

Runway Approach Categories	
Visual	The pilot navigates to the runway using visual references, typically in clear weather, with minimal instrument guidance.
Non-Precision	Uses instruments to provide horizontal (lateral) guidance to the runway, but no vertical guidance.
Precision	Provides both horizontal and vertical guidance using advanced instruments, allowing for safer landings in low visibility.

crane, mountain, trees, or building, that penetrates the height limits defined by Part 77's imaginary surfaces or otherwise poses a hazard to aircraft operation, as defined in CFR Part 77, Subpart C. In general, an object is an airspace obstruction if it's tall enough (over

require broader Part 77 surfaces, while airports with multiple runways require wider airspace protections. Refer to the [Airport Layout Plan Fact Sheet](#)¹ for more information about their purpose and development.

Development of Part 77 surfaces occurs early in the airport planning process, when a plan for a new airport is being developed, or a significant change to an existing airport is proposed, such as the construction of a new runway, the expansion of an existing runway, or a change in the critical aircraft. The critical aircraft is the most demanding aircraft that regularly uses the airport, with a minimum of 500 annual operations. Its weight, wingspan, and performance characteristics form the basis for designing airport facilities and are documented in the ALP. For more details, refer to the [Critical Aircraft Determination White Paper](#)². This aircraft criterion is used to determine the dimensions of the Part 77 surfaces, which are then incorporated into plans and used to guide land use decisions, zoning regulations, and obstruction evaluations. Preserving these imaginary surfaces over time is essential to accommodate future growth and ensure long-term aviation safety.

What are Airspace Obstructions?

Part 77 regulations not only ensure the safety of air travel by defining obstructions within the surfaces, but they also support the development of land near an airport by clearly defining compatible development. An obstruction is any natural or man-made object, like a cell tower, construction

499 feet), too tall in the wrong place (over 200 feet near airports), or if, at any height, it penetrates an imaginary surface or instrument procedure area. Identified Part 77 obstructions are categorized based on their disposition and recommended action. Some obstructions, such as mountains, are not feasible to remove and are designated to remain in place, while other obstructions, such as condemned buildings or tall trees, are designated for removal.

Part 77 surfaces are also used to evaluate new potential obstructions. The FAA uses the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA for short), a formal process to evaluate any proposed construction that could obstruct airspace. This process, established under Part 77, requires the filing of a Notice of Proposed Construction or Alteration, Form 7460-1, at least 45 business days before work begins. A sketch or drawing that depicts the proposed development and its location relative to the critical areas of an airport accompanies the form. The OE/AAA process ensures all proposed structures near airports are reviewed for safety impacts before construction begins. The FAA's Obstruction Evaluation Group (OEG) conducts an aeronautical survey to determine whether the object poses a hazard. The evaluation results in one of three determinations: "No Hazard", "No Hazard with Conditions", or "Hazard to Air Navigation". If the FAA issues a "No Hazard with Conditions" determination, the

project must meet specified requirements, such as height reductions or lighting additions, to ensure the safety of the airspace.

Clear Airspace for Reliable Access

With many remote communities, Alaskans rely on air travel for transportation, essential services, and medical care. Part 77 regulations protect the airspace required for safe aircraft operations by defining the size and location of imaginary surfaces surrounding each airport. FAA and airport sponsors apply these standards when evaluating proposed development to prevent structures from penetrating protected airspace. Permanent obstructions, such as mountainsides and those scheduled for removal, such as a building planned for demolition, are noted and mapped.

By maintaining awareness of existing and potential obstructions, Part 77 regulations support compatible land use, address future hazards, and provide the foundation for airport design and airspace analysis. This framework is a complex and essential part of airport planning in Alaska and the rest of the United States.

¹https://www.alaskaasp.com/media/5849/alp_fact_sheet_final.pdf

²https://www.alaskaasp.com/media/4587/2024_02_29_final_critical_aircraft_final.pdf



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FACT SHEET

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Understanding Part 77 Protected Airspace

Safe air travel depends on clear airspace for aircraft to take off and land without encountering obstacles. Defining airspace boundaries ensures airports maintain the space needed for safe operations. The Federal Aviation Administration (FAA) achieves this by defining five imaginary surfaces. These surfaces function like a protective bubble, ensuring safe aircraft maneuvers and the safety of people living and working nearby. Title 14 of the Code of Federal Regulation (CFR) Part 77 sets the standards for these surfaces.

Beyond defining protected airspace, Part 77 provides a framework for identifying, evaluating, and documenting obstacles within the airspace. This serves two key purposes: it defines which types of development near the airport are compatible with aviation navigation and ensures that existing obstructions are documented for pilots. Understanding Part 77 is crucial for anyone constructing a temporary or permanent structure near an airport, as well as for those involved in airport planning, development, and daily operations.

Visualizing Protected Airspace

Part 77 imaginary surfaces are the solution to defining the airspace above an airport that must remain free of obstacles. These surfaces are not physical structures, but regulatory boundaries used to evaluate whether proposed buildings, towers, terrain, or natural growth create a penetration. Each surface serves a distinct purpose in ensuring aircraft can safely maneuver during takeoff, landing, and approach operations. These surfaces are defined below and illustrated on the next page.

An airport's airspace layout, as well as any known obstructions, are documented in its Airport Layout Plan (ALP). The Part 77 surface dimensions vary from airport to airport based on the design aircraft size and approach type. An approach is a defined route an aircraft follows when descending to land, using a defined procedure or visual alignment. Approaches fall into three categories based on the number of navigational aids needed to follow the route. These categories are visual, non-precision, and precision approaches, as shown on the next page. Runways with more precise approaches or larger aircraft

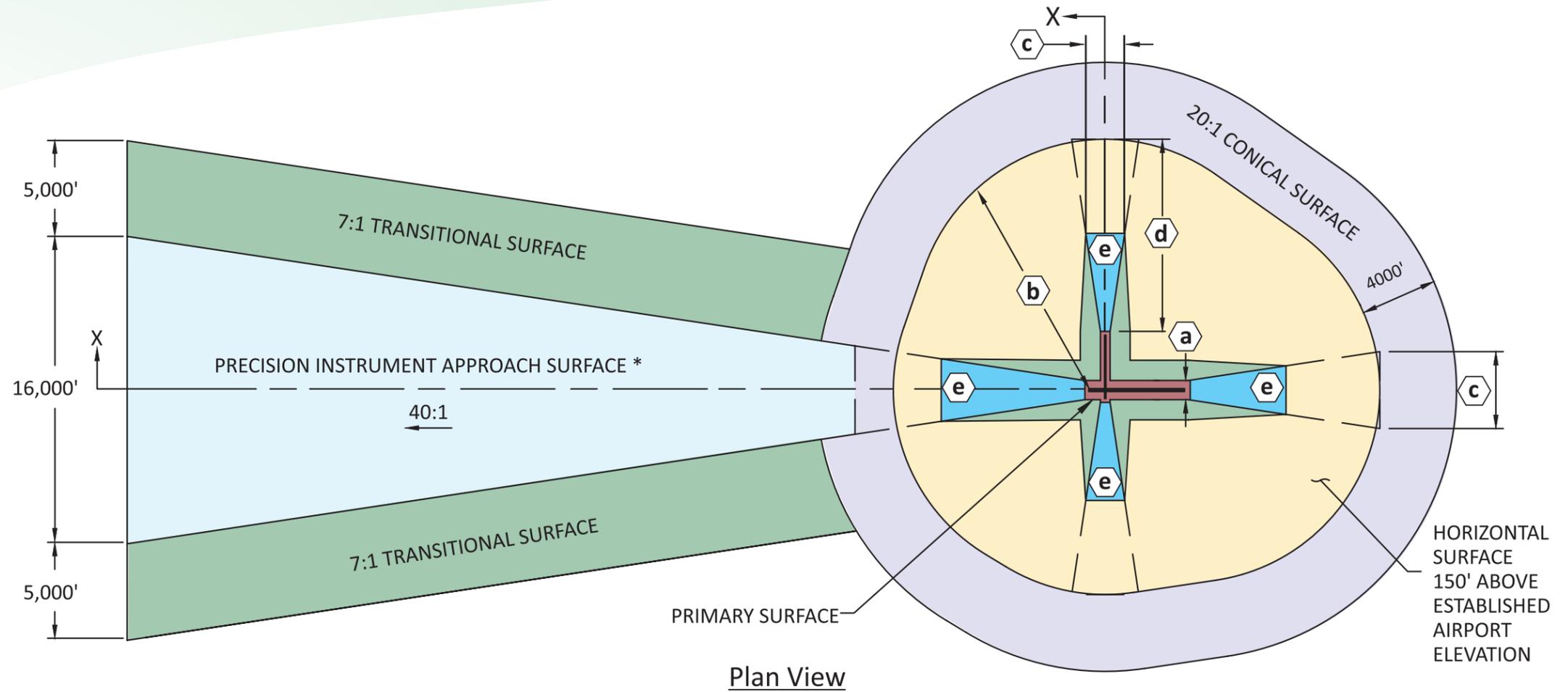
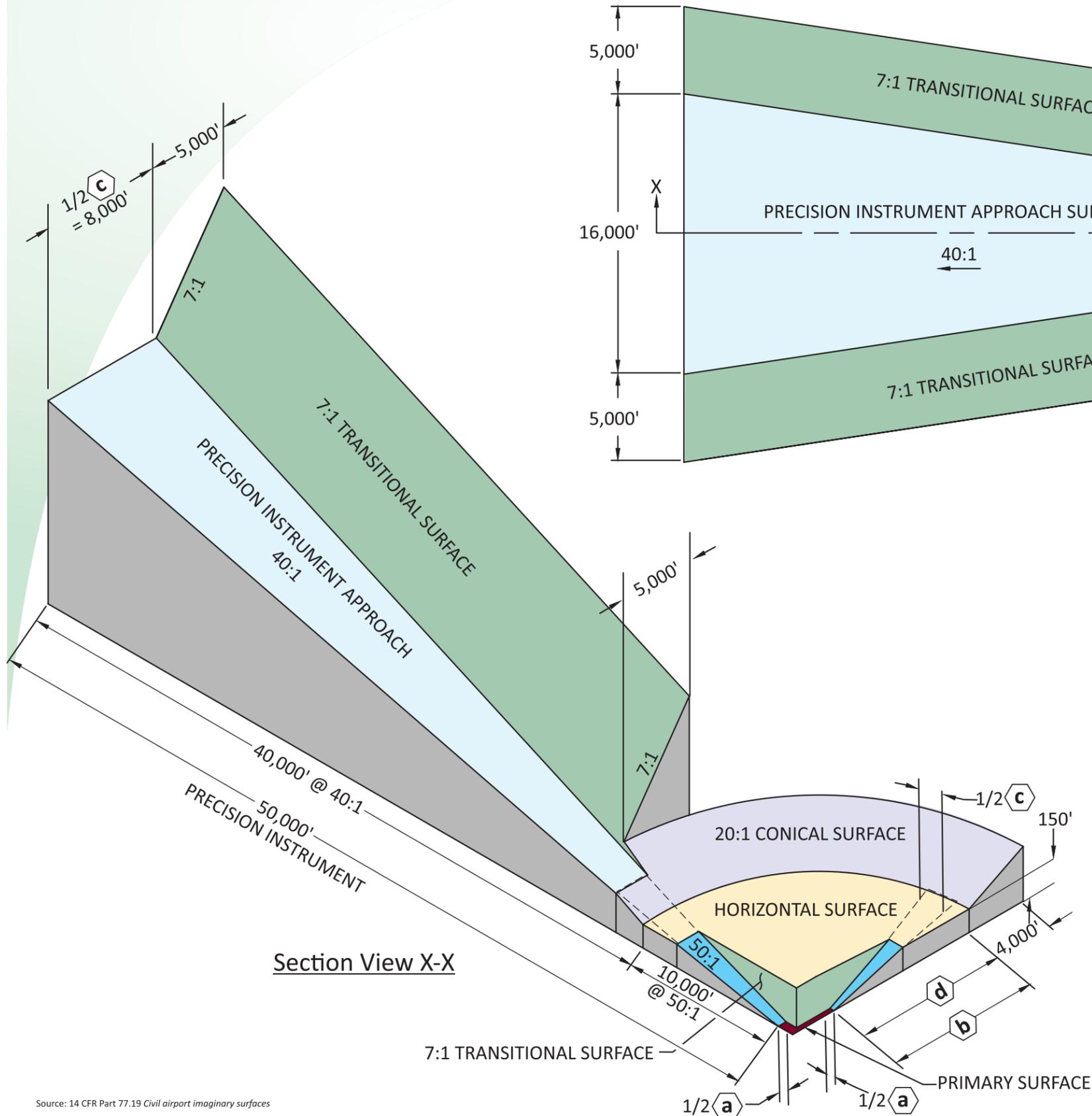
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Part 77 Surface	Description
Primary	The primary surface is a flat rectangular box set at the same elevation as the runway centerline that extends beyond each runway end. This airspace is used for aircraft takeoff and landing.
Approach	Approach surfaces are like a ramp extending from the ends of the runway up into the sky. This surface ensures that the path the aircraft uses to reach the runway is clear of obstacles.
Transitional	Transitional surfaces slope upward and away from the primary and approach surfaces. These ensure that an aircraft will not encounter obstacles if it drifts to the right or left.
Horizontal	Horizontal surfaces are a flat plane 150 feet above the runway elevation that protects aircraft flying above the airport in preparation for landing or after takeoff maneuvers.
Conical	Conical surfaces are like the outer rim of the airspace. It slopes upward and outward from the horizontal surface, providing a gradual transition to unrestricted airspace.

The five imaginary surfaces that define an airport's protected airspace.



14 CRF Part 77 Imaginary Surfaces



Plan View

Section View X-X

Dim	Item	Dimensional Standards (feet)					Precision Instrument*
		Visual Runway		Non-Precision Instrument Runway		Precision Instrument*	
		A	B	A	B		
a	Width of primary surface and approach surface width at inner end	250	500	500	500	1,000	1,000
b	Radius of horizontal surface	5,000	5,000	5,000	10,000	10,000	10,000
c	Approach surface width at end	1,250	1,500	2,000	3,500	4,000	16,000
d	Approach surface length	5,000	5,000	5,000	10,000	10,000	*
e	Approach slope	20:1	20:1	20:1	34:1	34:1	*

A Utility runways

B Runways larger than utility

C Visibility minimums greater than 3/4 Mile

D Visibility minimums as low as 3/4 Mile

*PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET