Draw the given top and front views, construct true-shape views of the two inclined surfaces

Reference line 1-4 parallel to edge view of ABCD
Draw the given top and front views, and construct true-shape views of the two inclined surfaces

Reference line 1-5 parallel to edge view of ADEF
Find the true length of line AB. Use both the auxiliary view and rotation methods.

Primary auxiliary plane 4 parallel to line AB (i.e., ref. 2-4 // a₂b₂)

Alternative method: rotate line AB about horizontal axis through B until it is parallel to plane 3
Solution steps (NB assume TL = 60 mm):

- project horiz. from e₃ and vert. from e₁ to find e₂
- place aux. vert. plane 4 // ED (i.e. ref. 1-4 // e₁d₁)
- project from e₁ and d₁ ⊥ ref. 1-4
- locate e₄ distance ✓ from ref. 1-4 (obtained from related view 2)
- draw arc from e₄ with radius = 60 mm (because ED seen in TL in view 4) to locate d₄ on projector from d₁
- locate d₂ distance § below ref. 1-2 (obtained from related view 4)
- project horiz. from d₂ to view 3
- locate d₃ distance ¶ from ref. 2-3 (obtained from related view 1)
Solution method:
• AB is seen in TL in view 1 (a₂b₂ // ref. 1-2)
• place auxiliary plane 4 perpendicular to AB (ref. 1-4 ⊥ a₁b₁)
• project onto plane 4
• locate a₄ and b₄ distance ‡ from ref. 1-4 (obtained from related view 2)
• locate c₄ similarly
• then line AB seen as a point, and plane ABC as a line
Solution method:

• cable AB is horizontal: a₁b₁ is TL view
• place auxiliary plane 4 perpendicular to AB (ref. 1-4 ⊥ a₁b₁)
• project A, B, O, P onto plane 4 (distances from ref. 1-4 equal vertical depths in related view 1)

TL

• AB is seen as a point in view 4
• draw clearance circle of radius 3 m
• draw o₄z₄ tangent to clearance circle; OZ is seen in TL in view 4 (minimum length)
• project from z₄ back to view 1
• draw o₁z₁ // ref. 1-4 (OZ is parallel to plane 4)
• project vertically from z₁ to locate z₂ at ground level

Find TL and angle of guy wire OZ to ground which clears cable AB by 3 m

Extension problem

true angle to ground