# PANS-OPS
# Visual segment surface (VSS)

## ICAO APAC FPP Office – Beijing, China

(June 2026)

# Visual Segment Surface

- *5.4.6.1 All new straight-in instrument approach procedures published on or after 15 March 2007 shall be protected for obstacles in the visual segment. For this purpose no obstacles, ~~except subject to 5.4.6.4~~, shall penetrate a Visual Segment Surface (VSS) laterally, defined as follows:*

- Not applied for procedure without FAF

# VSS description

- Vertically
  - The VSS originates at the runway threshold height and has a slope of 1.12 degrees less than the promulgated approach procedure angle.

- Horizontally 2 cases:
  - For Loc only, APV, PA
  - All others

# Visual Segment Surface
## straight-in instrument approach procedures
## NPA, APV baroVNAV

- *Horizontally :*
  - origin : 60 m before THR
  - orientation : **splaying 15% on either side of the extended runway centre line**
  - Base width : runway strip width
  - End : at the point where the height of the surface reaches the OCH

# Runway strip

From Annex 14 **3.4 Runway strips**

***Width of runway strips***

3.4.3 A strip including a precision approach runway shall, wherever practicable, extend laterally to a distance of at least:

— 140 m where the code number is 3 or 4; and

— 70 m where the code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

# Visual Segment Surface
## For all other straight-in instrument approach procedures (2)

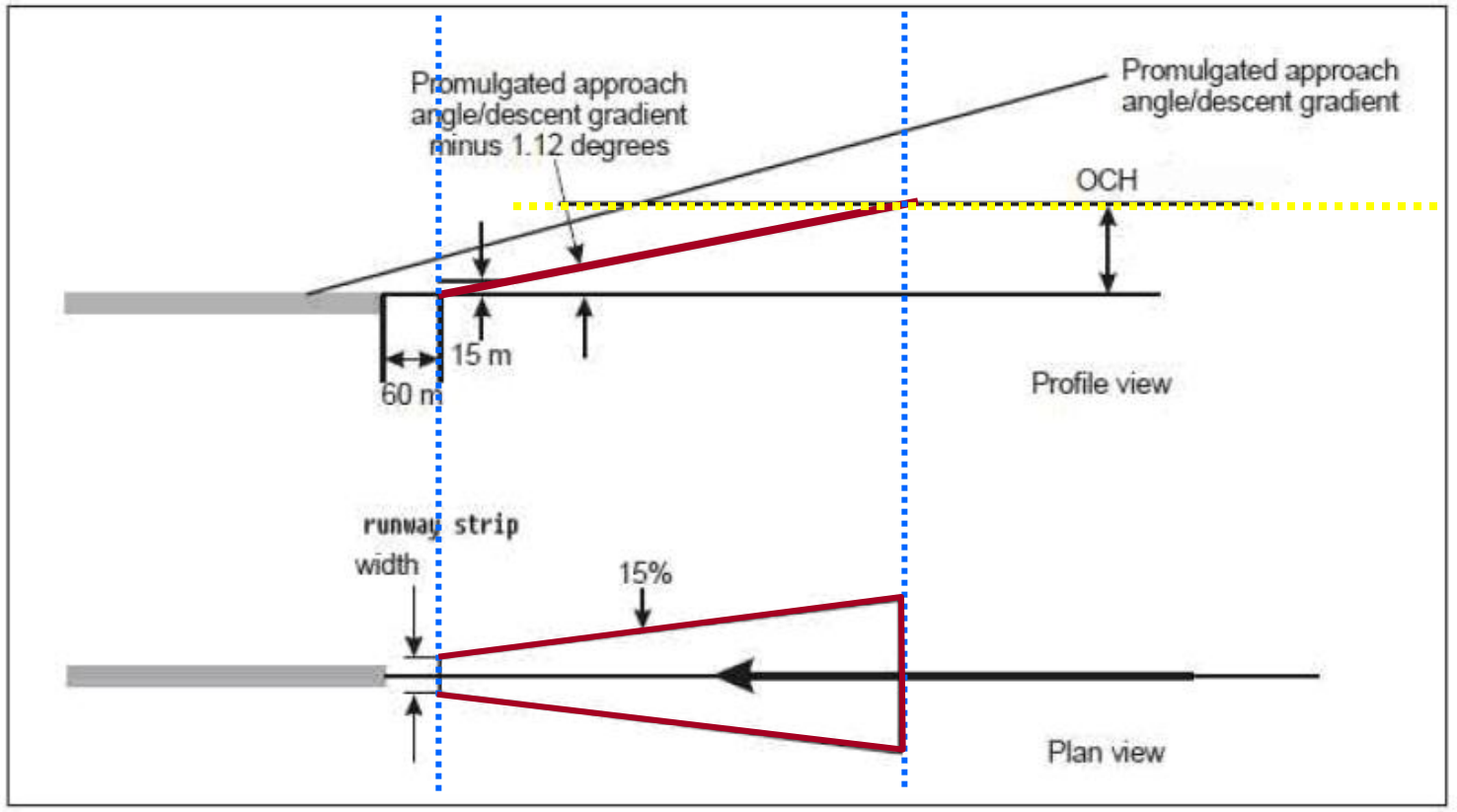



Figure I-4-5-7-b). Visual segment surface other approach procedures normal straight-in approach

# Visual Segment Surface

## For Offset final approach with runway centre line crossing

- *Horizontally* :

  - where the final approach course is offset and intersects the extended runway centre line, the splay on the side closest to the final approach course is increased by the offset angle

# Visual Segment Surface

## For Offset final approach with runway centre line crossing

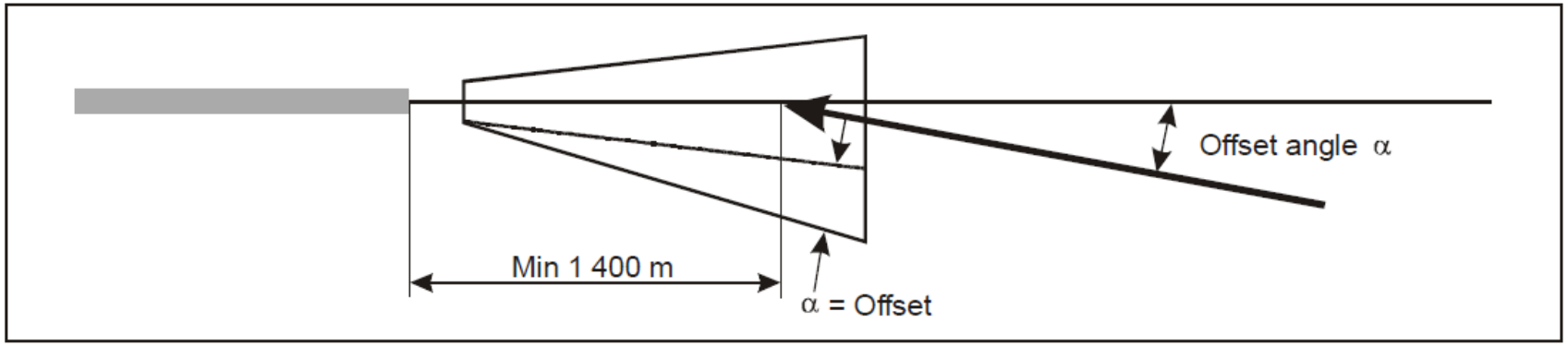



**Figure I-4-5-8. Plan view visual segment surface offset final approach with runway centerline crossing**

# Visual Segment Surface

## For offset final approach parallel to the runway centre line

- *Horizontally* :
  - where the final approach course is offset but does not intersect the extended runway centre line, the splay closest to the final approach course is increased by an amount equal to the final approach course offset at 1 400 m from the runway threshold

# Visual Segment Surface

## For offset final approach parallel to the runway centre line

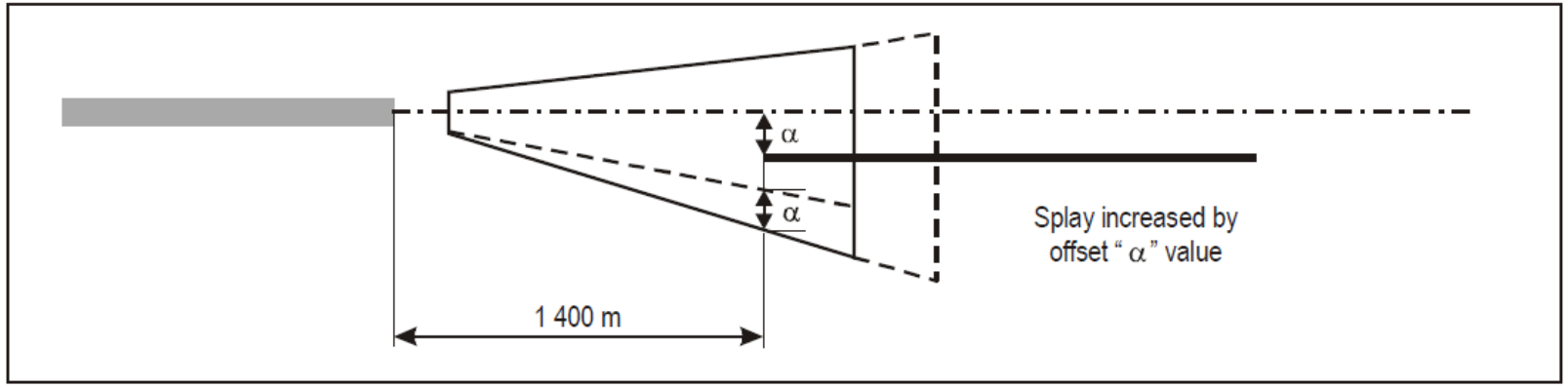



**Figure I-4-5-9. Plan view visual segment surface offset final approach parallel to the runway centreline**

# Visual Segment Surface- Obstacles Penetrating

- If obstacles penetrating VSS
  - increase of the descent gradient/angle
  - runway threshold displacement/
  - removal or lowering of the obstacle

- Obstacles with a height less than 15 m above the threshold may be disregarded when assessing the VSS.
  - Temporary moving obstacles such as aircraft holding at the runway hold-point are allowed.

- ~~Obstacles penetrating VSS should be clearly depicted on plan view of the IAC.~~
- As of 4 November 2021, indication that a VSS has been penetrated shall be promulgated in the AIP, Section AD 2.23 Visual segment surface (VSS) penetration

# VSS - Obstacle Clearance Surface (OCS)

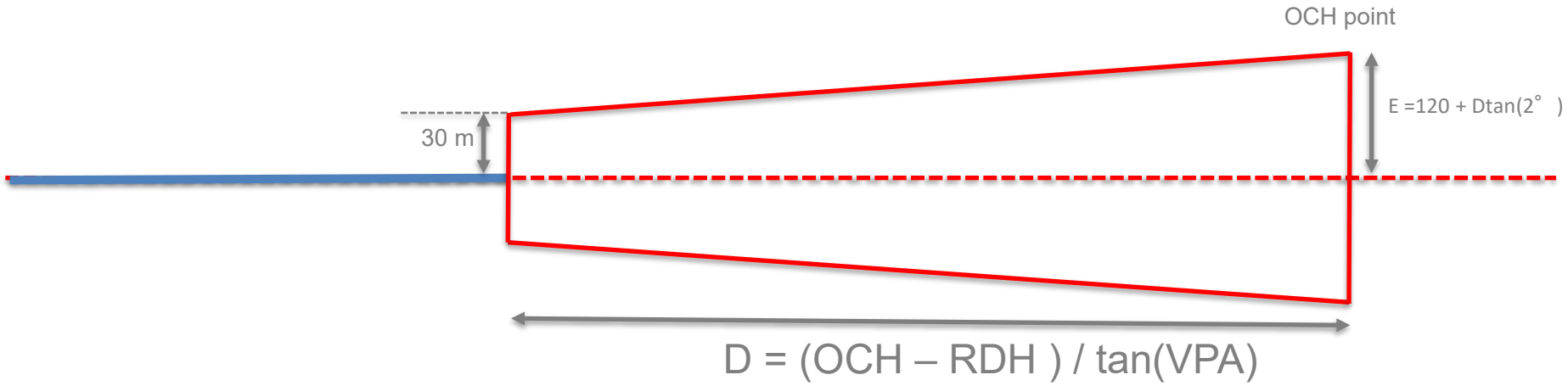
- mitigation actions are not acceptable
- Obstacles  penetrating the visual segment surface (VSS)

- These obstacles shall not require the pilot to destabilize the approach to avoid them.

# Obstacle segment surface : area

**Laterally:**

- **for all other straight-in instrument approach procedures :**
  - begins at the THR/LTP
  - extends up to the point where the OCH is reached on the promulgated profile (“OCH point”);
  - beginning width is 30 m each side of the runway edge
  - semi-width at “OCH point” is equal to E = 120 m + D*tan(2° ) where D is the distance between the THR/LTP and the “OCH point”.



# Obstacle clearance surface : area

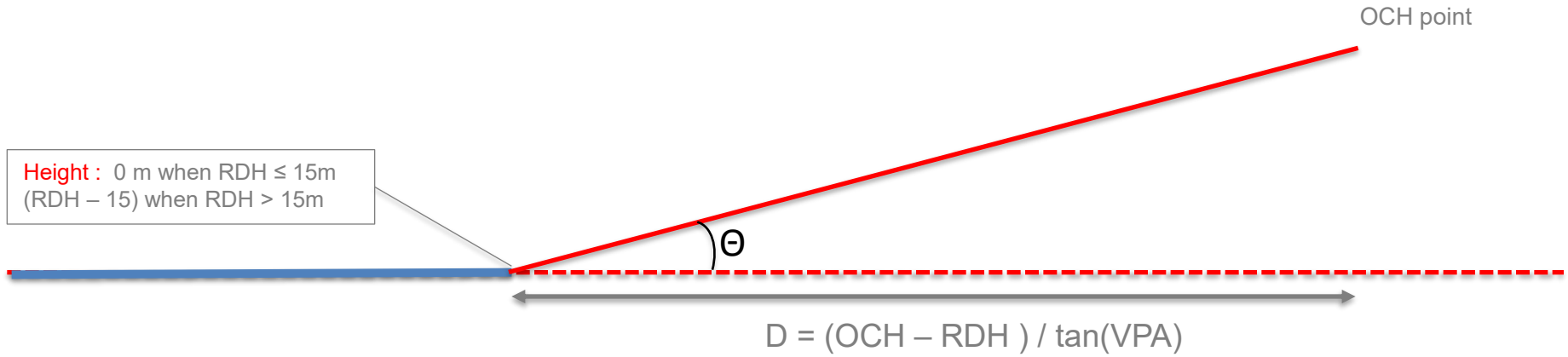
**Vertically:**

- originates at the runway threshold height where RDH is 15 m or smaller and at (RDH-15 m) above runway threshold height where RDH is greater than 15 m.
- slope of Θ defined as follows:

a) for NPA: Θ = promulgated approach procedure angle minus 1°

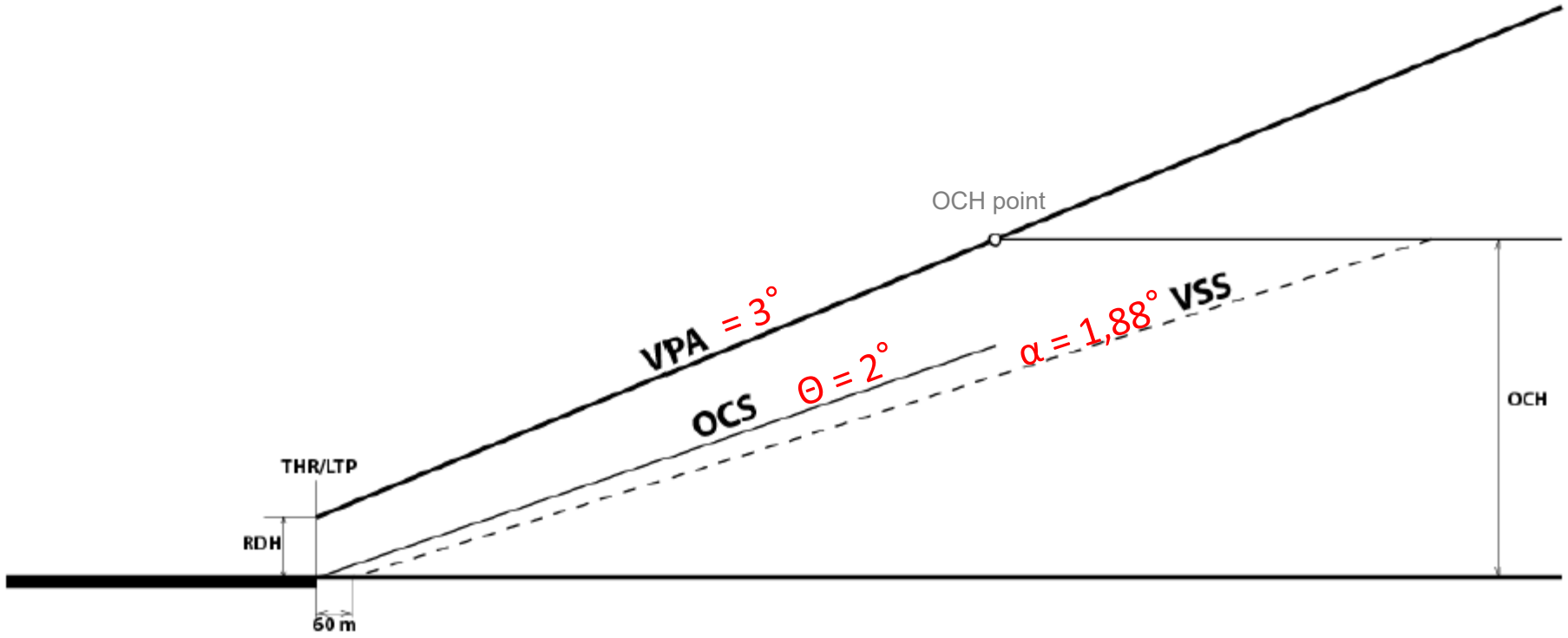
b) for APV Baro: Θ = minimum cold temperature VPA minus 0.5°

c) for APV with geometric vertical guidance: Θ = promulgated VPA minus 0.5°

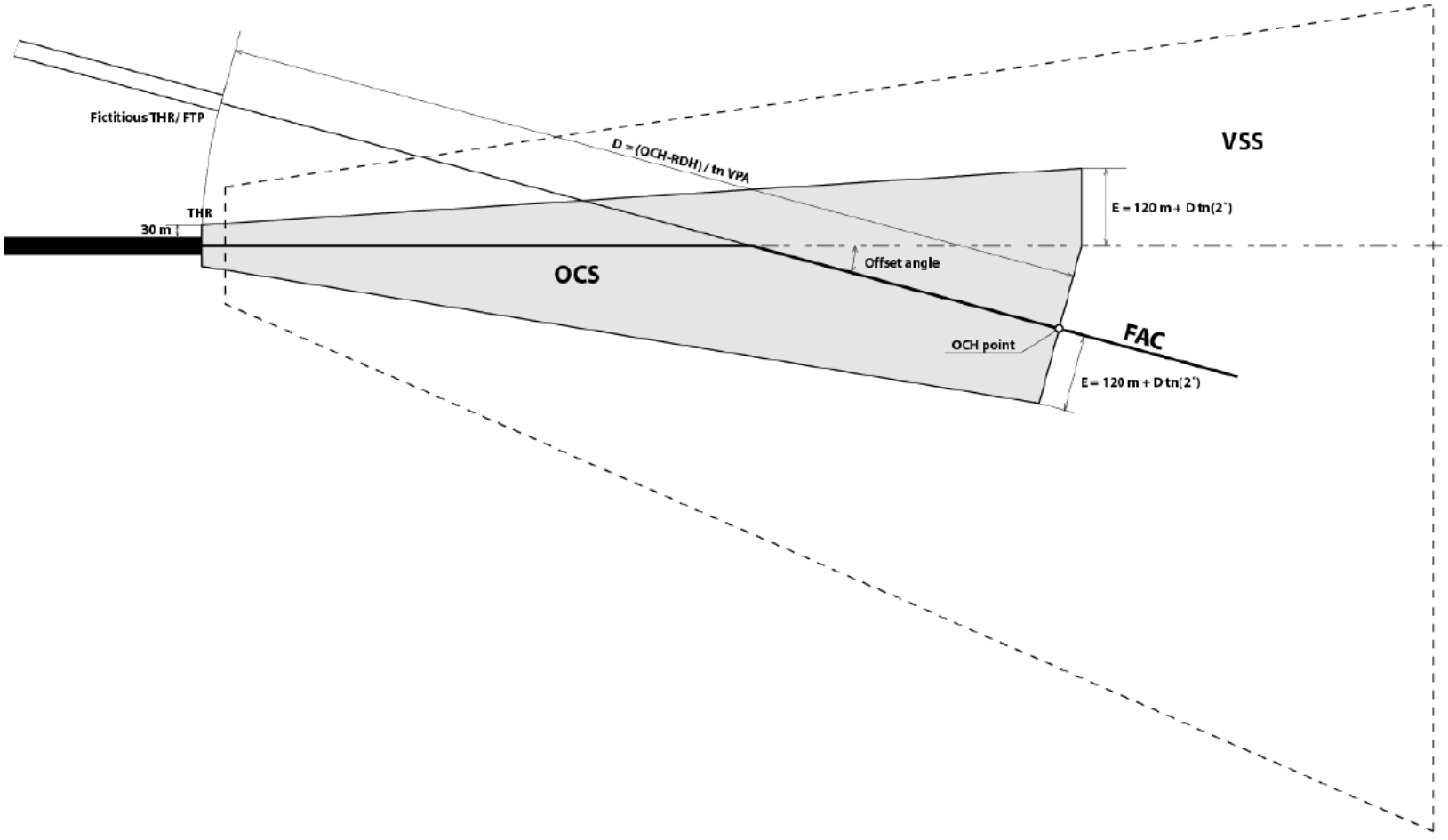



*Note — These values are not applicable for approaches above 3.5°.*

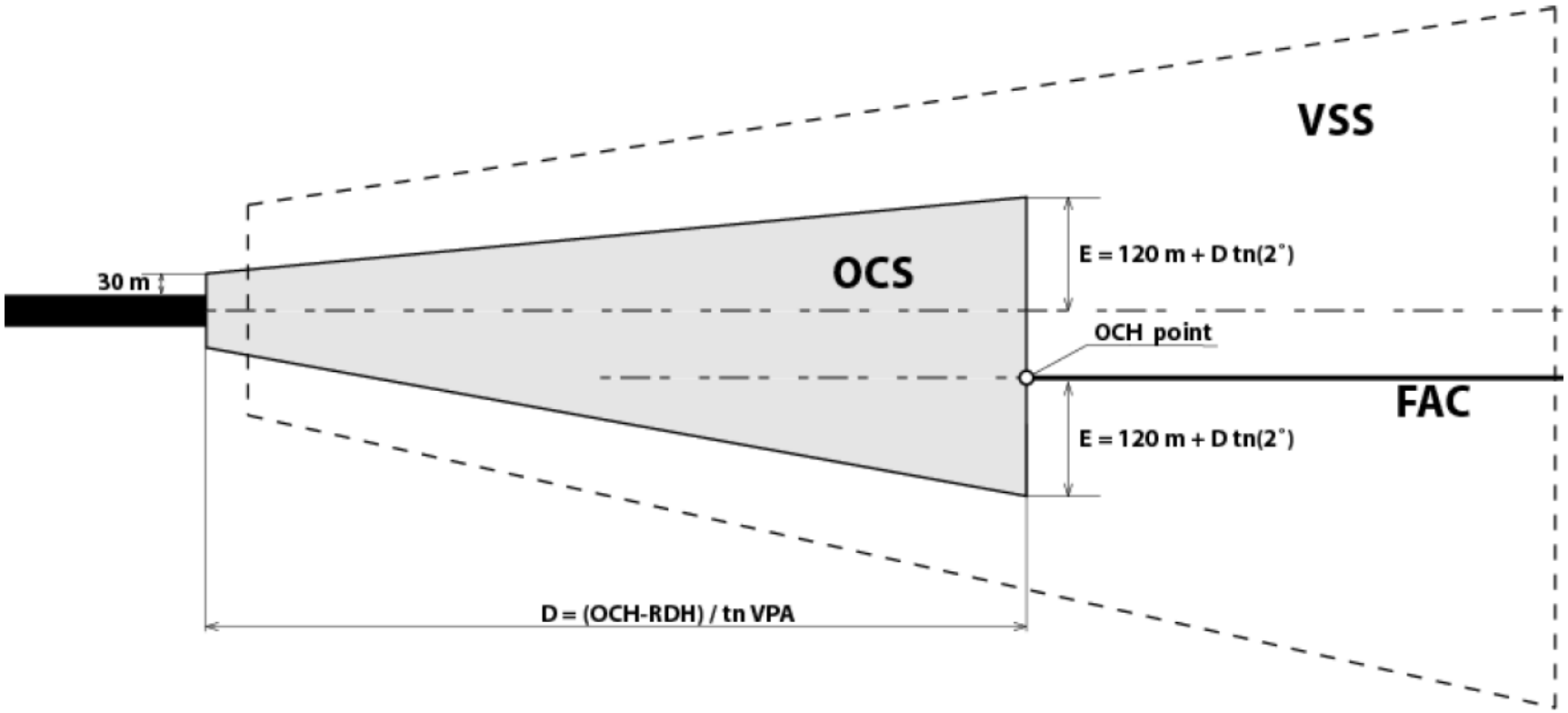
# VPA, VSS and VSS-OCS profile (2D procedure)



# Offset OCS


Fictitious THR/ FTP
D = (OCH-RDH) / tn VPA
VSS
THR
30 m
E = 120 m + D tn(2°)
Offset angle
OCS
OCH point
FAC
E = 120 m + D tn(2°)

# Offset OCS


VSS
OCS
30 m
E = 120 m + D tn(2˚)
OCH point
FAC
E = 120 m + D tn(2˚)
D = (OCH-RDH) / tn VPA


# Let's Focus/Propose/Plan Together