

Appendix

Runway 13R/31L Safety Area Mitigation and Runway Use Program

Appendix Addendum

In response to the review of the Draft Master Plan and the accompanying Airport Layout Plan Drawing Set, the Runway 13R/31L Safety Area Mitigation Program has been review by various FAA Divisions. A copy of the Air Traffic Control Manager's response (dated June 26, 2001) is provided on the following two pages. The comments in this response have been taken into consideration in the revisions made the Airport Layout Plan Drawing Set included in this Revised Draft Master Plan document. In addition, the comments related to taxiway markings, hold line markings, administration of agreements, and the letter of agreement will be adhered to in the implementation of the Safety Area Mitigation and Runway Use Program improvements.

It should be noted that in consideration of comments received from the FAA, the Taxiway X-Ray (X) designation referred to in this Appendix, has been changed to Taxiway Zulu (Z).

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U. S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: Response to FAA Study Number 00-SEA-297-NRA,
King County International Airport Layout Plan

Date: JUN 26 2001

From: Air Traffic Division Manager, ANM-500

Reply to
Attn. of:

To: Manager, Airports Division, ANM-600

SAFETY MEETING

This response addresses only the proposed establishment of an 880-foot non-standard runway surface at the approach end of Runway 13R at King County International Airport, Boeing Field (BFI). The Air Traffic Division does not object to the establishment of this non-standard area, which has been designated as the Prior Permission Required Pavement (PPRP). However, we do have concerns regarding the implementation and use of the PPRP. This memorandum details the impacts to BFI operations that we envision will result from the establishment of the PPRP, as well as issues that need to be resolved prior to the approved use of the new surface.

1. Part 77: Surfaces. 14 CFR, Part 77.21(a) establishes standards for determining obstructions to air navigation. Part 77.21(b) states the primary surface extends 200 feet beyond the end of the runway. It also states "At those airports...having a defined landing and takeoff area with no defined pathways for the landing and taking off of aircraft, a determination shall be made as to which portions of the landing and takeoff area are regularly used as landing and takeoff pathways. Those pathways so determined shall be considered runways and an appropriate runway surface as defined in 77.25(c) will be considered as being longitudinally centered on each runway so determined and each end of that primary surface shall coincide with the corresponding end of that runway." Advisory Circular 150/5325-4A, Runway Length Requirements for Airport Design, Chapter 1, paragraph 2, defines regular use as at least 250 operations per year. Planned use of the PPRP indicates more than 300 operations per year, which meets this definition. Therefore, the primary surface must be reestablished and depicted on the Airport Layout Plan (ALP).
2. Verification of taxiway centerline markings. Several configurations have been considered and it is our recommendation that the markings for Taxiway B remain in their present configuration. This is to help ensure unauthorized aircraft do not taxi beyond Taxiway B1 to the PPRP. The taxiway centerline markings should not be continuous from Taxiway B into Taxiway X. Taxiway B markings should terminate at taxiway B1 and Taxiway X markings should not begin until substantially north of Taxiway B1.

3. Verification of required Taxiway/Runway Holding Position markings. Location of the hold line is critical. The three options we recommend, in priority preference, are as follows:
 - a. Place the hold line coincidental with the runway safety area. This will facilitate the ability of controllers to clear aircraft to the PPRP. If placing the hold line at this location raises the approach minimums for the ILS Runway 13R approach, then option "b." becomes the preferred option.
 - b. Place the hold line at the point the Part 77 approach surface crosses Taxiway X (about 400 feet north of Taxiway B1). If this is not feasible due to any approach and/or airport surfaces, option c) is acceptable.
 - c. Place the hold line at the end of Taxiway B, as currently depicted on the ALP. It is important that all parties understand that if this is determined to be the best location for the hold line, it will be necessary to increase the arrival spacing to provide a 15 to 30 mile "slot" to accommodate each PPRP departure. This will result in substantial delays for both aircraft departing on the PPRP and for aircraft arriving on Runway 13R. This, in turn, will create a marked increase in controller workload and coordination for Boeing ATCT and Seattle TRACON.
4. Administration of agreements. Ensuring adherence to any agreement entered into by the airport and The Boeing Company shall not be the responsibility of the FAA. Air Traffic Control responsibilities are to ensure safe and efficient operations. Controllers will not question pilots who state they are authorized to utilize the PPRP of the runway. Additionally, FAA personnel should not respond to complaints regarding the existence and/or use of the PPRP; that will be the responsibility of King County International Airport/Boeing.
5. Letter of Agreement (LOA). A Letter of Agreement will be established between Boeing ATCT and King County International Airport to define the operating procedures for the use of the PPRP and Runway 13R. Items 1 through 4 above will need to be resolved prior to the establishment of this LOA.

Procedures must be established, and operational personnel trained in the use of those procedures. Therefore, Air Traffic will require definitive resolution to all of the above issues and concerns, as well as the impact of the construction equipment, no later than 90 days prior to planned use of the PPRP.

If there are additional Airport Layout Plan issues that must be addressed, please advise our Airspace Branch Manager, Carla Mawhorter, at extension 2520.


for David B. Johnson



**King County
International Airport**
Boeing Field



**RUNWAY 13R/31L
SAFETY AREA MITIGATION
and
RUNWAY USE PROGRAM**

9/1/2000

King County International Airport / Boeing Field

**Runway 13R/31L
Safety Area Mitigation
And
Runway Use Program**

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King County International Airport Runway 13R/31L Safety Area Mitigation

The runway safety area on the south end of the King County International Airport's main runway (approach end of Runway 31L) does not meet current FAA standards. It has also been documented that maintaining a 10,000 foot takeoff runway length is a vital component necessary to support some of the operational activity at the airport (primarily the Boeing flight test program and the AWACS modification and maintenance program).

Runway Improvements

A system of improvements is recommended to bring the safety area up to FAA standards, maintain the 10,000-foot takeoff runway length, and minimize potential effects on surrounding land uses. The first component of this system of recommendations is to shift the start-point for Runway 13R departures (departures to the south) approximately 880 feet to the north. The basic improvement is to construct approximately 880 feet of pavement on the north end of the main runway plus the required blast pad (400 feet in length). This new 880 feet of pavement will only be utilized by those aircraft that require a takeoff Accelerate Stop Distance Available (ASDA) length which exceeds 9,120 feet or require a takeoff runway length beyond 9,120 feet for special operations such as aircraft testing (e.g., the Boeing flight test program and the AWACS modification/maintenance program). Due to the new pavement's limited use for special operations, it will be referred to as the **Special Use Area – Runway 13R**. Based on master plan forecast, we conservatively estimate about 322 operations a year would require the use of the Special Use Area – Runway 13R by the end of the planning period (2017).

The second component of the system is to implement FAA's declared distances criteria, which defines the usable runway length in consideration of required safety area standards. Declared distances allow an airport operator to light and mark the runway in a manner that designates where landing thresholds are located and where the takeoff roll begins and ends. The recommended system of improvements provide the following operational characteristics:

1. The landing threshold on the north end of the runway remains in its existing location. In consideration of the safety area available, there is 9,120 feet of length declared available for aircraft landing on Runway 13R.
2. The landing threshold on the south end of the runway will be displaced approximately 80 additional feet to the north (the threshold was displaced 800 feet for the implementation of a new Instrument Landing System Approach to Runway 31L in 1998). In consideration of safety area available, there are (and will be in the future) 9,120 feet declared available for aircraft landing on Runway 31L.
3. For south departures, aircraft that require a takeoff ASDA beyond 9,120 feet or require a takeoff runway length beyond 9,120 feet for special operations such as aircraft testing (e.g., the Boeing flight test program and the AWACS modification/maintenance program), can begin their take-off roll 880 feet to the north of the existing landing threshold on the

proposed new pavement designed for this special use. Those aircraft that do not need an ASDA beyond 9,120 feet will utilize the existing runway end, south of the landing threshold, for the beginning of their takeoff roll.

4. For departures to the north, aircraft will continue to operate as they do now. They will utilize the existing southern runway end for the beginning of their takeoff roll. In consideration of declared distances, north departures will have a 10,000-foot takeoff runway length available.

Note that the new pavement on the north end of the runway will not be available for landing or takeoff to the north (i.e., operations on Runway 31L).

Taxiway System Improvements

The existing taxiway system at the airport provides efficient routing for taxiing aircraft between the runway system and various airport parking areas on the airport in consideration of present activity levels. The airport currently has full parallel taxiway systems serving the southwest side of the main runway and the northeast side of the secondary runway.

Taxiway access to the new pavement on the north end of the main runway is to be provided by an extension of the existing parallel Taxiway Bravo (B) which will be designated as Taxiway X-ray (X). Because the new runway pavement will receive only limited use as described above, the new taxiway pavement has been given a different name. The different designation of the new taxiway pavement will allow air traffic control tower personnel to more easily direct taxiing aircraft to the proper position for the start of the takeoff roll. In addition, the new taxiway pavement will be signed, marked, and lighted to indicate its limited use role.

Taxiway X will be constructed with a 325-foot taxiway to runway centerline separation, allowing an adequate Taxiway Object Free Area (TOFA) to be maintained between the taxiway and the Boeing Company's test stall A-6. A primary concern is the FAA standard 400 ft runway/taxiway centerline separation for new construction. However, a separation of more than the existing 325 feet will be very costly because the northwest side is extensively developed. Considering the very high cost to The Boeing Company of modifying test stall A-6 (\$3-3.5 million), Taxiway X has been designed to minimize impacts to the Boeing Company leasehold while maintaining the current level of safety.

Impacts of Taxiway Separation to Boeing Company

The Boeing Company's Facilities Asset Management organization has been supporting the airport runway relocation effort through their West Region Planning Office. Working with KCLIA management, it has reviewed a number of suggested taxiway configurations and developed estimates of physical and economic impact for each. Even the best alternative exacts a cost. The worst choices were so expensive as to make the project impractical.

The minimum impact to The Boeing Company is reflected in the present proposal, a straight extension of the present west taxiway ("Bravo") to serve the new Special Use Area - Runway 13R. In maintaining the existing 325-foot runway-taxiway centerline separation, Boeing estimates its cost will be about \$500,000. This provides for new blast fence and sound wall construction along the proposed new taxiway to protect the North Field Labs area located north of the "A" parking concourse, and some minor blast fence revisions on the east corner of stall A-6 (nearest the taxiway.) There would be minimal impact to parking stalls except when very large airplanes are parked in A-6, such as the 777. In that case, to honor the new TOFA, the airplanes could be oriented slightly more westward to meet clearance requirements.

If the west taxiway were extended with a separation exceeding 325 feet, the encroachment onto Boeing "A" concourse stalls becomes severe. As before, it would require new blast fence/sound wall construction along the taxiway for the North Field Labs. It would also force significant realignment of the "A" parking stalls with probable loss of stall A-4 used for 737 and 757 aircraft. The "A" stalls are usually busy even without major test programs, so this is a substantial operating hindrance. All parking stalls have in-pavement service for utilities, aircraft power, and computer data buss. Such realignments would require new underground utility vaults for 400 Hz electric power, air and water, and relocation of four crew shelters. This has been estimated to cost approximately \$3.5 million. This cost, along with the loss of one of six parking stalls, would be an unacceptable burden. Undoubtedly, The Boeing Company would want to reconsider the relative impact of the overall runway project. It would be forced to strongly consider operating with a shortened runway or conducting some or all of its flight operations elsewhere. The accompanying job impacts could adversely impact the region's economy.

Environmental Mitigation

Over the past several years the King County International Airport has been involved in preparing an Airport Master Plan. During the planning process, it was recognized that the existing Runway Safety Area for Runway 13R/31L does not meet the FAA's current airport design standards, a requirement under Federal Aviation Regulation Part 139. After all prudent and feasible alternatives were reviewed, it was determined that only two primary alternatives existed which would allow the airport to meet the required standards: shift the runway about 880 feet to the north or shorten the runway by about 880 feet.

It was determined that the shortening of the runway will create significant effects on the operational capability of the airport and adversely affect the capabilities of its tenants, primarily the Boeing Company and its customers such as the military AWACs. For these operators, aircraft testing and maintenance would be adversely affected. Therefore, the decision was made to shift the runway northward about 880 feet to maintain the departure runway length of 10,000 feet.

However, other factors complicated the northward shift. The Georgetown Steam Plant (the Steam Plant), a National Historic Landmark, is located at the Airport. It is the last working example of vertical Curtis turbines and is an example of the innovative fast-track design and construction method pioneered by Frank Gilbreth, a nationally recognized efficiency engineer.

The Steam Plant is owned by the City of Seattle, which leases the facility to a museum foundation whose purpose is to preserve the historical integrity of the Georgetown Steam Plant.

The Georgetown Steam Plant is located approximately 1,200 feet from the existing runway end and taxiway and will be about 420 feet away from the proposed runway shift.

Preliminary noise analysis showed that full use of the new pavement would have an unacceptable impact on the Steam Plant (an increase in noise by 1.5 DNL). Therefore the county began consultation with the FAA to develop a means of meeting the needs of the airport's tenants while preserving the integrity of the historic Steam Plant.

The Special Use Area of Runway 13R and its access Taxiway X emerged from a year long consultation with the FAA, the Boeing Company and other governmental agencies and airport users. To minimize aircraft noise impacts to the Steam Plant, the County proposed that only the aircraft that demonstrate the need for a runway in excess of 9,120 feet would use the additional pavement. Under this scenario, forecasters conservatively anticipate about 322 operations a year (about 1 per day) would require this length by 2017. This is expected to consist of primarily two subsonic aircraft: AWACs, Boeing aircraft testing, and on rare occasions, other aircraft operators requiring a longer runway.

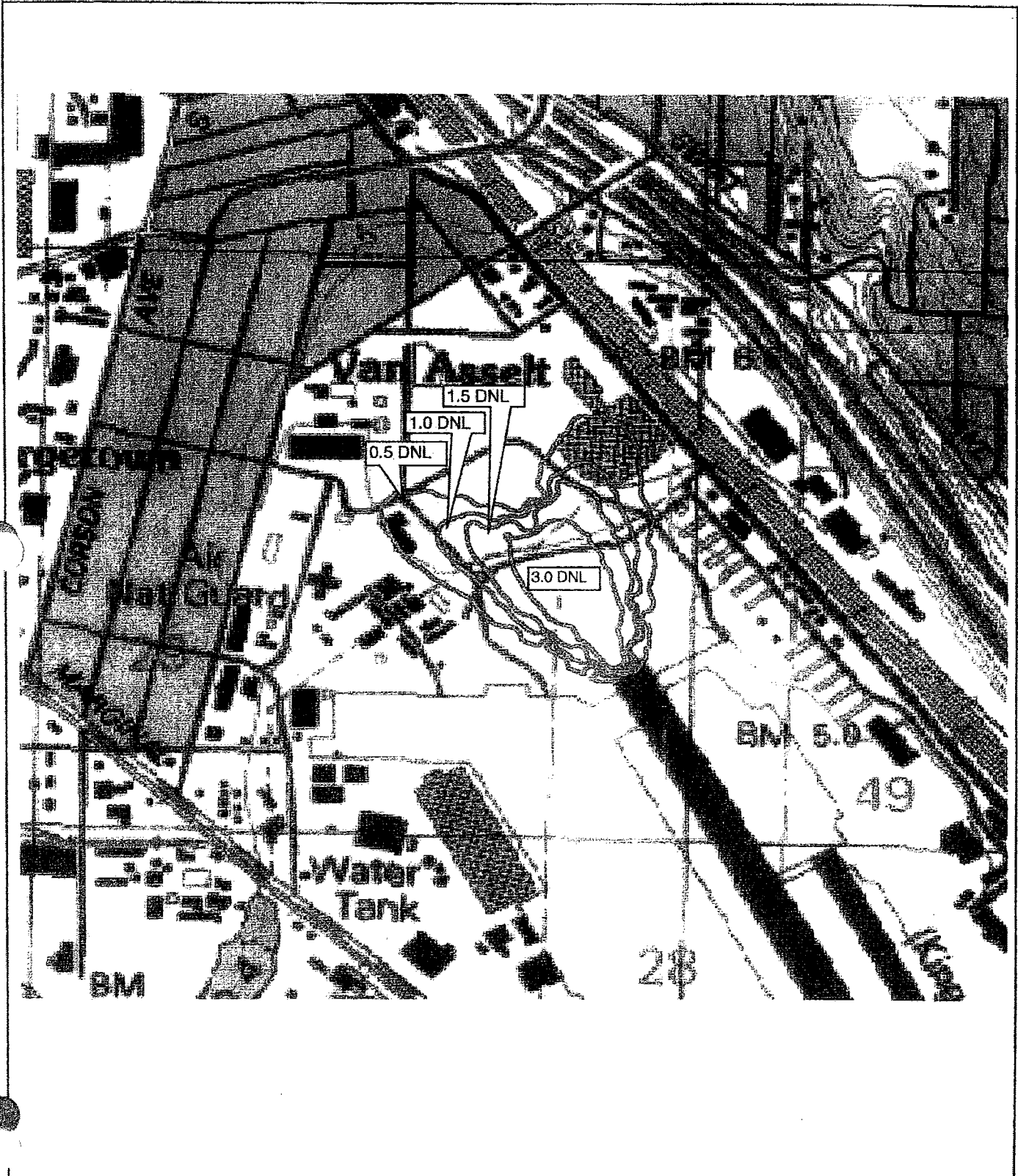
A noise analysis conducted for the State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS) for the airport master plan, which now reflects the construction of the new pavement (Special Use Area - Runway 13R), found that the limited use of the new pavement would not create a significant noise impact on the Steam Plant, as defined by FAA Order 5050.4A, and that no noise mitigation is warranted. The Georgetown Steam Plant would receive less than 1.0 DNL change as a result of the County's proposal. The map below shows the area of potential effect of the proposed development of the runway shift (Special Use Area - Runway 13R). Because the project noise level change is not considered significant to the Steam Plant or to other off-airport locations, as defined by the FAA's Order 5050.4A *Airport Environmental Handbook* (Paragraph 47e(1)(d)2), no other mitigation is warranted.

Figure 1

Future Change in DNL Noise Level

King County International Airport (EA)

Change in DNL due to the Master Plan 880' foot runway shift (0.5, 1.0, 1.5 and 3.0 DNL)



Prepared August 2000

**King County International Airport
Runway Use Program
Special Use Area - Runway 13R and Taxiway X**

Introduction and Purpose

The Federal Aviation Administration (FAA) and the King County International Airport (KCIA) have agreed to establish limited access provisions related to the use of pavement constructed north of the Runway 13R landing threshold at King County International Airport/Boeing Field (BFI) hereinafter to be called Special Use Area - Runway 13R. This use agreement will be administered under the informal use program, described below.

This Runway Use Program has been developed under FAA Order 8400.9, National Safety and Operational Criteria for Runway Use Programs, which provides safety and operational criteria for runway use programs. Under this program prior permission is required (PPR) from the KCIA management for an aircraft operator to use the Special Use Area – Runway 13R and Taxiway X.

Aircraft operations which will be approved under this runway use program include, but are not limited to, aircraft being tested or operated by the Boeing Company or its customers under separate voluntary agreements; and on rare occasions, other aircraft operators who require in excess of 9,120 feet when departing Runway 13R due to aircraft size and weight, weather conditions, and operational need.

For south departures on Runway 13R, aircraft that require a takeoff Accelerate Stop Distance Available (ASDA) beyond 9,120 feet or require a takeoff runway length beyond 9,120 feet for special operations such as aircraft testing (e.g., the Boeing flight test program and the AWACS modification/maintenance program) will be approved.

These aircraft will begin their take-off roll approximately 880 feet to the north of the runway 13R landing threshold on Special Use Area - Runway 13R after exhibiting an operational need and receiving approval from the airport manager. Special Use Area - Runway 13R includes approximately 880 feet of pavement on the north end of the main runway plus the required blast pad (400 feet in length). This segment of Runway 13R will be opened and closed at the discretion of the airport manager for operators exhibiting an operational need according to the procedures identified in this document.

Those aircraft that do not need an ASDA beyond 9,120 feet will utilize the existing runway end, south of the landing threshold, for the beginning of their takeoff roll.

Criteria for Use of Special Use Area – Runway 13R

Aircraft operators seeking use of Special Use Area - Runway 13R must meet the following criteria to obtain permission from the airport manager to access the area:

1. Be a party to a memorandum of agreement, which documents their need to use the Special Use Area - Runway 13R (e.g., Boeing Co.); or,
2. On rare occasions, show an operational need on a case by case basis.

Approval

Access to the special use area is allowed only if the airport manager approves a request. All aircraft operators wishing to use the Special Use Area - Runway 13R must request permission from the airport manager in writing using the appropriate airport application form(s) or letters of agreement. On approval, a PPR authorization number will be issued to the operator by the airport manager. This PPR authorization number will be required prior to receiving a clearance to access the Special Use Area by the Air Traffic Control Tower. The authorization applies only to the circumstances and dates described in the application, and all other use of the Special Use Area – Runway 13R will require an additional application.

Airport Staff will convey all PPR authorization numbers to the ATCT prior to their use by aircraft operators. Air Traffic Control personnel will record corresponding authorization numbers on aircraft flight strips.

Public Notice

Public notice and publication of this program's requirements will be made via insertion in the FAA Airport/Facility Directory for the Northwest Region and letter to airmen. Through use of the PPR process, non-based or operators that are not parties to a Memorandum of Agreement (see sample below) may request in advance, access to the Special Use Area - Runway 13R. Application forms are available from the airport management (see sample below).

Sample Airport/Facility Directory - Notice

“Prior Permission Required (PPR) for aircraft requiring the use of the Special Use Area north of Runway 13R to meet an ASDA exceeding 9,120 feet on Runway 13R (Max ASDA – 10,000’). Users are required to submit written request to obtain a PPR authorization number prior to taxi for takeoff. Request forms are available upon request by calling (XXX) XXX-XXXX.”



KING COUNTY INTERNATIONAL AIRPORT PRIOR PERMISSION REQUEST FOR SPECIAL USE AREA – RUNWAY 13R

King County International Airport (KCIA) has established a Prior Permission Requested (PPR) Policy and Procedure for use of the Special Use Area – Runway 13R (880 foot runway pavement north of the Runway 13R Landing Threshold). Access to this Special Use Area is granted on a case by case basis and is provided only to aircraft operators who can demonstrate the need for additional pavement length for takeoff based on aircraft specifications, i.e., aircraft specifications require an Accelerate Stop Distance (ASDA) greater than 9,120 feet. The Special Use Area is marked with yellow chevrons to indicate its restricted use and is not lighted as conventional runway or taxiway area except when an operator receives permission from the Air Traffic Control Tower controller to proceed for takeoff, in accordance with the PPR procedures. Operators wishing to use the Special Use Area must complete and submit this request. **Access to the Special Use Area is allowed only if the Airport Manager approves the request.** If approved, a PPR authorization number will be provided. This number is to be conveyed at time of initial contact with the Air Traffic Control Tower, prior to taxi.

Applicant Name: _____ Address: _____
(Please Print)

Aircraft Type: _____ Aircraft Tail Number: _____

Date of Application: _____ Date of Proposed Use: _____

Description of Operation(s) (and dates, if more than one) of Proposed Use: _____

(Please complete on reverse if more space is needed)

Documentation of Operational Need: _____

Applicant Certification:

The undersigned applicant requests use of the Special Use Area – Runway 13R, based on the operational need stated above. The applicant acknowledges that it may use the Special Use Area only if this request is approved by the Airport Manager. The applicant further acknowledges that this authorization applies only to the circumstances and dates described above, and that any other use of the Special Use Area – Runway 13R requires a specific additional application. The applicant agrees not to disclose its PPR authorization number to any other party. The applicant agrees to conduct all operations in strict compliance with all PPR procedures, Airport and FAA rules and regulations and all other applicable laws and regulations and with instructions from the Air Traffic Control Tower. The applicant understands that the Special Use Area is marked and lighted unconventionally to designate its restricted use. The applicant agrees to defend, indemnify, and hold King County, its officers, agents and employees harmless from and against any and all damages, actions, costs, claims, and/or judgments arising out of or relating to the applicant's use of the Special Use Area.

The applicant hereby acknowledges and agrees to these provisions and has caused this certification to be signed by its duly authorized officer or representative as of the date set forth below.

By: _____ For: _____
(Signature) (Printed Name) (Company) (Date)

Application Received Date: _____ (for Airport use only)
Airport Manager Review Date: _____

Approved _____ Denied _____

Airport Manager

PPR # Issue Date: _____

Faxed to ATCT: _____ Copy to Applicant: _____
Date/Time: _____ By: _____ Date/Time: _____ By: _____

**Memorandum of Agreement
between
King County International Airport
and
The Boeing Company**

For Access to the Special Use Area – Runway 13R

This Memorandum of Agreement (“Agreement”) is entered between the King County International Airport (“KCIA”) and The Boeing Company (“Operator”)

RECITALS

- A. The King County International Airport (KCIA) has established a Prior Permission Request (PPR) Policy and Procedure for use of the Special Use Area – Runway 13R. This Special Use Area consists of the 880- foot runway pavement north of the Runway 13R Landing Threshold.
- B. Permission to use the Special Use Area is granted on a case by case basis and is provided only to aircraft operators who can demonstrate the need for additional pavement length for takeoff based on aircraft specifications, i.e., aircraft specifications require an Accelerate Stop Distance (ASDA) greater than 9,120 feet or special needs are associated with aircraft testing, etc.
- C. The Operator has demonstrated a need to use the Special Use Area and the Airport Manager has approved this use subject to the terms of this Agreement.

NOW, THEREFORE, in consideration of the promises and mutual covenants and agreements herein, the adequacy of which is acknowledged, the parties agree as follows:

AGREEMENT

Section 1. Use of Special Use Area

The Operator is hereby granted permission to make the following use of the Special Use Area:

Testing of the Boeing 777 test aircraft as a regular part of the Boeing Flight Test Program.
Operation: Full performance departures at maximum gross weight
Frequency of Operation: 3 times weekly

(attach additional sheets as needed)

Any other use of the Special Use Area whatsoever is specifically prohibited without the prior written approval of the Airport Manager. Nothing herein shall be construed as granting the Operator an exclusive right to the use the Special Use Area.

Section 2. Term

This Agreement is from the date of execution to [insert date].

Section 3. Compliance with Law, Regulations, and Policies

The Operator shall conduct all operations in strict compliance with: 1) all KCIA PPR procedures; 2) all applicable laws and regulations, including, but not limited to, KCIA and Federal Aviation Administration rules and regulations; and 3) all instructions from the Air Traffic Control Tower.

Section 4. Indemnification

1. The Operator agrees to defend, indemnify, and hold King County, its officers, agents and employees harmless from and against any and all damages, actions, costs, claims, and/or judgments arising out of or relating to the Operator's use of the Special Use Area.
2. The foregoing provisions specifically and expressly intend to constitute a waiver of each party's immunity under industrial insurance, Title 49 RCW, as respects the other parties only, and only to the extent necessary to provide the indemnified party with a full and complete indemnity of claims made by the indemnitor's employees. This waiver has been mutually negotiated.
3. The defense, indemnification and hold harmless obligations contained herein shall survive the expiration or termination of this Agreement.

Section 5. Insurance

[To be obtained from Risk Management]

Section 6. Termination

1. If the Operator fails to comply with any provisions of this Agreement or any applicable law, rule, regulation or policy, KCIA may terminate this Agreement immediately for default upon written notice to the Operator.
2. Any party may terminate this Agreement for convenience upon 5 days prior notice in writing to the other party.

Section 7. Notice

All notices, requests, and other communications that are required to be or may be given under this Agreement shall be in writing and shall be deemed to have been duly given when delivered in person or transmitted by facsimile or upon receipt after dispatch by certified or registered first class mail, postage prepaid, return receipt requested, to the party to whom the same is so given or

made, to the addresses and/or facsimile numbers set forth below, or to such other address or facsimile number as any party may designate by giving notice to the other parties hereto.

If to KCIA, to:

**Airport Manager
King County International Airport
7233 Perimeter Road
PO Box 80245
Seattle, WA 98108
(206) 296-7430 FAX: (206) 296-0190**

If to the Operator:

**Flight Test Operations
The Boeing Company
PO Box 3707 MC 14-49
Seattle, WA 98124**

SAMPLE

Section 8. General Provisions

1. It is understood and agreed that this Agreement is solely for the benefit of the parties hereto and gives no right to any other party. No joint venture or partnership is formed as a result of this Agreement. No employees or agents of one party or its contractors or subcontractors shall be deemed, or represent themselves to be, employees, agents, contractors or subcontractors of the other party.
2. This Agreement shall be interpreted in accordance with the laws of the State of Washington in effect on the date of execution of this Agreement. The Superior Court of King County, Washington, shall have exclusive jurisdiction and venue over any legal action arising under this Agreement.
3. Each party's rights and remedies in this Agreement are in addition to any other rights and remedies provided by law.
4. This Agreement, constitutes the entire agreement. Any modification or waiver of the terms of the Agreement shall be in writing and signed by all parties.

Executed this ____ day of _____, 2000.

By: _____
Airport Manager

Operator

For: King County International Airport

For: The Boeing Company

How this Proposal Would Work

If initiated this proposal would work as follows. The new pavement will consist of two components:

Special Use Area - Runway 13R – Approximately 880 feet of pavement on the north end of the main runway plus the required blast pad (400 feet in length). This segment of runway will be opened and closed at the discretion of the airport manager as stated in the airport's runway use program.

Taxiway X-ray - Taxiway access to the new pavement on the north end of the main runway is to be provided by an extension of the west parallel Taxiway B which will be designated as Taxiway X. Taxiway X will be constructed with a 325-foot taxiway to runway centerline separation. This allows an adequate Taxiway Object Free Area to be maintained between the taxiway and the Boeing Company's test stall A-6.

Operation

Normal aircraft operations will use Taxiway B-1 for departures and arrivals. The Special Use Area – Runway 13R will be closed to all operations during normal periods.

In the case where usage of the special area is required, all aircraft operators using the new pavement will present the Air Traffic Control Tower (ATCT) with a PPR authorization number provided by the airport management. Airport staff will convey all PPR authorization numbers to the ATCT prior to their use by aircraft operators.

When the ATCT clears an aircraft to use the special use, the controller shall in effect open Taxiway X and Special Use Runway 13R and engage an electrical switch. The switch will:

1. Turn off the lighted "Stop Bar"
2. Turn off the "Do Not Enter" sign
3. Turn on the lights for Taxiway X and the Special Use Area - Runway 13R

After the pavement is vacated, the controller will in effect close Taxiway X and Special Use Runway 13R by disengaging the electrical switch, returning all lighting to its normal operating condition.

Lighting

- A red lighted “Stop Bar” will be placed between Taxiway B and Taxiway X.
- Taxiway X will have standard taxiway lights when in use.
- Special Use Area - Runway 13R will have standard runway lights for this declared distance configuration (split lenses – red to the north RW13R and blackened lenses to the south RW31L).
- Approach lights will be embedded in the runway pavement north of the Runway 13R landing threshold.

Signage

- Two informational signs will be added and will read as follows:
“Do Not Enter” (Lighted)
“Prior Permission Required for Use” (Reflectorized)
- Standard taxiway and runway identification and hold signs will be used.

Pavement Markings

- Special Use Area - Runway 13R will be marked as unusable pavement with yellow chevrons to indicate its restricted use.
- Taxiway X will be marked with standard yellow taxiway markings.
- Hold lines will be painted as appropriate.

Procedures at Other Airports as Examples for Boeing Field

At the FAA's request, we've reviewed airports throughout the country to see how others have resolved similar constraints and various concerns voiced during our efforts to comply with new Runway Safety Area requirements and maintain a 10,000-foot runway at BFI.

Several significant issues face King County airport, the FAA, airport tenants, workers and users, and the surrounding neighborhoods in addressing the relocation of runway 13R. All parties seek practical assurance that, to minimize noise, the northerly runway extension will not routinely be used for takeoffs. It is important that airport capacity and safety be preserved. A primary concern is the recent FAA standard 400 ft runway-taxiway separation for new construction. In fact, a separation more than the existing 325 feet will be very costly because the northwest side is extensively developed and has no open land. Considering the very high cost, primarily to The Boeing Company, these airport examples offer mitigating means that should be considered at BFI. The labor unions representing Boeing employees at BFI recognize that a solution that is too costly in dollars will likely be too costly in jobs. They strongly support efforts to adopt a practical and cost-effective proposal. Various alternatives have been considered. Some did not support safe aircraft operations, were needlessly complicated, or too expensive. A reasonable path needs to be adopted.

The following discussions illustrate airports around the country which offer proven solutions to similar, if not more severe, problems. The list is a quick sampling, certainly not exhaustive. All procedures are FAA approved and most airports are FAR part 139 certificated with extensive airline service. They address four main topics: access control to specialized runway areas, "intersection" takeoffs, substandard taxiway dimensions and ILS signal protection. After the examples in each section are discussed, a summary paragraph describes how the proposal for BFI would apply to this issue. The separate bundle of Jeppesen airport pages depicts these procedures graphically as pilots would see them.

With this in mind, we propose to extend the existing west parallel taxiway with its existing runway separation of 325 feet to serve the new northerly portion of runway 13R. Although less than the new standard separation, this minimizes the cost impacts to The Boeing Company, supports the proven excellent safe operating at BFI, and offers the best operational features for capacity and aircraft movement.

Approved Procedures Already in Use Elsewhere

A) To control and restrict access to special-use portion of the runway:

- (1) At Fairbanks International Airport in Alaska, note the following in the Jeppesen approach charts: " Noise abatement procedures restrict the north 750 ft of rwy 1L-19R to those aircraft with combined weight or other condition which necessitates an "extended length" departure of 11,800 ft."

The runway is 11,800 feet long but only the southerly 11,050 feet is normally available. They have no special taxiway patterns or designations, no special guidance lighting, just the note in the FAA-approved airport publications and in their own airport brochures.

- (2) Furthermore, at Anchorage International Airport a similar procedure is on the books called the "Runway 32 Extension Departure." This is described on a Jeppesen page as follows:
"...An 888' extension has been constructed on the south end and a 200' extension has been constructed on the north end of Runway 32. These extensions provide a TORA of 11,584' on runway 32...
b. Only aircraft whose combined weight, stage length or other condition necessitate an "extended length" departure from the extended Runway 32 departure end will request it.
c. Aircraft requiring an extended departure will notify ATC prior to taxi...."

Other than a displaced threshold, as BFI would also have, nothing special is used in the way of lighting or taxiway layouts. Anchorage noise abatement procedures are also defined in FAA Order 7110.65J Air Traffic Control, which cooperates with the extended departure.

Summary

The proposal at Boeing Field would include a combination of similar procedural notes, plus special lighting, signs and a different designator ("X-ray") for the new portion of parallel taxiway serving the northerly extension of runway 13R. Keep the existing "bravo" name south of the extension and routinely clear taxiing airplanes to that point. Only upon special request would ATC clear a pilot to taxi via "X-ray" for extended takeoff. This simple instruction would assure that virtually all operators would take off from the existing threshold. Signs and lighting would confirm the normal takeoff location and clarify that the northerly section of 13R is closed except to specific operations. Once specifically cleared, the markings would change to provide proper guidance to the extension. This should further prevent unauthorized airplanes from taxiing to the far north end.

B) To clear aircraft for takeoff at locations other than the extreme end of the departure runway:

- (1) **Los Angeles International, Chicago O'Hare International, Pittsburgh International and Cleveland International**, among others, publish notes on their Jepp pages that the tower may clear aircraft for takeoff at intersections other than the extreme end of the runway. Some are several thousand feet from the physical runway end. These airports all have more IFR operations than BFI.

Summary

The proposal for Boeing Field would include a different designator ("X-ray") for the new portion of parallel taxiway serving the northerly extension of runway 13R. Keep the existing "bravo" name south of the extension and routinely clear taxiing airplanes to that point. This simple instruction makes clear to pilots the limit of their taxi clearance (unless specially authorized) and would assure that "ordinary" operators would take off from the existing threshold. Additional lighting and signs would clarify that the northerly section of 13R is closed except to specific operations and should further prevent airplanes from taxiing unauthorized or unseen to the far north end. Given the much smaller IFR traffic volume this procedure should be completely acceptable.

C) To operate with runway-taxiway or taxiway-ramp separation or width issues:

- (1) **At Ontario International airport in California note the following in the Jeppesen charts: "Due to runway/taxiway centerline separation (275') when B747, B777 and A330/340 are landing or on take-off on rwy 8L/26R; twy N between twys A & U and twy M closed to B747, B777 and A330/340."** They do not depict any other means to prevent these large airplanes from using the taxiways except to withhold taxi clearance when a large airplane is landing. Taxiways M and N parallel runway 8L/26R (12,200' long, 150' wide) for about 3/4 of its length with only 275' separation.
- (2) **At Ft. Lauderdale International (Florida) a footnote cautions that "twys south of twy B and west of 13-31... are 50' wide or less. Design criteria for large aircraft not maintained."** Another note cautions that **"wide body aircraft departing rwy 9L should follow taxiway centerline into position on rwy."**
- (3) **Atlanta Hartsfield International** has reduced taxiway dimensions and notes **"category VI aircraft with a wing span greater than 214 ft are restricted from using taxiway Foxtrot..."** where it narrows near concourse E. This is not a matter of runway clearance, but of ramp clearance.
- (4) **Las Vegas McCarran International** has runway-taxiway clearance issues so **"twys E and F limited to MD-11 aircraft or smaller. Aircraft larger than B757 on prior request from the Dept of Aviation to use twy H."** Taxiways E and F parallel runway 19R which is 9770 ft long. Taxiway H runs alongside taxiway F farther from the runway.

- (5) **Memphis International** notes "... taxiway V parallel to rwy 9-27 closed to aircraft with tail heights greater than 63' 8" and B747 or larger aircraft." This taxiway is close to the runway such that tail height effects the airspace alongside the active runway.
- (6) **Milwaukee Mitchell International** protects taxiway-runway separation by closing midsections of the parallel taxiways during low IFR approach conditions: "Twy A closed... and Twy E closed... to DC-10, B747, C5A, MD-11 during CAT II and CAT III operations." The closed portions are midfield near the runway intersections.
- (7) **Duluth International** has a section of parallel taxiway C which is near the runway and closes it to larger airplanes when the associated runway is in use: "When rwy 3-21 is in use, taxiway C north of rwy 9-27 is restricted to aircraft with wingspan less than 49 ft."
- (8) **Miami International** restricts access to taxiway U off the approach end of runway 27R: "Aircraft with a wingspan greater than 143' are prohibited from using twy U."
- (9) **Windsor Locks Bradley International** also closes a section of taxiway paralleling runway 6 (ILS CAT II runway) to large airplanes: "Twy J closed... to acft with wingspans in excess of 171 ft."

Summary

There is a 325' taxiway-runway separation at BFI that has had no operational problems on taxiway B. Locating the extended taxiway for greater separation will cost Boeing a lot of money (perhaps several million dollars) and the loss of airplane parking stalls, without any real benefit. An established alternative would be to maintain existing taxiway separation and hold aircraft short to prevent movement on the new taxiway extension during IFR approach conditions. Procedural notes to this effect would also be used. Infrequent use of the extension and lower IFR traffic levels support this plan.

D) To designate taxi hold points well distant from the departure runway or unusual hold markings:

- (1) **Windsor Locks Bradley International** holds taxi traffic about 1200 ft short of runway end for runway 6 and 24 (ILS runways).
- (2) **Seattle-Tacoma International** holds traffic for 16R about 1500 ft short of the runway end and about 900 ft short of runway 34R. This protects ILS signal quality for those approaches.
- (3) **Boston Logan International** has a number of nonstandard ILS and VFR hold lines including a complex curved hold line at intersection of runway 9 and 4L.

The suggestion at BFI is to assure ILS quality by holding departing airplanes at the existing north end of 13R during ILS approaches until landing traffic has passed. This procedure is safe and practical as evidenced by the examples above. The low number of full-length takeoffs will not impact capacity when users are held at the existing end to protect ILS 13R signal.

Final Summary

The airports discussed here employ FAA-approved procedures that have proven themselves practical under circumstances at least as difficult as those facing BFI, without additional complication or embellishment. In combination with proper signage and lighting, similar methods should be more than adequate to assure safe operations, maintain airport capacity and protect the Special Use Area - Runway 13R from improper use at BFI.

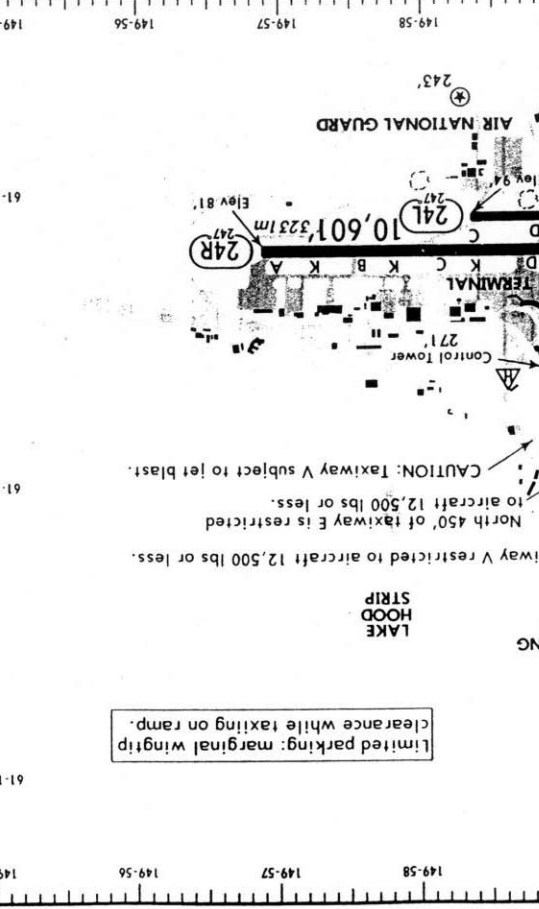
GENERAL
 CAUTION: Noise sensitive area in effect, contact Airport Directors office for further information. One hour prior permission required for non-transponder acft operations. Non-radio night operations not permitted. Prior permission required for non-radio acft operations. Pilots must provide an ETA & remain within ±15 min of ETA. To coordinate non-transponder or non-radio operations, contact Anchorage Tower weekdays or FAA other times.
 Birds in vicinity of airport.

PANC ANCHORAGE, ALASKA
 ANCHORAGE INTL
 051.9°/6.3 From ANC 114.3 N61 10.5 W149 59.8
 Var 23°E Elev 144'

ADDITIONAL RUNWAY INFORMATION

RWY	USABLE LENGTHS		TAKE-OFF	WIDTH
	Threshold	Glide Slope		
6R	HIRL CL ALSF-II TDZ PAPI-L (angle 3.0°) RVR 24L HIRL CL REIL VASI (3 bar)-L	9864' 3007m		150' 46m
6L	HIRL CL ALSF-II TDZ PAPI-L (angle 3.0°) RVR 24R HIRL CL REIL VASI (3 bar)-L	9864' 3007m		150' 46m
6L	HIRL MALS R VASI-L			150' 46m
6L	HIRL MALS R VASI-L			150' 46m
6L	Closed to aircraft over 105,000 lbs, except when other runways are closed.			
6L	Non-std, 35' from rwy edge.			
14	HIRL CL ODALS VASI (3 bar)-L grooved RVR 10,496' 3199m 9246' 2818m 10,496' 3199m			150' 46m
14	HIRL CL REIL VASI (3 bar)-L grooved RVR 10,696' 3260m			150' 46m

① Grooved.
 ② Mid RVR predicated on rwy 6L TDZ RVR transmissometer.
 ③ HIRL MALS R VASI-L
 ④ HIRL MALS R VASI-L
 ⑤ Closed to aircraft over 105,000 lbs, except when other runways are closed.
 ⑥ Non-std, 35' from rwy edge.



1 & 2 Eng	Rwys 14, 24L, 32		Rwy 6R		Other
	CL & RCLM any RVR out, other two req.	Adequate Vis Ref	With Min climb of 290'/NM to 2900'	CL & RCLM any RVR out, other two req.	
3 & 4 Eng	TDZ RVR 6 Mid RVR 6 Rollout RVR 6	RVR 16 or 1/4	TDZ RVR 6 Mid RVR 6 Rollout RVR 6	RVR 16 or 1/4 RVR 24 or 1/2	2800-1

1 & 2 Eng	Rwy 24R		Rwy 6L		Other
	Adequate Vis Ref	STD	With Min climb of 320'/NM to 3400'	Adequate Vis Ref	
3 & 4 Eng	1/4	1/2	RVR 16 or 1/4	RVR 24 or 1/2	3300-1

FOR FILING AS ALTERNATE

A	Precision	Other	Non-Precision	
			LOC Rwy 14	Other
B	600-2	600-2	NA	800-2
C		700-2		
D				

CHANGES: See other side.

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RUNWAY 32 EXTENSION PROCEDURES

GENERAL

- a. This information defines the use of the extension on Runway 32 to minimize the impact on Runways 6L/24R and 6R/24L.
- b. An 888' extension has been constructed on the south end and a 200' extension has been constructed on the north end of Runway 32. These extensions provide a TORA of 11,584' on Runway 32.
- c. An additional 1000' clearway is designated at the north end of Runway 32 which provides a TODA of 12,584' for carriers whose policies allow clearways to be utilized in departure length calculations.
- d. The Runway 32 threshold for arrivals remains the same and *does not change*.
- e. The Runway 14 threshold for arrivals and departure end remains the same and *does not change*. The 888' extension to the south of Runway 32 is not available for Runway 14 departures. The TORA and TODA on Runway 14 remain 10,496'.

DECLARED RUNWAY DISTANCES

Declared Runway Distances	TORA	TODA	ASDA	LDA
Rwy 32 (measured at the Runway 32 arrival threshold, north of Kilo Taxiway)	10,696'	11,696'	10,696'	10,696'
Rwy 32 Extended	11,584'	12,584'	11,584'	10,696'
Rwy 14	10,496'	10,496'	10,496'	10,496'
Rwy 6R/24L	10,897'	10,897'	10,897'	10,897'



RUNWAY 32 EXTENDED DEPARTURE POLICIES AND PROCEDURES

- a. Consistent with Airport Noise Abatement Procedures, Runway 32 is the preferred departure runway. All aircraft will use the normal Runway 32 departure, from Kilo or Lima Taxiway, unless they meet the criteria identified in **b.** below.
- b. Only aircraft whose combined weight, stage length or other condition necessitate an "extended length" departure from the extended Runway 32 departure end will request it.
- c. Aircraft requiring an extended departure will notify ATC prior to taxi.
- d. Aircraft requiring an extended Runway 32 departure during peak operating hours can expect delays because of the intersection with Runway 6L. *Delay alone does not constitute a reason for requesting a Runway 6R departure.*

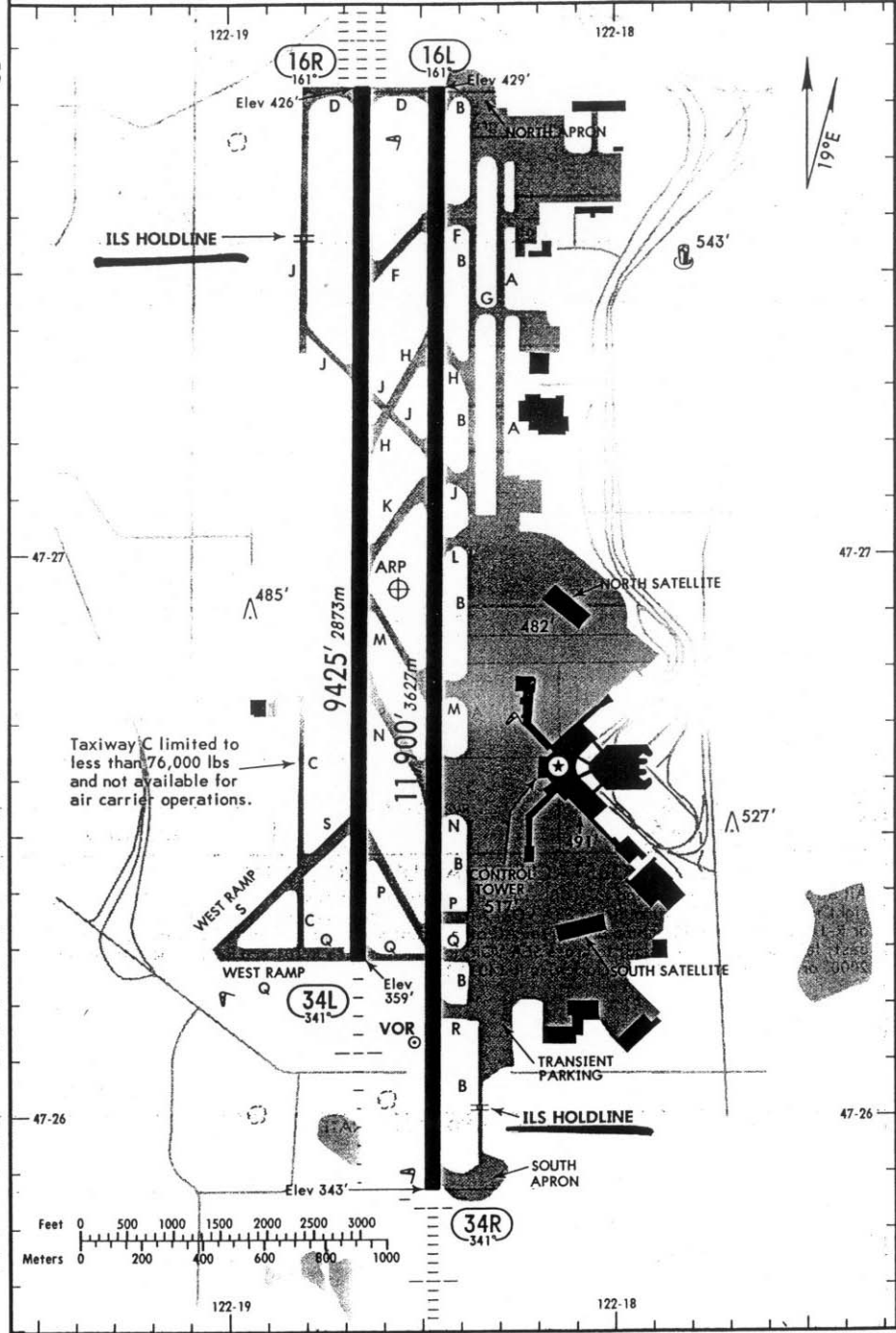


KSEA
Apr Elev 429'
 SEA 116.8 - On Airport

JEPPESSEN
 30 APR 99 (20-9)

SEATTLE, WASH
-TACOMA INTL
 N47 26.9 W122 18.6

D-ATIS 118.0	ACARS: D-ATIS PDC	SEATTLE Clearance (Cpt) 128.0	Ground 121.7	Tower 119.9
341°-075° 076°-160° Rwy 16	119.2 119.2	SEATTLE Departure (R) 125.9 126.5	199°-300° 301°-340° Rwy 16	120.1 120.4 125.9 VOT 117.5



CHANGES: See other side.

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Eff 12 Sep

SOCAL Departure (R)
 225°-044° **125.2**
 045°-224° **124.3**
 (Limited) VOT 113.9

ATIS De **135.65**
 Clear **121.4**
 Ground North Complex **121.65** South Complex **121.75**
 Tower North Complex **133.9** South Complex **120.95**
 Helicopter **119.8**

BE ALERT TO: Impaired wing clearance which may exist on taxiway B between C-6 and C-5 when taxiway C is occupied. Turbulence may be deflected upward from blast fence 180' (55m) east of rwy 25R.

Taxiways C-1, C-6, C-7, C-8, C-9 North of taxiway C, taxiway D-7 South of taxiway E, taxiway D between taxiways D-7 and D-8, and taxiways A-2 & A-4 will not accommodate B747 aircraft.

There is insufficient clearance between vehicles on adjacent service road and B747 aircraft on twy C between taxiways C-6 and C-5.

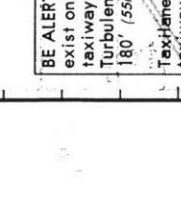
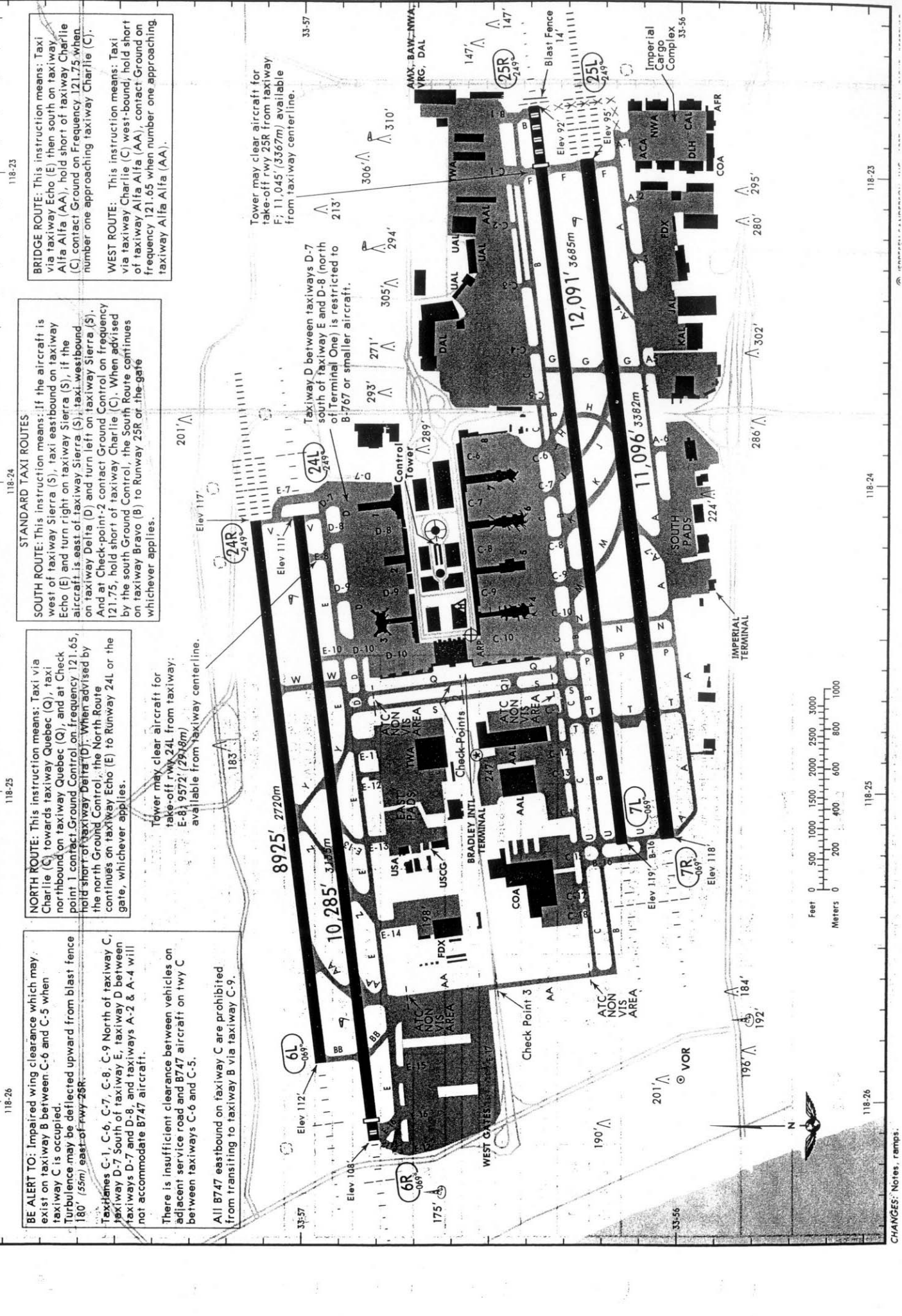
All B747 eastbound on taxiway C are prohibited from transiting to taxiway B via taxiway C-9.

NORTH ROUTE: This instruction means: Taxi via Charlie (C) towards taxiway Quebec (Q), taxi northbound on taxiway Quebec (Q), and at Check point 1 contact Ground Control on frequency 121.65, hold short of taxiway Delta (D). When advised by the north Ground Control, the North Route continues on taxiway Echo (E) to Runway 24L or the gate, whichever applies.

SOUTH ROUTE: This instruction means: If the aircraft is west of taxiway Sierra (S), taxi eastbound on taxiway Echo (E) and turn right on taxiway Sierra (S), if the aircraft is east of taxiway Sierra (S), taxi westbound on taxiway Delta (D) and turn left on taxiway Sierra (S). And at Check-point-2 contact Ground Control on frequency 121.75, hold short of taxiway Charlie (C). When advised by the south Ground Control, the South Route continues on taxiway Bravo (B) to Runway 25R of the gate whichever applies.

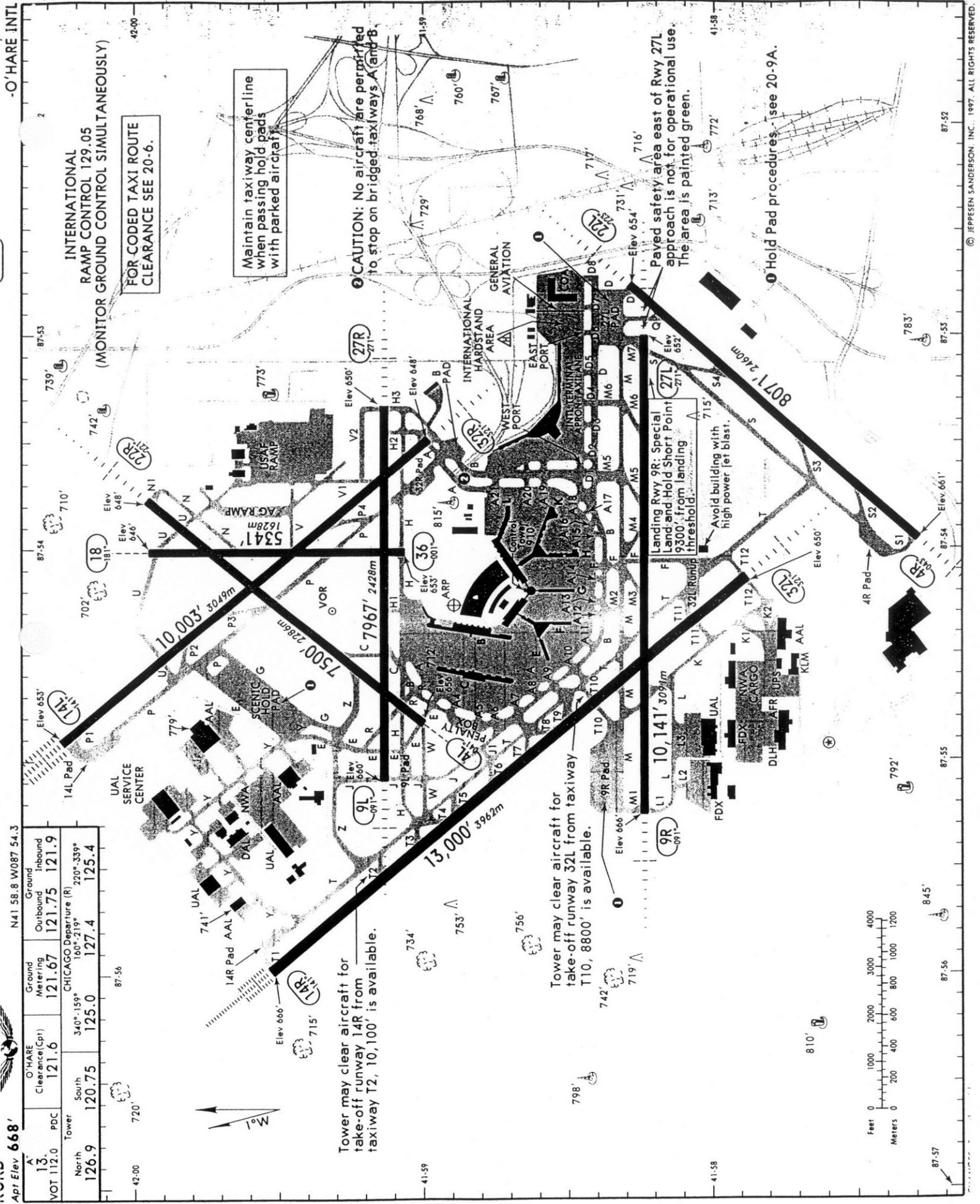
STANDARD TAXI ROUTES
SOUTH ROUTE: This instruction means: Taxi west of taxiway Sierra (S), taxi eastbound on taxiway Echo (E) and turn right on taxiway Sierra (S), if the aircraft is east of taxiway Sierra (S), taxi westbound on taxiway Delta (D) and turn left on taxiway Sierra (S). And at Check-point-2 contact Ground Control on frequency 121.75, hold short of taxiway Charlie (C). When advised by the south Ground Control, the South Route continues on taxiway Bravo (B) to Runway 25R of the gate whichever applies.

BRIDGE ROUTE: This instruction means: Taxi via taxiway Echo (E) then south on taxiway Alfa Alfa (AA), hold short of taxiway Charlie (C) contact Ground on Frequency 121.75 when number one approaching taxiway Charlie (C).
WEST ROUTE: This instruction means: Taxi via taxiway Charlie (C) west-bound, hold short of taxiway Alfa Alfa (AA), contact Ground on frequency 121.65 when number one approaching taxiway Alfa Alfa (AA).



CHANGES: Notes, ramps.

A	O'HARE Clearance(Cpl)	Ground Metering	Ground Outbound	Inbound
13.	121.6	121.67	121.75	121.9
VOT 112.0	PDC	CHICAGO Departure (R) 220°-339°		
North	South	340°-159°	160°-219°	220°-339°
126.9	120.75	125.0	127.4	125.4



INTERNATIONAL RAMP CONTROL 129.05
RAMP CONTROL 129.05
(MONITOR GROUND CONTROL SIMULTANEOUSLY)

FOR CODED TAXI ROUTE
CLEARANCE SEE 20-6.

Maintain taxiway centerline
when passing hold pads
with parked aircraft

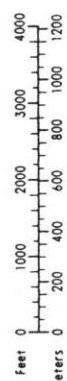
CAUTION: No aircraft are permitted
to stop on bridged taxiways A and B.

Paved safety area east of Rwy 27L
approach is not for operational use.
The area is painted green.

Hold Pad procedures - see 20-9A.

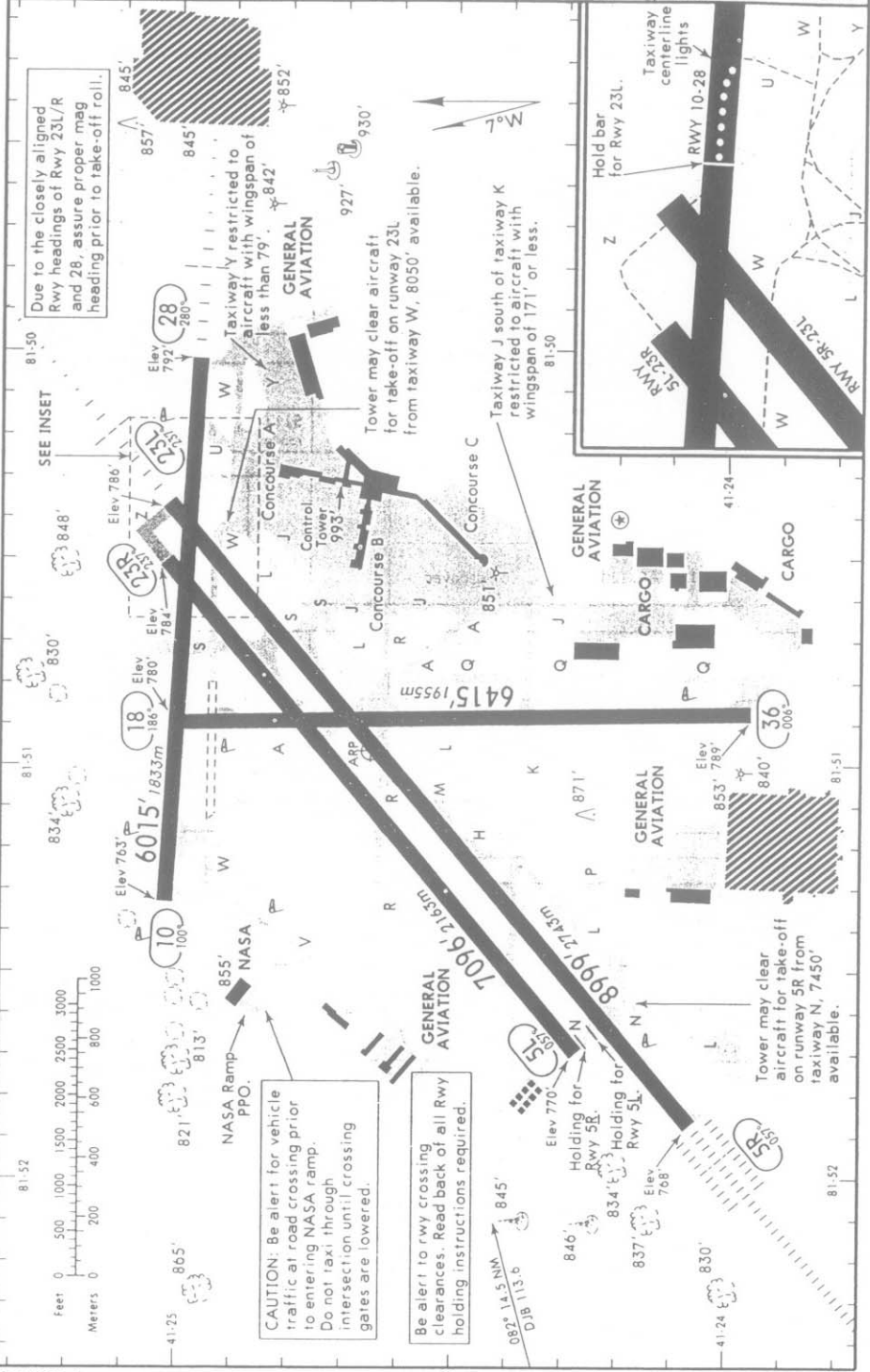
Tower may clear aircraft for
take-off runway 14R from
taxiway T2, 10,100' is available.

Tower may clear aircraft for
take-off runway 32L from taxiway
T10, 8800' is available.





ATIS 127.85	CLEVELAND Clearance (Cpt)	Ground	Tower	CLEVELAND Departure (R)	
VOT 110.4	PDC 125.05	121.7	120.9	234°-053°	054°-233°
				118.9	118.15



CHANGES: Ramp, notes.

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Due to the closely aligned Rwy headings of Rwy 23L/R and 28, assure proper mag heading prior to take-off roll.

Taxiway Y restricted to aircraft with wingspan of less than 79'. 842'

Tower may clear aircraft for take-off on runway 23L from taxiway W, 8050' available.

Taxiway J south of taxiway K restricted to aircraft with wingspan of 171' or less.

Tower may clear aircraft for take-off on runway 5R from taxiway N, 7450' available.

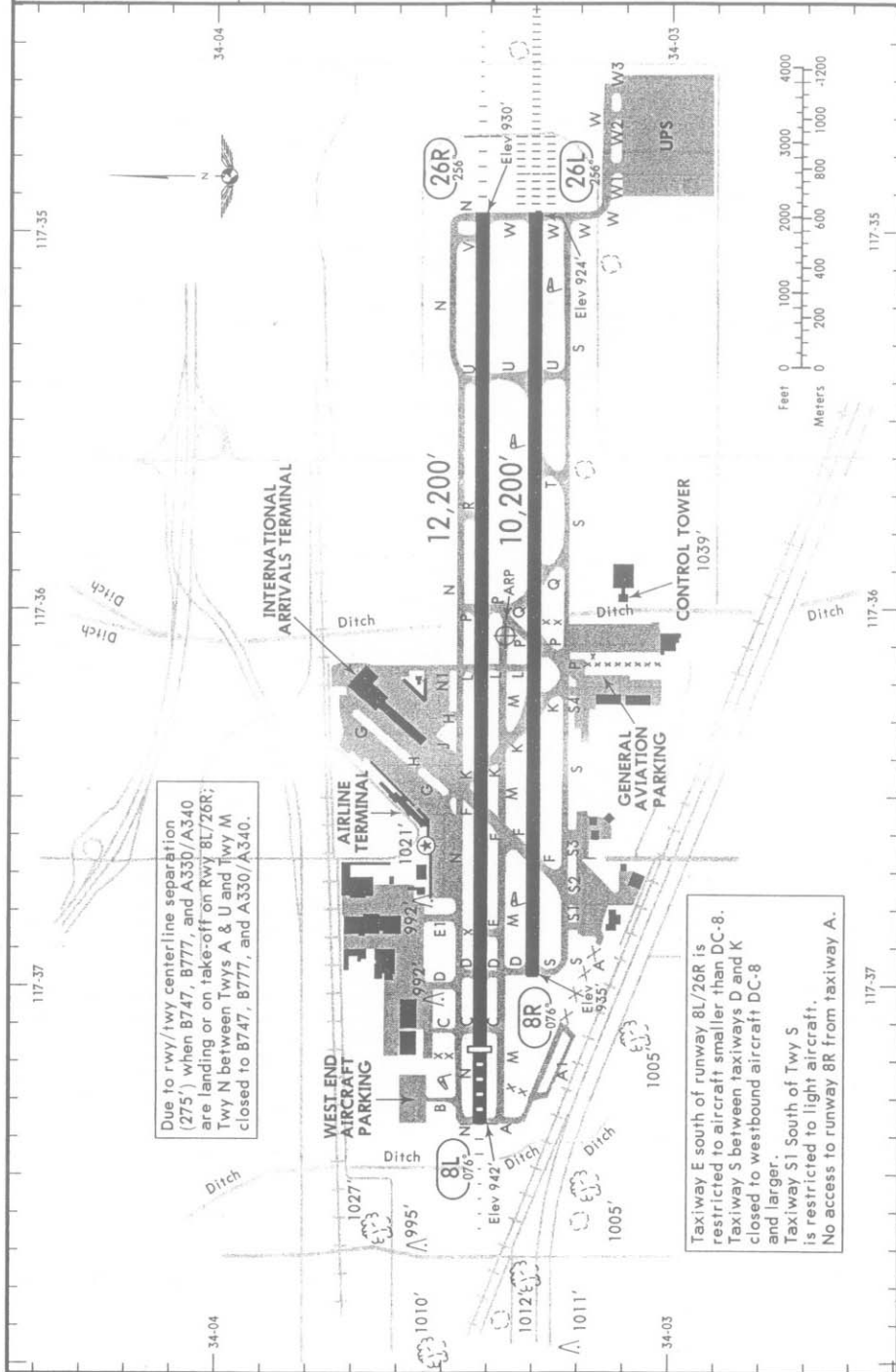
CAUTION: Be alert for vehicle traffic at road crossing prior to entering NASA ramp. Do not taxi through intersection until crossing gates are lowered.

Be alert to rwy crossing clearances. Read back of all Rwy holding instructions required.

ATIS 124.25	PDC	SOCAL Departure (R)
ONTARIO Clearance 118.1	N-NE 127.25	S-SW 135.4
Ground 121.9	NE-E 119.65	SW-N 125.5
Tower 120.6	E-S 134.0	

321.7°/9.0 From PDZ 112.2 N34 03.4 W117 36.1

Var 14°E Elev 943'



CHANGES: Taxiway E, airport notes.

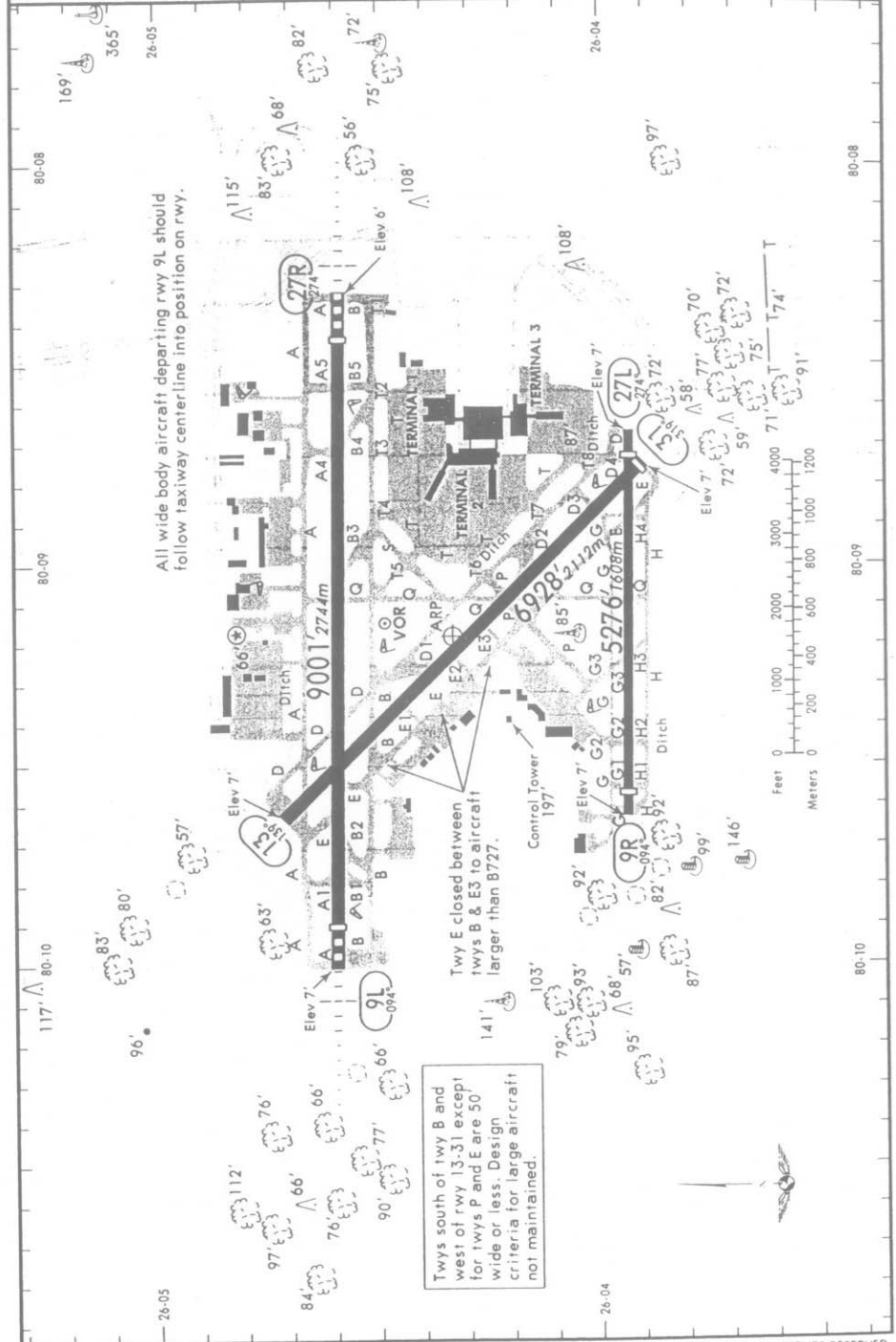
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ATIS **135.0** PDC
 FT LAUDERDALE Clearance (Cpt)
128.4
 Ground **121.4**
121.7 Alternate
 Tower **119.3** **120.2**

MIAMI Departure (R)
 271°-090° below 4000' **119.7**
 271°-090° 4000' & above **126.05**
 091°-270° **128.6**

KFLL FT LAUDERDALE, FLA
-HOLLYWOOD INTL

FLL 114.4-On Airport N26 04.3 W080 09.2
 Var 04°W Elev 11'



All wide body aircraft departing rwy 9L should follow taxiway centerline into position on rwy.

Twy E closed between twys B & E5 to aircraft larger than B727.

Twys south of twy B and west of rwy 13,31 except for twys P and E are 50' wide or less. Design criteria for large aircraft not maintained.

KATL

26 JUN 98

10-9

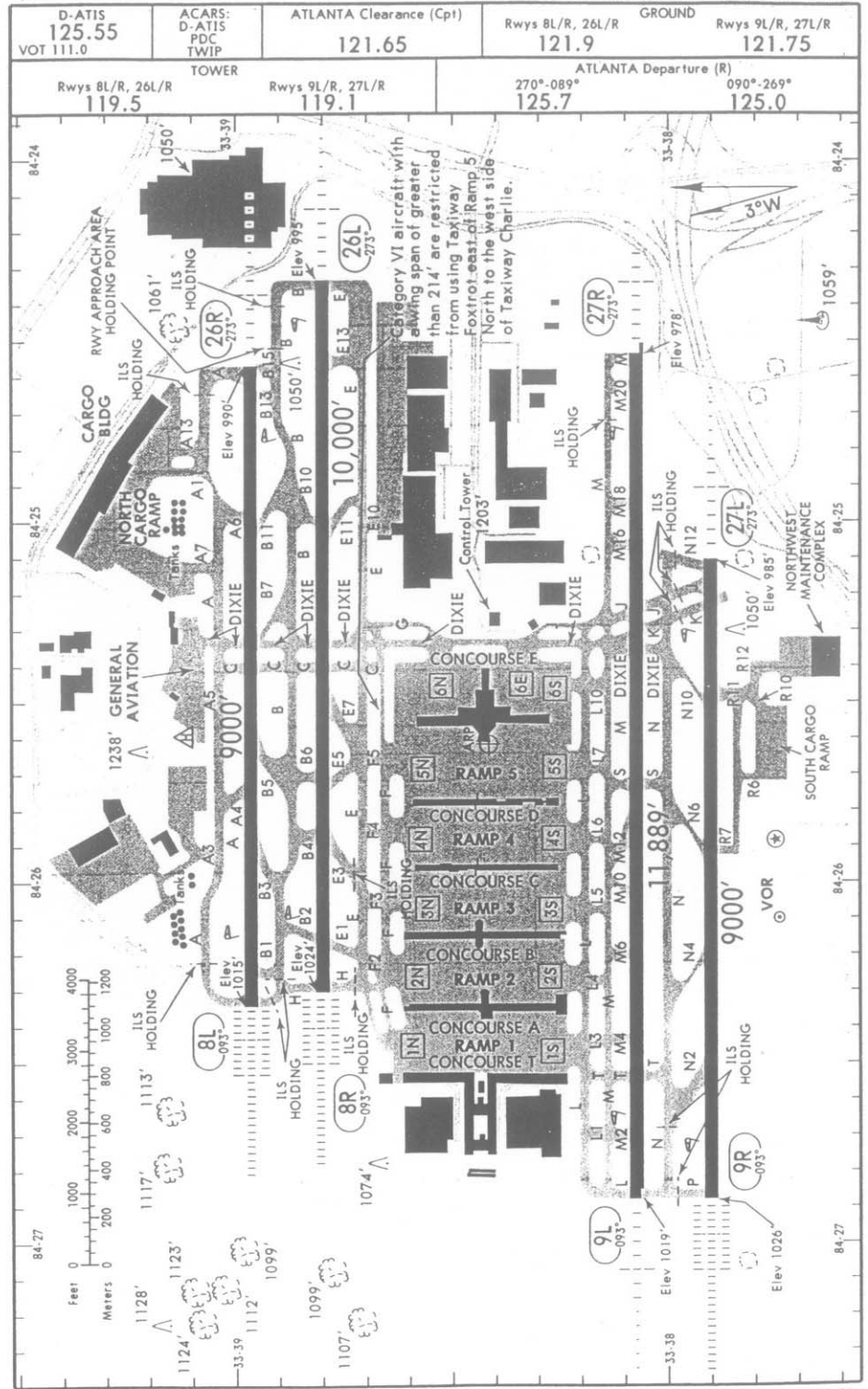


AIRPORT

ATLANTA, GA

THE HARTSFIELD ATLANTA INTL

Apt Elev 1026' N33 38.4 W084 25.6



CHANGES: Taxiway designators.

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JEPPesen

3 JUL 98 (10-9)

AIRPORT

D-ATIS **132.4**
 ACARS: D-ATIS PDC
 LAS VEGAS Clearance **118.0**
 Ground East of Rwy 1R-19L **121.1**
 West of Rwy 1R-19L **121.9**
 Tower Rwys 1 L/R, 19 L/R **118.75**
 Rws 7 L/R, 25 L/R **119.9**

LAS VEGAS Departure (R)
 North **133.95**
 South **125.9**
 Ramp Control
 West **124.4**
 East **127.9**

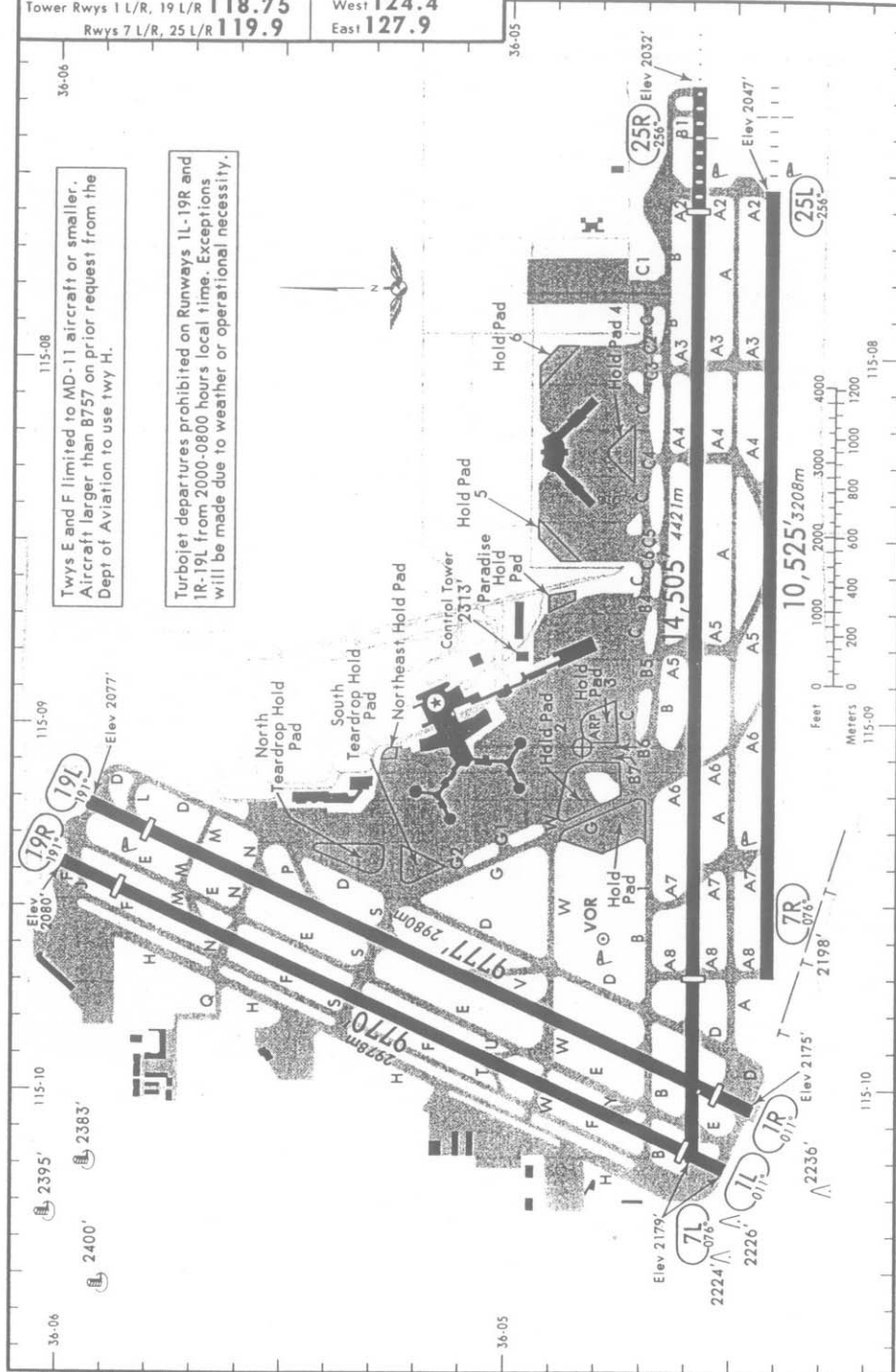
KLAS

LAS VEGAS, NEV.

McCARRAN INTL

LAS 116.9-On Airport N36 04.8 W115 09.1

Var 14°E Elev 2179'



CHANGES: Hold pads 2 and 3 modified.

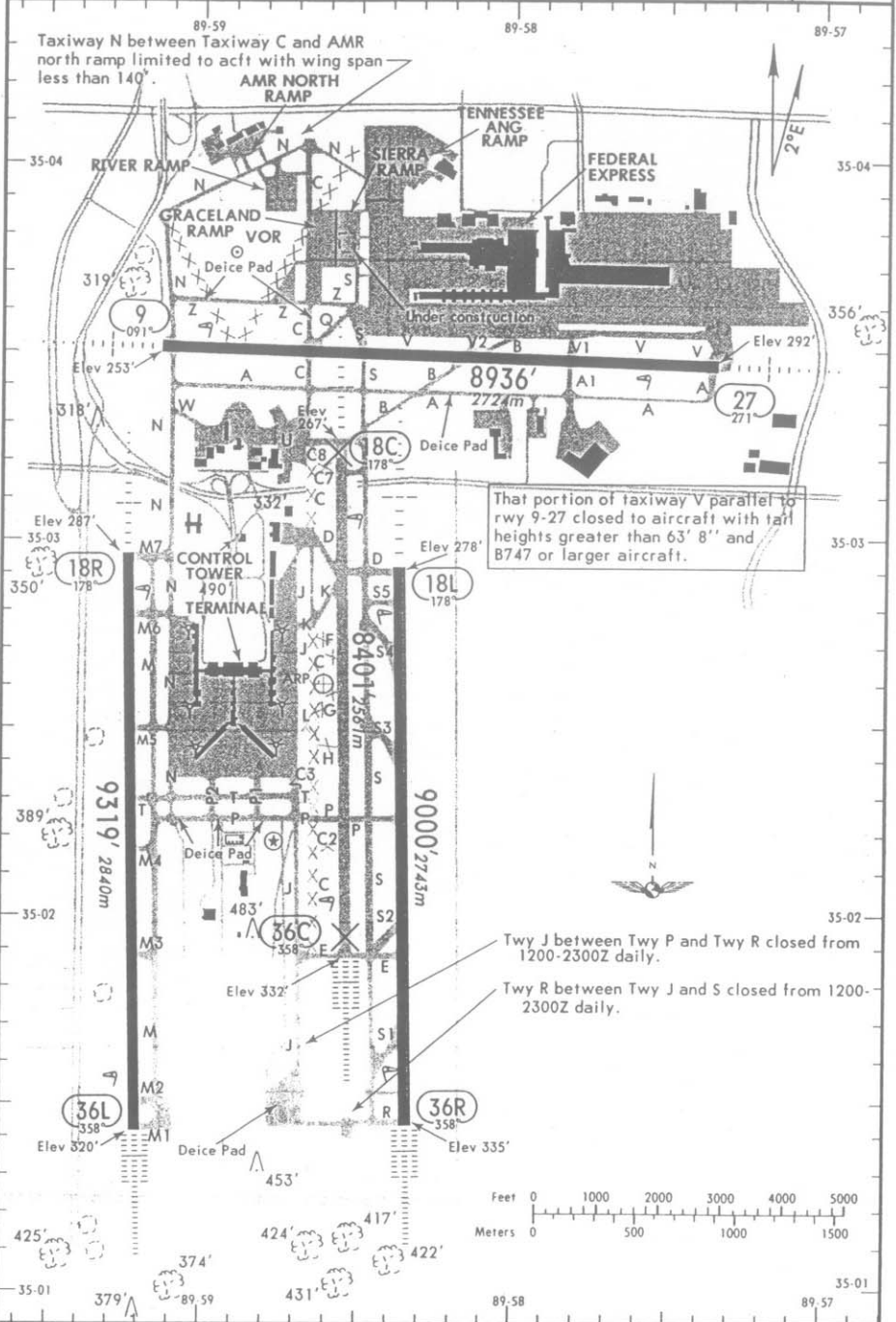
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KMEM 10 JUL 98 (10-9)
 Apt Elev 335' N35 02.6 W089 58.6



MEMPHIS, TENN
 MEMPHIS INTL

D-ATIS 127.75	ACARS: D-ATIS PDC TWIP	MEMPHIS Clearance (Cpt) 125.2	Ground Air Carrier only 121.9 121.65
Tower		MEMPHIS Departure (R)	
Rwys 9-27 118.3	Rwys 18C-36C, 18L-36R 119.7	Rwys 18R-36L 128.42	356°-175° 124.15
			176°-355° 124.65
			VOT 111.0



CHANGES: Taxiways.

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JEPPESEN

23 JAN 98 (10-9)

KMKE

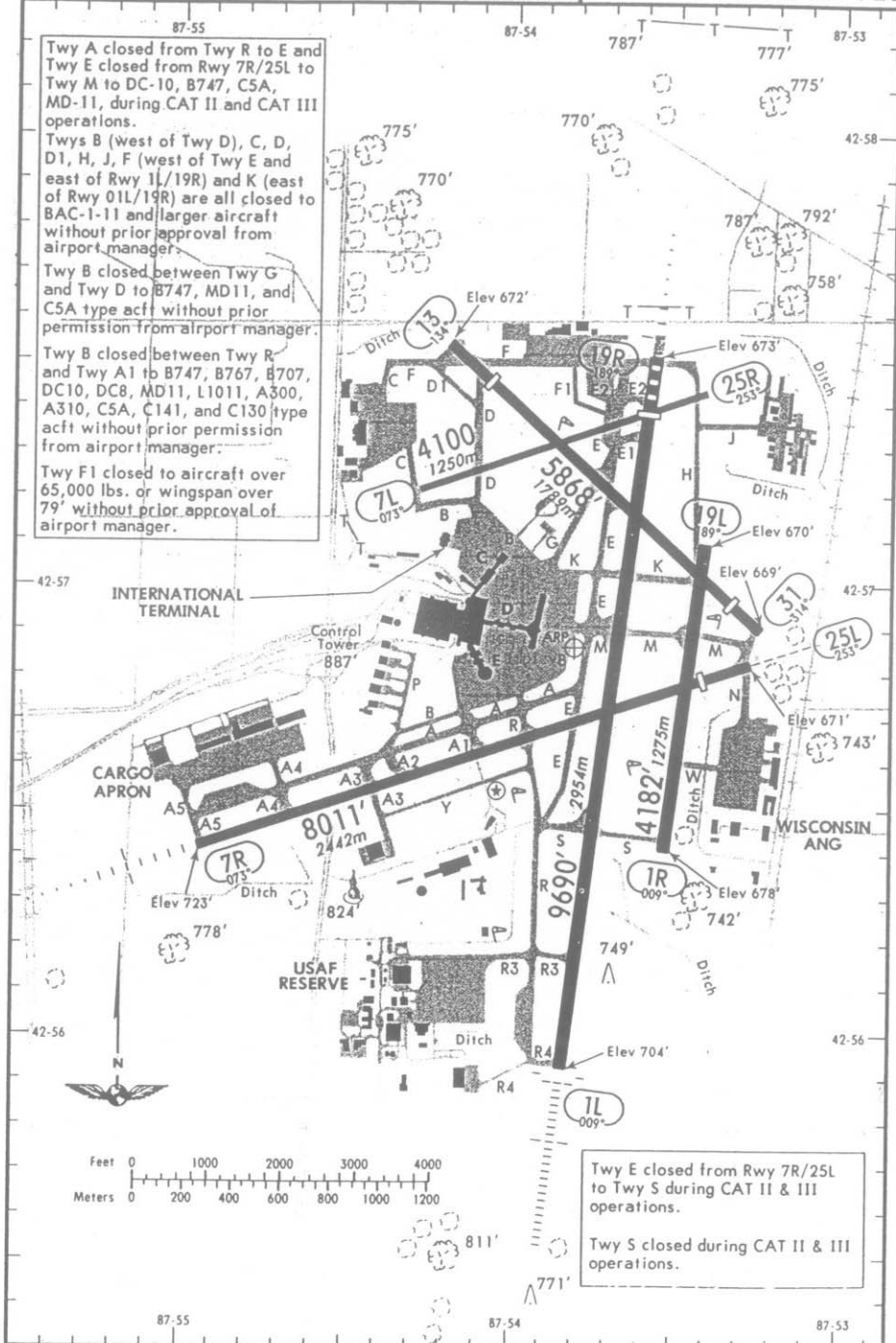
AIRPORT

ATIS 126.4 PDC
 MILWAUKEE
 Clearance (Cpt) 120.8
 Ramp hold 127.85
 Tower 119.1
 Ground 121.8

MILWAUKEE Departure (R)
 Rwy 1L-19R in use: 125.35 West of LOC crs
 119.65 East of LOC crs
 Rwy 7R-25L in use: 125.35 North of LOC crs
 119.65 South of LOC crs
 VOT 109.0

MILWAUKEE, WISC
 GEN MITCHELL INTL
 N42 56.8 W087 53.8
 118.8°/19.9 From BAE 116.4
 Var 02°W Elev 723'

Twy A closed from Twy R to E and Twy E closed from Rwy 7R/25L to Twy M to DC-10, B747, CSA, MD-11, during CAT II and CAT III operations.
 Twys B (west of Twy D), C, D, D1, H, J, F (west of Twy E and east of Rwy 1L/19R) and K (east of Rwy 01L/19R) are all closed to BAC-1-11 and larger aircraft without prior approval from airport manager.
 Twy B closed between Twy G and Twy D to B747, MD11, and C5A type acft without prior permission from airport manager.
 Twy B closed between Twy R and Twy A1 to B747, B767, B707, DC10, DC8, MD11, L1011, A300, A310, C5A, C141, and C130 type acft without prior permission from airport manager.
 Twy F1 closed to aircraft over 65,000 lbs. or wingspan over 79' without prior approval of airport manager.



Twy E closed from Rwy 7R/25L to Twy S during CAT II & III operations.
 Twy S closed during CAT II & III operations.

CHANGES: Taxiway E, Taxiways F1, E and S notes.

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DULUTH, MINN

KDLH (11-1) 28 MAR 97

JEPPESEN

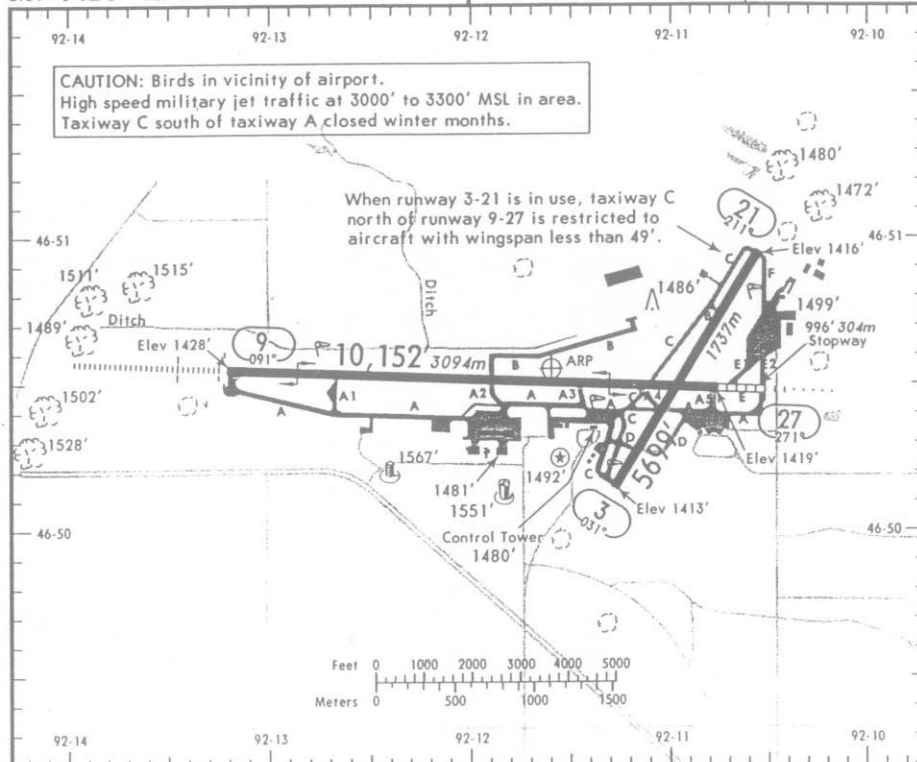
DULUTH INTL

N46 50.5 W092 11.6 004.0°/2.4 From DLH 112.6

Elev 1428' Var 01°E

ATIS **124.1**
Ground **121.9**
Tower **118.3**

DULUTH Departure (R)
125.45



ADDITIONAL RUNWAY INFORMATION

RWY		SURFACE	USABLE LENGTHS			WIDTH
			Threshold	LANDING BEYOND Glide Slope	Threshold to Intersecting Runway	
3						150' 46m
21	HIRL REIL VASI-L	grooved				
9	HIRL ALSF-I PAPI-L (angle 3.0°)	grooved RVR	9002' 2744m	3/21	8950' 2728m	150' 46m
27	HIRL MALSR PAPI-L (angle 3.0°)	grooved RVR	8567' 2611m			

TAKE-OFF			FOR FILING AS ALTERNATE		
All Rwy's			Precision	VOR Rwy 3 VOR DME Rwy 21 LOC Rwy 27 Radar-1	LOC Rwy 9 NDB Rwy 9
Adequate Vis Ref	STD				
1 & 2 Eng	RVR 16 or 1/4	RVR 50 or 1	600-2	800-2	NA
3 & 4 Eng		RVR 24 or 1/2			

CHANGES: Clearance frequency removed.

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6 MAR 98

10-9

AIRPORT

D-ATIS **118.15**
 ACARS: D-ATIS PDC
 BRADLEY Clearance **121.75**
 Ground **121.9**
 Tower **120.3**

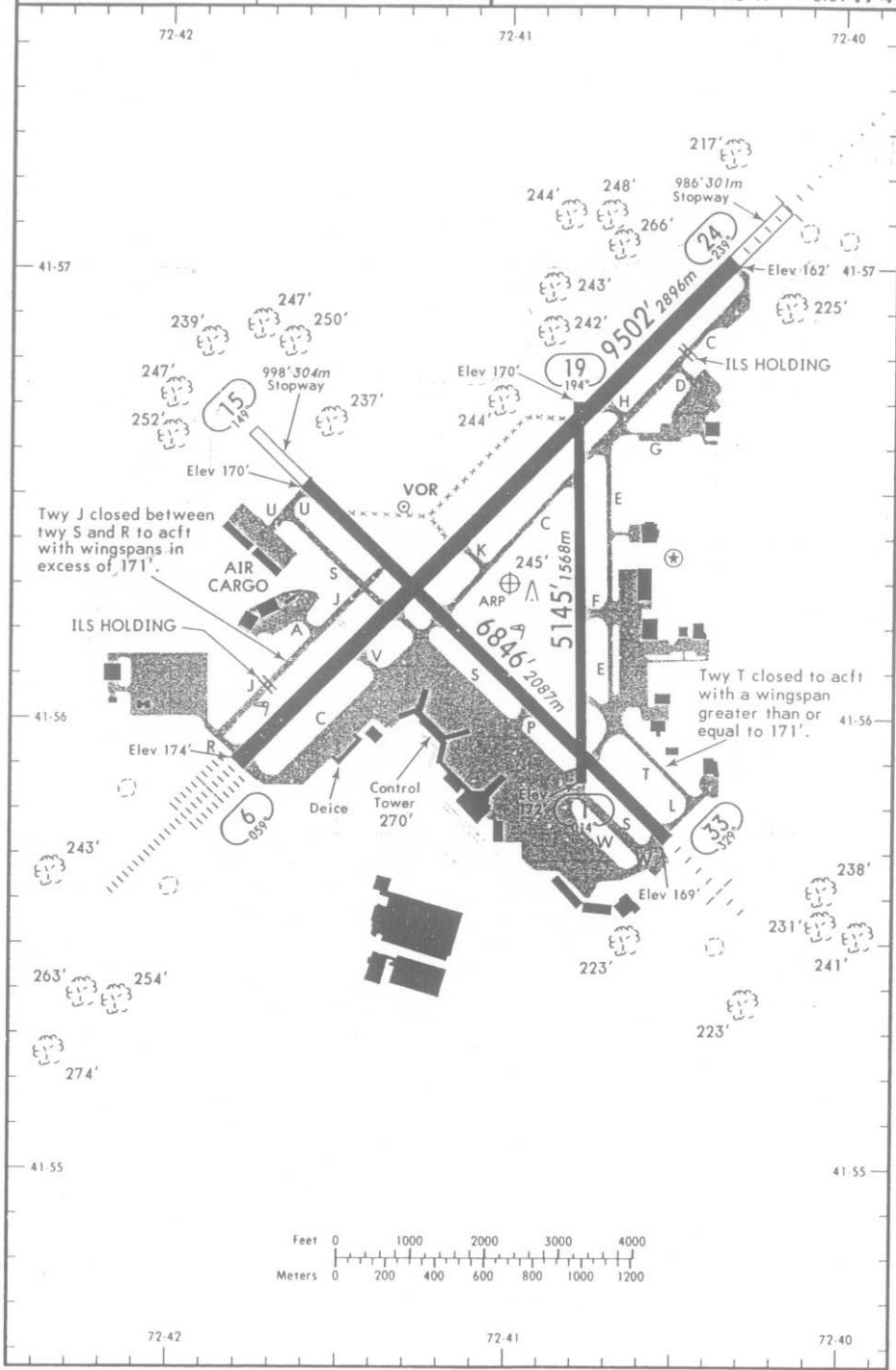
BRADLEY Departure (R)
 North & West **125.35**
 Northeast **123.95**
 South **127.8**
 VOT 111.4

KBDL WINDSOR LOCKS, CONN

BRADLEY INTL

BDL 109.0-On Airport N41 56.3 W072 41.0

Var 15°W Elev 174'



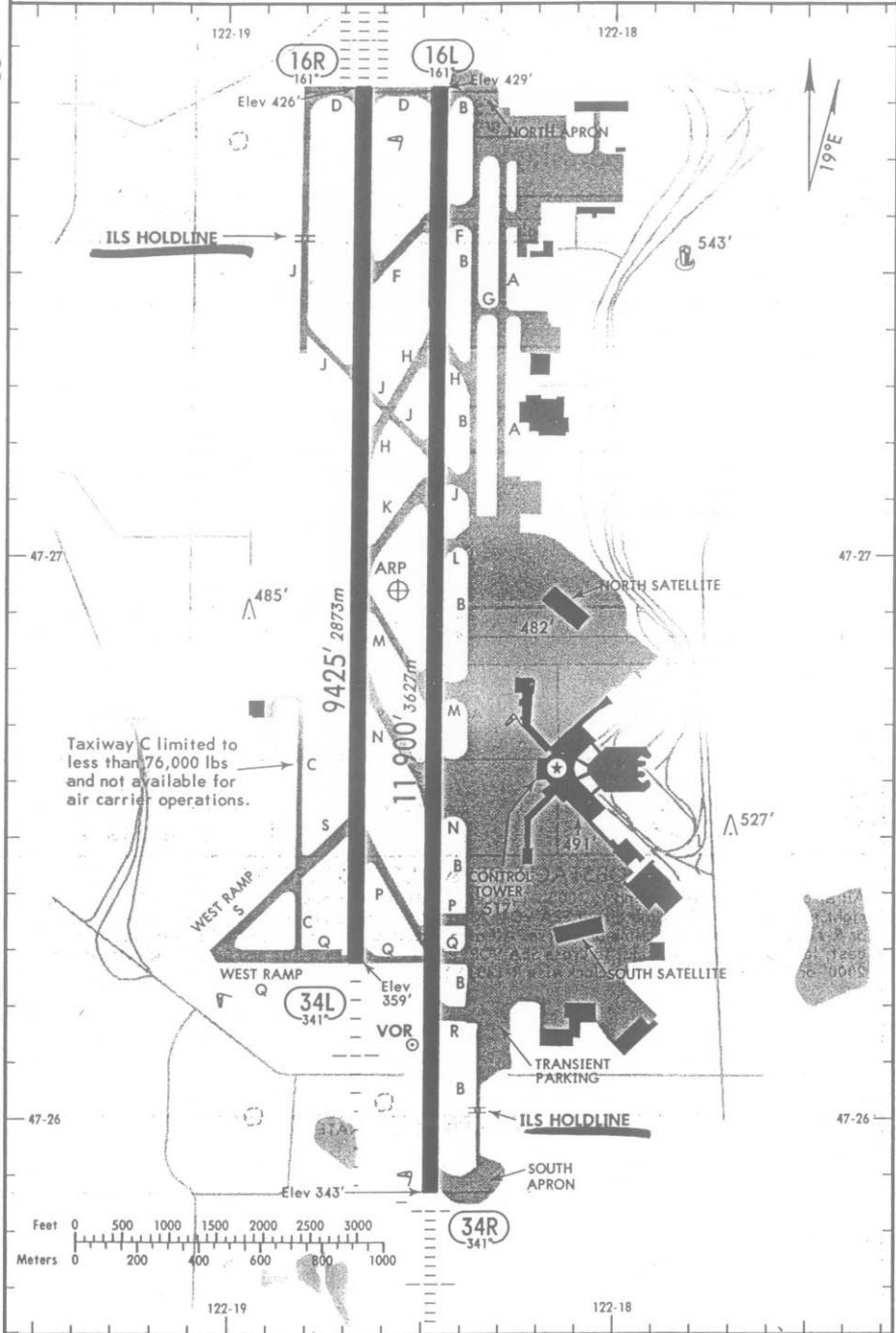
CHANGES: ACARS added, VOT changed, deice added. © JEPPESEN SANDERSON, INC., 1990, 1998. ALL RIGHTS RESERVED.

KSEA
 Apt Elev 429'
 SEA 116.8 - On Airport

JEPPESEN
 30 APR 99 (20-9)

SEATTLE, WASH
-TACOMA INTL
 N47 26.9 W122 18.6

D-ATIS	ACARS: D-ATIS	SEATTLE Clearance (Cpt)	Ground	Tower
118.0	PDC	128.0	121.7	119.9
SEATTLE Departure (R)				
341°-075°	119.2	076°-160° Rwy 34	125.9	199°-300°
076°-160° Rwy 16	119.2	161°-198°	126.5	301°-340° Rwy 16
			120.1	301°-340° Rwy 34
			125.9	VOT 117.5



Taxiway C limited to less than 76,000 lbs and not available for air carrier operations.

CHANGES: See other side.

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