- ③ ROADWAY EDGE STRIPE, ZIPPER STYLE, SEE DETAIL 7, SHEET 54.
- ④ NON-MOVEMENT BOUNDARY AREA MARKING, SEE DETAIL 12, SHEET 54.
- ⑤ STOP BAR MARKING, SEE DETAIL 8, SHEET 54.
- ⑥ VEHICLE SERVICE ROAD MARKINGS, SEE DETAIL 3, SHEET 54.
- ⑦ TAIWAY SHOULDER MARKINGS, SEE DETAIL 6, SHEET 54.
- ⑧ RAMP MUSTERING SPOT, SEE DETAIL 2, SHEET 54.
- ⑨ AIRCRAFT PARKING CENTERLINE, SEE DETAIL 9, SHEET 54.
- ⑩ TAXILANE SAFETY AREA EDGE MARKING, SEE DETAIL 10, SHEET 54.
- ⑪ APRON LIMIT LINE MARKING, SEE DETAIL 11, SHEET 54.



GRAPHIC SCALES  
 0 60 ft 120 ft  
 True North Project North

**HNTB**  
 ENGINEERS ARCHITECTS PLANNERS  
 1175 CORPORATION  
 601 N. G Street, Suite 1000  
 SAN ANTONIO, TX 78202  
 TEL: 214-222-2200  
 FAX: 214-222-2200

DATE: 05/14/18	REV: 04
DRAWN BY: JLD/BJR	
CHECKED BY: JLD/BJR	
DATE: 05/14/18	
PROJECT: SAN DIEGO INTERNATIONAL AIRPORT	
CONTRACT: 2-C001-0100	
CDP: 00000000	
BID SET	05/14/18
REVISED	DATE APPROVED



**SAN DIEGO INTERNATIONAL AIRPORT**  
 SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

2-C001-0100

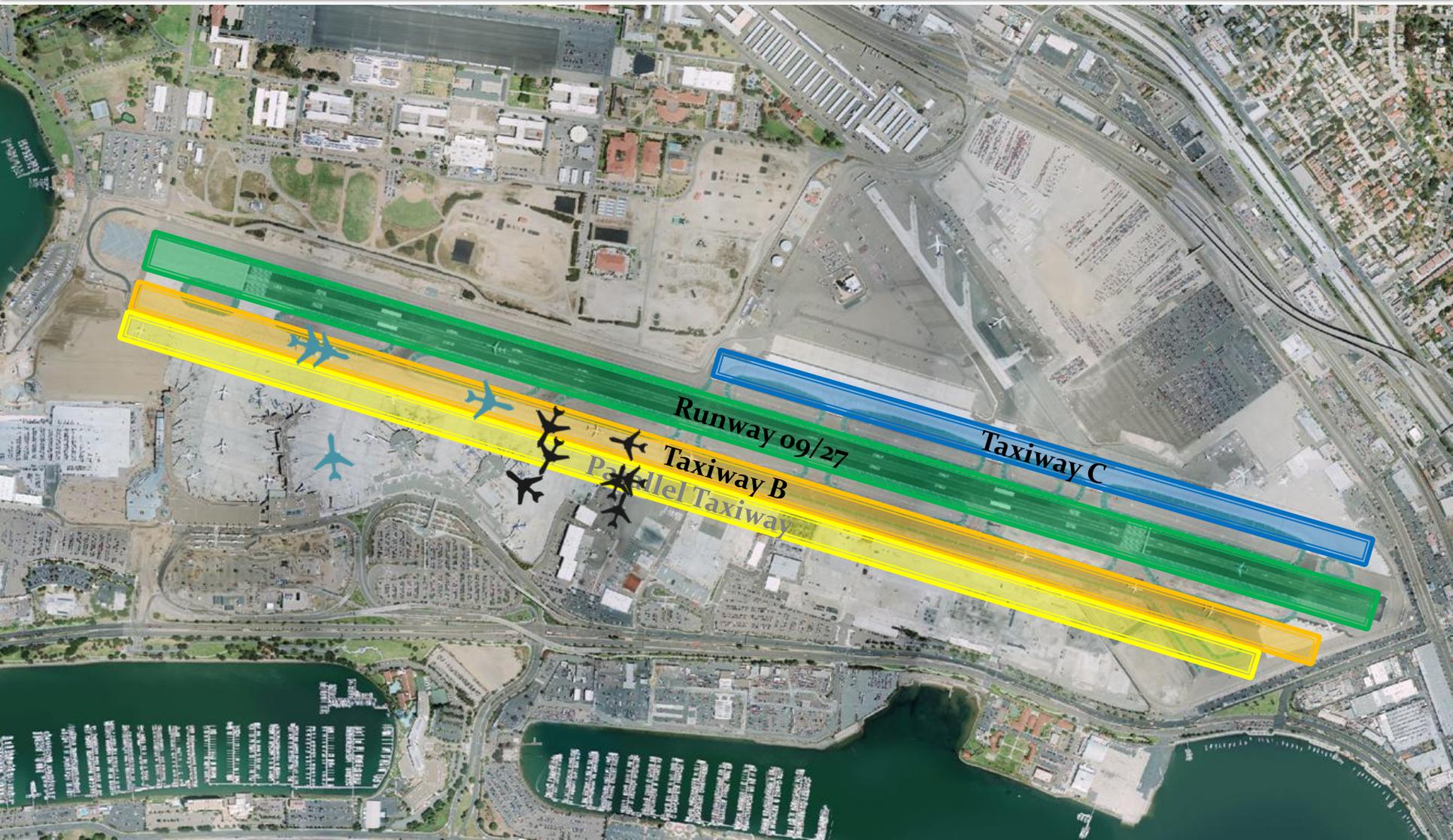
SAN DIEGO INTERNATIONAL AIRPORT  
**TERMINAL 2 WEST AIRSIDE EXPANSION**  
 PAVEMENT IMPROVEMENTS - BP2  
 OVERALL PAVEMENT MARKING PLAN

1 SHEET 4  
 DATE: 05/14/18  
 DRAWN BY: JLD/BJR  
 CHECKED BY: JLD/BJR  
 DATE: 05/14/18  
 PROJECT: SAN DIEGO INTERNATIONAL AIRPORT  
 CONTRACT: 2-C001-0100  
 CD: 00000000  
 3200-2

# Operational Analysis

- Aircraft ground movements into and out of the new Green Build infrastructure
- Current Taxiway B aircraft movements, challenges and opportunities

# Current Aircraft Ground Movements Overview



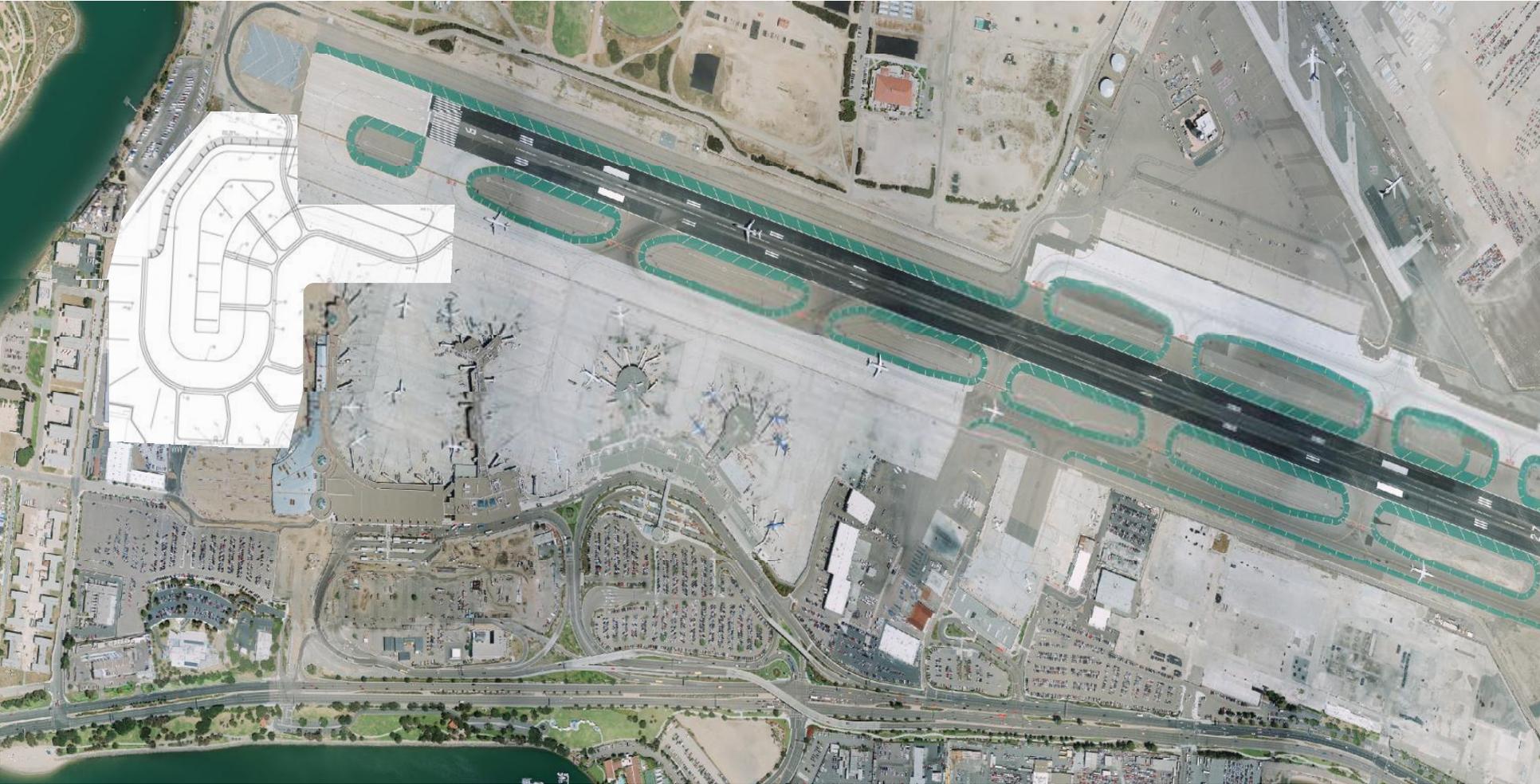
# Taxiway B Aircraft Movement Conjestion



# Taxiway B Congestion Impacting Runway Operations



# Green Build Infrastructure



# Options

- Video monitoring from a remote location.
- Location with a partial view of the gates, ramps, taxi lane and overnight parking.
- Control aircraft movements from the ground only using personnel and escort/tow vehicles.
- Ramp control facility with a full view of Green Build infrastructure and east end of taxiway B.

# Decision

- The Green Build taxi lane will reduce aircraft movement congestion on Taxiway B.
- Reduce aircraft movement congestion into and out of all aircraft parking gates at Terminal 2 East and Terminal 2 West.
- The most effective way to achieve this is by having continuous positive control of aircraft movements on the taxi lane.
- In combination with continuous communication / coordination with the FAA tower, aircraft flight crews and airline operations.
- This was the KEY consideration for the decision to build and operate the Green Build RCF.

**LEGEND**

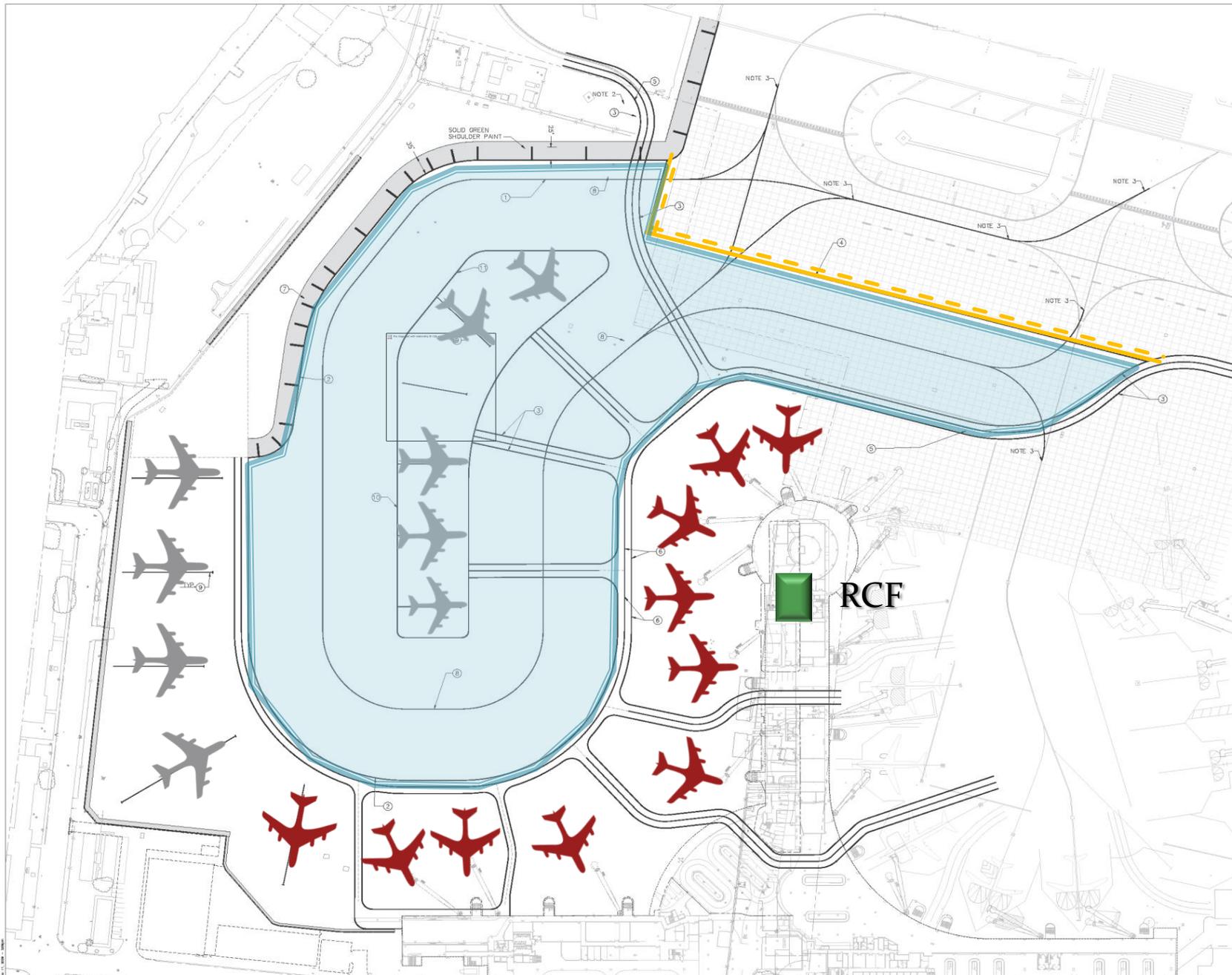
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- ⑨ AIRCRAFT PARKING CENTERLINE, SEE DETAIL 9, SHEET 54.
- ⑩ TAXILANE SAFETY AREA EDGE MARKING, SEE DETAIL 10, SHEET 54.
- ⑪ APRON LIMIT LINE MARKING, SEE DETAIL 11, SHEET 54.



**GRAPHIC SCALES**  
 0 60 ft 120 ft  
 True North Project North

**HNTB**  
 ENGINEERS ARCHITECTS PLANNERS  
 1175 CORPORATION  
 600 N. GARDEN ST., SUITE 1000  
 SAN ANTONIO, TX 78205  
 TEL: 214-222-2200  
 FAX: 214-222-2200

DATE: 05/20/2019	SCALE: AS SHOWN
DRAWN BY: J. GARCIA	CHECKED BY: J. GARCIA
DESIGNED BY: J. GARCIA	APPROVED BY: J. GARCIA
PROJECT: SAN DIEGO INTERNATIONAL AIRPORT	CONTRACT: 2-C001-010
SHEET: 3200-2	TITLE: OVERALL PAVEMENT MARKING PLAN

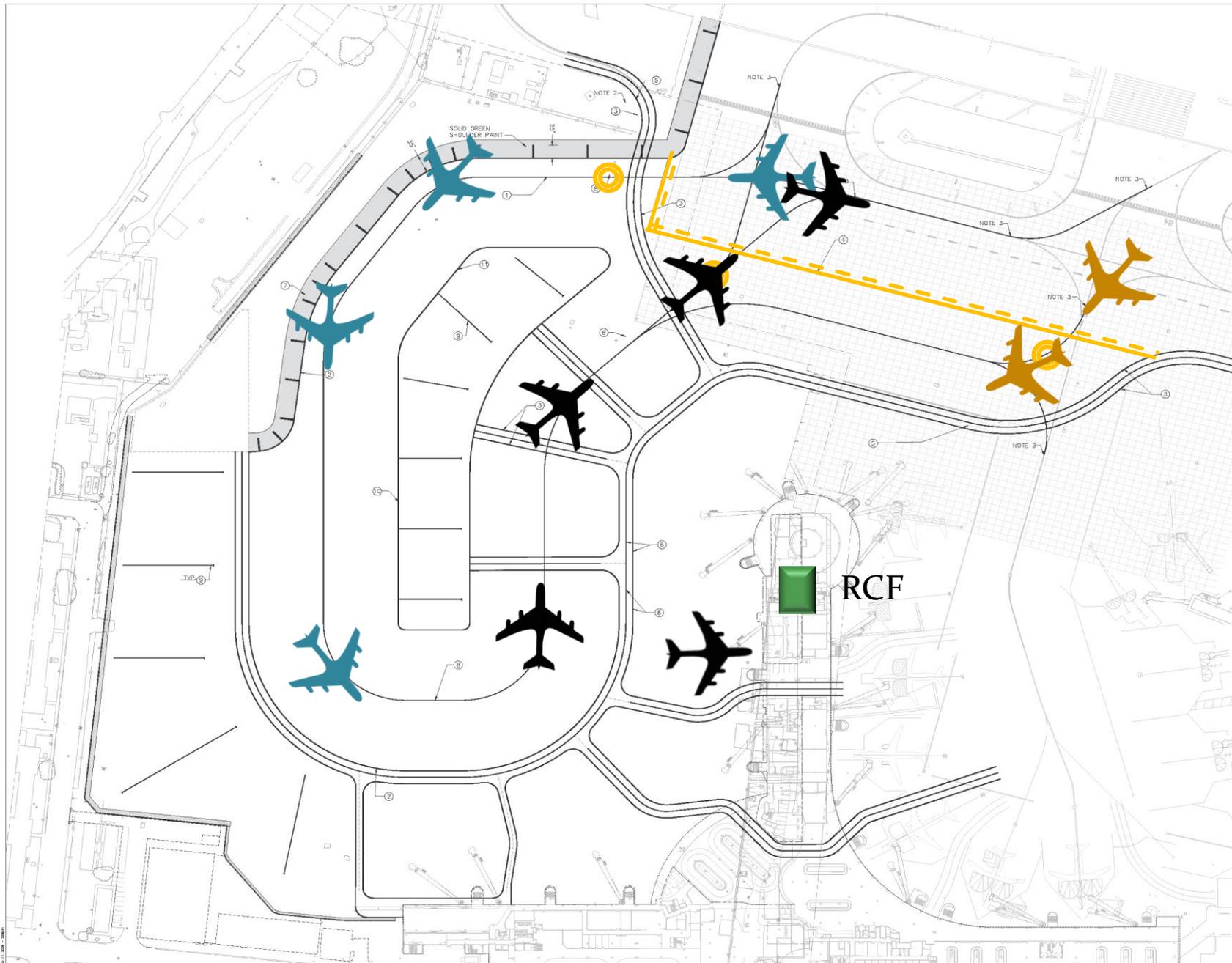


**SAN DIEGO INTERNATIONAL AIRPORT**  
**SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY**

2-C001-010

SAN DIEGO INTERNATIONAL AIRPORT  
**TERMINAL 2 WEST AIRSIDE EXPANSION**  
**PAVEMENT IMPROVEMENTS - BP2**  
 OVERALL PAVEMENT MARKING PLAN

3 SHEETS  
 SHEET NO. 3200-2 OF 3  
 DATE: 11/12/2009  
 DRAWN BY: J. GARCIA  
 CHECKED BY: J. GARCIA  
 3200-2



- LEGEND**
- TAXIWAY EDGE MARKING
  - APRON LIMIT LINE MARKING
  - EXISTING FEATURES
  - TAXIWAY CENTERLINE
  - NON-MOVEMENT BOUNDARY AREA
  - PROPERTY LINE

- NOTES**
1. ALL MARKINGS SHALL MEET FAA ADVISORY CIRCULAR (AC) 15015340-U. MARKINGS NOT ADDRESSED IN AC ARE NOTED BELOW.
  2. FOR STOP SIGN, REFER TO AIRFIELD LIGHTING PLAN, SHEET 75.
  3. MATCH IN TO EXISTING PAVEMENT MARKINGS

- KEY NOTES**
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  - 2 TAXIWAY EDGE MARKING. SEE DETAIL 5, SHEET 54.
  - 3 ROADWAY EDGE STRIPE, ZIPPER STYLE. SEE DETAIL 7, SHEET 54.
  - 4 NON-MOVEMENT BOUNDARY MARKING. SEE DETAIL 12, SHEET 54.
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  - 10 TAXIWAY SAFETY AREA EDGE MARKING. SEE DETAIL 10, SHEET 54.
  - 11 APRON LIMIT LINE MARKING. SEE DETAIL 11, SHEET 54.



**HNTB**  
 DESIGN PROJECTS PLANNING  
 1000 AVENUE OF THE STARS, SUITE 1000  
 FORT MYERS, FL 33907  
 TEL: 888-445-4321  
 FAX: 888-445-4321

DATE: 05/20/2009	REV: 05/20/09
DRAWN BY: [blank]	CHECKED BY: [blank]
DESIGNED BY: [blank]	APPROVED BY: [blank]
PROJECT: [blank]	DATE: [blank]
BY: [blank]	DATE: [blank]

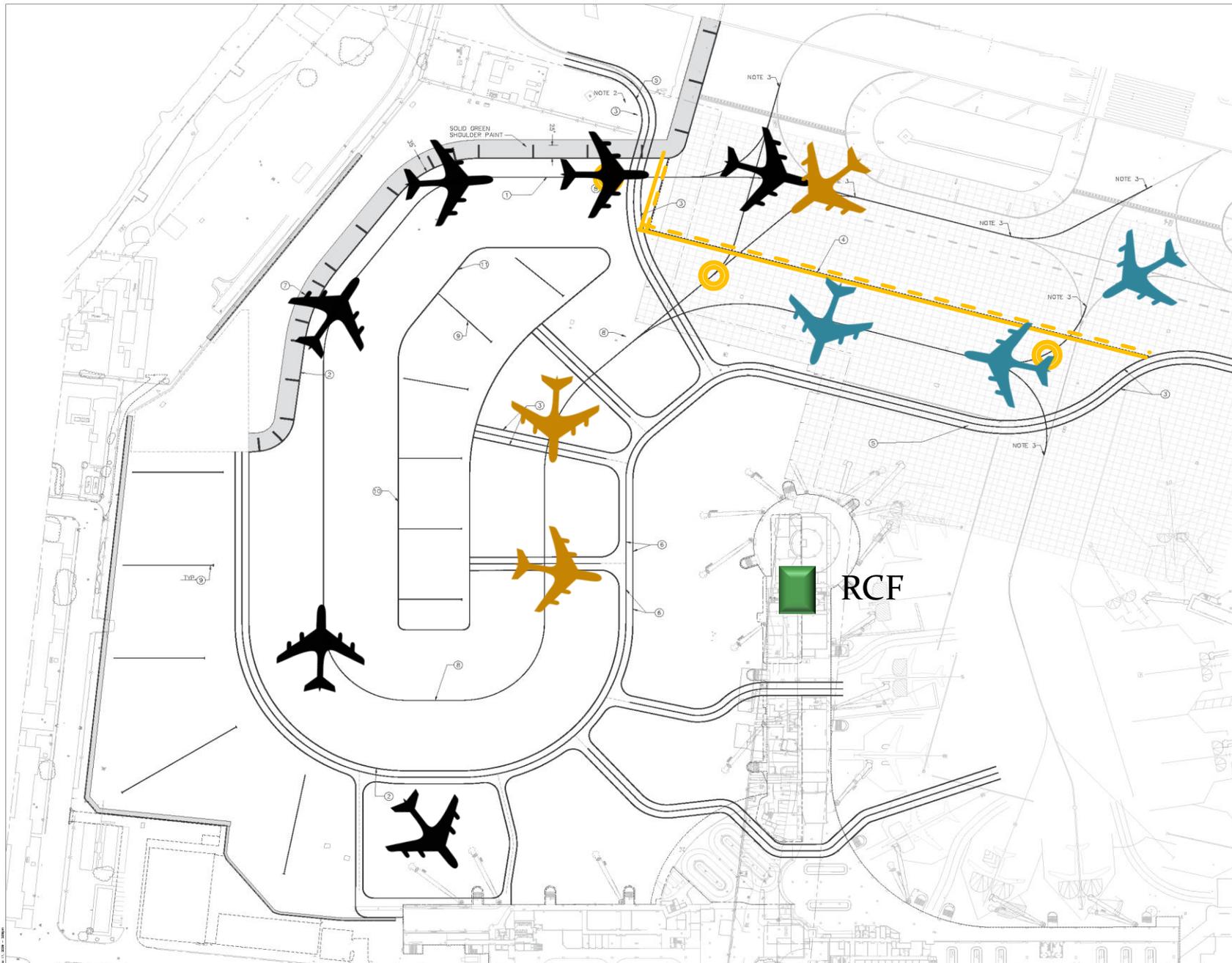


**SAN DIEGO INTERNATIONAL AIRPORT**  
**SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY**

DATE: 05/20/09  
 TIME: 11:12:00AM  
 FILE: 2-CDMP.dwg

**SAN DIEGO INTERNATIONAL AIRPORT**  
**TERMINAL 2 WEST AIRSIDE EXPANSION**  
**PAVEMENT IMPROVEMENTS - BP2**  
 OVERALL PAVEMENT MARKING PLAN

SHEET # 3200-2  
 OF 02  
 DATE: 11/12/2009



- LEGEND**
- TAXIWAY EDGE MARKING
  - APRON LIMIT LINE MARKING
  - EXISTING FEATURES
  - TAXIWAY CENTERLINE
  - NON-MOVEMENT BOUNDARY AREA
  - PROPERTY LINE

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TYP. 3

RCF



**HNTB**  
 DESIGN ARCHITECT PLANNERS

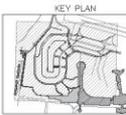
DATE: 05/20/2009	REV. NO.:	
DRAWN BY: [blank]	CHECKED BY: [blank]	DATE: [blank]
DESIGNED BY: [blank]	APPROVED BY: [blank]	DATE: [blank]
PROJECT: [blank]	SHEET: [blank]	TOTAL SHEETS: [blank]
CONTRACT NO.:	PROJECT NO.:	DATE: [blank]
BY: [blank]	DATE: [blank]	DATE: [blank]



**SAN DIEGO INTERNATIONAL AIRPORT**  
 SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

DATE: 05/20/2009  
 TIME: 11:12:00AM  
 USER: [blank]  
 SHEET: 3200-2

**TERMINAL 2 WEST AIRSIDE EXPANSION**  
 PAVEMENT IMPROVEMENTS - BP2



3200-2

- LEGEND**
- TAIWAY EDGE MARKING
  - APRON LIMIT LINE MARKING
  - EXISTING FEATURES
  - TAIWAY CENTERLINE
  - NON-MOVEMENT BOUNDARY AREA
  - PROPERTY LINE

- NOTES**
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**GRAPHIC SCALES**

0 60 120 FT

True North Project North

**HNTB**  
 DESIGN ARCHITECT PLANNERS

1000 UNIVERSITY AVENUE, SUITE 1000  
 SAN FRANCISCO, CA 94103  
 TEL: 415.774.2000  
 FAX: 415.774.2001

PROJECT NO.	10/20/09	REV. NO.	
PROJECT NAME	SAN DIEGO INTERNATIONAL AIRPORT		
CONTRACT NO.	10/20/09		
CONTRACTOR NAME	HNTB		
CONTRACTOR ADDRESS	1000 UNIVERSITY AVENUE, SUITE 1000, SAN FRANCISCO, CA 94103		
DATE	10/20/09	DATE	10/20/09
BY		APPROVED	



**SAN DIEGO INTERNATIONAL AIRPORT**  
**SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY**

2-CONV.dwg

SAN DIEGO INTERNATIONAL AIRPORT

**TERMINAL 2 WEST AIRSIDE EXPANSION**  
**PAVEMENT IMPROVEMENTS - BP2**

OVERALL PAVEMENT MARKING PLAN

DATE: 11/12/2009  
 DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 3200-2

# Operations with Green Build Infrastructure and RCF



# Current Runway 9 Operations



# Runway 9 Operations with RCF



# RCF Operations

- Visited four (4) airports with ramp control facilities.
- Airports included: Los Angeles (LAX), Las Vegas (LAS), Denver (DIA) and Seattle (SEA).
- Gathered information about operating procedures, facilities, equipment, technology, training programs, maintenance costs and personnel.

# RCF Staff

- Three models for staffing ramp control facilities:
  - Airline staff
  - Airport staff
  - Private company
- Staff Report provided a list of 24 U.S. airports currently using ramp control facilities.

# RCF Staff

- Authority staff has decided that the private company is the best option for staffing the SAN RCF.
  1. Provide the most qualified staff (service provider staff must have previous air traffic control experience).
  2. Reduced Authority risk and liability (service provider will be responsible for the first \$100,000,000 of liability and will name the Airport Authority as an additional insured).
  3. Allows for a competitive bid process.

# 2013/2014 Cost Estimate

	<b>2013</b>	<b>2014</b>
<b>Personnel</b>	\$245,600.00	\$668,968.00
<b>Training</b>	\$15,000.00	0
<b>Equipment</b>	\$300,000.00	\$20,000.00 (maintenance)
<b>Licenses</b>	\$72,000.00	0
<b>Materials &amp; Supplies</b>	\$5,000.00	\$5,000.00
<b>Totals</b>	\$637,600.00	\$693,968.00

# RCF RFP

- RFP was issued on October 2, 2012
- Proposals received October 31, 2012
- Potential Candidate interviews schedule for November 8, 2012.
- Staff to present a recommendation to execute an RFP staffing contract at the December 6, 2012 Board Meeting.

# Future RCF Responsibilities

- Provide control for aircraft movement at 14 additional gates at Terminal 2 East and Terminal 2 West.
- Use Authority gate management system (GMS) to maximize the benefits of common use gates during irregular operations.
- Coordinate hard-stand (ground boarding operations) on the west side of the Green Build ramp.
- RCF can be used as a backup FAA tower if needed.



# Closing Comments



# Questions & Answers

