U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Design of Aircraft Deicing Facilities	**Date:** DRAFT **Initiated By:** AAS-100	**AC No:** 150/5300-14E **Change:**

1 Purpose.

This advisory circular (AC) provides standards and guidance for designing aircraft deicing facilities.

2 Cancellation.

This AC cancels AC 150/5300-14D, *Design of Aircraft Deicing Facilities*, dated March 17, 2020.

3 Application.

This AC establishes Federal Aviation Administration (FAA) standards and guidelines to ensure uniform application of the design of aircraft deicing facilities. This AC does not constitute a regulation and is not legally binding in its own right. It will not be relied upon as a separate basis by the FAA for affirmative enforcement action or other administrative penalty. Conformity with this AC is voluntary, and nonconformity will not affect rights and obligations under existing statutes and regulations, except as described below.

Where applicable, the standards contained in this AC provide an acceptable means of satisfying the requirements of 14 Code of Federal Regulations (CFR) part 139, *Certification of Airport*s; and the requirements for federally obligated airport operators per Grant Assurance 19 and other applicable Grant Assurances. For all other airport operators, conformity with this AC is recommended. The FAA has determined the standards and guidelines contained in this AC are practices which provide an acceptable level of safety, performance, and support of operations for the design of aircraft deicing facilities.

1. For certificated airports: If an alternate means of compliance is proposed by an airport operator, the FAA will evaluate the request on a case-by-case basis. If the proposal is found to be acceptable by the administrator, those alternate provisions must be documented in the Airports Certification Manual and the Airport Layout Plan if applicable.
2. For federally obligated airports:

a. Use of these standards and guidelines is mandatory for projects funded under Federal grant assistance programs, including, but not limited to, the Airport Improvement Program (AIP). See Grant Assurance 34 and other applicable Grant Assurances.

b. Use of these standards and guidelines is mandatory, as required by regulation, for projects funded by the Passenger Facility Charge (PFC) program. See PFC Assurance 9 and other applicable PFC Assurances.

4 Related Documents.

Refer to paragraph 1.4 for documents referenced by this AC. ACs referenced in the text of this AC do not include a revision letter, as they refer to the latest version.

5 Principal Changes.

The AC incorporates the following principal changes:

1. Introduced Standard, Recommended Practices, and Requirements guidance methods, see paragraph 1.2.
2. Redefined Aircraft Deicing Pad with Vehicle Maneuvering Area, see paragraph 1.3.2.
3. Defined Gate (or Terminal) Deicing Facility, see paragraph 1.3.4.
4. Defined the term Vehicle Safety Zone, see paragraph 1.3.6.
5. Added section 1.7 Integrating Airport Safety Programs.
6. Adopted taxilane separation standards per AC 150/5300-13 for deicing pad clearances and removed the distinction between movement and non-movement areas, see section 3.2.
7. Simplified separation standards table in chapter 3 to reflect Taxilane Object Free Area (TLOFA) per Airport Design Standard, see Table 3-1.
8. Updated all figures and removed figures referencing electronic messaging boards.
9. Removed all guidance related to the Design of Infra-Red Aircraft Deicing Facilities.
10. Clarified and updated language throughout the document.
11. Removed references throughout to deicing fluids, i.e. Newtonian Fluid.

6 Using This Document.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the “ALT” and “←” keys simultaneously.

To aid in document navigation, users may add custom bookmarks to the bookmark panel list. Navigate to the location you want to bookmark. Highlight and select the text to appear on the bookmark, click the “add bookmark” button at the top of the bookmark panel, and edit the bookmark text as needed. New bookmarks appear at the end of the bookmark list, but you may drag and drop them to a preferred position.

Figures in this document are schematic representations and are not to scale.

7 **Use of Metrics.**
Throughout this AC, U.S. customary units are used followed with “soft” (rounded) conversion to metric units. The U.S. customary units govern.

8 **Where to Find this AC.**
You can view a list of all ACs at https://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at https://www.faa.gov/regulations_policies/faa_regulations/.

9 **Feedback on this AC.**
If you have suggestions for improving this AC, you may use the online AAS Advisory Circular (AC) Feedback | Federal Aviation Administration form.

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CHAPTER 1 Introduction

1.1 Overview.

Safe and efficient aircraft operations are of primary importance in the development of any aircraft ground deicing facility.

This advisory circular establishes the standards and guidance for sizing, siting, and environmental runoff mitigation to maximize deicing capacity while maintaining safety and efficiency.

This advisory circular reference industry design standards and recommendations for centralized aircraft deicing facilities (CDFs) having unique deicing/anti-icing operations. Related material to assist designers is established by the latest editions of the Society of Automotive Engineers (SAE) Aerospace Division (https://www.sae.org/) publications, primarily Aerospace Recommended Practice (ARP) documents:

ARP 4902 *Design of Aircraft Deicing Facilities*

ARP 5660 *Deicing Facility Operational Procedures*

1.2 Standards, Recommended Practices, and Requirements.

The promulgation of the standards and recommendations contained in this AC advances the goals and objectives of the FAA's statutory authorities and the national policies established by Congress.

1.2.1 Meaning of Terms.

1.2.1.1 Standard.

A physical characteristic, quality, configuration, function, operation, or procedure established by the FAA as a benchmark for uniformity, safety, capacity, performance, economy, and environmental quality. The FAA's standards serve a prominent role in fulfilling the statutory objectives summarized in paragraph 3, *Application*.

1.2.1.2 Recommended Practice.

Supplemental measures and guidelines the FAA recognizes as promoting safety, capacity, or efficiency. An airport has the discretion to implement a recommended practice to address site-specific condition.

1.2.1.3 Requirement.

Mandatory language such as "must," "shall," "required," or "requirements," used in this AC describes obligations that originate in either Federal statutes or regulations. This AC does not establish or modify any statutory or regulatory requirements; it provides information regarding existing requirements under the law or agency policies.

1.2.1.4 **Design Consideration.**

Additional factors to consider during airport design that may influence the application of a standard or recommended practice.

1.3 Definitions.

These definitions are specific to aircraft deicing facilities and are not comprehensive relative to general airport design. See AC 150/5300-13, *Airport Design*.

1.3.1 Aircraft Deicing Facility.

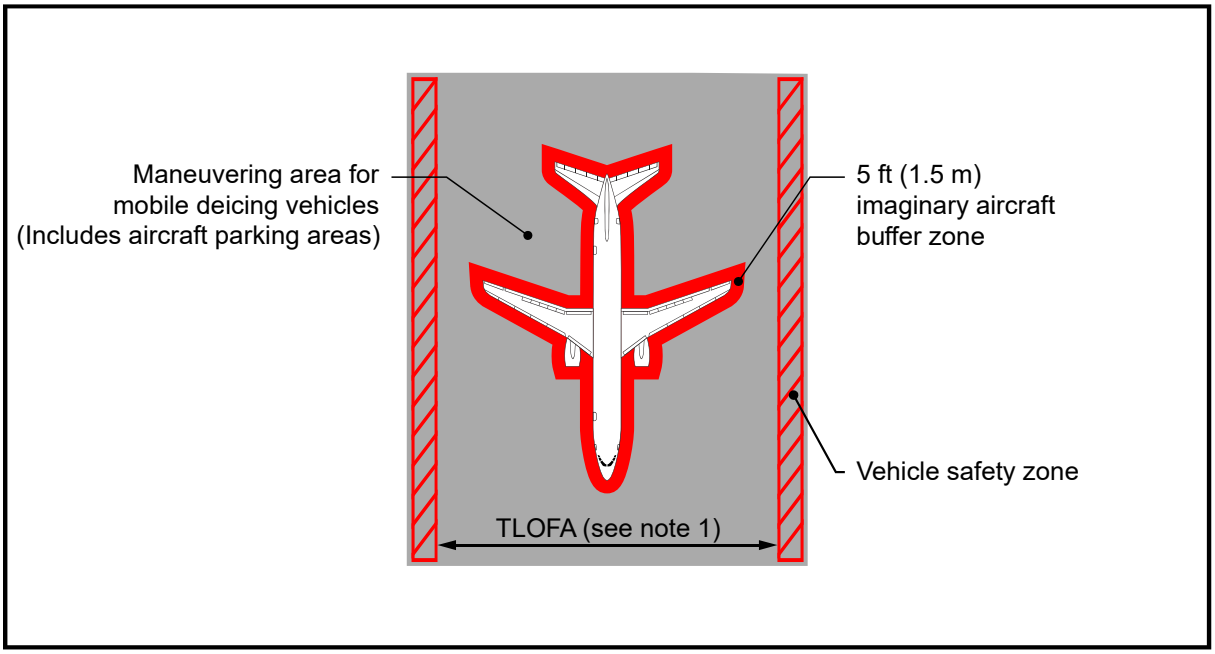
In general, an airport facility where:

1. Frost, ice, slush, or snow is removed (deicing) from aircraft to provide clean surfaces, and/or
2. Clean surfaces of aircraft receive protection (anti-icing) against the formation of frost or ice and accumulation of snow or slush for a limited period of time (Holdover Time).

1.3.2 Aircraft Deicing Pad.

An aircraft deicing pad consists of two areas: an inner area for the parking of aircraft to receive deicing/anti-icing treatment and an outer area for maneuvering two or more mobile deicing vehicles (see Figure 1-1).

Figure 1-1. Aircraft Deicing Pad with Vehicle Maneuvering Area



Note 1: Taxilane Object Free Area (TLOFA).

1.3.3 Centralized (or Remote) Aircraft Deicing Facility (CDF).

A specialized aircraft deicing facility located away from the terminal:

1. Along taxiways, taxilanes, or aprons leading to the departure runway.
2. On a dedicated apron away from the terminal gates where aircraft receive deicing/anti-icing treatment.
3. Typically includes a deicing control tower, fluid storage areas, vehicle loading zones, and stormwater/fluid collection systems.

1.3.4 Gate (or Terminal) Deicing Facility.

A deicing facility for one or several aircraft located at or near the terminal/gate or location where aircraft loading activity normally takes place.

1.3.5 Holdover Time (HOT).

Defined by the FAA Flight Standards organization, holdover time is the estimated time the application of anti-icing fluid will prevent the formation of frozen contamination on the protected surfaces of an aircraft.

- With a one-step deicing/anti-icing operation, the holdover time begins at the start of the operation.
- With a two-step operation, the holdover time begins at the start of the final anti-icing application.

FAA publishes Holdover Tables and related guidance at https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/.

1.3.6 Vehicle Safety Zone (VSZ).

A defined parking area where vehicles may safely park while:

1. Aircraft taxi in and out of a deicing pad, and/or
2. Not actively involved with a deicing operation.

1.4 **Related Reading Material.**

Publications referenced in this AC are available from the following organizations:

1. FAA documents, https://www.faa.gov.

AC 120-57	Low Visibility Operations/Surface Movement Guidance and Control Systems (LVO/SMGCS)
AC 120-58	*Pilot Guide Large Aircraft Ground Deicing*
AC 120-60	*Ground Deicing and Anti-icing Program*
AC 150/5200-30	*Airport Field Condition Assessments and Winter Operations Safety*
AC 150/5200-33	*Hazardous Wildlife Attractants On or Near Airport*

AC 150/5200-37	*Safety Management Systems for Airports*
AC 150/5300-13	*Airport Design*
AC 150/5320-5	*Airport Drainage Design*
AC 150/5320-6	*Airport Pavement Design and Evaluation*
AC 150/5320-12	*Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces*
AC 150/5320-15	*Management of Airport Industrial Waste*
AC 150/5340-1	*Standards for Airport Markings*
AC 150/5340-18	*Standards for Airport Sign Systems*
AC 150/5345-46	*Specification for Runway, Taxiway, Heliport, and Vertiport Light Fixtures*
AC 150/5360-13	*Planning and Design Guidelines for Airport Terminal Facilities*,
FAA Office of Airports Safety Management System (SMS) Desk Reference	
FAA Holdover Time Guidelines	

2. SAE International, https://www.sae.org/.
3. The International Organization for Standardization, https://www.iso.org/.
4. Airport Cooperative Research Program (ACRP) Research Report 72, *Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials,* by the Transportation Research Board (TRB), https://nap.nationalacademies.org/catalog/22749/guidebook-for-selecting-methods-to-monitor-airport-and-aircraft-deicing-materials.
5. National Fire Protection Association (NFPA), https://www.nfpa.org/.
6. Advancing Standards Transforming Markets (ASTM) International, https://www.astm.org/.

1.5 **Project Input.**

Because each airport is unique, deicing/anti-icing needs are better addressed when stakeholders are involved with identifying the requirements for deicing facilities.

1.5.1 Relevant Stakeholders.

The airport sponsor solicits input from the following stakeholders:

1. Station/operations managers of tenant air carriers, regional, and commuter air carriers.
2. Ground deicing managers of air carrier, regional, and commuter air carriers, and the service provider contracted with treatment responsibility.
3. FAA:

a. Air Traffic Control
b. Airports Division
c. Technical Operations
d. Flight Standards

4. Airport operations chief, environmental manager, and the aircraft rescue and firefighting chief (if applicable).
5. Pilot organizations or local pilot representatives, air taxis, and general aviation users.
6. Other parties at the discretion of the airport sponsor.

1.5.2 Other Stakeholders.

The FAA recommends that airports involve Federal, state, and local environmental authorities having jurisdiction early in the facility development process to ensure compliance with storm water permitting requirements. The addition of a centralized deicing operation may result in the need to update permits and plans. Review of aircraft deicing facility plans by environmental authorities is a significant step toward compliance with U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) storm water permitting requirements per 40 CFR 122.26 and 40 CFR Part 449.

1.6 Safety Risk Management.

A Safety Risk Management (SRM) analysis may be required in association with the Airport Layout Plan (ALP) update, review, and approval process. When airport sponsors initiate actions that trigger the need for an SRM, the sponsor provides the project information, including a project proposal summary to help the FAA determine the appropriate level of SRM documentation. Certificated airports that are required to implement Safety Management System (SMS) in accordance with 14 CFR Part 139.401 will evaluate the proposed deicing pad/facility project in accordance with the procedures described in their Airport SMS Manual. Please refer to AC 150/5200-37, *Safety Management Systems for Airports*.

1.7 Integrating Airport Safety Programs.

When identifying deicing/anti-icing requirements for a CDF, integrate current airport safety programs with the operation of the deicing facility including but not limited to:

1. Runway Incursion Prevention programs
2. Surface Movement and Guidance Control System (SMGCS)
3. Airport Emergency Plans (AEP)
4. Snow and Ice Control Plans (SICP)Driver Training Programs
5. Other Airport Safety Programs

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CHAPTER 2 Sizing and Siting Aircraft Deicing Facilities

2.1 General.

The FAA recommends aircraft deicing facilities at airports experiencing frequent snow events or icing conditions. This includes airports serving aircraft that develop frost or ice on critical surfaces even though the airport itself does not experience ground icing conditions. Aircraft deicing facilities are located either at or away from the terminal gates. A facility located away from the terminal gate area is a CDF.

2.1.1 The ALP and Siting and Sizing Facilities.

Review of the airport's ALP provides information that formalizes the CDF siting and sizing process. Some ALPs delineate planned land acquisition areas adjacent to airport property for airport development. Consequently, show areas identified for a deicing facility on the ALP. Carefully consider any changes to the ALP and all changes documented and submitted to the FAA for approval.

2.1.2 Role of Aircraft Deicing Facility.

2.1.2.1 The primary goal of an aircraft deicing facility is meeting, to the extent practicable, the needs of the air carriers as prescribed in their FAA-approved aircraft ground deicing/anti-icing program. Achieving this goal offers greater operational flexibility among the facility users**.**

2.1.2.2 To support this, the airport operator's FAA-approved Snow and Ice Control Plan generally classifies CDFs as a Priority one facility for snow clearance time under AC 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*. This action enables those facilities deemed necessary for the given storm conditions to remain fully operational during inclement weather; thereby icing conditions that affect the safety of flight are better managed.

2.1.3 Gates as Aircraft Deicing Facilities.

2.1.3.1 **Design Considerations.**

1. The use of gates as aircraft deicing facilities under varying weather conditions may adequately meet the deicing/anti-icing demands of users and provide for acceptable taxiing times for holdover times to the departure runway end(s).
2. To comply with Federal, state, and local environmental discharge permits of aircraft de/anti-icing fluids, airport operators may need to upgrade or expand gate facilities such as apron drainage areas that collect aircraft glycol runoff for proper disposal or recycling.
3. Deicing vehicles can maneuver all around the aircraft by maintaining a 5 ft (1.5 m) buffer from the aircraft.

2.1.4 CDFs – Decisional Factors.

2.1.4.1 **Design Considerations.**

1. Terminal gate facilities experience excessive gate delays or lack of gates for treatment,
2. The holdover time of applied glycols are frequently exceeded because of the taxiing times to the departure runway from the terminal gate, or because the taxi route encounters a variety of weather conditions, or
3. Accommodating additional runoff capacity at gates is too expensive or disruptive to construct.
4. Benefits of such facilities:
   a. Improved airfield operational flow, and
   b. Permit retreatment of aircraft nearer the departure runway instead of returning the aircraft back to the gates,
   c. The construction cost to improve runoff mitigation is not cost-effective at the terminal.

2.1.5 Basic Components of a CDF.

2.1.5.1 **Design Considerations.**

1. Paved aircraft deicing pad(s) for maneuvering aircraft and mobile deicing vehicles,
2. bypass taxiing capability for aircraft not needing treatment,
3. environmental runoff mitigation measure,
4. control center (snow desk) building,
5. nighttime lighting system,
6. deicing crew shelter with kitchen and toilet facilities,
7. co-located support facilities including storage tank(s), transfer system(s) for approved aircraft deicing/anti-icing fluid(s), or fixed-fluid turret-type or gantry deicing fluid applicators.
8. a gantry crane system having overhead fitted washing nozzles on a trolley for fixed parallel movement along the parked aircraft.

2.1.6 Siting Centralized Aircraft Deicing Facilities.

2.1.6.1 **Standard.**

Aircraft deicing facilities when sited near a runway are to follow the geometric accessibility standards outlined in AC 150/5300-13, *Airport Design*, to implement runway incursion prevention measures.

2.1.6.2 **Design Consideration.**

Centralized aircraft deicing facilities are away from the gate, along taxi routes leading to the departure runway(s). Typically, such facilities are closer to the runway ends to minimize the taxiing time between start of treatment and takeoff and avoid changing weather conditions encountered when aircraft have extra-long taxi routes.

2.1.7 Air Traffic Control Tower (ATCT) Line-of-Sight.

2.1.7.1 **Standards.**

The location of a standard CDF and its supporting structures:

1. Maintains ATCT's line-of-sight to active runway ends and their supporting taxiways.
2. Minimizes reductions to ATCT's visual view of the entire movement area.
3. Minimizes visual "shadows" created by the tail and wing surfaces of aircraft awaiting treatment, and by the plume created by the deicing operations.

2.2 FAA Clearance and Aircraft Separation Standards for a CDF.

2.2.1 Standards.

2.2.1.1 **Airport Geometry.**

To ensure safe and efficient aircraft maneuvering, design the location and size of a CDF to follow the clearance and separation standards specified in AC 150/5300-13. These include but are not limited to:

1. Dimensional standards for taxiways, taxilanes, and aprons.
2. Use taxilane dimensions for deicing pads separation.
3. Airport imaginary surface dimensions including:
   a. Safety areas
   b. Object free areas
   c. Runway visual zones
   d. Runway obstacle free zones (OFZ)
   e. Airport approach/departure surfaces
4. Jet blast protection

2.2.1.2 **FAA Electronic Facilities.**

1. Locate a CDF and related facilities so they do not interfere with:
   a. FAA radar and navigational aids (NAVAIDs)

b. Airport and runway approach visibility

c. Weather facilities (e.g., Automated Weather Observing System (AWOS))

d. Communications

2. Coordinate the installation of communications equipment and assignment of frequencies with FAA Technical Operations during planning and design of a CDF.

2.3 Capacity of Aircraft Deicing Facilities.

For airports needing aircraft deicing facilities (either at the gates or centralized), balance the required treatment capacity of the users with the airport's peak hour departure rate during snow/icing conditions.

2.3.1 Number of Deicing Facilities.

The estimated number of deicing pads plus other operational infrastructure needs of a CDF determine the approximate physical space requirement for siting the facility. Once the facility's overall physical size requirement is known, the search for suitable sites follows within the framework of safety and operational siting factors cited in this AC, plus AC 150/5300-13.

2.3.1.1 Multiple Deicing Facilities.

When the estimated number of deicing pads cannot be physically sited or operationally managed (such as under usual poor weather conditions) at a single site, consider multiple sites for additional CDFs.

2.3.1.2 Type of Facility User.

Airports serving a wide variety of scheduled service and nonscheduled service by air taxi, general aviation aircraft, and charters may better meet their deicing/anti-icing needs by constructing a separate deicing facility for each group. If a single facility is identified for all airport users, consider additional physical space to meet the specific needs for one of the groups, e.g., facilities that store specific, approved deicing/anti-icing fluids for smaller aircraft.

2.3.2 Number of Centralized Aircraft Deicing Pads.

Evaluating the following factors provides a better estimate of the necessary number of deicing pads at a facility.

2.3.2.1 Procedures and Methods of Users.

Facility users receive either one-step or two-step deicing/anti-icing treatment. The latter procedure results in longer occupancy times at deicing pads.

1. To provide users with operational flexibility, base the number of deicing pads on the two-step treatment operation.

2. Increase the occupancy time to reflect differences in the methods used to treat aircraft and perform preflight inspections. Users typically supplement preflight inspection recommendations by aircraft manufacturers with additional items for special operational conditions.

2.3.2.2 **Variations in Meteorological Conditions.**

Variations in meteorological conditions, e.g., type of precipitation, affect the extent and frequency of the deicing/anti-icing treatment.

1. For airports commonly experiencing heavy, wet snow or freezing rain, increase the number of deicing pads to maintain departure flow rates at levels that avoid unacceptable delays for subsequent aircraft awaiting treatment.
2. If revised aircraft ground flow control procedures fail to prevent meteorological conditions from frequently degrading the holdover time used for the initial treatment at a terminal gate facility, consider a facility closer to the active runway.
3. Strive for a balance between the number of aircraft deicing facilities (at terminal gates and CDFs) and their airport location to offset severe meteorological conditions so holdover times are still in effect at takeoff.

2.4 Design Considerations Affecting CDF Size and Location.

2.4.1 Number of CDF Aircraft Deicing Pads.

1. For the number of deicing pads in a CDF, the airport determines the:
   a. number of aircraft to be treated for a set time away from the gates.
   b. individual times to treat aircraft for various weather conditions (wet snow, pellets, freezing drizzle, cold rain, etc.).
   c. types of aircraft to be treated since some aircraft configurations require longer treatment than other aircraft.
   d. airport's peak hour departure rate during snow/icing conditions.
2. The FAA recommends that the CDF design considers future aircraft fleet mixes for a planning period of at least 10 years.
3. Multiple deicing pads provide more operational flexibility at a CDF when each deicing pad has its own individual entrance and exit queuing capabilities (for example, see Figure 3-3, Figure 3-4, and Figure 3-5).

2.4.2 Site Selection of CDFs.

2.4.2.1 The physical space available at an airport.

1. Many airports have some space constraints making the site selection challenging.

2. Build future CDF sites into the master planning process.

2.4.2.2 Taxiing time that begins with the start of the last step of the deicing/anti-icing treatment and ends with takeoff clearance, such that the holdover times of applied fluids are still in effect.

1. Use slower taxiing speeds experienced under winter-contaminated conditions as well as other time-contributing factors specific to the airport.

2. SAE AS6285 and ISO 11076, Aircraft – Deicing/Anti-Icing Methods on the ground, provide departure planning holdover procedures for various anti-icers, such as Type I and Type IV, which assist in balancing holdover times and winter taxiing times from the CDF to the takeoff point.

2.4.3 Fleet Mix.

CDF physical space depends on the airport's fleet mix. An airport serving a large variety of aircraft types and sizes may require more flexible and complex facilities (e.g., multi-lane deicing pad) than those airports serving predominantly one class of aircraft. It is possible that the most demanding aircraft will not be the critical aircraft. Plan accordingly to ensure sufficient space for future needs. See Figure 2-1 for more information.

2.4.4 Taxiing Routes.

When locating a CDF away from the terminal area(s), evaluate the airport taxiway system for:

1. Taxiing time from the CDF to the relevant runway threshold(s) are below the HOT for the deicing operations.

2. Ensure taxiing routes toward a CDF and its deicing queues maintain operational efficiencies of aircraft movements.

3. Provide bypass routes for aircraft not requiring deicing at the CDF. See Figure 2-1 for an example.

2.4.5 Environmental Runoff Alternative.

The cost-effective environmental alternatives available to the airport to control deicer runoff may limit the number of sites suitable for a CDF. Acceptable alternatives to mitigate deicer runoff vary according to city, county, and state environmental runoff regulations each airport follows.

2.5 Night and Low Visibility Lighting.

2.5.1 Standards.

1. Provide permanent or portable night-time lighting at all deicing facilities (gate, deicing pad, and CDF).

2. Provide ground crews the necessary illumination for deicing/anti-icing operations and pre-takeoff inspections during night or low-visibility conditions.
3. AC 150/5360-13, *Airport Terminal Planning*, provides general lighting recommendations for gate-related functions.
4. Design the height of lighting poles in accordance with paragraph 2.2.1.1.
5. Aim and/or shield permanent nighttime lights to minimize glare to pilots and the ATCT's line-of-sight, without reducing the illumination of critical areas.

2.6 **Surface Gradient.**

2.6.1 Final Grades.

When possible, site facilities on relatively flat land where the natural terrain features conform to the final grades for the ultimate design of the deicing facility.

2.6.2 Drainage Areas.

If possible, avoid selecting sites with high water tables that require sub drainage and a runoff mitigation alternative.

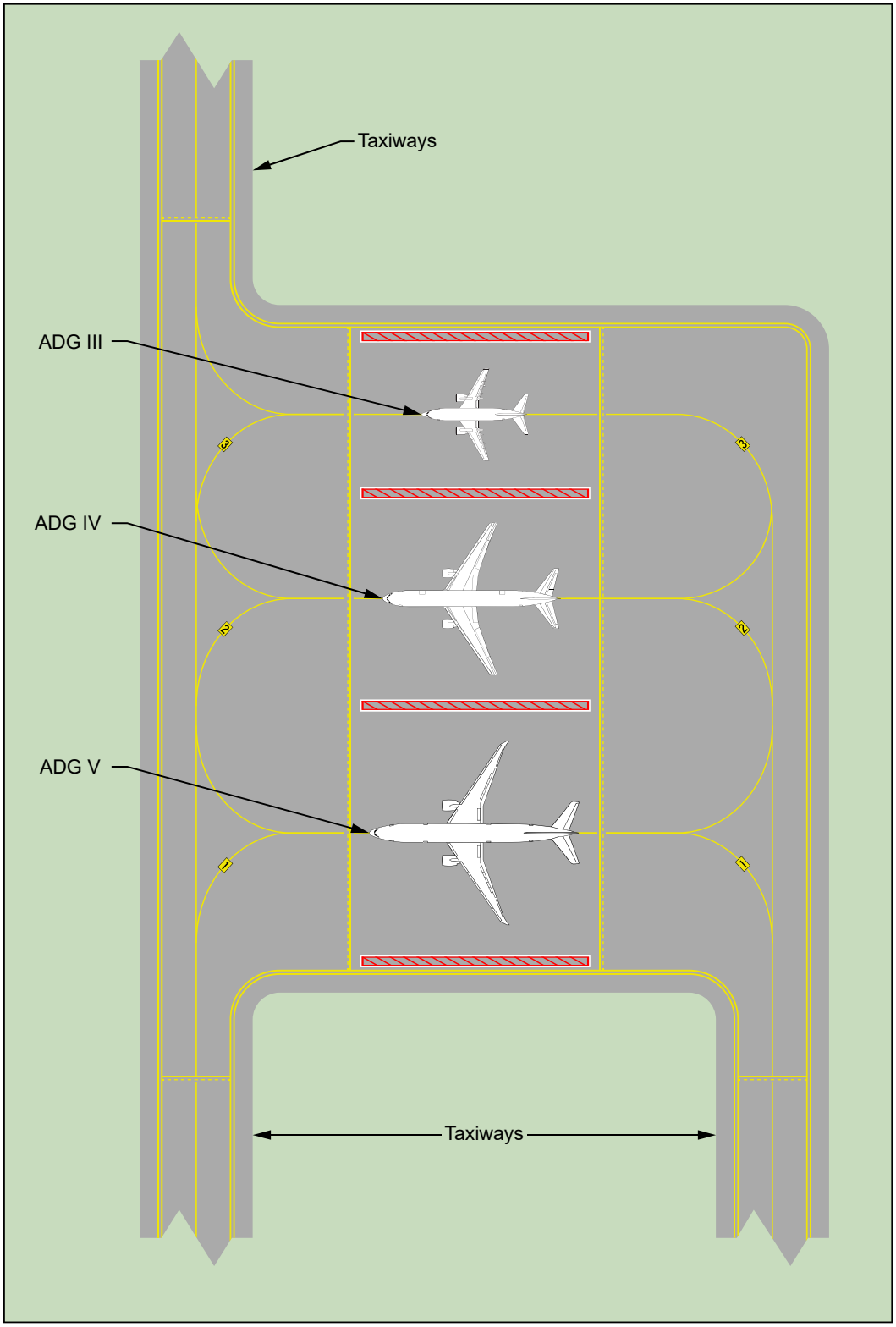
2.6.2.1 **Standard**

1. Design the grading for deicing facilities in accordance with AC 150/5320-5, *Airport Drainage Design*.

2.7 **Utilities.**

Evaluate cost when considering a location to extend water supply, electric power, communication service, and sanitary or storm sewers to support a CDF.

Figure 2-1. Example of a Separate Taxiing Entrance to a CDF



Note 1: The location of the deicing pad/facilities and equipment (e. g. light poles) to be clear of the 40:1 IFR Departure Surface for all runway ends on the airport.

Note 2: Design taxiways, taxilanes and runways in accordance with AC 150/5300-13.

CHAPTER 3 Design of Aircraft Deicing Facilities

3.1 Aircraft Deicing Facilities.

The sizing of an aircraft deicing pad comprises three components:

1. the aircraft parking area,
2. the maneuvering area for mobile deicing vehicles, see Figure 1-1, and
3. the five-foot imaginary buffer zone around the entire aircraft, see Figure 1-1.

3.1.1 Aircraft Parking Area.

This area is the inner area for parking aircraft to receive deicing/anti-icing treatment.

3.1.1.1 **Standards.**

1. Width.
   a. The width of a parking area equals the TLOFA of the most critical Aircraft Design Group (ADG). See paragraph 2.4.3.
   b. Locate any VSZ outside the TLOFA of the critical ADG. See Table 3-1.
2. Length.
   a. The length of the parking area equals the fuselage length of the most demanding aircraft using the deicing pad.

3.1.2 Maneuvering Area for Mobile Deicing Vehicles.

3.1.2.1 **Standard.**

Provide the vehicle lane width necessary for two or more mobile deicing vehicles to satisfactorily perform simultaneous and complete left and right-side uniform fluid distribution techniques for removing deposits of frost, ice, slush, and snow from aircraft surfaces and for anti-icing operations.

3.2 Separation for Aircraft Deicing Pads.

Movement speed within an aircraft deicing pad is slow, directed by air marshals and flaggers. Regardless of where the deicing pad is located at an airport, the separation criteria within the pad follows taxilane separation values as prescribed by AC 150/5300-13, *Airport Design*.

3.2.1.1 **Standards.**

1. A CDF with more than one aircraft deicing pad has parallel centerlines.
2. Follow the separation standards provided in Table 3-1.

3.2.1.2 **Design Considerations.**

1. Table 3-1 considers the need for individual deicing pads to provide sufficient maneuvering area around the aircraft by two or more mobile deicing vehicles (see paragraph 1.3.2 and Figure 1-1).
2. Table 3-1 defines taxilane centerline as a line located half the value of a TLOFA, measured from the inner edge of the VSZ.
3. Table 3-1 ensures that sufficient separation exists between taxi centerlines and VSZs.
4. Table 3-1 provides airport operators with the option to locate CDFs in the movement area or non-movement areas.

3.3 Pavement Surface Markings for Deicing Pad and CDF.

3.3.1 Taxilane Centerline Surface Marking.

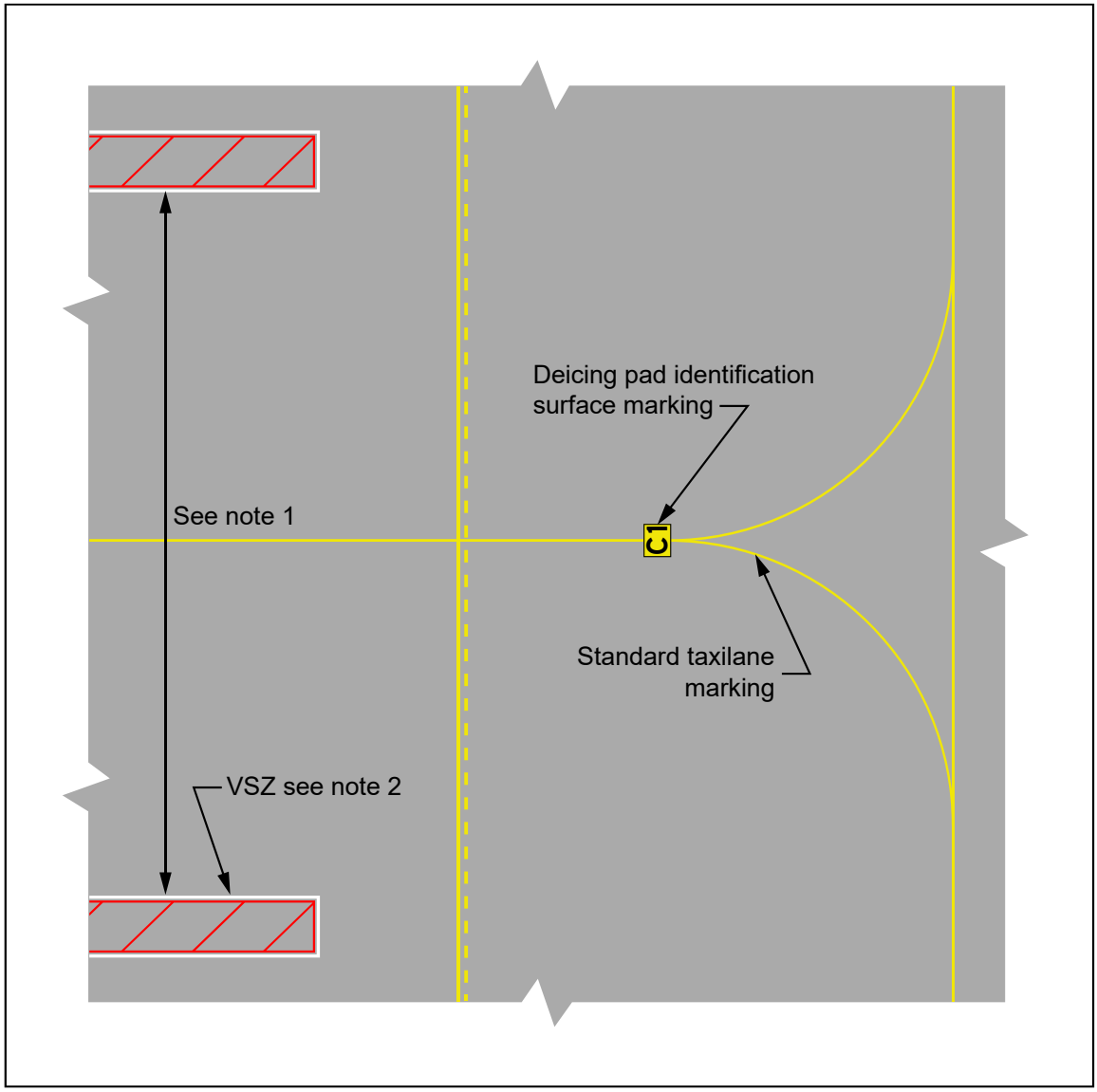
3.3.1.1 **Standards.**

1. Taxiway or taxilane surface markings leading the aircraft into the facility, moving through the deicing pad, and exiting the facility are yellow. See Figure 3-1.
2. Design all other deicing pad and CDF surface markings in accordance with AC 150/5340-1.
3. Red in-pavement lights or stop bars are necessary when deicing bay locations lead into an active runway and when a CDF is controlled by Air Traffic. See AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*, for further details.

3.3.1.2 **Design Considerations.**

1. At airports operating below 1,200 feet runway visual range (RVR), add a deicing pad or CDF located on a designated SMGCS low-visibility taxi route (see AC 120-57, *Low Visibility Operations/Surface Movement Guidance and Control Systems (LVO/SMGCS)*)
2. Such facility may need additional taxiing route surface marking, lighting, and sign systems necessary to support the SMGCS operations.

Figure 3-1. Deicing Pad Identification (“C1”) Surface Marking at Entrance Point



Note 1: See Table 3-1 for separation distances.
Note 2: See Figure 3.2.
Note 3: For details regarding the Deicing Pad Identification Surface Marking, refer to the Ramp Control Markings information contained in AC 150/5340-1.
Note 4: The maximum length of the VSZ should not infringe on the TLOFA limit of the taxilane leading onto the deicing pad.

3.3.2 CDF Pad Boundary Surface Visual Aids.

3.3.2.1 **Standards.**

Boundary Surface markings for a CDF delineate the entrance and exit points of the facility and are in accordance with paragraph 3.3.1. These markings also minimize intrusions into the OFA of nearby taxiways.

1. Mark the CDF with the taxiway/taxiway intermediate holding position surface marking for facilities under direct ATCT control.
2. Mark the CDF with the non-movement boundary surface marking for facilities not under ATCT control but by a service provider (Snow Desk). See Figure 3-3, Figure 3-4, and Figure 3-5.
3. This marking identifies the ground control transfer points between the ATCT and the Snow Desk control center.
4. Alternatively, the airport sponsor may use lighted signage instead of surface markings, only at the facility entrance.

3.3.2.2 **Recommended Practices.**

1. When using lighted signs, design in accordance with AC 150/5340-18.
2. The single taxilane entrance centerline separates into individual taxilane centerlines for the incorporated deicing pads. Mark each individual taxilane centerline entrance within the grouping with its own deicing pad identifier.
3. If a single deicing pad serves as a composite deicing pad (or "grouping") such as pad #2 in Figure 3-4, incorporating both pads #3 and #1, then use individual taxilane centerline surface markings for each group.
4. Since these pads are grouped, the deicing pad identifiers use the same alpha character followed by a different numeric character. For example, the pad grouping #3, #2, and #1 would be identified as D3, D1, and D2, respectively, with the main entrance taxilane centerline serving pad #2 designated as D2.
5. Ensure pad identifiers are not the same as taxilane designations elsewhere on the airport.

3.3.3 VSZ Surface Markings.

The VSZ is a safety zone for personnel and parked deicing vehicles and other equipment.

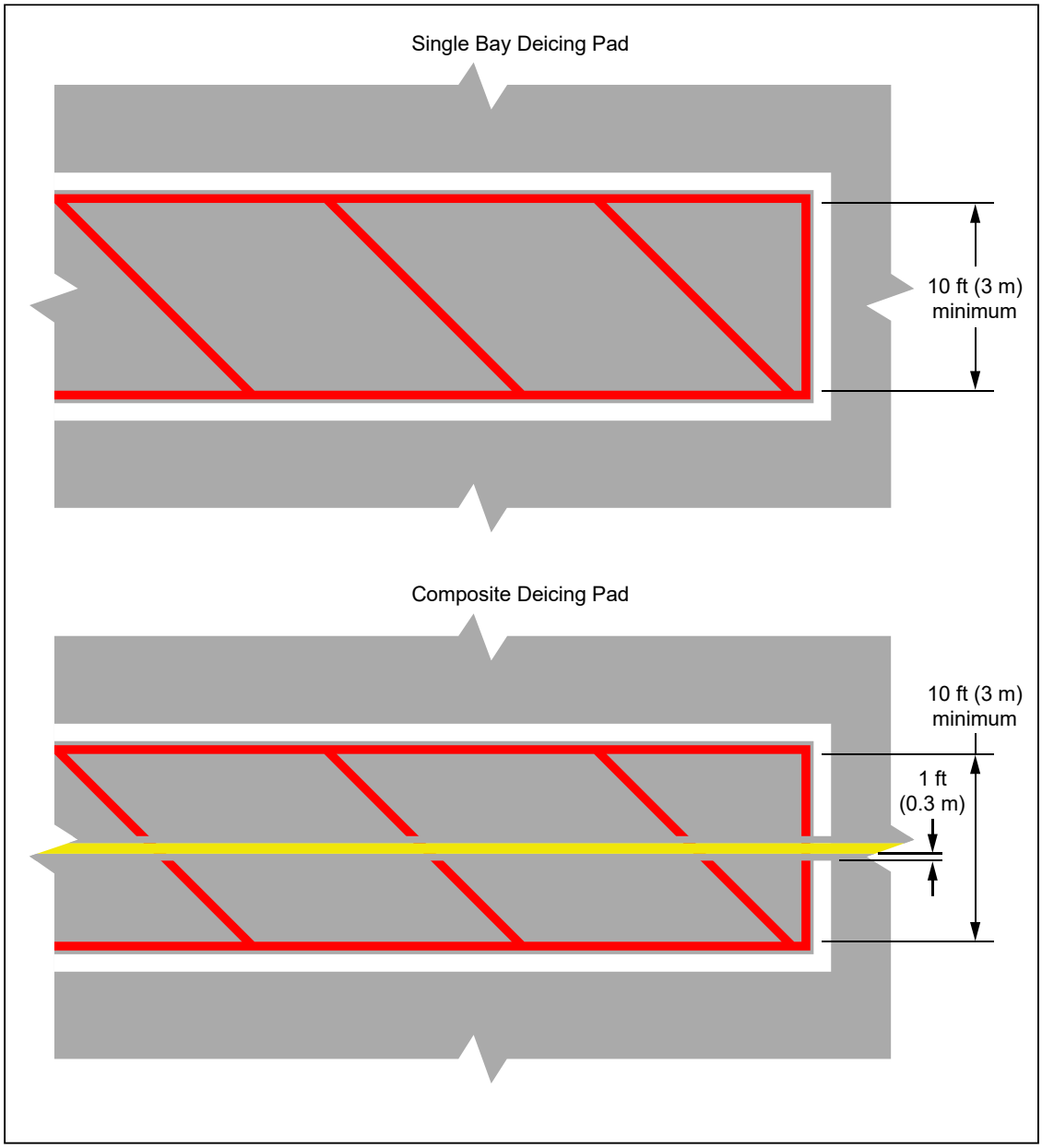
3.3.3.1 **Width of VSZs.**

3.3.3.1.1 Standards.

1. The minimum width for the VSZ is 10 feet (3.0 m).
2. Design each ADG specific deicing pad at the CDF with a VSZ surface marking equidistant from its taxilane centerline per Table 3-1, see Figure 3-2.
3. For a composite deciding pad the "middle VSZ" consist of a one foot (0.3 m) gap between the yellow taxilane centerline, and the red and white stripes, see Figure 3-2.

4. To define the VSZ limit, provide a red border and red diagonals six inches in width. Diagonal is at 45 degrees (optional) and spaced a maximum of 15 ft (4.6 m) feet apart, see Figure 3-2.
5. Surround a VSZ defined area with white striped border, 12 inches (3.5 cm) in width, see Figure 3-2.
6. Apply a two inch separation between the red and white striped borders all around, see Figure 3-2.

Figure 3-2. Vehicle Safety Zone Surface Marking Standards



Note 1: See paragraph 3.3.3 for design standards.

3.3.3.1.2 Recommended Practice.

For a composite deicing pad (grouping), such as pads #3, #2, #1 in Figure 3-4, provide three VSZs for the grouping (based upon the direction of travel), one VSZ to the left of pad #3, one VSZ to the right of pad #1, and one VSZ centered along the taxilane centerline.

3.3.3.2 **Overall Length of VSZs.**

The overall continuous length of the VSZ provides enough clearance for parking the vehicle fleet performing the deicing/anti-icing operations.

3.3.3.2.1 Standard.

The overall continuous length is such that neither end of the VSZ violates the taxilane object free area of the taxilanes or taxiways located outside the boundary of the deicing facility. See the TLOFA discussion in AC 150/5300-13 to evaluate VSZ length termination.

3.3.3.2.2 Recommended Practice.

Depending on the jet blast profiles of the fleet mix, reduce the length of the VSZ toward the exit side of the facility to minimize jet blast impacts onto parked vehicles and personnel when the aircraft exits and turns onto the connecting taxiway.

3.3.3.3 **Location of VSZs.**

1. VSZs between adjacent deicing pads is in accordance with paragraph 3.2 of this AC.
2. A VSZ on the outermost deicing pad follows the same separation criteria where the inner edge of the VSZ is located a distance of one-half the TLOFA from the taxilane centerline as specified in AC 150/5300-13 and Table 3-1 in this AC.

3.4 Deicing Pad Configurations.

Proper configurations for deicing pads maximize the flexibility of deicing operations and reduce ATCT workloads. The following configurations provide alternatives based on deicing pad location and airport capacity needs.

3.4.1 Configurations.

3.4.1.1 **Common Deicing Pad Configuration.**

A common deicing pad configuration has a single centerline through the deicing pad to guide all aircraft sizes. For facilities serving a fleet mix with numerous wide-body aircraft, separating deicing pads for wide-body aircraft from other aircraft increases deicing capacity (Figure 3-3).

3.4.1.2 **Composite Deicing Pad Configuration.**

A composite deicing pad configuration has more than one centerline through the deicing pad to guide different aircraft sizes. For facilities serving a balanced mix of different aircraft sizes, correlating the percentages of aircraft types to their departure rates may increase deicing capacity (see Figure 3-4). When two aircraft use a common centerline, evaluate the need for additional parking space between aircraft to account for exiting jet blast degradation of Types II or IV fluids and velocities on personnel/equipment (see paragraph 3.4.3.1).

Table 3-1. Separation Criteria for Centralized Aircraft Deicing Pads Having Parallel Taxilanes

Airplane Design Group	CDF Separation Criteria	
ADG	Edge of VSZ to taxilane centerline [1]	Taxilane centerline to taxilane centerline [2]
ADG I	39.5 ft (12 m)	89.0 ft (27.1 m)
ADG II	55.0 ft (16.8 m)	120.0 ft (36.6 m)
ADG III	79.0 ft (24.1 m)	168.0 ft (51.2 m)
ADG IV	112.0 ft (34.1 m)	234.0 ft (71.3 m)
ADG V	135.0 ft (41.1 m)	280.0 ft (85.3 m)
ADG VI	161.0 ft (49.1 m)	332.0 ft (101.2 m)
VSZ width	10 ft (3 m)	10 ft (3 m)

Note 1: Equals to half the TLOFA of the ADG.
Note 2: Equals the TLOFA of the ADG plus VSZ width.

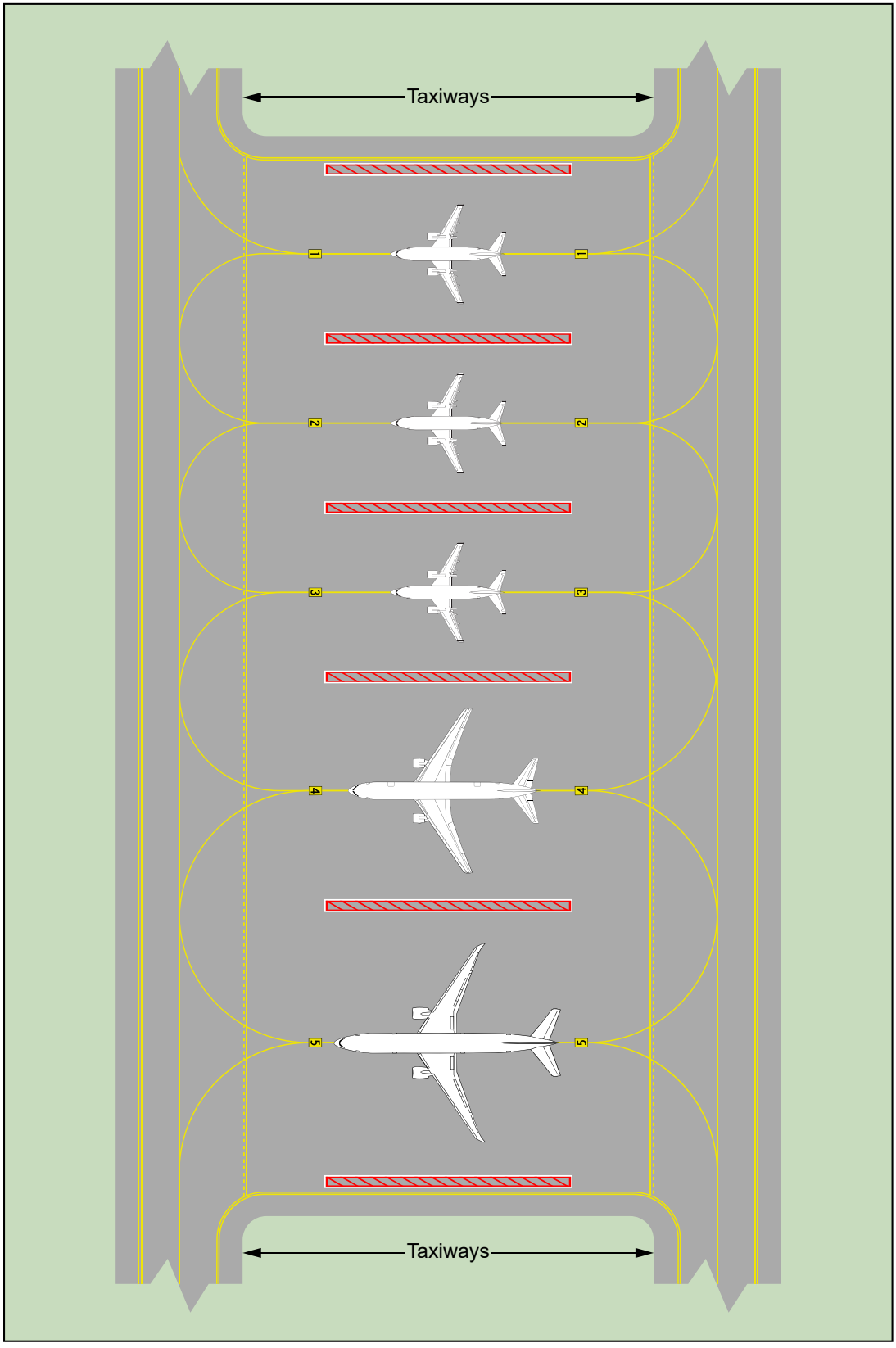
3.4.2 CDF Taxilane Centerline Orientation.

3.4.2.1 For airports experiencing frequent high wind velocities, orient the centerlines of deicing pads with the prevailing wind during icing events. This allows the application of heated fluids closer to the surface of the aircraft skin, thereby

minimizing heat loss and fluid usage, and takes advantage of the full hydraulic force of the fluid spray.

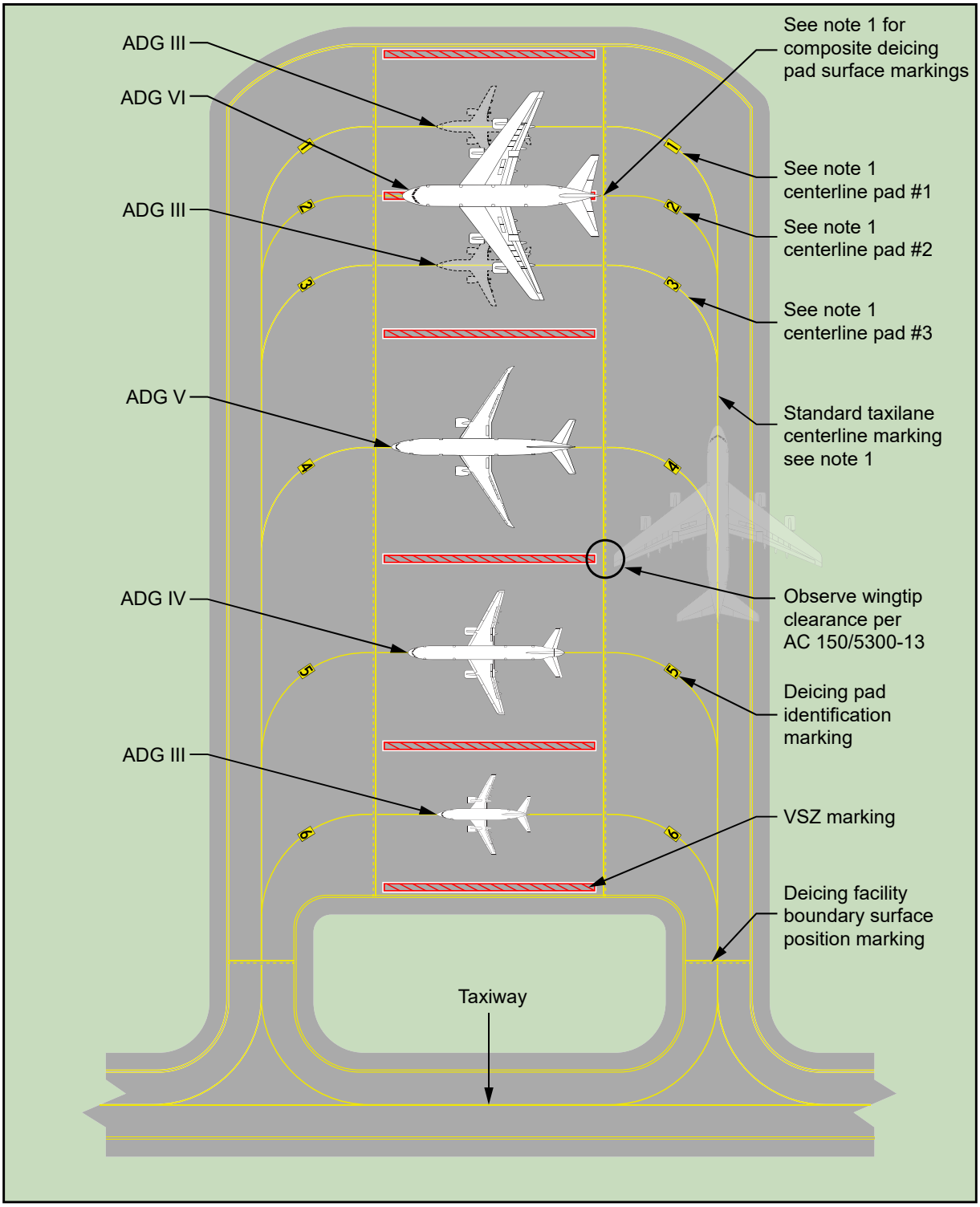
3.4.2.2 Orienting the centerlines of deicing pads so they are non-perpendicular to the connecting taxiway potentially expands suitable sites for a CDF. Figure 3-5 illustrates how the angled orientation reduces the facility's depths. Serving Boeing 737-800 (L=129 ft (39.45 m)), Boeing 767-300 (L=180.3 ft (55.14 m)), and Boeing 777-300 (L=209.1 ft (63.95 m)) will reduce the deicing pad footprint significantly (L is the fuselage length).

716 **Figure 3-3. Example of a Common Deicing Pad Configuration**



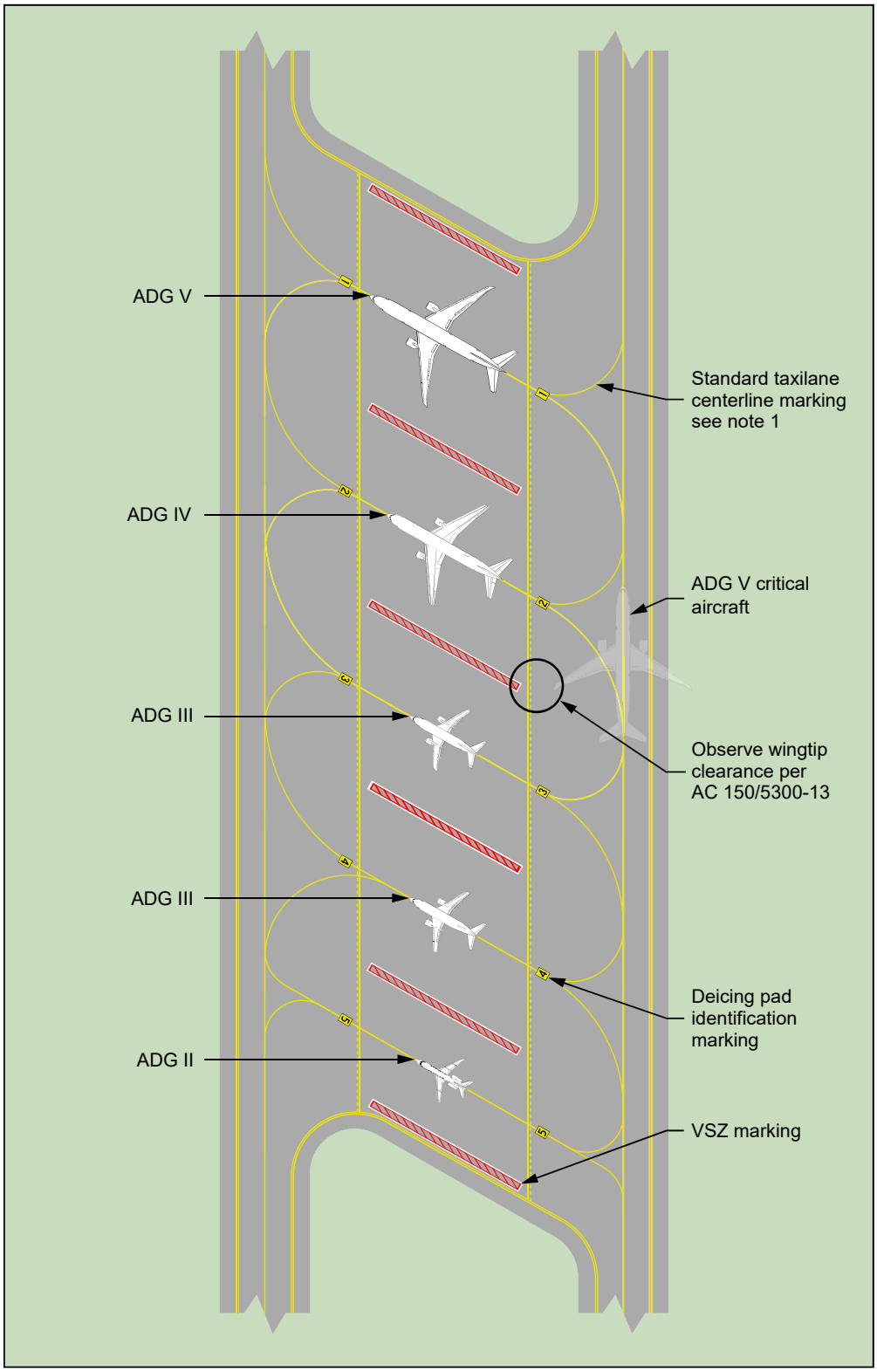
717

718 **Figure 3-4. Example of a Composite Deicing Pad Configuration**



719
720 **Note 1:** See paragraph 3.3.2.2.

Figure 3-5. Deicing Pad Centerlines Oriented 60 Degrees to the Connecting Taxiway



Note 1: See paragraph 3.4.2.2.

3.4.3 Jet Blast.

Jet blast velocities on adjacent aircraft cause a degradation of deicing fluids, leading to reduced holdover times. Reduced holdover times also result when taxiing aircraft recirculate snow onto following aircraft if trailing separations are not adequate. Blowing snow degrades the anti-icing protection of the aircraft, therefore a following aircraft maintains sufficient distance from the preceding aircraft.

3.4.3.1 **Standard.**

Design the deicing pad configuration to account for jet blast effects caused by exiting aircraft on aircraft receiving or just completed treatment, and on personnel and equipment performing duties.

3.4.3.2 **Design Considerations.**

1. See AC 120-58, *Pilot Guide Large Aircraft Ground Deicing*, and AC 120-60, *Ground Deicing and Anti-icing Program*, for additional information. Aircraft manufacturers are the primary source for jet blast pressures and velocity curves.
2. See AC 150/5300-13 for means of minimizing the effects of jet blast if it becomes an issue for the structures or any ground-based navigational facilities.

3.5 Electronic Message Boards (EMBs) for CDF Deicing Facilities.

The use of mobile or fixed electronic message boards (EMBs) at central deicing facilities by the service provider increase the overall efficiency of deicing/anti-icing aircraft operations by improving the transfer and clarity of information between flight crews and service providers.

Installing EMBs:

1. reduces verbal communication between all involved parties; [radio communication is still necessary to inform flight crews on exiting instructions].
2. provides flight crews with clear, concise information.
3. improves deicing pad operational safety and efficiency.
4. reduces ground congestion by removing personnel and equipment promptly from the deicing pad area after completing deicing/anti-icing operations.

3.5.1 Standards.

1. Mount signs that are located within the taxiway or taxilane safety area on frangible couplings.
2. Ensure sign clearances from aircraft are as described in AC 150/5340-18.

3.5.2 Recommended Practices.

1. Install EMBs in accordance with SAE Aerospace Standard 5635, Message Boards (Deicing Facilities), along with a written operational plan covering procedures when EMBs become inoperative.
2. One acceptable location for EMSs is within the vehicle safety zones discussed in paragraph 3.3.2.2.
3. Mount signs located outside of the taxiway or taxilane safety area but within the object free area on frangible couplings.

3.6 Deicing Pad Control Tower.

A dedicated tower, if needed, to control a CDF may be designed to efficiently manage the dispatching and movement coordination of deicing vehicles.

3.6.1 Standards.

Locate the tower adjacent to the deicing pad and observe compliance to:

1. Safety areas
2. Object free areas
3. Runway visual zones
4. Runway obstacle free zones (OFZ)
5. Airport approach/departure surfaces

3.6.2 Recommended Practice.

Cameras can be installed on high-mast light poles and provide an acceptable view of the deicing pad and deicing operations.

3.7 CDF Pavement Design.

3.7.1 Standards.

1. Design the pavement section for pads at the CDF to support the loads of the critical aircraft.
2. The pavement is either a rigid (concrete) or flexible (asphalt) pavement and designed in accordance with AC 150/5320-6, *Airport Pavement Design and Evaluation*, and AC 150/5320-12, *Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces*.
3. Groove deicing pads to assist in channeling deicing fluids for collection and providing aircraft and personnel better traction.

3.7.2 Grades and Surface Gradients.

3.7.2.1 **Standards.**

1. Design grades and adjacent surface gradients in accordance with AC 150/5300-13.
2. Design the deicing pavement grades for the fluid to flow away from deicing pad centerlines, fixed-fluid applicators, vehicle safety zones, and crew shelters, if applicable.
3. Design the deicing pad grade to direct flow towards collection facilities, if applicable.
4. If using covered drains, they must not create a hazard to aircraft and personnel. AC 150/5320-5 provides guidance on high-strength covers.

3.7.3 Perimeter.

3.7.3.1 **Recommended Practices.**

1. Design the perimeter of the CDF's apron so no aircraft surface being deiced/anti-iced extends beyond it.
2. Install a means for collecting or redirecting deicing fluid runoff such as a trench drainage system, at the apron perimeter.

CHAPTER 4 Aircraft Access and Vehicle Service Roads

4.1 Aircraft Access Routes.

4.1.1 Bypass Taxiing.

Besides supporting departure demand for the anticipated weather conditions, a bypass taxiway provides an aircraft with a return route for re-deicing if it exceeds its holdover time.

4.1.1.1 Recommended Practice.

Design the CDF with bypass taxiing capability so treated aircraft within the facility do not restrict the access by other aircraft to the active runways.

4.1.2 Holding Bays.

Some airports do not have enough physical space for facilities to have a separate taxiway bypass(s).

4.1.2.1 Recommended Practices.

1. Size the holding bay to provide sufficient aircraft maneuverability to be deiced/anti-iced while permitting subsequent aircraft bypass taxiing capability.
2. Provide adequate wingtip-to-wingtip clearances per AC 150/5300-13.

4.1.3 Taxiing Access Routes for CDFs.

4.1.3.1 Recommended Practices.

Design CDF access taxiing routes in accordance with AC 150/5300-13, AC 150/5320-6, and AC 150/5320-12. Additionally, taxiing routes:

1. minimize runway crossings and complex intersections,
2. avoid areas that require repeated ATCT clearances, and
3. provide for bypass capability.

4.2 Vehicle Service Roads (VSRs).

4.2.1 Standards

1. Design the VSR to accommodate the vehicle widths and turning radii requirements.
2. Ensure the VSR has the structural capacity for the necessary number of deicing vehicles to transport a quantity of fluid that equals the facility's peak deicing fluid demand.
3. Design all VSR markings in accordance with AC 150/5340-1.

4.2.2 Recommended Practices.

1. Provide a CDF with VSRs or vehicle staging areas.
2. SAE ARP 4806, *Aircraft Deicing/Anti-icing Self Propelled Vehicle, Functional Requirements*; SAE ARP 1971, *Aircraft Deicing Vehicle – Self-Propelled Large and Small Capacity*; and ISO 11077, *Aerospace – Self-Propelled De-icing/Anti-icing Vehicles –Functional Requirements* describes vehicle dimensions and other characteristics related to service road design.
3. Plan VSRs routes to reduce the likelihood of runway incursions by deicing equipment and ground service vehicles
4. Assist in providing required response times by ARFF vehicles. Construct pullover shoulders or make similar provisions for non-emergency response traffic.
5. Ensure VSR circulation routes are clearly defined and minimize taxiway and runway crossings. Consider SMGCS requirements at airports operating under a SMGCS Plan.
6. Design VSRs for bidirectional traffic if necessary for safety of high traffic areas.
7. Design the geometry complementing or enhancing Aircraft Rescue and Fire Fighting (ARFF) emergency response times,

4.2.3 Operational and Safety Dependency.

Typically, a CDF located near the terminal apron(s) depend less on VSRs than those facilities located near the departure runways.

4.2.3.1 **Recommended Practices.**

1. Install deicing fluid storage tanks and transfer systems or fixed-fluid applicators at CDFs.
2. Construct a service road when no other means, such as a non-active taxiway, is available for mobile deicing vehicles and service vehicles to reach the site.

4.2.3.2 **Design Considerations.**

1. VSRs provide authorized personnel the access necessary to conduct outside-the-aircraft and pre-takeoff contamination checks and to perform deicing/anti-icing treatment.
2. An extension to an existing VSR or perimeter road may be sufficient.
3. Depending on the airport's safety programs, physical constraints, etc., service vehicles without the benefit of a VSR may require operations personnel escorts on taxiways and runways.

CHAPTER 5 Water and Fluids Management

5.1 Best Management Practices (BMPs).

Since deicing/anti-icing fluids are chemical products with environmental consequences affecting the water quality of receiving waters and the aquatic communities that use those waters, deicing facilities typically need runoff mitigation management. There are many BMPs which manage contaminated runoff. Refer to SAE ARP 4902 for fluid runoff collection, deicing fluid storage, and fluid recycling.

Additionally, AC 150/5320-15, *Management of Airport Industrial Waste*, provides:

1. Additional BMPs for mitigating various types of pollutants from entering storm water runoff conveyances.
2. Basic information on the characteristics, management and regulations of industrial waste generated at airports.
3. Guidance for the development of a Storm Water Prevention Plan (SWPP) that applies BMPs to eliminate, prevent, or reduce pollutants in storm water runoff associated with airport industrial activities.

5.1.1 Treatment Advantages.

The recommended structures in this chapter are those that compose a mitigating alternative that collects and retains runoff for proper disposal or recycling. In terms of structural best management practices, this approach to "control the source" offers airport managers an effective and economical means of complying with storm water permitting requirements. This approach offers two treatment advantages:

1. Lessens the difficulty of dealing with the facility's deicer runoff by isolating it from airfield storm sewers or from terminal areas that do not divert seasonal flows of glycols.
2. Deicing facilities enhance the feasibility and economic benefits of recycling glycols by collecting higher glycol concentrations, as compared to drainage systems where glycols are further diluted with other runoff and precipitation.

5.1.2 Treatment Parameters.

A BMP mitigates biochemical oxygen demand (BOD) and toxicity that are the primary runoff effects. Additives in deicing/anti-icing fluids may affect the overall biodegradability. Depending on the type of discharge permit, the alternative needs to monitor specific items, generally based on BOD 5-day testing (BOD5), chemical oxygen demand (COD), total organic carbon (TOC), total suspended solids (TSS), oil/grease, pH, and flow rate limits.

5.2 Mitigation Alternatives.

The mitigation alternative allows users of the deicing facility continued use of deicing fluids within the framework of Federal, State, and local storm water runoff regulations (discharge permits). The FAA recommends the appropriate Federal, state, or local

environmental authority review the proposed alternative to verify its effectiveness in meeting water quality permit requirements. Prior to final selection, evaluate all alternatives on a lifecycle cost basis to avoid an accepted long-term alternative with a short useful life; for an example, see paragraph 5.3, Publicly Owned Treatment Works (POTWs). Additionally, it reflects the best alternative afforded by the facility's site and integration with the airport master drainage plan. A few alternatives:

1. Off-airport biochemical treatment of facility runoff at POTWs by way of a sanitary sewer. See paragraph 5.3 for additional guidance.
2. On-airport detention basin with a pump station for discharging metered runoff to receiving waters by an airport storm sewer. See paragraph 5.4, Detention Basins, for additional guidance.
3. On-airport anaerobic biochemical reactor for pre-treatment of runoff prior to discharge to POTWs or a detention basin. See paragraph 5.7, Anaerobic Bioremediation Systems.
4. On-airport underground storage tanks (USTs) or concrete vaults for detention of runoff that hauling tankers can pump out for proper disposal. Airports lacking the physical space for detention ponds can consider placing USTs near the deicing facility. See paragraph 5.5, Underground Storage Tanks (USTs), for additional guidance.
5. On-airport recycling system. See paragraph 5.6, Recycling Glycol Fluids, for additional guidance.
6. Diversion boxes for diverting seasonal glycol runs off to a specific location, such as a detention basin. Depending on the site and storm water permitting requirements, one of the above alternatives and/or other technologies working in tandem provide the airport manager with an effective alternative acceptable to Federal, state, and local environmental authorities.

5.3 Publicly Owned Treatment Works (POTWs).

The POTW alternative normally requires the airport manager to monitor flow volumes and pretreat glycol-contaminated storm water to protect the receiving POTW facility. For an example, see paragraph 5.7, *Anaerobic Bioremediation Systems*. Areas of probable pretreatment are high BOD5, COD, TOC, TSS, pH, and oil/grease. To alleviate the load on POTWs, the U.S. Environmental Protection Agency (USEPA) developed a national pretreatment strategy (1977) under the Clean Water Act. The regulations are published as Title 40 CFR, Part 403, *General Pretreatment Regulations for Existing and New Sources of Pollution*. Regardless of the size of the surrounding community, airport authorities and the local community considering this alternative not only need to evaluate the POTW's current capacity, but whether it can accept both future load demands from the airport and a growing community.

5.4 Detention Basins.

For airports with available physical space, an economical alternative to treating "first flush" runoff from deicing facilities is with a single or series of detention basins. The state or local authority having jurisdiction generally establishes construction and design standards.

5.4.1 Sizing.

The biodegradability rate, which varies by glycol types, is a primary factor for determining basin capacity. Reduce basin capacity by considering slower microbial activity during the winter season and the greater concentration of available oxygen in colder water. Detention of ethylene glycol, which degrades quicker than propylene glycol, permits earlier metered discharges and, thus, reduces basin capacity.

5.4.2 Mechanical Aeration.

Glycol's quick consumption of available oxygen levels within basins can lead to anaerobic conditions (lack of oxygen). This creates undesirable odors due to the adverse impacts to bacterial generation necessary for glycol degradation.

5.4.2.1 Design Considerations.

1. Install a mechanical aeration system to replenish oxygen levels. This supplemental acceleration of biodegradation, and earlier discharging of glycols, further reduces a basin's capacity. This system maintains dissolved oxygen levels at the level that places the alternative in environmental compliance.
2. Install pump stations at basins if the discharge cannot reach the desired outfall locations.

5.5 Underground Storage Tanks (USTs).

UST systems that collect deicing fluids are regulated under the USEPA UST regulations, i.e., 40 CFR, Part 280, *Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)*, and Part 281, *Approval of State Underground Storage Tank Programs*.

5.5.1 Recommended Practices.

1. Consider alternative designs to be in accordance with applicable USEPA and state UST regulations.
2. For facilities used on a yearly basis, collect regulated substances when the deicing pads are used for washing the exterior of aircraft.

5.5.2 Design Consideration.

A rigid pad with catch basin may be necessary for hauling tankers if the UST is a final collection point.

5.6 Recycling Glycol Fluids.

Depending on the nature of the runoff and economics, it may be possible to use technologies that recycle spent glycol fluids collected at concentrations of 5 percent and, under certain conditions, even lower percentages. Recycling provides airport management with two valued resources: recycled glycol and water. In addition to recouping some of the chemical cost for glycol and the utility cost for water, other recycling benefits may reduce sludge disposal costs incurred by other mitigation alternatives and reduce the physical space needed for equipment.

5.6.1 Design Considerations.

1. Follow established industry re-certifying standards, e.g. SAE, ISO, prior to using recycled glycols as the primary aircraft deicer/anti-icer fluid.
2. Recycled glycol fluids may be reused on the airfield pavements if they meet the appropriate glycol-based runway fluid recommendations in AC 150/5200-30.

5.7 Anaerobic Bioremediation Systems.

Anaerobic bioremediation systems in conjunction with POTWs or detention basins are an effective means of disposing of glycol-contaminated storm water.

The bioremediation system generally consists of:

1. a glycol contaminated storm water collection and storage system,
2. a bioreactor treatment system, and
3. a gas/heat recovery system.

5.7.1 Design Considerations.

1. Install anaerobic systems not only to reduce BOD5 concentration levels but to produce significantly less biomass.
2. These systems have demonstrated an additional ability to remove or lower to non-detectable levels “additive packages” that are necessary in deicer products from collected runoff.

5.8 Water Management to Runoff from Deicing Fluids.

AC 150/5320-5 provides design standards for airfield drainage systems.

5.9 Fluid Handling at Deicing Facilities.

5.9.1 Storage Tank and Fluid Transfer System Designs.

Install storage tanks and fluid transfer systems at deicing facilities in accordance with the fluid manufacturer’s recommendations. Dedicate the fluid transfer systems to each specific fluid to prevent the inadvertent mixing of fluids of different types or different manufacturers. Fluid manufacturers typically provide recommendations about

compatible pumps, control valves, piping, and compatible storage tanks. Additionally, industry documents SAE ARP 4737 and SAE ARP 4902 provide recommended industry practices for storage tank and transfer systems.

5.9.2 Separate Storage Tank Capacity.

Deicing facilities using various types of deicing/anti-icing fluids require more physical space to permit separate storage of fluids. Consult fluid manufacturers for storage tank requirements, maintenance, and precautions for both currently used fluids and possible future products at the airport. See SAE ARP 4902.

5.9.3 Tanks, Fill Ports, and Discharge Points Labeling.

To avoid cross-contamination of deicing fluids at a deicing facility, conspicuously label all tanks, fill ports, and discharge points for the type of fluid handled, e.g., SAE Type I Aircraft Deicing Fluid, ISO Type II Aircraft Deicing Fluid. See SAE ARP 4902.

5.10 **Wildlife Management.**

AC 150/5320-15 and AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, provide configurations and site location for detention basins to minimize potential wildlife issues.