

# **HSAC RP 2013-01**

## **GULF OF MEXICO PARKING AREA DESIGN GUIDELINES AND MARKINGS**

Recommended Practices (RP) are published under the direction of the Helicopter Safety Advisory Conference (HSAC). RP's are a medium for discussion of aviation operational safety pertinent to the transmission of product, energy exploration and production industry in the United States. RP's are not intended to replace individual engineering or corporate judgment or to replace instruction in company manuals or government regulations. Suggestions for subject matter are cordially invited.

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# 1. INTRODUCTION

As the Oil and Gas industry has moved further offshore, the reliance on long-range, high-capacity helicopters has increased significantly. The disruption caused by an unserviceable helicopter blocking the helideck of the distant platforms (Fixed, TLP, Spar or other. Not including floaters like drilling rigs and vessels) has become more critical as emergency response by helicopter is limited by not being able to use the helideck. The problem is compounded by the long travel times to move repair personnel and materials to these locations using alternative means of transportation (e.g. transfer by boat). A solution to mitigate this problem is to build a second helideck on the platform; however this has the downside of limiting the platforms infrastructure around two (or more) helidecks regarding obstacle free sectors, limited obstacle sectors and falling gradient sectors. The industry has responded by building helidecks with adjacent parking areas for both routine situations (expanded scheduling options, medevac aircraft, etc) and in the event of unserviceability of a helicopter offshore. As there is only limited industry or regulatory guidance, the individual platform owners have designed these parking areas by their own schemes.

This RP has been designed to give guidance to platform owners and helicopter operators in an HSAC recommended practice for designing and marking offshore parking areas. The guidance has been based in part on the current ICAO International Standards and Recommended Practices Annex 14 Volume II (Heliports)<sup>1</sup> and also takes best practices from CAP 437 and current practices in the Gulf of Mexico. For facilities other than the platforms this RP is intended for, the following applies:

(ICS) "Guide to Helicopter/Ship Operations" for vessels
International Maritime Organization (IMO) Code for Mobile Offshore Drilling Units (MODU)
U.S. Coast Guard (USCG) Code of Federal Regulation (CFR) 46 - Part 108 and CFR 33 - Part 143 for Floating Facilities in OCS Waters
BSEE 30CFR 250.154 Identification Signs

This RP provides parking area design guidance and standardizes the marking system across the GOM. All attempts have been made to align this RP wherever possible with the internationally recognized marking systems or with those mandated for non-fixed facilities as noted above. It will therefore allow pilots to become familiar with a common system that will give consistent cues and information, wherever they may be operating.

It is recognized that a number of platforms in the GOM do not comply with the minimum size requirements of ICAO and in some cases the obstacle clearances normally provided by the ICAO markings cannot be assured. To inform pilots when the markings do not provide the obstacle clearance that is normally assured an additional warning marking has been included in the guidance. (See **Figure 12**)

Where this RP differs from ICAO, the ICAO practice has also been added for reference.

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<sup>1</sup> The current International Civil Aviation Organisation (ICAO) International Standards and Recommended Practices Annex 14 Volume II is being revised/update and some changes have tentatively agreed at meeting held in December 2006: these changes are also reflected in this document.

## 1.1. BACKGROUND INFORMATION

Although this RP is designed as a comprehensive guide, further details of many of the requirements should be sought in the reference documents of ICAO International Standards and recommended Practices (Aerodromes) Annex 14 Volume II (Heliports), CAP 437API RP 2L and HSAC RP 2008-01 for Gulf of Mexico Helideck Markings.

Helideck parking area marking, size and color guidance are provided in **Appendix 1**. A table of useful dimensions relating to the *D value* of different helicopter types is shown in **Appendix 2**.

## 1.2. DEFINITIONS

Terms used throughout this RP are defined as follows:

<b>D - Value</b>	A measurement equal to the overall length of a helicopter (O/L), from the front of the rotor disc area to the rear of the tail rotor disc area.
<b>D Circle</b>	An imaginary circle with a diameter equal to <i>Helicopter (O/L)</i> used in connection with obstacle clearance areas.
<b>Final Approach and Take Off area (FATO)</b>	The <i>final approach and take off</i> area. It is a defined area over which the final phase of the approach to hover and landing is completed and from which the take-off maneuver is commenced.
<b>Helideck Parking Area (HPA)</b>	An area outside the FATO separated by a <i>Parking Transition Area (PTA)</i> designed to accommodate a parked helicopter.
<b>Limited Parking Area (LPA)</b>	An area separated by a <i>Parking Transition Area (PTA)</i> that is designed to accommodate a parked helicopter where restrictions/limitations apply (i.e. size of helicopter, parking area dimensions, weight load or obstacles).
<b>“No Nose” Marking</b>	The No Nose Marking is a white colored marking with a red border and the words ‘No Nose’ on the Touchdown Parking Circle (TDPC) or Touchdown Positioning Marking (TDPM) that provides visual cues to the flights crew that the helicopters nose shall not be positioned over this marking to assure tail rotor clearance from an obstacle.
<b>Obstacle free area</b>	Obstacle protection provided below the TLOF level to consider the possibility of helicopter loss of height due to power unit failure during the latter stages of the approach or early stages of take off.
<b>Parking Circle Orientation Marking (PCOM)</b>	The Parking Circle Orientation Marking (PCOM) is a white colored marking on the Touchdown Parking Circle (TDPC) located on the Parking Area that provides visual cues to the flight crew that the helicopter needs to be re-oriented before helicopter shutdown.

<b>Parking Transition Area (PTA)</b>	An extension to the parking area used to transition the helicopter to/from the parking area by Hover, Ground Taxi, or Ground Handling. The PTA provides a clearance between the parked helicopter and a helicopter operating on the TLOF.
<b>Push-in Area (PIA)</b>	An extension to the <i>touchdown and lift-off</i> area ( <i>TLOF</i> ) separated by a <i>Parking Transition Area (PTA)</i> designed to accommodate only a fully shut down helicopter. All allowed helicopter types shall be shut down and ground handled to/from the <i>TLOF</i> and to/from the <i>PIA</i> .
<b>Rotor Diameter (RD)</b>	A measurement, in feet, equal to the rotor diameter of a helicopter.
<b>Touchdown Positioning Marking (TDPM)</b>	The touchdown positioning marking is a yellow circle painted on the TLOF, used by the pilot for guidance and obstacle clearance information while landing, taking off, or maneuvering.
<b>Touchdown Parking Circle (TDPC)</b>	A yellow circular marking on the Parking Area and provides proper obstacle clearance when the pilot's seat is over the yellow portion of the TDPC.
<b>Touchdown and Lift-Off area (TLOF)</b>	The <i>touchdown and lift-off</i> area. It is the load bearing area of the helideck on which a helicopter may touchdown or from which a helicopter may lift off.

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## 2. PARKING AREA GENERAL

The ability to park a helicopter on an offshore installation and to be able to use the helideck for other helicopter operations at the same time provides greater operational flexibility. The *Helideck Parking Area*, *Limited Parking Area* or *Push-in Area* shall be located within the *150° Limited Obstacle Sector (LOS)*. Markings shall be provided to give visual cues to the flight crew. Additionally, written procedures shall be available to enhance safe operations.

### 2.1. PARKING AREA SURFACE COLOR

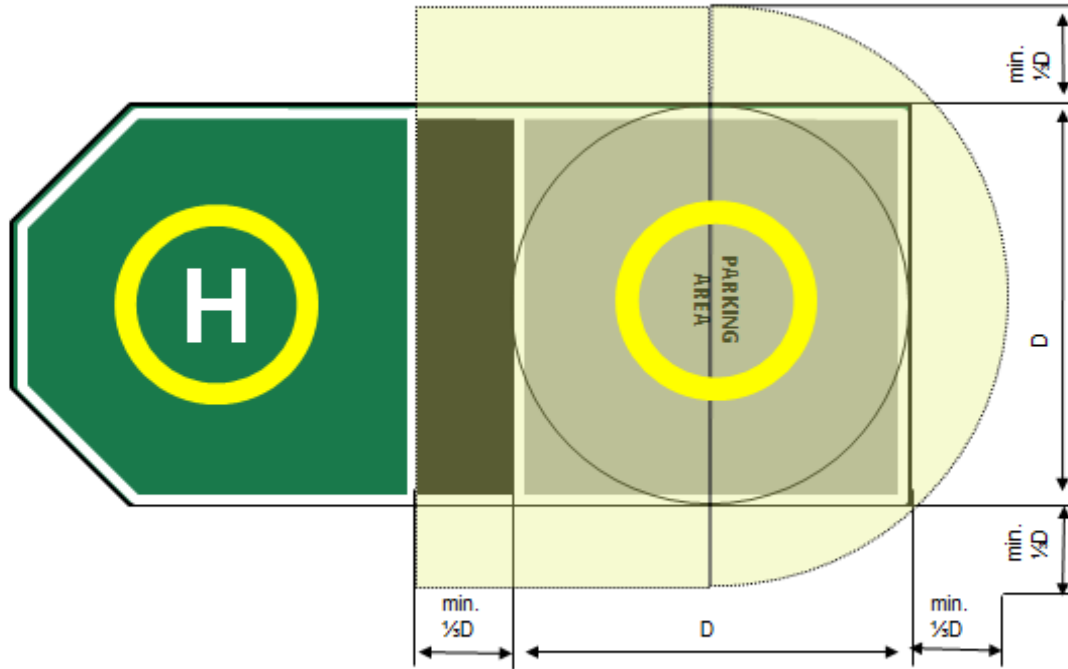
The parking area shall be clearly distinguished from the *TLOF*. This is achieved by a parking area that has a light grey color contrasting with the *TLOF*. This color also allows for aluminum decks to retain its structural friction characteristics by not having to paint the surface. The perimeter of the *HPA* should be marked by a white perimeter line with a width of at least 1ft (0.3m) as shown in **Figure 1**. Where the parking area is a Push-In Area then the white perimeter line should be 36 inches wide as shown in **Figures 9-10**.

### 2.2. HELIDECK PARKING AREA (HPA)

As a minimum the Helideck Parking Area (HPA) clearance will be D-Value (D) +  $\frac{1}{3} D$  of the largest helicopter from the TLOF and all obstructions as shown in **Figure 1**. The parking area footprint (deck size) shall be a minimum of D. Markings shall be added to provide visual cues to the flight crew to enhance safe operations.

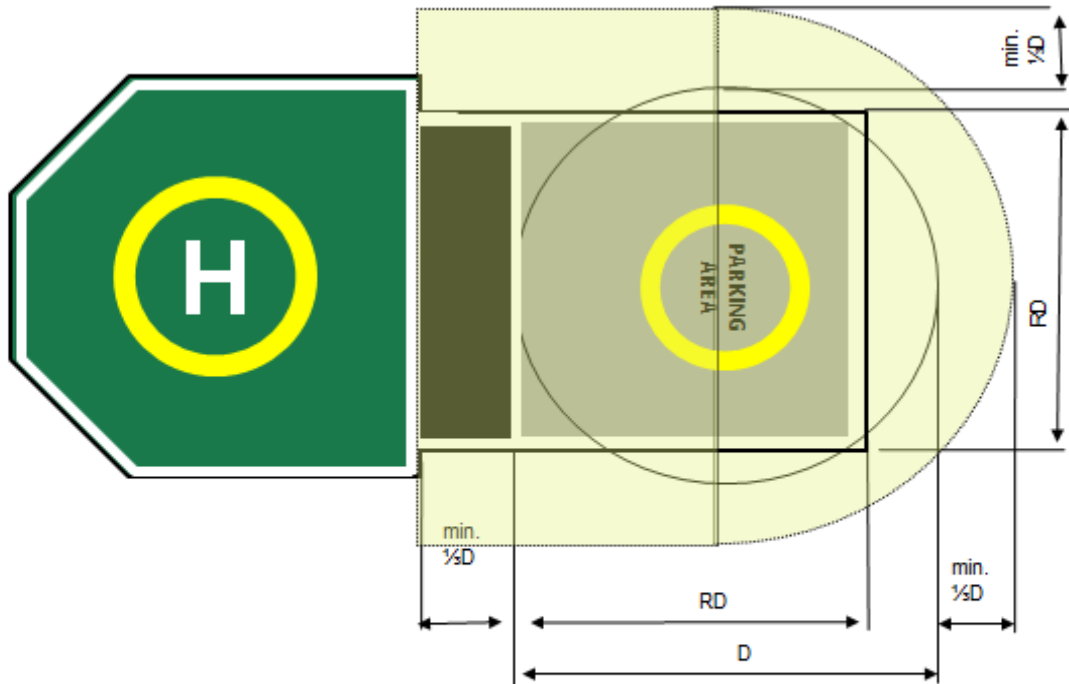
**Note** – for existing helidecks, the clearance of  $\frac{1}{3} D$  as noted above may be reduced to  $\frac{1}{3} RD$  if the helicopter operator and facility owner ensure that rotor blades are tied down so that the rotor blades offset provides clearance equal to  $\frac{1}{3} D$ . The parking area footprint (deck size) may also be reduced to a minimum of RD if the TDPC is properly offset to provide a minimum of  $0.5 D + \frac{1}{3} D$  (or  $\frac{1}{3} RD$ , see above) clearance from the center of the TDPM. The infringements of the  $\frac{1}{3} D$  shall be adequately marked and written documentation and procedures shall be available to air operators to identify obstruction(s) or limitation(s). See **Figure 2**.

**No restrictions**



Example of helideck layout with adjacent D-value parking area and  $1D + 1/3 D$  clearance area.

**Figure 1: Helideck Parking Area (HPA)**



Example of helideck layout with adjacent RD-value parking area and  $1D + 1/3 RD$  clearance area.

**Figure 2: Helideck Parking Area with offset TDPC**

An example of a helideck layout with adjacent RD-value parking area and  $1D + 1/3 D$  clearance area is shown in **Figure 2**. The TDPC may be offset where  $1/3 D$  clearance is still guaranteed and no part of the helicopter touching the surface is closer than 3 feet from the HPA deck edge.

### 2.3. LIMITED PARKING AREA (LPA)

A parking area is called a *Limited Parking Area (LPA)* when one or more of the following conditions exist(s):

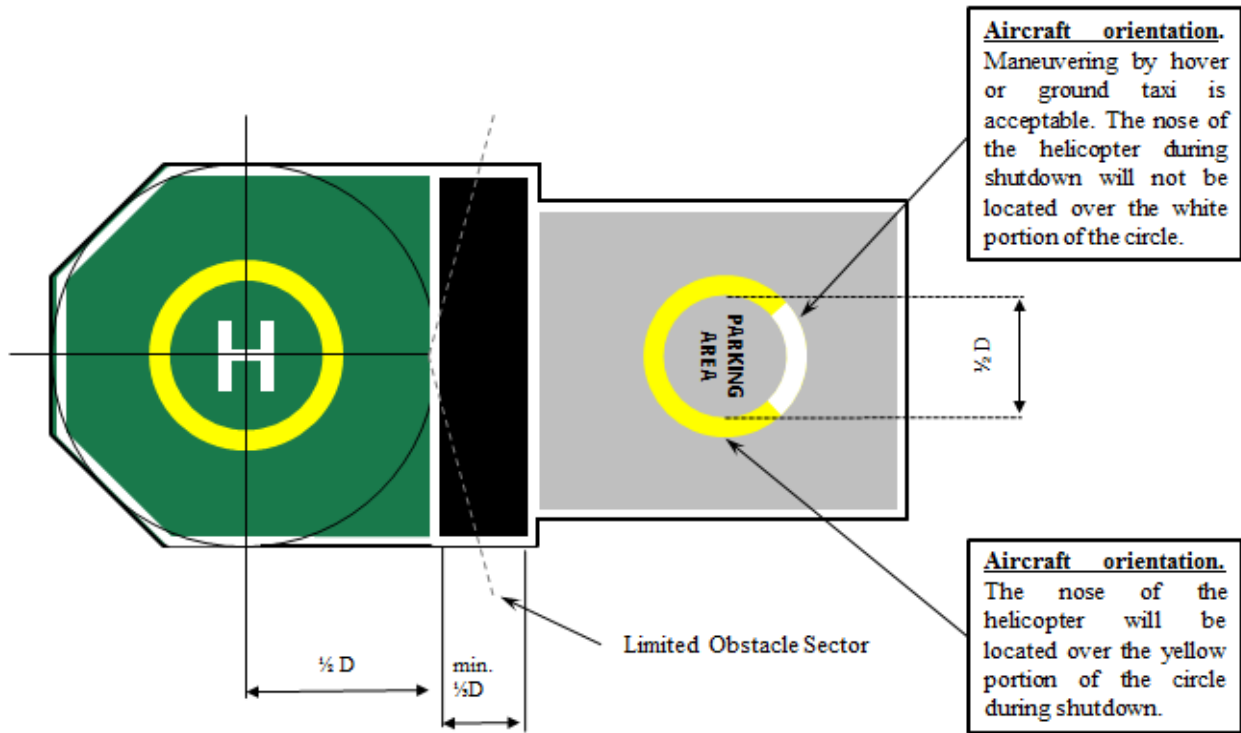
- 1) An infringement of the  $1/3 D$  area surrounding the *D-circle* on the *Parking Area* is present.
- 2) A weight limitation exists for the helicopter allowed onto the LPA due to structural constraints.
- 3) The dimensions of the LPA are insufficient to accommodate the helicopter type allowed onto the TLOF.

As a minimum the *Limited Parking Area* obstacle clearance will be *D-Value (D)*. Infringements of the  $1/3 D$  additional clearance area shall be adequately marked and written documentation and procedures shall be available to air operators to identify obstruction(s) or limitation(s).

A parking orientation restriction due to an infringement of a clearance area can be marked with a Parking Circle Orientation Marking (PCOM). The Parking Circle Orientation Marking (PCOM) is a

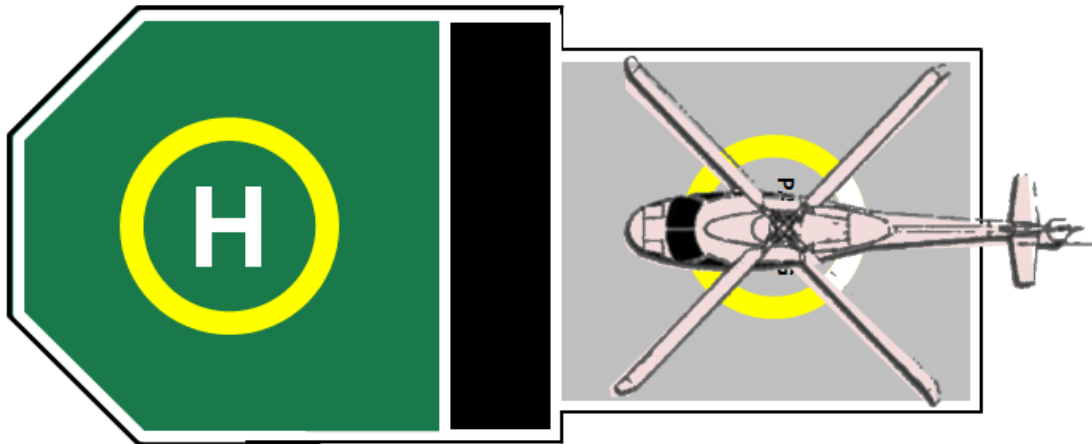


white colored marking on the Touchdown Parking Circle (TDPC) that provides visual cues to the flight crew that the helicopter needs to be re-oriented before helicopter shutdown (see **Figure 3**)



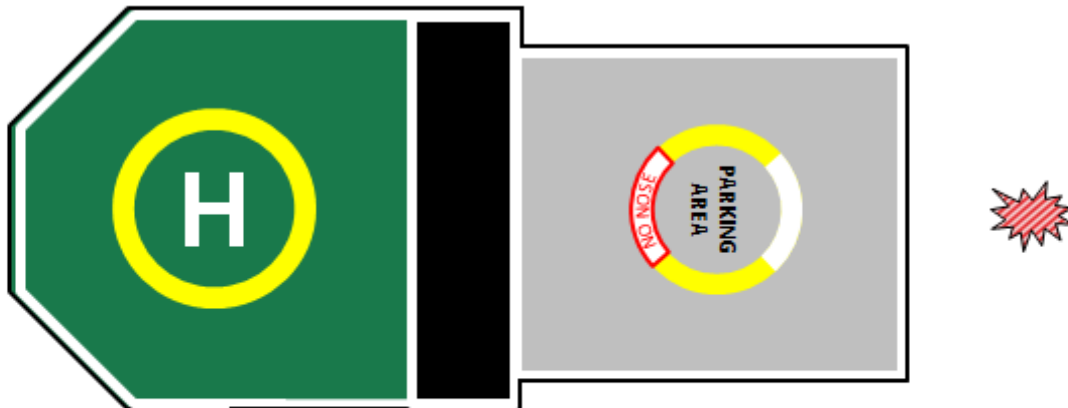
**Figure 3: Parking Circle Orientation Marking (PCOM)**

The example of a *PCOM* in **Figure 3** shows a helideck layout with adjacent RD-value parking area and  $1D + \frac{1}{3}D$  clearance area. The *PCOM* provides orientation information that prevents a helicopter’s tail rotor from being positioned in the *Parking Transition Area* and infringing on the  $\frac{1}{3}D$  clearance from the *TLOF* which would limit the use of the *TLOF*. **Figure 4** depicts the situation on the Parking Area with a helicopter parked after it has been oriented correctly before shutdown.



**Figure 4: Helicopter parked using Parking Circle Orientation Marking**

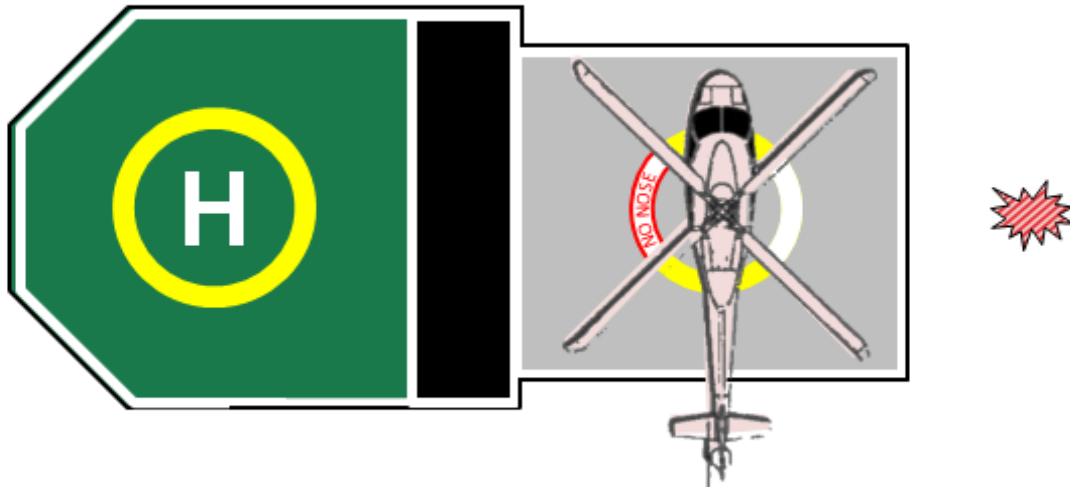
The “No Nose Marking” is a white colored marking with a red border and the words ‘No Nose’ on the *Touchdown Parking Circle (TDPC)* or *Touchdown Positioning Marking (TDPM)* (see paragraph 2.12) that provides visual cues to the flight crew that the helicopters nose shall not be positioned over this marking to assure tail rotor clearance from an obstacle. Unlike the “No Nose” marking on the *TDPM*, the minimum sector size for the “No Nose” marking section on a *TDPC* is 90 degrees. One or multiple obstacles may be covered by this sector. **Figures 5-8** show a parking orientation restriction due to an infringement of the transition area avoided by the *PCOM* marking and a “No Nose” marking to avoid a tail rotor hazard.



Example of helideck layout with a adjacent RD-value parking area and 1D + 1/3 D clearance area. There is an obstacle in 1/3 D area and a required orientation for the parked helicopter in order to avoid infringement of the Parking Transition Area when shutdown.

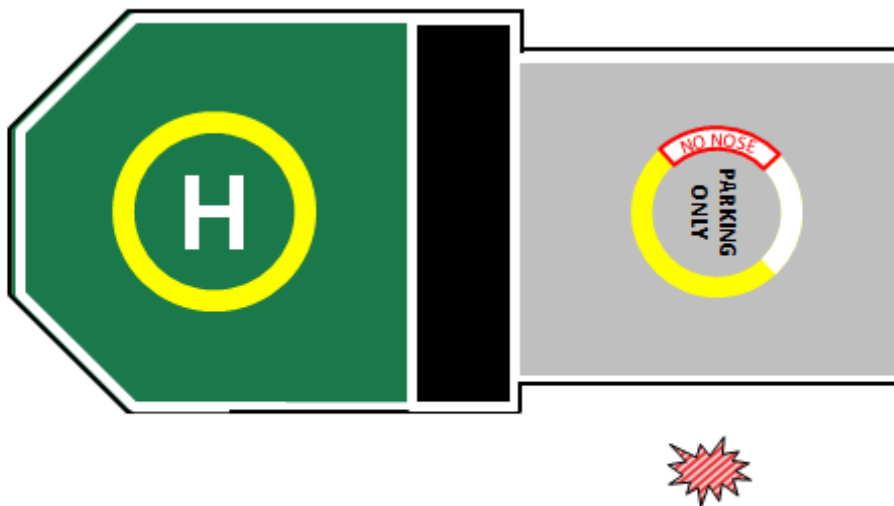
**Figure 5: "No Nose" marking and PCOM on TDPC – Layout 1**

Written procedures shall be required to reposition the helicopter to the SLA from the parking area i.e. lateral hover taxi or towing only.



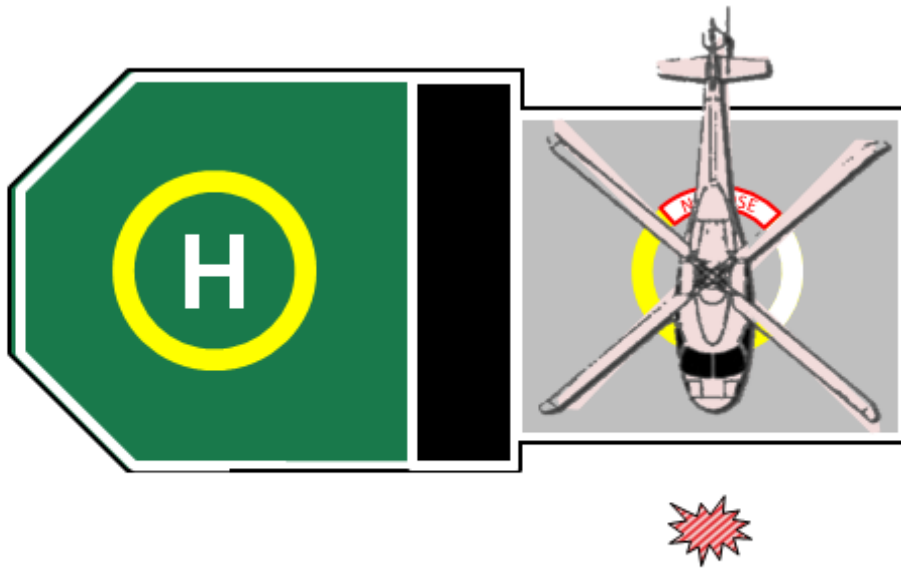
Example of helideck layout with a adjacent RD-value parking area and  $1D + 1/3 D$  clearance area. There is an obstacle in  $1/3 D$  area and a required orientation for the parked helicopter in order to avoid infringement of the Parking Transition Area when shutdown.

Figure 6: "No Nose" marking and PCOM on TDPC – Helicopter 1



Example of helideck layout with a adjacent RD-value parking area and  $1D + 1/3 D$  clearance area. There is an obstacle in  $1/3 D$  area and a required orientation for the parked helicopter in order to avoid infringement of the Parking Transition Area when shutdown.

Figure 7: "No Nose" marking and PCOM on TDPC – Layout 2



Example of helideck layout with a adjacent RD-value parking area and 1D + 1/3 D clearance area. There is an obstacle in 1/3 D area and a required orientation for the parked helicopter in order to avoid infringement of the Parking Transition Area when shutdown.

Figure 8: "No Nose" marking and PCOM on TDPC – Helicopter 2

## 2.4. PUSH-IN AREA (PIA)

The *Push-in Area (PIA)* parking area footprint (deck size) shall be a minimum that will provide unobstructed clearance for a rotors not turning helicopter to be safely ground handled including to and from the *TLOF* and on the *PIA*.

Consideration for the ability of maintenance to access the helicopter, i.e. work stands, ladders, tools and equipment, shall be considered when determining the overall size of the *Push-In Area*.

**At no time will any parked helicopter be positioned closer than 3 feet from the deck edge.**

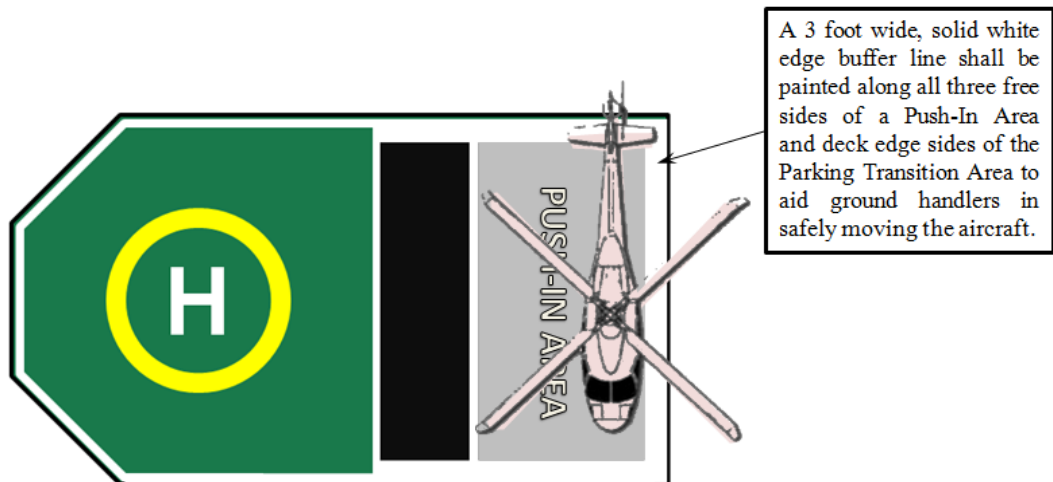


Figure 9: Push-In Area - 1

At no time will any parked helicopter be positioned closer than 3 feet from the deck edge.

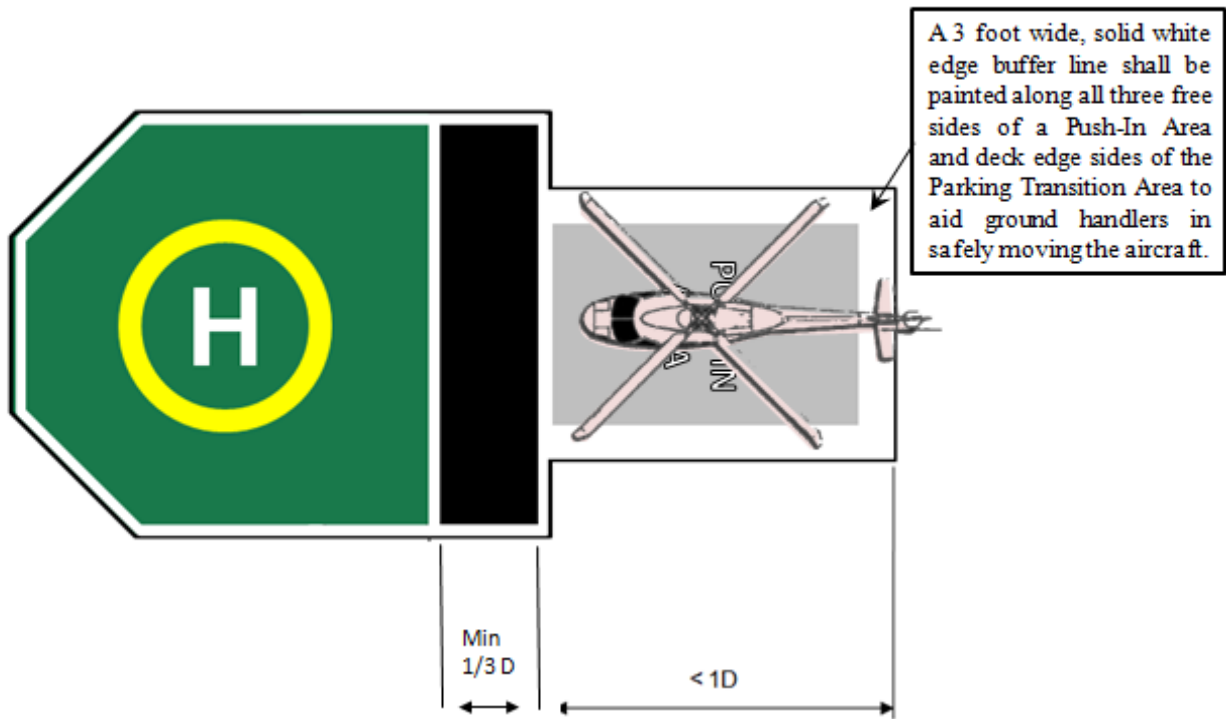
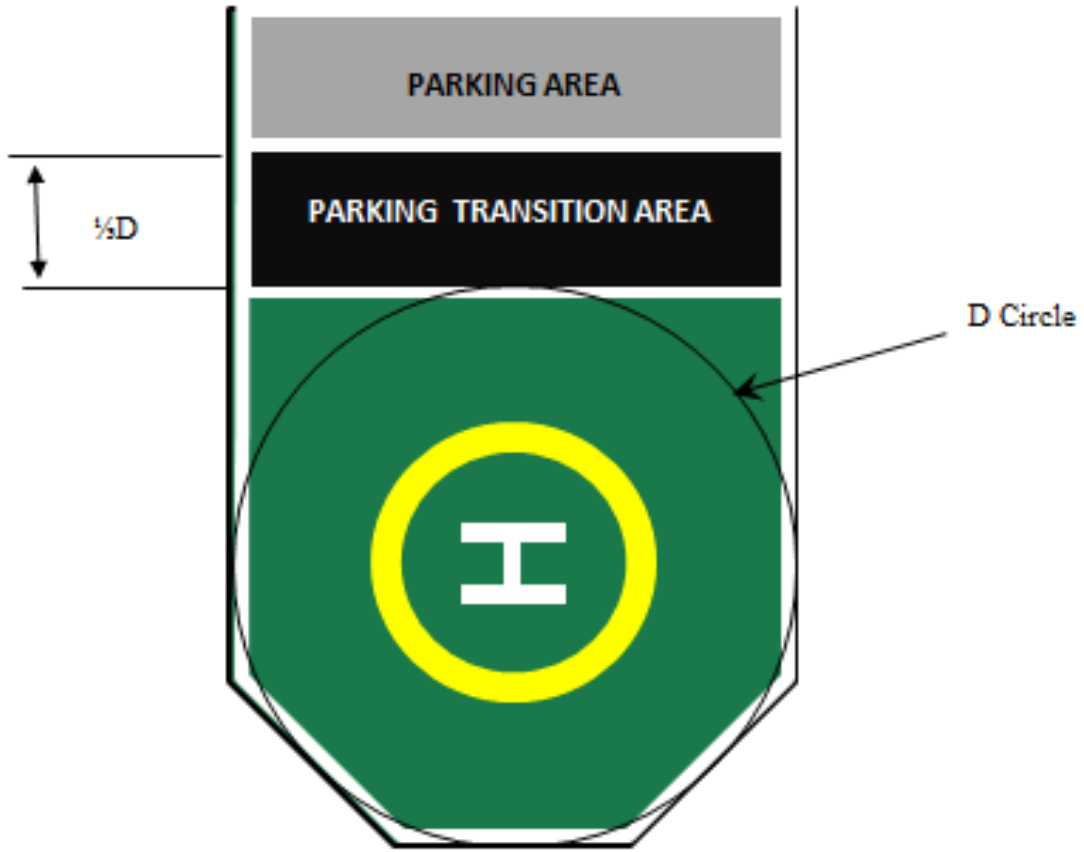


Figure 10: Push-In Area - 2

## 2.5. PARKING TRANSITION AREA (PTA)

The *Parking Transition Area (PTA)* is an area between the *Safe Landing Area* and the parking area used to transition the helicopter to/from the parking area by hover, ground taxi, or ground handling (see **Figure 11**). The *PTA* divides the *TLOF* and *Parking Area/PIA* in order to provide a minimum of  $1/3 D$  clearance between the parked helicopter and a helicopter operating on the *TLOF*. The *PTA* shall be painted in a black color, starting from the perimeter line of the *TLOF* to the *Parking Area/PIA* perimeter line. The minimum distance from the *D circle* of the *TLOF* will be  $1/3 D$  to the *Parking Area/PIA*. Restrictions to the method of transition, and any *Parking Area/PIA* restrictions, shall be marked in the *PTA*. During normal operations NO part of either a helicopter tied down or operating on the helideck will intrude this area except during transition to and from the *Parking Area/PIA*. In the event that a parked helicopter extends into the *PTA* written procedures to include crew notification shall be in place. This shall include restricting the size of the helicopter that can safely operate to the helideck while still providing  $1/3 D$  clearance to the parked helicopter.



**Figure 11: Parking Transition Area (PTA)**

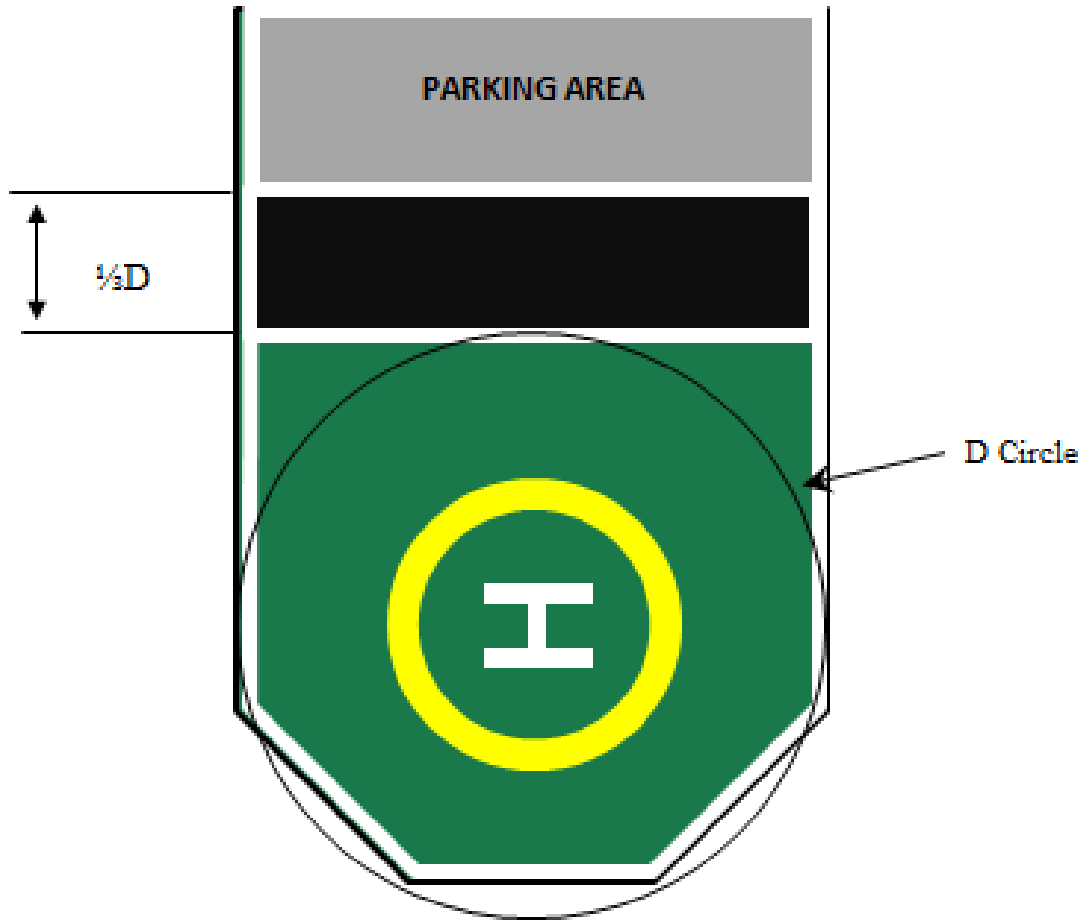


Figure 11a: Parking Transition Area (PTA) with offset TDPM

## 2.6. PARKING TRANSITION AREA MARKINGS

If the parking area can accommodate the same size helicopter allowed on the *TLOF* without limitations, no markings are necessary. In this instance the limitations box will be omitted as marking on the *PTA*.

A *Limited Parking Area* can be down-sized to accommodate a helicopter type with a lesser *D-value* than marked on the *TLOF* in order to achieve  $1D + 1/3 RD$  clearance for the smaller type. In this case, a reference shall be noted in the transition area of the restriction in helicopter size *D-value* allowed in the *Limited Parking Area*. It shall be adequately marked to alert the crew of all restrictions associated with the parking area. If either weight, dimension or *D-value* limitations are in effect, all three values shall be marked in a parking area *Limitations Box* on the right bottom side of the *Parking Transition Area* at a distance of 12" from the *TLOF* perimeter line. This serves as a visual warning to the flight crew that is about to transition a helicopter from the *TLOF* into the *Limited Parking Area*. An example is shown in **Figure 12**.

Only one of the following directives shall be used to identify the allowed method of transition into the parking area/PIA: “Push-in only”, “No hover taxi” or “No ground taxi”. The applicable directive will be marked in text in a white color in the center of the PTA 12” from the TLOF perimeter line.



**Figure 12: Parking Transition Area markings**



## APPENDIX 1: PARKING AREA MARKINGS SIZE AND COLOR



Figure 13: Parking Transition Area directive

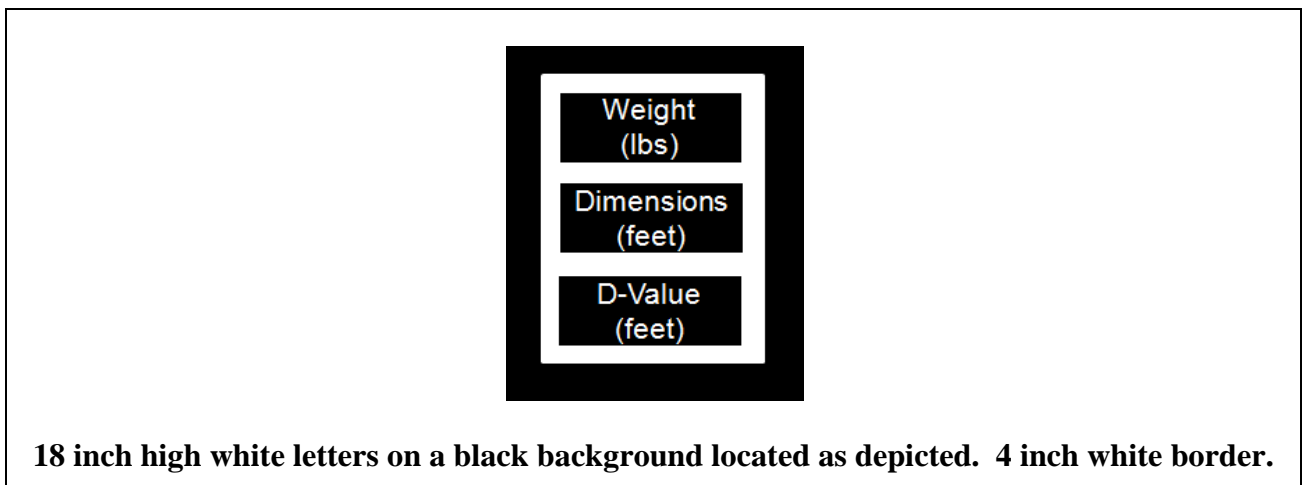


Figure 14: Weight, dimension or D-Value restriction

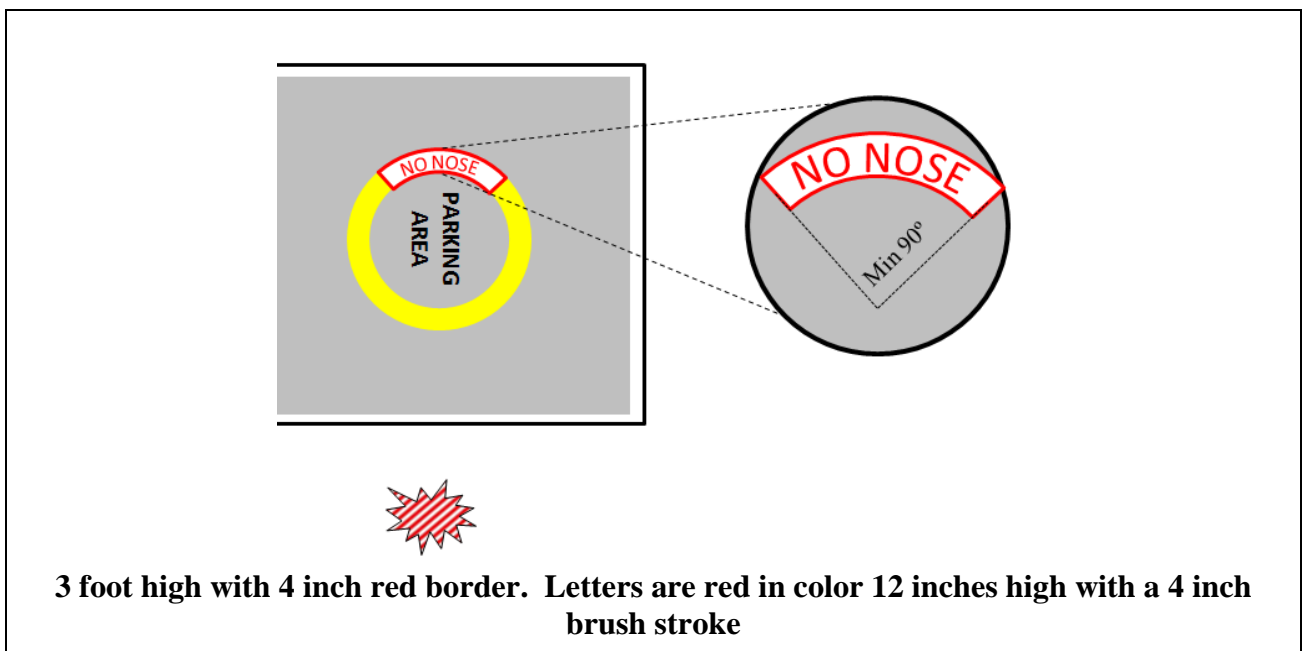
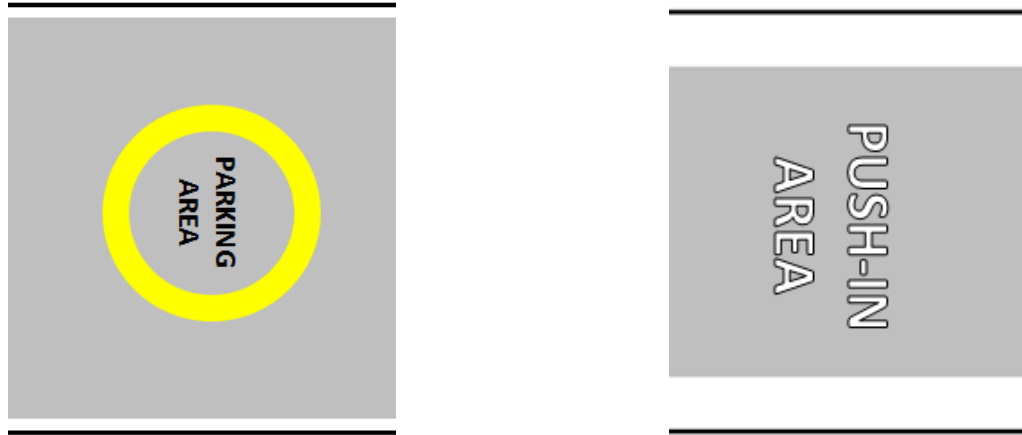
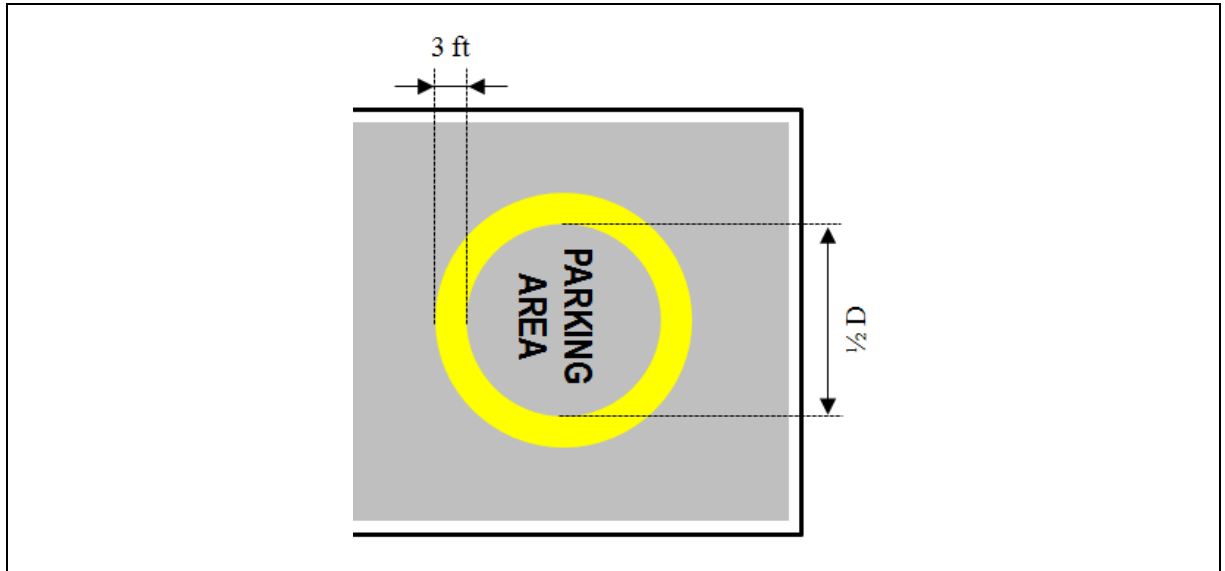


Figure 15: "No Nose" Marking

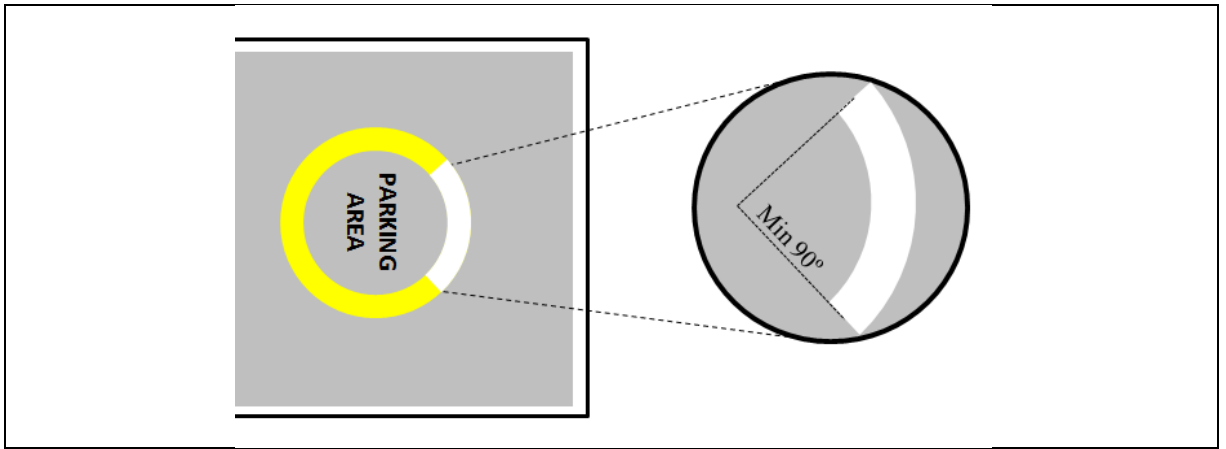


**24 inch high letters black in color with a 4 inch brush stroke stating “PARKING AREA”. The words shall be stacked (as illustrated above) and centered within the parking circle. A push-in area will not have a parking circle and the lettering will be 24 inch high letters white in color with a 4 inch brush stroke and a 1.5 inch black outline stating “PUSH-IN AREA”. The words shall be stacked (as illustrated above).**

**Figure 16: Parking Area/PIA Marking**



**Figure 17: Touchdown Parking Circle (TDPC)**



**Figure 18: Touchdown Parking Circle with Parking Circle Orientation Marking**

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