1. **Purpose of General Requirements:**
These requirements apply to all transformer pads (T.P.’s) except as noted on the T.P. drawings and not to Customer Station Design Group jobs and 34.5kV switch pads. Installations that do not comply with these requirements may be presented to Power Distribution Standards engineering for review and consideration.

2. **Transformer Pad Installation Requirements:**
The Department will provide a drawing giving the T.P. installation details.

3. **Transformer Pad Layout:**
   A. **Transformer Pad Locations:**
   All T.P.’s shall be installed in an unobstructed and leveled location in accordance with the requirements as noted below. There shall be no building projection underneath the T.P. or the required clearance area, such as a subterranean parking structure, basements, or building footings. Additionally, there shall be no foreign pipes, structures, retaining wall, or fence footings in the required clearance area, above or below grade.

   B. **Required Clearances:**
   1. Transformer pads shall have a 3ft minimum workspace clearance as shown in Figure 1, except as otherwise noted. All clearances must be on the property served.
   2. The footprint of architectural projections such as awnings, overhangs and/or balconies shall be considered part of the buildings floor area. Transformer pads, and the required clearance, shall be placed outside of these footprints. For minimum vertical clearance see Table 1 on page C721-01.5. Projections that are located above the minimum vertical clearance in Table 1 are exempt from these requirements.
   3. Plantings such as trees, plants and shrubs shall be outside of the required 3ft clearance on all sides of the T.P. and allow for access to the transformer for maintenance. Trees shall be placed so their growth does not inhibit replacement of the transformer during their lifetime. Light posts and other items shall not be in the required 3ft workspace nor inhibit placement or maintenance of the transformer.
C. Minimum Clearance To Openings (Other Than Natural Garage Vents)

Figure 1.

1. Transformer pads shall be placed at least 10ft radially from all doors (including garage access, meter room door), windows (fixed or operable), fire escapes and egress paths. The intent is to provide a safe path of travel around and away from the transformer. This measurement shall be taken from the closest perimeter of the opening to the closest edge of the T.P. at ground level. (Note: Recessing the window or door beyond the surface of the building does not mitigate the opening).

2. Forced air intakes and/or exhaust vents (such as, but not limited to garage ventilation) must also meet the 10ft clearance rule as stated above.

3. Exception: garage openings (excluding doors) with natural ventilation vents are not subject to the 10ft radial clearance.

FIGURE 1

* Projection to ground considered as floor area. Use as reference for required clearance area.
Switch Gear Location in Proximity of Transformer Pad

“D” = the depth of the switch gear. “L” = the length of the exterior door.

Switch gear doors that may impede safe egress will require at least 2ft of space beyond the door swing as indicated above (Fig. 2). Consult with DWP design engineer or Electric Service Representative (ESR) for clarification.

D. Visibility Obstructions at Uncontrolled Intersections:
At uncontrolled intersections transformer pads shall be placed outside of the visibility triangles to ensure the safe operation of motor vehicles (Fig. 3).
E. Transformer Pad Placed at or above Street Level in Proximity of Retaining Walls, Fences, & Buildings:

* Handrail shall be in compliance with the City of Los Angeles Handrail Standard S-463 latest revision and shall extend to the limits of the workspace.

** A minimum 5'-0" clearance is required when a 4' x 5'-6" precast pad is installed.

*** A minimum 8'-0" operating clearance is required in front of pad.

FIGURE 4

FIGURE 5

FIGURE 6

* Handrail shall be in compliance with the City of Los Angeles Handrail Standard S-463 latest revision and shall extend to the limits of the workspace.

** A minimum 5'-0" clearance is required when a 4' x 5'-6" precast pad is installed.

*** A minimum 8'-0" operating clearance is required in front of pad.
4. Transformer Pad Accessibility:

A. Truck Accessibility:

Transformer pads must be accessible to Department trucks by a permanent, clear, and unobstructed path with a minimum 12ft in width and 14ft in height leading to a staging area along any side of the T.P. If the path to the T.P. contains any turns or uneven terrain, the minimum requirements of 12ft & 14ft previously described may need to be increased. Consult the department engineer when such situations occur. Trucks must be able to approach the T.P. so the side of the truck will be no more than 3ft from any one edge.

B. Staging Area

1. A staging area, as depicted in Figure 7 page C721-01.5, shall be provided for department trucks to access the transformer. The staging area shall meet the size specified in the design matrix provided.

2. The staging area, and access to it, must be maintained on the customer’s private property.

3. The path and the staging area shall be designed to withstand highway loading requirements. Any substructure or underground facility that is located under the path or the staging area shall be designed for a minimum crane and transformer weight, as shown in Table 1 on page C721-01.5, with the load being concentrated on 1 to 4 outriggers.

C. Design:

To avoid any design complications, the Department, at early stages of design, shall approve the preliminary location of the path and staging area. The following items shall be submitted to the Department prior to installation of any DWP equipment:

1. Three drawings (8 1/2” x 11”) showing the path and staging area.

2. A letter releasing the DWP of all liability from any damages incurred to access path and/or staging area as a result of work done by DWP.

3. In the event that there are underground substructures located under the path or the staging area, a letter signed by the owner and a registered structural (civil) engineer accepting responsibility for the design shall also be submitted with the drawings.
TABLE 1

*For Guidance only. Does not apply to all transformers, refer to DWP Design Engineer and marked print.

<table>
<thead>
<tr>
<th>TRANSFORMER SIZE (kVA)</th>
<th>A (FEET)</th>
<th>B (FEET)</th>
<th>WEIGHT IN TONS CRANE PLUS TRANSFORMER</th>
<th>MINIMUM VERTICAL CLEARANCE (FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP TO 750</td>
<td>18</td>
<td>30</td>
<td>24 (MINIMUM)</td>
<td>70</td>
</tr>
<tr>
<td>*1000 TO 2500</td>
<td>30</td>
<td>38</td>
<td>30 (MINIMUM)</td>
<td>100</td>
</tr>
</tbody>
</table>

FIGURE 7

REVISON

C721-01.5

Issued Date: 10/27/09
Revised Date: 09/28/12
5. **Other Considerations:**

   **A. Protection:**

   All T.P.’s, especially when located near traffic or parking areas, shall be protected by non-removable barrier posts, unless otherwise specified by the Department engineer. Field evaluation shall be made by the Department ESR for each installation. Unless approved by the Department ESR, walls may not be used in place of barrier posts. Refer to the figures below for barrier post construction details. For barrier post layout, see T.P. drawings. Use 330-C-1700 or 420-D-1700 or 520-C-2500 for concrete mix design for barrier post anchor and fill. See Underground Construction Standards Drawing 2-125 for equivalent strength hand mix specification.
B. Landscaping and Other Obstructions:
Transformer Pad surroundings and screening are permitted with the compliance of required clearance (see page C721-01, 3B) and accessibility requirements (see page C721-01.4, 4A). Plants, shrubs and other items shall not obstruct the required work space as shown in Figures 1 (on page C721-01.1) and 4, 5, & 6 (on page C721-01.3), nor obstruct access to the T.P. Plantings that interfere with access or workspace may be removed without notice at the customers expense.

C. Inspection:
All material and workmanship are subject to inspection by the Department. Notify the Department ESR two (2) business days in advance of construction. Inspection will be provided free of charge during normal working hours. Charges may be incurred for lost-time inspections.

D. Excavation on Private or Public Property:
Contractors shall notify Underground Service Alert (8-1-1) for substructure locating at least 48 hours prior to any excavation on private or public property.

E. Hazardous Locations:
The T.P. shall be placed outside of classified hazardous locations as defined in Chapter 5-Special Occupancies of the National Electric Code (NEC), i.e. Article 514 on Gasoline Dispensing and Service Stations describes various location requirements.

Transformer Pad Clearances to Fuel Tanks and Associated Equipment

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>A/G Tank</th>
<th>U/G Tank</th>
<th>Dispenser</th>
<th>Fill Pipes</th>
<th>Generators, Self Contained</th>
<th>Piping</th>
<th>Pumps</th>
<th>Vents</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNG</td>
<td>5 ft</td>
<td>10 ft</td>
<td>5 ft</td>
<td>5 ft</td>
<td>10 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>5 ft R</td>
</tr>
<tr>
<td>Diesel</td>
<td>5 ft</td>
<td>10 ft</td>
<td>5 ft</td>
<td>5 ft</td>
<td>10 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>5 ft R</td>
</tr>
<tr>
<td>Gasoline</td>
<td>20 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>5 ft R</td>
</tr>
<tr>
<td>Jet (JP-4)</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft R</td>
</tr>
<tr>
<td>LNG</td>
<td>10 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>5 ft R</td>
</tr>
<tr>
<td>LOX</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft</td>
<td>50 ft R</td>
</tr>
<tr>
<td>Propane</td>
<td>20 ft</td>
<td>20 - 50 ft*</td>
<td>20 - 25 ft**</td>
<td>10 ft</td>
<td>10 ft</td>
<td>20 ft</td>
<td>20 ft</td>
<td>5 ft R</td>
</tr>
</tbody>
</table>

*For tanks over 2,000 gallons **Over 500 Lbs. stored

TABLE 2

F. Noise Considerations:
Some T.P. installations require additional clearance from the pad to adjacent residential property lines to comply with the Los Angeles City Noise Ordinance. Consult with Department design engineer and refer to C721-01.8 for guidelines.

G. Other DWP Specifications:
- DWP ‘P’, ‘H’, or ‘G’ drawing, job construction details
- UB721-XX - Actual T.P. specification drawing
- UB721-XX Switch Pad specification drawing
- UB721-12, UB721-16, Fence Grounding Requirements
- H-242, Methane Area, UG construction guidelines
- H-168, specification drawing, UG residential structure placement and trench design
- Spec. 104, UG conduit and substructure specifications
- DWP Electric Service Requirements
- Etc.
This guide is for use in determining acceptable locations for padmounted transformers in residential zones.

Instructions:
1. Determine the probable minimum ambient night-time sound level by using the typical location values on the chart.
2. Determine the size of the PM transformer to be installed.
3. Locate the point on the curve where the appropriate horizontal ambient sound level line intersects the transformer curve and project downward to determine the minimum distance in feet from the transformer case to adjacent residential property line.
4. If the padmount must be located nearer to an adjacent property then the minimum distance, additional noise mitigation measures may be needed including sound attenuating walls.

Notes:
- The minimum distance refers to the distance to the nearest residential property not including the property where the padmounted transformer is being installed.
- As required, specified customer or Department-provided ambient sound level test may be used instead of the typical values shown.