

AC.....Aircraft
 GSE.....Ground Service Equipment
 PBB.....Passenger Boarding Bridge
 RON.....Remain Over Night
 VSR.....Vehicle Service Road

abbreviations

- Co-locate similar AC on the same stop bar when possible
- All aircraft parking positions are to be designed in a manner that cargo/baggage operations do not interfere with fueling operation, adjacent gate aircraft support operations, etc.
- Ensure AC main gear has suitable clearance from fuel pit to allow fueling
- The minimum clearance between the PBB mounted bag slide and the engine cowling should not be less than 4' when the PBB is mated to the aircraft.
- Do not use circles or arcs for the safety boxes - POP maintenance doesn't like them
- When possible, ensure the landing gears do not sit at the edge of a concrete panel
- Each airline has independent GSE parking requirements, and PBB stow locations and striping. Additionally, Southwest Airlines has a unique safety box requirement. Often, the airline is responsible for their striping, but if we need to add their information to our design, you should refer to the standards provided by each airline for information on what they need.

Design considerations

Label each type of AC for each stop bar. If multiple models of same type, group label accordingly:

- B737-400/700/800/900
- A318/319/320

Stop bar label examples

- 1 Nose to obstruction (fence, building) 30'-0"
- 2 Wing tip to adjacent AC: 20'-0"
- 3 Wing tip to non-movable objects: 25'-0"
- 4 Maximum distance to fuel pit: 30'-0" radius

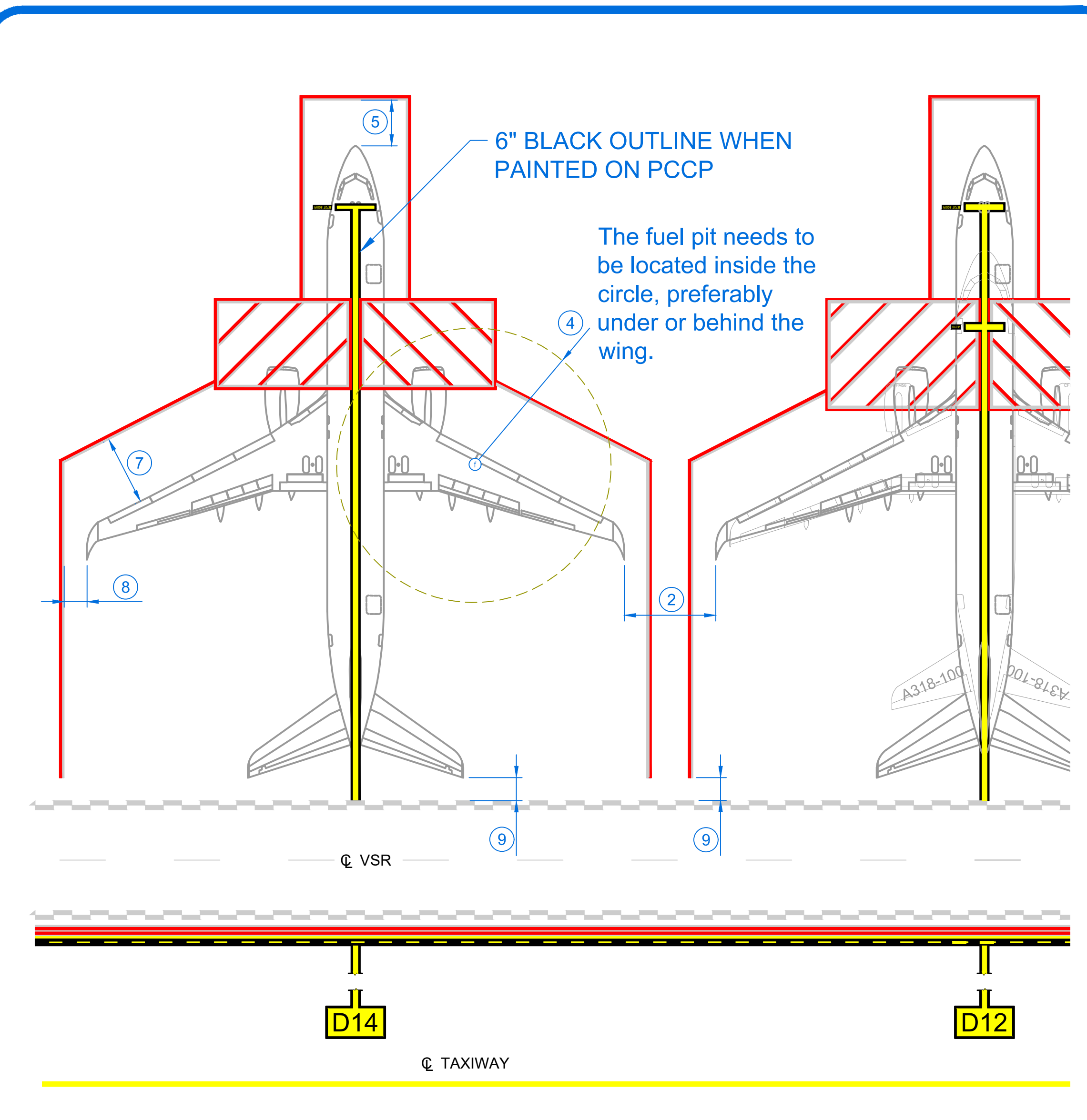
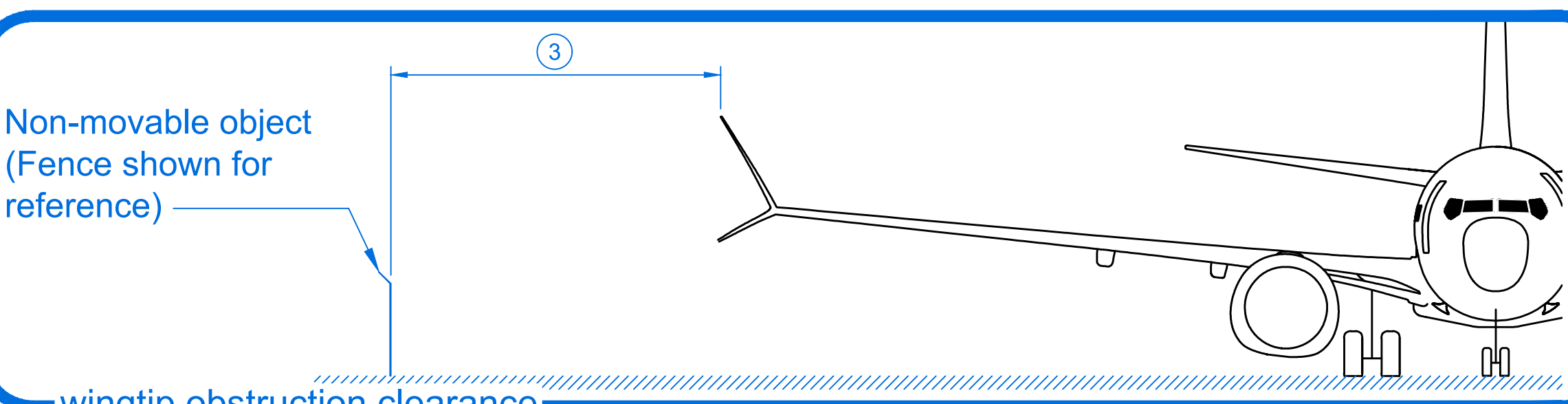
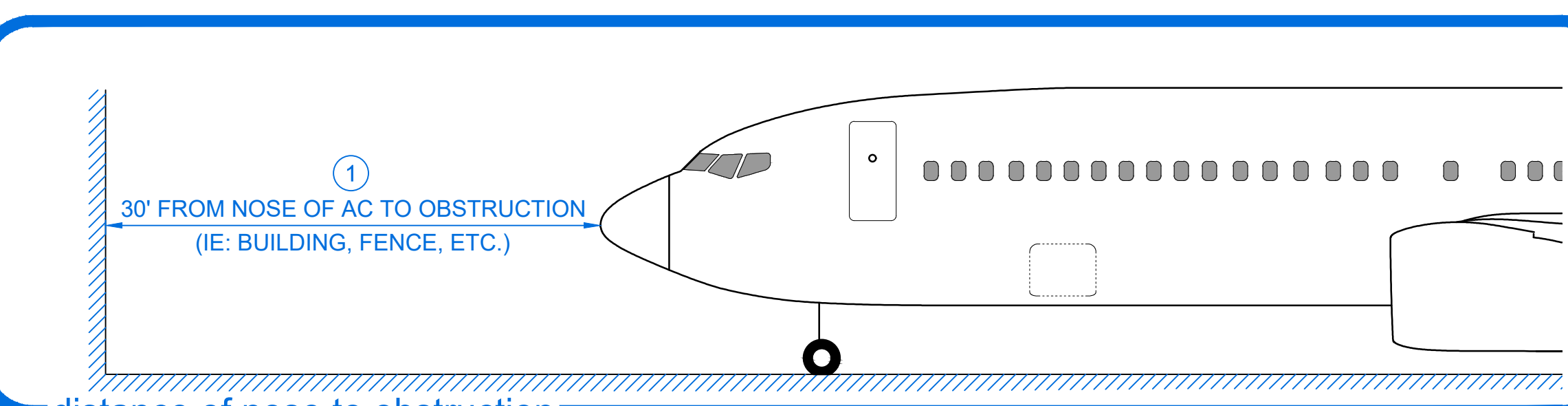
AC clearances

- 5 Forward of nose: 10'-0"
- 6 Each side of main fuselage: 5'-0"
- 7 Leading edge of wing: 15'-0"
- 8 Wing tip: 5'-0"
- 9 Tail to VSR: 5'-0" (recommended minimum) IF it is a temporary position and the tail is into the VSR, a cone may be placed below the tail to indicate the obstruction to vehicle traffic.
- Engine ingestion:
 - 10 forward and to sides: 15'-0" narrow body
18'-0" wide body
 - 11 rear: 5'-0"

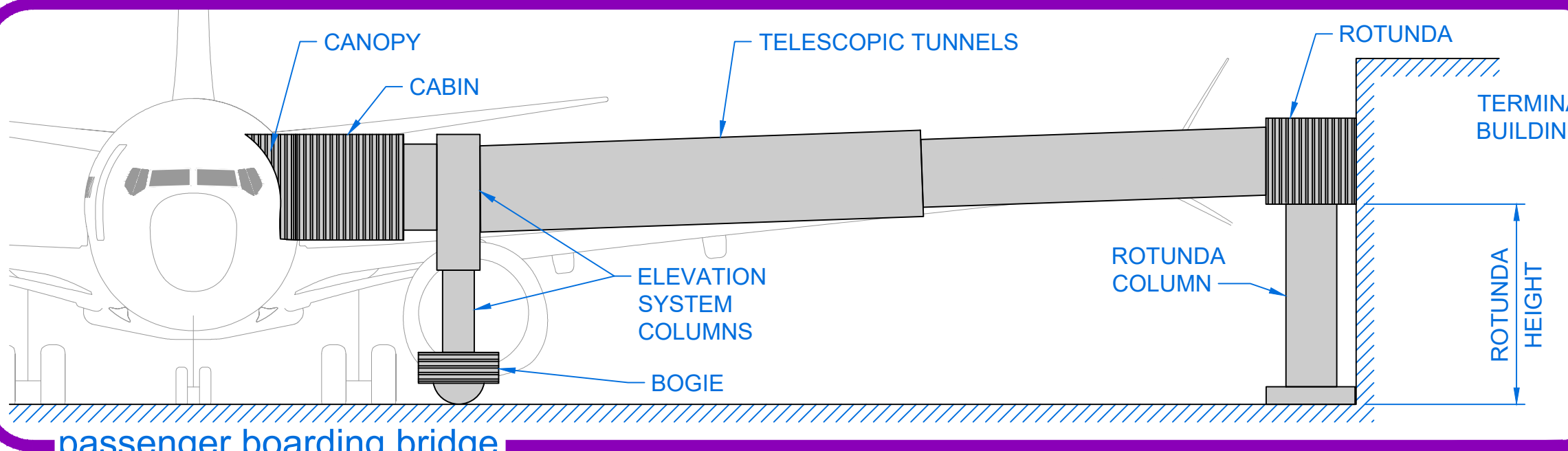
AC to striping clearances

- RON parking best practice utilizes not only 25' minimum around non-movable objects like fences, buildings, light poles, etc. but also for taxiing aircraft - unless wing walkers are utilized to guide the aircraft then you can go to a minimum of 10'.
- RON AC have a little more leeway for wingtip clearance than gate parked AC and can be parked closer together if wing walkers are used. Ideally, 20' is the minimum.
- RON AC require the same clearance from the nose of the AC to an obstruction as gate parking - 30' min. Sometime the airline may ask for more and that is ok.
- Remote parking AC and RON AC also need to take into account the FAR part 77 surface. Some situations require the tail of the AC to be further away from the runway or taxiway to remain clear of the surface.
- Position identifiers are smaller for RON than gate or cargo apron positions. Sometimes AC model is called out as well, if multiple positions are utilized on the same lead in stripe.

RON, Cargo, Remote parking



general gate layout - does not represent an actual gate at PDX



passenger boarding bridge

Concourse B
13.58'

Concourse C
15.00' - Gates C1, C3, C5, & C7
13.67' - Gate C6, & C8 through Gate C23

Concourse D
13.58'

Concourse E
12.50'

rotunda heights

reference: PBB Advisory Circular AC150/5220-21C

Unassisted the maximum slope is:
1:12 (8.333%)

If the distance is 5' or less, the maximum slope is: 1:8 (12.5%)

For assisted access the slope maximum is:
1:4 (25%).

Note that for slopes greater than 8.33% the airline would need to provide assistance. So, the question is, does the airline need to provide assistance or not? That is more of an operational limitation, rather than a design limitation. Every attempt will be made to stay below the maximum unassisted (8.33%) slope when designing the parking position. The Port of Portland Airside Operations will need to coordinate with the Airline to determine whether the proposed slope is acceptable, and what, if any, other options to take.

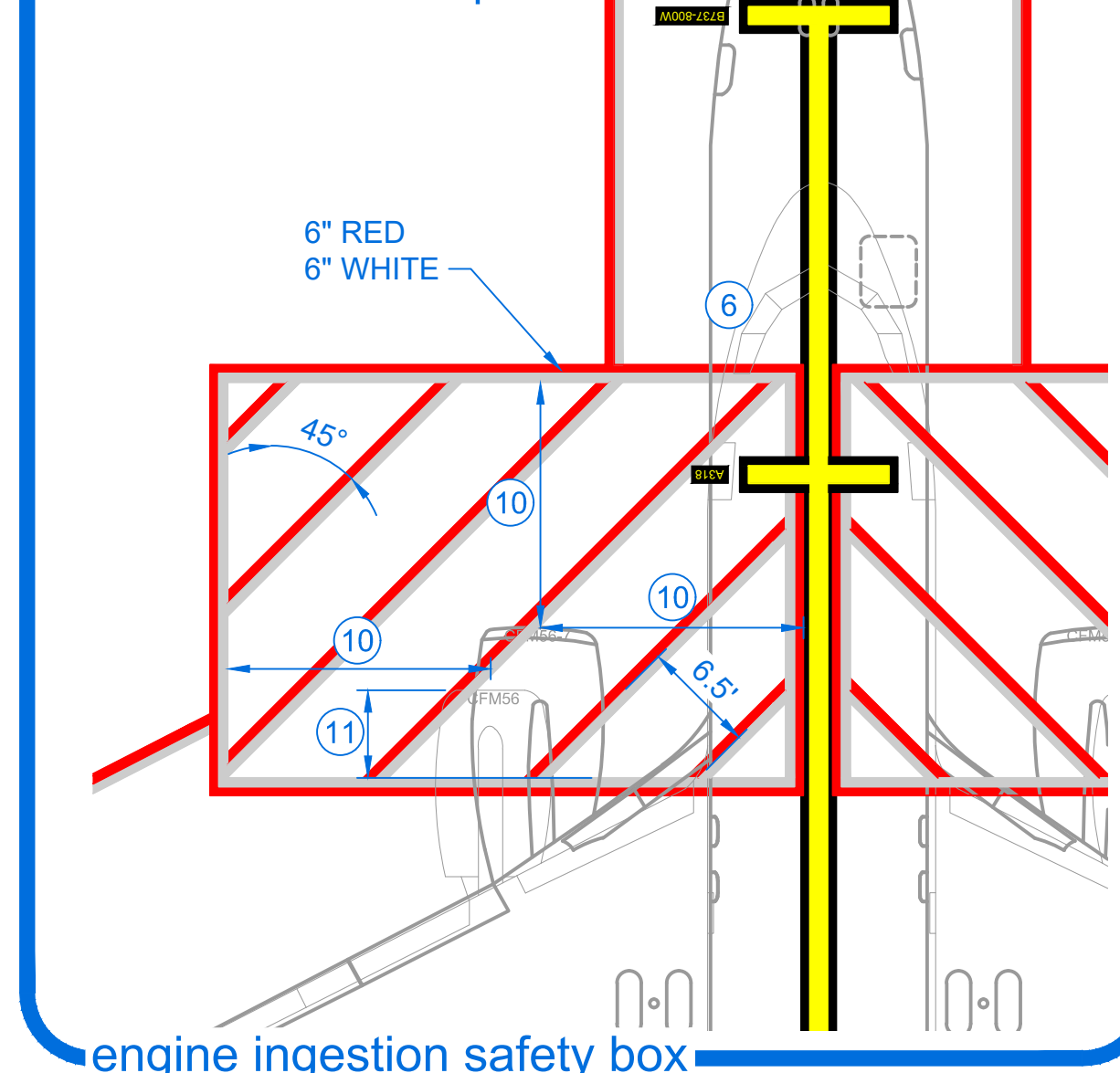
PBB slope

Gate Bridge Model	Gate Bridge Model
B2 A3-58/110-125R CE	D1 A3-58/110
B3 A3-68/141 125R CE	D3 A3-58/110
B4 A3-58/110-125R CE	D4 A3-50/95
B5 A3-58/110-125R CE	D5 A3-60/119 125R CE
C1 A3-60/119-125R	D6 A3-60/119 125R CE
C3 A3-60/119	D7 A3-60/119 125R CE
C4 A3-60/119-125R	D8 A3-60/119 125R CE
C5 A3-60/119-125R	D9 A3-60/119 125R CE
C6 A3-58/110-125R	D10 A3-60/119 125R CE
C7 A3-50/104-125R	D11 A3-58/110-125R
C8 A3-50/95-125R	D12 A3-60/119 125R CE
C9 A3-60/119 125R CE	D13 A3-60/119 125R CE
C10 A3-50/110-125R	D14 A3-60/119 125R CE
C11 A3-53/104-125R	D15 A3-60/119-125R
C12 A3-53/104-125R	
C13 A3-58/110-125R	
C14 A3-60/119 125R CE	
C15 A3-58/110-125R	
C16 A3-60/119 125R CE	
C17 A3-60/119 125R CE	
C18 A3-58/110-125R	
C19 A3-58/110-125R	
C20 A3-60/119-125R	
C21 A3-60/119-125R	
C22 A3-60/119-125R	
C23 A3-60/119-125R	

Gate	Bridge Model
E2 (old E1)	A3-50/95
E3	A3-58/110 125R CE
E4	A3-58/110 125R CE
E5	A3-58/110 125R CE
E6	A3-58/110 125R CE
E7	A3-58/110 125R CE
E8	A3-68/141 125R CE
E9	A3-60/119 125R CE
E10	A3-58/110 125R CE
E11	A3-58/110 125R CE
E12	A3-58/110 125R CE

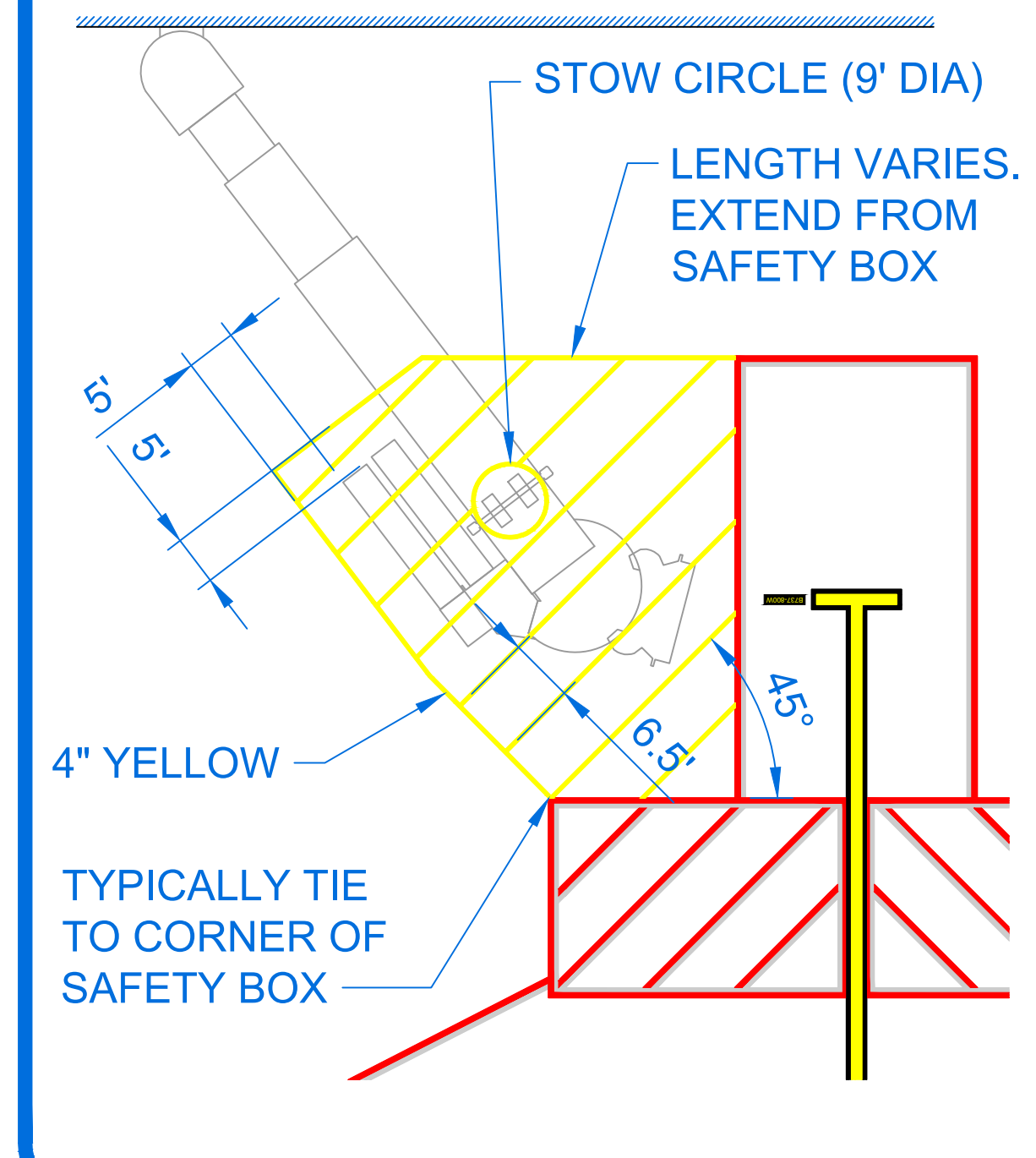
PBB model numbers

The safety box should be designed to encompass every AC type parked at the gate. Use the most extreme forward engine to establish the front stripe, the widest for the outside, the narrowest for the inside and the furthest back for the rear stripe.



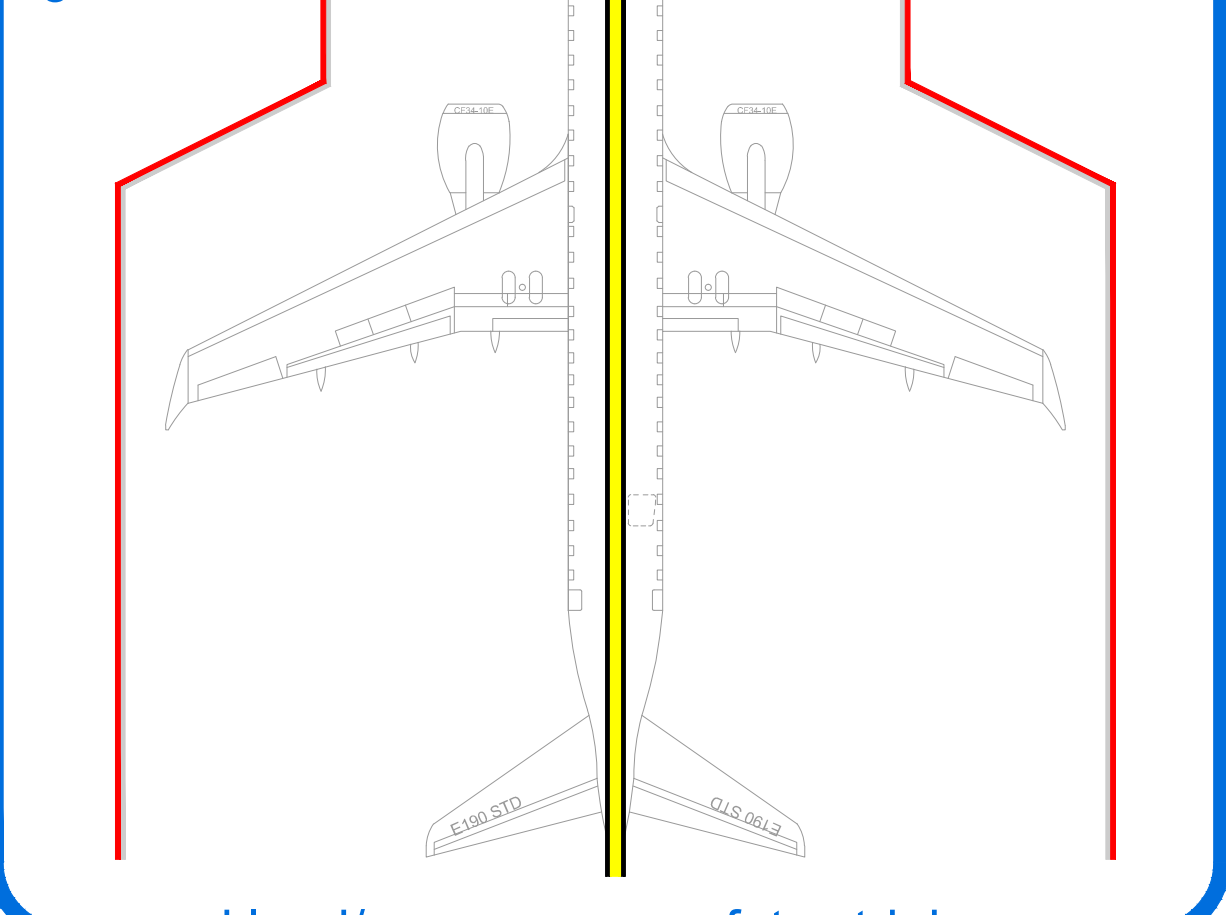
engine ingestion safety box

This is a guideline, modify as needed. Provide a 5' buffer around the stairs/baggage slide on the PBB when at the extreme locations of the PBB's movement. We typically locate the stow circle with assistance of airline crew.



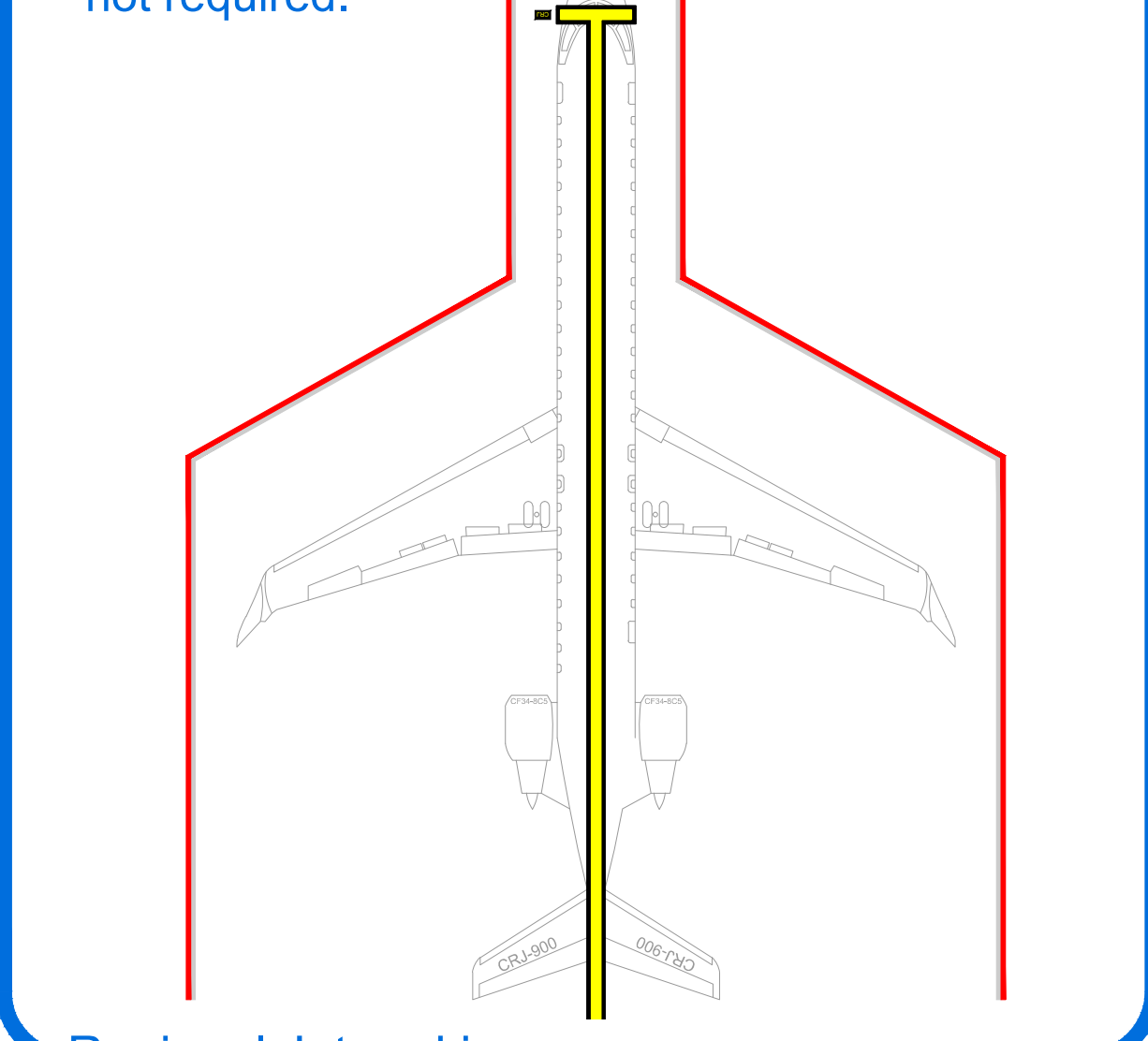
bogey box with stow circle

For ground loading and cargo apron striping, a simplified safety box is acceptable. All clearance dimensions remain the same as for the gates.



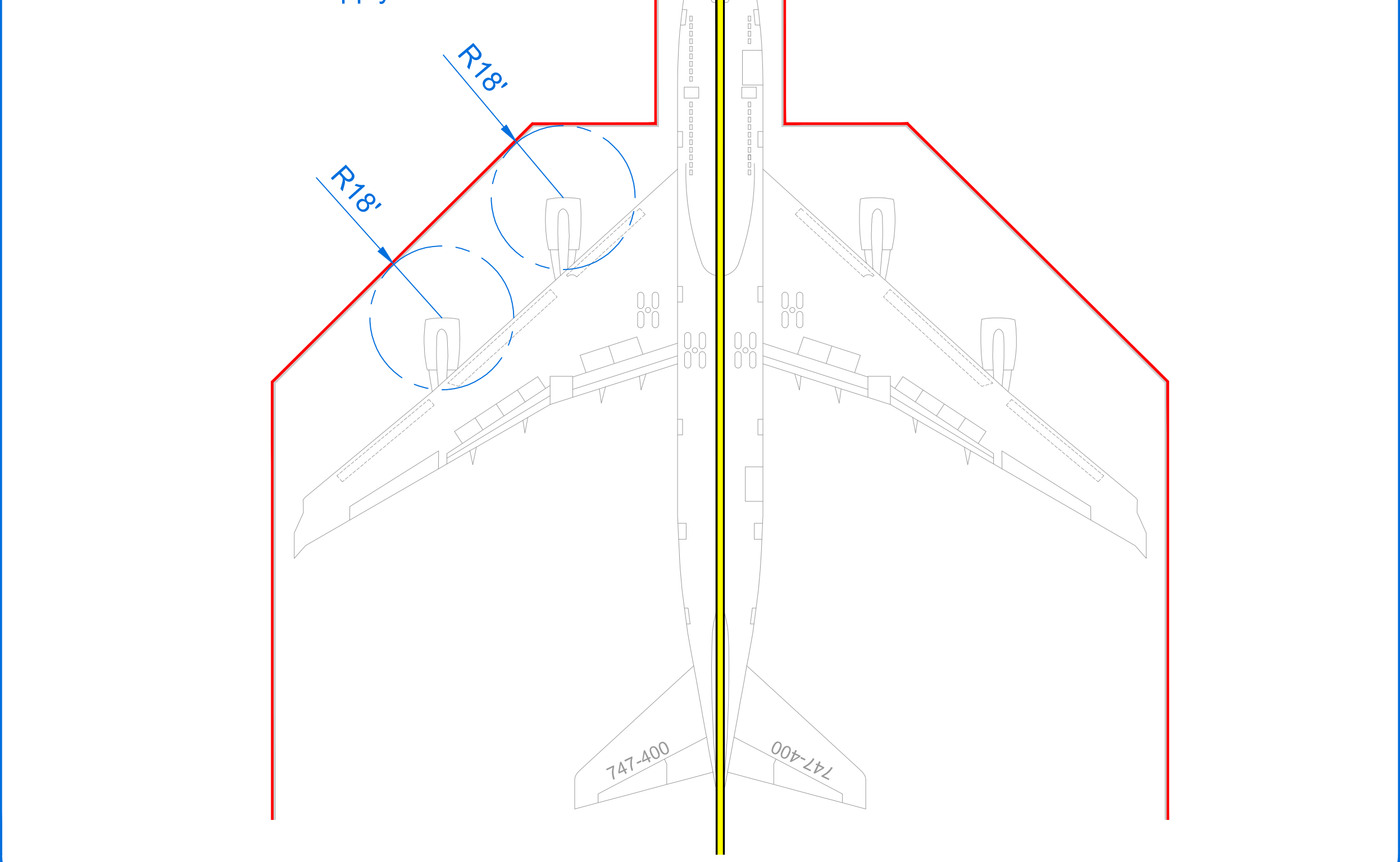
ground load/cargo apron safety striping

Use the standard clearances for regional jets - engine ingestion safety boxes are not required.

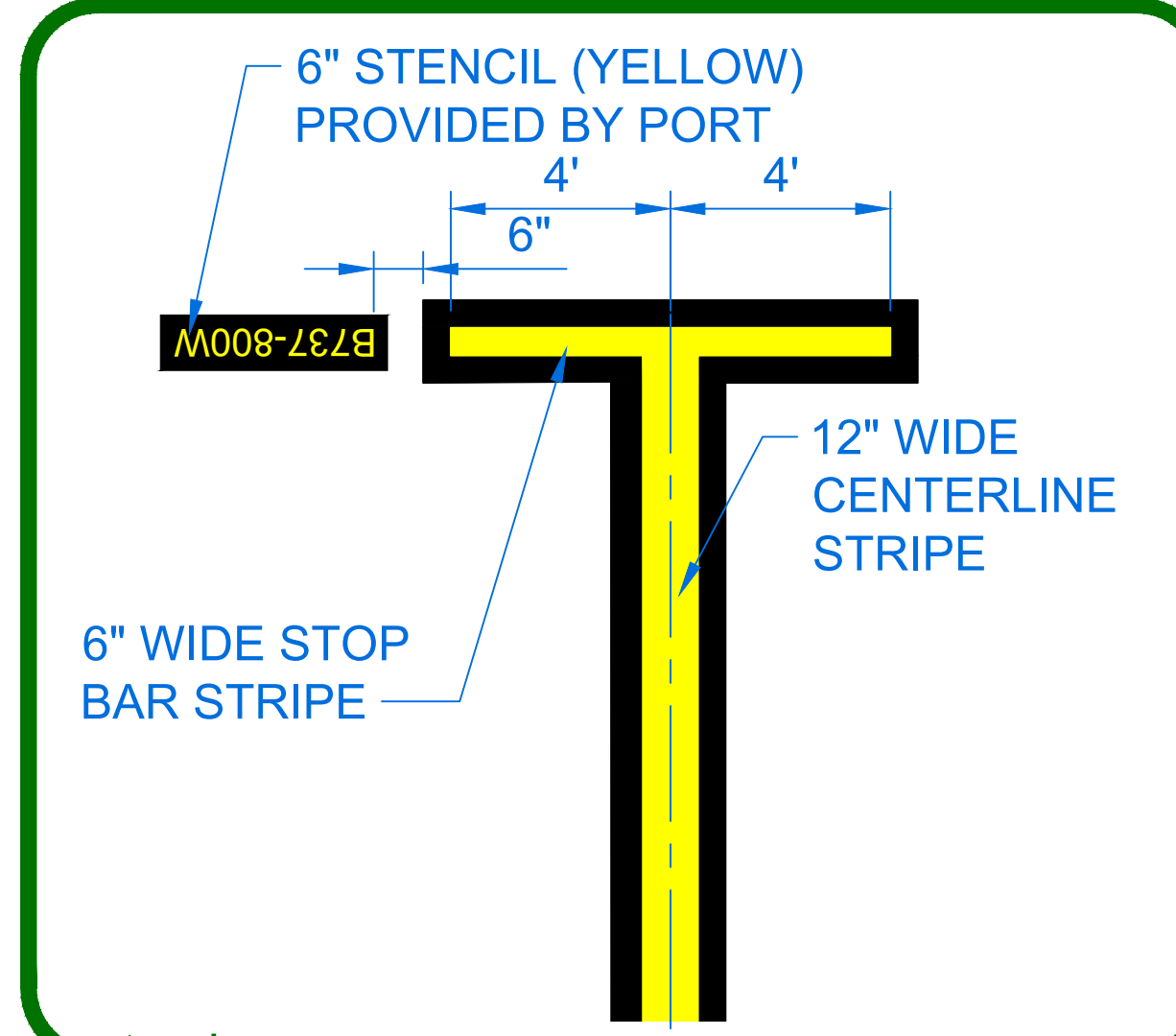


Regional Jet parking

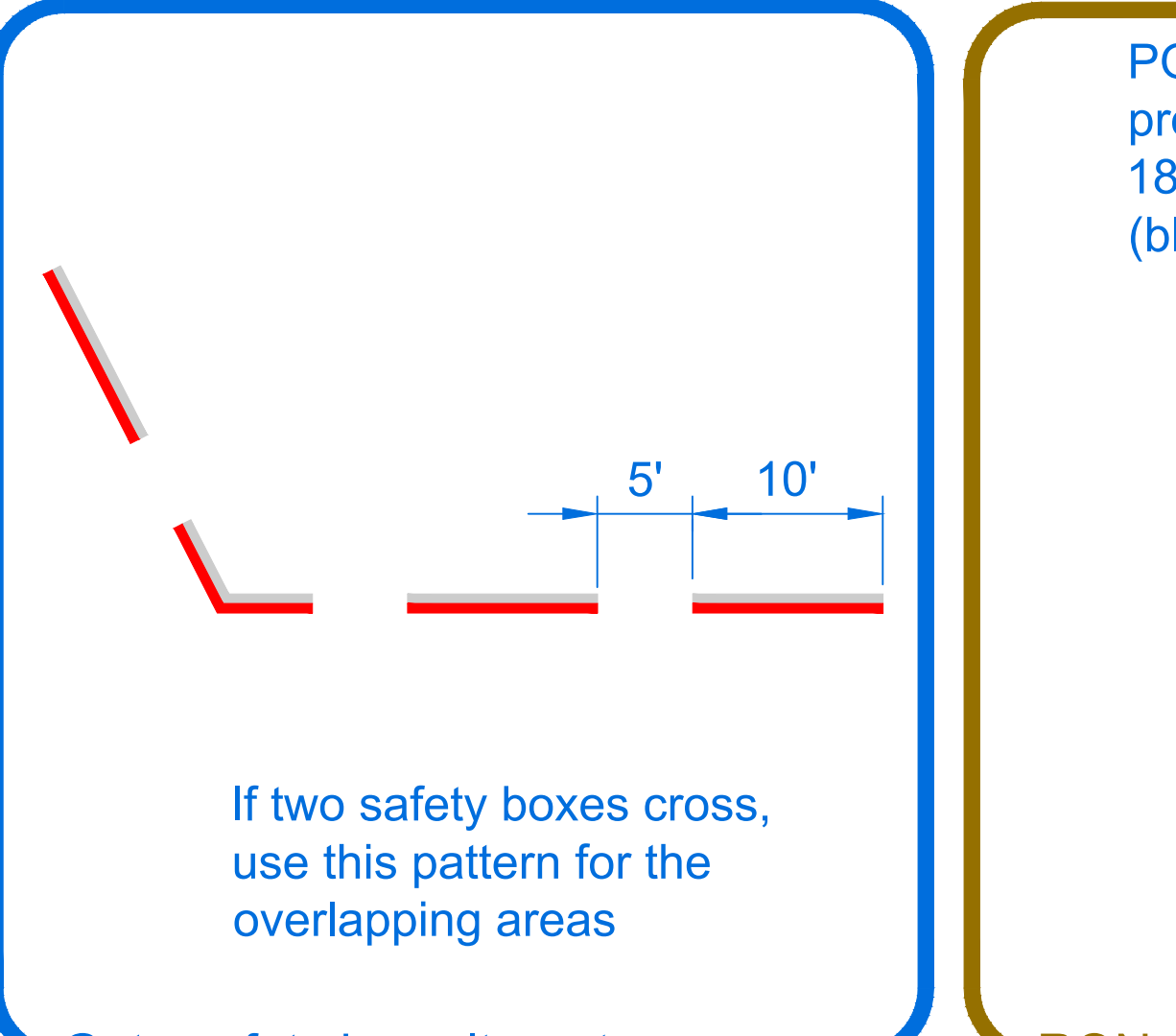
For multi-engine G VI AC engine ingestion safety boxes are not required. Use a line drawn tangentially to the 18' radius circles drawn from the center point of the engine cowling. All other standard clearance dimensions apply.



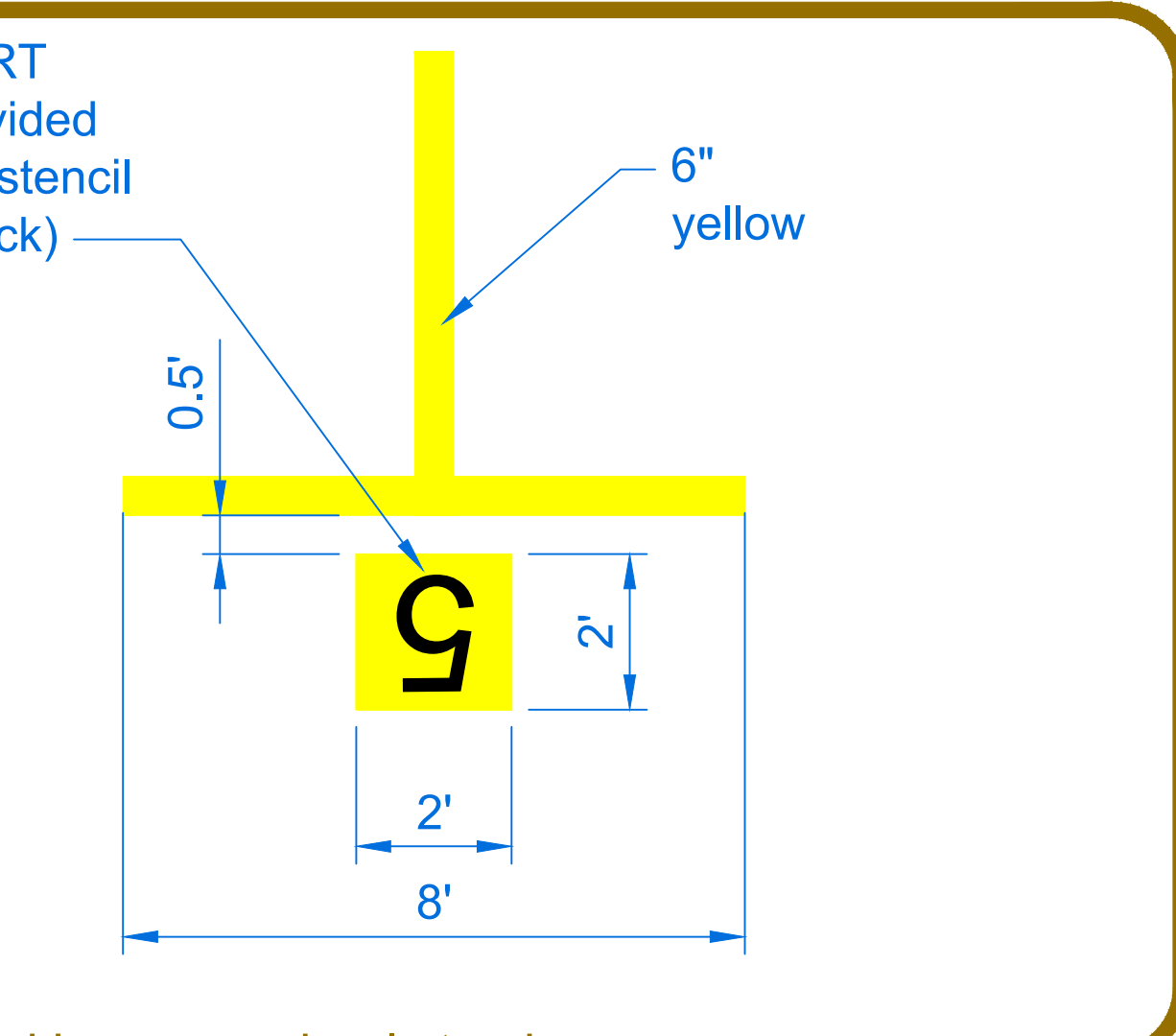
Multi-engine AC parking



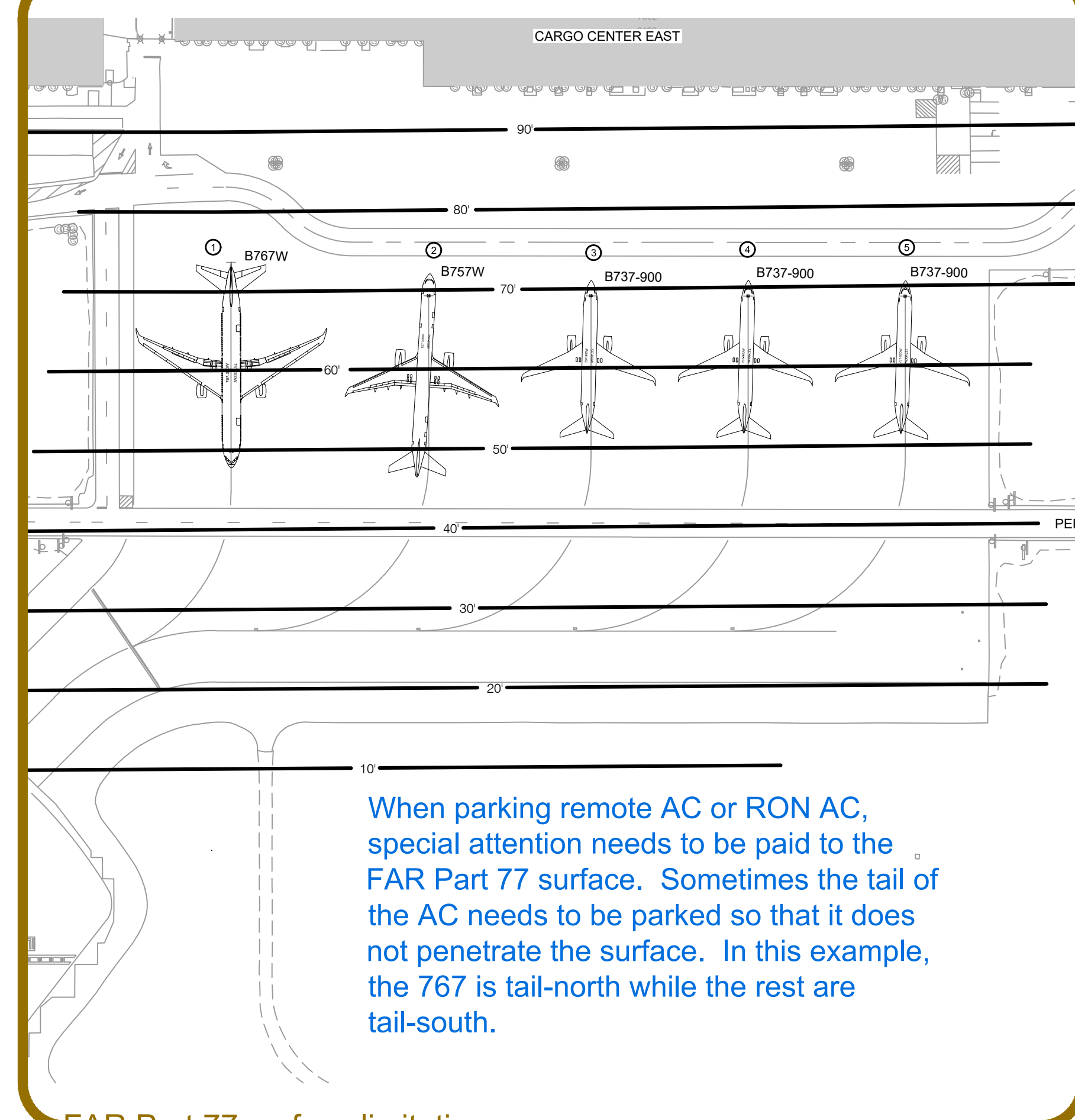
stop bar



Gate safety box alternate

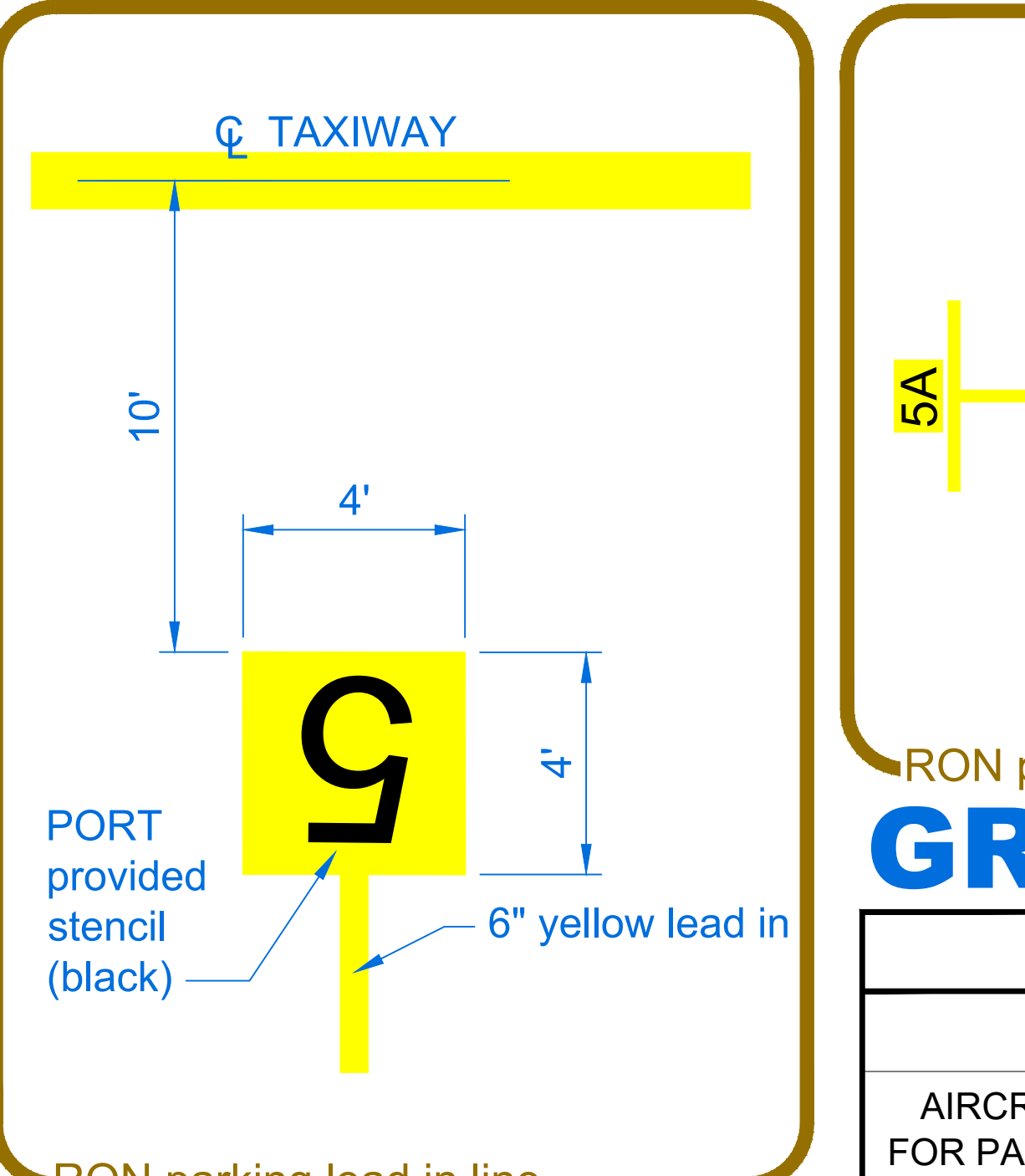


RON parking nose wheel stop bar

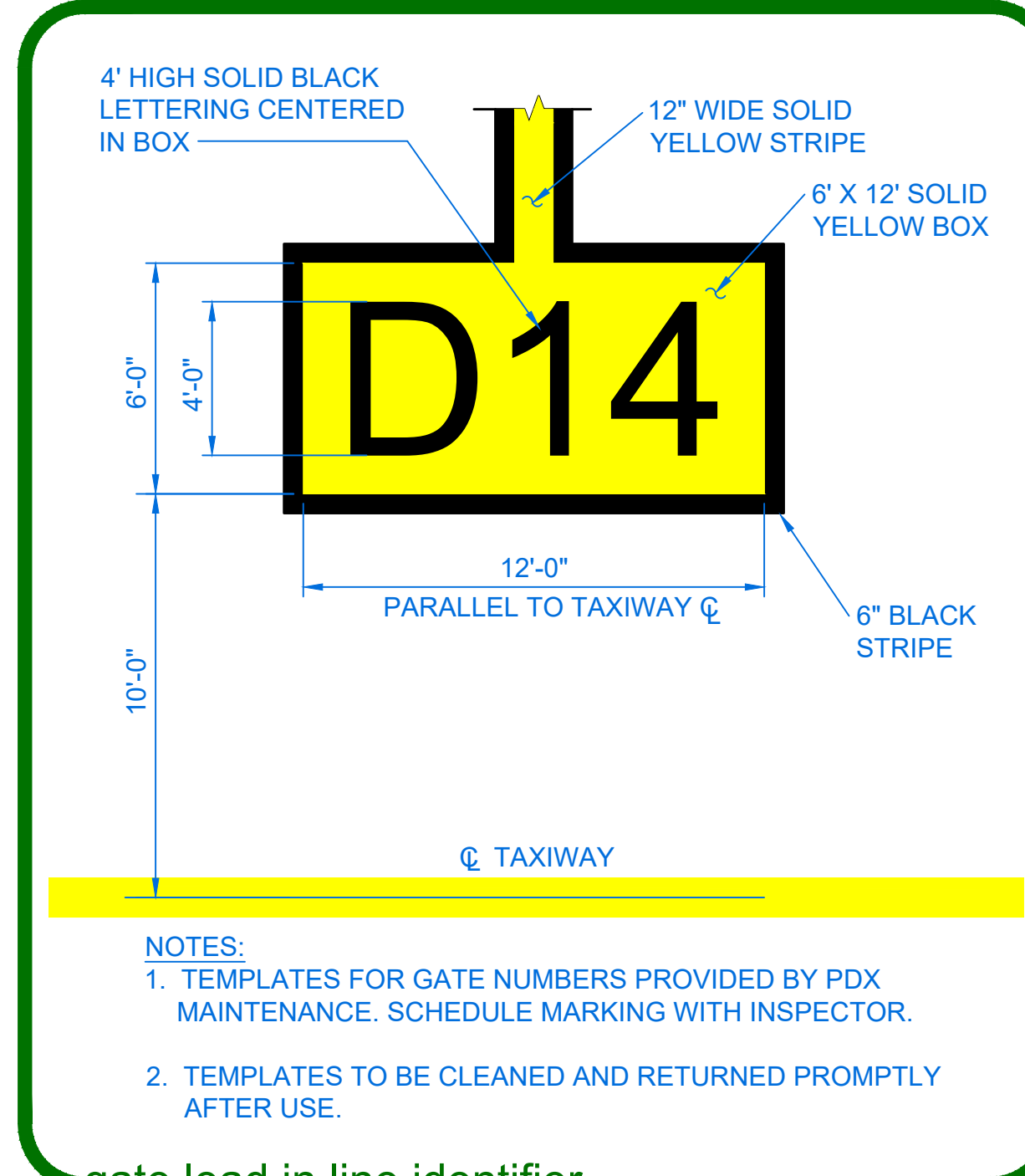


FAR Part 77 surface limitations

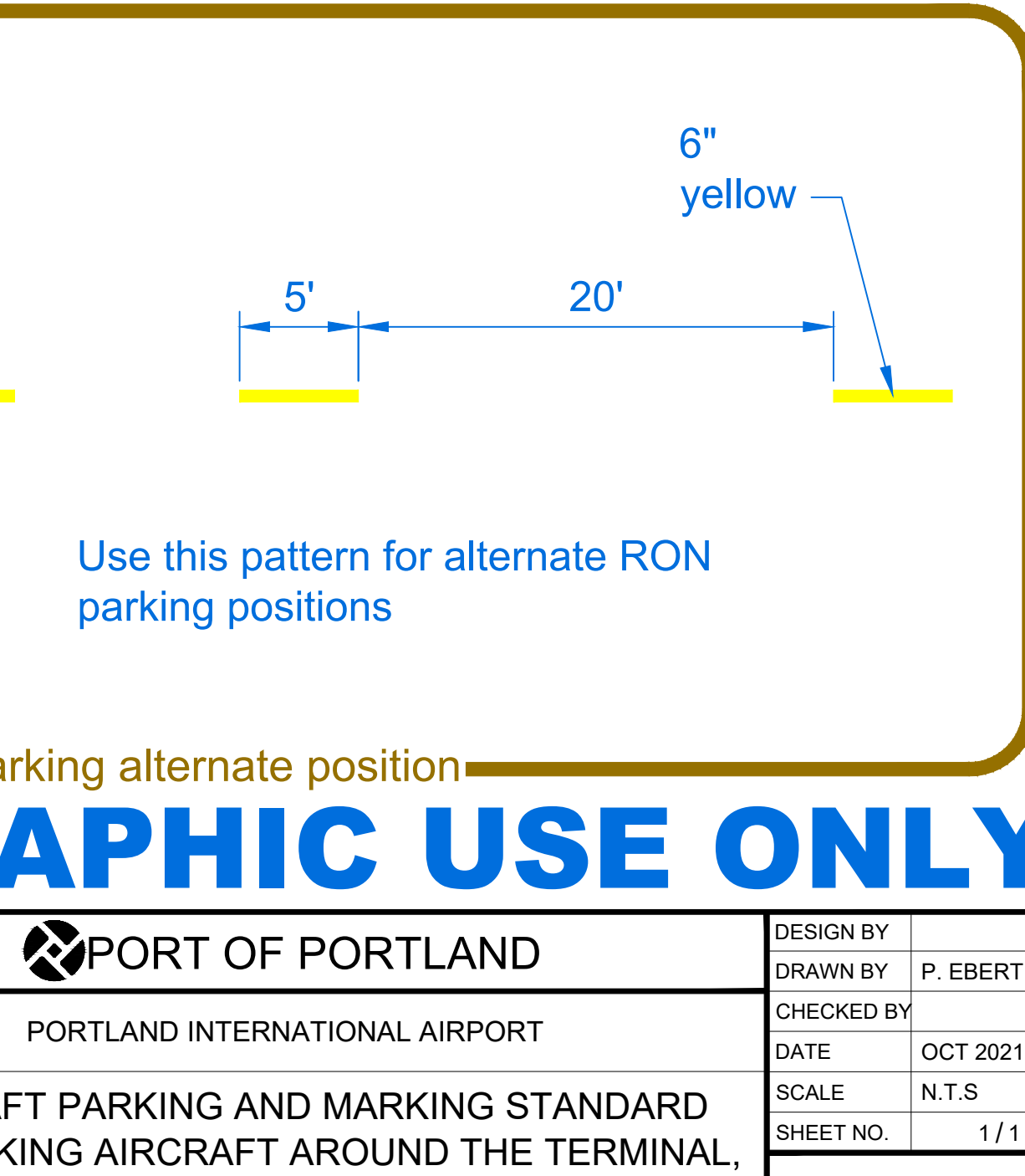
When parking remote AC or RON AC, special attention needs to be paid to the FAR Part 77 surface. Sometimes the tail of the AC needs to be parked so that it does not penetrate the surface. In this example, the 767 is tail-north while the rest are tail-south.



RON parking alternate position



gate lead in line identifier



RON parking alternate position

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 PORTLAND INTERNATIONAL AIRPORT

DESIGN BY P. EBERT
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 CHECKED BY
 DATE OCT 2021
 SCALE N.T.S.
 SHEET NO. 1/1

AIRCRAFT PARKING AND MARKING STANDARD FOR PARKING AIRCRAFT AROUND THE TERMINAL, APRON PARKING AND REMAIN OVER NIGHT

SK-1