

Set a scale for radius of wind speed, e.g.,  
1 cm = 3 knots

Then:

10.5 knots = 3.5 cm

16.5 knots = 5.5 cm

21.5 knots = 7.2 cm

27.5 knots =

Figure 16-3 A typical wind rose.

# Obstruction Standards

According to Federal Aviation Regulations (FAR), FAA, DOT, USA: An object is an obstruction to air navigation if it is of greater height than any of the following:

1. 500' (152 m) above ground level at any location
2. 200' above ground level or established Airport elevation within 3 n.mi of Airport Reference point (usually highest point of a runway or central between runways). Then 100 upward for each additional n.mi. up to 500'
3. less than minimum instrument flight altitudes within terminal clearance area including circling approach area.
4. less than minimum clearance altitude for en-route clearance area of approved airways
5. less than civil airport imaginary surfaces requirements (below)

**note:** add 5.2 m for expressways, 4.6 m for any public road, and 7.0 m for RR



§ 77. 23(a)(2) - NEAR AIRPORTS

**SUBPART C - OBSTRUCTION STANDARDS**

§ 77.23(a)(2) - An object would be an obstruction to air navigation if of greater height than 200 feet above ground at the site, or above the established airport elevation, whichever is higher -  
 (a) within 3 nautical miles of the established reference point of an airport with its longest runway more than 3,200 feet in actual length, and  
 (b) that height increases in proportion of 100 feet for each additional nautical mile from the airport reference point up to a maximum of 500 feet.  
 Note: Heliports excluded

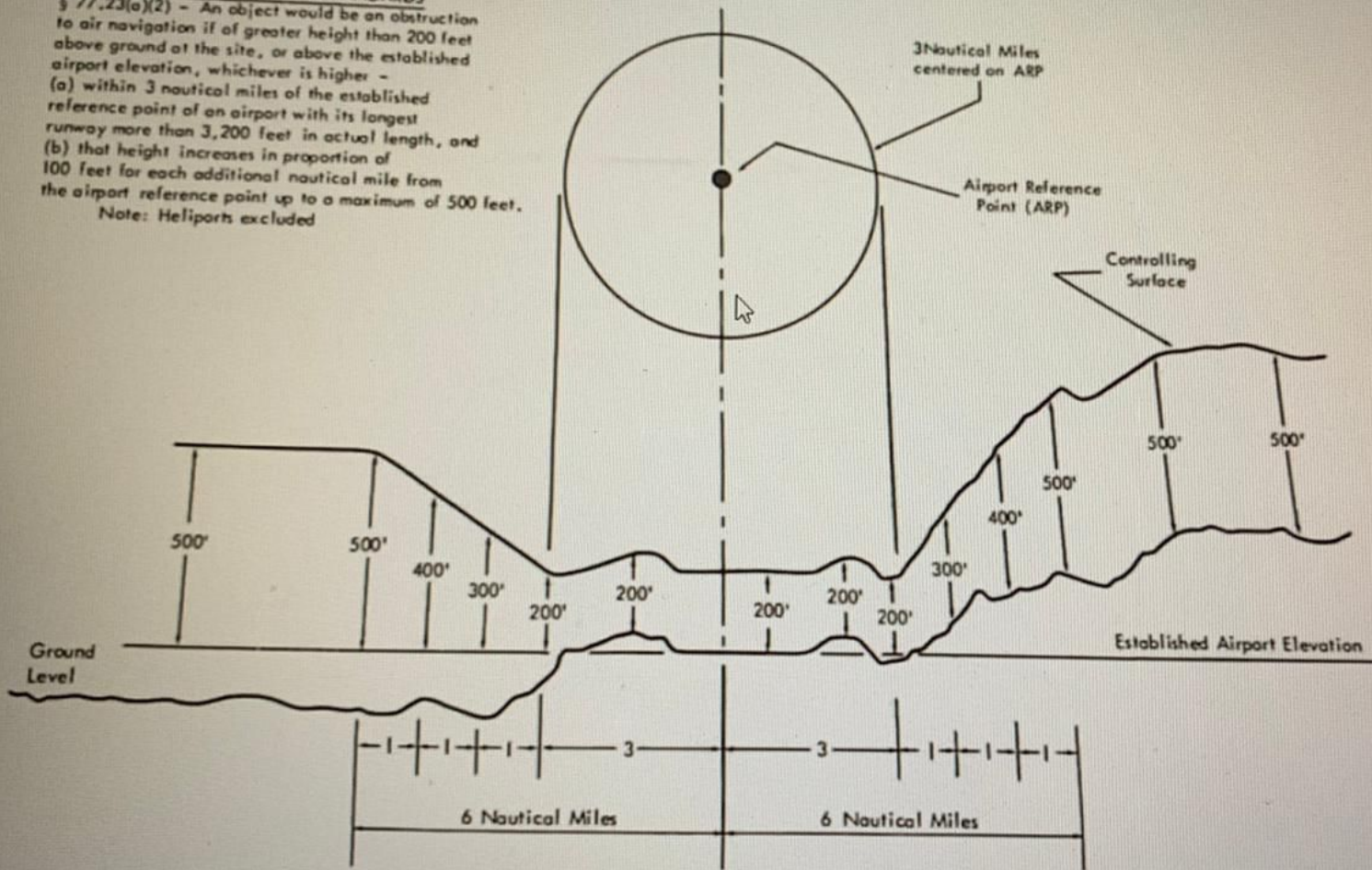
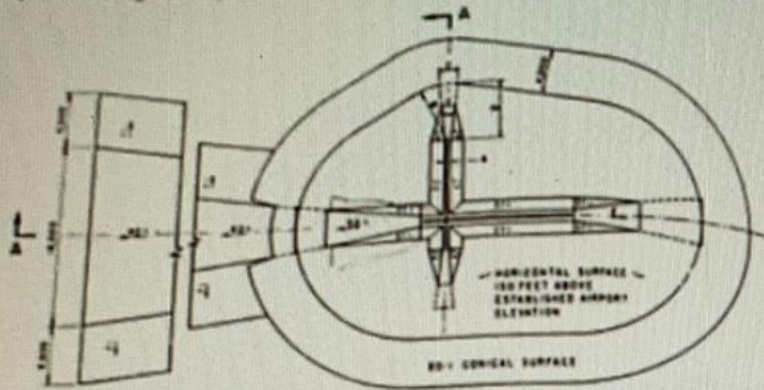


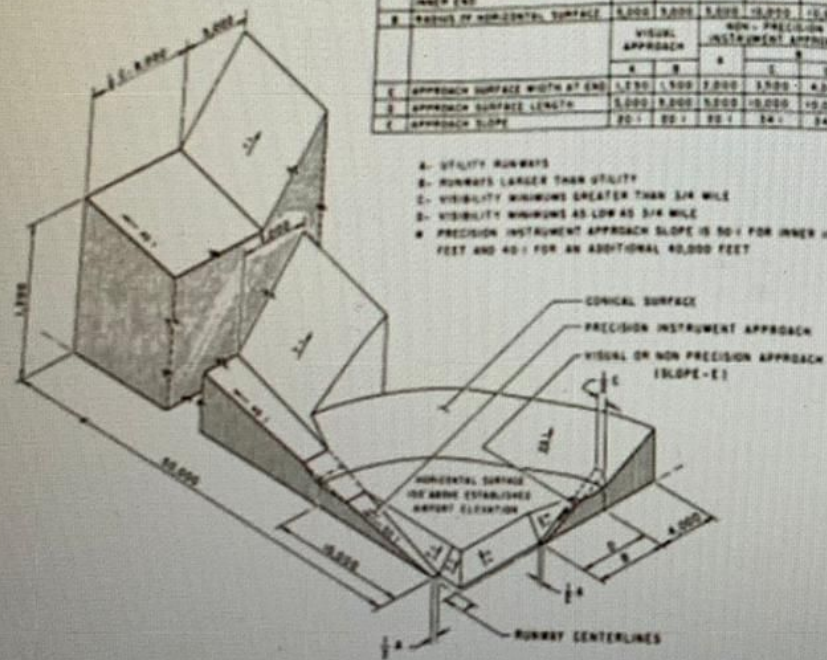
Figure 16-5 Obstruction standards in the vicinity of airports. (Source: *Federal Aviation Regulations, Part 77, 1975.*)



precision instrument Runway

| DIM | ITEM                                                             | DIMENSIONAL STANDARDS (FEET) |       |                                   |        |                               |        |
|-----|------------------------------------------------------------------|------------------------------|-------|-----------------------------------|--------|-------------------------------|--------|
|     |                                                                  | UTIL. RUNWAY                 |       | NON-PRECISION INSTRUMENT RUNWAY   |        | PRECISION INSTRUMENT RUNWAY   |        |
|     |                                                                  | A                            | B     | A                                 | B      | A                             | B      |
| A   | WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END | 750                          | 900   | 900                               | 1000   | 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                                    | VISUAL APPROACH              |       | NON-PRECISION INSTRUMENT APPROACH |        | PRECISION INSTRUMENT APPROACH |        |
|     |                                                                  | A                            | B     | A                                 | B      | A                             | B      |
| C   | APPROACH SURFACE LENGTH                                          | 1,100                        | 1,500 | 2,000                             | 3,000  | 4,000                         | 10,000 |
| D   | APPROACH SURFACE SLOPE                                           | 50:1                         | 50:1  | 50:1                              | 34:1   | 34:1                          | 30:1   |

- 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 10,000 FEET



ISOMETRIC VIEW OF SECTION A-A

§ 77.25 CIVIL AIRPORT IMAGINARY SURFACES

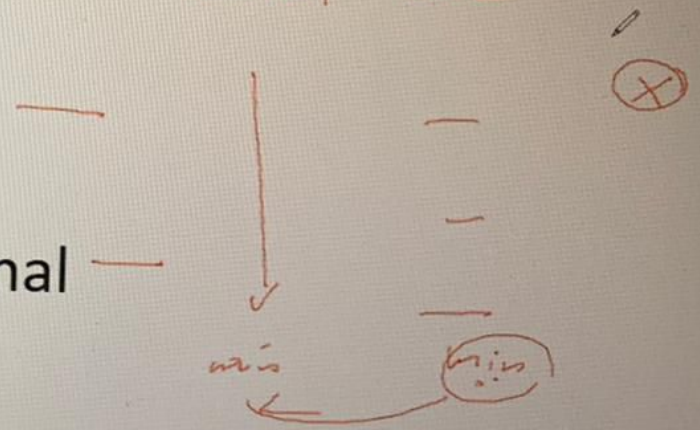
Figure 16-6 Civil airport imaginary surfaces. (Source: Federal Aviation Regulations, Part 77, 1975.)

**Civil Airport Imaginary Surfaces:** The highest objects permitted that is the minimum of heights of the following two groups and the minimum height for both groups for each runway (p.515. fig.16.6, p.516):

Group I: Primary, Horizontal and Conical

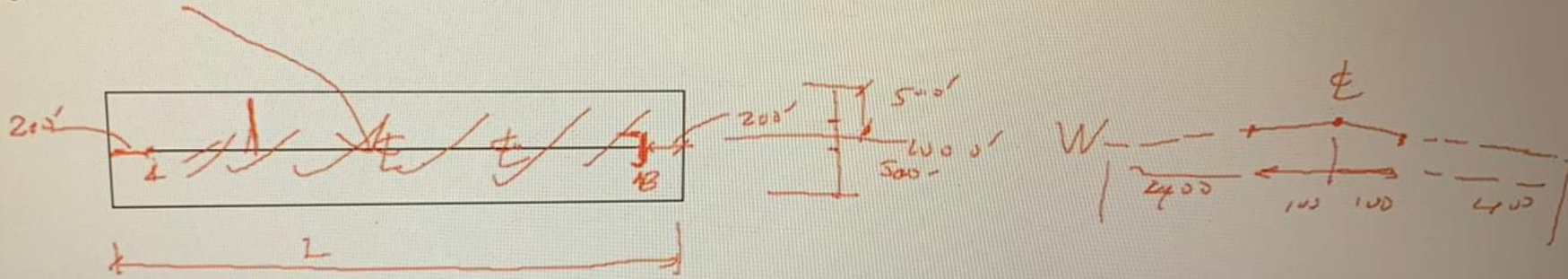
Group II: Primary, Approach and Transitional

RW1, RW2



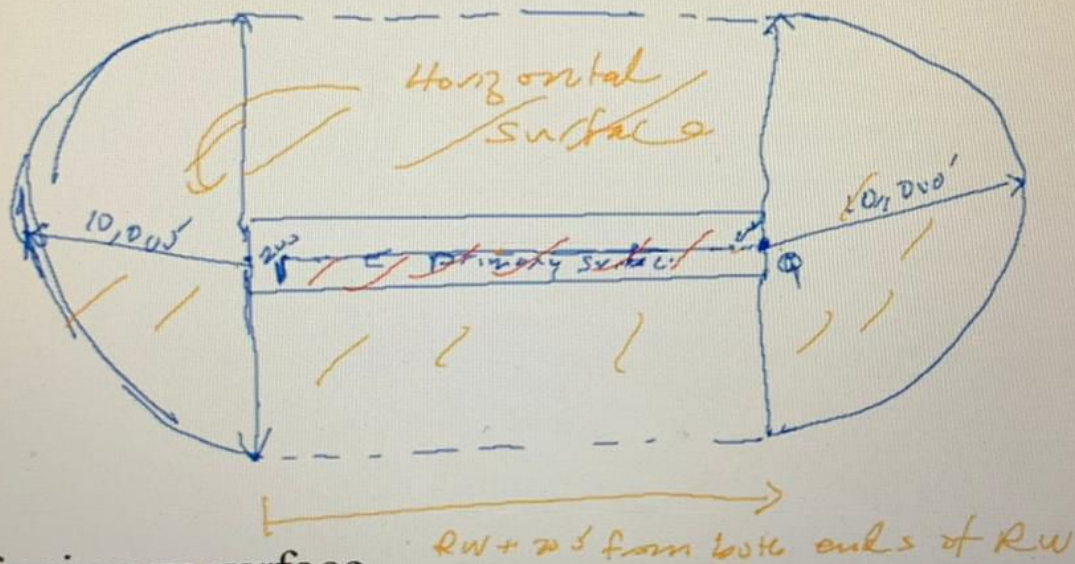
# Group I: Primary, horizontal, and conical group

## a. Primary Surface:



- Length: runway (RW) + 200' at each end for paved RW
- Width:
  - 250' for utility RW with only VFR approaches
  - ✓ ○ 1000' precision instrument RW
- Elevation = 0 (more precisely: the elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.)

## a. Horizontal Surface:



➤ L = length of primary surface

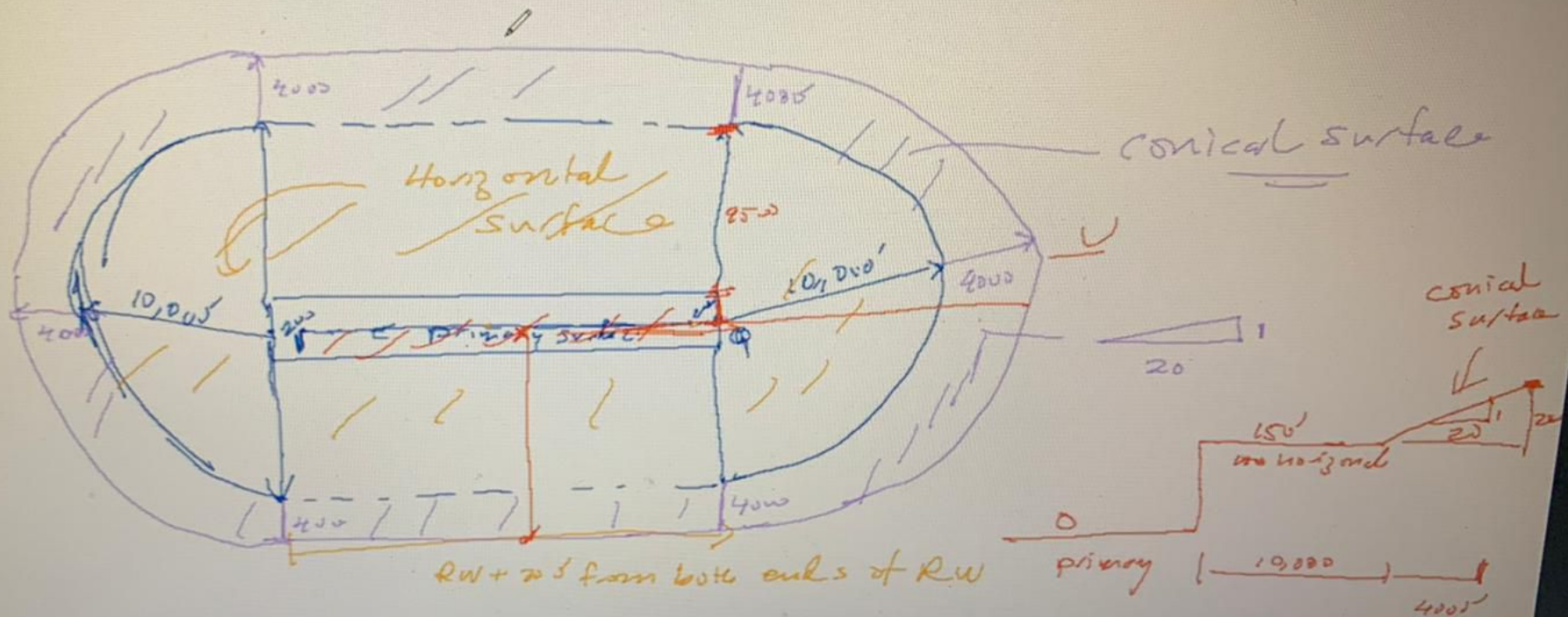
➤ R =

○ 5000' for utility or VFR runways

○ 10 000' for all other runways

➤ Elevation = 150' above established airport elevation (usually highest point of any runway)

# Conical Surface (for all airports):



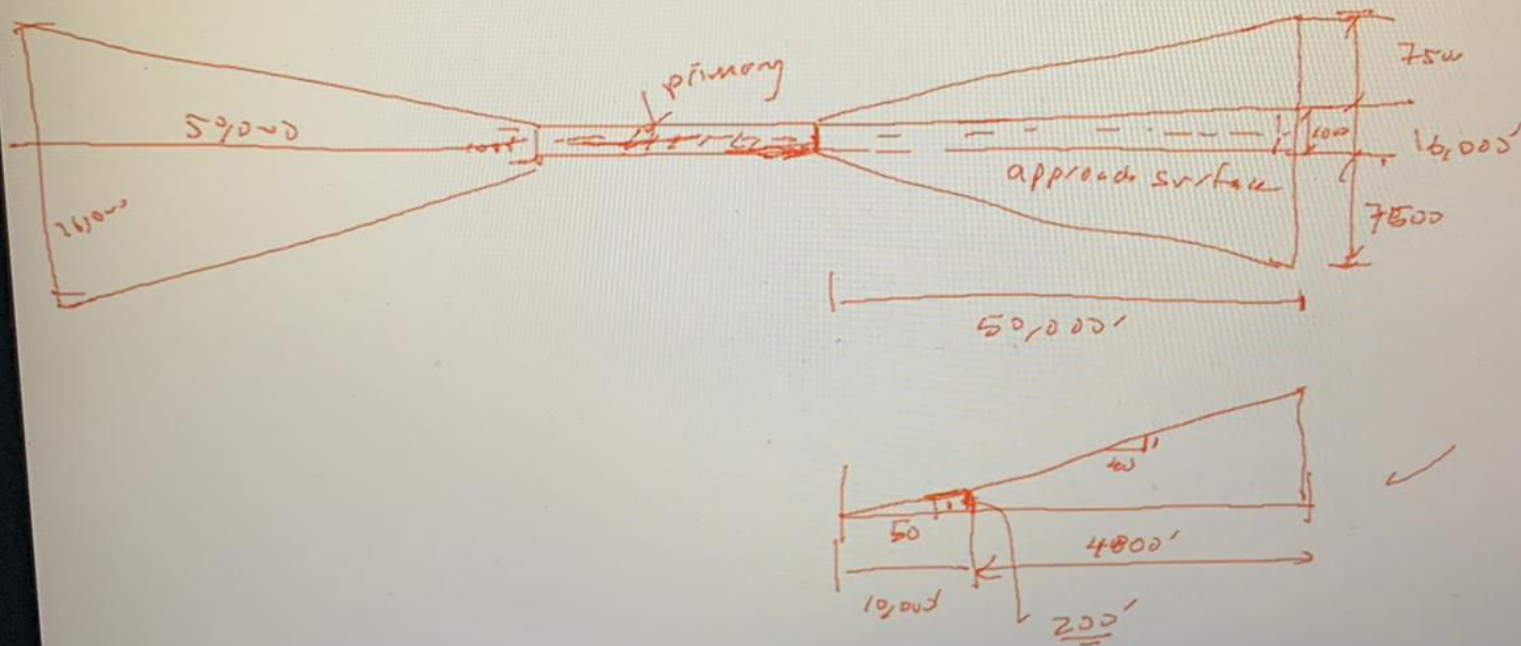
Q

A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4000'



## Group II: Primary, approach and transitional group

- a. Approach surface (many cases, only illustrated Precision Instrument RW)



- a. Transitional Surface: Extends outward and upward at a right angle from the RW centerline (or its extension) at a slope of 7:1 from the sides of the primary or approach surfaces to a maximum horizontal surface of 5000' (or until it meets another surface)

